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City of Sacramento
Planning and Development Department
Environmental Services Division

DRAFT ENVIRONMENTAL IMPACT REPORT (VOLUME 2)

RAILYARDS SPECIFIC PLAN

RICHARDS BOULEVARD AREA PLAN

Prepared by:

EIP Associates
Sacramento, California

June 10, 1992

City of Sacramento
Planning and Development Department
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2. INTRODUCTION

2. *INTRODUCTION*

This Environmental Impact Report (EIR) assesses the potential environmental effects of alternative land use plans that could be implemented under the proposed Railyards Specific Plan (RSP) and the Richards Boulevard Area Plan (RBAP). As required by Section 15165 of the California Environmental Quality Act Guidelines, this EIR assesses the expected individual and cumulative environmental impacts resulting from a range of alternative development plans, and identifies means of minimizing potential adverse impacts.

Notice of Preparation

This EIR has been prepared in compliance with the California Environmental Quality Act (CEQA) and the environmental guidelines of the City of Sacramento. The report addresses issues that were determined to be potentially significant in the Notice of Preparation (NOP), prepared by the City and published on April 15, 1991. Two previous NOPs were prepared and published by the City in September, 1989 and November, 1990. Changes in the project parameters and the desire of the City to receive comment on the scope of the EIR resulted in the need for more than a single NOP. The three NOPs are attached as Appendix A of this report. The responses to the NOPs are attached as Appendix B of this report.

Type of Document

This EIR is a Program EIR, pursuant to Section 15168 of the CEQA Guidelines. The Program EIR is an informational document designed to provide the basis for the local planning and decision-making process. A Program EIR assesses the impacts of a series of actions that can be characterized as one large project and are related in one of the four ways described in Section 15168(a) of the CEQA Guidelines:

- Geographically;
- As logical parts in a chain of contemplated actions;
- In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program; or
- As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

The alternative projects evaluated in this EIR fit each of the above described criteria.

Relationship between the Southern Pacific Railyards Area and the Richards Boulevard Area

Beginning in 1989, land use planning processes have been undertaken in the Southern Pacific Railyards Area, immediately north of the Central Business District, and in the Richards Boulevard Area, immediately north and east of the Railyards. The Southern Pacific Railyards planning process was initiated first and was on a separate schedule from the Richards Boulevard planning process. In 1991, a decision was made to combine the environmental evaluation of the two plan processes, because of the apparent physical tie between the two areas and because of the close scheduling of the otherwise separate environmental review processes.

Despite the physical proximity of the two planning areas, the planning processes for the respective subareas continue to be separate. This EIR evaluates the overall impact of implementation of alternative land use plans in both areas. Where an impact will occur as a result of development in one planning area, the impact is attributed to that planning area. Where an impact will occur as a result of development in both planning areas combined, the impact is considered to be a single effect. To the extent practicable, the separate contribution of each Planning Area to a particular impact is identified.

Alternatives and Special Considerations

This EIR evaluates a wide range of alternative land use plans for both the Southern Pacific Railyards and the Richards Boulevard Planning Area. Since no "proposed project" was identified at the time of the writing of this EIR, the document does not refer to one. A total of seven alternatives for the Planning Areas are evaluated equally in Chapter 4. It is anticipated that a Draft Railyards Area Specific Plan, a Draft Richards Boulevard Area Plan, and a Draft Facilities Master Plan for the combined Planning Areas will be published about the time of publication of this Draft EIR. The EIR alternative that most closely resembles the draft master plans is Alternative 4.

In addition to the seven alternatives that are evaluated fully in Chapter 4, three other alternatives are evaluated in Chapter 6 at a lesser level of detail, pursuant to Section 15126(d) of the CEQA Guidelines. These additional alternatives are presented primarily for comparative purposes.

Also presented in Chapter 6 is a set of "Special Considerations." The Special Considerations are discussions of alternative project characteristics that could have environmental effects, but which are not dependent upon any particular land use plan. The Special Considerations are presented to assist the reader in evaluating the environmental implications of the planning alternatives presented in this document.

Lead and Responsible Agencies

The lead agency for this EIR, as described in Section 15051 of the CEQA Guidelines, is the City of Sacramento Planning and Development Department. The City Planning Commission, acting

on behalf of the City Council, will consider this EIR for certification if it is deemed complete and adequate under CEQA.

Under CEQA, other agencies that have discretionary authority over the project or aspects of the project are considered "Responsible Agencies." Other agencies that may be Responsible Agencies for adoption and implementation of the RSP or the RBAP would include, but may not be limited to, the following:

- Sacramento Housing and Redevelopment Agency
- California Department of Toxic and Substance Control
- California Department of Transportation
- U.S. Army Corps of Engineers
- County of Sacramento
- State Lands Commission
- California State Reclamation Board
- Interstate Commerce Commission
- California Department of Fish and Game
- U.S. Fish and Wildlife Service
- Central Valley Regional Water Quality Control Board
- Sacramento Metropolitan Air Quality Management District
- California Public Utilities Commission

Each of these Responsible Agencies may need to review this EIR, or conduct separate environmental analyses and documentation, as part of their consideration of the project.

EIR Process

Initially, this EIR will be published as a Draft EIR and will be subject to review and comment by the public, as well as all responsible agencies and other interested jurisdictions, agencies and organizations during a period of 90 days, the longest period identified under CEQA Section 15105(a) beginning on June 10, 1992 and ending September 9, 1992. A public hearing will be held jointly by the Sacramento City Planning Commission and the Sacramento Housing and Redevelopment Commission to receive comments on this document on August 5, 1992. After

the end of the public comment period, written responses to all oral and written comments on the Draft EIR will be prepared. The responses to comments may specify changes to the Draft EIR. The responses to comments and any changes to the Draft EIR therein specified will be incorporated into the Draft EIR, and, as such, will become the Final EIR. The Final EIR will be presented to the Sacramento City Planning Commission for certification as to its adequacy under CEQA before the City Planning Commission acts on the project.

A Note to the Reader

This document provides a wide array of environmental information in differing levels of detail. The document is structured to allow the reader to easily track information from the Executive Summary (Chapter 1) through the Description of the Alternatives (Chapter 3) and the impact analyses (Chapter 4). Where appropriate, mitigation measures are identified and numbered consecutively in each section of Chapter 4. This numbering system is carried over into the Summary Table to allow easy location of the document's suggestions regarding a particular impact.

This document can be read in a number of different ways, depending on the reader's available time or interest in a particular issue or set of issues. The reader with a general interest might read only the Executive Summary (Chapter 1), which includes a brief description of the alternative development plans, a text summary of the unavoidable effects of the alternatives, and an impact summary table, which provides salient information about each impact and mitigation measure described later in the document. A somewhat more detailed reading of the EIR might involve careful reading of the full Description of the Alternatives (Chapter 3) and the Executive Summary. For those with an interest in a particular issue, it may be appropriate to add to the above a specific chapter or set of chapters. Finally, one can read the document in its entirety for a detailed presentation of all potential environmental effects of the alternatives.

In order to assist the reader, a summary of acronyms frequently used in this document is included in Table 2-1.

TABLE 2-1
FREQUENTLY USED ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
ADMMF	Average Daily Maximum Month Flow
ADT	Average Daily Traffic
ADWF	Average Dry Weather Flow
AFY	Acre-feet of Water per Year
APCD	Air Pollution Control District
AQAP	Air Quality Attainment Plan
ARB	Air Resources Board
ARPP	American River Parkway Plan
ASPIS	Abandoned Sites Program Information System
BACT	Best Available Control Technology
BMP	Best Management Practice
CAA	Federal Clean Air Act
CAL-EPA	California Environmental Protection Agency
CBD	Central Business District
CCAA	California Clean Air Act
CCOWP	City-County Office of Water Planning
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CERCLA	Comprehensive Environmental Response Compensation Liability Act
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CIP	Capital Improvement Program
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CNEL	Community Noise Equivalent Level
COE/USCOE	U.S. Army Corps of Engineers
CSOs	Control Street Flooding and Overflows
CSWMP	Comprehensive Stormwater Management Program
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Federal Clean Water Act
CWCS	Combined Wastewater Control System
CWTP	Combined Wastewater Treatment Plant
DHC	District Heating and Cooling
DNA	Downtown-Natomas Airport

TABLE 2-1 (Cont)
FREQUENTLY USED ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
DOT	Department of Transportation
DTSC	California Department of Toxic and Substances Control
DU	Dwelling Unit
DWR	California Department of Water Resources
dBA	A-weighted Decibels
EB	Eastbound
EDD	Employment Development Department
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAR	Floor Area Ratio
FIRE	Finance, Insurance and Real Estate
FIRM	Flood Insurance Rate Map
FEMA	Federal Emergency Management Agency
GO	General Order
GSF	Gross Square Feet
HAZOP	Hazards Operations Analysis
HOV	High Occupancy Vehicles
HSWA	Hazardous and Solid Waste Act
HWCL	Hazardous Waste Control Law
KV	Kilovolt
Ldn	Day-Night Average Noise Level
Leq	Energy Equivalent Noise Level
LOS	Level of Service
LRT	Light Rail Transit
MPH	Miles Per Hour
MSA	Metropolitan Statistical Area
MSF	Million Square Feet
MSL	Mean Sea Level
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NB	Northbound
NCIC-CSUS	North Central California Information Center - California State University Sacramento
NEMDC	Natomas East Main Drainage Canal
NEPA	National Environmental Protection Act
NOP	Notice of Preparation

TABLE 2-1 (Cont)
FREQUENTLY USED ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register Historic Places
NURP	National Urban Runoff Program
OSHA	Office of Safety and Health Administration
PG&E	Pacific Gas & Electric
PPM	Parts Per Million
PSR	Project Study Report
PUC	California Public Utilities Commission
PWWF	Peak Wet Weather Flow
RAQP	Regional Air Quality Plan
RBAP	Richards Boulevard Area Plan
RMPP	Risk Management and Prevention Plan
ROC	Reactive Organic Compounds
ROG	Reactive Organic Gases
ROW	Right of Way
RSP	Railyards Specific Plan
RT	Regional Transit
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SACOG	Sacramento Area Council of Governments
SAFCA	Sacramento Area Flood Control Agency
SAQMA	Sacramento Air Quality Maintenance Area
SARA	Superfund Amendments and Reauthorization Act
SB	Southbound
SCEMD	Sacramento County Environmental Management Department
SCS	U.S. Soil Conservation Service
SCUSD	Sacramento City Unified School District
SF	Square Feet
SGPU	Sacramento General Plan Update
SHP	State Historic Park
SHRA	Sacramento Housing and Redevelopment Agency
SLC	State Lands Commission
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utilities District
SPTC	Southern Pacific Transportation Company

TABLE 2-1 (Cont)
FREQUENTLY USED ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
SR	State Route
SRCSD	Sacramento Regional County Sanitation District
SRO	Single Room Occupancy
SRPMP	Sacramento River Parkway Master Plan
SRWTP	Sacramento Regional Wastewater Treatment Plant
STIP	State Transportation Improvement Program
STLC	Soluble Threshold Limit Concentration
SWAT	Special Weapons Assault Team
SWMM	Storm Water Management Model
SWRCB	State Water Resources Control Board
TCM	Transportation Control Measure
TDM	Transportation Demand Management
TMP	Transportation Management Plan
TOS	Traffic Operations System
TSM	Transportation Systems Management
TSP	Total Suspended Particulates
TTCL	Total Threshold Limit Concentration
UBC	Uniform Building Code
USBR	U.S. Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
USPS	U.S. Postal Service
UST	Underground Storage Tanks
V/C	Volume-to-Capacity Ratio
VELB	Valley Elderberry Longhorn Beetle
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WB	Westbound

Source: EIP Associates, 1992

3. *DESCRIPTION OF THE ALTERNATIVES*

3. *DESCRIPTION OF THE ALTERNATIVES*

INTRODUCTION

This Environmental Impact Report (EIR) presents the environmental analysis of seven alternatives for development of approximately 1,310 acres in, and adjacent to, the Richards Boulevard Redevelopment Area. Throughout the EIR, the full area under analysis is referred to as the "Planning Area." The 240-acre Southern Pacific Railyards (which is owned by the Southern Pacific Transportation Company) plus two blocks of the Alkali Flat neighborhood is called the "Railyards Area," and the remaining portion of the Planning Area is referred to as the "Richards Area."

At this writing, two plans have been drafted for the Planning Area. The Railyards Specific Plan (RSP) contains land use designations and design guidelines for the Railyards area. The land use designations and densities of the RSP are identical to those found in Alternatives 4 and 7. The Richards Boulevard Area Plan (RBAP) is more general than the RSP and contains land use densities and designations for the Richards area. These are identical to the designations and densities in Alternative 4. The circulation and utilities infrastructure requirements for the RSP and the RBAP are described in the Facility Element of the Railyards Specific Plan and the Richards Boulevard Area Plan (Facility Element), which appears as Volume II of each plan. For the purposes of this EIR, the physical improvements identified in the Facility Element are considered part of Alternatives 2, 3, 4, 5 (with some modifications), 6 and 7. The Facility Element policies are not considered part of any Alternative.

Planning Area Location and Existing Characteristics

The Planning Area is bounded by the American River to the north and the Sacramento River to the west. The southern border of the Planning Area is generally I Street, the Alkali Flat neighborhood, and the Southern Pacific Main Line railroad tracks. The eastern border is the northern extension of 28th Street. Figures 3-1 and 3-2 show the Planning Area vicinity and location. The Planning Area is depicted on Figures 3-3 and 3-4.

Richards Area

Although close to the Central Business District (CBD), the Richards area is isolated from downtown Sacramento by the Railyards and the elevated Southern Pacific rail line, which limits north-south access. Consequently, the Richards area has not been developed to the intensity of the adjacent CBD. Access to the Richards area is primarily through Richards Boulevard from either Interstate-5 (I-5) or State Route 160 (SR 160). Warehousing, distribution, light industrial

Pacific Ocean

LEGEND

Sacramento County

Project Site

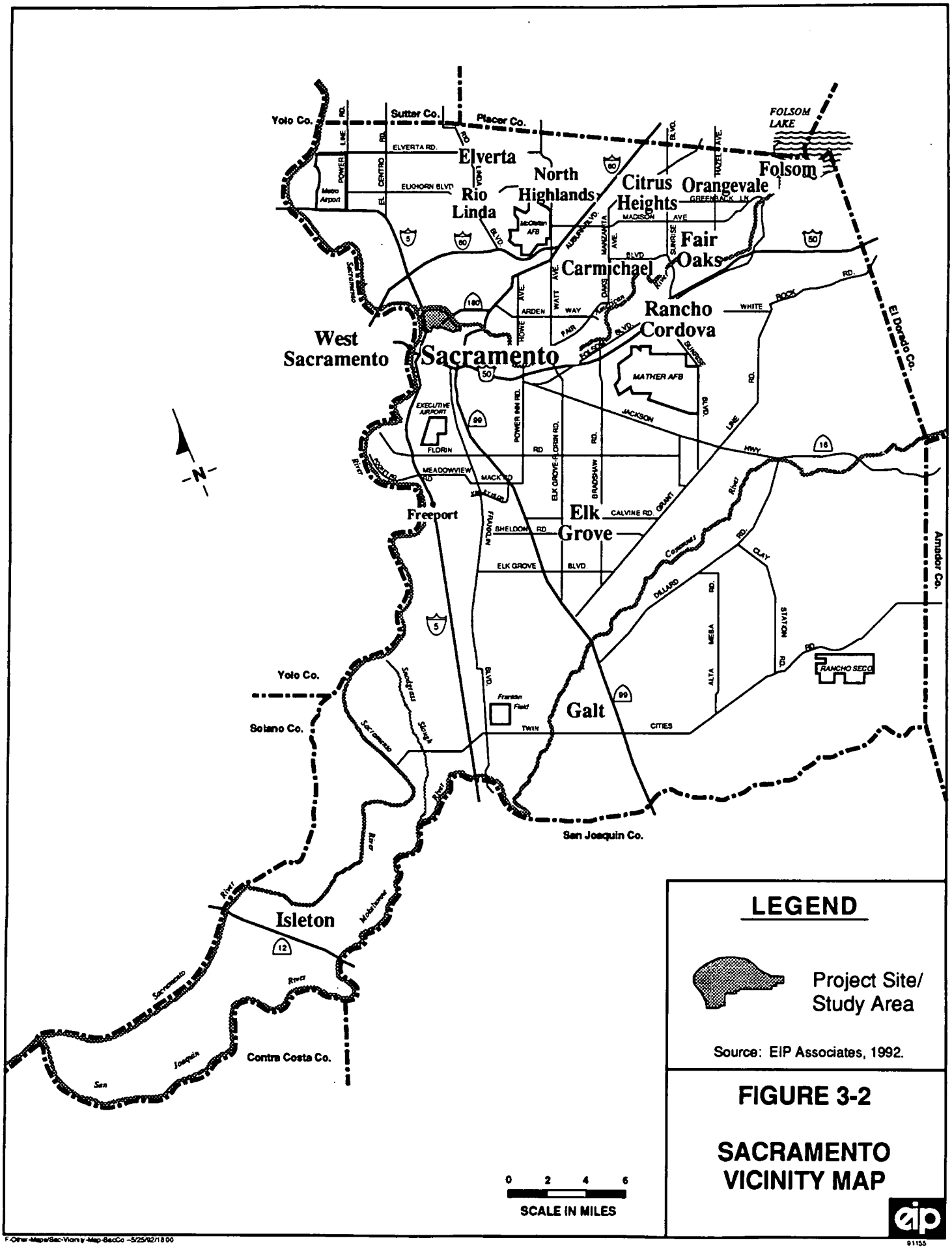
Source: EIP Associates, 1992.

FIGURE 3-1

STATEWIDE LOCATION MAP

F:\Other Maps\SacCo-Locn-NorthrnCalif-5/25/92/18:00

91155


Yolo Co.
Sutter Co.
Placer Co.
Elverta
North Highlands
Rio Linda
Citrus Heights
Orangevale
Folsom
FOLSOM LAKE
Fair Oaks
Carmichael
Rancho Cordova
West Sacramento
Sacramento
MATHER AFB
Freeport
Elk Grove
Galt
Isleton
Solano Co.
Yolo Co.
San Joaquin Co.
Contra Costa Co.
Amador Co.
El Dorado Co.
RANCHO SECO
N
0 2 4 6
SCALE IN MILES
LEGEND
Project Site/ Study Area
Source: EIP Associates, 1992.
FIGURE 3-2
SACRAMENTO VICINITY MAP
91155

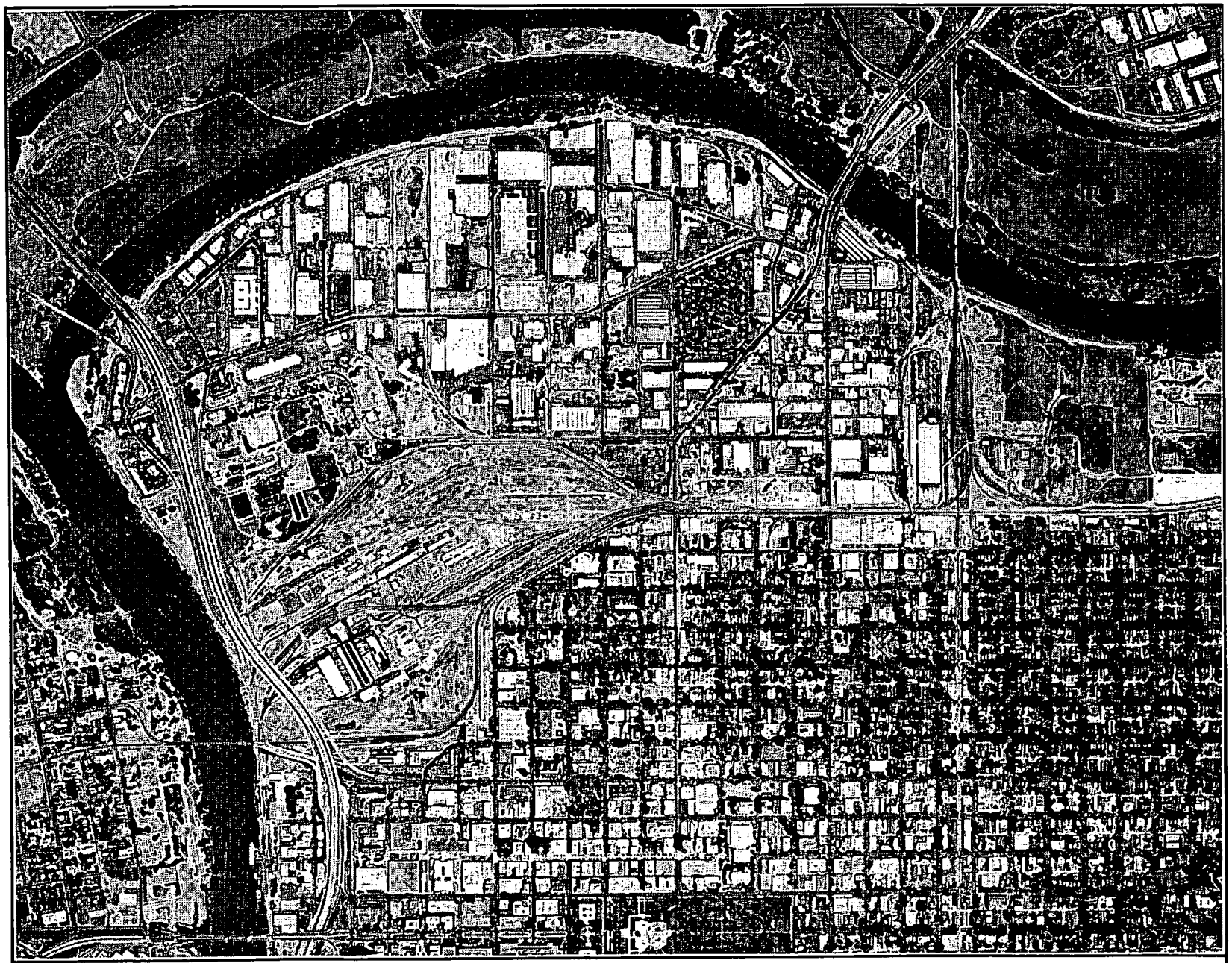


FIGURE 3-3

AERIAL PHOTOGRAPH OF THE PLANNING AREA

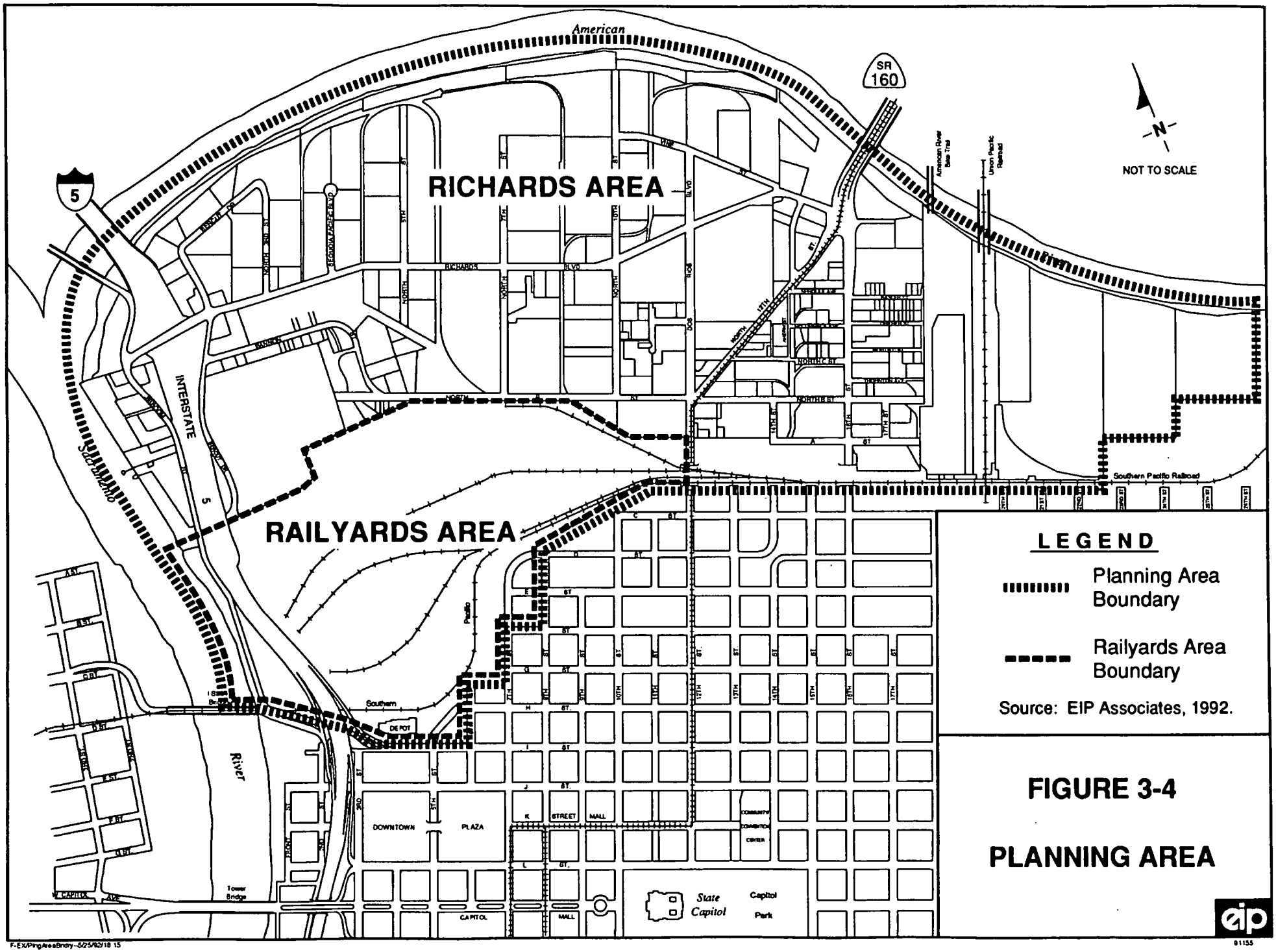


FIGURE 3-4

PLANNING AREA

and commercial uses predominate throughout the area. The portion of the Richards area that fronts on I-5 contains a number of hotels, motels, restaurants and highway commercial uses. In addition, there are two residential neighborhoods within the Richards area. According to the 1990 Census, the Basler-Dreher neighborhood, in the central-eastern portion of the Richards area, has approximately 19 single-family and 12 multifamily homes (a December 1991 SHRA survey found only 25 units). The Dos Rios neighborhood, located between North 12th and Dos Rios streets, is made up of 218 multifamily homes owned by the Sacramento Housing Authority. The Bannon/North B streets neighborhood, located immediately north of the Railyards, contains 18 units, including 11 single-family homes and two multifamily units. A small number of homes exist adjacent to the Railyards' eastern border in the Alkali Edge portion of the Railyards area. For the purposes of this EIR, it is assumed that there are a total of 272 residential units in the Richards area at present.

The Planning Area has one school, Dos Rios Elementary School, and several social service facilities, including the Salvation Army Homeless Shelter and Loaves and Fishes soup kitchen. The Union Gospel Mission and Volunteers of America are located on Bannon Street.

Railyards Area

The Railyards area is located immediately north of the CBD and adjacent to the existing County government center. Currently, the Railyards area contains the Central Shops complex (a rail car switching yard, engine and rail car maintenance and repair shops) and railroad tracks which carry east-west freight and passenger trains. In addition, the Amtrak passenger depot is located in the southern portion of the Railyards area. Several of the Central Shops and the Depot are considered to have historical value. An entryway off of 5th Street between H and I streets provides access to the Depot and adjacent areas. The Shops must be entered from Bercut Drive or Jibboom Street.

Project History

In July 1990, the approximately 1,310-acre Richards area, including the Southern Pacific Railyards, was designated a redevelopment planning area by the Sacramento Housing and Redevelopment Agency (the Redevelopment Plan Area boundary also includes the City/County government center, located between 8 and 10th, F and I streets.) The Agency found that despite the area's proximity to the CBD, its development was impeded by a number of serious problems, including inadequate and outdated infrastructure, poor traffic circulation, irregular configuration of land parcels, and general deterioration and blight. Therefore, the Agency approved establishment of the Richards Boulevard Redevelopment Project Area, finding that tax increment funds generated by the establishment of a redevelopment Planning Area could be employed to ameliorate existing inadequate conditions.

Concurrent with the adoption of the Richards Boulevard Redevelopment Project Area, the Southern Pacific Transportation Company (SPTC) commenced preparation of a master plan for the Railyards area following the SPTC's decision to relocate most of its maintenance, repair and switching operations from the Sacramento railyards to alternate locations throughout the West,

making possible redevelopment of the Railyards site. The RSP was developed over the last two years. Workshops and focus groups were held over the course of a year to solicit ideas and concerns from the community, and to review and refine concepts that would direct development of the plan. The plan proposed by SPTC is evaluated in both Alternative 4 and Alternative 7.

During the development of the RSP, plans were underway for an SHRA "social services campus" that would provide for the consolidation of social service facilities on the Richards area, including temporary shelter and "transitional" housing, along with social services and a new location for the City's detoxification facility. The site currently being considered for the campus is bounded by 12th Street, A Street, 16th Street and the Southern Pacific rail line. Although specific plans for the social service campus have yet to be adopted, the RSP, RBAP and this EIR assume that some sort of centralized social service facility will be located in the Planning Area.

The proposed redevelopment of the Railyards area, with the likely extension of the downtown street grid, extension of light rail to the area, and creation of an Intermodal Transit Station, presented the possibility of substantial land use changes in the Richards area. In response to this opportunity, the Sacramento Housing and Redevelopment Agency (SHRA) held workshops and meetings with the Richards Boulevard Project Area Committee, as well as the general public, in an effort to create a land use plan for the Richards area. The RBAP, as currently proposed (and described in Alternative 4), is intended to dovetail with the RSP. Much of the proposed infrastructure and circulation system is shared by the two plans; hence, the single Facility Element. Similarly, some land uses are related. For example, the RBAP is intended to take advantage of and support the Intermodal Transit Station (located at 7th and North B streets in the RSP) by concentrating high-density office uses near the station. Both areas are proposed for new residential development. There is, however, a difference in the nature of the two plans. Because the Railyards area is smaller than the Richards area, is largely undeveloped, and is held by a single owner, more detail is provided regarding land use designations and design elements.

Concurrent with the development of the RSP and RBAP, a Facility Element was created to identify the infrastructure and utility needs of the two land use plans. The Facility Element contains circulation, water, sewer, drainage and other facilities that will be required by both plans. For the purposes of this EIR, the physical improvements of the Facility Element are assumed as part of all Alternatives except 1 and 5. No circulation or other improvements are assumed for Alternative 1. For Alternative 5, the Facility Element improvements are assumed, as modified to reflect the land use differences.

Because of the relationship between the two planning processes, the City and SHRA elected to consider the environmental impacts of both concurrently. Likewise, the City, as lead agency for the project environmental review, determined that an analysis of both plans in a single EIR would provide a more comprehensive and intelligible assessment of environmental implications. Nevertheless, it would be possible for the Sacramento City Council to approve one plan and reject the other. This EIR is designed to provide adequate analysis of environmental impacts in that event.

Project Objectives

Objectives for the Planning Area were developed through the public workshop processes. Although the City has not acted on these objectives, they are presented here for the reader's information. To the extent that the City Council embraces these objectives, they should be used, in part, to determine the most desirable alternative.

The land use objectives described in the RBAP are as follows:

1. Provide for the development of a diverse mixture of uses within the Richards area which will complement Sacramento's downtown district, provide a variety of housing opportunities and facilitate the enhancement and revitalization of the Richards Boulevard area.

2. Provide for the continuation of existing industrial and service commercial uses.

3. Maintain and improve retail services in the area.

4. Strengthen Sacramento's Central City as the region's principal employment center, through the creation of a significant transit-oriented support office district in close proximity to the downtown and State Capitol.

5. Provide for a significant component of housing within the Richards Boulevard Planning Area, in order to reinforce the Central City as a place to live, as well as work.

6. Enrich the quality and livability of the area by improving community and human services.

7. Configure land uses and development intensity in a way that reinforces transit ridership and supports public investment in transit facilities, particularly the planned intermodal station, and the extension of light rail service through the area.

8. Strengthen the character and livability of the Richards Boulevard area by developing a strong system of public open space, and by preserving historic architectural resources.

9. Ensure that all new uses within the Richards Boulevard Planning Area comply with applicable law regarding hazardous material remediation and incorporate precautions that protect adjoining uses from unacceptable health and safety risks.

The objectives described in the RSP are as follows:

1. Create a high-density mixed-use residential neighborhood which builds upon the unique qualities of the Central City's neighborhoods, and that can contribute to the fulfillment of Sacramento's housing needs.

2. Extend the pattern and vitality of downtown Sacramento into the Railyards area to reinforce the role of the core as the principal governmental, commercial and cultural center of the region.

3. Create a significant support office district that enhances the competitive position of the Central City as a regional employment center, and that promotes transit ridership.

4. Preserve and restore the core of the Central Shops complex as a major cultural and public-oriented amenity of regional and statewide significance.

5. Introduce development and open spaces along and beneath the I-5 freeway viaduct, to reduce the visual and acoustical impacts of the highway and to provide linkages between the Central Shops, Sacramento River, and Old Sacramento.

6. Create a strong northern edge to the Central Shops historic district to reinforce its spatial definition and its viability as an activity center.

The purpose of the Facility Element is to identify the facilities and infrastructure required by development under the RSP and RBAP. The Facility Element objectives include the following:

Circulation

1. Reinforce downtown Sacramento as the regional transportation hub with improved light rail, intercity rail, commuter rail, intercity and local bus service.

2. Provide for freeway improvements that will relieve existing congestion points and improve regional access to the downtown planning areas.

3. Complete the Central City arterial street system in a manner which relieves existing congestion and serves future land use needs.

4. Create a system of collector roads that provide for the efficient distribution of traffic within the planning areas.

5. Create a street system which extends the unique qualities of downtown neighborhood streets, gives structure and orientation to the downtown experience, and enhances the pedestrian environment.

6. Extend and improve the existing system of bicycle circulation in downtown Sacramento.

7. Develop Transportation Systems Management (TSM) programs which discourage single occupancy vehicle trips and maximize transit use.

Utilities

1. Provide a storm drainage system that achieves water quality objectives for the Sacramento and American Rivers, and that relieves pressure on the existing combined system in the downtown area.

2. Provide for the sanitary sewage needs of the project while complying with standards established by the Regional Water Quality Control Board.

3. Provide adequate water facilities to serve the needs of new development, and apply water conservation techniques that will reduce overall demand.

4. Provide adequate electrical and gas service to support future development, and provide a program of energy conservation.

Implementation

1. Provide for the orderly phasing of development to correspond with the financing and construction of infrastructure.

2. Obtain the land required to implement the necessary public facilities and infrastructure.

3. Provide for the timely and cost-efficient design and construction of public facilities.

4. Establish institutional arrangements and administrative procedures necessary for implementation and ongoing management and maintenance of public facilities required by the plan.

5. Provide for the funding of all infrastructure improvements.

In addition, the City's objectives include redeveloping the Richards area and the Railyards area in a manner that provides the financial incentives to private developers necessary to implement land use changes, and to support the proposed infrastructure improvements and other public amenities. Further, it is the objective of private landowners and developer interests to realize a reasonable return on their investments in the area.

Project Characteristics

The EIR fully analyzes seven Alternative land use plans for the Planning Area. Each of these Alternatives is analyzed at an equal level of detail. For the purposes of the EIR, no single Alternative is considered the "proposed" or "preferred" project.

Full EIR Alternatives

The following project Alternatives are analyzed at the same level of detail:

A-1 Alternative 1 is the No Project Alternative, and assumes that development would continue under current zoning, with some limited discretionary approvals being granted for projects that are not consistent with existing zoning. The development of the SHRA social services campus, a small amount of new retail and one hotel are also assumed under this alternative.

A-2 Alternative 2 provides the greatest amount of housing of any of the Alternatives. In addition, Alternative 2 includes mid-rise office development. The development of the SHRA social services campus, a substantial amount of new retail space, some cultural/institutional uses, and over 1,000 hotel rooms are also assumed under this alternative.

A-3 Alternative 3 also contains a large amount of housing, although slightly less than that found in Alternative 2. The reduction of housing is accompanied by dense, high-rise office development. The development of the SHRA social services

campus, a substantial amount of new retail space, some cultural/ institutional uses, and over 1,000 hotel rooms are also assumed under this alternative.

A-4 Alternative 4 reflects the land uses proposed in both the RSP and the RBAP, with a mix of housing and office uses. The development of the SHRA social services campus, a substantial amount of new retail space, some cultural/ institutional uses, renovation of the historic Railyard shops, and over 1,000 hotel rooms are also assumed under this Alternative.

A-5 The major difference in Alternative 5 is the location of the Intermodal Transit Station just north of the existing Amtrak depot, rather than the 7th and North B streets location assumed under Alternatives 2-4, 6 and 7. The new rail alignment affects the location and intensity of housing and office uses, the circulation system and other infrastructure. The development of the SHRA social services campus, some new retail space, some cultural/institutional uses, and 1,000 hotel rooms are also assumed under this alternative.

A-6 Alternative 6 contains the greatest amount of office development among the Alternatives. Only a small number of residential units are found in this alternative. The development of the SHRA social services campus, a substantial amount of new retail space, some cultural/institutional uses, renovation of the historic Railyards shops, and over 1,000 hotel rooms are also assumed under this alternative. Due to limitations on the potential future office market, buildout of this alternative could take much longer than for other alternatives.

A-7 For the Railyards area, Alternative 7 is identical to Alternative 4. In the Richards area, Alternative 7 contains substantially more office space and a slightly higher number of residential units. The development of the SHRA social services campus, a substantial amount of new retail space, some cultural/institutional uses, renovation of the historic Railyards shops, and over 1,000 hotel rooms are also assumed under this alternative.

Each Alternative is described in detail later in this chapter.

Other EIR Alternatives

An additional set of three Alternatives is analyzed in the EIR at a lesser level of detail, for purposes of comparison with the seven fully-analyzed Alternatives. Each of the three additional Alternatives is a variation of one of the fully analyzed Alternatives. The three Alternatives that are analyzed at a lesser level of detail are described in Chapter 6. They are as follows:

A-1A. Under this No Project Alternative, special permits would be granted in the Richards area, resulting in a slightly higher level of development.

A-4A. Development in the Railyards area would be the same as Alternative 4, but office and residential uses would not occur north of Richards Boulevard, resulting in less development. The light rail line would extend to the Intermodal Transit Station.

A-4B. This Alternative is similar to Alternative 4A, except that some amount residential and office development would occur in the Richards area. The light rail would extend to Richards Boulevard, but not beyond.

Special Considerations

The EIR also evaluates a range of land use and planning decisions that are elements of the Alternatives, but that are not dependent on any one particular set of land uses. These separate "special considerations" include the following:

- Circulation Alternatives for the Richards Area: The effects of a single boulevard, rather than the couplet systems found in Alternatives 2 through 7, are examined, along with other possible roadway systems configurations.

- New Rail Bridge Over the Sacramento River: Because of track realignment, most of the Alternatives include a new rail bridge. The effects of using the existing I Street Bridge permanently, rather than constructing a new one, are addressed.

- Location of the Intermodal Transit Station: There is a wide range of potential locations for the Intermodal Transit Station in addition to those evaluated in the Alternatives. These additional locations are analyzed.

- Convention Center: Although not a proposed use in any plans, a convention center has been debated as a potential future use in the Planning Area. The effects of a building a convention center in the Planning Area are discussed.

Description of the Alternatives

The Alternatives fully analyzed in this EIR were chosen to represent a broad range of development, a diverse mix of uses, and a number of land use configurations. New office development ranges from 1 million square feet (msf) in Alternative 1 to 26.4 msf in Alternative 6, while residential development ranges from zero new units in Alternative 1 to 3,700 units in Alternative 6 to 11,900 units in Alternative 2.

The amount of development, by use, is described below and in the attached tables and figures. The Facility Element is discussed after the Alternatives descriptions. The Alternatives are described according to phase: Phase One represents development for the first 10 years following project approval; Phase Two represents the subsequent 10 years; and Phase Three represents 20 years following project approval to buildout. For the purposes of this EIR it is assumed that Phase One would be complete by the year 2000 and Phase Two by 2010. It is likely that

buildout will take place sometime beyond 2025. The circulation and infrastructure components described in the Facility Element are designed to be constructed on a phased basis as needed to correspond with development. The EIR evaluates the effects of development in each of the phase years where appropriate.

Table 3-1 provides a comparison of the commercial and institutional square footage, and the number of dwelling units and hotel rooms between the seven Alternatives. Tables 3-2 through 3-8 describe the amount of new development by type allowed under each Alternative. In addition, the amount of space that exists at present, and that would remain under each Alternative is shown by phase and land use.

TABLE 3-1

COMPARISON OF NEW DEVELOPMENT BY ALTERNATIVE
(in thousands of square feet unless otherwise noted)

Land Use Alternative	Office	Retail	Industrial	Residential (dwelling units)	Hotel (rooms)	Cultural/ Institutional
1	1,000	140	1,000	0	250	0
2	10,540	1,150	0	11,630	1,140	130
3	11,840	1,050	0	11,330	1,140	150
4	15,648	1,057	0	6,660	1,140	320
5	16,440	290	0	6,120	1,000	170
6	26,400	1,030	0	3,430	1,140	320
7	19,898	1,052	0	6,690	1,140	320

SOURCE: ROMA Design Group, 1992.

Alternative 1

CEQA requires an analysis of the effects that would occur if no project were approved. In this EIR, impacts are measured against the existing conditions, as described in the "Setting" of each section. The No Project Alternative includes development that might take place if no action is taken on any of the Alternatives, and no new plan documents pertaining to the Planning Area are adopted.

For the purposes of this EIR, it is assumed that some development, consistent with existing zoning, would take place under this Alternative (see Figure 3-5 and Table 3-2). Total new development at buildout would include 1 msf of office space, 140,000 square feet of highway commercial/retail use, 1 msf of heavy commercial/light industrial uses, and 250 hotel rooms. No new housing or cultural/institutional space would be constructed.

About 1 million square feet of transportation and utility-related industrial development would occur in the Railyards area, with half of this development occurring in Phase One and the remainder completed in Phase Two. The existing shops and station site would remain and continue to be used for their current purposes.

A limited amount of new development would occur in the Richards area, primarily warehouse and office. New development in the Richards area would amount to 1 million square feet of office uses, 140,000 square feet of highway commercial/retail and 250 hotel rooms in the Riverfront/I-5 area. All of the office space would be expected to be built in Phase One, while the additional hotel development would occur in Phase Two. Highway commercial/retail uses would be spread out among the three phases, with 40,000 square feet in each of Phase One and Phase Two and 60,000 square feet in Phase Three. The Sacramento Regional Transit (RT) Downtown-Natomas-Airport (DNA) light-rail line would transect the Planning Area as planned and the social services campus would be developed. Table 3-2 presents development by area and phase for the No Project Alternative.

Alternative 2

Alternative 2 represents the greatest amount of housing among the Alternatives. The increased residential use would require substantial amounts of land, thus the potential for office development would decrease, resulting in a skyline that would differ from the other Alternatives. With office development reduced, the Planning Area would not be likely to generate tax increment revenue or revenue from developer fees adequate to renovate and maintain the Central Shops complex as cultural space. In addition, increased residential uses would require extensive open space to meet City park and open space requirements. Consequently, there is no preservation of historic buildings under this Alternative, and the entire Central Shops complex would be converted to open space.

This Alternative would result in the development of 11,650 residential units and 10.54 msf of office space in the Planning Area (see Figure 3-6 and Table 3-3). Other development would include a total of 1.15 msf of highway commercial/retail use, and 1,140 hotel rooms in the Riverfront/I-5 area, and 130,000 square feet of cultural and institutional uses along the Sacramento Riverfront, west of the Central Shops Area. Office development under this Alternative would be in buildings of mid-rise height (10 to 15 stories), which is not as tall as under Alternatives 3, 4, 5, 6, or 7. With more residential development, residential areas would be larger, although density is not expected to be higher than other Alternatives. The Southern Pacific rail line would be moved to the northern alignment of the Railyards area.

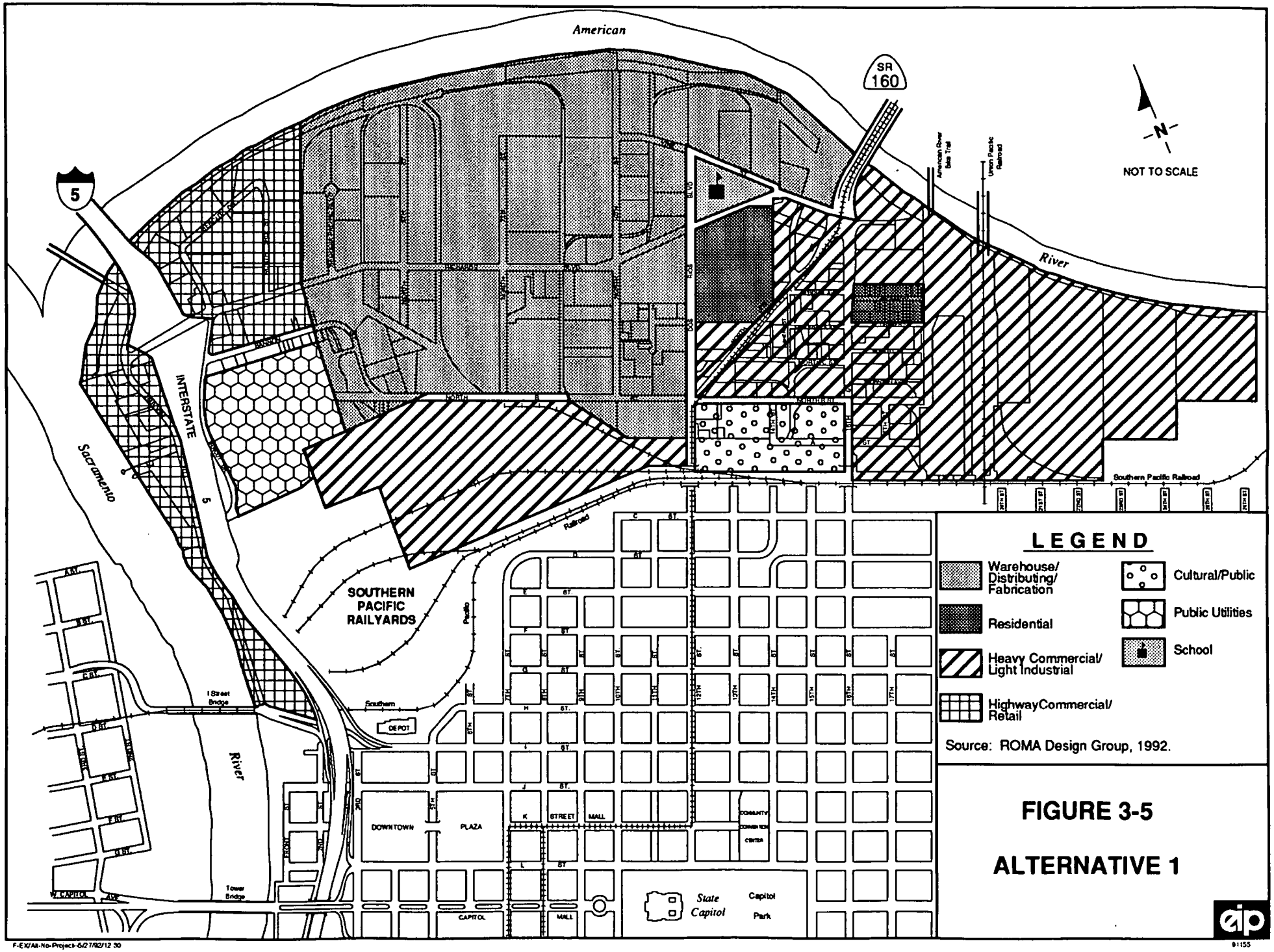


FIGURE 3-5

ALTERNATIVE 1

TABLE 3-2
PROJECT CHARACTERISTICS - ALTERNATIVE 1
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain-- Railyard	Existing to Remain-- Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			--	1,000	1,000	
2010			--	--	--	
Buildout			--	--	--	
Total Office	--	850	--	1,000	1,000	1,850
Highway Commercial/Retail						
2000			--	40	40	
2010			--	40	40	
Buildout			--	60	60	
Total Highway Commercial/Retail	--	260	--	140	140	400
Heavy Commercial/ Light Industrial						
2000			500	--	500	
2010			500	--	500	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	600	6,000	1,000	--	1,000	7,600
Residential (Units)						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Residential Units	--	272	--	--	--	272
Hotel (Rooms)						
2000			--	--	--	
2010			--	250	250	
Buildout			--	--	--	
Total Hotel Rooms	--	1,250	--	250	250	1,500
Cultural/Institutional						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Cultural/Institutional	--	--	--	--	--	--

SOURCE: ROMA Design Group

Figure 3-6

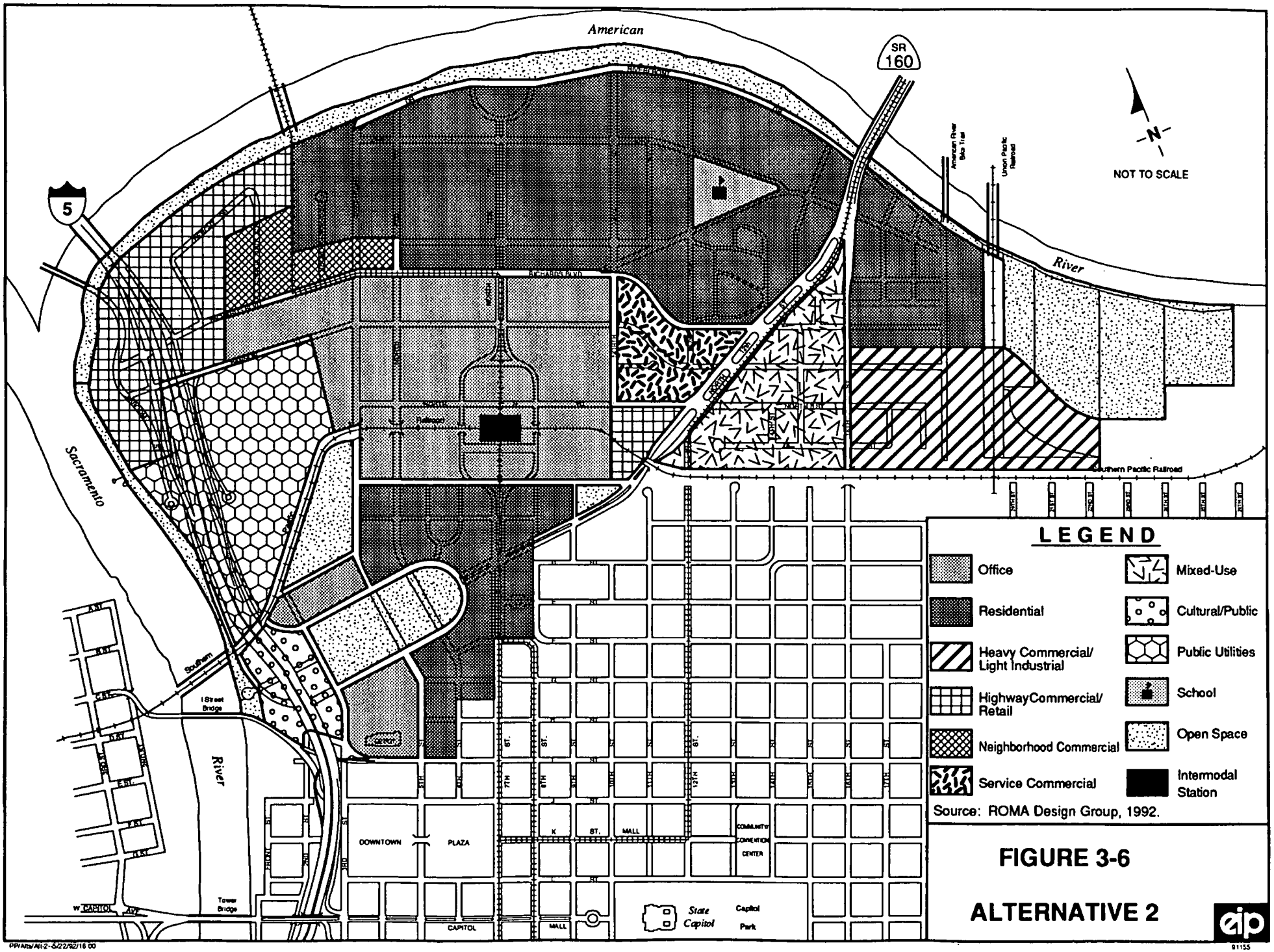


FIGURE 3-6

ALTERNATIVE 2

TABLE 3-3
PROJECT CHARACTERISTICS - ALTERNATIVE 2
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain-- Railyard	Existing to Remain-- Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			2,110	1,200	3,310	
2010			3,010	2,000	5,010	
Buildout			--	2,220	2,220	
Total Office		850	5,120	5,420	10,540	11,390
Highway Commercial/Retail						
2000			100	150	250	
2010			170	250	420	
Buildout			250	230	480	
Total Highway Commercial/Retail	--	50	520	630	1,150	1,200
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	1,350	--	--	0	1,350
Residential (Units)						
2000			1,310	700	2,010	
2010			1,340	2,260	3,600	
Buildout			950	5,070	6,020	
Total Residential Units	--	272	3,600	8,030	11,630	11,900
Hotel (Rooms)						
2000			--	250	250	
2010			500	250	750	
Buildout			140	--	140	
Total Hotel Rooms	--	1,250	640	500	1,140	2,390
Cultural/Institutional						
2000			--	--	--	
2010			65	--	65	
Buildout			65	--	65	
Total Cultural/Institutional	--	--	130	--	130	130

SOURCE: ROMA Design Group

Table 3-3 presents development by land use and phase for Alternative 2. Residential development in the Railyards area would be phased, with 1,310 units constructed in the first phase, 1,340 in the second phase, and 950 in the third phase. Most of the Richards area residential development--5,070 units--would occur in Phase Three, while 2,260 units would be constructed in the second phase and 700 units during Phase One. Office space in the Railyards area would be completed in the second phase. Phase One would include 2.11 msf of office and Phase Two would have 3.01 msf. Office development would occur in the Richards area in each phase with 1.2 million square feet in Phase One, 2.0 msf in Phase Two, and 2.22 msf in Phase Three.

Alternative 3

This Alternative is similar to Alternative 2, but includes more office development at higher densities (see Figure 3-7). Total new office development in Alternative 3 would include 11.8 msf; other uses would include 1.05 msf of highway commercial/retail, 150,000 square feet of cultural/institutional, 1,140 new hotel rooms and 11,330 dwelling units.

Within the Railyards area, 2.3 million square feet of office development would occur in Phase One, 3.3 msf in Phase Two and .5 msf in Phase Three. Residential areas would be somewhat smaller in the Railyards area under this Alternative than under Alternative 2. However, residential densities would be higher on the RSP portion of the site, so that the total number of units would be only slightly lower than Alternative 2. Approximately 800 units would be constructed in Phase One, 1,300 units in Phase Two and 1,200 units in Phase Three.

The total number of housing units in the RBAP would be the same, but the phasing differs slightly with 1,000 units in Phase One, 2,250 in Phase Two and 4,770 in Phase Three, for a total of 8,050. Some of the most important historical buildings in the Central Shops complex would be preserved, but many of the historic buildings would be demolished in order to provide open space.

As under Alternative 2, the Southern Pacific rail line would be moved to the northern alignment in the Railyards area. Table 3-4 presents development by land use and phase for Alternative 3.

Alternative 4

Under this Alternative, development in the Planning Area would be consistent with the RSP and the RBAP as currently proposed. As shown in Table 3-5, development under this Alternative is assumed to result in approximately 15.65 million square feet of office uses, approximately 1.06 million square feet of highway and retail commercial uses, 6,750 new residential units, 1,140 new hotel rooms and 320,000 square feet of cultural/institutional uses.

With Alternative 4, the Railyards area would have a mix of uses including office, residential, neighborhood commercial and cultural uses. Class "A" and government office space would be concentrated at the southern end of the Railyards area, on the Sacramento Station site. Residential uses would be concentrated in the center of the Railyards area, north and east of the Central Shops. The Intermodal Transit Station would be located at the 7th Street/B Street location; uses in the blocks surrounding the station would be a mixture of prime and support

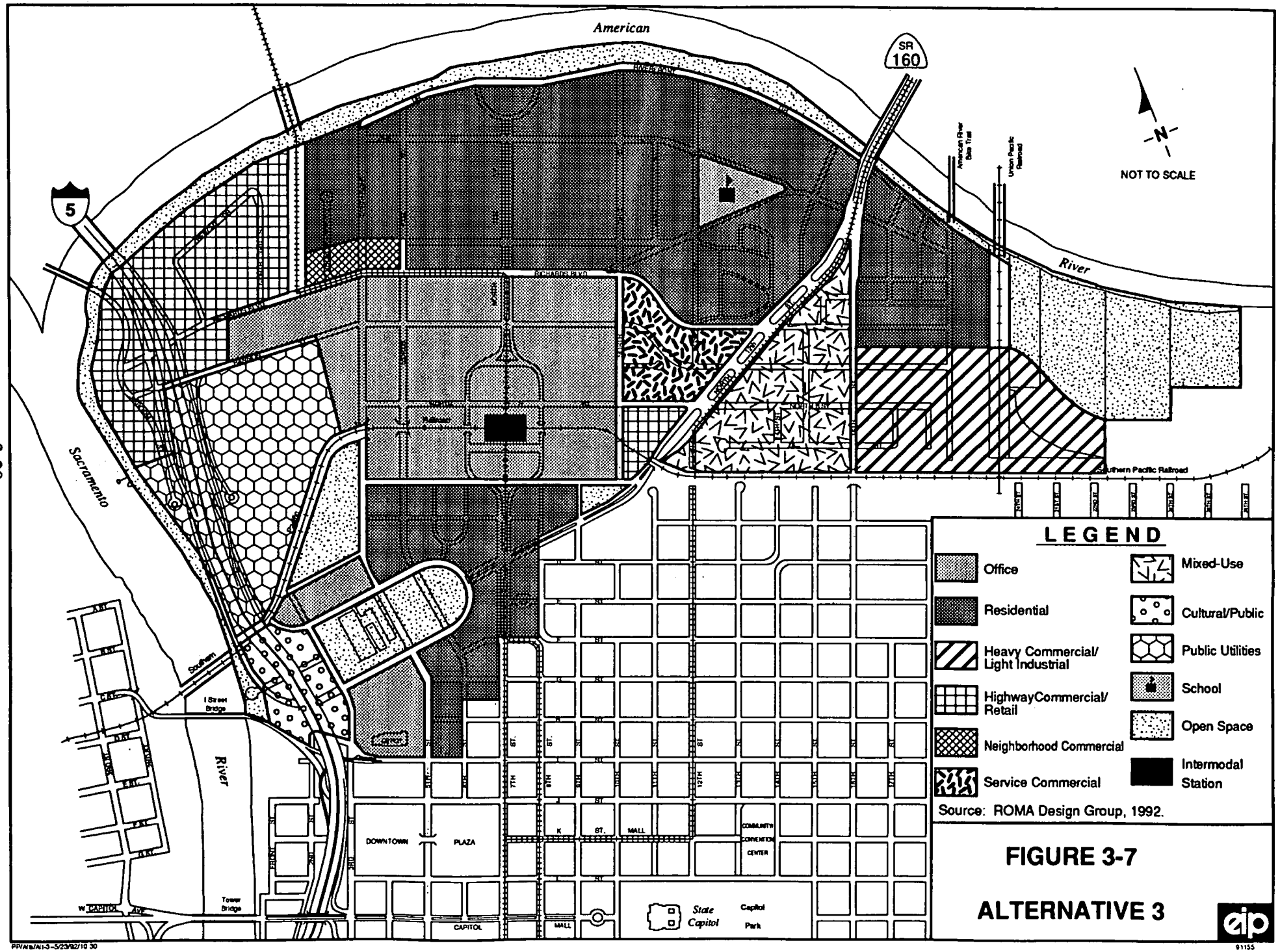


FIGURE 3-7

ALTERNATIVE 3

TABLE 3-4
PROJECT CHARACTERISTICS - ALTERNATIVE 3
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain--Railyard	Existing to Remain--Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			2,340	1,200	3,540	
2010			3,330	2,000	5,330	
Buildout			550	2,420	2,970	
Total Office	--	850	6,220	5,620	11,840	12,690
Highway Commercial/Retail						
2000			100	50	150	
2010			170	250	420	
Buildout			250	230	480	
Total Highway Commercial/Retail	--	50	520	530	1,050	1,100
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	1,350	--	--	0	1,350
Residential (Units)						
2000			810	1,000	1,810	
2010			1,290	2,260	3,550	
Buildout			1,200	4,770	5,970	
Total Residential Units	--	272	3,300	8,030	11,330	11,600
Hotel (Rooms)						
2000			--	250	250	
2010			500	250	750	
Buildout			140	--	140	
Total Hotel Rooms	--	1,250	640	500	1,140	2,390
Cultural/Institutional						
2000			--	--	--	
2010			75	--	75	
Buildout			75	--	75	
Total Cultural/Institutional	--	--	150	--	150	150

SOURCE: ROMA Design Group

TABLE 3-5
PROJECT CHARACTERISTICS - ALTERNATIVE 4
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain--Railyard	Existing to Remain--Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			2,342	870	3,212	
2010			3,967	1,650	5,617	
Buildout			3,339	3,480	6,819	
Total Office	--	850	9,648	6,000	15,648	16,498
Highway Commercial/Retail						
2000			75	50	125	
2010			192	215	407	
Buildout			250	275	525	
Total Highway Commercial/Retail	--	50	517	540	1,057	1,107
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	2,000	--	--	0	2,000
Residential (Units)						
2000			--	--	--	
2010			1,130	1,450	2,580	
Buildout			1,670	2,410	4,080	
Total Residential Units	--	272	2,800	3,860	6,660	6,930
Hotel (Rooms)						
2000			--	--	--	--
2010			500	250	750	
Buildout			140	250	390	
Total Hotel Rooms	--	1,250	640	500	1,140	2,390
Cultural/Institutional						
2000			--	--	--	
2010			170	--	170	
Buildout			150	--	150	
Total Cultural/Institutional	--	--	320	--	320	320

SOURCE: ROMA Design Group

offices. The Central Shops complex would house cultural and commercial-recreational uses, and would serve as a major public gathering area with direct access to the Sacramento River and Crescent Park.

Within the Railyards area, 9.6 msf of office space would be built--2.3 msf in Phase One, 4.0 msf in Phase Two and 3.3 msf in Phase Three. Office development in the Richards area would include .87 msf in Phase One, 1.65 msf in Phase Two and 3.48 msf in Phase Three, for a total of 6 msf. Railyards area housing development would include 1,130 units in Phase Two and 1,670 units in Phase Three. Development of housing in the Richards area for Phases Two and Three would include 1,450 and 2,500 units, respectively, for a total of 3,950. No housing would be constructed in Phase One.

Under Alternative 4, development in the Railyards area would be guided by the RSP. General Plan designations and zoning would conform to Figure 3-8. Because the Railyards has one owner that is planning to vacate the site, the entire area can be redesignated at one time. The phasing outlined in Table 3-5 is driven by physical and economic constraints. For example, residential uses will not be developed until Phase Two, so that hazardous areas may be fully remediated and a market created for the housing type that will be constructed.

The principle objective of the RBAP is to create "a mixed-use district of office, residential and commercial uses oriented to transit" (page 17). Within the Richards area, primary land use districts would be established as shown in Figure 3-8. Most districts would have a combination of allowable uses. The districts and allowed uses are:

Highway/Commercial: Within 400 feet of the American and Sacramento Rivers, permitted uses include visitor oriented services, such as hotels, motels, restaurants, visitor centers, and recreational retail uses. Outside the 400-foot zone, permitted uses include automobile service stations, convenience markets, and existing office and flex space uses.

Service Commercial: Permitted uses include heavy commercial uses, such as printing, small-scale assembly and manufacturing, wholesale home and business enterprises, "incubator businesses", research and development, and region-serving retail. Ancillary office uses are allowed up to a maximum of 25 percent of gross floor area. Conditionally allowed uses include social services (including the social service campus with homeless shelter, detoxification center, counseling, medical and administrative services), neighborhood retail, restaurants, nightclubs, indoor recreation, single and multiple family residential, alternative housing (e.g. live/work, cottages and single-room occupancy units), and day care facilities.

Office: Permitted uses are limited to offices for government or private industry that reinforce the use of transit facilities planned for the area. Conditionally permitted uses include multifamily residential, neighborhood-serving retail, restaurants, and child care centers.

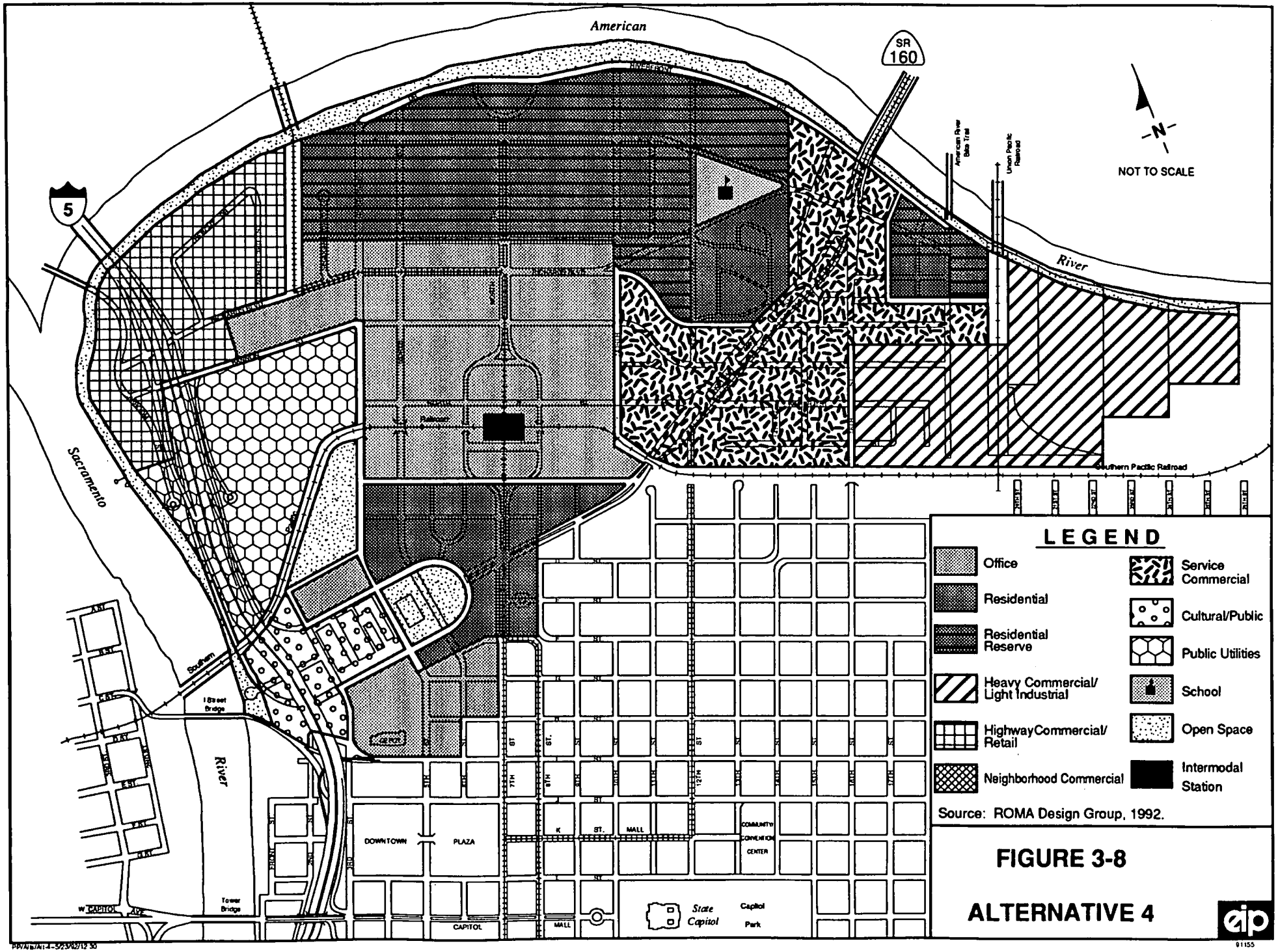


FIGURE 3-8

ALTERNATIVE 4

Residential: Applied to the existing Dos Rios and Basler-Dreher neighborhoods. Single and multifamily residential uses would be permitted. Conditionally permitted uses include senior housing, child care centers, neighborhood-oriented commercial, residential care facilities, and community facilities.

Residential Reserve: Existing commercial and industrial uses are allowed to continue as conforming uses and may expand, contingent on meeting performance standards for noise, light and glare, hours of operation, and handling of hazardous and toxic materials. Land is identified for future residential development. Conditional uses include new service commercial with less than 50,000 square feet, alternative housing (live/work, single-room occupancy (SRO), cottages), senior housing, neighborhood commercial, residential care facilities, and community facilities (parks, schools, community centers, religious institutions). New office and heavy processing and manufacturing would not be allowed. M-2 zoning would be retained for the first 15 years, after which residential zoning would be enforced.

Industrial Preserve: Permitted uses limited to industrial uses, such as food processing and small-scale processing and fabrication, public utilities, and administrative offices that do not exceed 25 percent of the floor area of industrial buildings. No conditional uses are identified.

Public Facilities: Large public facilities and utilities, primarily the City's water treatment plant at the west end of the Planning Area would be allowed.

Like the RSP, the RBAP calls for securing land and preparing sites for housing development in Phase One. The first housing units would be constructed in Phase Two, and would be subsidized. By Phase Three, it is anticipated that a market for housing in the Planning Area would be created, and the subsidies would cease.

Alternative 4 evaluates full buildout of both the RSP and the RBAP as currently proposed. Alternatives 4A and 4B, found in Chapter 6, describe the impacts that are anticipated if the RBAP is not fully built out. The anticipated impacts should housing not be successfully established in the residential reserve designation are discussed under Alternative 4A. The failure to construct the entire transit portion of the circulation element, particularly the light-rail extension, will affect the provision of office and other uses in the Richards area and is examined under Alternative 4B.

Alternative 5

Under this Alternative, the Southern Pacific rail line would be moved toward the center of the Railyards area, just south of the existing Central Shops complex, rather than to the northern alignment assumed for Alternatives 2, 3, 4, 6, and 7 (see Figure 3-9). The Intermodal Transit Station would be located adjacent to the Central Shops complex on a southeast-northwest alignment. As assumed under most of the other Alternatives, 5th, 6th, and 7th streets would be extended to Richards Boulevard. Development under this Alternative would result in a total of

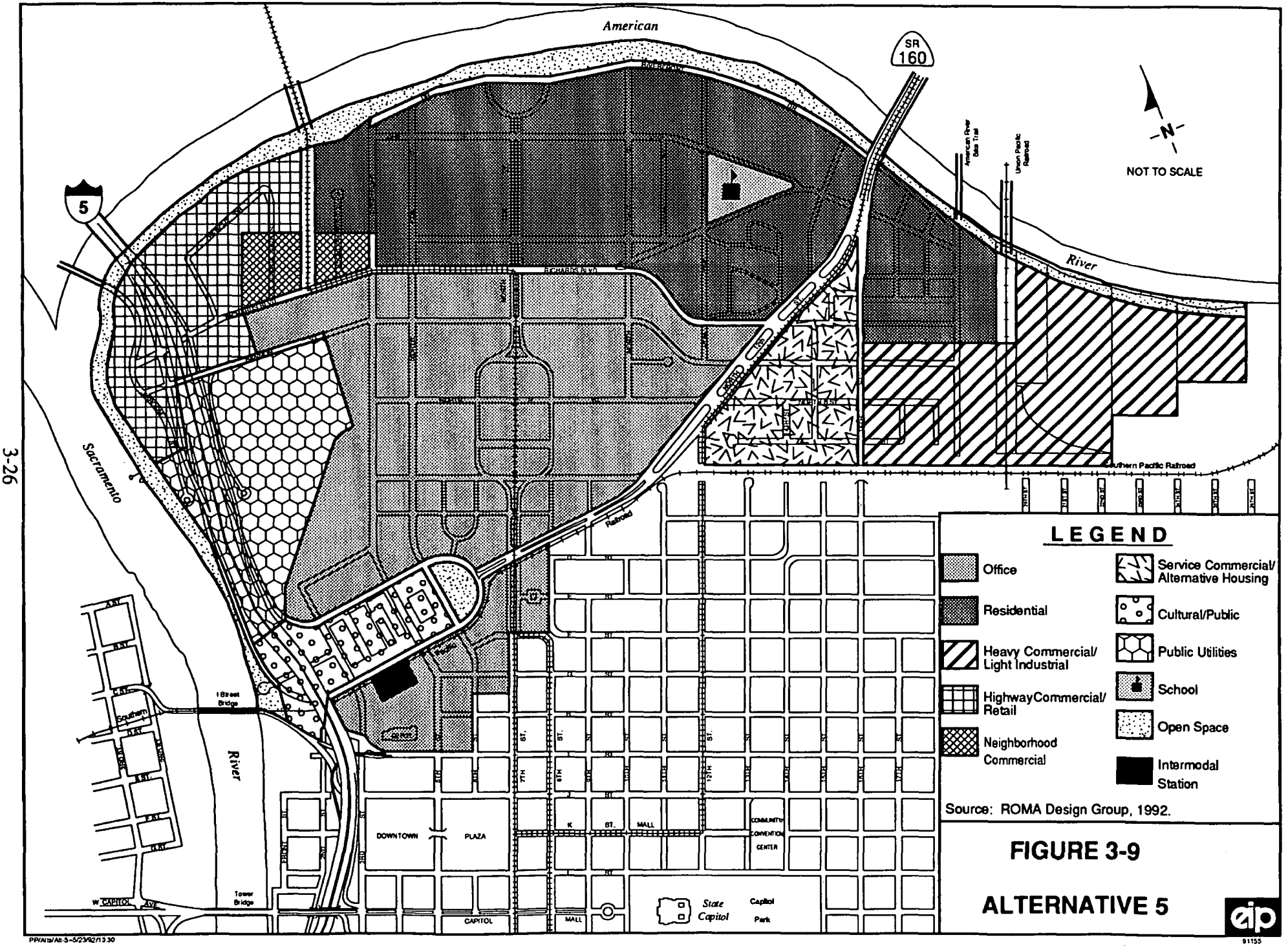


FIGURE 3-9

ALTERNATIVE 5

16.44 million square feet of office uses, 290,000 square feet of highway and retail commercial uses, 6,120 residential units, 1,000 new hotel rooms and 170,000 square feet of cultural/institutional uses.

The realignment of the tracks, as proposed under this Alternative, would reduce the amount of land available for residential uses in the Railyards area, limiting the number of units to 300, which would be built in Phase One. Residential development in the Richards area would be the same as under Alternative 7, with 700 units in Phase One, 2,000 in Phase Two, and 3,120 in Phase Three.

Since the Intermodal Transit Station would be a greater distance from the Richards area than under other Alternatives, the amount of office development in the RBAP would be less than in other Alternatives, with 800,000 or .8 msf in Phase One, 1.5 msf in Phase Two, and 2 msf in Phase Three. In the Railyards area, office development would be higher--2.3 msf in Phase One, 3.8 msf in Phase Two, and 5.9 msf in Phase Three--reflecting the location of the Intermodal Transit Station closer to the existing CBD.

Table 3-6 presents development by land use and phase for Alternative 5.

Alternative 6

This Alternative would increase the amount of office space to 26.4 msf by building on land designated residential reserve under Alternative 4, and by increasing office densities in some areas. The only area designated residential in the Richards area would be the existing Dos Rios neighborhood and the land immediately north to the American River. In the Richards area, commercial use would be extended to the American River. Residential use would be reduced to 400 units in the Railyards area and 2,030 units in the Richards area.

Development under this Alternative would result in a total of 26.4 million square feet of office uses on the Planning Area, 1.03 million square feet of highway and retail commercial uses, 3,700 residential units, 1,140 new hotel rooms, and 320,000 square feet of cultural/institutional uses.

Under this Alternative, the predominate use in the Railyards area would be office, with 2.3 msf in Phase One, 4.8 msf in Phase Two, and 5.8 msf in Phase Three. In the Richards area, office uses would include 3.2 msf in Phase One, 5 msf in Phase Two, and 5.4 msf in Phase Three. A limited amount of residential development would occur in the Railyards area, including 810 units in Phase One and 590 units in Phase Two, and in the Richards area 700 units in Phase One and 1,330 units in Phase Two.

Table 3-7 presents development by land use and phase for Alternative 6 (see also Figure 3-10).

TABLE 3-6
PROJECT CHARACTERISTICS - ALTERNATIVE 5
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain-- Railyard	Existing to Remain-- Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			2,330	800	3,130	
2010			3,820	1,500	5,320	
Buildout			5,950	2,040	7,990	
Total Office	--	850	12,100	4,340	16,440	17,290
Highway Commercial/Retail						
2000			10	40	50	
2010			50	40	90	
Buildout			100	50	150	
Total Highway Commercial/Retail	--	260	160	130	290	550
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	1,350	--	--	0	1,350
Residential (Units)						
2000			300	700	1,000	
2010			--	2,000	2,000	
Buildout			--	3,120	3,120	
Total Residential Units	--	272	300	5,820	6,120	6,390
Hotel (Rooms)						
2000			--	250	250	
2010			500	250	750	
Buildout			--	--	--	
Total Hotel Rooms	--	1,250	500	500	1,000	2,250
Cultural/Institutional						
2000			--	--	--	
2010			85	--	85	
Buildout			85	--	85	
Total Cultural/Institutional	--	--	170	--	170	170

SOURCE: ROMA Design Group

TABLE 3-7
PROJECT CHARACTERISTICS - ALTERNATIVE 6
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain--Railyard	Existing to Remain--Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			2,340	3,200	5,540	
2010			4,830	5,000	9,830	
Buildout			5,850	5,450	11,300	
Total Office	--	850	13,020	13,650	26,400	27,520
Highway Commercial/Retail						
2000			100	50	150	
2010			150	250	400	
Buildout			250	230	480	
Total Highway Commercial/Retail	--	50	500	530	1,030	1,080
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	--	--	--	0	--
Residential (Units)						
2000			810	700	1,510	
2010			590	1,330	1,920	
Buildout			--	--		--
Total Residential Units	--	272	1,400	2,030	3,430	3,700
Hotel (Rooms)						
2000			--	250	250	
2010			500	250	750	
Buildout			140	--	140	
Total Hotel Rooms	--	1,250	640	500	1,140	2,390
Cultural/Institutional						
2000			--	--	--	
2010			170	--	170	
Buildout			150	--	150	
Total Cultural/Institutional	--	--	320	--	320	320

SOURCE: ROMA Design Group

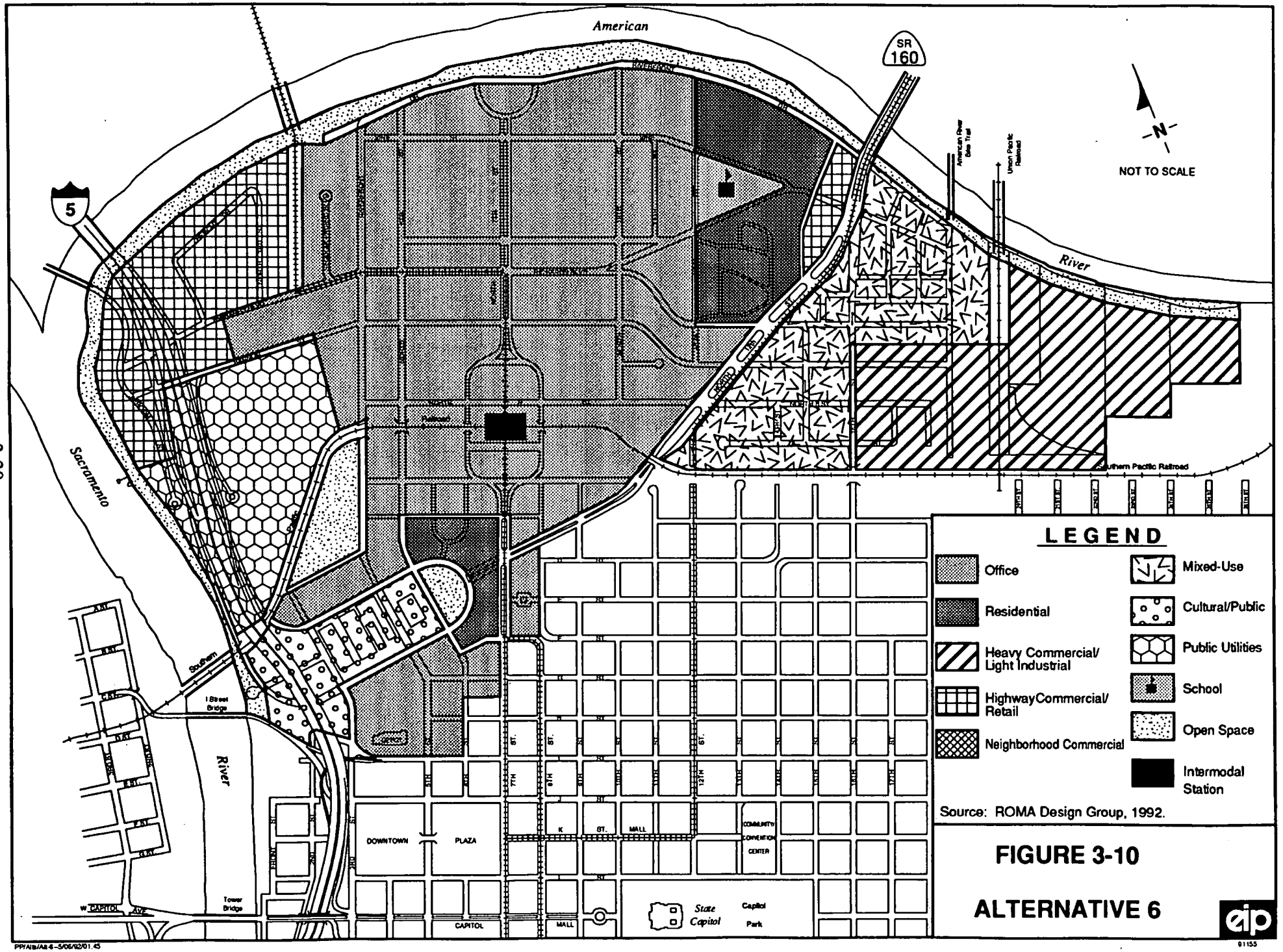


FIGURE 3-10

ALTERNATIVE 6

Alternative 7

Land use patterns and mixes of uses in this Alternative would be similar to those described for Alternative 4 (see Figure 3-11). The difference between Alternative 7 and Alternative 4 is that under Alternative 7, development of office space in the Richards area is assumed to be considerably more intensive throughout the life of the plan and housing construction is assumed to begin in Phase One. The differences in office and housing development assumptions are based on market demand and absorption analyses conducted for the RSP and RBAP which concluded that buildout would take place at a much slower pace than originally thought. (It should be noted that development under Alternative 7 is similar to that described in the preliminary master plan presented in Winter 1991 and reflected in the April 1991 Notice of Preparation.)

Other aspects of the two Alternatives are substantially the same. The Amtrak Depot and the Central Shops complex would be preserved for historic preservation-related community-oriented uses in a cultural park. An Intermodal Transit Station would be located along 7th Street, north of B Street (connecting light rail, intercity and commuter rail, and buses) and a new rail bridge would be built over the Sacramento River. As assumed under the other Alternatives (except Alternative 1), 5th, 6th, and 7th streets would be extended to Richards Boulevard.

Development under this Alternative would result in approximately 19.9 million square feet of new office uses, 1.05 million square feet of new highway commercial, 320,000 square feet of new cultural/institutional, 1,140 new hotel rooms and 6,710 new dwelling units. In the Railyards area, there would be 2.3 msf of office space built in Phase One, 3.9 msf in Phase Two and 3.3 msf in Phase Three. Office development in the Richards area would include 1.6 msf in Phase One, 3 msf in Phase Two and 5.6 msf in Phase Three. Approximately 1.05 million square feet of highway and retail commercial uses, 6,710 residential units, 1,140 new hotel rooms and 320,000 square feet of cultural/institutional uses would be constructed.

Residential construction under the RSP would include 630 units in Phase One, 1,440 in Phase Two, and 730 units in Phase Three. In the Richards area, residential uses would be constructed at a rate of 500 units in Phase One, 1,260 units in Phase Two, and 2,130 units in Phase Three. Table 3-8 presents development by land use for Alternative 7.

Facilities Element

Circulation Plan

The basic circulation plan is described in the Facility Element, and would serve the Planning Area. The plan includes the creation of an Intermodal Transit Station to serve intercity and commuter passenger trains, inter- and intracity buses and light rail transit. As shown on Figure 3-12, the station would be located at 7th and North B streets. The Southern Pacific rail line would be moved in Phase One to the east-west alignment between A and North B streets. Construction of the station would take place in Phases One and Two, along with the extension of the 7th Street light-rail tracks to Richards Boulevard. The proposed new rail bridge across the Sacramento River is planned for Phase Two.

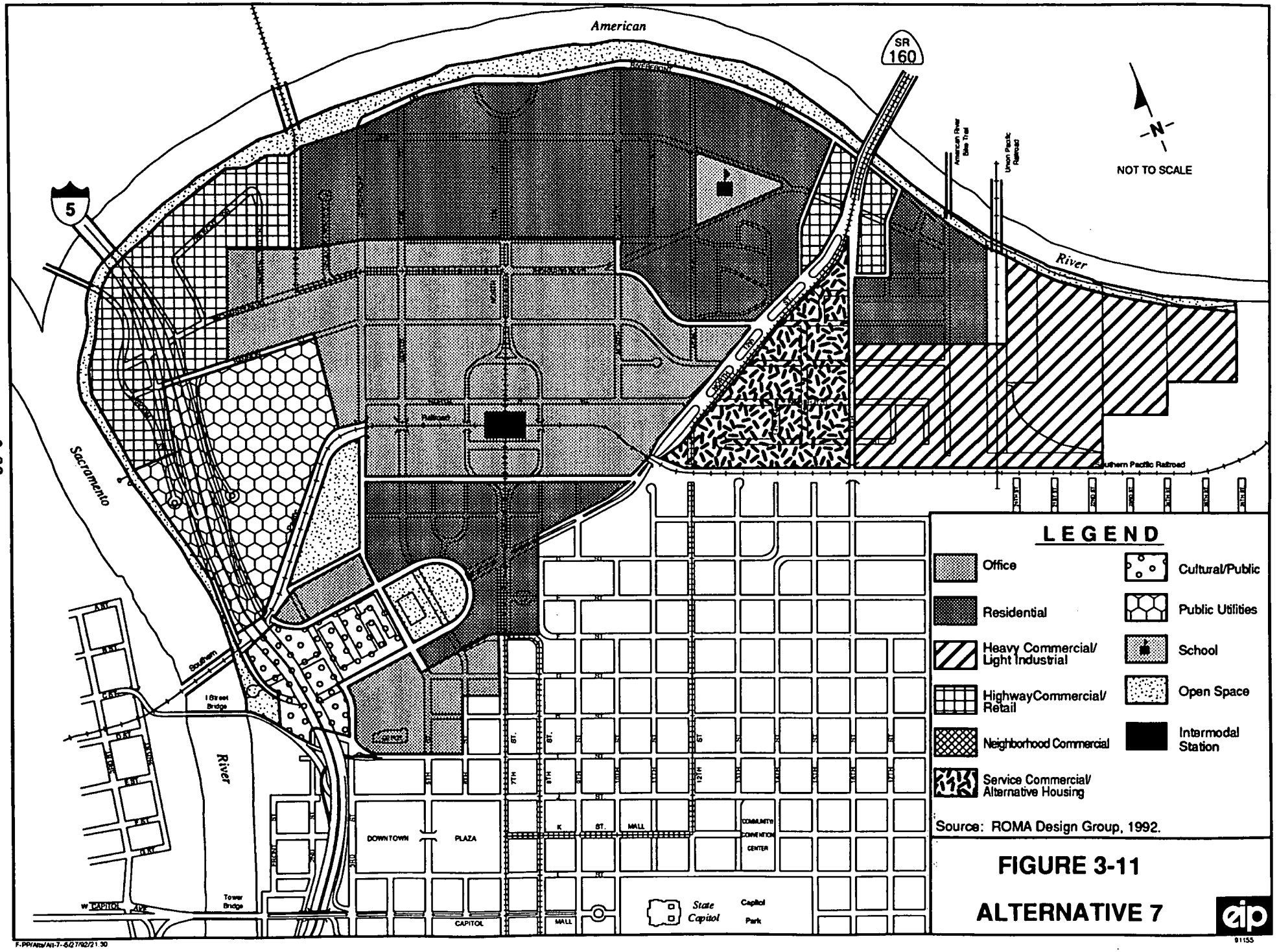


FIGURE 3-11

ALTERNATIVE 7

F-PP/Alts/Alt-7-6/27/92/21:30

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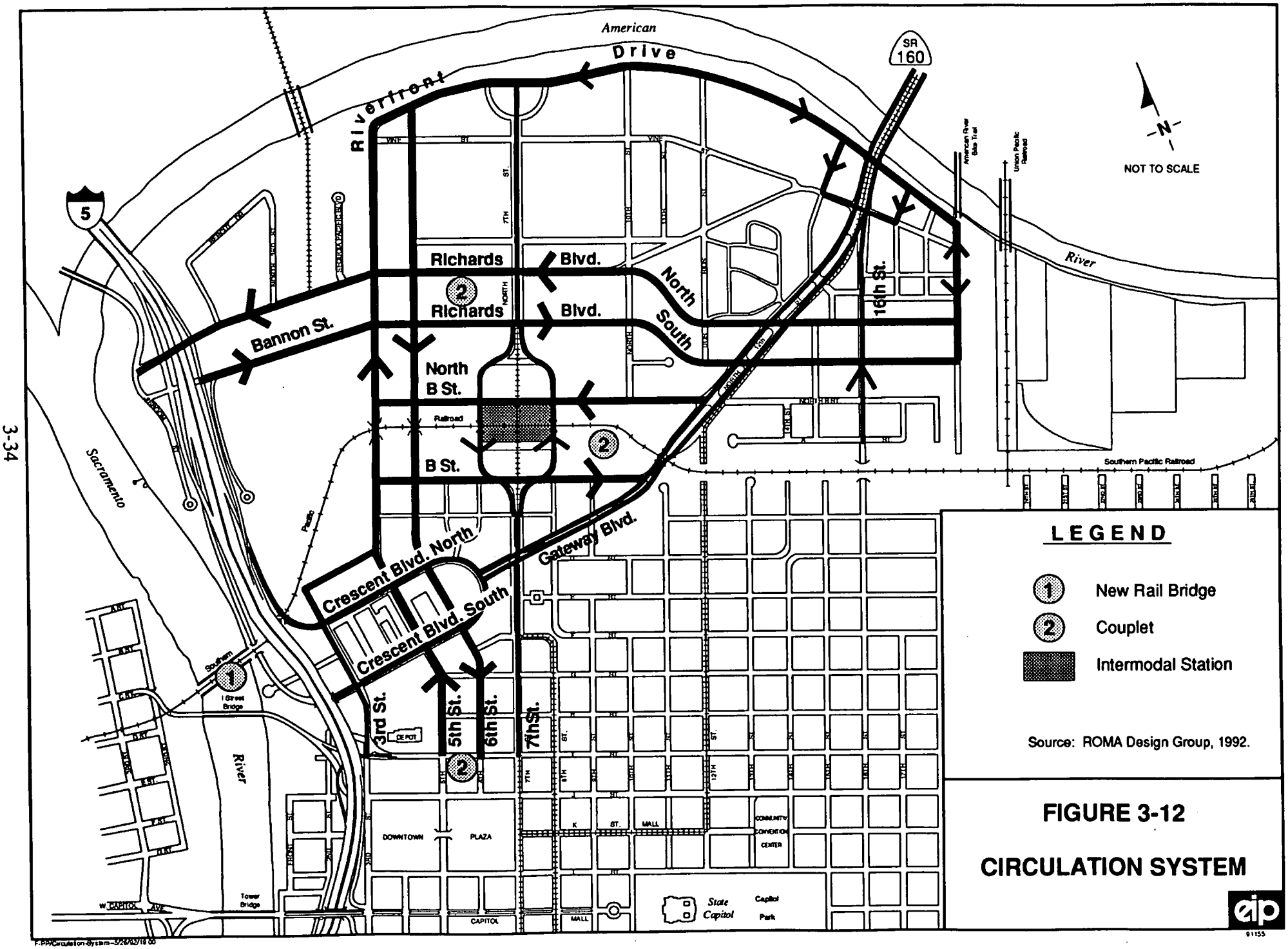
TABLE 3-8
PROJECT CHARACTERISTICS - ALTERNATIVE 7
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain-- Railyard	Existing to Remain-- Richards	New Railyard	New Richards	Total New Railyard & Richards	Total Railyard & Richards
Office						
2000			2,342	1,600	3,942	
2010			3,967	3,000	6,967	
Buildout			3,339	5,650	8,989	
Total Office	--	850	9,648	10,250	19,898	20,748
Highway Commercial/Retail						
2000			75	50	125	
2010			192	250	442	
Buildout			250	235	485	
Total Highway Commercial/Retail	--	50	517	535	1,052	1,102
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	1,350	--	--	--	1,350
Residential (Units)						
2000			630	500	1,130	
2010			1,440	1,260	2,700	
Buildout			730	2,130	2,860	
Total Residential Units	--	272	2,800	3,890	6,690	6,960
Hotel (Rooms)						
2000			--	250	250	
2010			500	250	750	
Buildout			140	--	140	
Total Hotel Rooms	--	--	640	500	1,140	1,140
Cultural/Institutional						
2000			--	--	--	
2010			170	--	170	
Buildout			150	--	150	
Total Cultural/Institutional	--	--	320	--	320	320

SOURCE: ROMA Design Group


American River Drive
Riverfront
SR 160
NOT TO SCALE
5
Richards Blvd.
Richards Blvd.
Bannon St.
North B St.
B St.
Railroad
North 16th St.
South 16th St.
American River Bike Trail
Union Pacific Railroad
River
Southern Pacific Railroad
Sacramento
Pacific
Crescent Blvd. North
Crescent Blvd. South
Gateway Blvd.
3rd St.
5th St.
6th St.
7th St.
DEPOT
I Street Bridge
Southern
River
Tower Bridge
W. CAPITOL AVE.
DOWNTOWN PLAZA
K ST. MALL
COMMUNITY CONVENTION CENTER
CAPITOL
MALL
State Capitol
Capitol Park
LEGEND
New Rail Bridge
Couplet
Intermodal Station
Source: ROMA Design Group, 1992.
FIGURE 3-12
CIRCULATION SYSTEM
F:\PM\Circulation-System-5/26/92/10:00
91155

As discussed above, crucial to the proposed development of the Richards area is the extension of several north-south streets. During Phase One, 7th Street would be extended to Richards Boulevard. The extension of the 5th/6th streets couplet would begin in Phase One and be completed in Phase Two. Also during Phase Two, Gateway Boulevard, Crescent Boulevard and the North-B/B streets couplet would be built. The Richards Boulevard Couplet would be constructed from I-5 to 7th Street in Phase 2 and extended to SR 160 in Phase 3.

The phasing for improvements described in the Facility Element (May 1, 1992) are summarized below.

Phase I Project Improvements

- Relocation of Southern Pacific Railroad main Line track to the north portion of the Railyards area.
- Extension of Light Rail north to Richards Boulevard (i.e., Phase 1 of the Downtown-Natomas-Airport Extension).
- Construction of the Phase 1 Intermodal Transit Station.
- Extension of 7th Street north to Richards Boulevard.
- Widening of Richards Boulevard to five lane cross-section from I-5 to Sunbeam.
- Extension of 5th Street, 6th Street, G Street and H Street by one block in the south portion of the Railyards area.
- Extension of 6th Street as a two-way street north to Richards Boulevard.
- Phase 1 improvements to the I-5/J street interchange.
- Phase 1 improvements to the I-5/Richards Boulevard interchange.

Phase II Project Improvements

- Construction of Phase 2 Intermodal Transit Station Improvements.
- Construction of 7th Street East and 7th Street West around Intermodal Transit Station.
- Extension of 5th Street north to Richards Boulevard and designation of 5th Street/6th Street couplet.

- Construction of Gateway Boulevard as two-way facility between Crescent Park and the State Route 160 crossing of the American River.
- Phase 2 Improvements to the I-5/Richards Interchange.
- Construction of Richards Boulevard Couplet between I-5 and 7th street.
- Construction of B Street/North B Street couplet between 5th Street and Gateway Boulevard.
- Construction of the State Route 160/Riverfront Drive Interchange.
- Construction of the I-5/Crescent Drive Interchange (e.g., I-5 braided ramps).
- Widening of the I-5 Bridge at the American River.
- Construction of a new rail bridge across the Sacramento River.

Buildout Project Improvements

- Widening of the State Route 160 Bridge at the American River.
- Construction of Richards Boulevard Couplet between 7th Street and State Route 160.

A local transit center is planned for Gateway Boulevard between Richards Boulevard and Bannon Street. The purpose of the transit center would be to create a link between light rail and the City bus system.

The Facility Element contains a number of pedestrian and bicycle improvements. An exclusive pedestrian way would link Old Sacramento, Downtown Plaza and Chinatown to the depot and Central Shops areas. Pedestrian circulation between the social services campus and downtown would be improved. Access to the south shore of the American River would be improved as well. A bicycle path would be developed along the river parkways and bike lanes would be part of the street system within the Planning Area. Facilities for bicyclists would be provided in new office development and at transit stations.

The Facility Element calls for development of Transportation Systems Management programs, in accordance with City of Sacramento policies, to discourage the use of single-occupancy automobiles.

The circulation plan is described in detail in Section 4.8, Transportation. The improvements described above are assumed for each Alternative, except Alternative 1 and Alternative 5. No roadway, rail or transit improvements would be included in Alternative 1. For Alternative 5, the Intermodal Transit Station would be constructed along a track alignment between the existing

depot and Railyards shops. Fifth, 6th and 7th streets would be extended to Richards Boulevard. The Richards Boulevard and North B/B streets couplets would not be built. Twelfth Street would be realigned and extended through the center of the Railyards area in a manner similar to the proposed Gateway and Crescent boulevards.

Infrastructure and Utilities

Like the circulation network, many of the planned infrastructure improvements are integral to both the RBAP and the RSP. The Facility Element covers water supply, sanitary sewer, storm drainage, and electrical utilities for the entire Planning Area. The Facility Element proposes the following infrastructure improvements.

Water Supply

A network of 12-inch mains along each new street alignment with dual mains along both sides of streets that have central medians would be constructed. The existing Railyards water distribution system would be abandoned. Water mains would be connected to existing transmission mains on North B Street, H Street, Richards Boulevard, Bannon Street, 12th Street, and other locations. The plan does not provide for new supply or transmission facilities.

Water supply is discussed in detail in Section 4.15, Water Supply.

Sanitary Sewer System

The existing combined sewer system in the Railyards area would be abandoned as the proposed system is constructed. The separate sewer system currently serving the Richards area west of 12th Street would, for the most part, be retained.

Within the Railyards area, sanitary wastewater would be collected at a centrally located pumping station, then pumped through a 24-inch-diameter force main to 12th and A streets, where it would merge with sanitary waste from the existing separated sewer system in the Richards area. The merged sanitary waste will flow by gravity through a proposed 48-inch-diameter sewer along A street to a proposed pumping station at 18th and A streets. The waste would then be pumped through an existing 30-inch-diameter force main across the American River, then through a proposed 30-inch-diameter force main, easterly to the existing 78-inch-diameter Regional Sanitation District interceptor.

As a result of this system, new waste would not be transmitted into the existing combined system and existing sewage from the Railyards area would be diverted out of the combined sewer system.

The wastewater system would transport extracted ground water from Southern Pacific Railyards contaminated groundwater cleanup operations and from first flush storm runoff.

The sewer system is discussed in detail in Section 4.16, Wastewater Conveyance and Treatment.

Storm Drainage Facilities

The storm drainage system is designed to be separate from the sanitary sewer system. In the first phase, a pumping station and the first half of a detention pond would be built along the Sacramento River. A pumping station within the Railyards area would be constructed. A force main would be extended west along C Street, and a portion of a 144-inch trunk drain would be constructed from there to the riverside pumping station. During Phase One, storm drainage from the Railyards area would be detained on-site and bled to the city combined system. First-flush and low-flow runoff would be held in a 60-acre-foot detention basin adjacent to the pump station.

The riverside pumping station and detention pond would be completed in Phase Two. Other facilities to be built during Phase Two would include extension of a 96-inch-diameter pipeline from North B and 6th streets to Richards Boulevard and 6th Street; a pumping station near 12th and A streets, with a 42-inch pipeline extending to the 144-inch pipe at North B and 6th streets; 60-, 54- and 48-inch trunk drains on A and 16th streets, which would discharge into the 12th and A streets pumping station; and a 48-inch trunk drain on Bannon Street which would connect to the 96-inch pipeline at 6th and Bannon streets.

During the third phase, only project-specific drainage facilities would be constructed. The design and capacity of such facilities would be determined on a project-by-project basis and be the responsibility of the project developer.

Storm drainage is described in Section 4.17, Storm Water and Drainage.

Gas and Electrical Facilities

Based on discussions with Pacific Gas and Electric, the utility that would provide natural gas to the Planning Area, gas facilities would be designed as specific projects are proposed.

The Sacramento Municipal Utilities District (SMUD) would serve both the Richards and Railyards areas. At present, SMUD indicates that development in the two areas would require a new substation, which would be located at either the City water filtration plant (adjacent to I-5) or near the intersection of North B and North 7th streets.

According to the Facility Element, a 115-kilovolt (kV) feeder would be required by buildout. In addition, 21-kV underground facilities would be constructed along portions of 5th Street, Bannon Streets, B Street and Gateway Boulevard. The Facility Element also includes a policy calling for measures that promote energy conservation. For a full discussion of project energy requirements, see Section 4.22, Electricity and Gas Service.

Community Facilities

The RSP and RBAP each contain a Community Facilities Element, which includes policies calling for provision of services that will be required by Planning Area residents and employees, including schools, parks and open space, law enforcement, fire protection, cultural facilities, the social service complex and child care.

The Community Facilities Elements call for 5 acres of parkland per 1,000 residents in the Richards area, and designated 28.2 acres of parkland in the Railyards area. Several specific park sites have been identified in the Railyards area, including the 8.8-acre Crescent Park, north of the Cultural Shops, a 5.5-acre riverfront park, and a 13.9 acre neighborhood park and playfields immediately east of the City Water Treatment Plant.

The RSP Community Facilities Element provides for a 6,000-square-foot, single-engine fire station. The current station serving the Richards area, on North C Street, may be relocated to North 10th Street in order to take advantage of access provided by the North 10th Street corridor.

The focal point of cultural facilities within the Planning Area would be the historic shops. In addition, the RSP Community Facilities Element calls for community-oriented uses on the first floor of the depot and public uses under the I-5 freeway and adjacent to the Sacramento River.

The RBAP Community Facilities Element incorporates the social service complex currently being planned by SHRA. The complex, located at North A Street between 12th and 14th streets, would include temporary and permanent bed space, an Aid-In-Kind Center, a Detoxification Center and transitional housing. The Community Facilities Element also calls for provision of child care services in project-related residential and office development.

Implementation

The Facility and Community Facilities Elements address the development of the facilities and infrastructure discussed above. The elements' phasing strategy is discussed above and, where applicable, in specific sections of this EIR. For the most part, the financing strategy is not discussed in this EIR, as it is not an environmental issue under CEQA. However, for the information of the public and decision-makers, the City has prepared a fiscal impact analysis, published separate from this EIR, which provides an analysis of the costs and revenues associated with implementation of Alternative 4.

Required Approvals

In order to approve Alternatives 2 through 7, described in this EIR, the following actions must be taken:

- Certification of this EIR
- City General Plan Amendment
- Adoption of RSP and RBAP including the Facility Element

- Master Parcelization Plan for Railyards Area (Appendix C)
- Adoption of a City Zoning Ordinance Amendment

Subsequent actions or permit requirements could include, but would not be limited to the following;

- City/SPTC Development Agreement
- US Dept. of Fish and Wildlife Incidental Take Permit
- City or County Storm Drainage Discharge Permit
- Army Corps of Engineers Section 401 Certification
- Army Corps of Engineers Section 404 Permit
- Department of Fish and Game Streamed Alteration Agreement
- Section 10 of the Federal River and Harbors Act
- Discharge Permit (Flood Control)
- City Encroachment Permit
- Department of Toxic Substances Control - various actions

Schedule

It is anticipated that this EIR will be certified by the end of 1992. Development of the Planning Area and full implementation of an adopted plan may take 35 years or more.

The City of Sacramento anticipates holding at least one public workshop to present the contents of this document, and one public hearing to receive public comments.

4. ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

4.0 INTRODUCTION TO THE ANALYSIS

4.0 INTRODUCTION TO THE ANALYSIS

Scope of the EIR

This Program EIR is being prepared pursuant to Section 15168 of the CEQA Guidelines. On April 15, 1991 the City of Sacramento Planning and Development Department, Environmental Services Division, issued a Notice of Preparation (NOP) for the EIR. In the NOP it was identified that the following issues would be evaluated in the EIR:

Land Use
Parks and Open Space
Urban Design and Visual Quality
Microwave, Radar and Radio Transmissions
Microclimate
Cultural Resources
Population
Employment
Housing
Transportation
Air Quality
Noise
Geology, Soils, and Seismicity
Hydrology and Water Quality
Hazardous Materials
Biotic Resources
Water Supply
Wastewater Conveyance and Treatment
Storm Water and Drainage
Solid Waste
Police Services
Fire Protection Services
Schools and Childcare
Energy

Issues Not Included in the EIR

In the City's NOP, it was identified that fiscal considerations would be presented in the EIR. The City has subsequently determined that an evaluation of the fiscal effects of the proposed RBAP and RSP should be presented separately from the EIR. Fiscal impacts are not considered

to be physical environmental effects pursuant to CEQA. A separate fiscal impact analysis is being prepared by the City and will be issued under separate cover.

Evaluation of Alternatives in the EIR

As required by Section 15126(d) of the CEQA Guidelines, this EIR evaluates the comparative impacts of "a range of reasonable alternatives to the project." In this case a "project" has not yet been identified by the City. The impacts of seven of the Alternatives are evaluated at a level of detail equal to the analysis typically presented for a "proposed project." Similarly, mitigation measures which may be required for impacts of the Alternatives are presented at an equal level of detail. A description of the Alternatives is included in Chapter 3 of this EIR.

Analysis of Cumulative Development

This EIR includes a detailed assessment of the impacts of the Alternatives in light of existing conditions and potential cumulative development which could occur between 1990 and 2010. The analyses in the EIR look at two primary timeframes: Year 2000 and Year 2010. Buildout of the Planning Area would take place at a time beyond 2010 and, as such, a separate "buildout" analysis is also included.

As part of this EIR, the City Planning Department, Environmental Services Division, has prepared a "Cumulative Development Scenario" that is used to form the basis for the cumulative analyses in the EIR. The Cumulative Development Scenario is an economic analysis of projected growth in the region, and includes an assessment of the reasonable growth scenarios in the Central City area with and without the redevelopment of the Planning Area. Section 15130(b)(1)(B) allows the lead agency to use a "summary of projections contained in an adopted general plan or related planning document which is designed to evaluate regional or areawide conditions." The Cumulative Development Scenario, included in Appendix D of this EIR, is intended by the City to serve as such a summary. The conclusions of the Cumulative Development Scenario form the basis of the cumulative analyses contained in this EIR.

Presentation of the Impact Analysis

The evaluation of impacts and identification of mitigation measures included in this EIR are an integrated assessment of potential effects of development of the Alternatives and potential solutions which could limit the degree of adversity of those effects. For each impact that is described, a measure which could serve to eliminate or decrease the severity of the impact is identified, where available. In this EIR, impacts and mitigation measures are numerically consistent.

4.1 LAND USE

4.1 LAND USE

INTRODUCTION

The Land Use Section analyzes the development of the Planning Area for the Alternatives. Issues addressed include land use intensity, compatibility with existing uses and plans, and compliance with current zoning designations.

SETTING

Introduction

The Planning Area occupies approximately 1,310 acres of land at the confluence of the American and Sacramento Rivers in the central portion of the City of Sacramento. The Planning Area is a composite of two subareas for which plans have been developed: the Railyards Area and the Richards Area. The Railyards Area covers approximately 260 acres on the northwestern edge of downtown Sacramento. The remaining portion of the Planning Area, the Richards Area, encompasses approximately 1,050 acres contiguous with the Railyards. Together, the Railyards Area and the Richards Area compose the Planning Area and are the subject of this EIR.

Existing Land Use in the Planning Area

The Sacramento and American Rivers form the western and northern boundaries of the Planning Area, respectively. To the south, the Planning Area is bounded primarily by 7th Street and I Street and the Southern Pacific Railroad track. Two blocks of the Alkali Flat neighborhood are included within the southernmost edge of the Planning Area (referred to as "the Alkali Edge"). These two blocks are part of the Alkali Flat Redevelopment Area. The eastern edge of the Planning Area borders undeveloped land and the 28th Street Landfill. Existing land uses are depicted on Figure 4.1-1.

Numerous streets and sets of railroad tracks cross the Planning Area. Interstate 5 and the frontage roads of Jibboom Street (west of the freeway) and Bercut Drive (east of the freeway) traverse the western edge of the site near the Sacramento River. The primary arterial in the Planning Area is Richards Boulevard, which connects Jibboom Street along the Sacramento River with State Route 160 in an east/west axis alignment. In the eastern third of the Planning Area, North 12th Street (southbound) and North 16th Street (northbound) link downtown to the North Sacramento area across the American River. The only public road in the Railyards Area is 7th Street in the Alkali Edge; therefore, the Railyards Area presents an obstacle to north-south travel from downtown to Richards Boulevard.
Figure 4.1-1

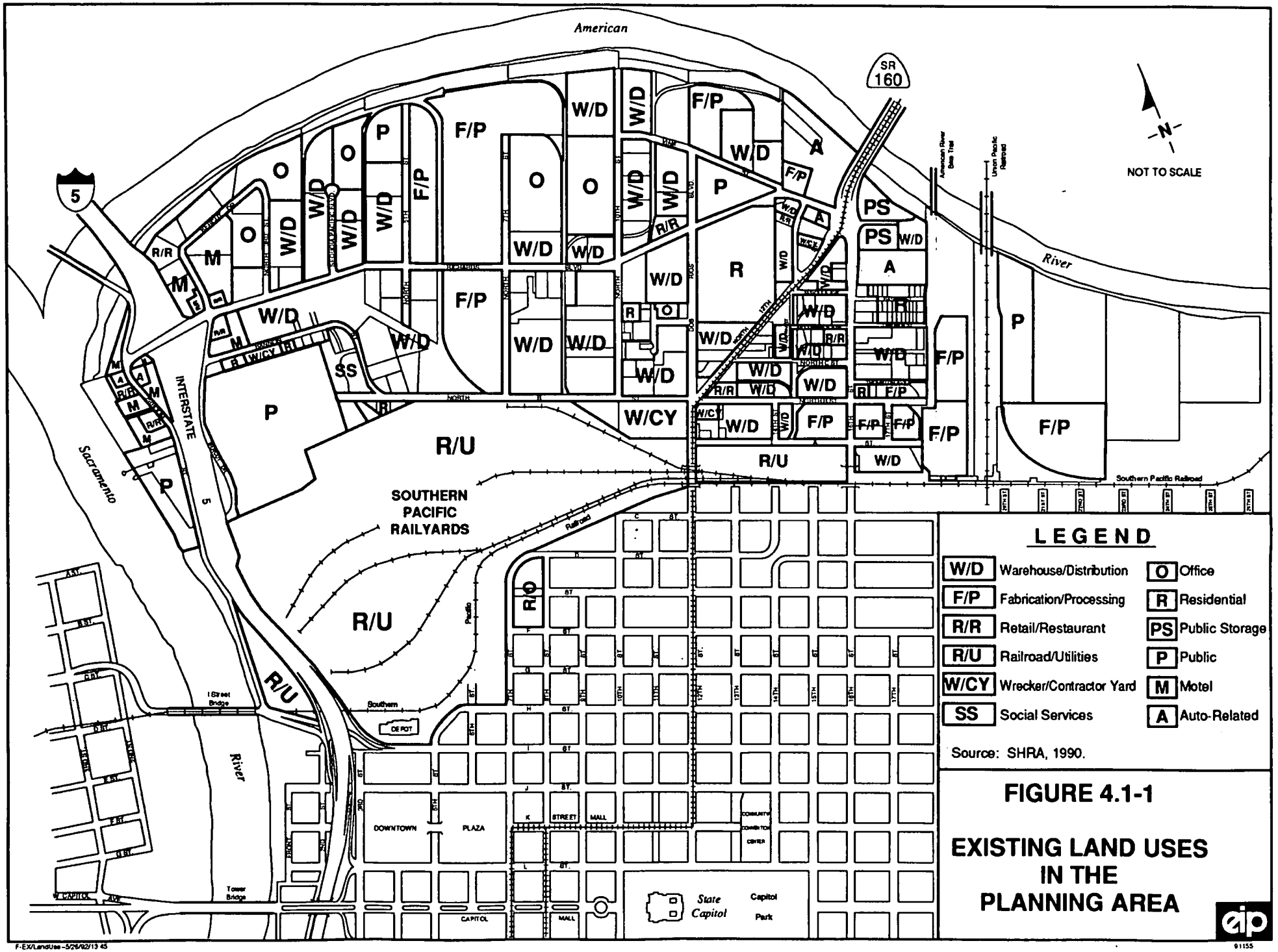


FIGURE 4.1-1

EXISTING LAND USES IN THE PLANNING AREA

Five railroad tracks cross the Railyards Area, and the Union Pacific Railroad runs north/south across the eastern portion of the Planning Area, between 19th and 20th streets.

Major access points to the Planning Area are the I Street Bridge, I-5 Freeway, Highway 160 (North 16th Street, and 12th Street).[1]

Railyards Area

A broad range of land uses and activities occur in the Planning Area. The Railyards Area contains the Southern Pacific Locomotive Works and the Amtrak Passenger Depot. The Amtrak depot has two passenger platforms and three tracks through the station area. Amtrak currently operates four passenger trains through the station each day.[2] In addition, 15 freight trains move through the site each day.[3]

South and east of the Railyards Area is the Alkali Edge, the western edge of the Alkali Flat neighborhood. This part of the neighborhood consists of: parking lots; a few Victorian residences, some of which have been divided into apartments; slightly larger apartment buildings; two law offices; the Sacramento County Probation Department; and the Crystal Creamery. Nearby uses include the Zapata Park multifamily housing complex, and the KCRA television station.

Richards Area

The majority of the land along Richards Boulevard and the cross streets that extend north and south of Richards Boulevard is occupied by warehouses and distribution facilities. These facilities require good access to freeways and streets that can accommodate large trucks. In older areas along Richards Boulevard, some of the loading spaces are designed so that trucks extend into the street, which causes traffic congestion.[4]

Light industrial or food processing uses are also a major land use in the Richards Area. These uses comprise approximately 5,921,144 square feet as of the second quarter of 1991. Industrial and processing uses in this area include the State Printing Office, Martin Sprocket and Gear, the California Almond Exchange, the Crystal Dairy, the Sacramento Pipe Works, and the Sierra Pacific Cannery.[5]

Office and retail/wholesale uses are scattered throughout the Richards Area. Administrative offices for the California State Lottery occupy a large site on North 10th Street, north of Richards Boulevard. Substantial amounts of office space are contained in buildings that are used primarily as warehouses. Several warehouse buildings throughout the area, including the Continental Can and WEMCO buildings, are proposed for, or are in the process of, being expanded to include office uses. The few retail/wholesale stores that exist in the Planning Area are scattered throughout the site. Retail stores are currently found on Richards Boulevard, 16th Street, North 12th Street, Sunbeam Avenue, and Jibboom Street.[6]

Auto-related uses in the Planning Area include auto sales dealerships, service stations, auto repair facilities, and a taxi facility. Auto sales, rental and repair establishments are located mainly in the North 12th Street and 16th Street vicinity. Two truck terminals exist south of Richards Boulevard. There is a wrecking yard on Bannon Street near Bercut Drive.[7]

Visitor uses such as motels, restaurants, and service stations are clustered near Interstate 5 and Richards Boulevard, along either Jibboom Street or Bercut Drive. Four of the eight motels in the area are located on Jibboom Street and the remaining four are on Bercut Drive. Food service in this area ranges from sit-down restaurants to fast food outlets.[8]

Housing in the Planning Area is located primarily in four locations. The largest concentration of housing, the Dos Rios Housing project, contains 218 low-income, subsidized housing units located at Dos Rios and Richards Boulevards. The Alkali Edge neighborhood comprises three to four blocks immediately south and east of the Railyards Area and includes a mix of single-family and multi-family housing, comprising approximately 20 units. Another residential area is located on the south sides of Bannon and North B streets. This area has an estimated 17 units, of which nine are in single-family structures and eight are in duplexes. Finally, at the eastern portion of the site on Basler and Dreher streets, there are approximately 31 units, of which 19 are single-family.[9]

A number of social service facilities exist in the Planning Area. Facilities located on the west side of the Planning Area are the Bannon Street Shelter (Volunteers of America), the Transitional Living and Community Support (TLCS), and the Union Gospel Mission. On the east side of the Planning Area, social service facilities include the Legal Center for the Elderly and Disabled, the Salvation Army, Maryhouse, the Mustard Seed School, and Loaves and Fishes.

There are several junkyards scattered among industrial and warehousing facilities in the area bounded by North 12th Street, North B Street, and the railroad tracks. Also, there is a junkyard on Basler Street. Shelters that transients have made from oil drums and other materials exist south of North B Street, and throughout the Richards Area.

The eastern portion of the Richards Area contains Blue Diamond Almond processing operations, the California Almond Growers Exchange, a SMUD station, and sand and gravel mining operations along the eastern border of the Richards Area. Land uses are summarized on Tables 4.1-1 and 4.1-2.

The Sacramento River Water Treatment Plant, one of three filtration plants in Sacramento, is located directly north of the railyards and adjacent to Interstate 5. Other public facilities in the area are the Dos Rios Elementary School and Park, a City fire station, the Sacramento County Work Release Facility, and the American/Sacramento River Parkways. Captain Tiscornia Park (approximately 10 acres) is located at the confluence of the two rivers on the west side of Interstate 5.

TABLE 4.1-1

EXISTING LAND USES IN THE PLANNING AREA

Land Use	Approximate Acreage	Percent of Area
Utilities[1]	395	30.2
Warehouses	265	20.2
Public & Quasi-Public	200	15.3
Vacant	185	14.1
Office	90	6.9
Manufacturing	80	6.1
Highway Commercial	30	2.3
Light Industrial	25	1.9
Neighborhood Commercial	20	1.5
Housing	20	1.5
Total	**1,310**	**100**

[1] Includes Southern Pacific Railyards property.

Source: General Plan Data Set, City of Sacramento Planning and Development Department, 1991.

TABLE 4.1-2

EXISTING LAND USES
IN THE PLANNING AREA

Land Use	Square Feet
Utilities	N/A
Warehouses	4,775,000
Public & Quasi-Public	N/A
Office	255,000
Manufacturing	354,000
Highway Commercial	91,000
Light Industrial	361,000
Neighborhood Commercial	161,000
Housing	272 units
Total	**5,997,000**

N/A = Not Available.

Source: City of Sacramento, 1991.

Public Trust

Prior to construction of the Railyards, portions of the Railyards Area were marshlands containing two small bodies of water: Sutter Lake (China Slough) on the southerly portion of the site and Willow Lake on the north. At that time, the course of the American River was considerably farther south than its current location, and crossed portions of the Planning Area (see Figure 4.1-2). In the early 1860s, the lakes were filled and the American River relocated to allow for the construction of railroad facilities by the Central Pacific Railroad (subsequently acquired by the Southern Pacific Railroad).

The uses of any lands in the Planning Area that formerly were submerged could be restricted by the existence of a public trust easement. The existence of a public trust easement would limit the allowable uses of the underlying lands to commerce, navigation, fisheries, and other water dependent or water-oriented public uses. The public trust easement is not extinguished by filling (Marks v. Whitney, 6 CA. 3d 251 (1971)). The public trust easement may be extinguished by the State Lands Commission (SLC) or State Legislature pursuant to certain specific criteria set forth in the Public Resources Code and as established by the courts in cases such as County of Orange v. Heim, 30 Cal. App. 3d 694 (1973).

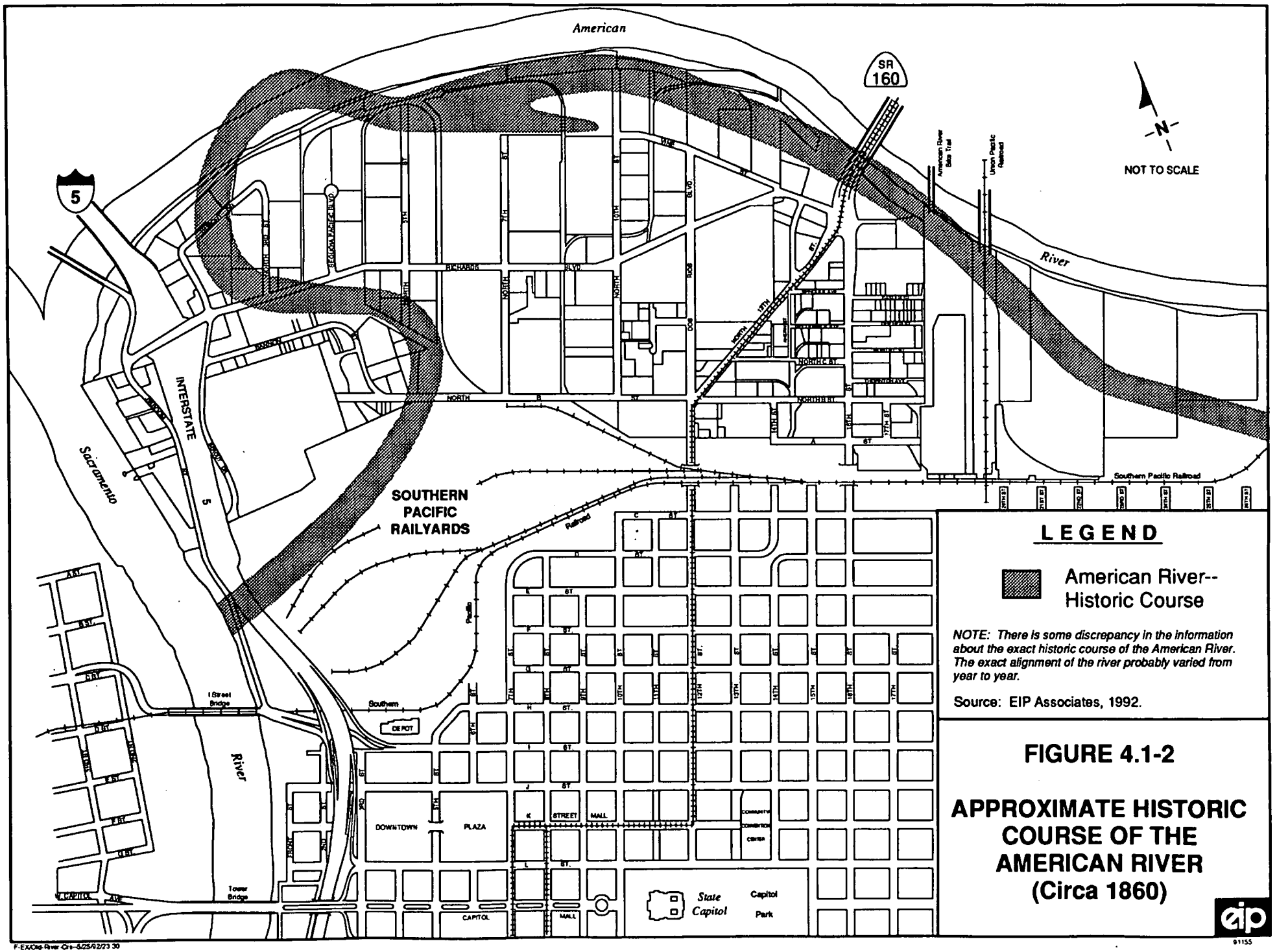
The staff of the SLC has stated, in several letters (dated December 1, 1989, December 3, 1990, and May 20, 1991) responding to the City's Notices of Preparation, that portions of the Planning Area including Sutter Lake (China Slough) and the former bed of the American River are subject to a public trust easement. In a subsequent telephone conversation with SLC staff, it was learned that the SLC no longer believes that Sutter lake (China Slough) is subject to a public trust easement, under the United States Supreme Court decision in Summa Corp. v. California State Lands Commission, 466 U.S. 189 (1983), because that area was part of an historic Mexican rancho.

According to the SLC, it has "exclusive jurisdiction and authority over all ungranted tidelands, submerged lands, and the beds of navigable rivers, sloughs, lakes, etc. (Public Resources Code Section 6301)." However, the Sacramento River to 17th Street was transferred to the City in 1868.

At this time, the full extent of the public trust easements affecting the Planning Area is unresolved. Resolution of this issue could either restrict the allowable land uses or, more likely, require title settlement with the SLC or legislative action to extinguish the public trust easements through a land trade or some other arrangement.

Adjacent Land Uses

The southern boundary of the Planning Area is approximately 1.4 miles long and borders the Alkali Flat and the Washington School neighborhoods. These neighborhoods are characterized by the presence of mature trees and a mix of older homes, apartment buildings and small commercial or office establishments. The north central part of downtown and the K Street Mall


American
SR 160
NOT TO SCALE
5
INTERSTATE 5
Sacramento
River
SOUTHERN PACIFIC RAILYARDS
Southern Pacific Railroad
Pacific
Railroad
Southern
DEPOT
I Street Bridge
Tower Bridge
DOWNTOWN
PLAZA
K STREET MALL
CAPITOL
MALL
State Capitol
Capitol Park
LEGEND
American River--
Historic Course
NOTE: There is some discrepancy in the information about the exact historic course of the American River. The exact alignment of the river probably varied from year to year.
Source: EIP Associates, 1992.
FIGURE 4.1-2
APPROXIMATE HISTORIC COURSE OF THE AMERICAN RIVER
(Circa 1860)
eip
91155

are south of the Alkali Flat neighborhood, and the County/City government center is directly east of the southern portion of the Southern Pacific Railyards.

Land to the east of the Planning Area includes undeveloped parcels and the 28th Street Landfill. In 1989, a Landfill Closure Plan was filed by the City to close the landfill in 1992.[10] The 113-acre landfill site and additional acreage may be developed to create a regional park, as designated in the City's 1984 Master Plan for Park Facilities and Recreation Services and the American River Parkway Plan. Interstate 80 runs north-south, to the east of the landfill, with East Sacramento located further to the east.

The Sacramento and American Rivers form large natural boundaries between the Planning Area and land to the west and north of the site. River crossings near the Planning Area are the I Street Bridge, which crosses the Sacramento River to the waterfront zone of West Sacramento; the Jibboom Street Bridge, which crosses the American River to Discovery Park; the I-5 Bridge, which crosses the American River to South Natomas; and the 160 Bridge, which crosses the American River to North Sacramento. Land uses in West Sacramento, South Natomas, and North Sacramento are discussed in the section titled "Surrounding Land Uses", below.

Surrounding Land Uses

The Sacramento River forms the boundary between the City of Sacramento and the City of West Sacramento. Land uses in West Sacramento nearest to the Planning Area consist primarily of a mixture of medium-to-high-density residential areas, commercial uses, vacant land, and several public service facilities, including the City of West Sacramento Police Station and the Yolo County Health Services facility. Several projects are being planned as part of the West Capital Avenue Action Program. These include two mixed-use projects known as Raley's Landing and One Riverfront Plaza. In addition, the West Sacramento Triangle Specific Plan, currently in preparation, is intended to encourage mixed-use, urban development along the Sacramento River.

Like the Sacramento River, the American River provides a natural boundary between the site and the South Natomas and North Sacramento areas, which lie north of the river. Discovery Park, which contains 385 acres, fronts the northern side of the American River from the Sacramento River on the west to Northgate Boulevard on the east.

According to the Sacramento General Plan, the South Natomas area has a planned holding capacity of an additional 9,680 housing units, 1.7 million square feet of retail space, 4.8 million square feet of office space, and 4.1 million square feet of business park uses. Most of the land in North Sacramento is occupied with residential and industrial development. Land uses planned for North Sacramento include residential infill and industrial uses.

City of Sacramento Land Use

Tables 4.1-3 and 4.1-4 show developed and vacant land for employment generating land uses in the City of Sacramento based on a 1985 land use survey. Projections for the Central City are

TABLE 4.1-3

CITY OF SACRAMENTO
EXISTING DEVELOPED (1985) ACREAGE

	Employment Generating Uses							
Community Planning Area	Community/ Neighborhood Commercial	Community/ Neighborhood Office	Regional Commercial	Regional Office	Public Office	Heavy Commercial Warehouse	Industrial	Industrial Employee Intensive
Airport Meadowview	95	24	0	0	18	0	22	0
Arden-Arcade	86	22	172	308	3	179	0	0
Central City	400	267	20	94	103	552	0	0
East Broadway	219	55	0	0	37	647	664	0
East Sacramento	180	45	0	26	0	162	25	0
Land Park	178	44	0	0	33	146	0	0
North Natomas	0	0	0	0	0	0	179	0
North Sacramento	228	57	0	0	13	310	10	25
Pocket	83	21	0	0	0	0	0	0
South Natomas	72	18	0	37	0	0	0	0
South Sacramento	204	51	0	0	0	377	0	0
Planning Area Total	1,746	603	192	466	206	2,373	900	25

Assumptions:

- Data for areas with office/industrial mix land use designation have been allocated to Regional Office and Industrial Employee Intensive designations.

Note:

- Data for South Natomas and North Natomas include some County areas. Data for all other community Planning Areas include only City areas.
- Values less than 0.5 are shown as 0 due to rounding. Sum of values may not equal total shown due to rounding.

Source: City of Sacramento General Plan.

TABLE 4.1-4

CITY OF SACRAMENTO
EXISTING VACANT LAND (1985) ACREAGE

	Employment Generating Uses							
Community Planning Area	Community/ Neighborhood Commercial	Community/ Neighborhood Office	Regional Commer-cial	Regional Office	Public Office	Heavy Commercial Warehouse	Industrial	Industrial Employee Intensive
Airport Meadowview	46	11	35	179	0	13	0	245
Arden-Arcade	1	0	11	30	0	0	0	15
Central City	5	1	0	1	0	86	0	0
East Broadway	18	89	0	0	0	646	0	90
East Sacramento	22	15	0	0	0	80	0	9
Land Park	0	0	0	0	0	10	0	0
North Natomas	170	42	0	465	0	0	726	1,481
North Sacramento	19	5	0	51	0	871	97	202
Pocket	10	49	0	117	0	0	0	0
South Natomas	143	33	0	316	0	0	0	36
South Sacramento	177	44	0	0	0	867	0	0
Planning Area Total	**609**	**291**	**46**	**1,158**	**0**	**2,573**	**822**	**2,077**

Assumptions:

- Data for areas with office/industrial mix land use designation have been allocated to Regional Office and Industrial Employee Intensive designations.

Note:
- Data for South Natomas and North Natomas include some county areas. Data for all other community Planning Areas include only city areas.
- Values less than 0.5 are shown as 0 due to rounding. Sum of values may not equal total shown due to rounding.

Source: City of Sacramento General Plan.

underestimated because they are based only on vacant land capacities and do not account for reuse and redevelopment activities.[11]

Existing Land Use Plans

Sacramento City General Plan

The Sacramento City General Plan is a 20-year policy guide (1986-2006) for the physical development of land uses in the 97 square mile area of the City. The General Plan provides a broad framework of policy within which more precise plans can be prepared, and is the principal tool for the City to use in evaluating proposed public and private development. Consistency of precise plans or projects with General Plan policies is a major step toward their approval; such consistency is determined by the City Council as part of their deliberations on a plan or project. The following policies can be considered to relate to the development and redevelopment of the Planning Area. They are quoted directly from the General Plan. The relationship of the Alternative land use plans to the policies is then discussed. Policies related specifically to housing, circulation and public facilities, outside of a land use context, are discussed in Chapters 4.7, 4.8, and 4.16 through 4.22 of this EIR.

Residential Land Use Element

Goal A: **Improve the quality of residential neighborhoods Citywide by protecting, preserving and enhancing their character.**

Policy 4: Promote the reuse of abandoned structures which are sound or can be renovated for residential use to ensure neighborhood vitality.

In the Richards Area, under all Alternatives except Alternative 1, smaller historic structures in the triangle area between 12th and 16th streets are encouraged for residential reuse.

Policy 5: Continue redevelopment and rehabilitation efforts in existing target areas and identify other areas experiencing blighting conditions. Explore methods to expand public or private rehabilitation efforts in potential improvement areas and in areas of opportunity or reuse identified in the General Plan. [Note: The Richards Area has been targeted as a redevelopment area for the purpose of eliminating blight.]

Implementation of all of the Alternatives, except the No Project Alternative, would result in the renovation of the blighted Richards Area, which has been targeted through the redevelopment process.

Policy 6: Prohibit the intrusion of incompatible uses into residential neighborhoods through adequate buffers, screening and zoning practices that do not preclude pedestrian access to arterials that may serve as transit corridors.

Alternatives 2, 3, 4, and 7 would provide for a residential buffer in the Alkali Edge between the Railyards Area and the Alkali Flat neighborhood. Alternative 1 would allow for the continuation of the existing patterns of development in the Planning Area and, thus, similar continued relationships to adjacent neighborhoods. Alternatives 5 and 6, with their broader spread of commercial uses in the Railyards Area and the southern portion of the Richards Area could result in potential spillover of non-residential uses into the adjacent residential neighborhoods.

Policy 7: Protect and preserve architectural, cultural and historic structures through the existing preservation program.

As is discussed above and in Chapter 4.6, Cultural Resources, preservation of the historic Central Shops and older structures in the Richards Area would take place under Alternatives 3, 4, 5, and 7. Although the Central Shops would be preserved under Alternative 6, it is likely that higher densities of office development in the Richards Area could result in the loss of some smaller historic structures in that area.

Goal B: Provide affordable housing opportunities for all income household categories throughout the City.

Policy 1: Establish methods to provide more balanced housing opportunities in communities that lack a full range of housing opportunities.

Very limited housing opportunities currently exist in the Planning Area. Alternatives 2, 3, 4, 5, 6 and 7 would expand the available housing opportunities in the Planning Area. Alternative 1 would preserve existing housing resources at the Dos Rios housing project and in the Basler-Dreher neighborhood.

Goal C: Develop residential land uses in a manner which is efficient and utilizes existing and planned urban resources.

Policy 1: Identify areas where increased densities, land use changes or mixed uses would help support existing services, transportation facilities, transit, and light rail. Then proceed with necessary General Plan land use changes for property with service capacities adequate to support more intensive residential development.

Policy 2: Identify areas of potential change where higher density development would be appropriate along major thoroughfares, commercial strips and near light rail stations, and modify plans to accommodate this change.

All of the Alternatives, with the exception of Alternative 1, would allow for the expansion of transit facilities and the development at appropriate high densities and land uses in the immediate vicinity of the light rail and other transit improvements.

Policy 4: Promote development as a means to meet future housing needs by expanding the benefits for this type of development and actively promote development in identified areas through outreach programs designed to inform the development community and property owners of this program.

Under Alternatives 2, 3, 4, 5 and 7, redevelopment activities in the Planning Area would provide for major new housing resources in the Central City. Alternative 1 would exclude new residential use. Alternative 6 would allow for some new residential development, but would focus redevelopment activities on non-residential uses.

Policy 6: Continue to support redevelopment and rehabilitation efforts that add new and reconditioned housing to the housing stock while eliminating neighborhood blight and deterioration.

Alternatives 2, 3, 4, 5 and 7 would allow for the renovation, rehabilitation, or replacement of existing older housing units in the Richards Area. In addition, these Alternatives would provide for expanded residential opportunities around existing residential neighborhoods.

Goal D: Maintain orderly residential growth in areas where urban services are readily available or can be provided in an efficient cost effective manner.

Goal E: Provide appropriate residential opportunities to meet the City's required fair share of the region's housing needs.

Policy 1: Provide housing opportunities in newly developing communities and in large mixed use developments in an effort to reduce travel time to and from employment centers.

Policy 2: Use mixed use housing and employment centers to help meet housing needs and reduce traffic in new development within the City.

Policy 3: Establish guidelines for mixed use projects and allow these uses in urbanized areas of the City where intensive development is planned.

Alternatives 2 and 3 would provide for the closest jobs/housing balance of any of the Alternatives evaluated in this EIR. Alternatives 4, 5 and 7 contain a mix of uses that provides housing in greater proportion to jobs than occurs in the existing Planning Area. Alternatives 1 and 6 would continue or exacerbate the imbalance between jobs and housing in the Planning Area.

Commerce and Industry Land Use Element

Downtown Sacramento

Goal A: Maintain and strengthen Downtown's role as a major regional office, retail commercial, governmental, and cultural/entertainment center.

Policy 1: Provide incentives for regional commercial and office development projects locating within the downtown area.

The planning and implementation policies of the RSP and the RBAP in concert with designation of the Planning Area as a redevelopment area provide an incentive for expansion of the area as a regional commercial and office center, and as an expansion of the downtown commercial center. Under Alternative 1, there would be no incentives for such expansion provided.

Policy 2: Actively support the development of cultural and entertainment facilities and events in the downtown area.

Under Alternative 1, no expansion of cultural and visitor facilities would be provided in the Planning Area. Under Alternatives 4, 5 and 7, there would be a significant expansion of cultural facilities, through the renovation and adaptive reuse of the Central Shops buildings. Under all Alternatives, with the exception of Alternative 1, a new riverfront park and amphitheater would be constructed along the Sacramento River. This park and amphitheater would provide a new public gathering spot along the river for performances and other cultural programs.

Policy 3: Actively support efforts to develop visitor and convention facilities in the downtown area.

Under any of the Alternatives, a major new convention center at a variety of sites in the Richards Area is possible, although not currently considered as a specific element in the Alternatives. See also the discussion of the Convention Center in Chapter 6.3.4, Special Considerations.

Policy 4A: Actively support efforts to develop child care facilities for downtown employees, shoppers, and visitors.

The Facility Element would require "provide child care facilities in new residential and commercial developments, as required by the City of Sacramento."

Goal B: Promote the successful development of mixed-use projects in the Central City.

Policy 1: Actively support and encourage mixed use commercial, office, and residential development in identified areas of opportunity.

See discussion above related to mixed use development in the Planning Area.

Goal C: Maintain and strengthen Downtown's role as a center for governmental office activity.

Policy 1: Encourage continued construction and leasing of public office space in downtown Sacramento.

Under all Alternatives, with the exception of Alternative 1, large amounts of "back office" space, with large floor plates, would be made available in the northern portion of the Railyards Area and in the Richards Area. Such "back office" is generally believed to be attractive to public office users such as the State of California, the federal government, and other local and regional public office users.

Regional Commercial and Office Areas

Goal A: Ensure that the City of Sacramento captures a Regional Central City's share of the regional office market.

Policy 1: Assist public and private interests in developing strategies for attracting and retaining major office users inside the City of Sacramento.

Economic analysis prepared for this EIR suggests that approval of major redevelopment efforts for the Planning Area, such as those under Alternative 4, would encourage an increased capture of regional office space demand in the Central City. This would be the case for all Alternatives with the exception of Alternative 1.

Goal B: Promote development of mixed-use regional commercial and office projects.

Policy 1: Strongly encourage new regional commercial and office centers to incorporate accessory uses as stated below.

Land use plans and policies for both the Railyards Area and the Richards Area encourage supportive relationships between large-scale commercial, office and residential uses.

Neighborhood/Community Commercial and Office Areas

Goal A: Ensure that all areas of the City are adequately served by neighborhood/community shopping districts.

Policy 1: Maintain and strengthen viable shopping districts throughout the City.

Under all Alternatives with the exception of Alternative 1, increased residential and employee population in the Planning Area would be supportive of the major retail users in downtown Sacramento, including the Downtown Plaza specialty retail center.

Goal B: Promote mixed use development of neighborhood/community commercial districts through new construction and revitalization.

Policy 1: Allow mixed use development in accordance with the requirements set forth previously in this Section.

See discussion above related to mixed use development in the Planning Area.

Policy 2: Promote the development of mixed use local commercial/office and high density residential projects.

See discussion above related to mixed use development in the Planning Area.

Heavy Commercial/Warehouse Industrial Areas

Goal A: Maintain and strengthen Sacramento's role as a major West Coast warehousing/distribution center.

Policy 1: Provide adequate land for expansion of existing facilities and opportunities for new warehousing/distribution activities.

Policy 2: Assist private interests to maintain and strengthen the competitive advantages of Sacramento's warehousing/distribution industry.

Under Alternative 1, large amounts of land would remain available for expansion of heavy commercial and warehousing activities. Under Alternative 4, such land would also be made available for other uses, including office and higher density residential, which may ultimately successfully compete with warehousing and heavy commercial uses, resulting in limitations on the possible expansion of such uses. Under Alternatives 2, 3, 5, 6, and 7, no major expansion of heavy commercial and warehousing uses would be allowed. The City has been concentrating warehousing uses in areas outside the Central City, where land prices are more competitive.

Industrial/Manufacturing Areas

Goal A: Continue to identify and attempt to minimize potential adverse impacts from increased industrial development.

Policy 1: Allow industrial development only in those areas where potential impacts can be expected to be minimized.

None of the Alternatives allow for the significant expansion of industrial uses in the Planning Area.

Policy 2: Prohibit industrial uses within the American River Parkway. Also, prevent incompatible industrial development adjacent to the American and Sacramento River Parkways.

None of the Alternatives , except for Alternative 1, would allow industrial development within the American River Parkway. Most types of industrial uses would be prohibited under Alternative 1 without a use permit. Exceptions to this include some uses that are classified as industrial such as recycling or warehousing. Under Alternative 1, these uses could expand. Similarly, under all Alternatives, incompatible industrial uses would not be allowed adjacent to either the Sacramento or American Rivers.

Industrial Employee Intensive Areas

Goal A: Promote the development of employee intensive uses in selected locations where such uses would encourage Light Rail Transit ridership, promote planned housing opportunities; and offer incentives for reuse.

Policy 1: Support employee intensive uses where appropriate along transportation corridors, adjacent to Light Rail stations, within selected mixed use areas, and where community plan and redevelopment goals would be implemented.

Under Alternatives 4, 6, and 7, employee intensive uses have been concentrated around the proposed Intermodal Transit Station at 7th and North B streets. Under Alternatives 2 and 3, much of the employee-generating uses have been replaced with residential uses; however, office uses would surround the Intermodal Transit Station. Under Alternative 5, lower-intensity

employee-generating uses would spread north of the Intermodal Transit Station, which would be located immediately north of the employee-intensive Sacramento Station site and the existing downtown area.

Economic Development and Employment Opportunities

Goal A:	**Expand local industrial base through diversification and increased manufacturing activities.**
Policy 1:	Develop an industrial development strategy for the City that would identify: the City's industrial market segment; City actions available to diversify the local economic base; and ways to effectively compete with other industrial lands in the Metropolitan area.

The Planning Area would serve as an element of the City's strategy to maintain and enhance its industrial sector only under Alternative 1.

City of Sacramento Zoning Ordinance

The Zoning Ordinance contains regulations that govern the type and intensity of land use and standards for development. Zoning districts in the Planning Areas are shown on Figure 4.1-3. The following descriptions of zoning districts apply to the Richards Area and are drawn from the Zoning Ordinance.

R-3 Multi-Family Zone This is a multifamily residential zone intended for more traditional types of apartments. This zone is located outside the Central City, serving as a buffer along major streets and shopping centers. Minimum land area per unit is 1,500 square feet.

R-3 zoning restricts buildings to 35 feet in height. The front yard setback requirement is governed by the setbacks of existing buildings on the same street frontage. The rear yard setback must be at least 15 feet, except when the lot abuts a public alley, it may be reduced to 5 feet. The side yard setback requirements are 5 feet for an interior side and 25 feet for a street side. Minimum lot size is 1,500 square feet per dwelling unit, and maximum lot coverage is 50 percent.

In the Planning Area, the R-3 zoning applies to the Dos Rios Housing Project.

O-B Office Building Zone This zone permits development of business office centers, and institutional or professional buildings where they would not normally be permitted, such as residential neighborhoods. The maximum height in an O-B zone is 35 feet without a special permit. The front yard setback is governed by the setbacks of existing buildings on the same street frontage. The rear yard setback must be at least 15 feet, except when the lot abuts a public alley, it may be reduced to 5 feet. The side yard setback requirements are 5 feet for buildings up to three stories in height. For buildings over three stories, the required minimum shall be increased by one foot for each story over three. A building in an O-B zone may not exceed 40,000 square feet of gross floor area, except in special circumstances.

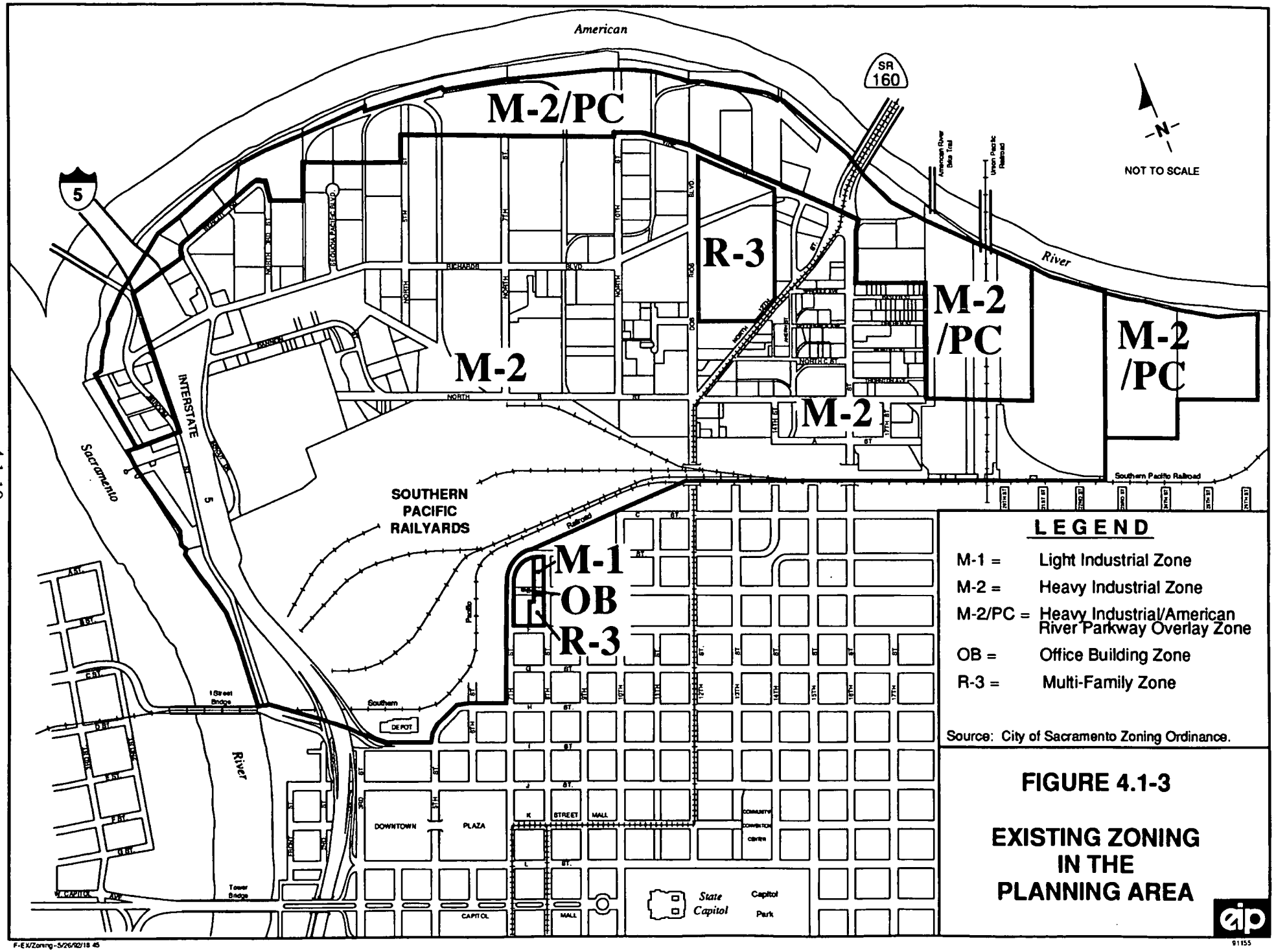


FIGURE 4.1-3

EXISTING ZONING IN THE PLANNING AREA

O-B zoning applies to some portions of the Alkali Edge neighborhood that are in the Planning Area.

M-1 Light Industrial Zone This zone permits most fabricating activities, with the exception of heavy manufacturing and the processing of raw materials. In addition, regulations are provided in the M-1(S) zone to provide more attractive and uncrowded developments. A wide variety of commercial and industrial uses are permitted in an M-1 zone. Residential uses may be permitted, subject to special conditions.

M-1 zoning applies to some portions of the Alkali Edge neighborhood that are in the Planning Area.

M-2 Heavy Industrial Zone This zone permits the manufacture or treatment of goods from raw materials. Like the M-1(S) zone, the M-2(S) zone has certain regulations designed to obtain industrial park developments that are in keeping with the modern concept of attractive, landscaped industrial plants. A wide variety of commercial and industrial uses are permitted in an M-2 zone. Residential uses may be permitted, subject to special conditions.

M-2 zoning applies to the Railyards Area and large portions of the Richards Area.

ARP-F Zone The ARP-F zone regulates land uses in the floodway of the American River. All uses other than public uses in the ARP-F zone are non-conforming. Public facilities that could have an adverse impact on the natural character of the Parkway may be allowed if they are deemed necessary to promote the overall health, safety, and welfare of the community.

PC American River Parkway Overlay Zone The purpose of the PC overlay zone is to mitigate the potential adverse environmental impacts associated with urban development on the American River and its adjacent flood plain. The PC zone includes all land adjacent to the American River Parkway where development could have an adverse effect on the Parkway. The width of this zone varies from a couple of hundred feet to over 1,000 feet. Some uses permitted in the M-2 zone require special permits to be located in the PC overlay zone. All proposed development is subject to architectural and site development controls. Uses in the PC zone requiring a special permit are:

Boat buildings
Communication and transmission facilities
Contractor's storage yards
Drive-in restaurants
Earth moving and heavy construction equipment rental, sales and storage yards
Hotels
Motels
Outdoor assembly, service, testing or repair of engines or motors
Public utility yards
Restaurants or bars
Service stations

Truck or tractor repair
Gas, oil or water wells
Campgrounds, including recreational vehicle parks
Sports stadiums or complexes

There is also a series of agricultural, recreational, commercial, and industrial uses that are prohibited as they are believed to have a high potential for having significant adverse effects on the Parkway. These uses are listed in the American River Parkway Plan.

Sacramento Housing and Redevelopment Agency Plans

The Sacramento Housing and Redevelopment Agency has implemented two redevelopment plans that occur within the Planning Area. One of these is the Richards Boulevard Redevelopment Plan, and the other is the Alkali Flat Redevelopment Plan. The Richards Boulevard Redevelopment Plan and Implementation Strategy was adopted July 17, 1990 and has a term of 35 years. Adopted on February 10, 1972 and amended in July of 1984, the Alkali Flat Redevelopment Plan will terminate in December, 1993.

Richards Boulevard Redevelopment Plan

The Richard Boulevard Redevelopment Plan is intended to accomplish several goals, which include the improvement of land use, the consolidation of social service facilities, the removal and replacement of substandard housing, and improvement of entrances to the city.

The Redevelopment Plan identified the following constraints to development in the Richards Boulevard Area:

- physical isolation from the adjacent downtown area;
- inaccessible and vacant land area;
- traffic congestion and circulation problems due to a lack of public infrastructure;
- multiple social service area providing food and shelter at different times and in different locations;
- existence of hazardous substances in soil and groundwater; and
- deteriorated housing stock constructed prior to WWII.

The goals of the Plan include:

- The removal of blight and deterioration;
- the promotion of private sector investment;

- the consolidation of social service facilities;
- the expansion of business/employment opportunities;
- the provision of public improvements and facilities including streets, sewers, parks, police and fire; and
- the expansion of the supply of housing, particularly for low- and moderate-income households.

Improvement of Land Use

The redevelopment area covers slightly more than 1,310 acres, and is occupied by a patchwork of warehouse, food processing, and distribution centers, many of which are located in older structures in various conditions of repair. Approximately 95 acres of the Redevelopment Area are vacant. Most of the vacant parcels are smaller than 5 acres, which limits development opportunities for mid-sized or larger users. The redevelopment process will be used either to incorporate vacant parcels into surrounding parcels or for infill development. Junkyards would be eliminated, and vacant structures would be razed or renovated.[12]

Consolidation of Social Services

The Sacramento Housing and Redevelopment Agency plans to provide social services and community-based organizations in a district in the Richards Area east of North 12th Street, which will be known as East Gateway. Several community service organizations, such as Loaves and Fishes, the Salvation Army, St. John's Shelter, Maryhouse, and the Mustard Seed School, are already located in this district. The district would provide safe pedestrian ingress and egress and a light rail station, which would be convenient for those receiving social services. A new social services complex and a park, and facilities such as a laundry, showers, restrooms and rest areas would be developed in this district. Specifically, the social services complex would comprise the following program components: a 114-bed shelter for participants of the Department of Social Services Aid-in-Kind program for the homeless; a 180-bed shelter component for homeless individuals who do not participate in the Aid-in-Kind Program; and a 120-bed detoxification facility which would replace the current public inebriate facility at 2700 Front Street.[13]

Removal and Replacement of Substandard Housing

Housing is located in the Redevelopment Area on Bannon Street and on Dos Rios Boulevard (the Dos Rios public housing site). Substandard houses near North B and Bannon streets would be razed and the parcels they occupy consolidated and dedicated to another use. The occupants would be entitled to relocation benefits.[14]

Improvement of Entrances to the City

The agency would like to improve the appearance of views from State Highway 160 by improving the quality of development and maintenance along the corridor. Berms, landscaping, and beautification efforts would be planned along the entire entrance strip.

Alkali Flat Redevelopment Planning Area Redevelopment Plan

The Alkali Flat Redevelopment Area is located immediately adjacent to and north of the City's Central Business District and comprises 25 blocks of residential, commercial and industrial property. Four blocks of the Alkali Flat Redevelopment Area are included in the Southern Pacific/Richards Planning Area.

The Redevelopment Plan is intended to accomplish the following goals:

1) The provision of safe, decent, adequate and sanitary housing through the development and rehabilitation of a mixture of housing types for all income groups;

2) The restoration of historically or architecturally significant structures;

3) The creation of additional employment opportunities for Planning Area residents, particularly by area businesses and industry, by assisting in the creation of an economically viable commercial and industrial area;

4) The provision of a parking and circulation system which is conducive to a neighborhood character by reducing or rerouting through commuter traffic and preventing future intrusions of non-residential parking in residential areas;

5) The maximization of private participation and investment in the redevelopment effort;

6) The elimination of environmental deficiencies in the Planning Area, including substandard alleys and sidewalks; and

7) The accommodation of public and private social service providers and facilities to support services needs of persons residing in the Planning Area.

American River Parkway Plan

The American River Parkway Plan, adopted in 1986, provides a comprehensive description of the individual areas of the American River Parkway. The location and natural and artificial features of each area are described in the plan. The plan also describes land use regulations that apply to land in and around the American River Parkway. Regulations that apply to the proposed

Planning Area are described in this chapter in the above section, "City of Sacramento Zoning Ordinance."

The Sacramento County Department of Parks and Recreation (Department) has the primary responsibility for the administration and management of the portion of the American River Parkway between Hazel Avenue and the American River's confluence with the Sacramento River. The entire American River Parkway includes an open space greenbelt that extends from Folsom Dam to the American River. The Parkway was established in part because of the increased feasibility of urban development along the American River due to Folsom Dam. The department's jurisdiction includes both the unincorporated and City of Sacramento portions of the Parkway.

The American River Parkway Plan contains a set of goals and policies which provide guidelines for preservation, recreational use, development and administration of the American River Parkway. The following goals and policies are those from the Plan that are relevant to the Planning Area and anticipated redevelopment activities:

Goals

- To provide, protect and enhance for public use a continuous open space greenbelt along the American River extending from the Sacramento River to Folsom Dam; and
- To provide appropriate access and facilities so that present and future generations can enjoy the amenities and resources of the Parkway which enhance the enjoyment of leisure activities; and
- To preserve, protect, interpret and improve the natural, archaeological, historical and recreational resources of the Parkway, including adequate flow of high quality water, anadromous and resident fishes, migratory and resident wildlife, and diverse natural vegetation; and
- To mitigate adverse effects of activities and facilities adjacent to the Parkway; and
- To provide public safety and protection within and adjacent to the Parkway.

Relevant Policies

1.2 The Parkway shall be oriented to passive, unstructured water-enhanced recreation activities which are appropriate in a natural environment, and which are not normally provided by other County recreational facilities. To this end, development in the Parkway shall be minimal, and facilities which are primarily visitor attractions should be placed in less sensitive areas within the County Park system. Insofar as possible, development shall not occur in areas of natural ecosystems that are still relatively undisturbed.

3.3 Discharge or drainage of pollutants into the Lower American River shall be eliminated.

5.7 Structures that are in the Parkway or visible from the Parkway shall be of a design, color, texture and scale that minimizes adverse visual intrusion into the Parkway.

5.7.1 Structures shall be constructed of naturalistic materials which blend with the natural environment.

5.7.2 Colors shall be earth tones, or shall blend with the colors of surrounding vegetation.

5.7.3 Structures may emulate authentic historic design, but shall be unobtrusive.

5.7.4 To the extent possible, structures shall be screened from view by natural landscaping or other naturally occurring features.

5.7.5 Structures shall not include any commercial advertising.

5.7.6 Structures shall be located so that neither they, nor activities associated with them, cause damage to native plants or wildlife.

5.7.7 Structures shall be located so that neither they, nor activities associated with them, disrupt the recreational use of the Parkway, and such structures shall be consistent with the goals and policies of this Plan.

5.7.8 Structures shall be fire resistant construction and designed and located in a manner such that adequate emergency services and facilities can be provided.

6.2 Adverse impacts upon the Parkway caused by adjacent land uses and activities shall be eliminated or mitigated.

6.4 Levees, landscaping, and other man-made or natural buffers should be used to separate the Parkway visually and functionally from adjoining land uses.

7.1 Public accesses for equestrians, pedestrians, bicyclists, and vehicles are appropriate in all land use categories except in Nature Planning Areas, Open Space Preserve Areas, and Recreation Reserve Areas.

7.2 Access points and parking lots shall be located where there is the least potential environmental damage and adverse impacts on the Parkway environment and surrounding neighborhoods.

Sacramento River Parkway Plan

The 1975 Sacramento River Parkway Plan (SRPP) was prepared for the purpose of providing a comprehensive plan for the preservation and use of the river resource. Access to the Sacramento River from the Planning Area is restricted by the Southern Pacific Railyard property. Direct access to the river is available at Tiscornia Park within the Planning Area, and at Discovery Park immediately north of the Planning Area.

The SRPP encompasses an area that is located along the easterly bank of the Sacramento River extending from the confluence of the Sacramento and American Rivers on the north to the City limits of Freeport on the south. Planning of the Sacramento River differs from the American River in that the former is classified as an "urban" river. Natural and artificial constraints make access and recreation development of this parkway difficult by both auto and foot. The parkway levee and berm are easily eroded by rain, flooding and wave action. The SRPP analyzed all of the constraints that exist and presents a planing tool that is intended to guide the orderly development of the Parkway.

The SRPP contains a set of goals and policies developed for the Parkway. The following Parkway concepts are those from the Plan that are relevant to the Planning Area and anticipated redevelopment activities. The Plan requires that new developments in or adjacent to the Parkway comply with the intent and purpose the following Concepts:

a. that, the Parkway is a recreational, open space, educational, and water oriented resource.

b. that, the Parkway constitutes a designated floodway susceptible to periodic inundation.

c. that, although it is to be developed for human use, the natural environment shall be protected, preserved and enhanced to the fullest extent possible, especially large aggregations of significant vegetation and wildlife.

d. that, except for designated high use areas of the Parkway and on adjacent parklands, a majority of the Parkway shall be retained in a natural state for passive recreational uses.

e. that, permitted recreational and educational uses of the Parkway shall be such that:

1) they enhance but do not destroy or significantly alter the natural resources of the Parkway;

2) they require a minimum of man-made improvements and facilities;

3) they are appropriate for and suitable to the nature of the area;

4) that the access points and associated improvements shall not have adverse impact upon adjacent land uses;

5) that high use activities and facilities shall be accommodated only at designated locations which afford the least conflict with adjacent land uses.

The portion of the Sacramento River Parkway that is within the Planning Area has been designated Planning Area "A" in the Plan. According to the Plan,

> "The proposed development in this segment will provide a Parkway and trail linkage from both Discovery Park and American River Bikeway to Old Sacramento and the Central Business District. The Parkway facilities will enable greater access and use of the river area around the mouth of the American River, which is so popular for fishing. The proposed access points, parking areas, restroom facility, and trail system will complement the development in Discovery Park. This plan will require the acquisition of the land between the levee and Jibboom Street north of Richards Boulevard, and the construction of an underpass below the "I" Street Bridge."

Segments along the Parkway were identified as Low Use Areas, Moderate Use Areas, or High Use Areas depending on the opportunities and constraints that exist. The segment adjacent to the Planning Area is identified as a High Use Area with two major access points. This area includes property from Jibboom Street in the north to Old Sacramento in the south. Continuing south, Old Sacramento and Miller Park are both identified as High Use Areas. The use intensities then shift between Low Use, Moderate Use, and High Use Areas between Sutterville and Freeport Area.

High Use Areas are so designated because these are the areas that are able to withstand and accommodate relatively intensive use. This designation is applied to areas where park development will not have a significant adverse impact upon the surrounding natural and cultural environment. The intent is to provide recreational opportunities for all users, but not at the expense of the Parkway, nor of the surrounding neighborhood. These high use areas are intended to attract the highest number of users among all use classifications.

Draft 1991-1992 Sacramento River Parkway Plan

The 1975 Sacramento River Parkway Plan is in the process of being updated by the City's Planing Division, Planning and Development Department. This Plan is, in part, the result of a number of plans currently being developed for the River area. These plans include the City's Bikeway Master Plan and Draft Update, the Draft Sacramento River Riparian Study, and the Sacramento River Marina Carrying Capacity Study. A draft of the Sacramento River Parkway Update is expected in mid-summer 1992 and will include goals and objectives for future Parkway development from the southern City limits to the northern limits of the South Natomas Community Plan area.

This plan differs from the 1975 Plan in that areas north of the Sacramento and American Rivers' confluence are included, as well as more detailed goals and policies than the original plan. The land uses included in the update will be reflective of land uses identified in the Riparian Parkway Plan (see below) in addition, the bikeway plan included within the Sacramento River Update will be reflective of the Bikeway Master Plan Update (see Bicycle Recreation Plan Section).

Draft Sacramento River Riparian Parkway Plan

Multiple jurisdictions including the City of Sacramento, County of Sacramento, County of Yolo, and State Lands Commission formed an interagency planning team in late 1990 and early 1991 to establish a Sacramento River Riparian Parkway. The boundaries of the parkway include both the east and west side of the Sacramento River extending from the Sacramento-Sutter County lines in the north to an area south of Freeport. This interagency planning team was formed in response to the increasing demand for development along the riverfront, which is not always compatible with habitat preservation, public access, flood control and wildlife preservation. The City of West Sacramento was mentioned in the Memorandum of Understanding (MOU) for the interagency team, but did not join the interagency planning team. The MOU states that conservation and recreation are major goals of the Plan. Specifically, the Plan is to include the following objectives: 1) preserve, protect, enhance, and restore the riparian corridor and its associated ecosystems, and 2) design a system of controlled public access for active and passive recreational uses related to the River. The Plan is to include such features as management alternatives; an analysis of the physical, social, and economic effects associated with the management alternatives; and a preferred alternative with guidelines and standards for defining, implementing and managing the Parkway. A final Plan is expected to be released in late 1993.

Components of the Plan, as outlined to date by the interagency planning team, includes a section for background setting, goals and objectives, and Plan implementation. Any goals, objectives,

and implementation measures adopted as part of the Plan will pertain exclusively to public lands within the Plan's boundaries.

One element of the Plan will be to create an overlay zone for public properties within the Plan boundaries identifying appropriate recreation activities and facilities. To date, a preliminary draft overlay map has been developed identifying overlays for public lands throughout the study area; however, the public release of a draft Plan isn't expected until August 1992. The draft conceptual plans for public lands appear to be consistent with the intent of the ARPP for land including the Developed Recreation and Bannon Island Nature Study Area of the Discovery Park Area.

Sacramento Central City Community Plan

The Central City Community Plan, covering an area defined by the Sacramento River on the west, the Southern Pacific Railyards on the north, and the Business 80 freeway on the south and east, provides specific policies for the City of Sacramento's Central Business District and Midtown neighborhoods. Because the Planning Area is not located within the Community Plan boundaries and the Plan does not address adjacent uses, the Planning Area is not subject to the Plan.

Proposed Land Use Plans

Richard Boulevard Area Plan Policies

The following objectives and policies from the proposed RBAP apply to type and location of land uses in the Richards Area:

Objective 1: **Provide for the development of a diverse mixture of uses within the Richards area which will complement Sacramento's downtown district, provide a variety of housing opportunities and facilitate the enhancement and revitalization of the Richards Boulevard area.**

Policy 1.1: The mixture of land uses and activities that is permitted within the Richards area should be guided by the physical features and environmental conditions of the area.

Policy 1.2: Ensure that adequate infrastructure and community facilities are developed to support the proposed mixture of uses.

Policy 1.3: Establish land use standards and design guidelines which promote a comfortable coexistence between the diverse land uses permitted in the Richards Boulevard area.

Objective 2: **Provide for the continuation of existing industrial and service commercial uses.**

Policy 2.1: Preserve and enhance opportunities within the Richards Boulevard area for service businesses and start-up or incubator businesses.

Policy 2.2: Allow existing manufacturing and processing uses to remain in the area as conforming uses.

Objective 3: Maintain and improve retail services in the area.

Policy 3.1: Provide for the continuation and directed expansion of highway-oriented commercial and regional retail services.

Policy 3.2: Encourage retail businesses which serve the shopping and entertainment needs of residents and office workers.

Objective 4: Strengthen Sacramento's Central City as the region's principal employment center, through the creation of a significant transit-oriented support office district in close proximity to the downtown and State Capitol.

Policy 4.1: Direct the development of new office uses to the southern portion of the Richards Boulevard Planning Area, where such development would be served by planned regional transit facilities.

Objective 5: Provide for a significant component of housing within the Richards Boulevard Planning Area, in order to reinforce the Central City as a place to live as well as work.

Policy 5.1: Preserve housing in the Dos Rios and Basler-Dreher areas.

Policy 5.2: Establish residential reserve districts which identify areas for future housing development.

Policy 5.3: Maintain the current M-2 zoning within areas designated Residential Reserve. Fifteen years following plan adoption, rezone area designated Residential Reserve to an appropriate multi-family residential zoning district.

Objective 6: Enrich the quality and livability of the area by improving community and human services.

Policy 6.1: Consolidate existing social services and related service providers into a single campus.

Policy 6.2: Provide for the establishment of child care services in appropriate locations.

Objective 7: Configure land uses and development intensity in a way that reinforces transit ridership and supports public investment in transit facilities, particularly the planned intermodal station, and the extension of light rail service through the area.

Policy 7.1: Create a higher intensity office and residential core near the intermodal station.

Policy 7.2: Create an attractive pattern of streets and blocks which is more in scale with the downtown, that can accommodate a mixture of uses and activities, and that can add to the diversity and interest of the Richards Boulevard area.

Objective 8: **Strengthen the character and livability of the Richards Boulevard area by developing a system of public open space, by preserving historic architectural resources.**

Policy 8.1: Configure new development and land uses to enhance public access and recreational use of the American River Parkway.

Policy 8.2: Locate and configure new open spaces to provide focus and amenity to future neighborhoods, and the Richards Boulevard area as a whole, and ensure that new open spaces reinforce the pedestrian network.

Policy 8.3: Place eligible historic buildings on the National Register of Historic Places and the Sacramento Historic Register. Encourage the adaptive reuse of historic warehouse buildings in the Gateway area in a manner which preserves their architectural character.

Policy 8.4: Identify historic archaeological sites within the area.

Objective 9: **Ensure that all new uses within the Richards Boulevard Planning Area comply with applicable law regarding hazardous material remediation and incorporate precautions that protect adjoining uses from unacceptable health and safety risks.**

Policy 9.1: Ensure that all sites proposed for residential, office, retail, community facilities, or other similar development complete hazardous substances investigation, characterization and remediation prior to the issuance of development approvals.

Policy 9.2: Adopt development standards which ensure that new commercial development near proposed residential, office or mixed-use districts does not create an unacceptable risk of human exposure to hazardous materials.

Policy 9.3: Require reconnaissance-level testing for hazardous materials for all commercial development proposals on existing commercial or industrial sites which would significantly increase the number of people brought into the area.

Railyards Area Policies

The RSP divides the Railyards Area into six land use districts. These districts include the Residential Mixed-Use District, the Downtown Commercial Mixed-Use District, the Transit-Oriented Commercial Mixed-Use District, the Central Shop Historic District, the Riverfront Commercial-Recreational District, and the North of Shops Commercial Mixed-Use District. For each of the land use districts the plan provides for a range of land use objectives and policies, as well as development standards and design guidelines. The following is a summary of the land use objectives and policies pertaining to each district:

Residential Mixed-Use District

The Residential Mixed-Use District comprises 46.0 acres in the center of the Railyards Area. The District is planned for residential uses, with ground level commercial support retail uses. Objectives and policies for the Residential Mixed-Use District are:

Objective 1: **Create a high-density mixed-use residential neighborhood which builds upon the unique qualities of the Central City's neighborhoods, and that can contribute to the fulfillment of Sacramento's housing needs.**

Policy 1.1: Encourage a wide diversity of multi-family housing types and a mixture of rental and ownership housing.

Policy 1.2 Encourage elderly housing and a mixture of low and moderate income housing well integrated with market-rate housing.

Policy 1.3 Establish minimum densities for housing in order to optimize the utilization of Land resources to achieve Central City housing goals.

Policy 1.4: Provide for a mixture of activities, with residential as the dominant land use within the area.

Policy 1.5: Preserve historic structures within the Alkali Edge, and contribute to the enhancement of the West Alkali Historic District.

Policy 1.6: Configure development in a manner that respects the single-family nature of Alkali Flat and that reinforces the overall land use and urban design objectives of the plan.

Policy 1.7: Create a pattern of development, through subdivision and parcelization within the Railyards, that reinforces and extends the block structure of downtown Sacramento.

Policy 1.8: Develop building prototypes that promote a visually diverse and rich fabric, and that reinforce the neighborhood scale of the district.

Policy 1.9: Provide active ground-level uses that promote the walkable and pedestrian nature of the area.

Policy 1.10: Provide on-site open space and amenities that create an attractive and liveable residential environment.

Policy 1.11: Provide parking and servicing facilities that are well integrated within development, and that do not detract from the pedestrian environment and neighborhood character of the area.

Downtown Commercial Mixed-Use District

The Downtown Commercial Mixed-Use District is located on approximately 21.5 acres immediately north of Chinatown and immediately west of the Civic Center and government complex. This district is planned for an expansion of existing commercial and administrative uses consistent with the type of development in the downtown core today. Land use objectives and policies for the Downtown Commercial Mixed-Use District are:

Objective 2: **Extend the pattern and vitality of downtown Sacramento into the Railyards area to reinforce the role of the core as the principal governmental, commercial and cultural center of the region.**

Policy 2.1: Allow for the expansion of government uses between Fifth and Seventh Streets to consolidate the Government Center as a cohesive district within the downtown, and to discourage facility decentralization throughout the region.

Policy 2.2: Concentrate high-density commercial uses west of Fifth Street in a manner that reinforces Downtown Plaza, Old Sacramento, and the future role of the Southern Pacific Depot and Central Shops complex.

Policy 2.3: Preserve and rehabilitate the Southern Pacific Depot complex in a manner that will enhance its civic significance in the downtown and Railyards area.

Policy 2.4: Create a major public gathering space in close conjunction with the Southern Pacific Depot.

Policy 2.5: Extend the block pattern of downtown streets and pedestrian ways into the district to create an integrated urban fabric.

Policy 2.6: Create buildings that are appropriately scaled to surrounding areas, historic structures and planned open spaces.

Policy 2.7: Limit surface parking within this area, and confine parking structures to the below-grade facilities and/or facilities that are integrated and encapsulated within development.

Transit-Oriented Commercial Mixed-Use District

The Transit-Oriented Commercial Mixed-Use District is composed of 24 acres of land surrounding the proposed Intermodal Transit Station. The intent for this area is that it would house medium-density support and state office uses. Objectives and policies for this area include:

Objective 3: Create a significant support office district that enhances the competitive position of the Central City as a regional employment center, and that promotes transit ridership.

Policy 3.1: Allow for a concentration of commercial and government office uses within this area.

Policy 3.2: Concentrate the highest densities within walking distance (i.e., one-quarter mile) of the intermodal transportation terminal.

Policy 3.3: Promote the strong visual presence of the intermodal station along the 7th Street corridor.

Policy 3.4: Create an active public gathering space immediately adjacent to the intermodal station and along the 7th Street corridor.

Policy 3.5: Create development that is compatible with the mixed-use residential neighborhood to the south.

Policy 3.6: Limit the supply of parking to promote transit use, and control its design and configuration to create a strong pedestrian environment.

Central Shops Historic District

This District includes about 10.3 acres of land at the center of the Railyard Area. It is characterized by the presence of a number of large historic masonry and metal-clad buildings that housed the Southern Pacific Locomotive Works. The plan calls for the preservation and reuse of these structures for cultural and commercial-recreational uses. Objectives and policies related to the Central Shops Historic District are:

Objective 4: **Preserve and restore the core of the Central Shops complex as a major cultural and public-oriented amenity of regional and statewide significance.**

Policy 4.1: Preserve the core of the Central Shops as an historic district within the Railyards, maintaining, to the extent practicable, the buildings an intimate network of open spaces, streets and pedestrian ways that exist between them.

Policy 4.2: Allow for the infill of additional metal-clad structures to replace demolished or deteriorating shed buildings. Design these buildings in a manner that generally replicates the style of the original structures.

Policy 4.3: Introduce a range of public-oriented activities that will highlight the historic significance and meaning of the Central Shops and ensure their viable reuse and ongoing maintenance.

Policy 4.4: Reinforce the unique pedestrian environment that exists between the historic buildings and promote strong linkages with the Southern Pacific Depot, Old Sacramento, and the Sacramento River.

Policy 4.5: Maintain or relocate artifacts that highlight the historic role and significance of the Railyards complex.

Policy 4.6: Limit parking within the historic district by taking advantage of shared parking opportunities with adjacent uses, and by locating parking structures beneath and/or adjacent to the I-5 freeway.

Riverfront Commercial-Recreational District

The Riverfront Commercial-Recreational District is composed of about 19 acres of land on either side of the I-5 freeway located between the Central Shops and the Sacramento River. The primary uses intended for this area in the plan included commercial-recreational and support uses that are complementary in relation to the Central Shop Historic District. Objectives and policies that relate to land uses in the Riverfront Commercial-Recreational District include:

Objective 5: **Introduce development and open spaces along and beneath the I-5 freeway viaduct, to reduce the visual and acoustical impacts of the highway and to provide linkages between the Central Shops, Sacramento River, and Old Sacramento.**

Policy 5.1: Create an active pedestrian street connecting the Central Shops Historic District with the planned Riverfront Park and Old Sacramento.

Policy 5.2: Introduce development that will complement and enhance the public-orientation and recreational potential of the planned Riverfront Park.

Policy 5.3: Introduce development that will complement and enhance destination appeal and historic quality of Central Shops complex.

Policy 5.4: Encourage joint-use parking facilities that can serve adjacent areas and provide an additional acoustical and visual screen from the freeway viaduct.

Policy 5.5: Ensure that new development within this district accommodates transportation requirements, including rail access to Old Sacramento and future I-5 improvements.

North of Shops Commercial Mixed-Use District

The North of Shops Commercial Mixed-Use District is located on about 5.4 acres of land immediately north of the Central Shops. This district is intended to provide office and commercial uses that are supportive of the central shops historic district and adjacent residential to the east. Objectives that relate to land uses in the North of Shops Commercial Mixed-Use District are:

Objective 6: Create a strong northern edge to the Central Shops historic district to reinforce its spatial definition and its viability as an activity center.

Policy 6.1: Allow for a mixture of medium-density office, retail and public uses within this district.

Policy 6.2: Provide for the inclusion of a fire station as part of mixed-use development.

Policy 6.3: Organize the district into two blocks of development, divided by a local street providing a pedestrian and vehicular linkage between Crescent Boulevard and the neighborhood park.

Policy 6.4: Ensure that new development is compatible with the low and mid-rise scale of the Central Shops complex and the adjacent residential neighborhood.

Policy 6.5: Locate parking and service facilities in areas that do not visually affect the Central Shops complex or the neighborhood park and playfields.

Cumulative Land Use in the Central City and the Region

Although growth in the Planning Area would constitute a substantial amount of the development potential of the Central City during the life of the redevelopment activity, other growth in the downtown area would continue and would provide the cumulative context for the growth of the Planning Area. Cumulative development in the Central City would occur in a number of development sectors, including office, retail, and residential land uses. Table 4.1-5 summarizes projected cumulative development in the Central City between 1990 and 2010.

Office and retail development will occur mainly from reuse of land and existing structures, as there is little vacant land for this type of development in the Central City. Most residential development will be infill in existing neighborhoods. The Alhambra corridor and the R Street corridor will be primary locations for residential construction.

The office development component of the cumulative assumptions is based on an economic projection of growth in the Sacramento region during the 20-year period from 1990 through 2010. This projection is summarized in a report entitled *Cumulative Development Scenario* and is included in its entirety in Appendix C. It should be noted that the projected cumulative office development component varies depending on the assumed Alternative. This is due in large part to the assumption that approval of a major redevelopment project in the Planning Area would change the overall demand for space in the Central City area. As such, the type and magnitude of each Alternative affects the overall demand in the downtown area.

Key findings about the regional and Central City office markets include:

- The average annual absorption of office space in the Sacramento region between 1990-2010 is projected to remain more or less the same as it was during the 1985 to 1990 period, averaging about 2.7 million square feet per year.

- The redevelopment of the Railyards Area as a large-scale, mixed-use urban project is unprecedented in the Sacramento region. If the project is developed in a high-quality manner and competitively priced, it can be expected to be very competitive in the marketplace. If successful, it is likely to substantially increase downtown's capture of growth in the regional office market.

- The Richards Area, as a more typical urban redevelopment project with existing uses that will continue in the future, is also expected to be competitive, although it may develop in a more gradual manner with a mix of uses that includes service, light industrial, research and development and office uses.

- Additional office supply in Central Sacramento, whether in the Railyards Area or the Richards Area, will cause a redistribution of projected demand from some Sacramento region market subareas that would otherwise receive the development activity. Although there may be some "shift" of demand from existing Central Sacramento sites, a significant amount of redistributed demand will come from outlying areas. The major submarkets of the region that could be considered competitive under the Planning Area are described in Table 4.1-5.

- There appears to be sufficient demand in the region to support realistic expectations of absorption in existing submarkets, and to support projected absorption in the Planning Area, without major impacts on the existing downtown.

- In the absence of redevelopment in the Planning Area, regional demand would have to be accommodated through increased development:

TABLE 4.1-5

CUMULATIVE REGIONAL DEVELOPMENT ASSUMPTIONS
(in 1,000s of square feet)

Regional Submarket	With RSP/RBAP		Without RSP/RBAP	
	Sq. Ft.	%	Sq. Ft.	%
Total Sacramento Region	54,137	100	54,137	100
Downtown Sacramento	16,187	30	9,587	18
Railyards/Richards	8,829	16	0	0
Other Downtown	7,358	14	9,587	18
Highway 50	14,500	27	16,125	30
Natomas/Northgate	5,875	11	7,500	14
Point West	1,000	2	1,000	2
Roseville/Rocklin	4,025	7	4,750	9
West Sacramento	3,750	7	5,875	11
Other	8,800	16	9,300	17

Source: Economic and Planning Systems, 1991.

  - In areas that have significant physical or market constraints (e.g., North Natomas, West Sacramento);
  - In areas that are not currently considered competitive primary office locations (e.g., Roseville/Rocklin);
  - By increased absorption in the I-50 corridor, which has already been high relative to the region; and/or
  - By the emergence of major new office submarkets.

- Without the potential supply added by development in the Railyards and the Richards Areas, existing areas of downtown Sacramento may actually capture a lower share of demand within the region than they do now.

- The Alternatives for the Railyards Area have unique advantages for the future expansion of State offices, most importantly the ability to meet transit requirements and its proximity to the existing State office complex. State office demand may be a cornerstone of expected absorption in the Railyards Area, assuming that competitive rental rates can be achieved.

Cumulative Development in the Core of the Region

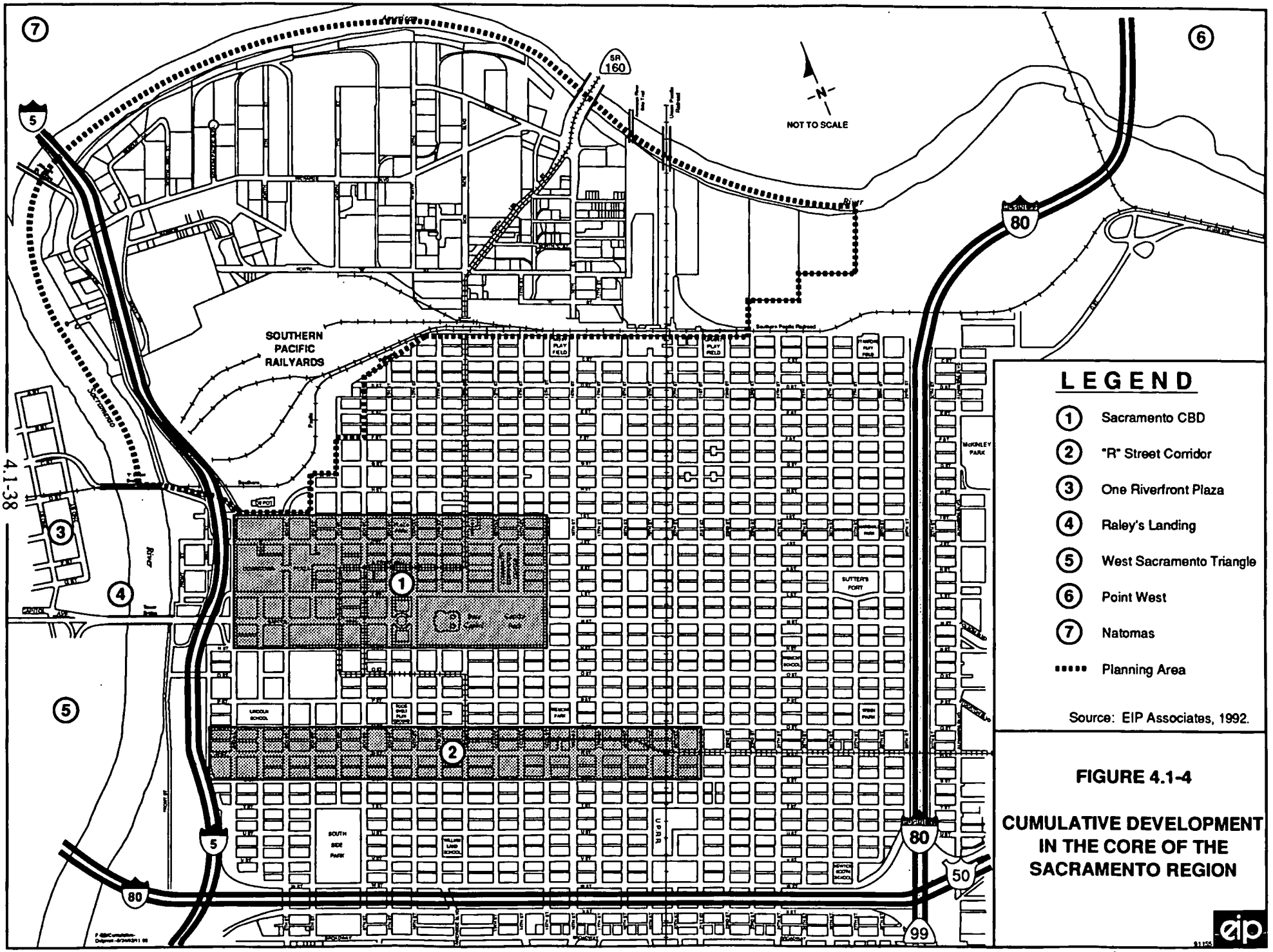
The Planning Area lies in downtown Sacramento, at the core of the Sacramento Metropolitan Area. Although the analysis described in Table 4.1-5 suggests that future development in the Planning Area would cause a redistributional effect throughout the region, there are a number of other submarkets elsewhere in the core that are particularly relevant to the Planning Area (See Figure 4.1-4).

Sacramento

In Sacramento, the remainder of downtown, including the R Street corridor, would nearly double the amount of prime office space currently existing in the downtown area. From a regional perspective, Natomas (both South and North) lie close to the core area and will absorb from 6 to 7.5 million square feet of space. The Point West area, near Cal Expo, is projected to absorb another million square feet of space.

West Sacramento

Historically, West Sacramento has not absorbed much office space in the region; existing and currently planned office space in West Sacramento is about 1.2 million square feet of space. However, the City of West Sacramento has recently been engaged in planning for significant expansion of office development, particularly along its Sacramento River waterfront. There the planning efforts for the Raley's Landing, One Riverfront Plaza, and the West Sacramento Triangle Specific Plan (currently under preparation) create the potential for substantial expansion of office development in West Sacramento. Although ultimate (buildout) development of office space in West Sacramento may be higher, this EIR has assumed development of approximately 3.75 to 5.9 million square feet of office space. The majority of this space is anticipated to take


7
6
5
SR 160
N
NOT TO SCALE
80
SOUTHERN PACIFIC RAILYARDS
SACRAMENTO
RIVER
PLAY FIELD
McKINLEY PARK
SUTTER'S FORT
3
4
1
2
5
80
50
99
LEGEND
1 Sacramento CBD
2 "R" Street Corridor
3 One Riverfront Plaza
4 Raley's Landing
5 West Sacramento Triangle
6 Point West
7 Natomas
Planning Area
Source: EIP Associates, 1992.
FIGURE 4.1-4
CUMULATIVE DEVELOPMENT IN THE CORE OF THE SACRAMENTO REGION
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place within the West Sacramento Triangle Specific Plan Area, located along the Sacramento River between State Route 275 (Tower Bridge) and Business 80/Highway 50 (Pioneer Bridge). This Specific Plan is currently under preparation and subject to environmental review (see Figure 4.1-4).

Downtown Office Development Scenarios

Table 4.1-6 summarizes downtown office development scenarios with and without redevelopment of the Planning Area. The scenarios suggest that without such redevelopment activity, the downtown will absorb about 9.6 million square feet of office space between 1990 and 2010. This represents an 18 percent market share, down slightly from the 21 percent share of regional office demand captured downtown between 1985 and 1990.

With redevelopment in the Planning Area, it is estimated that downtown could absorb approximately 16.2 million square feet, representing a 30 percent share of the regional office market (see Table 4.1-7). If Alternative 4 absorption forecasts are achieved, these two areas would account for about 8.8 million square feet of office development, leaving a total of 7.4 million to be absorbed in the remainder of downtown. The latter figure represents a reduction in demand of about 2.2 million square feet for the existing downtown area, if the Planning Area is redeveloped.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Specific criteria used in this report for determining significance of land use impacts are consistent with significance criteria set forth in the guidelines implementing CEQA. Under CEQA a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment. The land use analysis evaluates the consistency of the alternative land uses with the type and intensity of land uses that currently exist in the Planning Area. An impact is considered to be significant if:

- the Alternatives result in substantial, adverse changes to the type or intensity of existing or planned land uses in the area;
- the Alternatives include land uses that are considered to be incompatible with surrounding land uses or with the general character of the surrounding neighborhood; or
- the Alternatives would be unsupportive or contrary to the general direction of adopted City plans and policies.

TABLE 4.1-6

DOWNTOWN DEVELOPMENT ASSUMPTIONS[1]

Land Use Type	1990-2000 Addition	2000-2010 Addition	1990-2010 Change
Office (Downtown)[2]			
Alternative 1	3,856	4,731	8,587
Alternative 2	3,921	3,946	7,867
Alternative 3	3,691	3,626	7,317
Alternative 4	4,019	3,339	7,358
Alternative 5	4,104	3,636	7,740
Alternative 6	1,691	0	1,691
Alternative 7	3,289	1,989	5,270
Retail (Central City)[3]	400	775	1,175
Residential (Dwelling Units)	500-3,000	550-3,700	1,100-6,700

[1] Represents cumulative development downtown without redevelopment of the Railyards Area and Richards Area.
[2] Based on marketability analysis.
[3] Based on traffic zones--to west side of Alhambra and north side of Broadway plus former Centrage site, per City.

Source: Economic and Planning Systems; Williams Kubelbeck; City of Sacramento, 1991.

TABLE 4.1-7

COMPARATIVE SUMMARY
PROJECTED ABSORPTION OF OFFICE SPACE
AND SHARE OF MARKET CAPTURED BY PLANNING AREA

Area	Projected Absorption			
	Baseline Scenario: Without Railyards/Richards		Project Scenario: With Railyards/Richards	
	1990-2010	%	1990-2010	%
Sacramento Region[1]	54,137,000	100%	54,137,000	100%
Railyards Area[2]	N/A	N/A	6,309,000	12%
Richards Area[2]	N/A	N/A	2,520,000	5%
Other Downtown[3]	9,587,000	18%	7,358,000	14%
Total Downtown	9,587,000	18%	16,187,000	30%

[1] Total projected absorption for the Sacramento region is a forecast based on projected employment growth in the Sacramento region from 1990-2010. Growth in all industry sectors, including government, is projected. Because future absorption is based on employment growth, the office space demand is net of a vacancy allowance.

[2] Absorption assumptions based on development for Alternative 4.

[3] "Other Downtown" may include any Richards Area development that occurs in the event that the Railyard Area site is not developed.

Source: Economic and Planning Systems; Williams Kubelbeck; City of Sacramento, 1991.

Method

Land Use

The land use evaluation is based on a quantitative and qualitative comparison of the existing and alternative future uses in the Planning Area, and their compatibility with existing and planned adjacent
land uses. Of particular concern would be situations in which the development identified in the Alternatives would be incompatible with existing residential and industrial uses.

Land Use Policies

City plans are used for assessing how the Alternatives fit into the larger community planning framework. Each Alternative is compared to the applicable goals and policies found in City plans. The EIR does not attempt to assess the consistency of the characteristics of the Alternatives with individual goals and policies of applicable local and regional plans, but rather makes an evaluation of the supportiveness of the Alternatives with the general direction of the planning documents, as a body of goals and policies, and determines whether the Alternatives would preclude a goal from being met.

Zoning

Alternative land uses in the Planning Area are evaluated for their consistency with the permitted uses, densities, and other provisions of the existing zoning designations for the Planning Area.

Impacts and Mitigation Measures

Land Use Change Within the Planning Area

4.1-1 Development of any of the Alternatives would result in a change in the amount, type, and intensity of land use that currently exists in the area, and would result in a change to the character of the Planning Area.

The Planning Area has historically served as a warehouse, distribution and manufacturing center. The Richards Area has been designated as a redevelopment area, which is intended to improve land uses, and consolidate social services. At present, there are 9.87 million square feet (msf) of development in the Planning Area. All of the proposed Alternatives would result in changes to land uses in the Planning Area. Total existing and new development at buildout for each Alternative is summarized on Table 4.1-8. Total new office, commercial and cultural institutional development ranges from 2.14 to 27.43 million square feet depending on the Alternative (see Table 4.1-8), and residential units and hotel rooms range from zero units and 250 rooms to 3,700 units and 2,390 rooms, respectively. The significance of this impact for each Alternative is discussed below.

A-1 New development under Alternative 1 would include 1.0 msf of Heavy Commercial/Light Industrial development on existing vacant land on the eastern portion of the Railyards Area. In the Richards Area, about 1 million square feet of office uses would replace existing low-intensity trucking facilities and warehouses. Four-hundred thousand square feet of Heavy Commercial/Retail would be constructed in the Richards Area. Most subareas in the Planning Area and the Alkali Edge would remain as they now exist.

TABLE 4.1-8

DEVELOPMENT IN THE PLANNING AREA BY ALTERNATIVE

Land Use	Alt. 1		Alt. 2		Alt. 3		Alt. 4		Alt. 5		Alt. 6		Alt. 7	
	Railyards	Richards	Railyards	Richards	Railyards	Richards	Railyards	Richards	Railyards	Richards	Railyards	Richards	Railyards	Richards
Office[1]	-	1,850	5,120	6,270	6,220	6,470	9,648	6,850	12,100	5,190	13,020	14,500	9,648	11,100
Highway Commercial/Retail[1]	--	400	520	680	520	580	517	590	160	390	500	580	517	585
Heavy Commercial/Retail[1]	1,600	6,000	--	1,350	--	1,350	--	2,000	--	1,350	--	--	--	1,350
Cultural/Institutional[1]	--	--	130	--	150	--	320	--	170	--	320	--	320	--
Residential[2]	--	272	3,600	8,300	3,300	8,300	2,800	4,130	300	6,090	1,400	2,300	2,800	4,160
Hotel[3]	--	1,500	640	1,750	640	1,750	640	1,750	500	1,750	640	500	640	500

[1] In thousands of square feet.
[2] Units
[3] Rooms

Source: ROMA Design Group, 1991.

Total new development under this Alternative would include 2.14 msf of office,heavy commercial, and light ialindustrial, plus 250 hotel rooms. Because development would occur in a relatively limited portion of the Planning Area and would not replace large amounts of existing development, this is considered to be a ***less-than-significant impact.***

A-2 Implementation of Alternative 2 would result in a central commercial area flanked by large residential areas to the north and south. As with most of the Alternatives, a mixed use "Gateway Area" would contain social service facilities, residential units, and some retail development. The Dos Rios neighborhood would be preserved and expanded, and many of the warehouse uses that now exist along the American River would be replaced with high-density housing. Intensive residential development would also occur throughout much of the Railyards Area. Office development (11.3 msf) would predominate in the southwestern portion of the Planning Area. It should be noted that substantial redevelopment of the Planning Area with commercial, residential, and public uses is a goal of the planning process for this area and could be considered beneficial. However, under CEQA, such development under Alternative 2 would be considered to result in a ***less-than-significant impact.***

A-3 The location of development under Alternative 3 would be similar to that under Alternative 2. Compared to Alternative 2, there would be slightly more office and cultural/institutional development, and slightly less residential and retail development. It should be noted that substantial redevelopment of the Planning Area with commercial, residential, and public uses is a goal of the planning process for this area, and could be considered beneficial. However, under CEQA, such implementation of Alternative 3 would be considered to result in a ***less-than-significant impact.***

A-4 Alternative 4 involves the use of multi-use zones to allow a range of future land uses in addition to the heavy commercial and industrial uses that now exist. Unlike the other Alternatives, Alternative 4 would not attempt to phase out existing uses but, rather, would permit a wide range of uses to co-exist. Under this Alternative, about 16.4 msf of office development is expected to be the predominate new use. It should be noted that substantial redevelopment of the Planning Area with commercial, residential, and public uses is a goal of the planning process for this area, and could be considered beneficial. However, under CEQA, such implementation of Alternative 4 would be considered to result in a ***less-than-significant impact.***

A-5 Development of Alternative 5 would include 17.29 msf of new office space, 550 tsf of highway commercial/retail, 1,750 hotel rooms, 170 tsf of cultural/institutional space, and 6,100 new residential units. A large commercial/office area with a low floor area ratio (FAR 1.0) would compose the center of the Planning Area and residential areas would front the American River. It should be noted that substantial redevelopment of the Planning Area with commercial, residential, and public uses is a goal of the planning process for this area, and could be considered beneficial. However, under CEQA, such implementation of Alternative 5 would be considered to result in a ***less-than-significant impact.***

A-6 Office space would be the primary use in the Planning Area with a total of 26.4 msf. There would be 3,700 residential units for 4.4 msf. Cultural space would account for 320,000 sf, hotel for 1,140 rooms, and highway commercial/retail for 1.0 msf. Commercial/office areas with a FAR of 1.0 would front the American River. Higher density commercial/office areas with a FAR of 3.0- 5.0 would occur in the southwestern portion of the site. The Dos Rios neighborhood would be replaced with higher density housing. It should be noted that substantial redevelopment of the Planning Area with commercial, residential, and public uses is a goal of the planning process for this area, and could be considered beneficial. However, under CEQA, such implementation of Alternative 6 would result in a ***less-than-significant impact.***

A-7 Alternative 7 involves the use of several mixed use areas that would surround an office/commercial core. Mixed-use areas with an emphasis on residential development would occur along the American River. The mixed-use "Gateway Area" would contain social service facilities, residential units, and some retail development. A riverfront commercial area would be developed. The Dos Rios neighborhood would be retained and expanded at greater densities. It should be noted that substantial redevelopment of the Planning Area with commercial, residential, and public uses is a goal of the planning process for this area, and could be considered beneficial. However, under CEQA, such implementation of Alternative 7 would result in a ***less-than-significant impact.***

Mitigation Measures

4.1-1 *None required.*

4.1-2 Implementation of the Alternatives would result in a broad mix of allowable uses in the Planning Area, which could result in conflicts between existing warehouse and industrial uses and new office and residential uses.

The Planning Area has historically been used primarily for transportation, industrial, warehouses and distribution facilities, and light manufacturing uses. Project implementation would add to the diversity of land uses in the area by phasing in residential, office, and commercial uses. Potential conflicts for each Alternative are discussed below.

A-1 New office development would occur on a limited scale in the heart of the Richards Area. The new development anticipated under this Alternative would be similar in type, intensity and pattern to the recent office development that has occurred in the Richards Area. The resultant mix of development in the area would not be substantially changed from existing conditions. Generally, the low-density character of the area's development tends to offset the incompatible aspects of adjacent uses. Development in the Railyards Area under this Alternative would be transportation-related and generally compatible with existing development at the Railyards. This is considered a ***less-than-significant impact.***

A-2 through A-7

New development under the Alternatives would allow a mixture of land uses that would be phased in to replace or coexist with existing uses. The result could be the juxtaposition of incompatible adjacent land uses, particularly new high-density residential development which could exist in close proximity to intense heavy commercial activities. In Alternatives 2, 3, 5, 6 and 7, this impact is likely to be short-term, since the redesignation of land uses in the Planning Area would ultimately result in a conversion of uses to be compatible with such new adjacent uses. Under Alternative 4, with its system of multi-use land use designations, incompatible adjacent uses may be permanent, in that existing heavy commercial uses could coexist permanently with residential and office uses. Implementation of Alternatives 2-7 is considered a ***potentially significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce impacts to a *less-than-significant level.*

4.1-2 *Implement land use compatibility standards and design guidelines that promote compatibility between existing land uses and new development by ensuring soil testing and remediation of contaminants, study and mitigation of noise impacts, and construction of six-foot walls along property lines with adjacent non-residential uses. This mitigation measure would be required for Alternatives 2 through 7.*

Land use compatibility standards have been devised in the Richards area to provide for a diversity of land uses in the Planning Area. As the variety and mixture of land uses increases in the Planning Area, land use compatibility standards must be applied, and to some extent developed on a site-by-site basis, to account for the specific characteristics of each development proposal and the existing land uses that surround the site. Residential land uses are particularly sensitive to the effects of noise, light and glare, dust, and odors that may result from Heavy Commercial or Industrial uses.

4.1-3 Implementation of the Alternatives could result in the displacement of existing uses in Planning Area.

A-1 Alternative 1 would not displace any existing businesses, as most or all development would take place on abandoned Railyards property and vacant land within the Richards Area. Therefore, this is a ***less-than-significant impact.***

A-2 through A-7

With the exception of Alternative 1, each of the Alternatives would depend upon roadway/circulation infrastructure that would require the displacement and relocation of

some existing active businesses, particularly in the Richards Area. This is considered to be a ***less-than-significant impact.***

The primary actions that would cause such displacement would involve the development of a new backbone roadway system through the Richards Area. The creation of the Richards Couplet system, using the existing Richards Boulevard and Bannon Street corridors but extending them to the east, south of the Dos Rios housing complex, could result in significant loss of businesses in those areas. Furthermore, the creation of Riverfront Drive, at the northern edge of the Richards Area, could result in the displacement of existing businesses that currently back up to the American River. In addition, the extension of the downtown roadway system, through the Railyards Area to Richards Boulevard, would result in the loss of all or portions of a number of existing buildings south of Richards Boulevard. The circulation plan is a programmatic document and currently does not provide adequate detail to specifically identify particular structures that would be affected. However, prior to implementation of these roadway improvements, such specific and detailed design would be available and the business displacement affects of those improvements would be assessed as part of project-specific environmental analysis.

As part of the implementation of the Planning Area roadway and infrastructure system, the City shall identify all existing businesses that would be potentially displaced or adversely affected through construction of these projects. Relocation benefits shall be made available to all displaced businesses that qualify under the California Administrative Code, Title 25, Chapter 6, "The California Relocation Assistance and Real Property Acquisition Guidelines."

Mitigation Measures

4.1-3 *None required.*

Land Use Compatibility with Adjacent Areas

4.1-4 Implementation of the Alternatives could be incompatible with land uses that border on the Alkali Flat and Midtown neighborhoods.

Current land uses in the Planning Area adjacent to the Alkali Flat and Midtown neighborhoods include warehouse and light industrial uses. The Planning Area is also home to a number of social service providers which are planned to be consolidated with a single social service campus located between the Southern Pacific main line, North B Street, 12th Street and 16th Street. The Planning Area is separated from adjacent residential neighborhoods to the south by a 12- to 20-foot high levee/railroad right of way that runs eastward from 7th Street. The levee is continuous except for underpasses at 12th and 16th Street, and a pedestrian undercrossing at 14th Street.

The levee separates the Planning Area from the Alkali Flat and the Midtown districts. Impacts for each Alternative are discussed below.

A-1 The No Project Alternative would result in the addition of a small amount of Commercial/ Retail/Light Industrial land uses near existing off-site residential areas. This is considered a ***less-than-significant impact.***

A-2 Alternative 2 would result in the addition of 500 residential units and 80 tsf of Highway Commercial/Retail near existing off-site residential areas. The presence of additional adjacent residential units, as well as improvements to the circulation system, including moving the Southern Pacific main line to the north (away from the Alkali Flat neighborhood), and the availability of transit and support commercial uses, could be considered to be beneficial. This is considered a ***less-than-significant impact.***

A-3 Alternative 3 would add 2,900 residential units, 200 tsf of office space, and 250 tsf of retail space near existing off-site residential areas. Land uses closest to the Alkali Flat and Midtown neighborhoods are predominately residential. The presence of additional adjacent residential units, as well as improvements to the circulation system, including moving the Southern Pacific main line to the north, and the availability of transit and support commercial uses, could be considered to be beneficial. This is considered a ***less-than-significant impact.***

A-4 Land uses proposed for the Planning Area under Alternative 4 that are closest to the Alkali Flat and Midtown neighborhoods include 2,800 residential units, 354 tsf of office uses, and 280 tsf of retail use. Proposed land uses closest to the existing residential areas are predominately residential. The presence of additional adjacent residential units, as well as improvements to the circulation system, including moving the Southern Pacific main line to the north, and the availability by transit and support commercial uses could be considered to be beneficial. This is considered a ***less-than-significant impact.***

A-5 Alternative 5, would add 4.74 msf of office space, and 60 tsf of retail space near existing off-site residential areas. Office space in the Railyards Area would abut the Alkali Edge. This is considered a ***significant and unavoidable impact.***

A-6 Under Alternative 6, 2.0 msf of office space, 240 tsf of commercial/retail space, and 1,000 residential units would be developed near the Alkali Edge. This is considered a ***significant and unavoidable impact.***

A-7 Land uses proposed for the Planning Area that are closest to the Alkali Flat and Midtown neighborhoods include 500 tsf of office space, 230 tsf of commercial/retail space, and 2,400 residential units. Proposed land uses closest to the existing residential areas are predominately residential. The presence of additional adjacent residential units, as well as improvements to the circulation system, including moving the Southern Pacific main line to the north, and the availability by transit and support commercial uses could be considered to be beneficial. This is considered a ***less-than-significant impact.***

Mitigation Measures

4.1-4 *None required for Alternatives 1 through 4 and 7; none available for Alternatives 5 and 6.*

4.1-5 Implementation of the Alternatives could be incompatible with existing or planned land uses that are west of the Sacramento River in the City of West Sacramento.

A-1 and A-5

Land uses in West Sacramento nearest to the Planning Area include large areas of vacant land interspersed with medium-to-high-density residential neighborhoods with some commercial development and public service facilities (see Figure 4.1-5). The Planning Area is separated from West Sacramento by the Sacramento River, which is a large natural boundary. Land uses in the Planning Area on the riverfront would remain substantially the same. This is considered to be a ***less-than-significant impact.***

A-2 through A-4, A-6 through A-7

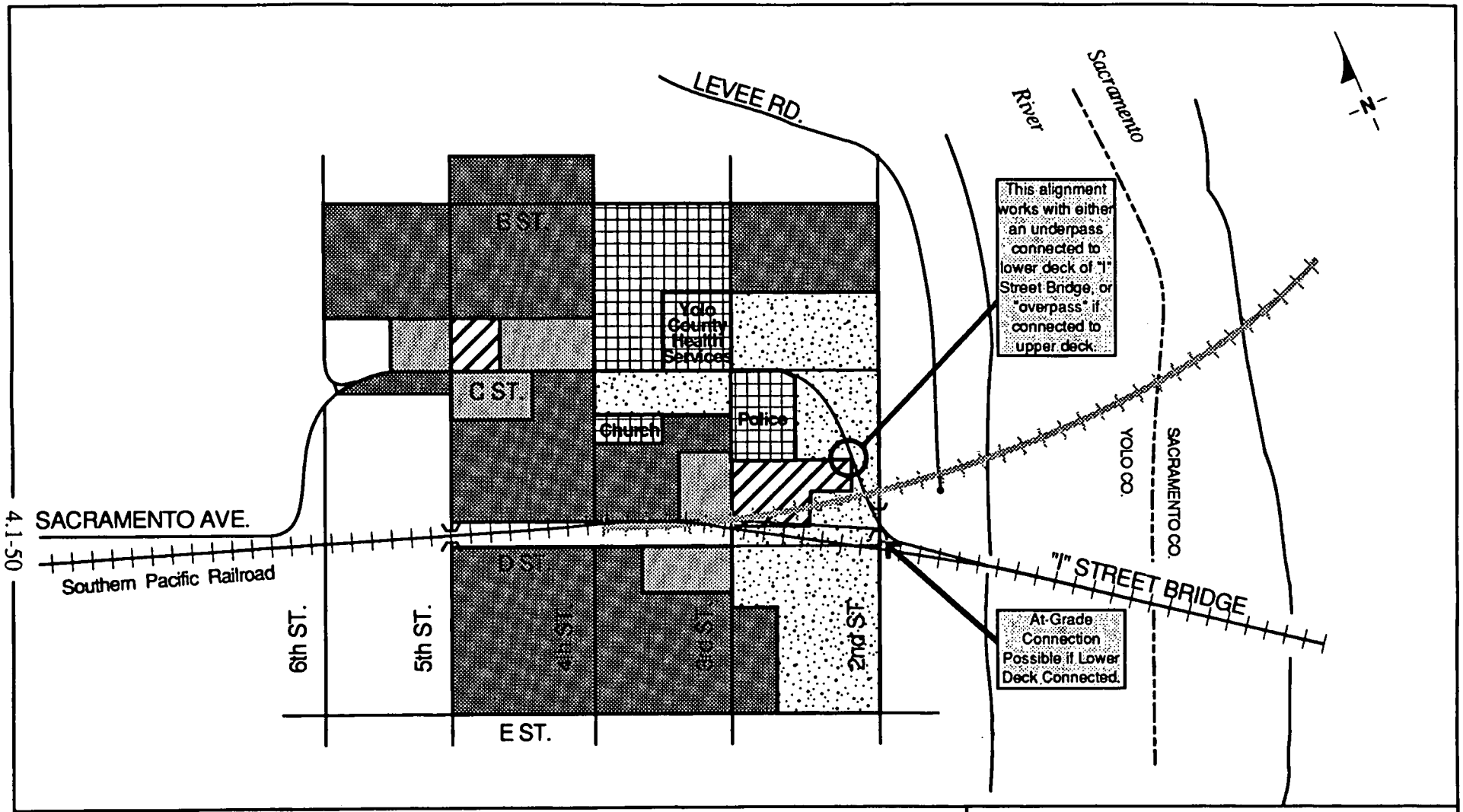
Under these Alternatives, a new railroad bridge would be constructed, spanning the Sacramento River north of the existing I Street Bridge. The rail line would curve southward through West Sacramento, joining the existing tracks at a point between 3rd and 4th streets.

The proposed rail realignment would pass through a vacant area along the river, a site occupied by Capitol Plating, and continue in close proximity to the Bridge View Market and residential uses between 3rd and 4th streets, where it would rejoin the existing alignment. Crossing of the Capitol Plating property could be affected by the timing of a hazardous materials remediation necessary for the site. Such cleanup could be critical to the phasing of this improvement. Although the existing plans indicate a continuation of at-grade crossings of the rail at 3rd Street, the City of West sacramento staff has indicated a desire for a grade separation with the road passing under the rail. Such a grade separation is not considered necessary for rail operations, but could have the resultant loss of commercial and residential units along 3rd Street, north and south of the rail track. This is considered to be a ***less-than-significant impact***

Mitigation Measure

4.1-5 *None required.*

4.1-6 Implementation of the Alternatives could be incompatible with existing or planned land uses that are north of the American River.



LEGEND

- Existing Railroad Track Alignment
- Proposed Railroad Track Realignment
- Residential
- Public/Institutional
- Commercial/Industrial
- Commercial/Retail
- Vacant

Source: EIP Associates, 1992.

FIGURE 4.1-5

WEST SACRAMENTO EXISTING LAND USES AND PROPOSED RAIL REALIGNMENT

F:\West-Sac-LandUse-5/26/92/20 30

91155

A-1 through A-7

Land on the northern side of the American River is used for recreational and open space (Discovery Park). The South Natomas Community area, which lies north of Discovery Park, includes retail, residential, business park, and office uses. Implementation of the Alternatives would change land uses along the riverfront which may be visible from Discovery Park. This issue is discussed in Chapter 4.3 of this report. Land use changes in the Planning Area are considered to have a ***less-than-significant impact*** on existing or planned land uses north of the American River.

Mitigation Measure

4.1-6 *None required.*

Relationship to Existing Plans, Policies and Regulations

4.1-7 Development of the Alternatives could result in development patterns unsupportive of the City of Sacramento General Plan goals and policies related to land use in the Central City.

A-1 Alternative 1, which would not encourage any changes to the existing land uses and trends in the Planning Area, would generally be unsupportive of most of the relevant policies of the City General Plan, including policies encouraging the development of internally balanced mixed-use development, residential land uses, expansion of the City's downtown area, support of regional commercial developments, etc. The only policies that this Alternative would be supportive of would include those that encourage the support and expansion of heavy commercial and industrial development sectors in the City. However, since the No Project Alternative would not cause any change in land use with environmental implications, this is considered to be a ***less-than-significant impact.***

A-2 and A-3

Alternatives 2 and 3 would be generally supportive of most of the residential and commercial policies of the General Plan, and would be unsupportive of the policies of the General Plan that encourage expanded heavy commercial and industrial development. In light of the fact that the City Council has provided direction as to the mixed-use nature of the redevelopment of the Planning Area, this is considered to be a ***less-than-significant impact.***

A-4, A-5, and A-7

Alternatives 4, 5, and 7 would be supportive of all land use policies of the General Plan, with the exception of those that encourage expansion of the industrial development sector. In contrast to Alternatives 2, 3, 5, 6, and 7, Alternative 4 would be supportive of those

policies encouraging expansion of the heavy commercial sector by allowing continuation of these uses in the Richards Area for a period of time. In light of the fact that the City Council has provided direction as to the mixed-use nature of the redevelopment of the Planning Area, this is considered to be a ***less-than-significant impact.***

A-6 Although this Alternative would result in substantial redevelopment activity in the Planning Area, the lack of balance between residential and non-residential land uses in Alternative 6 would not be supportive of the residential and mixed-use land use policies of the General Plan. This is considered to be a ***significant and unavoidable impact.***

Mitigation Measure

4.1-7 *None available for Alternative 6, and none required for Alternatives 1, 2, 3, 4, 5 and 7.*

4.1-8 Implementation of the Alternatives could be unsupportive of the implementation of the Richards Boulevard Redevelopment Plan and the Alkali Flat Redevelopment Plan.

The Richards Boulevard Redevelopment Plan was initiated in order to consolidate social service facilities, improve the entrances to the City, to result in the replacement of substandard housing in the Planning Area, and to eliminate blight.

A-1 Alternative 1, the No Project Alternative, would not facilitate the implementation of any of the overall goals of the Redevelopment Plan. However, since this Alternative would not cause any change in land use with environmental implications, this is considered to be a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2, 3, 4, 5, 6 and 7 would result in the implementation of the overall goals of the Redevelopment Plan, although each would result in a different configuration or mix of land uses in the Redevelopment Area. This is considered to be a ***less-than-significant impact.***

Mitigation Measure

4.1-8 *None required.*

4.1-9 Implementation of the Alternatives could be unsupportive of the goals and policies of the American River Parkway Plan.

The American River Parkway Plan contains goals and policies that are intended to guide the preservation, recreational use, development and administration of the American River Parkway.

The City of Sacramento has adopted the American River Parkway Plan as an element of its General Plan, and enforces the American River Parkway Plan through its zoning ordinance. Elements of the Alternatives that encourage intensification of urban uses along the northern edge of the Richards Area, including the development of a Riverfront roadway circulation system, could conflict with specific policies of the American River Parkway Plan that attempt to maintain a natural environment in the river area.

A-1 Implementation of Alternative 1, the No Project Alternative, would result in little or no change to the existing uses and building form along the American River frontage in the Richards Area. To the extent that existing development and circulation patterns do not provide access by the public to the south shore of the American River in the Richards Area, policies of the plan that relate to provision of such access along the length of the American River would not be supported by this Alternative. This is considered a ***less-than-significant impact.***

A-2 through A-7

In each of these Alternatives, significant new development in the northern part of the Richards Area would allow for development that could be in conflict with specific policies of the American River Parkway Plan. Those policies generally encourage new development to be constructed in a manner that is not visible from the parkway, and that in building form and building materials is compatible with the natural environment of the parkway. New development under Alternatives 2 through 7 could result in higher density buildings in close proximity to the parkway. Those buildings could be of a height that would allow them to be seen from the parkway itself. Similarly, these Alternatives provide for the construction of a riverfront roadway/parkway that would substantially increase access to the south shore of the American River. To the extent that the Parkway plan encourages increased public access to the river, these Alternatives would be supportive. On the other hand, to the extent that the Parkway plan calls for the protection of the natural environment of the parkway and for limitations on the clearing of brush and management of the riparian vegetation, these Alternatives could be unsupportive. The residential alternatives, including Alternatives 2 and 3, would significantly increase the residential population in close proximity to the American River in the Richards Area. This increased residential population, including a substantially increased number of domestic pets, would have negative effects on the natural resources of the parkway. Alternative 6, which encourages a higher density of offices throughout the Richards Area all the way to the river itself, could allow for much higher building along the riverfront parkway than the other Alternatives. To this extent, Alternative 6 may result in greater conflict with Parkway Plan policies than the other Alternatives. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce impacts to a *less-than-significant level.*

4.1-9(a) *Implement the American River Parkway Zone as proposed in the Richards Boulevard Area Plan. This measure is required for Alternatives 2 through 7. The measures to be included in this overlay zone are:*

- *Development standards related to building orientation along Riverfront Drive. Such new development shall be oriented such that active areas face the Riverfront Roadway, not the river parkway. Parking areas shall be located no closer than 100 feet to the toe of the levee.*

- *Development standards for building orientation along Jibboom Street. Buildings should be set back an average of 100 feet from the parkway. Landscaping within the setback shall incorporate riparian species compatible with adjoining riverfront vegetation.*

4.1-9(b) *In the construction of the riverfront roadway along the south shore of the American River, ensure compliance with all requirements within their jurisdiction of the U.S. Army Corp of Engineers, State Lands Commissions, U.S. Fish and Wildlife Service, and California Department of Fish and Game. This measure is required for Alternatives 2 through 7.*

4.1-9(c) *Ensure that development in proximity to the American River Parkway complies fully with policies of the American River Parkway Plan related to visibility and design of buildings in or near the parkway, in particular, Policy 5.7 of the Parkway Plan. This measure is required for Alternatives 2 through 7.*

4.1-10 Implementation of the Alternatives could be unsupportive of the goals and policies of the Sacramento River Parkway Master Plan.

A-1 Implementation of Alternative 1, the No Project Alternative, would result in no change to the existing treatment of the Planning Area boundaries along or the Sacramento River. To the extent that no additional intrusion into the river parkways would be called for, this Alternative would be compatible with the goals and policies of the Sacramento River Parkway Plan. This is considered to be a ***less-than-significant impact.***

A-2 through A-5 and A-7

In each of these Alternatives, new public access to the Sacramento River would be called for through the construction of a riverfront amphitheater in the Railyards Area. This structure would comply with those policies of the Sacramento River Parkway Master Plan that encourage public access to the Sacramento River, but would be inconsistent with those policies that discourage the disruption of the natural riparian habitat along the riverbank. This is considered to be a ***significant impact.***

A-6 In Alternative 6, new public access to the Sacramento River would be called for through the construction of a riverfront amphitheater in the Railyards Area. This structure would comply with those policies of the Sacramento River Parkway Master Plan that encourage public access to the Sacramento River, but would be inconsistent with those policies that discourage the disruption of the natural riparian habitat along the riverbank. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce impacts to a *less-than-significant level.*

4.1-10 *In the construction of the amphitheater on the Sacramento River, ensure compliance with all requirements within the jurisdiction of the U.S. Army Corps of Engineers, State Lands Commission, U.S. Fish and Wildlife Service, California Department of Fish and Game. This is mitigation measure would be required for Alternatives 2 through 7.*

4.1-11 Implementation of the Alternatives could result in lands that may be subject to a public trust easement being converted or permanently committed to non-public trust uses.

Portions of land within the Railyards Area and the Richards Area may be determined to be subject to the public trust. Currently, the full extent of the public trust easements affecting the Planning Area is unresolved. Resolutions of this issue could either restrict the allowable land uses or, more likely, require title settlement with the SLC or legislative action to extinguish the public trust easements through a land trade or some other arrangement. Because lands in the Planning Area are currently not in public trust uses, this impact is considered to be ***less-than-significant.***

Mitigation Measures

Implementation of the following mitigation measure is not required, but would further reduce the magnitude of this impact.

4.1-11 *In the event that lands in the Planning Area are determined to be subject to a public trust easement, means shall be implemented to lift the public trust easement, such as land trades or other arrangements.*

Cumulative Impacts

4.1-12 Implementation of the Alternatives could result in a change in the Central City's share of office space in the region.

Downtown Sacramento currently contains about 7.4 million square feet of office space, about 25 percent of the regional total office space inventory. During the 1985-1990 period, the existing downtown area captured about 540,000 square feet of newly absorbed space, or about 21 percent of the office space absorbed in the region. Without the redevelopment of the Planning Area, it is projected that the existing downtown will capture about 18 percent of the regional office market during the 1990-2010 period. This would constitute absorption of about 9.6 million square feet of office space, but would represent a decrease in the downtown area regional market capture rate.

With redevelopment of the Planning Area, it is anticipated that the overall capture of the regional office market in the downtown (including the Planning Area) will increase to about 30 percent, or 16.2 million square feet of space. About 8.8 million square feet of space (or 16 percent of the regional market) would be located in the Planning Area, while about 7.4 million square feet (or 14 percent of the regional market) would be located in the existing downtown area.

A-1 Under this Alternative, downtown Sacramento would continue to grow but would decrease in its percentage capture of the regional office market. This is considered a ***less-than-significant impact.***

A-2 through A-7

Market projections of office growth in the downtown area indicate that the capture of office space in the downtown will increase with any alternative, with the exception of Alternative 1. Such an increase in overall capture of office and commercial space in downtown Sacramento would further the City's efforts to redevelop blighted parts of the Central City area resulting in a vital, 24-hour downtown. Such an effect could be considered to be beneficial. The physical adverse impacts associated with this level of development are evaluated in other chapters of this EIR, including Chapter 4.10, Transportation, Chapter 4.11 air Quality, Chapter 4.12 Noise, and a wide range of public services and utilities in Chapters 4.15 to 4.22. This is considered a ***less-than-significant impact.***

Mitigation Measure

4.1-12 *None required.*

ENDNOTES

1. Linda Peirce Associates. 1990. *Southern Pacific Railyards Master Plan Existing Conditions, Volumes 1 and 2*. June 1990.

2. Ibid.

3. Korve Engineering Inc. 1990. *Southern Pacific Railyards Master Plan Existing Conditions, Volume 2, Transportation Report*, September 1990.

4. Ibid.

5. Spargo, Dave. Coldwell Banker Commercial Real Estate Services, personal communication, July 29, 1991.

6. Blumberg, Paul. Associate Community Development Planner, Sacramento Housing and Redevelopment Agency, City of Sacramento, personal communication, August 5, 1991.

7. Linda Peirce Associates. 1990. *Southern Pacific Railyards Master Plan Existing Conditions, Volumes 1 and 2*. June 1990.

8. Ibid.

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4.2 PARKS AND OPEN SPACE

4.2 PARKS AND OPEN SPACE

INTRODUCTION

This section discusses parks and open space issues related to development in the Planning Area. Existing parks and open space facilities and associated recreational facilities in the Planning Area vicinity are documented, and standards for such facilities are presented. The City's Master Plan for Park Facilities and Recreation Services (Parks Plan) divides Sacramento into a series of Planning Areas; the Planning Area falls within the Central City Planning Area. For clarity of presentation and analysis, this section uses the Central City boundary used in the Parks Plan essentially between the rivers and the freeways (See Figure 4.2-1). The evaluation addresses potential effects of the Alternatives and cumulative development on parks and open space resources in the Planning Area vicinity, primarily the Central City, and analyzes the Alternatives' support of applicable goals and policies of local planning documents.

SETTING

Park Facilities

The City Department of Parks and Community Services (Parks Department) provides park and recreation services at city-owned facilities within the City of Sacramento. The Parks Department is divided into a series of divisions; the Parks and Recreation Division North Region oversees facilities in the Planning Area. Several facilities within the City of Sacramento are owned or operated by other jurisdictions, such as the State of California.

Existing park facilities within the Central City consist of approximately 36 acres of neighborhood parkland, and 21 acres of community parkland (See Table 4.2-1). In addition, the following non-city owned parks and open space areas are situated within the Central City: Capitol Park encompasses 36 acres; Old Sacramento State Historic Park occupies 28 acres; and Sutter's Fort State Historic Park consists of 7 acres. These non-city owned parks account for a total of 71 acres of parkland within the Central City area.

Of the parks within the Central City, only one, Dos Rios School Park, falls within the Railyards or Richards Area. Dos Rios Park consists of 4.8 acres, and shares a site with Dos Rios elementary school. Table 4.2-1 identifies existing park facilities by acreage within the Central City.

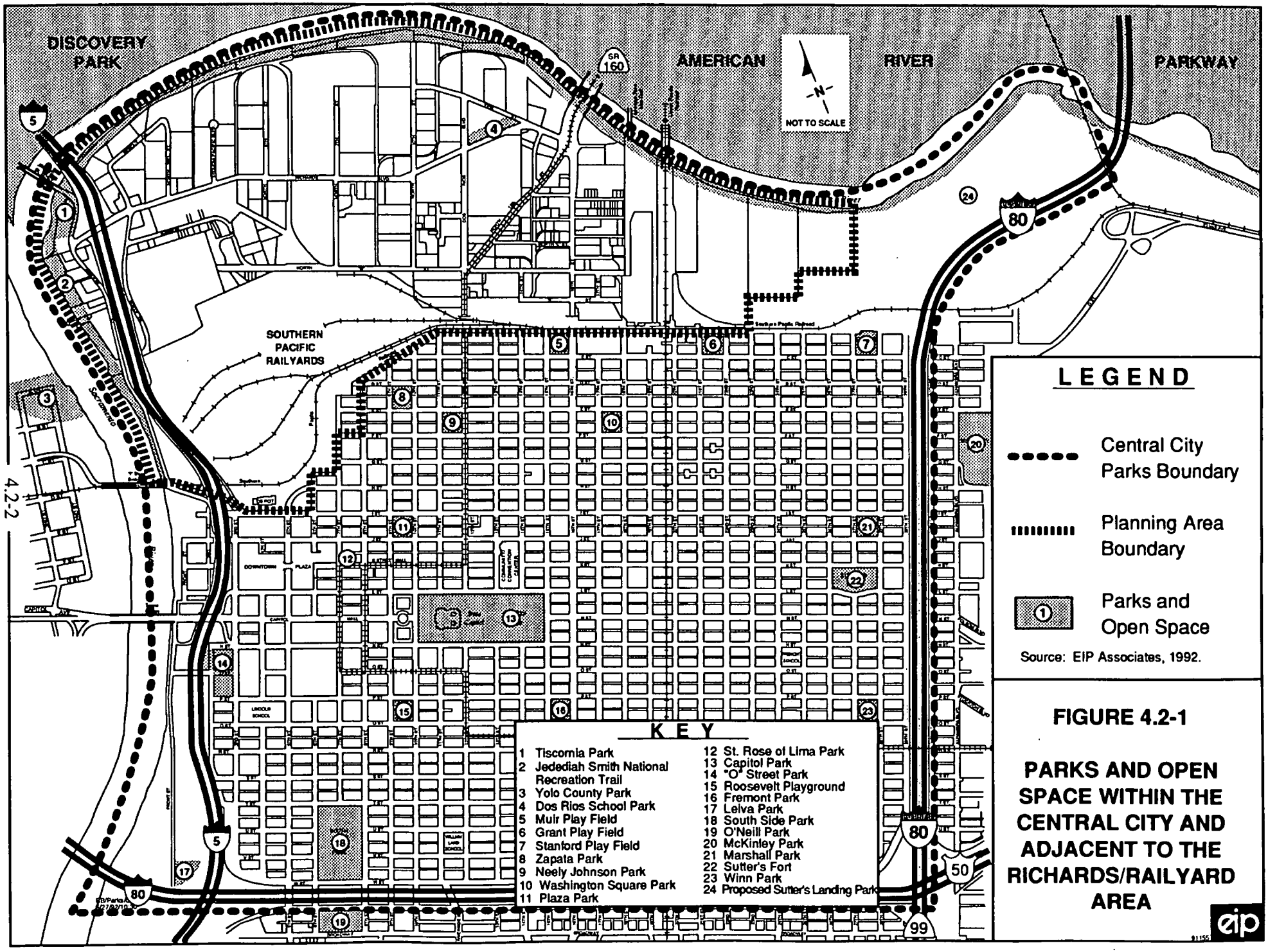


FIGURE 4.2-1

PARKS AND OPEN SPACE WITHIN THE CENTRAL CITY AND ADJACENT TO THE RICHARDS/RAILYARD AREA

TABLE 4.2-1

EXISTING CITY PARKS IN THE CENTRAL CITY AREA

Name	Type	Acres
City Plaza Park	Neighborhood	3.05
Crocker Park	Community	7.88
Dos Rios School Park	Neighborhood	4.80[1]
Fremont Park	Neighborhood	3.05
Grant Park	Community	2.61
Johnson Park	Neighborhood	1.17
Marshall Park	Community	3.05
Muir Park	Neighborhood	2.69
O'Neill Park	Community	6.45
Roosevelt Park	Community	3.05
Southside Park	Community	19.99
Stanford Park	Community	3.05
Tiscornia Park	Community	9.83
Washington Park	Neighborhood	1.56
Winn Park	Neighborhood	3.05
Zapata Park	Neighborhood	1.37

[1] Includes school acreage.

SOURCE: EIP Associates, 1991; City of Sacramento Master Plan for Park Facilities and Recreation Services, 1984.

Open Space Areas

A variety of open space areas exist within the Central City in addition to the parks represented above, such as the American River Parkway, the Sacramento River Parkway, non-city owned parks and public plazas. In addition to these open space areas, a large number of additional recreational resources are situated outside the Central City in close proximity to the Planning Area. These include areas dedicated to such uses as marinas and boat launches, golf courses, and the Sacramento Zoo.

Open space in Sacramento is maintained for one or more of the following reasons: natural resource preservation, managed production of resources, recreational use, agriculture, mineral deposits, and plant and wildlife preservation. Open space areas in the Planning Area currently include portions of the American River and Sacramento River Parkways, several parcels of vacant land, and utility and transportation easements. These open spaces serve a variety of purposes, from the preservation of natural resources, plants and wildlife to managed production of resources and outdoor recreation.

Government Code Section 65560 defines recreational open space as:

> Open space for outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.[1]

Figure 4.2-1 depicts existing open space areas within the Central City and adjacent to the Planning Area.

American River Parkway

The northernmost portion of the Planning Area, adjacent to the American River, encompasses a section of the American River Parkway. The American River Parkway is a large area of open space. Portions included in the Planning Area serve a variety of purposes, ranging from the maintenance of natural resources to active recreational uses. Although most of the Parkway lies within Sacramento County, the City of Sacramento oversees that portion of the Parkway located within the city limits. The Lower American River passes through the Parkway to join the Sacramento River at the northwestern corner of the Planning Area.

The Lower American River, which runs from Folsom Dam to its confluence with the Sacramento River at Discovery Park, is classified by the State as a "recreational" river within the State and Federal Wild and Scenic River System.[2,3] Recreational rivers are defined as those which are "readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past."[4]

The Planning Area includes the Tiscornia Park and Jibboom Street East portions of the Parkway's Discovery Park Area. In addition, an undeveloped segment of the Parkway stretches east to the eastern Planning Area boundary. Figure 4.2-2 illustrates the parkway areas located in the American River Parkway, and Table 4.2-2 indicates the characteristics allowed within each type of land use.

Tiscornia Park, on the south side of the American River at its confluence with the Sacramento River, is designated Developed Recreation Area. The park is small (less than 10 acres) and primarily characterized by sandy beaches, with cottonwood trees near the levee. Facilities at Tiscornia Park consist of a paved parking lot, boat launch, and portable toilets. County-operated bicycle trails connect the park to Old Sacramento. Access to the park is by way of Jibboom Street.

Jibboom Street East runs eastward along the southern bank of the American River, from the I-5 bridge to State Route 160 bridge, and is a designated Protected Area. Despite relative inaccessibility from the shore, a sandy beach and river bottom along with other natural features make this area popular for fishing and day uses, picnicking and boating.

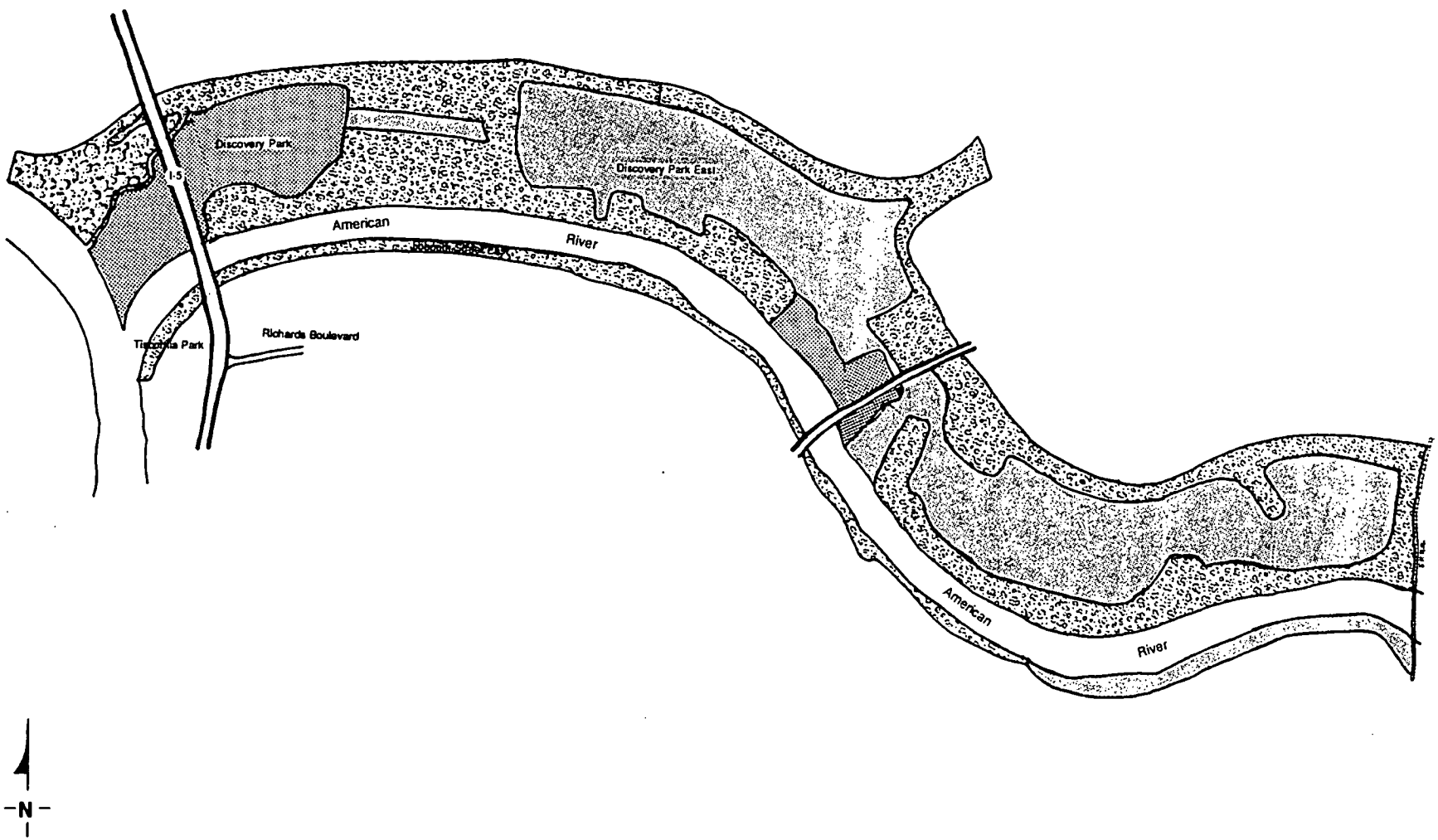
The remainder of the northern Planning Area boundary is situated upriver of State Route 160 bridge. This portion of the Planning Area consists of Protected Area from State Route 160 bridge eastward to approximately 25th Street. The area from 25th Street to the eastern Planning Area boundary is designated Limited Recreation.

Discovery Park and Discovery Park East are situated directly across the American River from the Planning Area, connected to the site by the Jibboom Street bridge. Due to their proximity to the Planning Area, both of these facilities are discussed in this section.

Discovery Park, situated on the north side of the American River at its confluence with the Sacramento River, includes a variety of uses on approximately 385 acres. Designations within the park include Nature Study Area, Protected Area, Limited Recreation and Developed Recreation. Facilities include a six-lane boat launching ramp, several parking areas and information kiosks, restrooms, a fish cleaning facility, picnic areas, archery range, and an equestrian staging area. The Jedediah Smith Memorial Bicycle Trail begins at Discovery Park and runs eastward along the river to Folsom Lake.

Discovery Park East, situated immediately east of Discovery Park, consists primarily of privately owned lands. The Jedediah Smith Memorial Bicycle Trail and other trails cross this property through easements; consequently, recreational resources in this area are currently limited to the existing trails. Much of this area is intended for Protected Area and Limited Recreation uses upon eventual purchase by the City.

A bicycle trail presently extends north of North B Street across the American River on the old Sacramento Northern Inter-Urban Bridge. The bicycle trail passes beneath the Southern Pacific main line and connects to bike lanes leading to the State Capitol along 14th Street. Bicycle facilities are addressed in detail in Section 4.8, Transportation, of this document.



Source: EIP Associates, 1989.

LEGEND

- Limited Recreation
- Developed Recreation
- Protected Area
- Nature Study Area

FIGURE 4.2-2

AMERICAN RIVER PARKWAY (in Project Area)

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TABLE 4.2-2
CHARACTERISTICS OF AMERICAN RIVER PARKWAY DESIGNATIONS
FOUND WITHIN THE RICHARDS BOULEVARD AREA PLANNING AREA

Designation	Characteristics
NATURE STUDY AREA	
Activities	• Nature Study, including: - Sightseeing, study and appreciation of natural features, artificial features, people, or events; - Painting and sketching; - Photography; and - Reading and writing for pleasure • Recreational locomotion, including: - Pedestrian use of designated trails.
Facilities	• Drinking fountains • Portable restrooms • Minor trail improvements • Trail stops • Observation points • Interpretive signs
PROTECTED AREA	
Activities	• Nature Study, including: - Sightseeing, study and appreciation of natural features, artificial features, people, or events; - Painting and sketching; - Photography; and - Reading and writing for pleasure. • Recreational Locomotion, including: - Walking, hiking and running on trails; - Horseback riding on designated equestrian trails; - Bicycling; - Swimming, including wading, snorkeling, and scuba diving; and - Boating, including canoeing, kayaking, rafting, and sailing. • Fishing
Facilities	• Surfaced and unsurfaced trails • Water fountains • Family unit picnic tables • Portable restroom

TABLE 4.2-2
CHARACTERISTICS OF AMERICAN RIVER PARKWAY DESIGNATIONS
FOUND WITHIN THE RICHARDS BOULEVARD AREA PLANNING AREA

Designation	Characteristics
LIMITED RECREATION AREA	
Activities	• Nature Study, including: - Sightseeing, study and appreciation of natural features, artificial features, people, or events; - Painting and sketching; - Photography; and - Reading and writing for pleasure. • Recreational Locomotion, including: - Walking, hiking and running on trails; - Horseback riding on designated equestrian trails; - Bicycling; - Swimming, including wading, snorkeling, and scuba diving; and - Boating, including canoeing, kayaking, rafting, sailing, and motorboating. • Fishing • Picnicking
Facilities	• Trails of all types • Small developed rest stops • Water fountains • Equestrian staging areas (trailer loading and unloading) • Picnic areas
DEVELOPED RECREATION AREA	
Activities	• Any permitted activities listed above. • Recreational Living, including: - Picnicking; - Day camping; and - Group overnight camping • Participation in games, sports and athletics, including: - Team gamefield sports; - Outside court sports; - Golf; and - Archery
Facilities	• Any facilities permitted in the more restrictive areas listed above • Interpretive centers • Group picnic facilities • Unsurfaced boat staging facilities • If incidental to picnic facilities: - Play apparatus - Permanent restrooms - Horseshoe pits - Non-exclusive game fields - Parking lots - Barbecue facilities

Sources: EIP Associates, 1991; City of Sacramento, American River Parkway Plan, 1985.

Sacramento River Parkway

The City Parks Department maintains recreational activities and facilities within the Sacramento River Parkway. The California State Lands Commission, in conjunction with Sacramento County, Yolo County, and the City of Sacramento, is in the process of developing a parkway plan along the Sacramento River from the Sutter/Sacramento County line to the area near Freeport. The objectives for establishment of the parkway include protection of riparian vegetation and public access to the Sacramento River. It is expected that finalization of the parkway plan would occur within two to three years. To date, initial mapping and land use evaluations have been conducted; however, the draft parkway plan has not been prepared. The Sacramento River is classified as an "urban" river, with natural habitat limited to a few areas.[5] Access to the parkway is difficult by both auto and foot. Because it is zoned "Flood Plain," the area is limited to facilities that can withstand repeated inundation.

The Sacramento River is a popular fishing and boating area. Most fishing takes place between the Pioneer Bridge and Discovery Park.[6] Currently, access to and travel within the Parkway are restricted by the Southern Pacific Railroad right of way and yard, industrial development, Interstate 5, fences and gates within the Parkway, and the nature of the river itself. Although access to the levee along urbanized portions is difficult due to the proximity of adjacent uses, fishing and other natural recreational uses continue to be popular in the area.

Major river access points providing vehicular access to the Sacramento River Parkway near the Planning Area presently exist at the Jibboom Street Bridge, Old Sacramento, and Capitol Mall. Minor river access points providing pedestrian access only are found at a variety of points throughout the Parkway; most of these have no public improvements.

The Sacramento River Parkway Master Plan designates the portion of the Sacramento River Parkway situated within the Planning Area as a High Use Area, suitable for developed parkland uses. This category roughly corresponds to the Developed Recreation Area designation used in the American River Parkway Plan, and permits amenities similar to those found in a neighborhood park.

A paved bicycle path extends along the east bank of Sacramento River and along the edge of the Southern Pacific Railyards site, providing a recreation resource and connection between Old Sacramento and the Jedediah Smith National Recreation Trail on the north bank of the American River. Bicycle trails are discussed in greater detail in Section 4.8, Transportation, of this document.

Additional Recreational Resources in the Planning Area Vicinity

Additional recreational resources in the vicinity of the Planning Area occur in the form of public and privately operated parks, marinas, boat launches, and golf courses. In addition to the open space areas within the Central City, adjacent or nearby resources include Discovery Park (385 acres), Yolo County Park (4 acres), William Land Park (167 acres), and Miller Park (57 acres). Although these areas are not located within the Central City, they are included in the discussion because they are within usable distance of the Planning Area.

Yolo County Park, located directly across the Sacramento River from the Railyards Area, contains mostly undeveloped parkland. Primary uses of the park are boat launching and fishing. The Broderick Boat Launch, a popular launching facility, is situated within Yolo County Park.

William Land Park is situated several miles south of the Planning Area. William Land Park contains a wide variety of recreational facilities, including the Sacramento Zoo, William Land Park Golf Course, Fairytale Town, and an amphitheater. Miller Park, located south of the Planning Area on the Sacramento River, includes several amenities, such as a marina, boat launching and service facilities, and a concession stand.

Although no golf courses are located within the Central City, the William Land Park golf course is near the Planning Area.

The Sacramento River supports 21 marinas adjacent to the Sacramento metropolitan area.[7] Of these, none are located adjacent to or directly across the river from the Planning Area.

Six boat launch facilities are located along the Sacramento River within the Sacramento metropolitan area. These facilities are primarily intended for boat launching use and do not include typical marina amenities, such as mooring, fueling or market facilities. The nearest boat launch to the Planning Area is the Broderick Boat Launch, located directly across the river at Yolo County Park. Other nearby launching facilities are found at Miller Park and Garcia Bend.

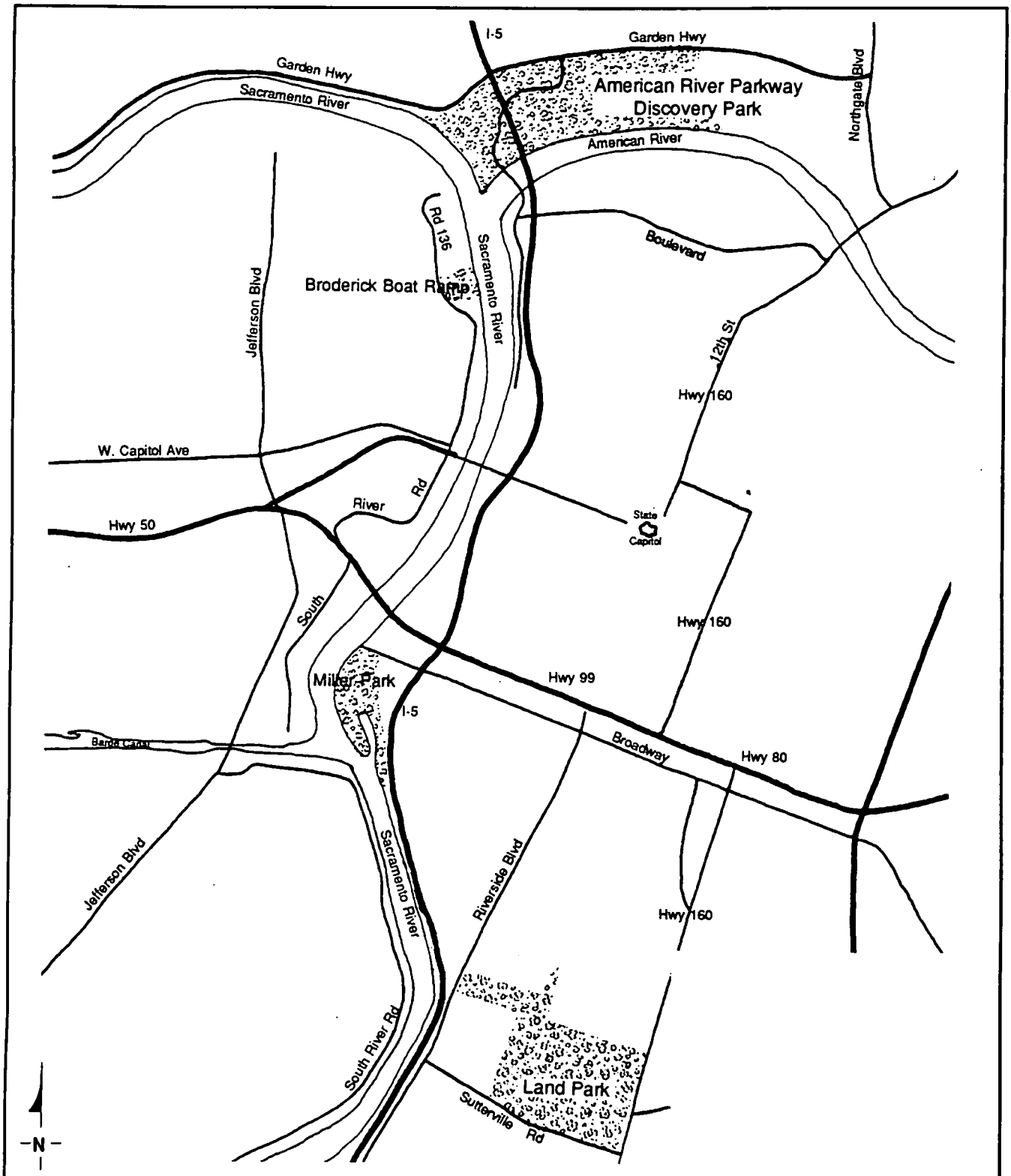
Figure 4.2-3 illustrates recreational resources in proximity to the Planning Area.

Parks and Open Space Standards

The City's Master Plan for Park Facilities and Recreation Services (Parks Plan) establishes goals for City-owned recreation sites, calling for a minimum of 10 acres of City parks per 1,000 people. These 10 acres are divided among neighborhood, community, and City regional parks as shown in Table 4.2-3. The Parks Plan also recognizes the value of city linear parkways and landscaped and dedicated open spaces. However, no goals for these types of facilities have been established.

Although the City maintains a goal of 10 acres of parkland per 1,000 residents, the City's standards for new development require the dedication of land or in-lieu fees equivalent to 5 acres of neighborhood and community parkland per 1,000 residents of the development.[8] Pursuant to City parkland dedication policy and the Quimby Act, the Parks Department intends to acquire enough parkland to satisfy the dedication requirements for the entire Planning Area.

Each type of City park has a unique set of features. Neighborhood parks, often adjacent to elementary schools, contain improvements usually oriented toward the recreational needs of children. Typical elements of a neighborhood park include playgrounds, play courts, walkways and picnic areas. In addition to these elements, a community park may include restrooms, a community center, a swimming pool, and lighted sport fields. Some community parks may be devoted to one particular use such as a sports field complex. In addition to neighborhood and community park elements, a regional park might include a golf course, a marina, amusement areas, a zoo or a nature area. City parkways have no separate standard, and are generally



Source: EIP Associates, 1992.

LEGEND

Recreational Park

FIGURE 4.2-3

RECREATIONAL RESOURCES IN PROXIMITY TO PROJECT AREA (In Project Area)

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TABLE 4.2-3

CITY PARK GOALS

Type of Park	Radius to Serve (Miles)	Size (Acres)	Goal (Acres/ 1,000 Population)
Neighborhood Park	0.5	2-10	2.5
Community Park	3.0	6-60	2.5
City Regional Park	30 minutes driving time	>75	5.0
City Parkway	Varies (linear)	N/A	N/A
Landscaped and Dedicated Open Space	Varies	N/A	N/A
School Parks	Varies	N/A	N/A

N/A: Not Applicable

SOURCES: City of Sacramento Department of Parks and Community Services, Master Plan for Park Facilities and Recreation Services, 1984; City of Sacramento General Plan Update Draft EIR, 1987; Railyards Specific Plan Analysis of Existing Conditions, Linda Peirce Associates, May 1990.

categorized as a form of regional park. City parkways, therefore, are not credited toward meeting neighborhood or community park requirements.

A City parkway consists of an elongated and narrow linear park or a closely interconnected system of City or school parks located along a roadway, waterway, bikeway, or other corridor. Landscaped and dedicated open spaces are City-owned areas developed, operated, or maintained by the Parks Department. As they have limited or no recreational use, these areas serve primarily to beautify Sacramento. Landscaped and dedicated open space has no established standard; open space is not generally credited toward meeting neighborhood/community park or regional park requirements.

School parks are situated on school district lands, and, subject to special agreement with the Department of Parks and Community Services, are developed, operated, or maintained by both agencies to meet the recreation needs of both the general public and the schools.

Projected Needs and Planned Parks

As Sacramento's population continues to grow, greater demands will be imposed on existing recreation facilities, and development of new residential areas will require new parks. Most of the revenue for park acquisition currently comes from the residential development fees, with some additional funds from grants and assessments.

The City of Sacramento, through California Government Code 66477 (the Quimby Act), requires the dedication of land or payment of in-lieu fees for parkland acquisition or recreational purposes prior to approval of residential developments.[9] The Quimby Act requires that the amount of land dedicated or fees required provide at least 3 acres of neighborhood or community park per 1,000 persons residing in the residential development. Although the City maintains a goal of 10 acres of parkland per 1,000 residents, the upper limit that can be required through the Quimby Act and the number that the City requires from developers is 5 acres of neighborhood or community park per 1,000 residents.[10]

The City Parks and Community Services Department uses the Quimby Act to obtain land dedications or in-lieu fees for new residential developments whenever possible.[11]

In addition to the existing park facilities within the Central City, one regional park is currently planned. Approximately 178 acres of former city landfill land have been set aside along the American River for this purpose. This park cannot be developed in the near future, however, due to hazards associated with the presence of methane gas. Section 4.13, Public Health and Safety, provides a more detailed discussion of this issue.

A recent report on parkland deficiencies indicates that there are 71.5 acres of park within the Central City area, or approximately 2 acres per 1,000 residents.[12] Projections in the same report suggest that total anticipated park acreage within the Central City at buildout, including all additional required acreage for new development, would only bring the parkland ratio up to 2.6 acres per 1,000 residents.[13]

Relevant Local Plans and Policies

Park, recreation, and open space goals and policies relevant to the Planning Area are found in the following documents: City of Sacramento General Plan Update, Central City Community Plan, City of Sacramento Master Plan for Park Facilities and Recreation Services, American River Parkway Plan, and the Sacramento River Parkway Plan. Applicable goals and policies are outlined below. An analysis of the relationship between the Alternatives and these policies is found in the Impacts and Mitigation Measures portion of this section.

City of Sacramento General Plan Update

Overall Urban Growth Policies

Policy 10

Open Space and Natural Resource Conservation

It is the policy of the City to conserve and protect natural resources and planned open space areas, and to phase the conversion of agricultural lands to planned urban uses.

Overall Goal

Achieve and maintain a balance among the conservation, development and utilization of planned open space and natural resources.

Conservation and Open Space Element - Preservation of Natural Resources

Policy A.1

Continue programs for the planting and maintenance of trees, grass, floral displays and other public landscapes both in the parks and on other city land such as street medians, public buildings and grounds.

Policy B.1

Protect the wooded areas along the waterways and drainage canals insofar as possible.

Goal C

Conserve and protect the planned open space areas along the American and Sacramento Rivers, floodways and undevelopable floodplains to the extent feasible.

Development of any of the Alternatives would provide for the preservation of open space landscaping within the Planning Area, and all of the Alternatives except the No Project Alternative would encourage augmentation of these features. Alternative 1 does not call for expansion of open space areas within the Planning Area. All of the Alternatives would afford an opportunity to protect and enhance the open space areas along the rivers.

Conservation and Open Space Element - Outdoor Recreation

Goal A

Conserve and protect the Sacramento and American Rivers, their shorelines and parkways.

Policy A.1

Implement the goals and policies of the 1986 American River Parkway Plan.

All of the Alternatives would protect the shorelines and parkway along the Sacramento and American Rivers. Under Alternative 1, both rivers would remain essentially unchanged. Under Alternatives 2 through 7, although development would occur nearby, additional public open space areas would be created adjacent to both the Sacramento and American Rivers and existing parkway areas would be preserved. Alternatives 2 through 7 would provide increased public access to the Sacramento River through the development of a riverfront amphitheater. This structure would result in the loss of some riparian habitat within the Sacramento River Corridor.

Public Facilities and Services Element - Parks and Recreation Services

Goal A

Provide adequate parks and recreational services in all parts of the City, adopted to the needs and desires of each neighborhood and community. Attempt to achieve the park acreage standards established in the Parks and Recreation Master Plan.

Policy 2

Give high priority to improving parks, open space and recreation uses in redevelopment plans where these uses are deficient.

Policy 3

Continue to acquire land utilizing the Quimby Act.

Implementation of all of the Alternatives, except the No Project Alternative, would produce additional parks, open space areas, and recreation uses in the Planning Area, an area known to be deficient in such facilities. In the Railyards area such new parklands are shown on Figures 3-5 though 3-10. In the Richards Area it is anticipated that policies of the RBAP would required the provision of adequate parkland (see Mitigation Measure 4.2-2). Although the No Project Alternative would not result in additional facilities, it would not increase demand for those facilities.

As described above, all of the Alternatives would exceed Quimby Act requirements for 3 acres of dedicated parkland per 1,000 residents. Alternative 1, the No Project Alternative, proposes no new residential development within the Planning Area. Consequently, although the Planning Area is currently deficient in parkland acreage, implementation of the No Project Alternative would not affect the relationship between parkland dedication and residential population within the Planning Area.

Policy 5

Design parks to enhance and preserve the natural site characteristics.

Policy 7

Locate community and regional nodal and linear recreational areas on or adjacent to major thoroughfares.

Policy 9

Continue the practice of providing neighborhood outdoor recreation facilities on or adjacent to public schools.

Policy 12

Ensure adequate access to the American and Sacramento Rivers in developing areas.

Policies of the RSP and the RBAP are intended to ensure that, although no specific design measures have been developed for most of the proposed parkland, the designs are compatible with their respective site characteristics. Under Alternatives 2, 3, 4, and 7, the characteristics of the Sacramento and American Rivers have been considered in the location of several park facilities. In addition, many of the proposed park are situated in proximity to major thoroughfares, such as the proposed Crescent Boulevard and Interstate 5.

City of Sacramento Master Plan for Park Facilities and Recreation Services

Park Acreage and Location Policies

V In general, the City shall not consider acquisition of any sites less than one acre in size for utilization as a park except in areas found to be deficient according to the standards of the Master Plan.

The City has found the Planning Area to be deficient in park facilities; consequently, parks of less than 1 acre may be considered.

Facility Development Policies

VII Neighborhood parks shall not contain the following elements: community centers, swimming pools, on-site parking, wading pools, and permanent restrooms. There shall be no restrictions on recreation elements for community, regional or special use parks.

None of the facilities listed in this policy have been specifically identified for use in neighborhood parks under any of the Alternatives.

X The Department shall develop a greater emphasis on a river oriented network of parks that will enhance the public's ability to use this important recreation resource.

Under all of the Alternatives except Alternative 1, emphasis has been placed on the importance of the rivers as recreation resources. Alternative 1, the No Project Alternative, does not address this issue.

American River Parkway Plan

4.3 Picnic facilities shall be installed in appropriate locations to accommodate user demand, but shall be limited in size to minimize the impact on Parkway users.

4.7 A separate designated pedestrian trail shall be provided along the entire length of the Parkway. This trail shall follow existing fire breaks and informal trail alignments to the extent possible in order to minimize damage to vegetation. New trail sections shall avoid heavily vegetated areas and low spots. This trail shall not be paved; instead, it shall have a naturalistic surface.

9.4.1 Any improvements in the park must be able to withstand inundation for one to several months each year.

9.4.2 Play apparatus, barbecue pits, public boat launches and similar facilities are not permitted at Jibboom Street East.

Minimal improvements are proposed for the American River Parkway area, primarily concentrating on improved pedestrian access to the area. The RBAP anticipates developed recreational uses near the parkway outside of and adjacent to the American River Parkway under Alternatives 2, 3, 4, 5 and 7 . Alternative 6 does not anticipate any developed recreational uses near the Parkway.

Sacramento River Parkway Plan

The 1975 Sacramento River Parkway Plan was adopted in 1975, but was never implemented. Consequently, policies from that document are included here for reference purposes only. The City is currently in the process of updating this plan.

3. The City shall adopt the following Parkway Concepts:

   a. that the Parkway is a recreational, open space, educational and water oriented resource.
   b. that, the Parkway constitutes [sic] a designated floodway susceptible to periodic inundation.
   c. that, although it is to be developed for human use, the natural environment shall be protected, preserved and enhanced to the fullest extent possible, especially large aggregations of significant vegetation and wildlife.
   d. that, except for designated high use areas of the Parkway and on adjacent parklands, a majority of the Parkway shall be retained in a natural state for passive recreational uses.
   e. that permitted recreation and educational uses of the Parkway shall be such that:

      1) they enhance but do not destroy or significantly alter the natural resources of the Parkway,
      2) they require a minimum of man-made improvements and facilities,
      3) they are appropriate for and suitable to the nature of the area,
      4) that the access points and associated improvements shall not have adverse impact upon adjacent land uses,
      5) that high use activities and facilities shall be accommodated only at designated locations which afford the least conflict with adjacent land uses.

With the exception of Alternative 1, the Alternatives recognize the importance of the Sacramento River Parkway as a recreational open space resource. Alternatives 2 through 7 propose varying degrees of development along the river edge, including the 5.5-acre Riverfront Park and amphitheater on the Sacramento River.

Sacramento Central City Community Plan

Parks and Recreation

- Provide adequate parks and recreation facilities and services within convenient access of Central City residents.
- Increase development of bikeway facilities within the Central City and provide convenient access to City and regional bikeways.
- Encourage joint use of school sites for active recreation areas.
- Encourage development of community recreation centers in conjunction with park and recreation facilities.
- Provide neighborhood mini-parks with activities oriented towards the Central City neighborhood residents.
- Enhance the open space/recreation and scenic value of the Sacramento and American Rivers.

Under Alternative 1, the existing Dos Rios School Park would continue to serve nearby residents. No new parks or recreation facilities are proposed for the Planning Area under this Alternative. Development under Alternatives 2 through 7 would substantially increase the number of parks and recreation facilities available to Central City residents, including bikeways, urban parks, and large-scale recreation facilities. Furthermore, mini-parks are expected to be scattered throughout the Planning Area under these Alternatives, and improved access to both rivers would strengthen their recreational value.

Open Space

- Continue to make improvements to existing parks to accommodate active recreation activities.
- Develop the Sacramento River Parkway facilities.

The existing Dos Rios School Park would continue to function under all of the Alternatives. In addition, under Alternatives 2 through 7, this park would be slightly expanded. Particular emphasis would be placed on the development of the Sacramento River Parkway area for open space purposes under Alternatives 2 through 7.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

In accordance with CEQA and professional standards, impacts are considered significant if implementation of the Alternatives would:

- Result in an impact upon the quality or quantity of existing recreational opportunities; or
- Affect or require the designation of substantial additional parkland or recreational facilities to ensure implementation of local park standards.

In addition, an impact is considered significant if implementation of the Alternatives would not support existing applicable goals and policies of local planning documents, including the City of Sacramento General Plan Update, Central City Community Plan, City of Sacramento Master Plan for Park Facilities and Recreation Services, American River Parkway Plan, and the Sacramento River Parkway Plan.

The City's present parkland dedication requirements, as discussed earlier in this section, are used to determine the Alternatives' level of support of local park standards. These requirements are outlined in Table 4.2-3.

Method

The Alternatives' dwelling unit and population assumptions were used to determine additional park requirements generated by redevelopment of the Planning Area. For purposes of this analysis, residential development in the Planning Area was assumed to include approximately 1.67 residents per dwelling unit. The City of Sacramento uses a planning standard of 5 acres of parkland per thousand population. This ratio was employed in determining the Alternatives support of City parkland dedication standards, and is illustrated in Tables 4.2-4 and 4.2-5.

The residential population of the Railyards Area would generate a demand for parks and open space, and recreational facilities. The City Parks Department has estimated the demand to be at a ratio of approximately 5 acres of parks and open space for every 1,000 residents of the City. The City General Plan goal reflects this level of demand.

As is discussed earlier in this section, the Parks Department has also determined that City employees generate a demand for parks in the vicinity of their workplace. The Parks Department has estimated that this demand is equal to approximately 5 acres of parks and open space for every 9,000 employees. Since the City has not formally adopted this standard, this EIR does not directly assess the demand for parks from employees. It should be noted, however, that in dense, mixed-use urban areas, parks can be developed in close proximity to both residential and employment-generating uses. Such parks can be considered to be available to residents during the days, but especially during weekday evenings and on weekends when residential use is highest. During weekdays, when residential use is likely lowest, such parks can be available to

TABLE 4.2-4

CITY PARK REQUIREMENTS
FOR PLANNING AREA[1]
(By Phase)

	1990-2000		1990-2010		1990-Buildout	
	New Residential Population	Required Parkland	New Residential Population	Required Parkland	New Residential Population	Required Parkland[2]
Alt 2	3,357	16.8	9,369	46.90	19,422	97.1
Alt 3	3,023	15.1	8,952	44.8	18,921	94.6
Alt 4	0	0	4,309	21.6	11,123	55.6
Alt 5	1,670	8.4	5,010	25.1	10,220	51.1
Alt 6	2,522	12.6	5,728	28.6	5,728	28.6
Alt 7	1,887	9.4	6,396	32.0	11,172	55.9

[1] Anticipated population base on number of proposed new dwelling units for each alternative, using a factor of 1.6743 residents per dwelling unit.
[2] Based on existing City requirements for five acres of parkland per 1,000 residents.
SOURCE: EIP Associates, 1992

TABLE 4.2-5
CITY PARK REQUIREMENTS
FOR RICHARDS AND RAILYARDS AREAS

	Railyards Area		Richards Area		Planning Area[1]	
	Population	Required Parkland	Population	Required Parkland	Population	Required Parkland[2]
Alt 2	6,012	30.1	13,410	67.1	19,422	97.1
Alt 3	5,511	27.6	13,410	67.1	18,921	94.6
Alt 4	4,676	23.4	6,446	32.2	11,123	55.6
Alt 5	501	2.5	9,719	48.6	10,220	51.1
Alt 6	2,338	11.7	3,390	17.0	5,728	28.6
Alt 7	4,676	23.4	6,496	32.5	11,172	55.9

[1] Anticipated population base on number of proposed new dwelling units for each alternative, using a factor of 1.6743 residents per dwelling unit.
[2] Based on existing City requirements for five acres of parkland per 1,000 residents.
SOURCE: EIP Associates, 1992

local workers for their use. Such conjunctive use of parks could result in a lower overall level of demand for parks.

Impacts and Mitigation Measures

4.2-1 Implementation of most of the Alternatives could affect the provision and demand for park and recreational facilities in the Railyards Area vicinity.

A-1 Alternative 1 would not affect use of existing park and recreational facilities. This is considered a ***less-than-significant impact.***

Under this Alternative, no new residential uses would be built within the Railyards Area, thereby maintaining the present use of parks and recreational facilities within the vicinity of the Planning Area.

A-2 Alternative 2 would provide parks in excess of the demand for park and recreation facilities in the Railyards Area. This is considered a ***beneficial impact.***

Under this Alternative, approximately 3,600 dwelling units would be constructed within the Railyards Area by buildout. The Railyards Area would include approximately 38.5 acres of parks and open space, a net surplus of 8.4 acres of parks required by City policy (See Tables 4.2-5 and 4.2-6). These parks could serve residents from outside the Railyards Area.

TABLE 4.2-6

SUPPLY AND DEMAND OF PARKS
IN THE RAILYARDS AREA

ALTERNATIVE	DEMAND	SUPPLY	SURPLUS/ (DEFICIT)
Alternative 2	30.1	38.5	8.4
Alternative 3	27.6	28.2	0.6
Alternative 4	23.4	28.2	4.8
Alternative 5	2.5	14.3	11.8
Alternative 6	11.7	28.2	16.5
Alternative 7	23.4	28.2	4.8

SOURCE: EIP Associates, 1992; ROMA Design Group, 1992.

A-3 Alternative 3 would provide parks to meet the demand for park and recreation facilities in the Planning Area. This is considered a ***less-than-significant impact.***

Under this Alternative, approximately 3,300 dwelling units would be constructed within the Railyards Area by buildout. The Railyards Area would include approximately 28.2 acres of parks and green space, a net surplus of 0.6 acres of parks.

Table 4.2-5 illustrates the relationship between expected population growth and required parkland dedication in the Railyards Area, and Table 4.2-6 compares the projected population with anticipated parkland and open space dedication.

A-4 Alternative 4 would provide parks in excess of the demand for park and recreation facilities in the Railyards Area. This is considered a ***beneficial impact.***

Under this Alternative, approximately 2,800 new units would be constructed within the Planning Area by buildout. The Railyards Area would include approximately 28.2 acres of parks and open space, a net surplus of 4.8 acres of parks (see Table 4.2-5 and 4.2-6). These parks could serve residents from outside the Railyards Area.

A-5 Alternative 5 would provide parks in excess of the demand for park and recreation facilities in the vicinity of the Railyards Area. This is considered a ***beneficial impact.***

Under this Alternative, only 300 new dwelling units would be constructed within the Railyards Area by buildout. The Railyards Area would include approximately 14.3 acres of parks and open space in the Crescent Park and Riverfront Park. This would represent a net surplus of 11.8 acres of parks (see Tables 4.2-5 and 4.2-6). These excess parks could serve residents from outside the Railyards Area.

A-6 Alternative 6 would provide parks in excess of the demand for park and recreation facilities in the Railyards Area. This is considered a ***beneficial impact.***

Under this Alternative, approximately 1,400 dwelling units would be constructed within the Railyards Area by buildout. The Railyards Area would include approximately 28.2 acres of parks and open space, a net surplus of 16.5 acres of parks (see Tables 4.2-5 and 4.2-6). These parks could serve residents from outside the Railyards Area.

A-7 Alternative 7 would provide parks in excess of the demand for park and recreation facilities in the Railyards Area. This is considered a ***beneficial impact.***

Under this Alternative, approximately 2,800 dwelling units would be constructed within the Railyards Area by buildout. The development of approximately 28.2 acres of parkland and open space in the Railyards Area, would compensate for the anticipated population increase within this areas and leave a surplus of about 4.8 acres of parks that could be used by residents of areas outside the Railyards Area. Table 4.2-5 illustrates the relationship between expected population growth and required parkland dedication in the

Railyards Area, and Table 4.2-6 compares the projected population with anticipated parkland and open space dedication.

Mitigation Measure

4.2-1 None Required

4.2-2 Implementation of most of the Alternatives could create unmet demand for parks and recreational facilities in the Richards Area vicinity.

A-1 Alternative 1 would not affect the use of or demand for park and recreational facilities in the Richards Area. This is considered a ***less-than-significant impact.***

Under this Alternative, no new residential uses would be built in the Richards Area, thereby maintaining the present use of parks and recreational facilities in the vicinity of the Planning Area.

A-2 through A-7

Alternatives 2 through 7 would generate a demand for parks and recreational facilities to serve the population of new housing units to be constructed in the Richards Area. This is considered to be a ***potentially significant impact.***

The amounts of parkland necessary to meet demand in the Richards Area would range from 17.0 acres under Alternative 6 to 67.1 acres under Alternatives 2 and 3. Alternatives 4 and 7 would generate a demand for about 32 acres of parks, and Alternative 5 would generate a demand for about 50 acres. None of the land use maps for the Richards Area in Alternatives 2 through 7 identify the designation of land for parks and open space uses, with the exception of existing lands within the American River Parkway. Such lands are not considered toward meeting the City requirement.

Although no lands are designated on the Alternative land use maps, it is anticipated that parks and open space would be provided on a project-by-project basis. The mitigation measure described below is reflective of the policies of the draft RBAP.

Mitigation Measure

Implementation of Mitigation Measure 4.2-2 would reduce the above impacts to a *less-than-significant level.*

4.2-3 The RBAP shall include policies requiring the provision of a minimum of 5 acres of parkland for every 1,000 residents of the Richards Area. The RBAP shall require that development of park facilities be phased in conjunction with residential development in

the Richards Area. This mitigation measure would be required for Alternatives 2 through 7.

By requiring dedication of parkland equal to currently enforceable City requirements, this mitigation measure would ensure dedication of an adequate amount of parkland and open space to serve the needs of the Richards Area.

4.2-3 Implementation of most of the Alternatives could influence the bicycle and pedestrian linkage of the Planning Area with parks and downtown Sacramento.

A-1 Alternative 1 would not affect the bicycle or pedestrian linkage of the Planning Area with parks and downtown Sacramento. This is considered to be a ***less-than-significant impact.***

Under this Alternative, most of the Planning Area would maintain its present function, and a portion of the Railyards Area would serve as a heavy commercial/light industrial area. These uses are not conducive to development or use of pedestrian or bicycle facilities. Consequently, no further development of such facilities would be compatible with much of the Planning Area. Any additional development of pedestrian or bicycle facilities within the Sacramento or American River Parkway areas would be independent of this Alternative, and the present condition of the Planning Area's pedestrian and bicycle facilities would remain unchanged.

A-2 through A-7

Alternatives 2 through 7 would strengthen the presently inadequate pedestrian and bicycle linkages between the Planning Area and downtown Sacramento. This is considered to be a ***beneficial impact.***

These Alternatives emphasize the importance of pedestrian and bicycle linkage of public parks, plazas and open space. Although specific characteristics of pedestrian and bicycle facilities cannot be determined at this stage, these Alternatives promote the development of a pedestrian network throughout the Planning Area, and place particular emphasis on development of such a system within office and residential areas.

Mitigation Measures

4.2-3 *None required.*

4.2-4 Implementation of the Alternatives in the Richards Area could affect the provision of open space and public access associated with the American River Parkway.

A-1 Alternative 1 would not affect the provision of open space or public access along the American River Parkway. This is considered to be a ***less-than-significant impact.***

Under this Alternative, no parks or open space are anticipated to be developed within the Richards Area. Consequently, any changes to open space use or public access along the American River Parkway would occur independently of this project.

A-2 through A-5. and A-7

Alternatives 2 through 5 and 7 would improve access to the American River Parkway. This is considered to be a ***less-than-significant impact.***

Under Alternatives 2 through 5 and 7, the commercial and industrial uses that adjoin much of the Parkway would be replaced by high density residential uses. Such residential uses, as well as the development of the Riverfront Drive Parkway, would open up access to the Americana River Parkway as compared to the fenced-off commercial and industrial uses that currently border the Parkway. Consequently, Parkway access would improve within the Planning Area. In addition, these Alternatives would involve the dedication of a large parcel of land bordering the river between approximately 20th Street and the eastern Planning Area boundary for regional open space use.

A-6 Alternative 6 would improve access to the American River Parkway. This is considered to be a ***less-than-significant impact.***

Under Alternative 6, access to the American River Parkway would be improved by the development of the Riverfront Drive and adjacent office uses. Some high-density residential uses would be developed near the eastern end of the Planning Area. Consequently, Parkway access would improve within this portion of the Planning Area.

Mitigation Measures

4.2-4 *None required.*

4.2-5 Implementation of the Alternatives in the Railyards Area could affect the provision of open space and public access along the Sacramento River Parkway.

A-1 Alternative 1 would not substantially increase access to open space within the Sacramento River Parkway. This is considered to be a ***less-than-significant impact.***

Under this Alternative, no new residential development would occur within the Planning Area, and no population increase would occur. Further, no steps would be taken to provide improved public access to the Sacramento River Parkway in the Planning Area. Consequently, use of the Parkway would not increase substantially.

A-2 through A-7

Development of Alternative 2, 3, 4, 6 or 7 would substantially increase access to open space within the Parkway area. This is considered to be a ***less-than-significant impact.***

Under these Alternatives, increased residential, employee and visitor densities within the Planning Area, in conjunction with steps to provide increased access to the riverfront, would increase the use of the Parkway areas in the Planning Area. Each of the Alternatives proposes the incorporation of useable open space within the Sacramento River Parkway through the development of a Riverfront Park, and facilitates river access from the Planning Area.

Mitigation Measures

4.2-5 *None required.*

Cumulative Impacts

4.2-6 Development of the Planning Area, in conjunction with cumulative development, would contribute to an intensification of residential and office uses within the Central City area which would increase demand for parks and recreational facilities.

A-1 through A-7

Alternatives 1 through 7, in combination with cumulative development, would not result in a demand for parks and open space within the Central City greater than the expected increased supply of parkland. This is considered to be a ***potentially significant impact.***

Cumulative development could provide an additional 6,700 dwelling units within the Central City. In addition, development under Alternatives 2 through 7 would increase the number of residents and employees of the area. If implemented, parkland dedication acreage for the Planning Area under these Alternatives would not meet requirements for the combined anticipated populations of the Planning Area and cumulative development within the Central City. Table 4.2-7 illustrates the cumulative effects of development within the Planning Area and the Central City on parkland dedication requirements, and reveals the amount by which the cumulative requirements are unmet for each of these Alternatives.

Mitigation Measures

Implementation of this Mitigation Measure 4.2-6 would reduce the above impacts to a *less-than-significant level.*

TABLE 4.2-7

CUMULATIVE[1] SUPPLY AND DEMAND FOR PARKLAND REQUIRED BY THE YEAR 2010

Alternative	City Requirements		Total Parkland Required	Expected Parkland Dedication		Total Parkland Dedication Expected	Surplus (Deficit)
	Planning Area	Central City		Planning Area[2]	Central City[3]		
1	0	56.0	56.0	0	0	0	(56.0)
2	97.1	56.0	153.1	105.6	0	105.6	(47.5)
3	94.6	56.0	150.6	95.3	0	95.3	(55.3)
4	55.6	56.0	111.6	60.4	0	60.4	(51.2)
5	51.1	56.0	107.1	62.9	0	62.9	(44.2)
6	28.6	56.0	84.6	45.2	0	45.2	(39.4)
7	55.9	56.0	111.9	60.7	0	60.7	(51.2)

[1] This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.9, Housing, for a discussion of the likely range of cumulative housing units.

[2] Parkland assumed to be dedicated in accordance with the policies of the and RBAP and Mitigation Measure 4.2-2.

[3] Does not include the 178 acre regional park on the City landfill.

SOURCE: EIP Associates, 1992.

4.2-6 *Developers of Central City residential projects shall be required to provide a minimum of 5 acres of parkland for every 1,000 residents of the development or to pay in-lieu fees established by the City Parks Department. This Mitigation Measure would be required for Alternatives 1 through 7.*

ENDNOTES

1. City of Sacramento. 1988. City of Sacramento General Plan Update, *Conservation and Open Space Element*, page 1.

2. Ibid, page 10.

3. City of Sacramento. 1986. *American River Parkway Plan*, page 4-1.

4. Ibid.

5. City of Sacramento. 1988. City of Sacramento General Plan Update, *Conservation and Open Space Element*, Page 10.

6. City of Sacramento. 1986. *Sacramento River Parkway Plan*, pages 22 through 23.

7. California State Lands Commission. 1986. *Sacramento River Marina Carrying Capacity Study*, August 1986, page 1.

8. Rudek, Michele. Landscape Architect, City of Sacramento Parks and Community Services Department, personal communication, October 1991.

9. City of Sacramento. 1988. *City of Sacramento General Plan Update Draft Environmental Impact Report*, page Q-5.

10. Ibid.

11. Ibid.

12. Rudek, Michele. Op. Cit.

13. Ibid.

4.3 URBAN DESIGN AND VISUAL QUALITY

4.3 URBAN DESIGN AND VISUAL QUALITY

INTRODUCTION

This section addresses urban design and visual quality issues related to development of the Alternative plans. Existing visual characteristics of the Planning Area and vicinity are documented. The architectural properties that distinguish particular buildings are discussed in this section solely in relation to visual quality of the Planning Area and surrounding areas. A detailed discussion of architectural and historic character is included in Section 4.6, Cultural Resources, of this EIR. Standards used to judge visual sensitivity are presented, and relevant scenic resource plans are reviewed. The evaluation addresses potential effects of each Alternative and cumulative development on visual quality in the site vicinity, and analyzes the Alternatives' support of applicable goals and policies of local planning documents.

SETTING

Visual Character of Planning Area

The Planning Area is currently used for a variety of purposes. The southwestern portion consists of the Railyards Area, characterized by industrial and railyard uses. The Richards Area features a mixture of residential, commercial, office and industrial uses, in addition to open space areas along the American and Sacramento River Parkways.

Railyards Area Specific Plan

Approximately 240 acres of the Planning Area are used by the Southern Pacific Locomotive Works and the Amtrak Passenger Depot. This area is divided into smaller segments by the railroad tracks traversing it. The 50,000-square-foot Southern Pacific Railroad passenger depot, now used by Amtrak, and the American Railway Express building, both constructed in 1925, are situated on the southernmost portion of the Railyards Area, visible and accessible from parts of downtown Sacramento (see Figure 4.3-1).

Both the passenger depot and the railway express building are distinguished by red brick facades with symmetrical elevations. Patterned bricks frame their windows. These buildings have certain elements in common; both have pale bases, parapet cornices, and metal canopies. In addition, both structures incorporate two-story arched openings and patterned metal window mullions. The similarities between these buildings lends the area visual consistency.

North of the passenger depot, the remainder of the Railyards Area consists primarily of industrial uses and maintenance shops, including several historic buildings. Historic structures of particular

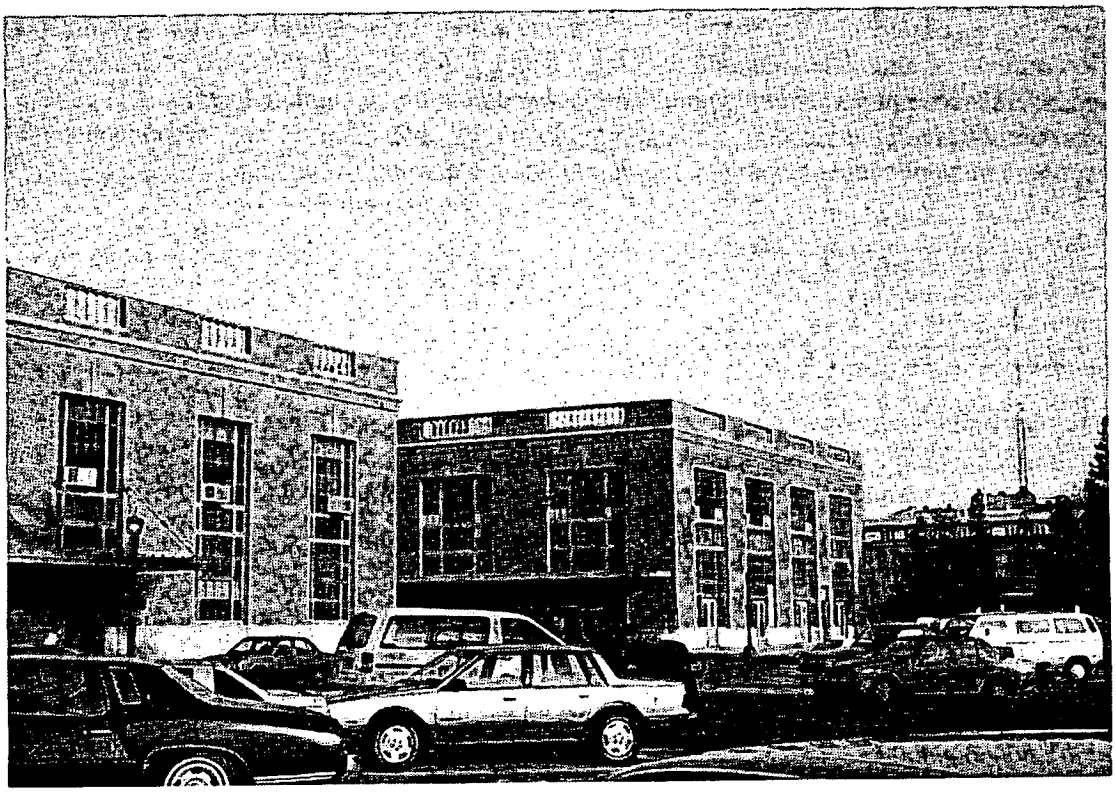


FIGURE 4.3-1

SOUTHERN PACIFIC DEPOT

architectural and aesthetic interest are identified and discussed in detail in Section 4.6, Cultural Resources, of this document.

Although the styles vary among these buildings, and exterior materials range from corrugated metal to decorative brick, particular design features persist within the Railyards Area. A common pattern can be established throughout these structures. Variations on the following components appear on buildings throughout the site: brick facades; a height range from one to three stories; gabled roofs, often metal-clad; rows of segmented arched windows and bays, frequently separated by shallow brick pilasters; grid patterns created by the recurrence of these bays and pilasters; multi-paned windows; and clerestory windows. Figures 4.3-2 through 4.3-4 illustrate the present character of the Railyards Area.

A continuous railroad levee, approximately 20 feet high, runs along the north and east edges of the Railyards Area, as well as the southeastern edge of the site. The levee forms a partial barrier, visually separating much of the Railyards Area from the adjacent Alkali Flat neighborhood to the east and from the Richards Area to the north and east.

The Alkali Edge

The Alkali Flat neighborhood lies immediately east of the Railyards Area. Two blocks of Alkali Flat lie within the Planning Area boundaries (the "Alkali Edge"). This area is characterized by a mixture of residential, office, light industrial and commercial uses.

Richards Area

The northern portion of the Planning Area, the Richards Area, is characterized by scattered clusters of residential, commercial, office, and industrial uses. Although the Richards Area is close to downtown Sacramento, its development pattern diverges from that of the downtown area. The American River Parkway, a large area of open space, parallels the northern boundary of the Richards Area, and the Sacramento River adjoins the western boundary. Figures 4.3-5 through 4.3-16 illustrate the existing visual character of the Richards Area.

Most of the Richards Area supports warehouses and distribution facilities, which occupy most of the frontage along Richards Boulevard. In addition, warehouse and distribution structures are noticeable north and south of Richards Boulevard on North 3rd, North 5th, and North 10th streets and Dos Rios Boulevard, south on North 7th Street, and north on Sequoia Pacific Boulevard. Warehouse and distribution facilities also are prevalent along North B Street, Vine Street, North 12th Street, 16th Street and the southern boundary of the Richards Area.

Industrial uses, primarily processing and fabrication activities, comprise another highly visible activity in the Richards Area. The Sierra Pacific Cannery occupies approximately 50 acres north of Richards Boulevard; the State Printing Office is located south of Richards Boulevard; Martin Sprocket and Gear is situated opposite Dos Rios School; the California Almond Exchange occupies the southeastern corner of the area; and Sacramento Pipe Works is located at the southwest corner of 16th Street and North B Street.

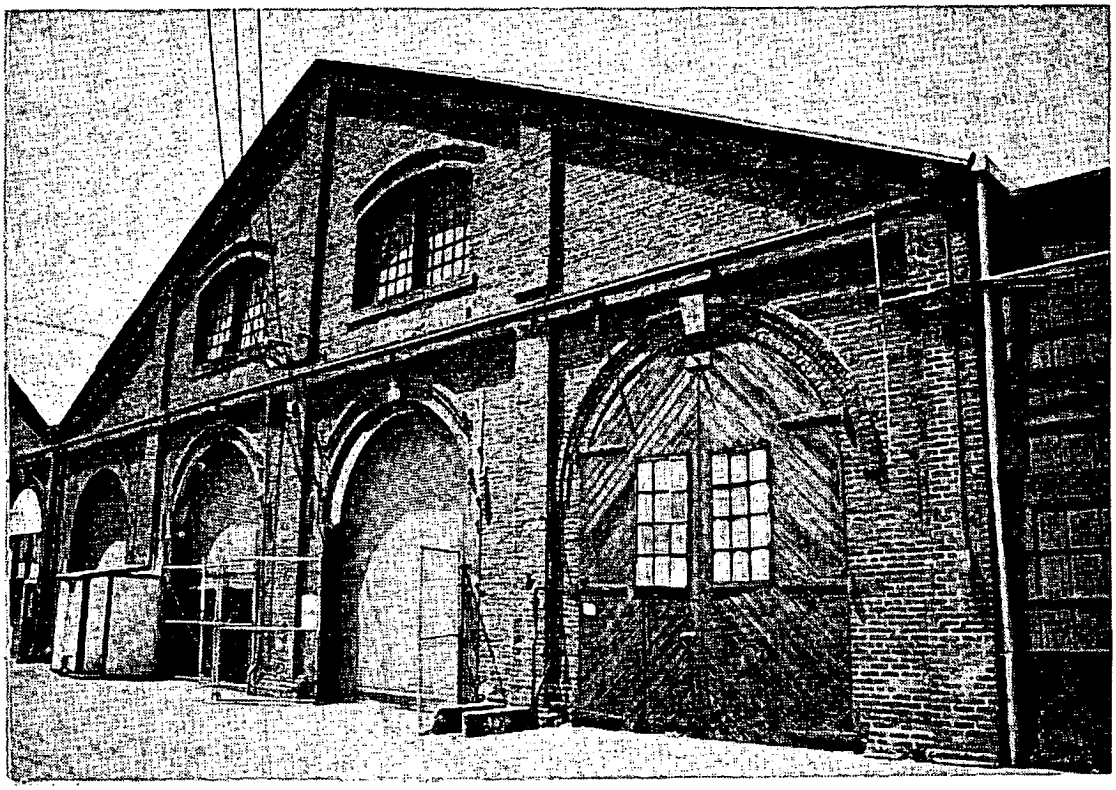
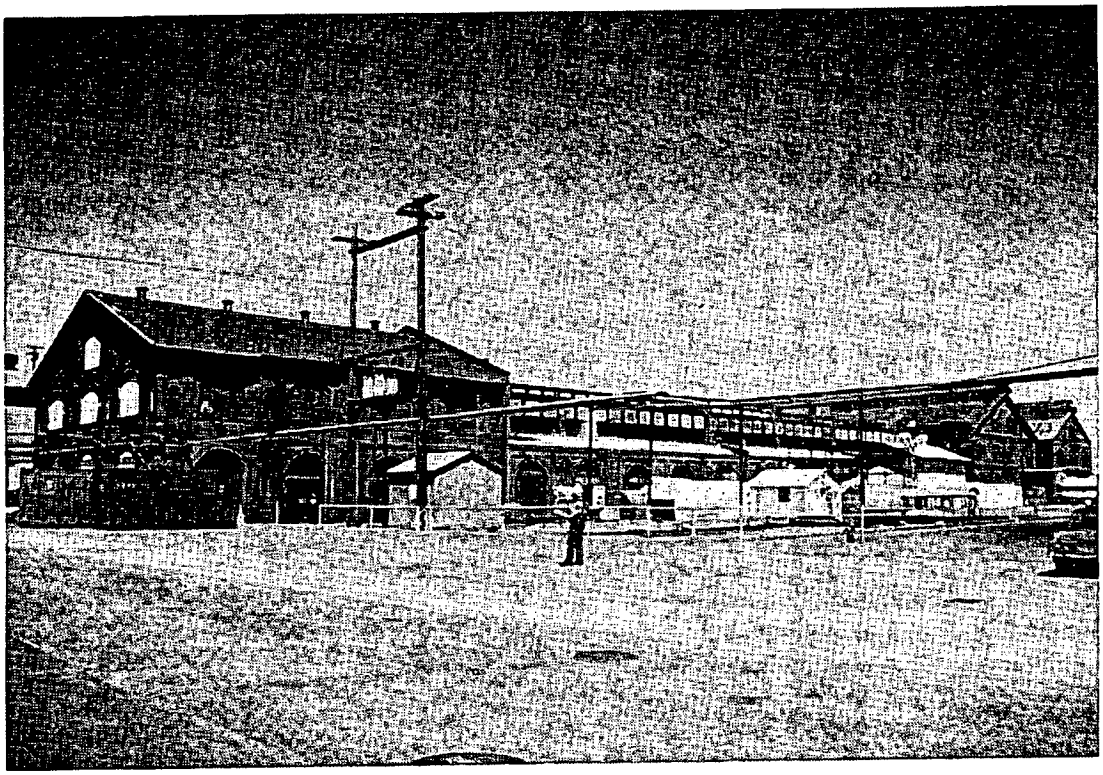


FIGURE 4.3-2

PRESENT CHARACTER OF SOUTHERN PACIFIC RAILYARDS



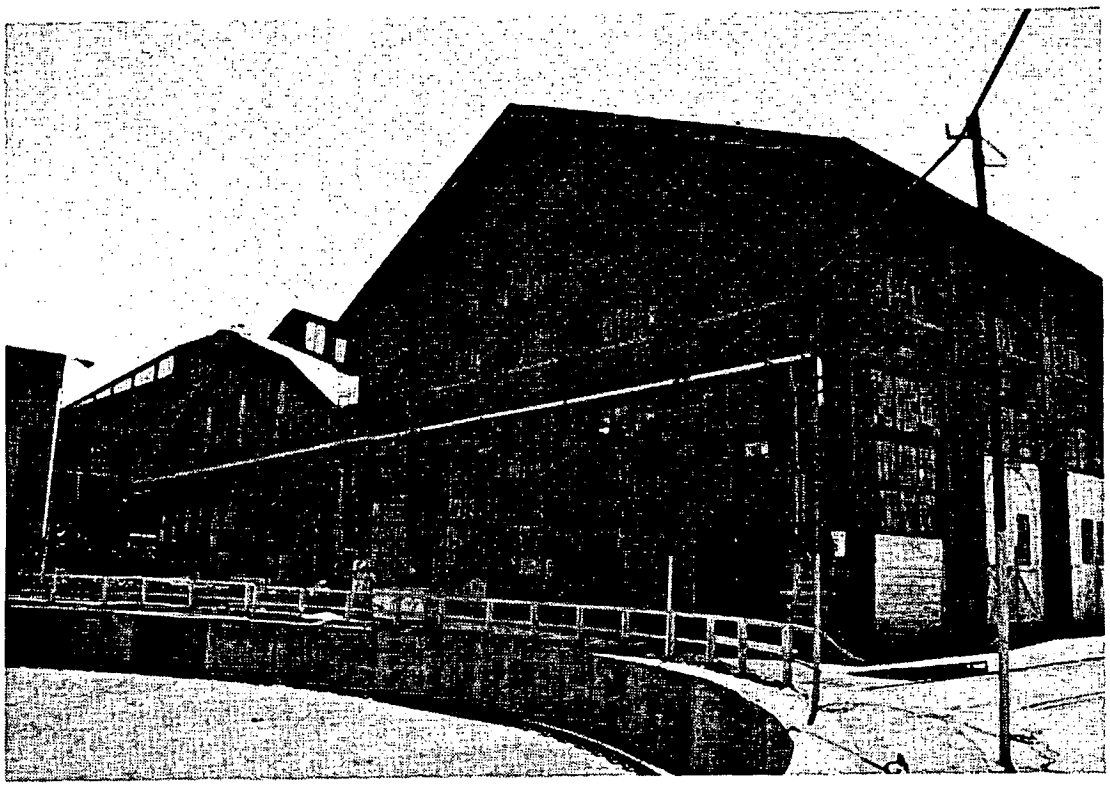


FIGURE 4.3-3

PRESENT CHARACTER OF SOUTHERN PACIFIC RAILYARDS

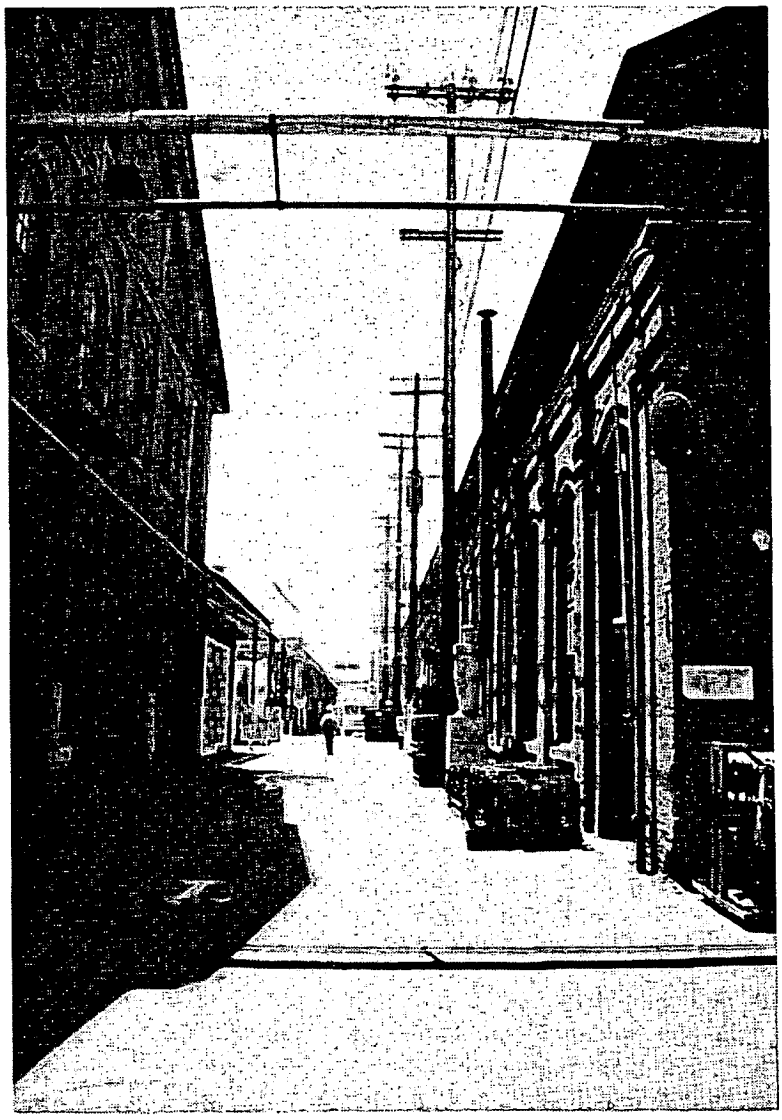


FIGURE 4.3-4

PRESENT CHARACTER OF SOUTHERN PACIFIC RAILYARDS

FIGURE 4.3-5

VIEW OF SOUTHERN PACIFIC RAILYARDS FROM ALKALI EDGE

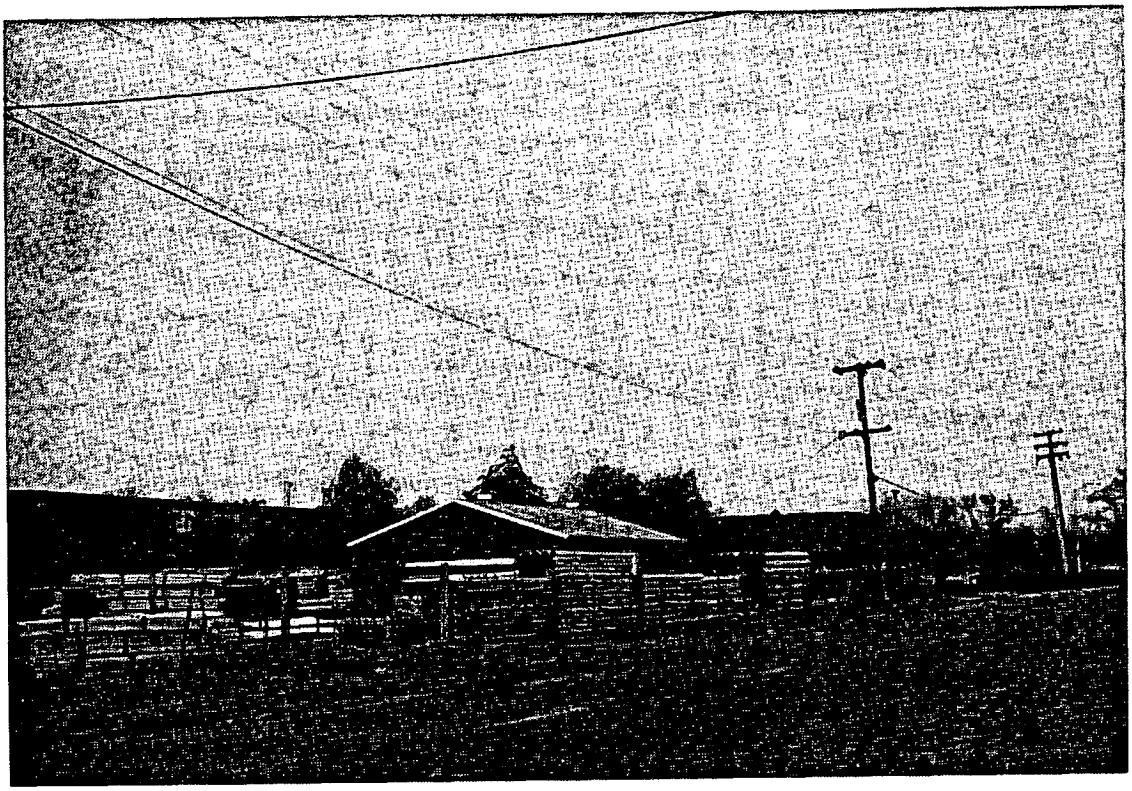


FIGURE 4.3-6 EXISTING VISUAL CHARACTER OF RICHARDS AREA WAREHOUSE USES

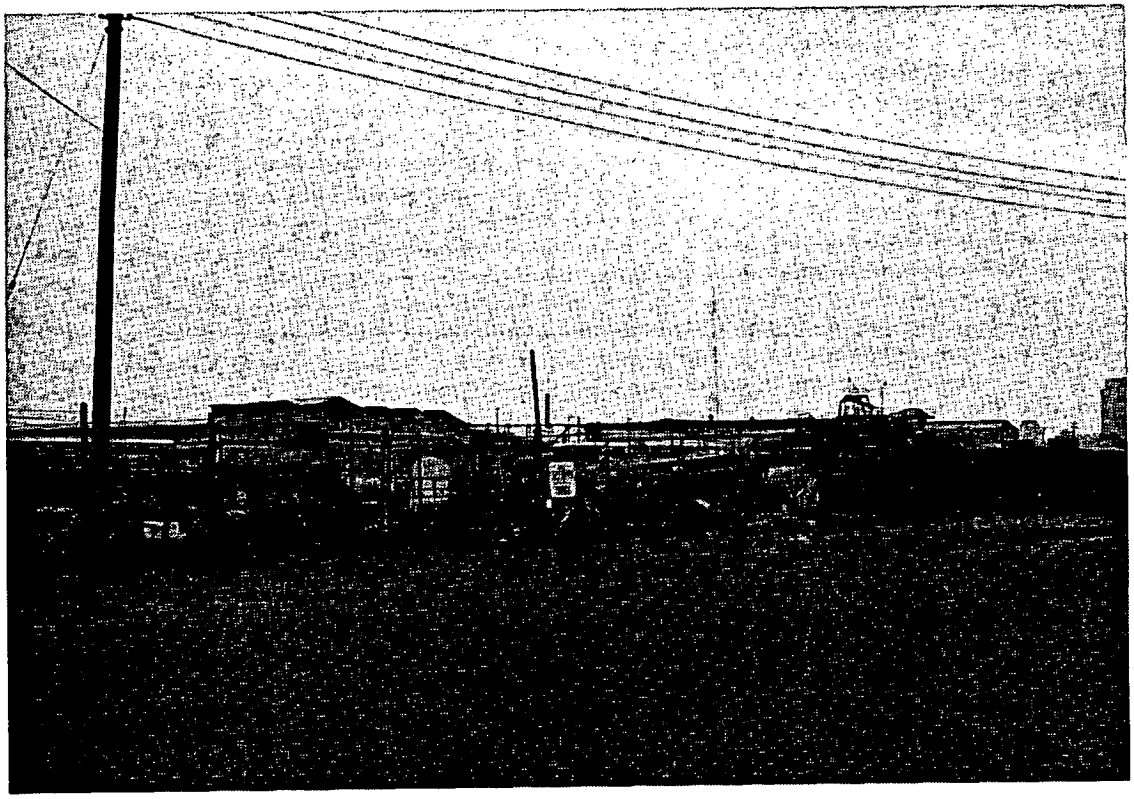


FIGURE 4.3-7 EXISTING VISUAL CHARACTER OF RICHARDS AREA INDUSTRIAL USES

FIGURE 4.3-8 EXISTING VISUAL CHARACTER OF RICHARDS AREA AUTO DEALERSHIPS

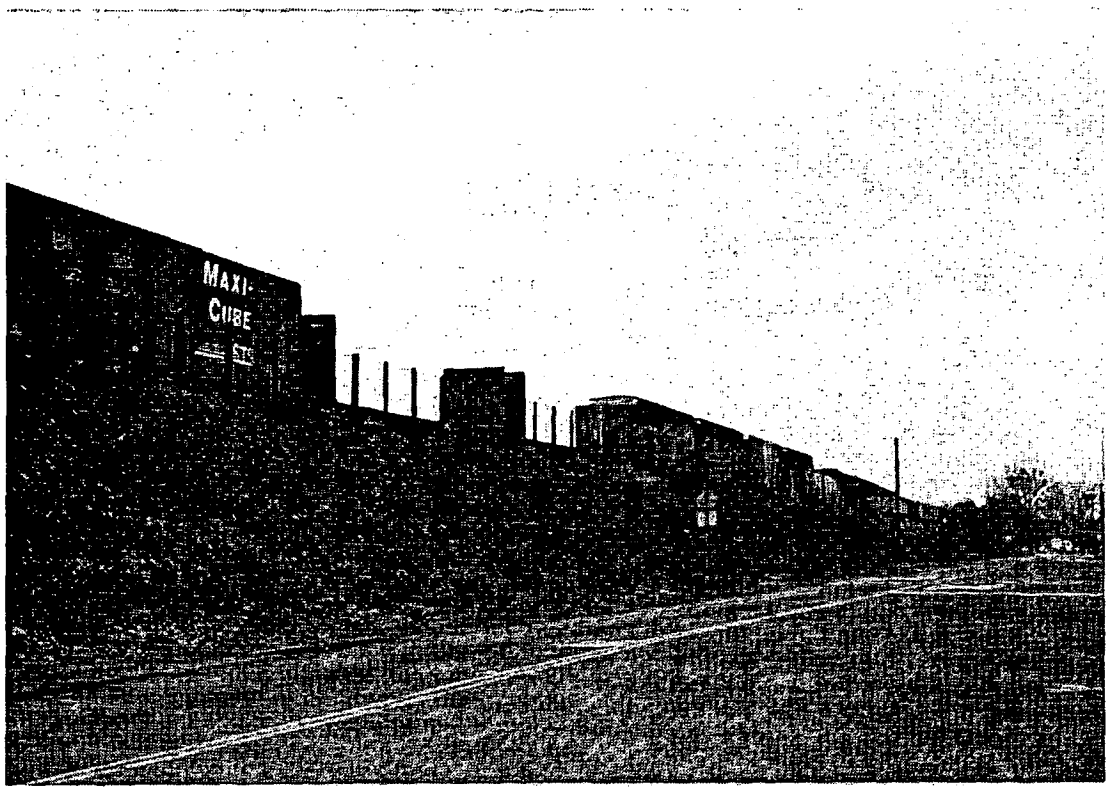


FIGURE 4.3-9 EXISTING VISUAL CHARACTER OF LEVEE AREA BETWEEN RICHARDS AND RAILYARDS AREAS

FIGURE 4.3-10 EXISTING VISUAL CHARACTER OF RICHARDS AREA WEST OF I-5

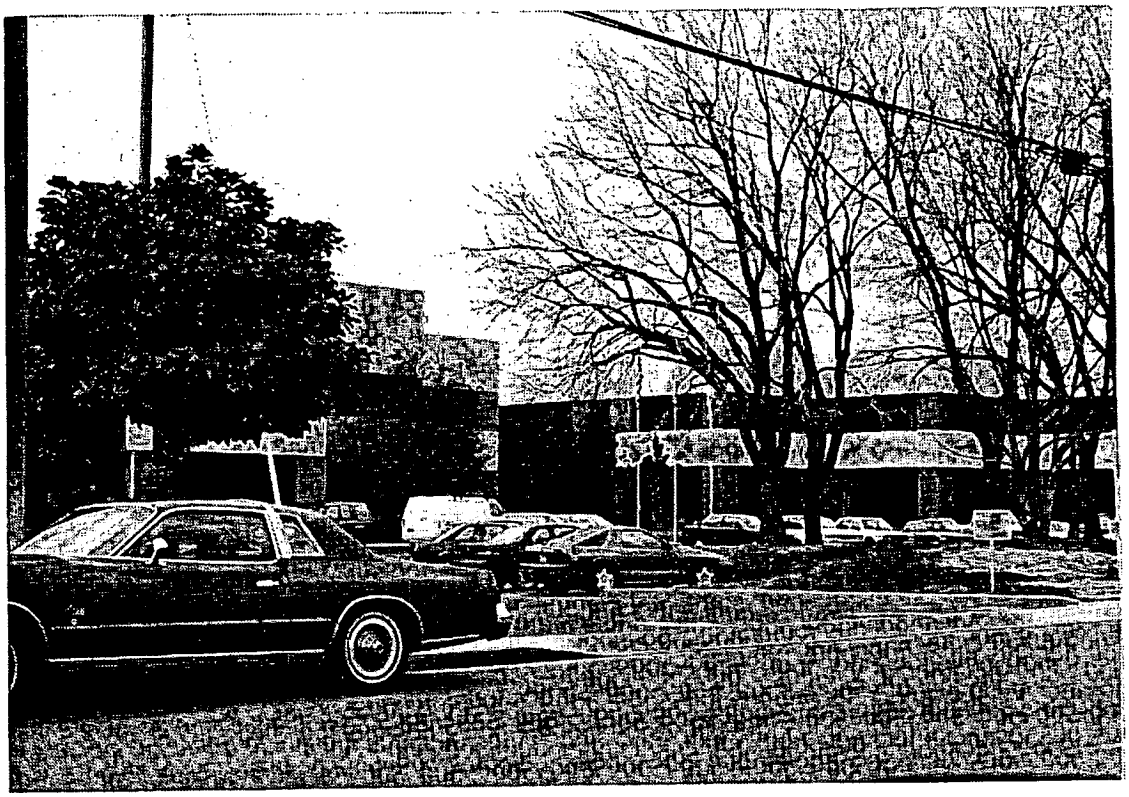


FIGURE 4.3-11 EXISTING VISUAL CHARACTER OF RICHARDS AREA EAST OF I-5

FIGURE 4.3-12 EXISTING VISUAL CHARACTER OF RICHARDS AREA BERCUT DRIVE AREA

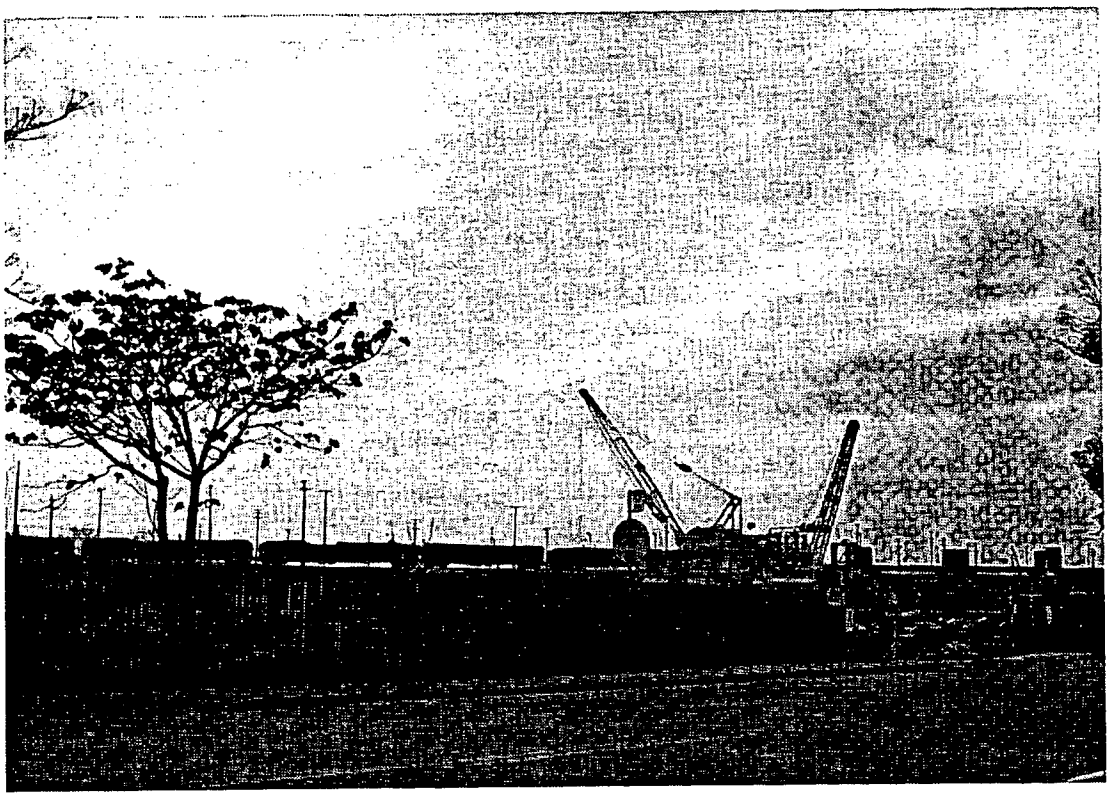


FIGURE 4.3-13 EXISTING VISUAL CHARACTER OF RICHARDS AREA SCRAP YARDS

FIGURE 4.3-14 EXISTING VISUAL CHARACTER OF RICHARDS AREA DOS RIOS AREA

FIGURE 4.3-15 EXISTING VISUAL CHARACTER OF RICHARDS AREA BASLER/DREHER NEIGHBORHOOD

FIGURE 4.3-16 EXISTING VISUAL CHARACTER OF RICHARDS AREA SACRAMENTO RIVER (RIVERFRONT AREA)

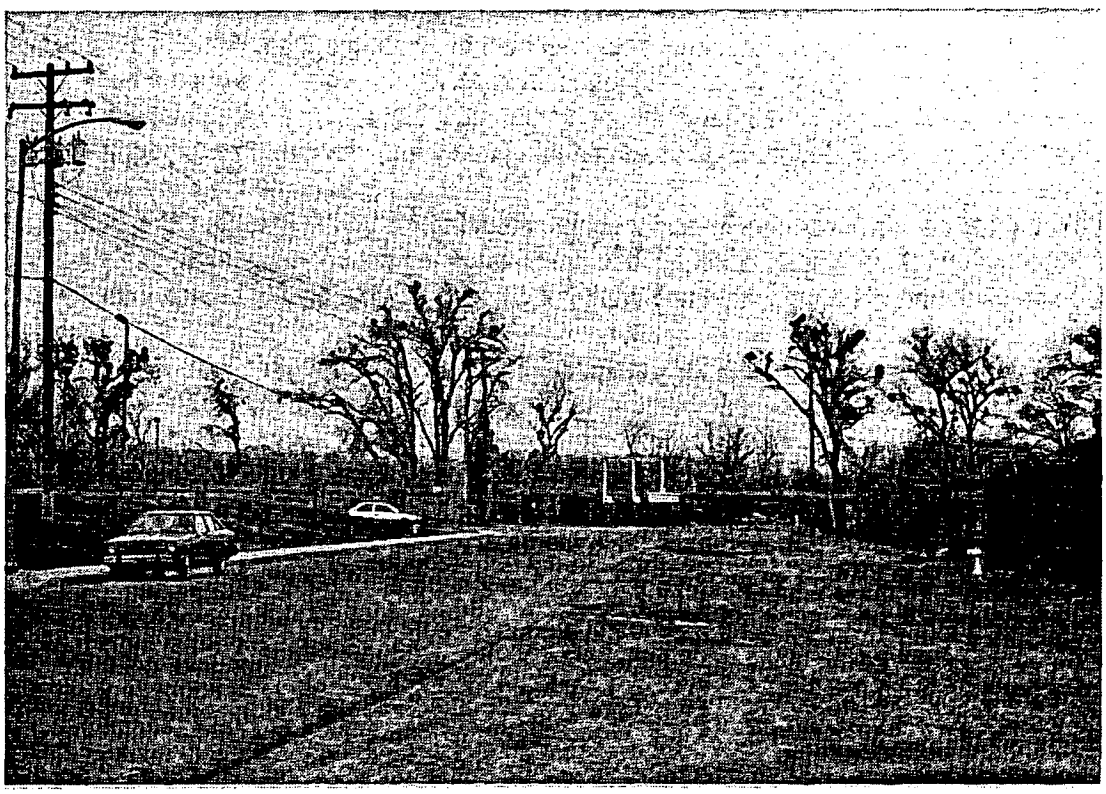


FIGURE 4.3-17 EXISTING VISUAL CHARACTER OF RICHARDS AREA AMERICAN RIVER (RIVERFRONT AREA)

A variety of automobile-related uses also forms an important visual component in the Richards Area. Three auto dealerships are located at the eastern end of the site. In addition, several service stations and auto repair facilities are scattered throughout the area, and a Yellow Cab facility is located on Richards Boulevard.

The boundary between the Richards Area and the Railyards Area is visually defined by a levee, which prevents short-distance views between the two areas. Immediately north of the levee, residential uses are interspersed with wrecking yards, trucking and industrial facilities. Buildings in this area lack unifying characteristics, contributing to the image of a dissociated, rather than cohesive, group of structures and land uses.

The portion of the Richards Area west of I-5 along Jibboom Street is characterized by a mixture of motels, restaurants and fast food eateries, as is the area immediately east of I-5 and north of the Southern Pacific Railyards along Bercut Drive. Motels and restaurants are clustered at the western edge of the area, primarily on Jibboom Street, west of I-5. Several are also located on Bercut Drive near Richards Boulevard. These uses are highly visible to travelers on I-5. The California Department of Water Resources (DWR) owns the historic Pacific Gas & Electric (PG&E) power plant building west of Jibboom Street. This structure is also highly visible, as it stands alone. In addition, the City of Sacramento Water Filtration Plant, although screened slightly by trees, is visible immediately north of the railyards on the east side of Bercut Drive.

Office structures are also apparent in the western portion of the area, primarily on Bercut Drive and North 3rd Street. Additional offices exist on North 10th and North 7th streets. A number of warehouse buildings have also been converted to office use in this area.

The visual character of the Richards Area north of Richards Boulevard is defined primarily by large warehouse and distribution facilities with some renovated warehouses operating as office space. Industrial uses are also prevalent in this area; many of these are housed in large warehouses surrounded by expansive paved parking and outdoor storage areas.

Views along Richards Boulevard consist predominantly of parking lots and loading docks surrounding older warehouses. No sidewalks or curbs are present along most of Richards Boulevard, and no significant landscaping exists, giving the area a highly industrial appearance.

The area between North 12th Street and North 16th Street includes a mixture of warehouse and distribution functions that date back to the 1920s; many of these are in disrepair. These warehouses often include streetside parking lots and loading docks, and many have open storage areas for equipment and materials. Some of these storage yards are well-kept and clean; others are disorderly, emphasizing the visual disharmony of the area.

A group of large open air scrap yards are visible at the corner of 12th and North B Streets, at the end of the North 12th Street view corridor. Others are evident on North 5th Street, along Bannon Street and at the eastern end of Basler Street. These yards are dirty and unattractive, and their presence detracts from the image of the area.

Housing is scattered throughout the site, but established primarily in three areas. The most prominent being the Dos Rios Housing Project east of Dos Rios Boulevard, characterized by a large number of multifamily housing units in a garden setting. North of the housing project is the Dos Rios Elementary School, which contains the only neighborhood park in the Richards Area.

The Basler-Dreher Neighborhood, located immediately east of North 16th Street, exhibits a combination of single and multifamily residential, industrial and commercial uses. This juxtaposition of dissimilar uses presents an image of disarray in this area. The homes east of 16th Street seem to be in much better condition than others in the area, and are located on streets with houses on both frontages. Additional residences consist of small houses along North B Street and along Bannon Street across from the Pacific Truck Terminal facility. The houses on Bannon Street vary greatly, but are generally in poorer condition than others in the Planning Area.

The easternmost portion of the Richards Area is generally undeveloped, and includes part of the City Landfill.

Riverfront

Riverfront areas on the northern and western edges of the Planning Area are heavily vegetated and contain few or no structures. The northern boundary of the Richards Area consists of the American River and the southern portion of the American River Parkway. Although the levee blocks views of the American River from ground level, the trees along the riverbank are visible above the levee, and provide a strong visual suggestion of the river's proximity.

Visual Character of Planning Area Vicinity

The Planning Area is located north of Sacramento's Central Business District, within the Central City. Part of the southernmost Railyards Area boundary, I Street, also forms the northern boundary of the Central Business District. Existing buildings in this area, primarily of modern architectural style, range chiefly from three to eight stories in height, although newer buildings now range from 10 to 30 stories. Most blocks in this area are dominated by a few large buildings. A sense of unity is formed by a recurring pattern of large buildings with uniform setbacks, block-like shapes, and exterior materials of concrete, glass, and stucco.

Much of downtown Sacramento is over 100 years old and characterized by tree-lined streets. Due to their maturity, the trees lining the downtown streets provide dense shade in the summer heat. As most of these trees are deciduous, they also permit sunlight to reach the streets in winter.

Buildings constructed most recently in this area tend to be taller than the older buildings. For example, Sacramento City Hall and the Post Office, both located immediately southeast of the Planning Area, are low-rise structures, while the recently constructed Plaza Park Tower nearby rises to 24 stories. Large buildings in the downtown area are highly visible from the Planning Area vicinity, particularly Plaza Park Tower at 8th and I streets, Riverview Plaza at 6th and I

streets, and the County Jail at 5th and I streets. In addition, the Holiday Inn at 3rd and J streets and Renaissance Tower at 8th and K streets are prominent, as are the recently constructed Wells Fargo Tower at 400 Capitol Mall, and the Capitol Bank of Commerce at 300 Capitol Mall. All of these buildings can be characterized as contemporary designs exhibiting a combination of modern and post-modern influences. Chinatown and the K Street Mall, directly south of the Planning Area, also contribute to the urban atmosphere of the area.

The Alkali Flat area southeast of the Planning Area consists of a mixture of primarily low-rise buildings, ranging from a large number of Victorian residences and some recent multi-family housing to numerous industrial and small office structures. This area is characterized by its tree-lined streets and emphasis on the preservation and enhancement of its Victorian structures.

The American River borders the northern portion of the site, with the American River Parkway providing the northern boundary, and continuing across the river to Discovery Park. More detailed descriptions of this area can be found in Sections 4.1 and 4.2 of this document, Land Use, and Parks and Open Space, respectively.

The Planning Area's western boundary is defined by the Sacramento River. West of the Sacramento River, West Sacramento is visually connected to the southern portion of the Planning Area by the Sacramento River Parkway, a predominantly undeveloped area along the river. The most prominent visual features of West Sacramento from the Planning Area include the silos at the Rice Growers' Association facility and Yolo County Park's Broderick Boat Launch, the latter located directly across the river from the Planning Area.

Old Sacramento, located southwest of the Planning Area, attracts numerous tourists every year. This area is characterized by Gold Rush and post-Gold Rush era western-style structures, with plank sidewalks and cobbled streets.

Visual Sensitivity

Sensitive Receptors

Under certain Alternatives, eventual buildout of the Planning Area would include buildings up to 500 feet in height. High-rise development of this scale could be highly visible from much of the surrounding area. People using area parks and the American and Sacramento Rivers, visitors to Old Sacramento, residents of the Alkali Flat, Dos Rios and other nearby neighborhoods, and pedestrians along protected view corridors would generally have high concern for scenic quality in the project vicinity. Commuters and other travelers on I-5, I-80 and Highway 160 are assumed to have moderate concern. Although the Planning Area presently contains few features to distinguish it from a distance, the planned development of the site is anticipated to alter this perception.

Receptors considered most sensitive to high-rise development include scenic view corridors, local residences and recreational uses. Scenic corridors are considered sensitive because large numbers of individuals use these routes, which have been identified as areas of outstanding scenic quality. The protected view corridors designated along 4th, 7th, 9th, 10th and I streets would fall into this

category, as would the priority streetscape area along I Street between 3rd and 6th streets. Local residents are considered sensitive due to the duration of their exposure to any change, their familiarity with the existing landscape, and their ability to detect change. Consequently, residents of the Alkali Flat, Dos Rios, and Basler-Dreher neighborhoods would be considered highly sensitive to visual change. Scenic quality also generally carries importance for recreational users enjoying activities such as bicycling, hiking, picnicking and water-related uses, such as fishing and boating. The American River Parkway is a heavily utilized recreational area, as is the Sacramento River. Both of these locations would be considered sensitive receptors.

Moderately sensitive receptors include nearby businesses, public open spaces, and tourist destinations, such as Old Sacramento. The perceptions of users in these areas are important; however, exposure of these individuals to the landscape is generally of shorter duration and secondary importance to the primary purpose of their presence. Areas in the vicinity of the Planning Area that fall into this category include Old Sacramento, the K Street Mall, Capitol Park, and workers in nearby office buildings.

Figure 4.3-18 illustrates the sensitivity level of land uses in the project vicinity.

Key Observation Points

A group of six key observation points that relate to the types of sensitive receptors discussed above have been identified (see Figures 4.3-24 through 29). Key Observation Point 1 illustrates the view looking south along North 7th Street from the American River; Key Observation Point 2 presents the view eastward toward the Planning Area as seen from the Yolo Causeway; Key Observation Point 3 looks northeast to the site from Pioneer Bridge on Interstate 80; Key Observation Point 4 looks southeast towards the area from the junction of Interstates 5 and 80; Key Observation Point 5 illustrates the view of the site from Old Sacramento; and Key Observation Point 6 denotes the view northward along 7th Street from "I" Street.

Applicable Scenic Resource Plans

Discussions of scenic resource and view corridor classifications for the project vicinity appear in the Sacramento Urban Design Plan. These designations are discussed below.

Sacramento Urban Design Plan

The Sacramento Urban Design Plan designates particular streets in the Central Business District as protected view corridors. View corridors on or adjacent to the Planning Area include I Street, 4th Street, 7th Street, 9th Street and 10th Street. The Planning Area itself does not fall within the Central Business District; however, as views along 4th, 7th, 9th and 10th streets lead directly to the Planning Area, the Plan is considered relevant to this project in relation to these view corridors. The Sacramento Urban Design Plan protects these streets from development that would in any way block existing vistas.

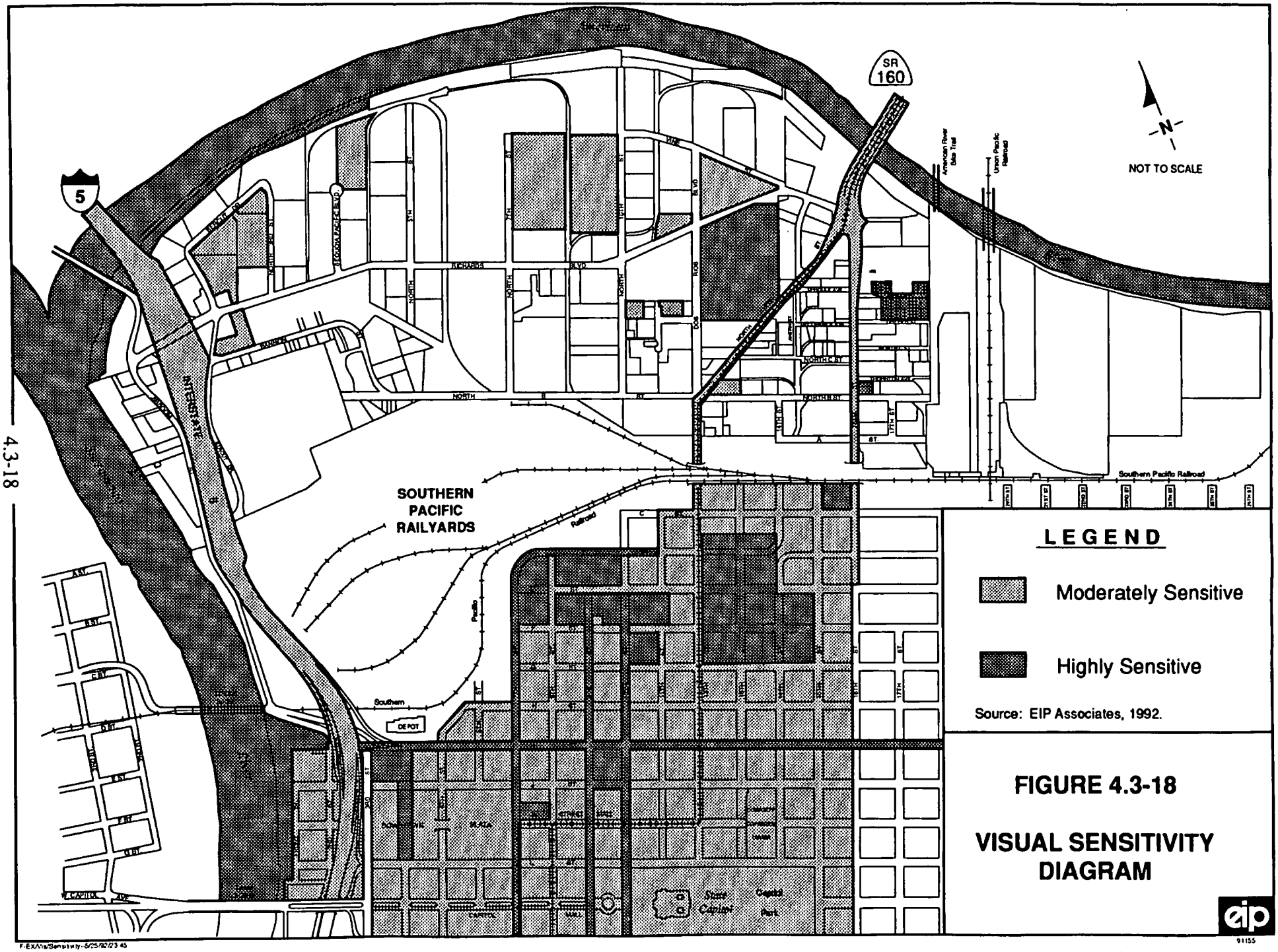


FIGURE 4.3-18

VISUAL SENSITIVITY DIAGRAM

In addition, the southernmost site boundary, I Street from 3rd to 6th streets, is included in the Sacramento Urban Design Plan's Priority Streetscape Program for the Central Business District.

Figure 4.3-19 represents view corridors and scenic or aesthetic designations in the Planning Area vicinity.

Relevant Local Plans and Policies

Portions of the Planning Area fall under the jurisdiction of a variety of local plans, including the *1986 to 2006 General Plan for Sacramento* (updated in 1987), the *Central City Community Plan*, the *American River Parkway Plan*, the *Sacramento River Parkway Plan*, the *Richards Boulevard Redevelopment Plan*, the *Sacramento Urban Design Plan*, and the *Alkali Flat Urban Design Guidelines*. Relevant policies from each of these documents are outlined below, and the analysis of each Alternative with respect to these policies is addressed in the Impacts and Mitigation Measures portion of this section.

1986 to 2006 General Plan for Sacramento (October 30, 1987 Update)

The following goals and policies found in the 1986 to 2006 General Plan for Sacramento are relevant to the development of the Planning Area.

Residential Land Use Element

Goal A	Improve the quality of residential neighborhoods citywide by protecting, preserving and enhancing their character.
Policy A.7.	Protect and preserve architectural, cultural and historic structures through the existing preservation program.

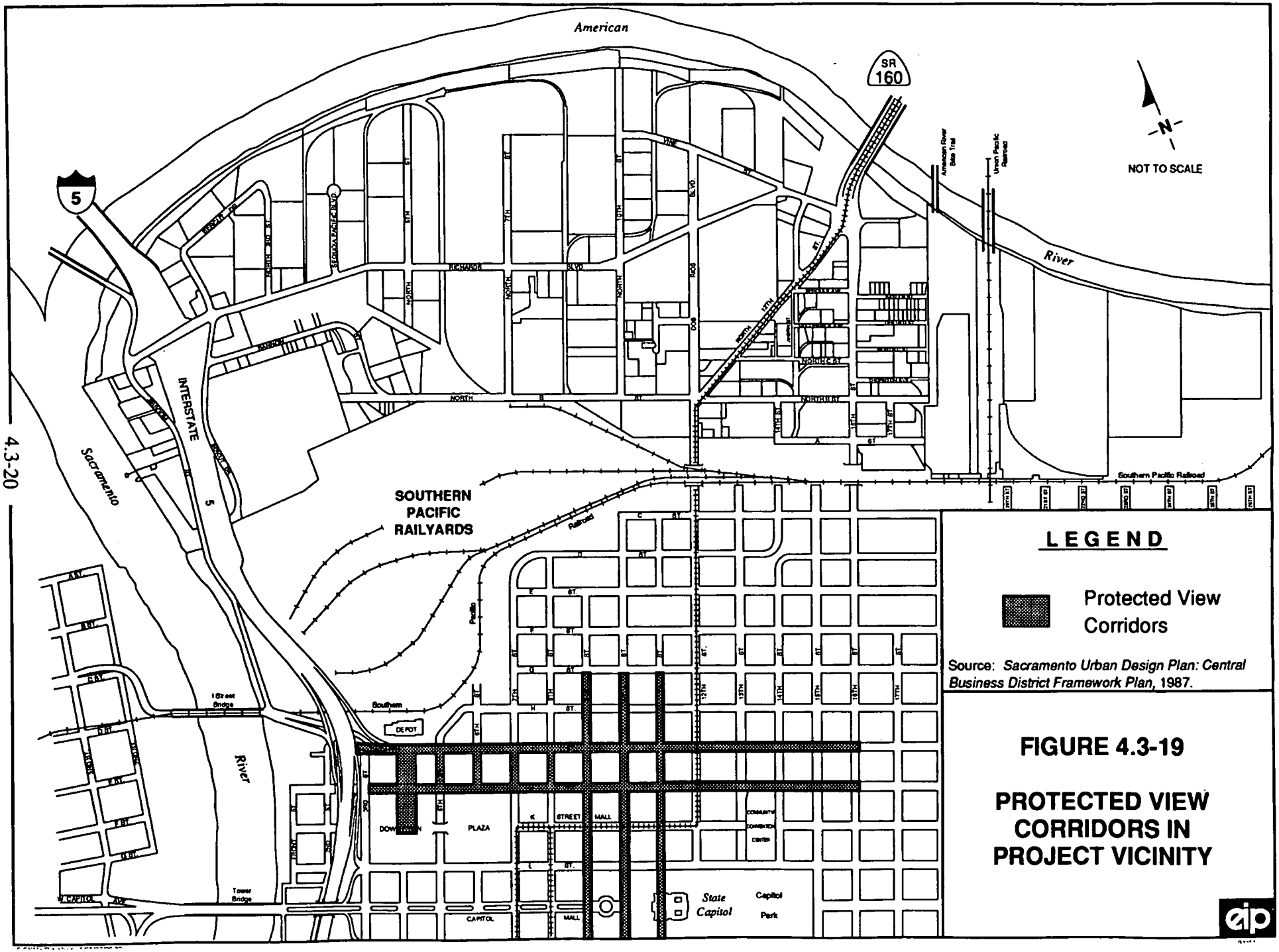
Development of Alternative 1 would not change existing residential neighborhoods in the Planning Area and vicinity. Under Alternatives 2 through 7, existing residential uses in the Dos Rios and Basler Dreher neighborhoods would be retained, although existing units may be replaced with new residences. There would be no net loss of housing under any of the Alternatives. All of the Alternatives emphasize the preservation of the architectural and historic character of the area.

Central City Community Plan

The following goals and policies of the Central City Community Plan apply to the southernmost and southeast portion of the Planning Area, as indicated in Figure 4.3-20.

Goals:

- Improve the physical and social conditions, urban aesthetics and general safety of the Central Business District.
- Improve the physical quality of the environment for Central City residents, shoppers, employees and visitors.


American
SR 160
5
INTERSTATE 5
Sacramento
River
SOUTHERN PACIFIC RAILYARDS
Southern Pacific Railroad
American River Bike Trail
Union Pacific Railroad
NOT TO SCALE
N
I Street Bridge
Tower Bridge
DEPOT
PLAZA
K STREET MALL
State Capitol
Capitol Park
CAPITOL
MALL
LEGEND
Protected View Corridors
Source: Sacramento Urban Design Plan: Central Business District Framework Plan, 1987.
FIGURE 4.3-19
PROTECTED VIEW CORRIDORS IN PROJECT VICINITY
eip

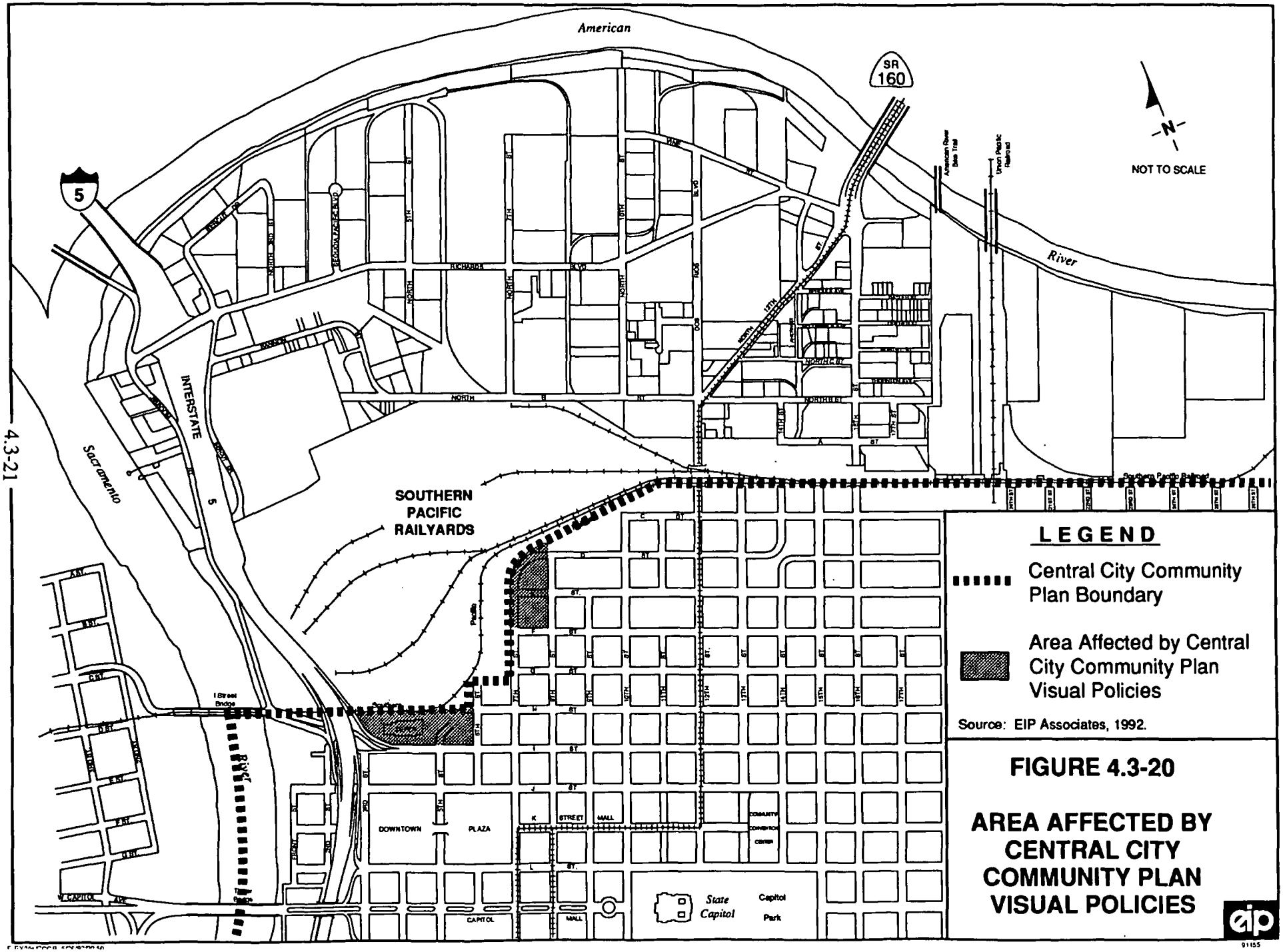


FIGURE 4.3-20

AREA AFFECTED BY CENTRAL CITY COMMUNITY PLAN VISUAL POLICIES

- Create an attractive urban setting through the preservation of existing amenities in the Central City and development of an urban design addendum to the Central City Plan.
- Encourage new residential office and commercial development which is human in scale, sensitive to open space and aesthetic needs and which will minimize [sic] air and noise pollution.
- Improve visual qualities, especially signing, building and yard maintenance, commercial developments and overhead utilities.
- Protect and enhance the unique visual features such as entrances into the Central City, attractive arterials, notable landmarks, and access to views of the rivers.

All of the Alternatives, other than the No Project Alternative, are intended to significantly improve the physical, social, and aesthetic circumstances of the Planning Area, including the portion influenced by the Central Business District, through the establishment of an appealing urban setting and the preservation of amenities. Development of any of the Alternatives, except the No Project Alternative, could substantially improve visual qualities of the Planning Area. Implementation of any of the Alternatives would reinforce the perception of entrances to the central city.

American River Parkway Plan

Portions of the Planning Area adjacent to the American River, from the Sacramento River to the eastern boundary, are under the jurisdiction of the American River Parkway Plan. Applicable goals and policies from this document are listed below.

4.17 Facilities shall be designed to blend into the surrounding natural environment.

5.7 Structures that are in the Parkway or visible from the Parkway shall be of a design, color, texture and scale that minimizes adverse visual intrusion into the Parkway.

5.7.1 Structures shall be constructed of naturalistic materials which blend with the natural environment.

5.7.2 Colors shall be earth tones, or shall blend with the colors of surrounding vegetation.

5.7.3 Structures may emulate authentic historic design, but shall be unobtrusive.

5.7.4 To the extent possible, structures shall be screened from view by native landscaping or other naturally occurring features.

6.4 Levees, landscaping, and other man-made or natural buffers should be used to separate the Parkway visually and functionally from adjoining land uses.

None of the Alternatives propose construction of facilities within the parkway. However, landscaping and open space areas are planned to physically and visually separate the parkway from adjacent development under Alternatives 4 and 7. Development of Alternative 1, the No Project Alternative, would occur primarily in the southern portion of the Planning Area and would not directly affect the American River Parkway. Under the remaining Alternatives,

existing vegetation and any additional landscaping would effectively screen views of new development from the parkway.

Sacramento River Parkway Plan

Although the 1975 Sacramento River Parkway Plan was never officially adopted, policies from that document are included here for reference purposes. The Sacramento River Parkway borders the Planning Area on the west, thereby placing that border area under the jurisdiction of the Sacramento River Parkway Plan. The following goals and policies of the Sacramento River Parkway Plan apply to that portion of the Planning Area indicated in Figure 4.3-21.

Recommendations for Design

Alteration to Existing Levee and Berm Areas:

- All alterations to the parkway area should be designed to aesthetically blend with the area.

Functional and Aesthetic Planting:

- Planting of trees, shrubs and groundcover in the Parkway should be undertaken to protect the levee, provide screening of private residences, and to create an aesthetically pleasing environment.
- The plantings on the berm and levee areas should, to the greatest extent possible, be designed to create a naturalistic character.

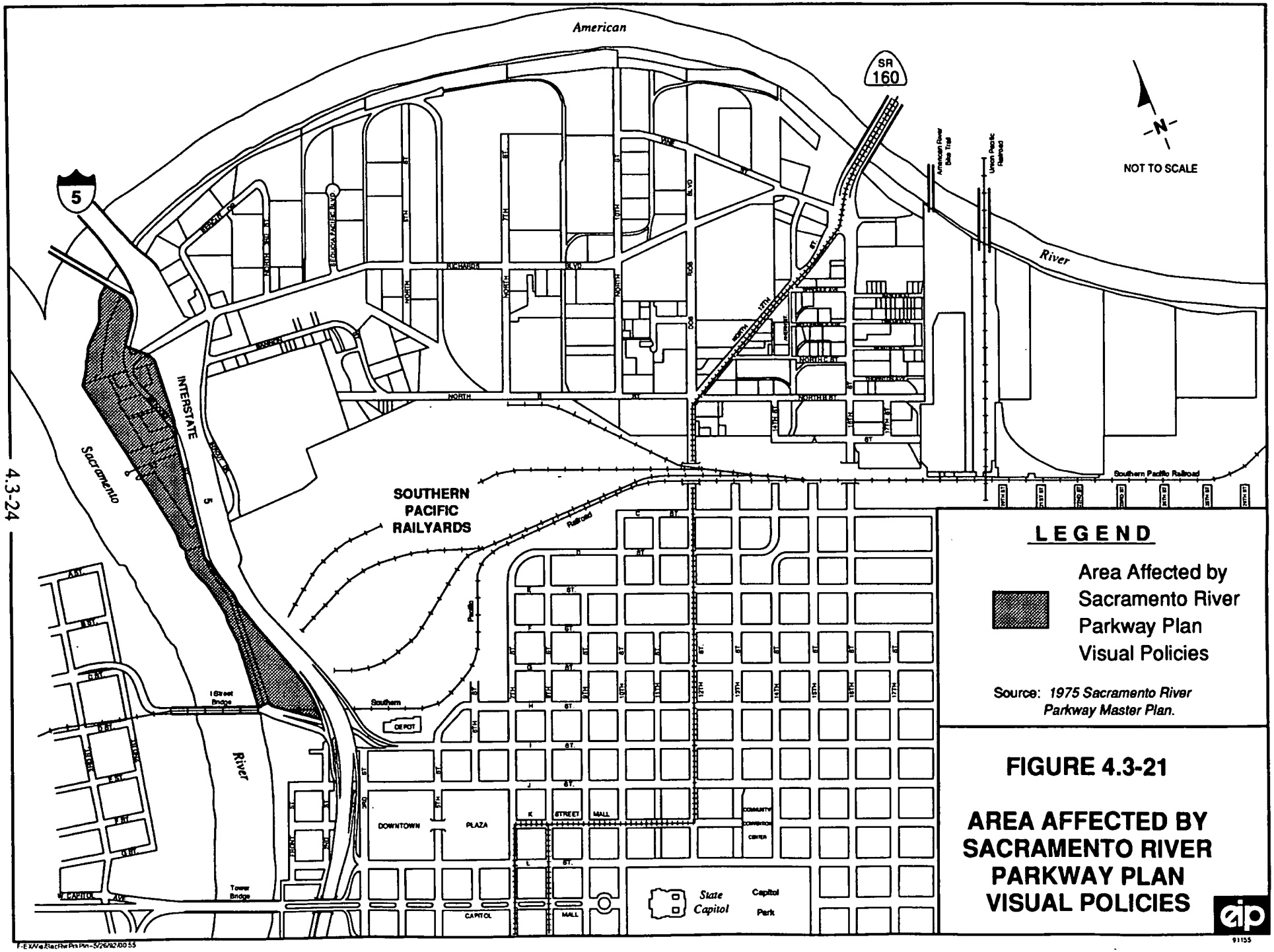
Safety and Security:

- Parkway and adjacent areas which will be used in the evenings should be provided with adequate security lights.

All of the Alternatives recognize the importance of the Sacramento River Parkway as an aesthetic open space resource. Alternative 1 would not directly affect this resource. Alternatives 2 through 7 propose development of the river edge, primarily as open space. Specific information regarding proposed plantings in this area is not yet available; however, as all of these Alternatives emphasize a minimal amount of man-made improvements, a safe and aesthetically pleasing environment is anticipated.

Sacramento Urban Design Plan

Development design in downtown Sacramento is guided by the *Sacramento Central Business District Urban Design Plan* (Urban Design Plan), which is divided into three documents, the *Urban Design Framework Plan*, the *Architectural Design Guidelines*, and the *Streetscape Guidelines*. Portions of the Planning Area indicated in Figure 4.3-22 are affected by the goals and policies of these documents.


American
River
SR 160
5
INTERSTATE 5
Sacramento
SOUTHERN PACIFIC RAILYARDS
Southern Pacific Railroad
American River Bike Trail
Union Pacific Railroad
NOT TO SCALE
N
I Street Bridge
Tower Bridge
DOWNTOWN PLAZA
K STREET MALL
CAPITOL MALL
State Capitol
Capitol Park
DEPOT
LEGEND
Area Affected by Sacramento River Parkway Plan Visual Policies
Source: 1975 Sacramento River Parkway Master Plan.
FIGURE 4.3-21
AREA AFFECTED BY SACRAMENTO RIVER PARKWAY PLAN VISUAL POLICIES
eip

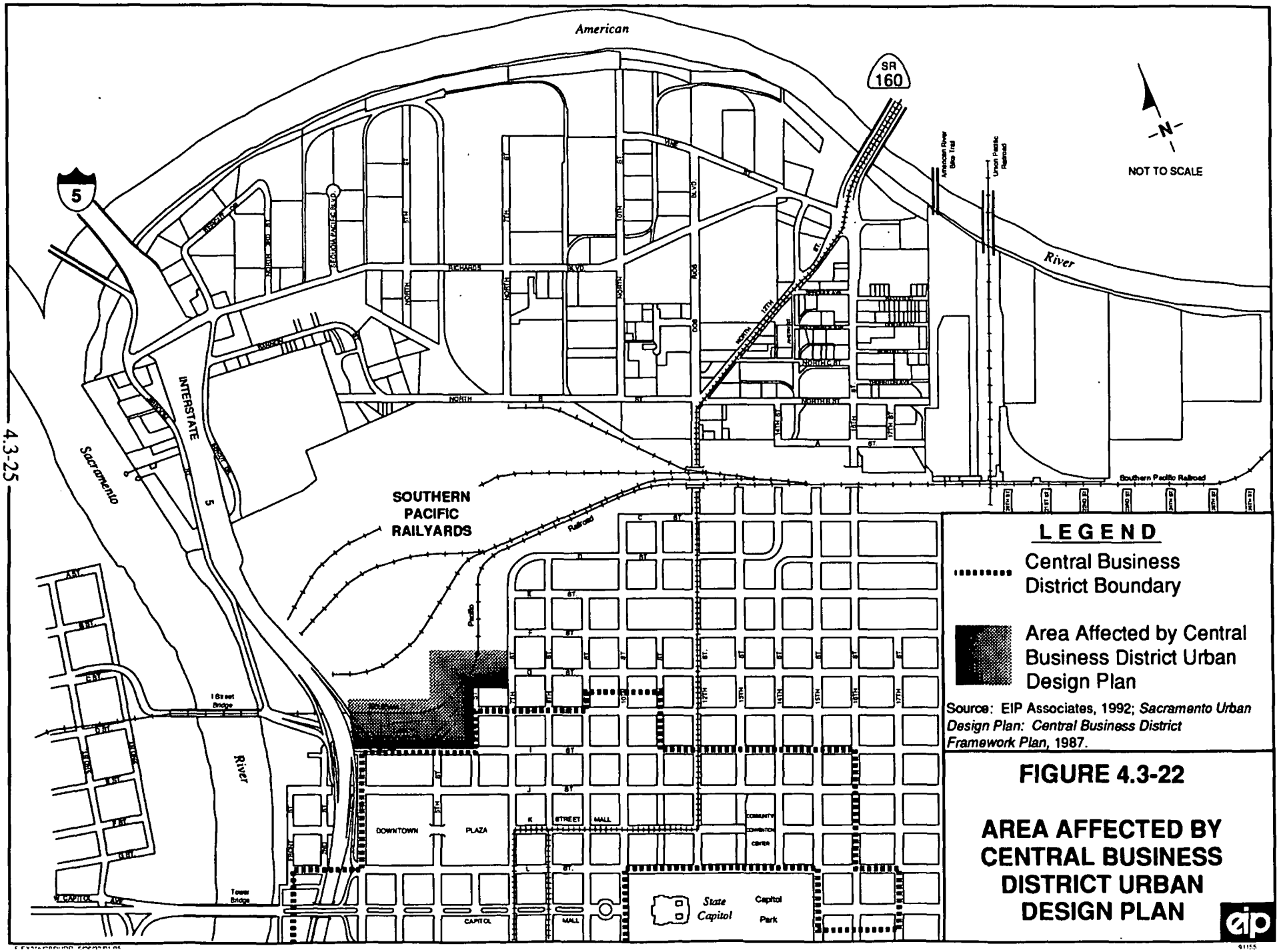


FIGURE 4.3-22

AREA AFFECTED BY CENTRAL BUSINESS DISTRICT URBAN DESIGN PLAN

Urban Design Framework Plan

Urban Form (Massing):

4. Edges and entries to the downtown should be defined and enhanced.

Development under any of the Alternatives, including the No Project Alternative, would clearly define the northern entries to the downtown area.

Architectural Design:

1. The design guidelines should complement the architectural character of existing historic building enclaves.

2. The design guidelines should identify architectural elements indigenous to areas of the downtown to enhance these areas unique qualities.

3. The design guidelines should allow for creative architectural solutions that acknowledge contextual design issues.

Preservation of Vistas:

1. Second level pedestrian bridges over public streets should not be allowed except for special circumstances.

2. Construction or intrusion of private or public development over public streets and right-of-ways should not be permitted.

3. Landscaping and building massing should enhance views of landmarks.

Development under the proposed design guidelines would complement the architectural features of the historic Southern Pacific shops structures, existing Amtrak station and Railway Express building, and emphasize the use of local architectural elements and contextual compatibility. No second level bridges are proposed over public streets or view corridors under any of the Alternatives. Furthermore, none of the Alternatives propose development that would encroach upon view corridors or interfere with views of landmarks.

Priority Streetscapes:

1. Concentrating a focus of features and pedestrian amenities in a central core area (7th to 13th and I to L Streets).

2. Highlighting major open space squares to establish a strong identity and to recall the historic layout of Sacramento.

3. Identifying key intersections and entries to the City with special signing, street furnishings and landscape.

Implementation of any of the Alternatives other than Alternative 1 would allow for development of pedestrian amenities and useable open space areas within the southernmost portion of the Planning Area, directly adjacent to the existing downtown area.

Architectural Design Guidelines

Building Design Elements - General Requirements

Color, Texture and Material:

- New developments should respond in a compatible manner to the existing color, texture and materials used on surrounding significant buildings.
- Highly reflective mirrored glass walls as the primary design element should be avoided.

Building Rhythm:

- New development should respect building rhythms of adjacent buildings on the same block-face.
- Facades should employ several related rhythms and avoid repetition of one or very few elements at all levels.

Although some specific design details are not yet available for the Alternative development scenarios of the Planning Area, guidelines and policies included in the proposed plans reflect those outlined in the Architectural Design Guidelines of the Urban Design Plan.

Protected View Corridors:

1. Second level pedestrian bridges over public streets should not be allowed unless for very special circumstances.
2. Construction or intrusion of private or public development over public streets and right-of-ways should not be permitted.
3. Landscaping and building massing should enhance views of landmarks.

None of the Alternatives propose construction of second level bridges over public streets or view corridors, nor do any of the Alternatives propose development that would encroach upon view corridors or interfere with views of landmarks.

Streetscape Guidelines

Goals:

1. Encourage nighttime use by making areas attractive, well lit, and safe.
4. Preserve features that are historic, aesthetic and unique to Sacramento.
5. Emphasize, protect and enhance entrances and edges of CBD.
8. Maintain major vistas toward the Capitol and other special landmarks.
9. Provide summer shade and access to winter sunlight.

10. Enhance the personalization of space by creating a sense of openness and pedestrian scale (at parks and in high use areas).

14. Preserve and maintain existing trees.

15. Enhance street level design to attract pedestrian use.

Streetscape Policies:

4. Highlight major open space 'squares' to establish a strong identity and to recall the historic layout of Sacramento.

Development of Alternative 1 could encourage pedestrian use of the southernmost portion of the Planning Area, although most of this use would occur during daytime hours. Under Alternatives 2 through 7, development in the southern portion of the Planning Area is intended, through a variety of measures, to encourage pedestrian activity during day and nighttime hours. In addition, development of all of the Alternatives would preserve historic features, emphasize the entrances and edges of the Central Business District, and maintain and enhance vistas.

I Street Streetscape Policies:

1. Establish formal boulevard drive character with wide setbacks (15' ±) on the north side of the street within the core area (similar to the front of City Hall), and additional landscape setbacks (5-10') on the remainder of the street.

Other Streets - 4th Street (K to I):

3.a. Load with amenities for pedestrian activity including lighting, street furnishings, outdoor cafes, artwork, information kiosks, special paving, and landscape.

Although the Planning Area does not encompass these areas, development in adjacent portions of the Planning Area would observe the character envisioned by these streetscape policies under all of the Alternatives.

Tree Planting Criteria:

1. Existing large trees and other planting should be maintained and protected.

6. Trees should allow for sun in winter on the north side of the street and shade in the summer.

8. New development should continue to be required to plant, replace and maintain street trees. The quantity and spacing should be specified appropriate to the tree type selected.

9. The use, design and location of primary street trees in pots should be discouraged.

Under all of the Alternatives, the planting and use of street trees would be encouraged in this area.

City of Sacramento Design Review Guidelines Plan

Policies of the City of Sacramento Design Review Guidelines Plan relevant to the Planning Area are listed below.

B.5. The Board discourages long, uninterrupted horizontal lines of parapet, unless they are integral to a building design. Generally it is preferred to break the parapet line up by vertical or horizontal off-sets or changing of roof forms.

B.7. Multi-building projects should incorporate more than one form and architectural treatment consistent with the design concept, to prevent monotonous repetition.

C.1. Proposed structures should be harmonious to the existing surroundings including existing buildings, existing landscaping, existing open space and existing view corridors.

C.2. As a general rule, completed projects should fit into their surroundings as an integral part. They should act to complete and complement the existing surroundings.

C.3. Structure should generally continue an established facade line; for example structures should be located toward street frontage, with parking to the rear or side when consistent with adjacent patterns.

Although specific design details are not yet available for the Alternative development scenarios of the Planning Area, guidelines and policies included in the proposed specific plans reflect those outlined above from the City Design Review Guidelines Plan.

Alkali Flat Urban Design Guidelines

Several blocks of the southeastern area of the Planning Area site fall within the Alkali Flat neighborhood, and are therefore under the jurisdiction of the Alkali Flat Urban Design Guidelines (see Figure 4.3-23). The following goals and policies of the Alkali Flat Urban Design Guidelines apply to those portions of the Planning Area indicated in Figure 4.3-23.

Goals:

A.1.A. Promote conservation of the built environment, encourage building design treatment, both rehabilitation and new construction which is compatible with the existing historic character of the area.

A.2.A. Landscape treatments which will provide both visual continuity and a buffer between varied land uses.

A.2.C.1. Encourage the replacement, retention and maintenance of the typical Central City landscape treatment.

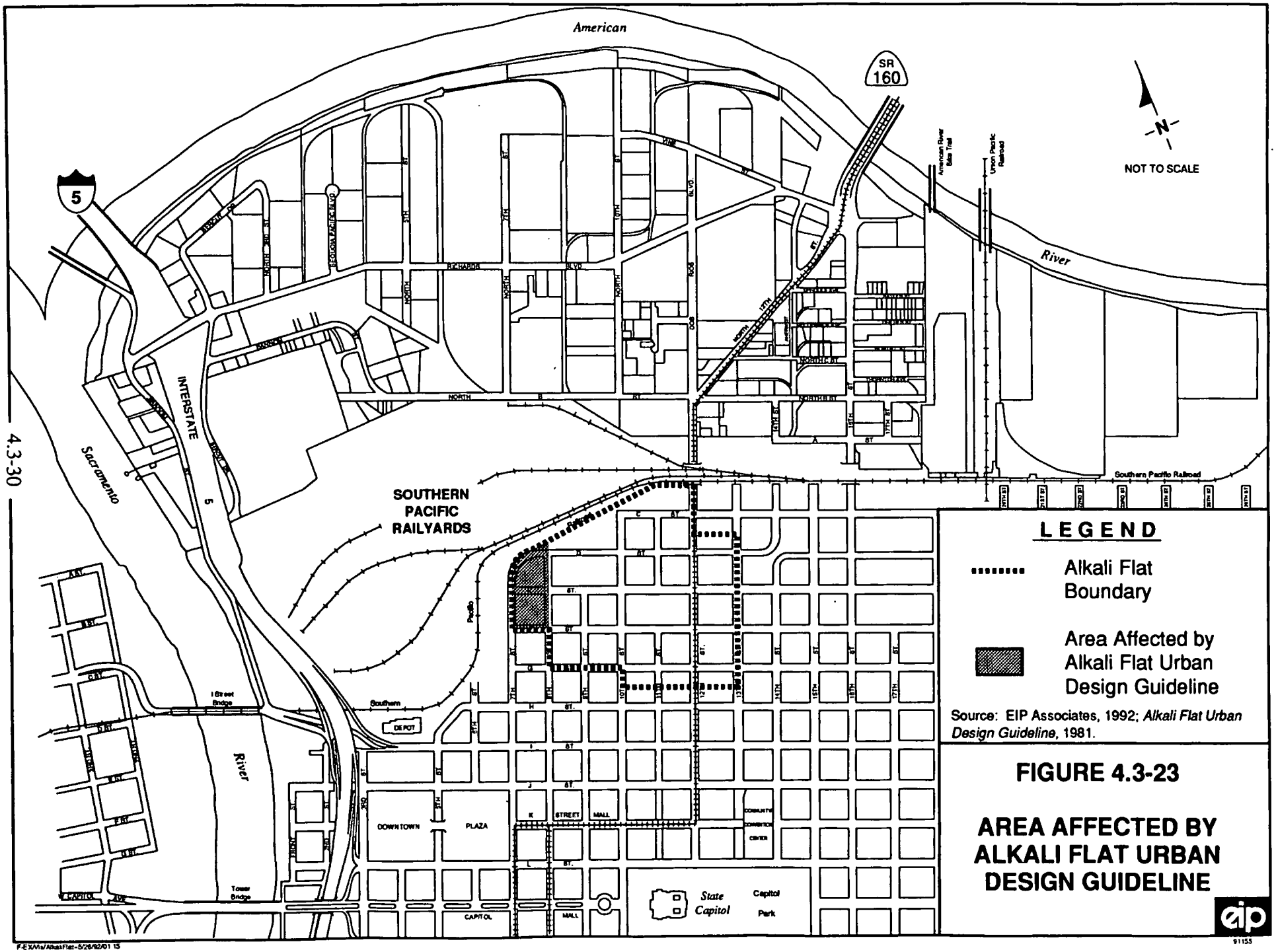


FIGURE 4.3-23

AREA AFFECTED BY ALKALI FLAT URBAN DESIGN GUIDELINE

Design Criteria:

Scale	No higher than three stories. Clusters of 1 or 1-1/2 story buildings may occur.
Material	Materials, or what the building is constructed of, should be limited to that range of materials dominant in Alkali Flat.

Development of Alternative 1 would not substantially affect the Alkali Edge. Under all of the other Alternatives, development of the Alkali Edge would emphasize the maintenance of the existing character of the area and the visual transition between new structures in the Planning Area and the existing qualities of Alkali Flat.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

In accordance with CEQA Guidelines and for the purposes of this EIR, impacts are considered significant if one or more of the following conditions would result from development of the Planning Area:

- A substantial, demonstrable negative aesthetic effect;
- Conflict with any adjacent existing structures in relation to building height, bulk, massing, materials or landscaping;
- Compromised preservation of views and sunlight;
- Alteration to the existing character of the site; or
- Production of light and glare that may disturb activities in adjacent areas.

Additional standards by which significance of visual impacts will be judged include the Alternatives support of applicable goals, policies and programs contained in the City of Sacramento General Plan Update, the Central City Community Plan, the American River Parkway Plan, the Sacramento River Parkway Plan, the Sacramento Urban Design Plan and the Alkali Flat Urban Design Guidelines.

For the shadows analysis, conditions in which more than 50 percent of an open space would experience shadow coverage between 11:00 AM and 2:00 PM from September through March are considered significant.

Methods

Visual impacts are generally subjective, as sensitivity to change in the visual environment varies and individuals respond differently to these changes. Furthermore, at the Plan stage, specific design details of the components of the Planning Area, particularly for the Richards Boulevard Area Plan, have not yet been identified. The RSP and RBAP contain general policy-level information regarding future uses on the Planning Area. In addition, the site plans provided for the proposed project contain information identifying the possible locations of various uses, with

generalized square footage or number of units for each. Design guidelines are included in the Plans; however, these can only be evaluated in general terms, as they would apply to future development not yet designed. For these reasons, the EIR can only address the visual impacts on a qualitative level, based on the textual and graphic descriptions of the Planning Area provided.

Photomontages prepared for the visual analysis (Figures 4.3-24 through 4.3-29) show the proposed Planning Area in the existing visual environment from six different vantage points. These photomontages include views from key observation points and areas of high visual sensitivity, as identified in Figure 4.3-18. Potential impacts on these sensitive receptors and observation points, based on the degree of visibility of development, were assessed in relationship to the following issues:

- View corridors
- Loss of sunlight/light
- Potential light and glare.

In addition, impacts on visual quality were determined by assessing the Planning Area's support of aesthetics and design standards established by the City of Sacramento, and by analyzing the relationship between the general visual characteristics of the Alternatives and the characteristics of existing development in the Planning Area and vicinity.

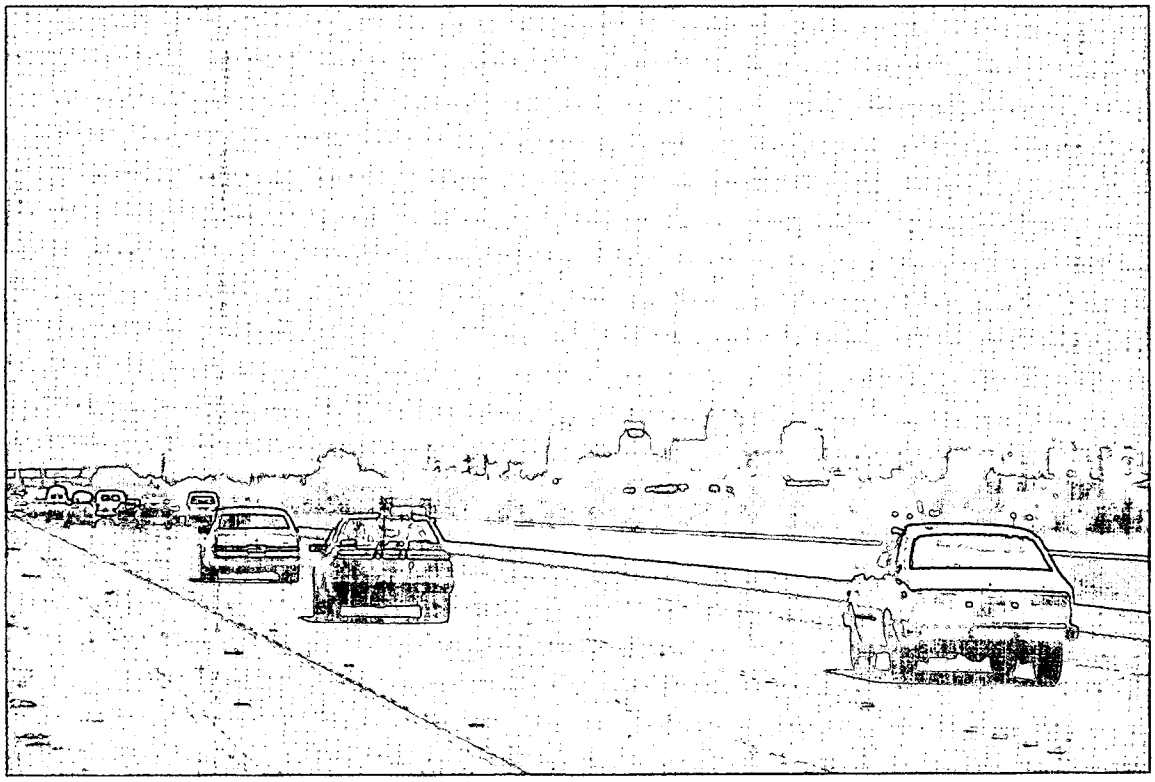
A base computer model of the Alternatives 4 and 7 plans for the Railyards Specific Plan was developed for use in the shadow analysis. This model included all proposed buildings and any existing buildings that could potentially have a shadow impact on the Railyards Area under Alternatives 4 and 7. Expected shadow coverage of the Railyards Area was estimated for the remaining Alternatives based on the results of these projections. Shadow patterns for existing and proposed buildings under Alternatives 4 and 7 in the Planning Area are shown in Figures 4.3-30 through 4.3-41 for 10 AM, 12 PM (Noon) and 3 PM on each of the equinoxes (March 21 and September 21) and the summer and winter solstices (June 21 and December 21, respectively). These dates and times were chosen because of their unique sun angle attributes. Shadow projections use a generally accepted algorithm to calculate solar position at Sacramento's latitude for the above times. It should be noted that although the sun follows the same path at the two equinoxes, shadow patterns differ because Daylight Savings Time is in effect in September, but not in March.

Shadows are shown in two categories: "proposed shadows", those created from new buildings in the Planning Area; and "existing shadows", those created from existing buildings outside the Planning Area that would remain and may have an impact on the Area itself. The analysis includes the impacts of shadows cast on open space in the vicinity potentially affected by the Planning Area. Figures 4.3-30 through 4.3-41 on pages 4.3-54 through 4.3-65, illustrate the shadows analysis.

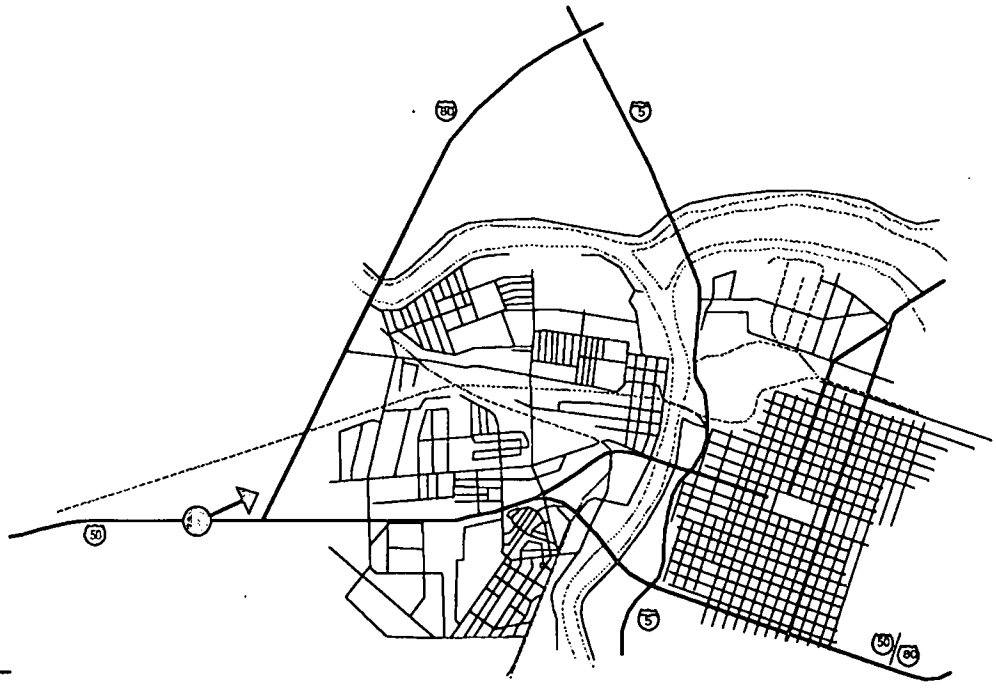
FIGURE 4.3-24

PHOTOMONTAGE SERIES:

VIEW FROM I-80 EAST TO DOWNTOWN



EXISTING VIEW



OBSERVATION POINT

LEGEND

Location and
Direction of Photograph

91155

VIEW FROM
I-80 EAST TO
DOWNTOWN

ALTERNATIVE 2

ALTERNATIVE 5

ALTERNATIVES 3, 4 AND 7

SP Development

Downtown Proposed /Approved

A. Central Library Tower
B. River Tower
C. 6th and Capitol Mall (Lot A)
D. PERS Garage (Capitol Square)

ALTERNATIVE 6

SP Development

Downtown Proposed /Approved

A. Central Library Tower
B. River Tower
C. 6th and Capitol Mall (Lot A)
D. PERS Garage (Capitol Square)

NOTE:
Views are as modeled for each proposed Alternative, using the general guidelines of RSP and RBAP. These models were created for illustrative purposes only, and are not intended to represent specific projects within the Planning Area.

Source: ROMA Design Group, 1992.

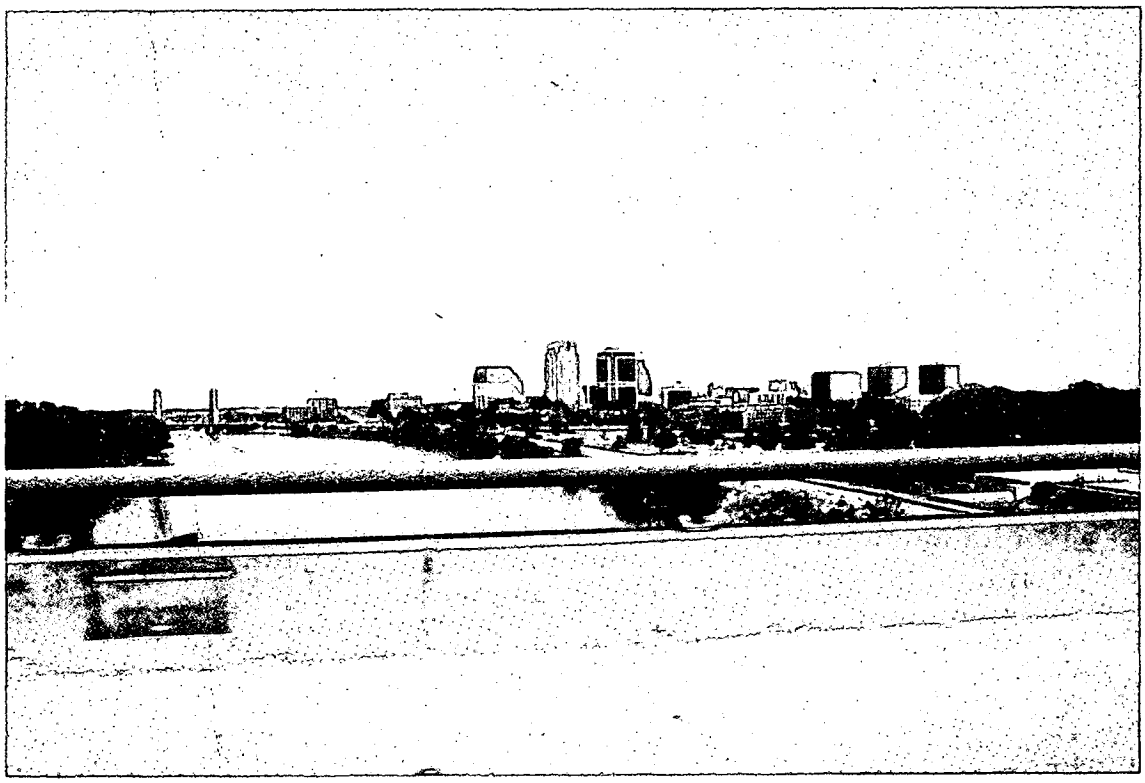
91155

FIGURE 4.3-25

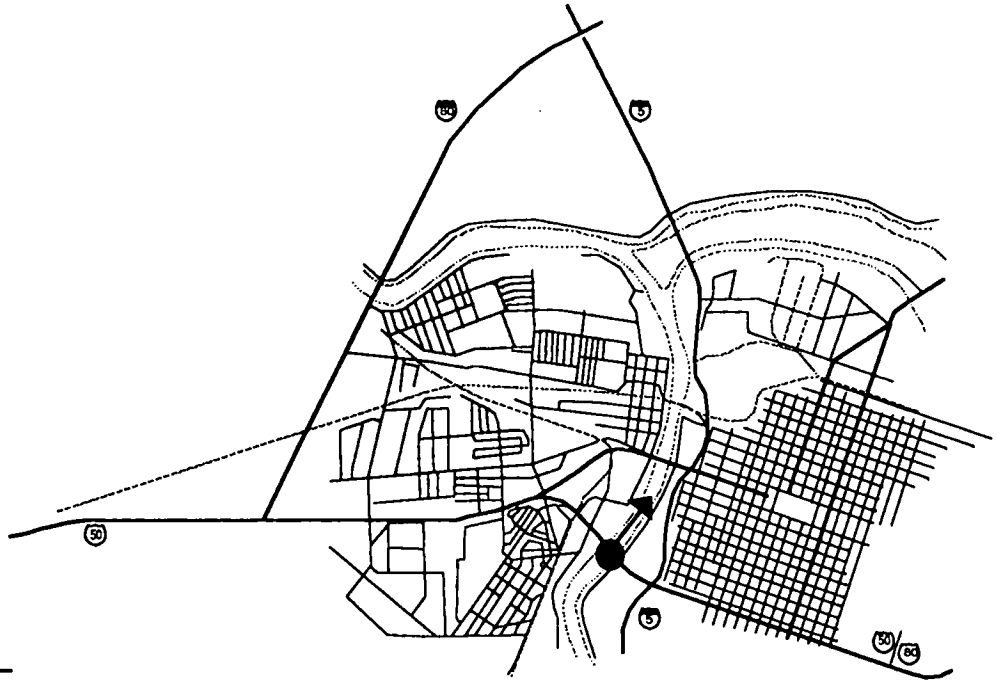
PHOTOMONTAGE SERIES:

VIEW FROM PIONEER BRIDGE

FIGURE 4.3-25



EXISTING VIEW



LEGEND

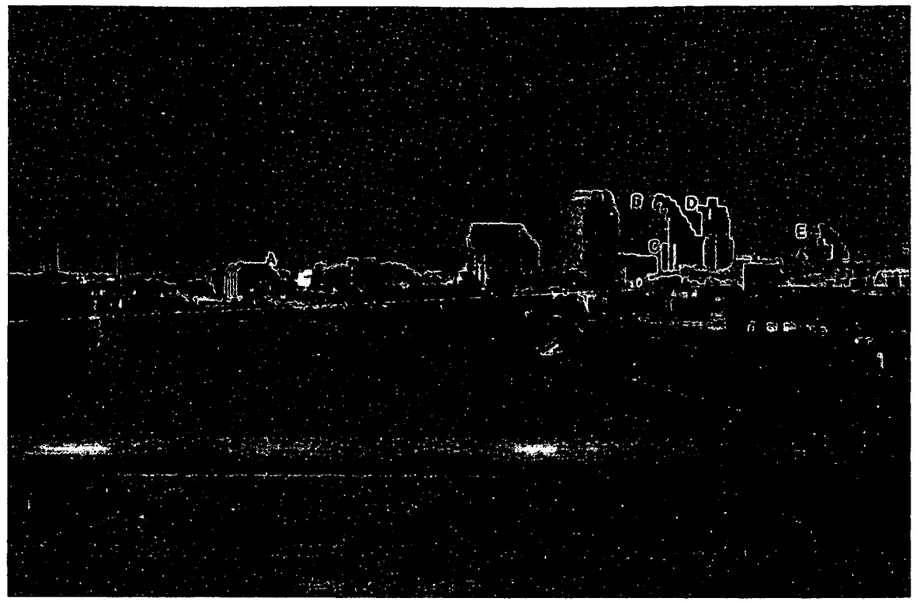
Location and
Direction of Photograph

OBSERVATION POINT

91155

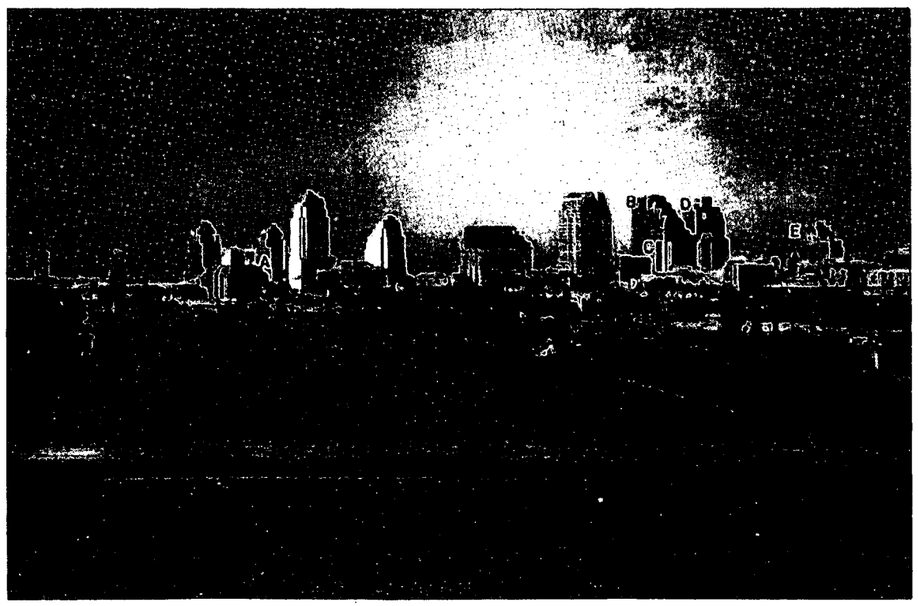
VIEW FROM
PIONEER BRIDGE

ALTERNATIVE 2



ALTERNATIVE 5

ALTERNATIVES 3, 4 AND 7

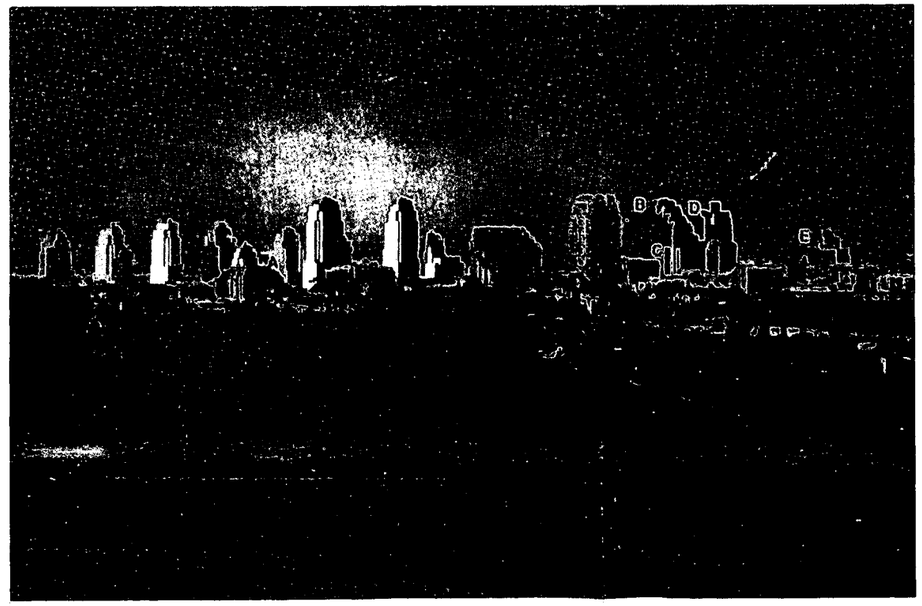


SP Development

Downtown Proposed /Approved

A. River Tower
B. 1213 K Street
C. Central Library Tower
D. 703 L Street
E. 6th and Capitol Mall (Lot A)

ALTERNATIVE 6



SP Development

Downtown Proposed /Approved

A. River Tower
B. 1213 K Street
C. Central Library Tower
D. 703 L Street
E. 6th and Capitol Mall (Lot A)

NOTE:
Views are as modeled for each proposed Alternative, using the general guidelines of RSP and RBAP. These models were created for illustrative purposes only, and are not intended to represent specific projects within the Planning Area.

Source: ROMA Design Group, 1992.

91155

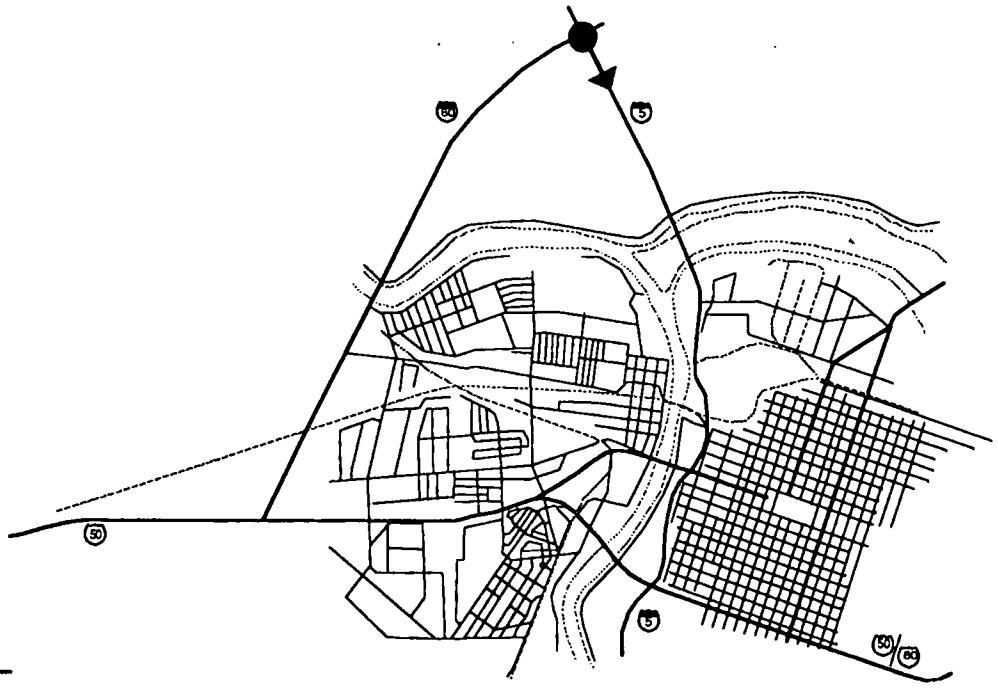
FIGURE 4.3-26

PHOTOMONTAGE SERIES:

VIEW FROM I-5 SOUTHEAST TO DOWNTOWN

FIGURE 4.3-26

EXISTING VIEW



LEGEND

Location and
Direction of Photograph

OBSERVATION POINT

91155

VIEW FROM
I-5 SOUTHEAST
TO DOWNTOWN

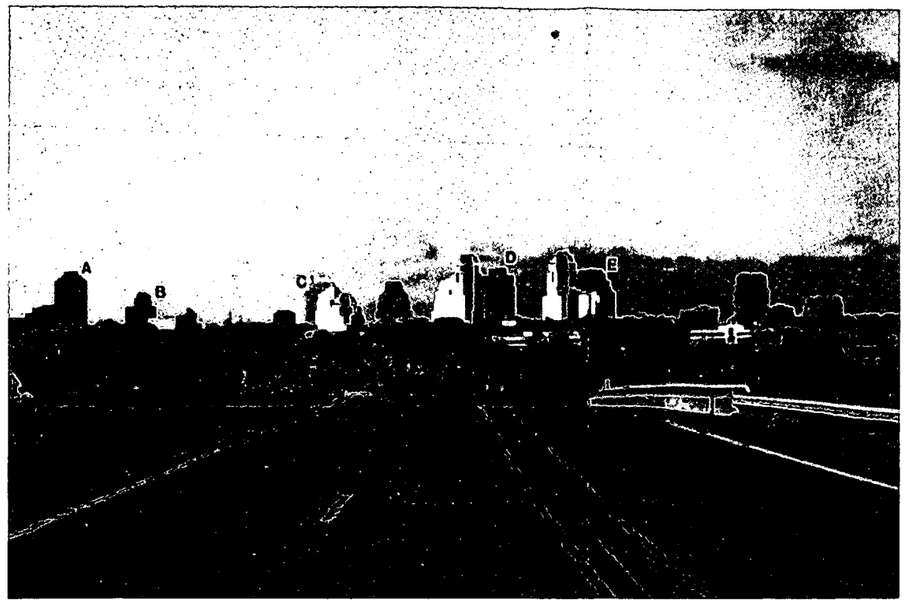
ALTERNATIVE 2

ALTERNATIVES 3, 4 AND 7

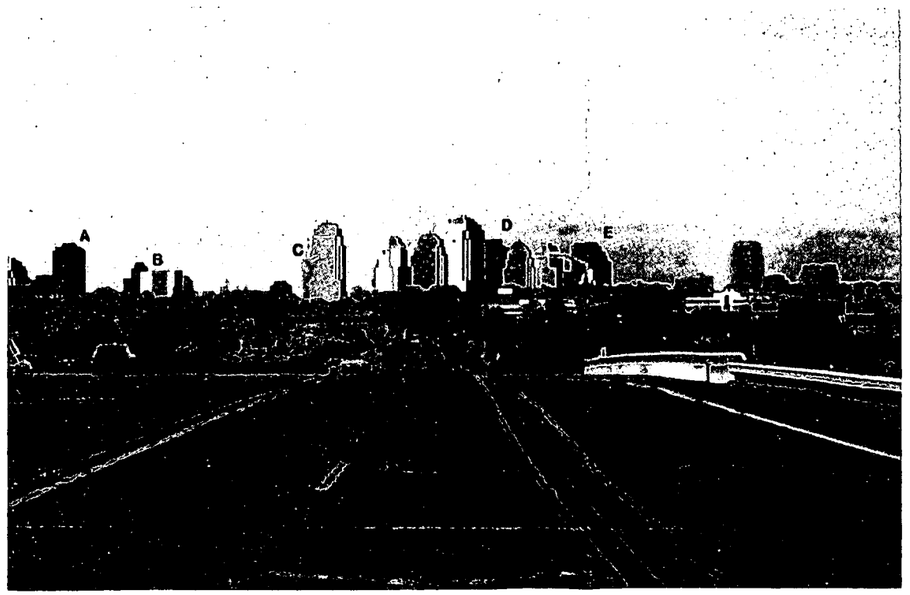
SP Development
Downtown Proposed /Approved

A. River Tower
B. 1213 K Street
C. Central Library Tower
D. 703 L Street
E. 6th and Capitol Mall (Lot A)

ALTERNATIVE 5



ALTERNATIVE 6



SP Development
Downtown Proposed /Approved

A. River Tower
B. 1213 K Street
C. Central Library Tower
D. 703 L Street
E. 6th and Capitol Mall (Lot A)

NOTE:
Views are as modeled for each proposed Alternative, using the general guidelines of RSP and RBAP. These models were created for illustrative purposes only, and are not intended to represent specific projects within the Planning Area.

Source: ROMA Design Group, 1992.

91155

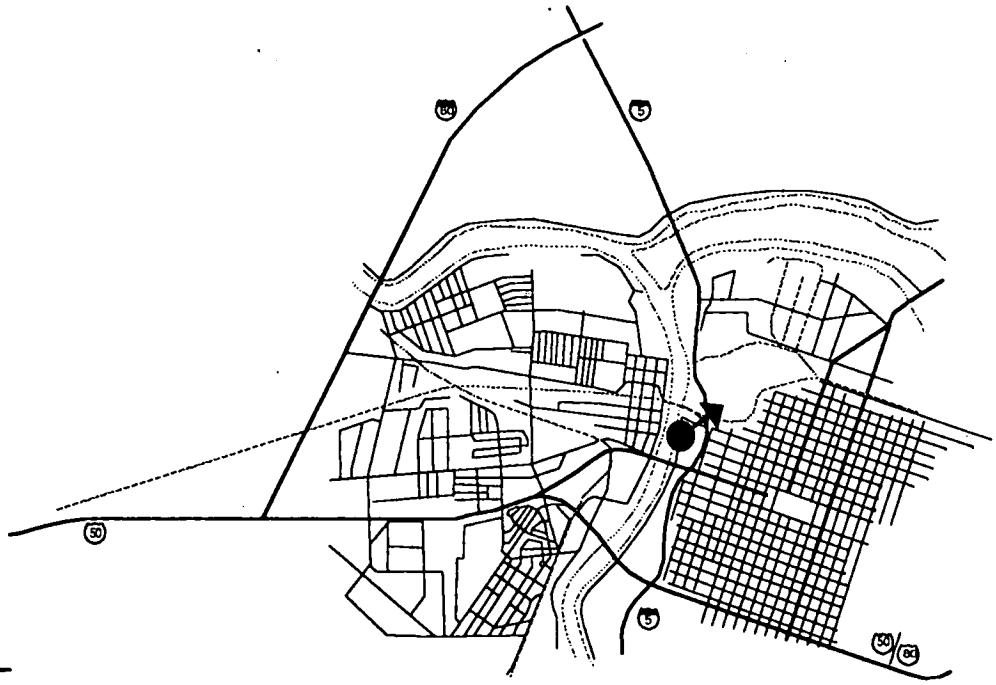
FIGURE 4.3-27

PHOTOMONTAGE SERIES:

VIEW FROM OLD SACRAMENTO

FIGURE 4.3-27

EXISTING VIEW



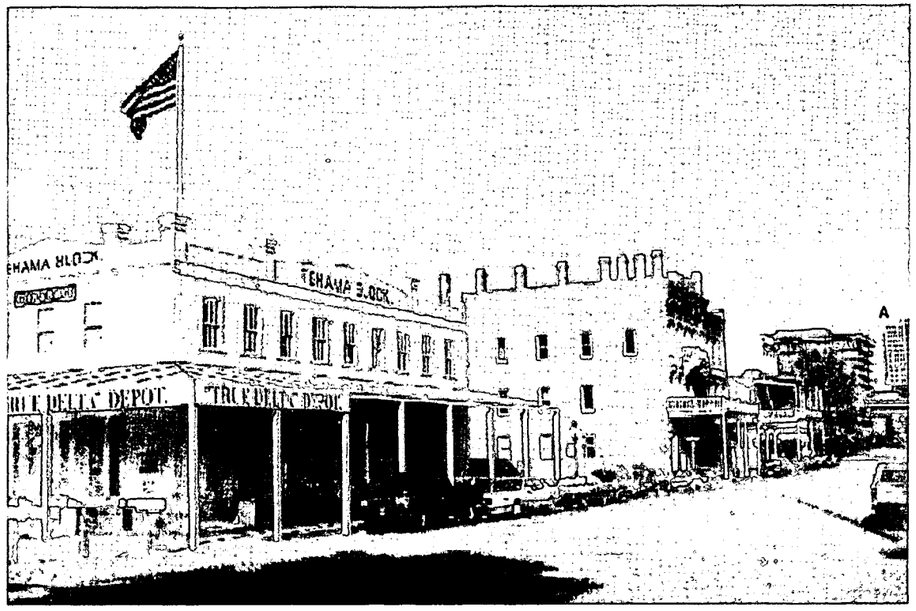
OBSERVATION POINT

LEGEND

Location and
Direction of Photograph

91155

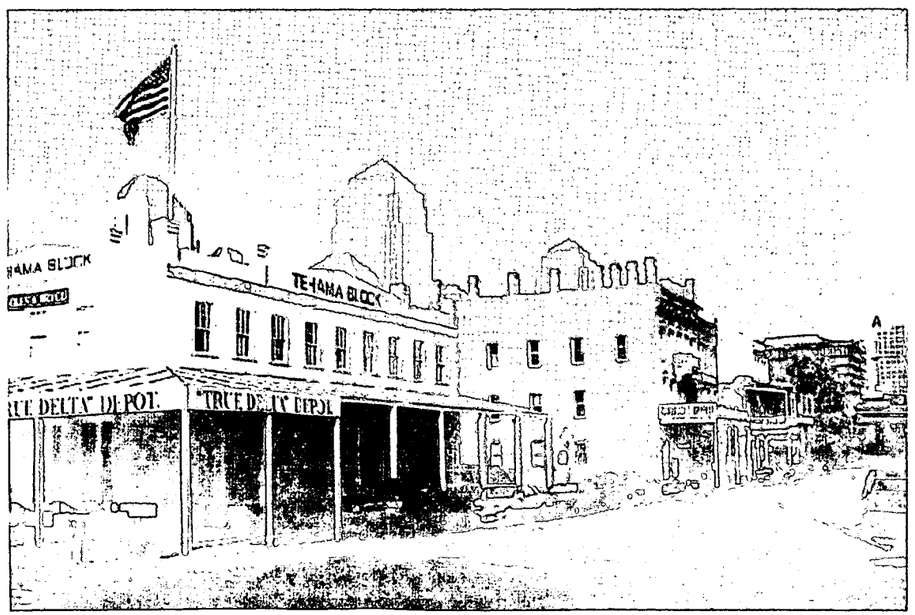
ALTERNATIVE 2



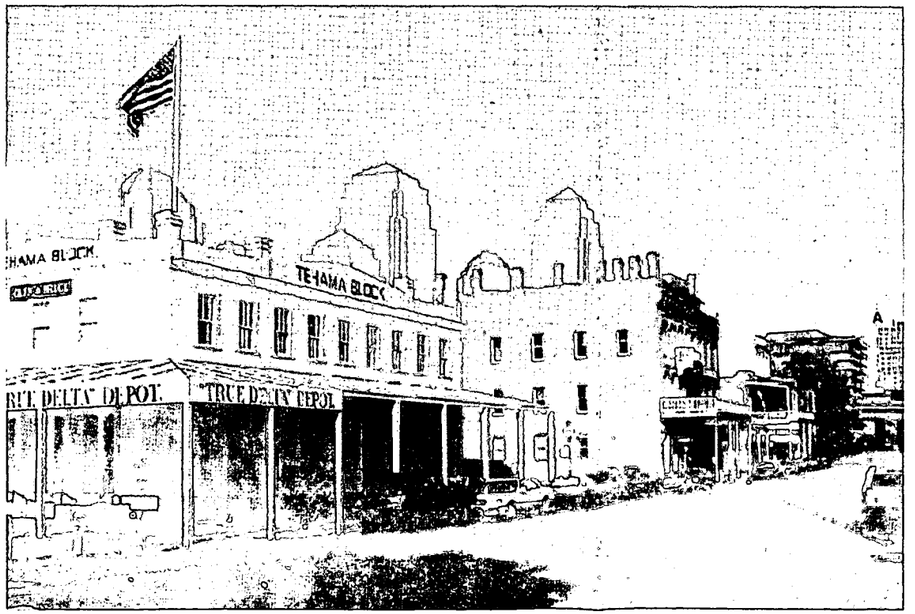
ALTERNATIVE 5

VIEW FROM
OLD SACRAMENTO

ALTERNATIVES 3, 4 AND 7



ALTERNATIVE 6



SP Development

A. Park Plaza

SP Development

A. Park Plaza

NOTE:
Views are as modeled for each proposed Alternative, using the general guidelines of RSP and RBAP. These models were created for illustrative purposes only, and are not intended to represent specific projects within the Planning Area.

Source: ROMA Design Group, 1992.

91155

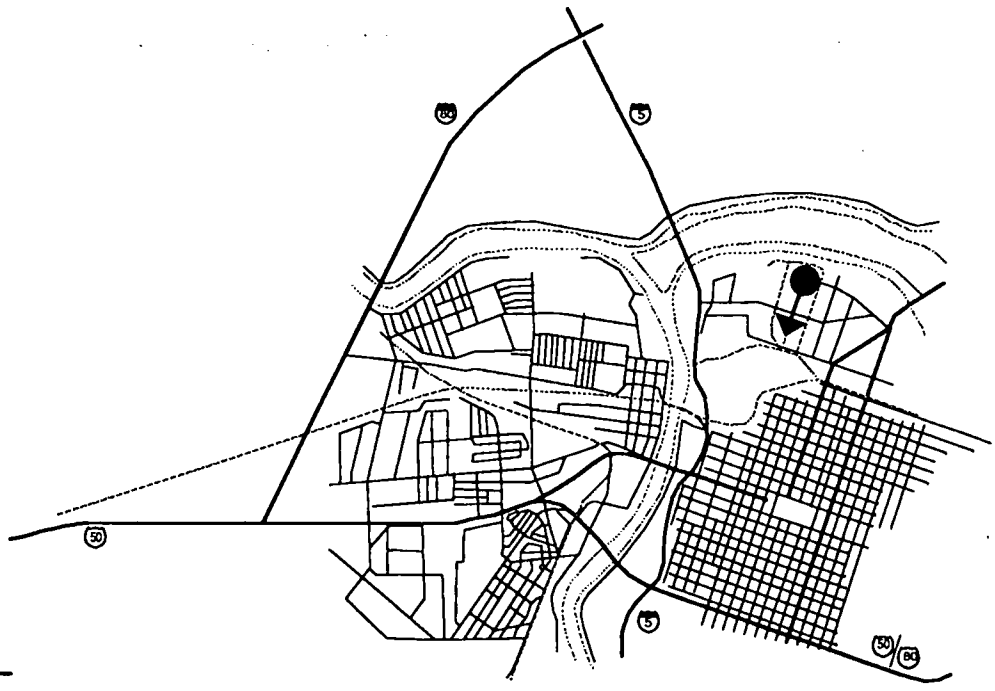
FIGURE 4.3-28

PHOTOMONTAGE SERIES:

VIEW SOUTH ON 7TH STREET FROM AMERICAN RIVER

FIGURE 4.3-28

EXISTING VIEW



LEGEND

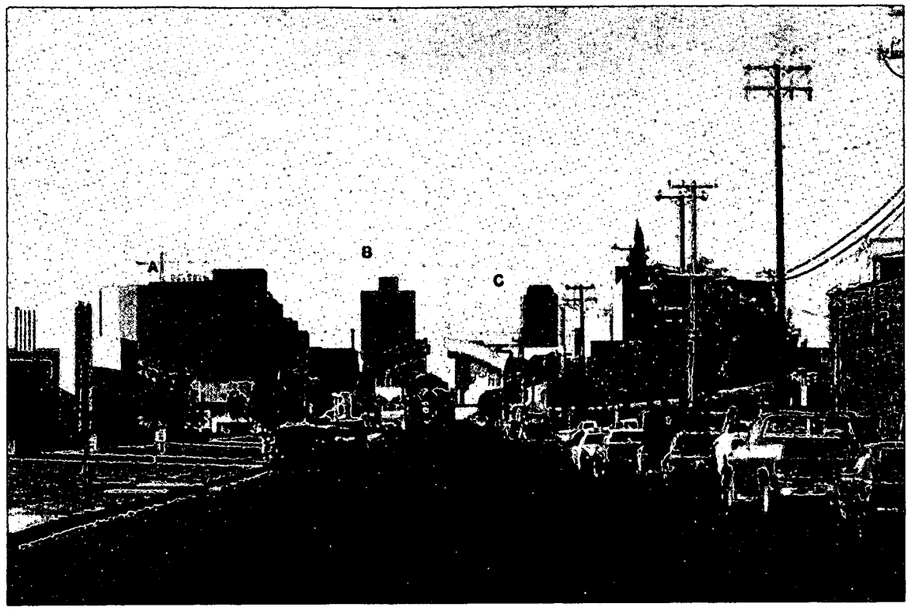
Location and
Direction of Photograph

OBSERVATION POINT

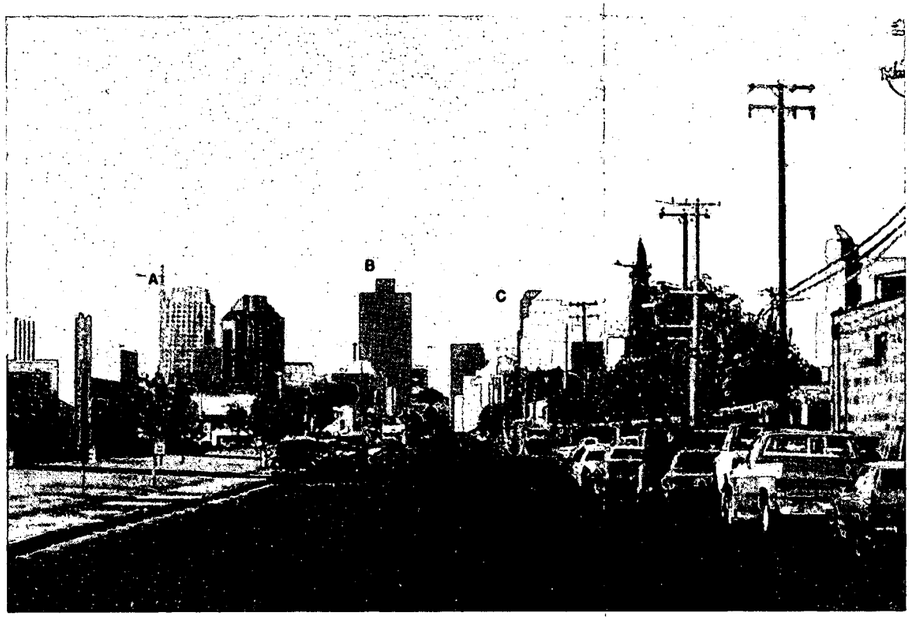
91155

VIEW SOUTH ON
7TH STREET FROM
AMERICAN RIVER

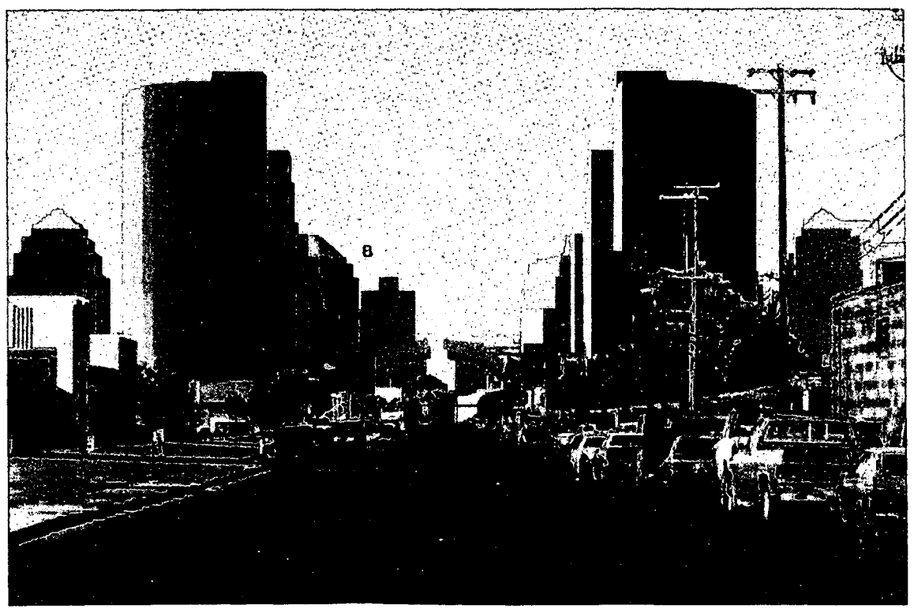
ALTERNATIVE 2



ALTERNATIVE 5



ALTERNATIVES 3, 4 AND 7

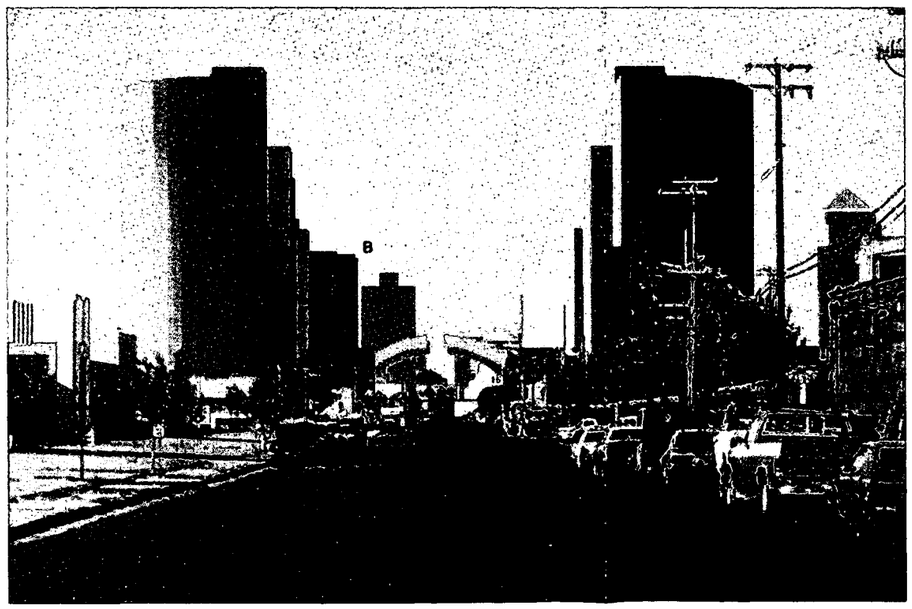


SP Development

Downtown Proposed /Approved

A. Central Library Tower
B. 703 L Street
C. 6th and Capitol Mall (Lot A)

ALTERNATIVE 6



SP Development

Downtown Proposed /Approved

A. Central Library Tower
B. 703 L Street
C. 6th and Capitol Mall (Lot A)

NOTE:
Views are as modeled for each proposed Alternative, using the general guidelines of RSP and RBAP. These models were created for illustrative purposes only, and are not intended to represent specific projects within the Planning Area.

Source: ROMA Design Group, 1992.

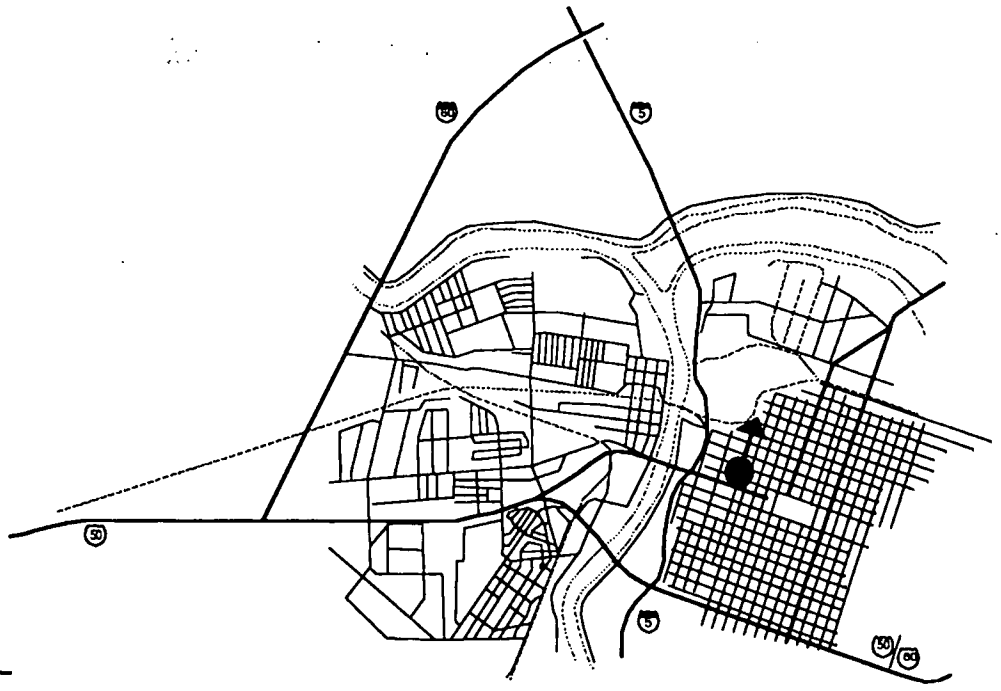
91155

FIGURE 4.3-29

PHOTOMONTAGE SERIES:

VIEW FROM 7TH STREET NEAR I STREET

EXISTING VIEW



LEGEND

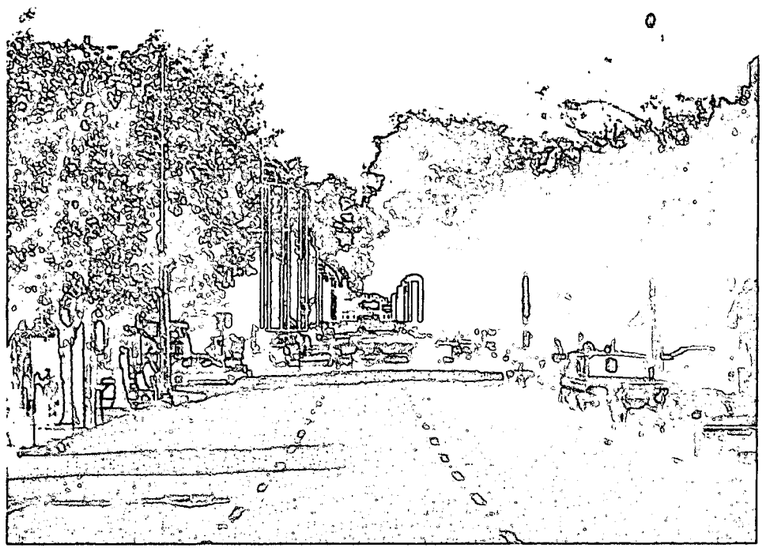
Location and
Direction of Photograph

OBSERVATION POINT

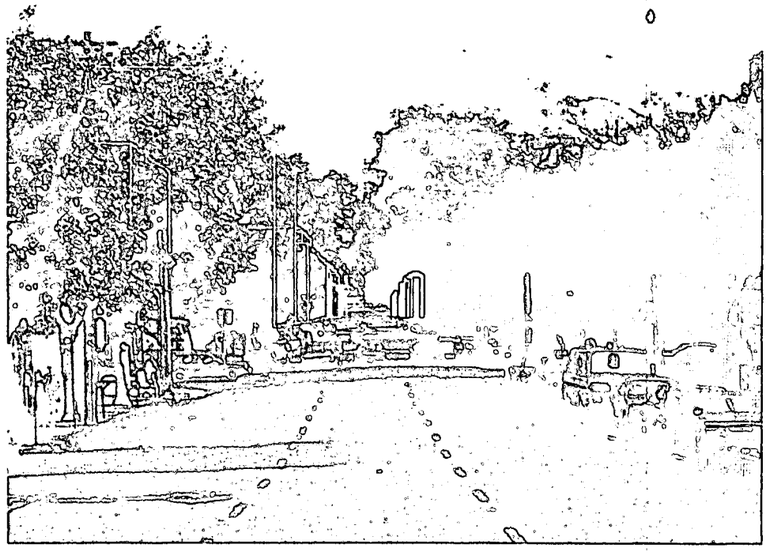
91155

VIEW FROM
7TH STREET
NEAR I STREET

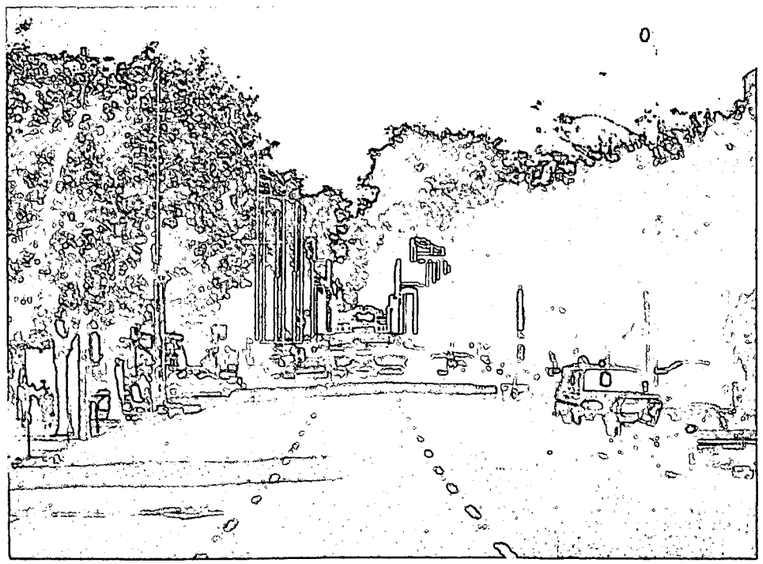
ALTERNATIVE 2



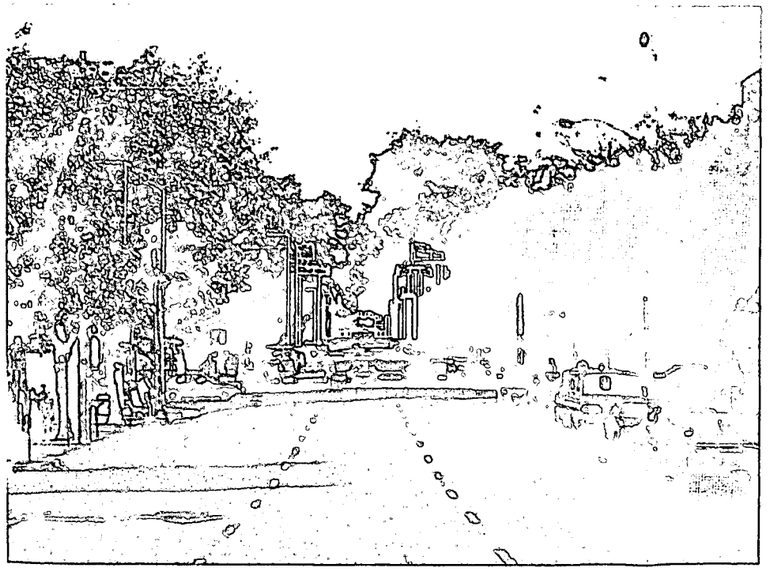
ALTERNATIVE 5



ALTERNATIVES 3, 4 AND 7



ALTERNATIVE 6



SP Development

SP Development

NOTE:
Views are as modeled for each proposed Alternative, using the general guidelines of RSP and RBAP. These models were created for illustrative purposes only, and are not intended to represent specific projects within the Planning Area.

Source: ROMA Design Group, 1992.

91155

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.3-1 Implementation of most of the Alternatives could affect the visual relationship between the Planning Area and sensitive receptors in the surrounding community.

A-1 Alternative 1 would not substantially alter the visual relationship between the Planning Area and the surrounding sensitive receptors. This is considered to be a ***less-than-significant impact***.

Under this Alternative, only a small amount of office and industrial development would occur in the Planning Area. Such development would be visually compatible with existing on-site and adjacent characteristics, thereby maintaining the present image of the Area as seen from local residences, scenic view corridors and recreational facilities. Views from moderately sensitive receptors such as nearby businesses, public open spaces and Old Sacramento would also remain essentially unchanged.

A-2 through A-7

Alternatives 2 through 7 would substantially alter the visual relationship between the Planning Area and the surrounding sensitive receptors. This is considered to be a ***significant and unavoidable impact***.

Under these Alternatives, new high-rise structures in the Planning Area would have maximum heights ranging from 150 to 500 feet. Although development would not physically intrude upon the City's designated view corridors, the proposed residential and office towers would visually dominate these receptors and enlarge the perceived downtown area. Additional sensitive receptors that would be affected by Planning Area development include local residences, recreational facilities, such as the American River and Sacramento River Parkways, and Old Sacramento.

Mitigation Measures

Implementation of Mitigation Measure 4.3-1 would reduce the above impacts, *but not to a less-than-significant level.*

The following mitigation measures would be required for Alternatives 2 through 7.

4.3-1 *The final approved version of the RSP shall include the design standards with specific requirements for maximum heights; building setbacks; scale; architectural treatment; preservation of historical structures; building materials; and roof treatments.*

4.3-2 Implementation of several of the Alternatives could affect the relationship between the Planning Area and key observation points in the surrounding community.

A-1 Alternative 1 would not substantially alter the relationship between the Planning Area and the nearby key observation points. This is considered to be a ***less-than-significant impact.***

Under this Alternative, only a small amount of office and industrial development would occur in the Planning Area. Such development would be visually compatible with existing on-site and adjacent characteristics, thereby maintaining the existing image of the Area as seen from the key observation points identified in Figure 4.3-18 of this section.

A-2 Alternative 2 would be somewhat visible from Key Observation Points 4 and 6. This is considered to be a ***less-than-significant impact.***

Under this Alternative, structures of up to 150 feet in height would be allowed within the Planning Area. Development of this scale in the Planning Area would slightly affect the city skyline, and be visible from Key Observation Points 4 and 6 as identified above.

A-3, A-4, and A-7

Alternatives 3, 4 and 7, would dominate the skyline from Key Observation Points 1, 2 and 5. This is considered to be a ***significant and unavoidable impact.***

Under these Alternatives, structures of up to 500 feet in height would be allowed within the Planning Area, with numerous structures of approximately 350 feet also proposed. Development of this magnitude in the Planning Area would create notable visual effects on the City skyline, and be highly visible from Key Observation Points 1, 2 and 5 as identified above. The proposed towers would be visible for great distances in all directions, creating a cluster of high-rise construction adjacent to and expanding upon the existing Sacramento skyline.

Views from Key Observation Points 3 and 4 would also be affected by development of the towers proposed under Alternative 4. Rather than dominating the views from these points, development of this Alternative would expand the area perceived as downtown from these locations.

A-5 Alternative 5 would be visible from Key Observation Points 2 and 5. This is considered to be a ***less-than-significant impact.***

Under this Alternative, structures of approximately 400 feet in height would be allowed within the Planning Area. Development of this scale in the Planning Area would slightly affect views of the overall city skyline from Key Observation

Points 1, 3 and 4, and be quite visible from Key Observation Points 2 and 5 as identified above.

A-6 Alternative 6 would dominate views of the skyline from Key Observation Points 1, 2, 4 and 5. This is considered to be a ***significant and unavoidable impact.***

Under this Alternative, development of structures up to 500 feet in height would be allowed within the Planning Area. Development of this scale in the Planning Area would substantially affect views of the overall city skyline from Key Observation Points 3 and 6, and dominate skyline views from Key Observation Points 1, 2, 4 and 5 as identified above.

Mitigation Measures

Implementation of Mitigation Measure 4.3-2 would reduce the above impacts, *but not to a less-than-significant level.*

4.3-2 *Implement Mitigation Measures 4.3-1. This mitigation measure would be required for Alternatives 3, 4, 6 and 7.*

4.3-3 Implementation of any one of the Alternatives may not support the aesthetics and design-related goals and policies of the City of Sacramento General Plan Update.

A-1 through A-7

All of these Alternatives may not support relevant goals and policies contained in the City of Sacramento General Plan Update. This is considered to be a ***potentially significant impact.***

Under all of the Alternatives, conflicts could arise with the goals and policies of the City of Sacramento General Plan Update. Due to the lack of specificity regarding the visual attributes of each Alternative in the land use maps, development of Alternatives 1 through 7, although not obviously in direct conflict with the City of Sacramento General Plan Update policies, would not necessarily be in full support.

Mitigation Measures

Implementation of Mitigation Measures 4.3-1 would assure maintenance of the goals and policies of the City of Sacramento General Plan Update, for all Alternatives.

4.3-3 *Implement Mitigation Measures 4.3-1. This is required for all Alternatives.*

4.3-4 Implementation of most of the Alternatives could affect the amount of glare generated within the Planning Area.

A-1 Alternative 1 would not substantially increase the amount of glare present within the Planning Area. This is considered to be a ***less-than-significant impact.***

Under this Alternative, only a small amount of development would occur within the Planning Area. Such development would not substantially increase the amount of reflective surfaces within the Planning Area, thereby maintaining approximately the same amount of glare presently visible in the area.

A-2 through A-7

Alternatives 2 through 7 would substantially increase the amount of glare present within the Planning Area. This is considered to be a ***significant impact.***

Under these Alternatives, new high-rise structures would be constructed in the Planning Area, with maximum heights ranging from 150 to 500 feet. Glare can be caused by reflections from pavement, vehicles and reflective building materials. The introduction of high-rise development within the Planning Area would substantially increase the amount of glare present. This glare would be visible from the adjacent residential areas and other surrounding sensitive receptors.

Mitigation Measures

Implementation of Mitigation Measure 4.3-4 would reduce the above impacts to a *less-than-significant level.*

These mitigation measures would be required for Alternatives 2 through 7.

4.3-4(a) *Include the following design standards and guidelines in the final approved version of the RSP:*

- *Fenestration of all mixed-use residential buildings shall employ a "punctured wall" treatment, with window casings recessed from the building face to provide shade and detail. Building walls shall also be articulated with exterior recessed or protruding balconies and bay windows.*

- *The use of glass walls as a predominant facade treatment shall be avoided.*

4.3-4(b) *Include the following design standards and guidelines in the final approved version of the RBAP:*

- *The configuration of exterior light fixtures shall emphasize close spacing and lower intensity light that is directed downward, in order to minimize glare on adjacent streets and properties.*

- *Highly reflective mirrored glass walls shall be avoided as a primary building material for facades.*

By regulating the design and the amount of reflective materials used in high-rise development within the Planning Area, this mitigation measure would ensure minimal impacts related to glare within the Planning Area.

Impacts Due to Development in the Richards Area Only

4.3-5 Implementation of any of the Alternatives would support the aesthetics and design-related policies of the American River Parkway Plan.

A-1 Alternative 1 would not be unsupportive of relevant aesthetics or design-related policies contained in the American River Parkway Plan. This is considered to be a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 could result in building heights and designs that may be unsupportive of policies of the American River Parkway Plan. Please see Impact 4.1-10. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.3-5 would reduce the above impacts to a *less-than-significant level.*

4.3-5 *Implement Mitigation Measures 4.1-10(a)-(c). This mitigation measure would be required for Alternatives 2 through 7.*

The Alternatives support the aesthetics and design-related policies of the American River Parkway Plan.

Impacts Due to Development in the Railyards Area Only

4.3-6 Implementation of several of the Alternatives may not respect the visual form of adjacent existing structures, particularly in relation to building height, bulk, massing, materials or landscaping.

A-1 Alternative 1 would not substantially alter the existing visual form of the Planning Area. This is considered to be a ***less-than-significant impact.***

Under this Alternative, only a small amount of office and industrial development would occur in the Planning Area. Such development would be low-scale and of the same character as the existing on-site uses. Development under Alternative

1 would therefore visually respect the existing on-site and adjacent development in terms of building height, bulk, massing and materials.

A-2 through A-4, A-6 and A-7

Alternatives 2 through 4, 6, and 7 could conflict with the height, mass and scale of adjacent existing structures. This is considered to be a ***potentially significant impact.***

Under these Alternatives, development would contribute to an overall intensification of land uses in the Planning Area. This intensification would be apparent through development of taller and more massive buildings within the Planning Area, resulting in a significantly different aesthetic impression from nearby viewpoints. Several areas would include structures of approximately 350 feet in height, similar in scale to existing buildings in the downtown area.

Development of this scale would draw the perceived boundary of downtown Sacramento northward, expanding the downtown area to include much of the Planning Area. Greater visual emphasis would be placed on structures within the Planning Area.

A-5 Alternative 5 would be respectful of the visual form of adjacent existing structures. This is considered to be a ***less-than-significant impact.***

Under this Alternative, development would be on a similar scale to that occurring within the downtown area, with the exception of slightly increased building height, mass and scale in the Planning Area.

Mitigation Measures

Implementation of Mitigation Measure 4.3-6 would reduce the above impacts to a *less-than-significant level.*

4.3-6 *Implement Mitigation Measures 4.3-1. This mitigation measure would be required for Alternatives 2, 3, 4, 6, and 7.*

By regulating the height and bulk of proposed high-rise development within the Planning Area, these mitigation measures would provide a transition between existing lower-scale buildings in adjacent areas and the scale of structures proposed under Alternatives 2 through 4, and Alternative 7.

4.3-7 Implementation of the Alternatives would support the aesthetics and design-related goals and policies of the Sacramento River Parkway Plan, the Central City Community Plan, and the Urban Design Plan.

A-1 through A-7

All of the Alternatives would support relevant aesthetics or design-related goals or policies contained in the Sacramento River Parkway Plan, the Central City Community Plan, or the Urban Design Plan. This is considered to be a ***less-than-significant impact.***

Mitigation Measures

4.3-7 *None required.*

4.3-8 Implementation of the Alternatives could result in shadow coverage of the Central Shops Historic District.

A-1 Alternative 1 would not affect shadow coverage of the Central Shops Historic District. This is considered to be a ***less-than-significant impact.***

Under Alternative 1, development of the Central Shops Historic District would not occur, and the shops structures would retain their present use. Consequently, shadow coverage of this area would not be an issue.

A-2 Alternative 2 would not generate shadow coverage of the Central Shops Historic District in excess of 50 percent. This is considered to be a ***less-than-significant impact.***

Under Alternative 2, development of this area would involve the removal of the Southern Pacific shops structures, creating a large open space area in their present location. Mid-rise structures would cast some shadow on this area, but shadow coverage of this area is not expected to reach 50 percent.

A-3, A-4 and A-7

Alternatives 3, 4 and 7 could generate shadow coverage of the Central Shops Historic District in excess of 50 percent. This is considered to be a ***potentially significant impact.***

Under Alternatives 3, 4 and 7, the Central Shops Historic District, just east of Interstate 5, would experience variable shadow due to the density of buildings in the Planning Area and the three large towers at the south side of the District. The northern strip of the District would receive the most constant shading due to the proximity of the bordering shops. The north-south open space area between the shops receives most of its shadow in the morning and afternoon hours, while the southern strip of the District is shaded at various times by the three towers to the south. On March 21, June 21, and September 21, coverage ranges from an estimated 20 percent during midday hours to approximately 50 percent during

morning and afternoon hours. On December 21, shadow coverage ranges from 50 percent at midday to 90 percent during morning and afternoon hours. The adjacent low buildings prevent greater amounts of shadow coverage during much of the year.

A-5 Alternative 5 would not generate shadow coverage of the Central Shops Historic District in excess of 50 percent. This is considered to be a ***less-than-significant impact.***

Under Alternative 5, the Central Shops Historic District would not be developed and shadow coverage of the park from surrounding buildings would not be an issue.

A-6 Alternative 6 may generate shadow coverage in excess of 50 percent for the Central Shops Historic District. This is considered to be a ***potentially significant impact.***

Under Alternative 6, the Central Shops Historic District would receive variable shadow coverage. The high-rise structures north and south of the area would contribute to this coverage, as would the shops buildings themselves. Shadow coverage of this area could exceed 50 percent during the midday hours of December 21 under Alternative 6.

Mitigation Measures

Implementation of Mitigation Measure 4.3-8 would reduce this impact to a *less-than-significant level.*

4.3-8 *Any towers adjacent to the Central Shops Historic District shall be designed so as to avoid shadow coverage in excess of 50 percent of the park between the hours of 11 am and 2 pm, September through March. This mitigation measure would be required for Alternatives 3, 4, 6, and 7.*

4.3-9 Implementation of the Alternatives would not substantially affect shadow coverage of the Riverfront Park area.

A-1 Alternative 1 would not affect shadow coverage of the Riverfront Park area. This is considered to be a ***less-than-significant impact.***

Under Alternative 1, the Riverfront Park area would not be developed for park and open space uses. Consequently, shadow coverage of this area would not be an issue.

A-2 through A-7

Alternatives 2 through 7 would not generate shadow coverage of greater than 50 percent of the Riverfront Park area. This is considered to be a ***less-than-significant impact.***

Under Alternatives 2 through 7, placement of buildings near the Riverfront Park area would not create shadow coverage of 50 percent or more on the park. Due to its location in the southwest corner of the Planning Area, Riverfront Park would not have any adjacent buildings to the south or west, and is not likely to be affected by any mid- or high-rise structures to the north or east. The degree of shadow coverage of this area would be minimal.

Mitigation Measures

4.3-9 *None required.*

4.3-10 Implementation of some of the Alternatives could substantially affect shadow coverage of the Intermodal Transit Station Plaza.

A-1 and A-5

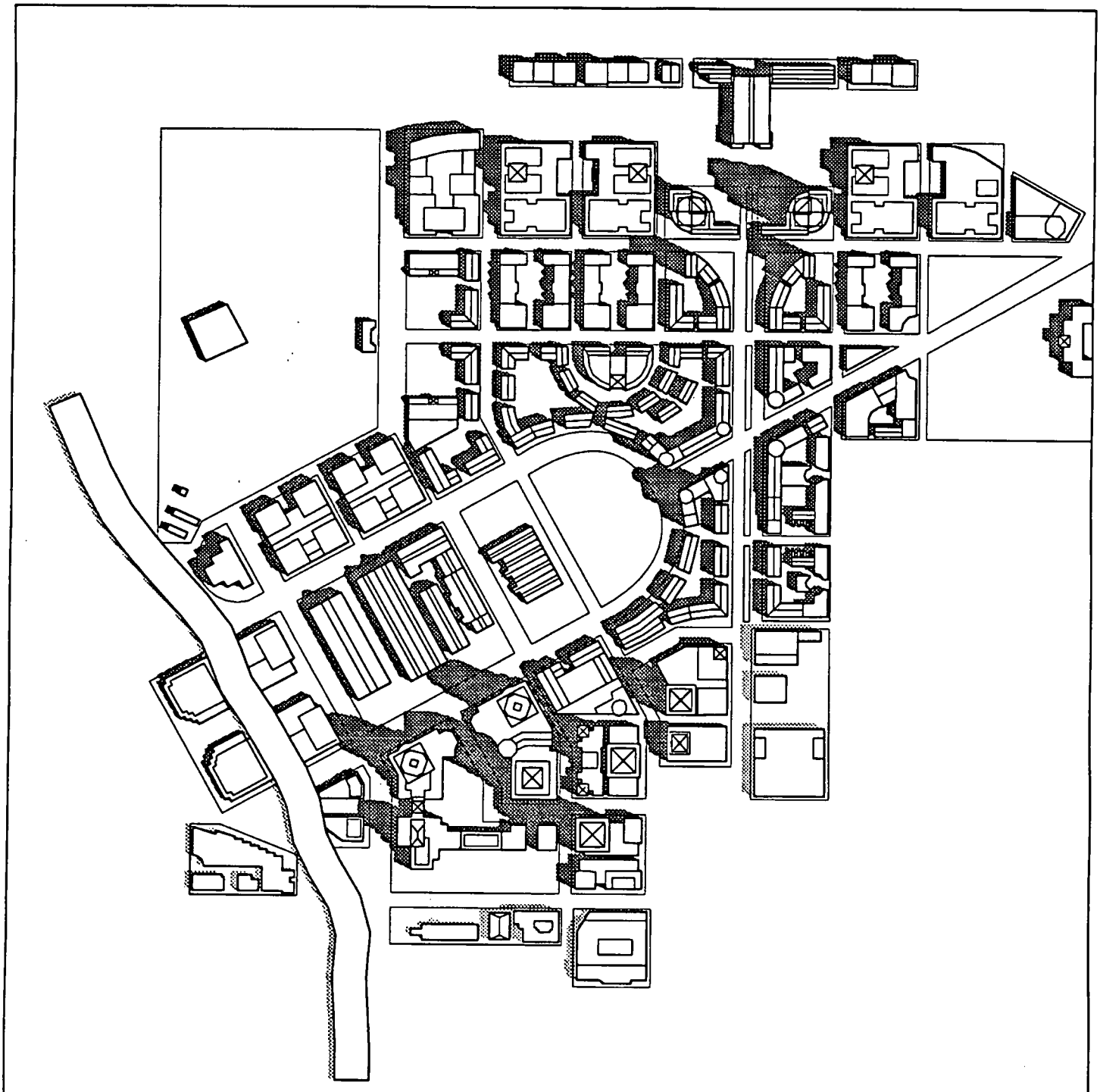
Alternative 1 and Alternative 5 would not affect shadow coverage of the Intermodal Transit Station Plaza. This is considered to be a ***less-than-significant impact.***

Under Alternatives 1 and 5, development of the Intermodal Transit Station Plaza would not occur, and shadow coverage of this area would not be an issue.

A-2 through A-4, A-6, and A-7

Alternatives 2, 3, 4, 6, and 7 would generate shadow coverage of the Intermodal Transit Station Plaza in excess of 50 percent at several times throughout the year. This is considered to be a ***significant impact.***

Under these Alternatives, the Intermodal Transit Station Plaza would receive variable shadow coverage throughout the year. Coverage would exceed 50 percent during the mornings of March 21 and September 21, and all day on December 21, due to the proximity of the nearby towers south of the plaza. Shadow coverage during these times is estimated to range from 50 to 95 percent of the plaza area.



LEGEND

Existing Shadow

Future Shadow

Source: CADP, 1992.

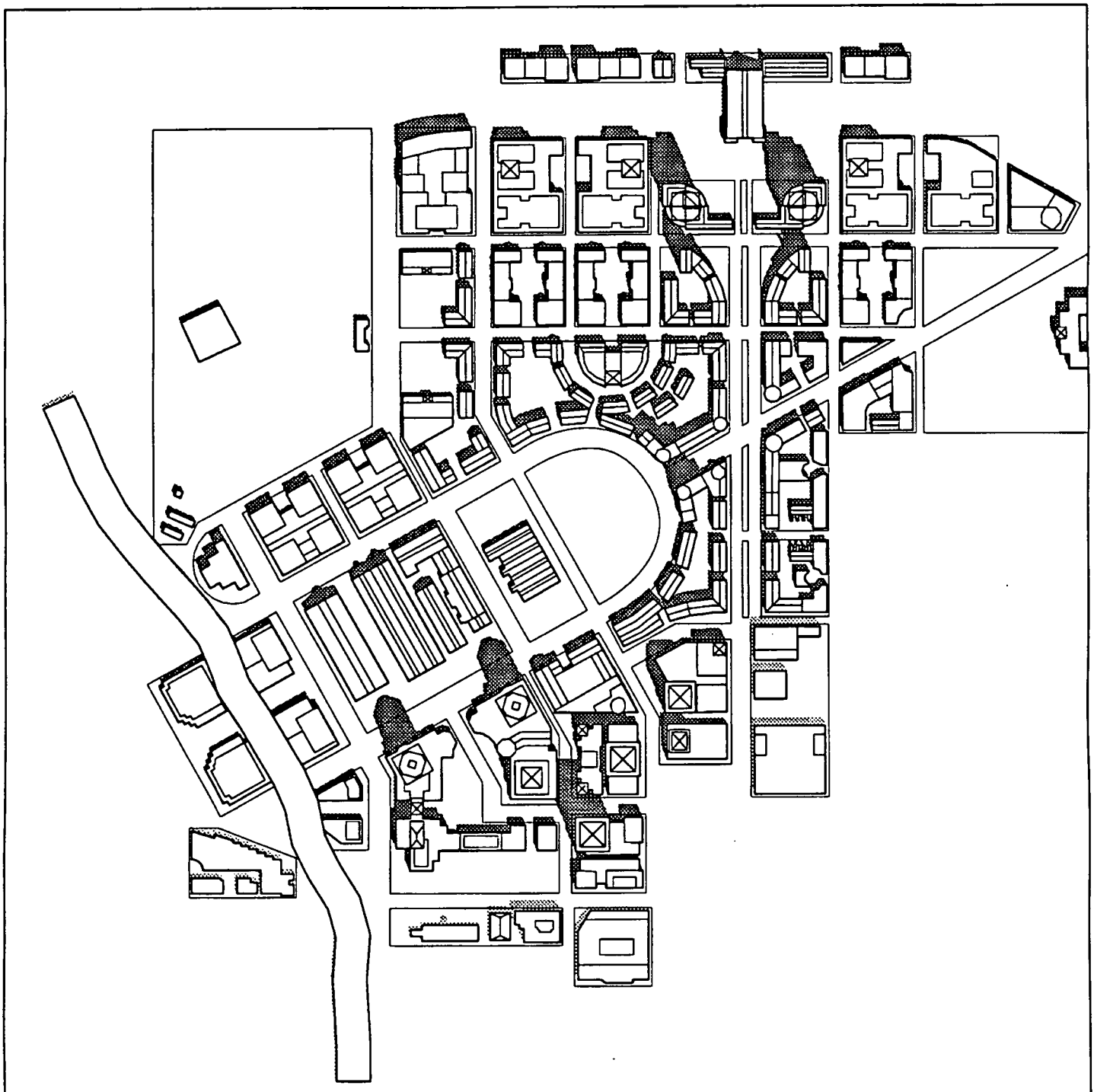
0 200 400 600

Scale: 1" = 600'

FIGURE 4.3-30

RAILYARDS AREA SHADOW STUDY

MARCH 21, 10:00 AM



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

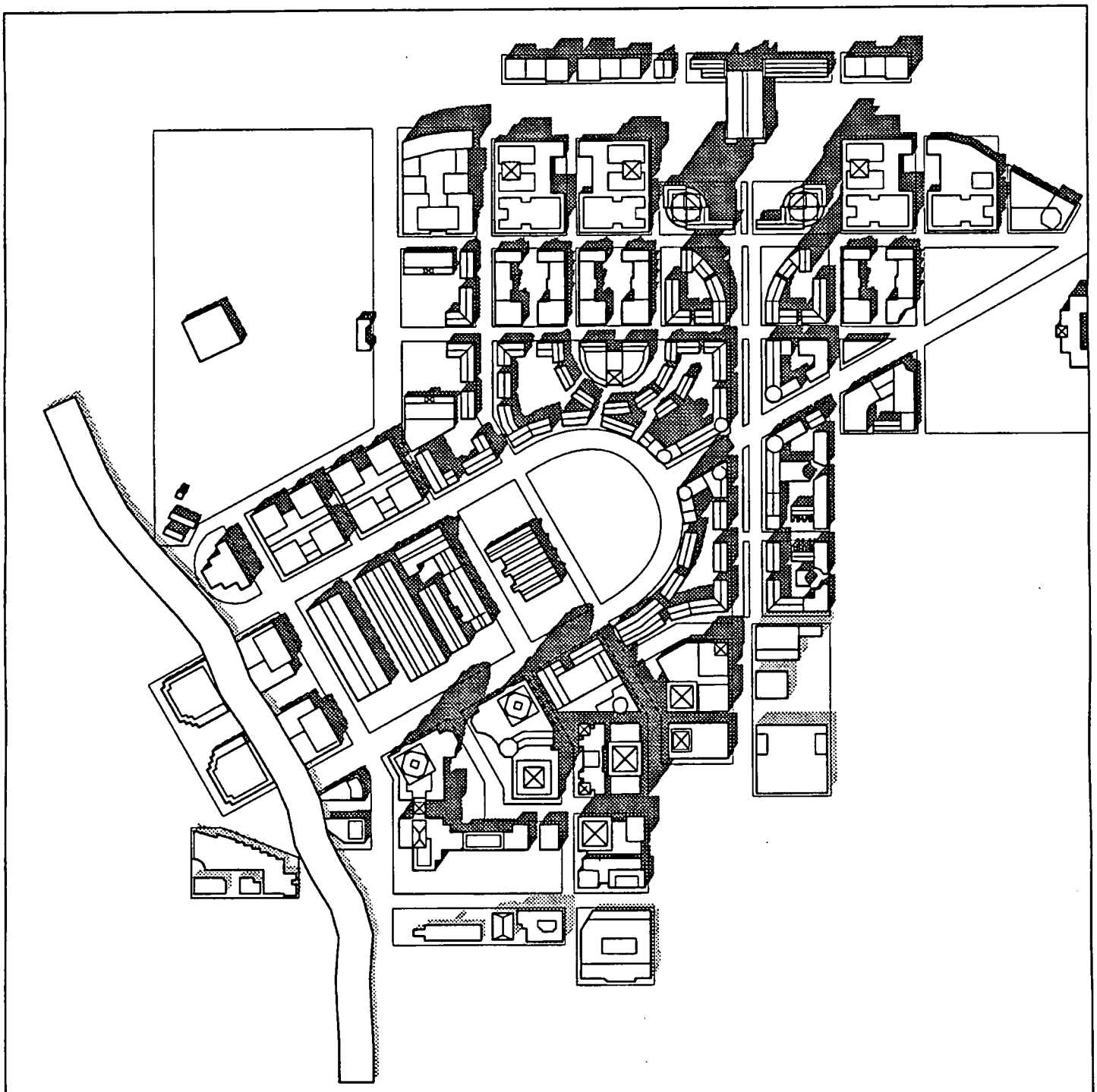
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-31

RAILYARDS AREA SHADOW STUDY

MARCH 21, 12:00 NOON



LEGEND

Existing Shadow

Future Shadow

0 200 400 600

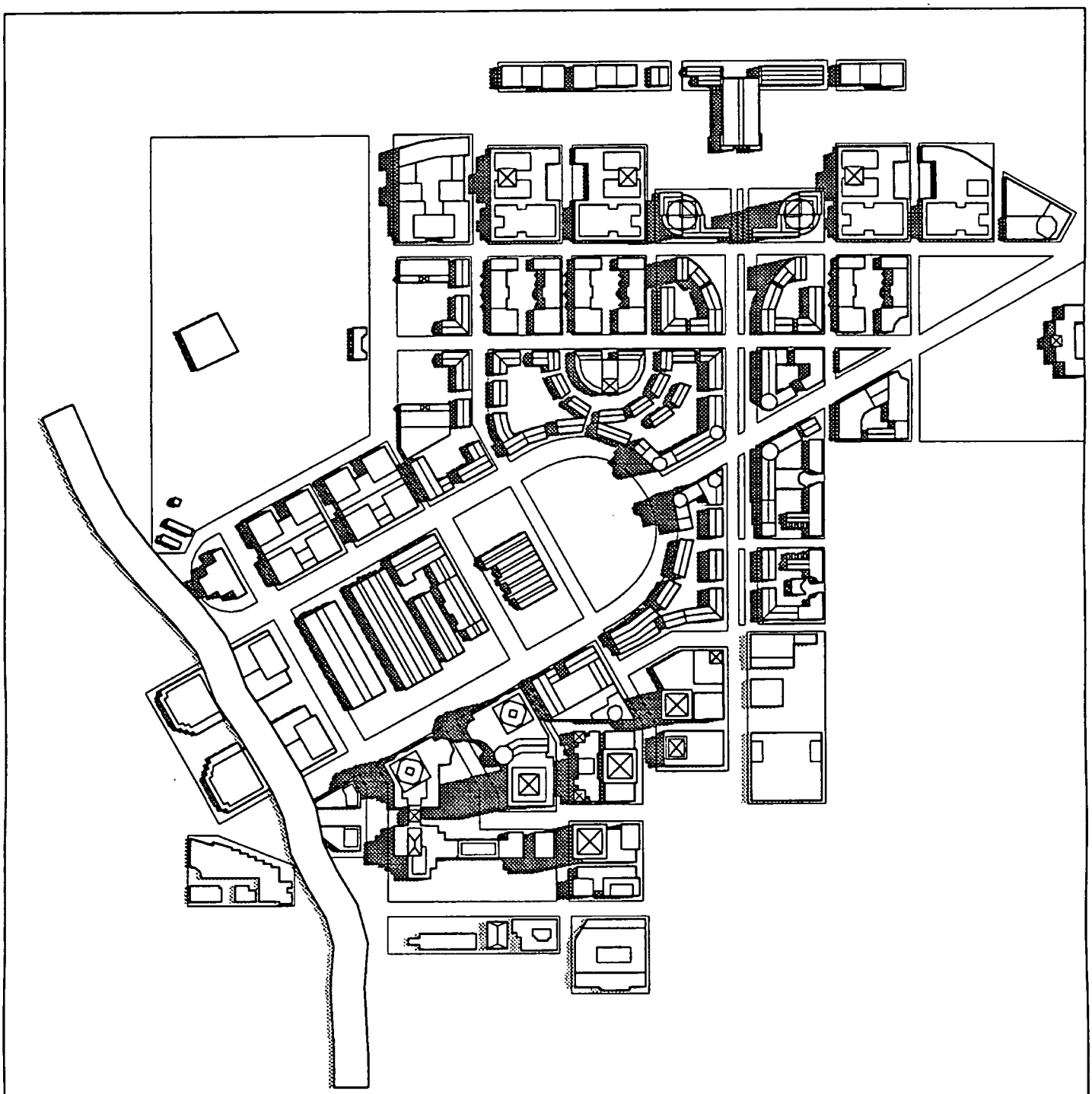
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-32

RAILYARDS AREA SHADOW STUDY

MARCH 21, 3:00 PM



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

Scale: 1" = 600'

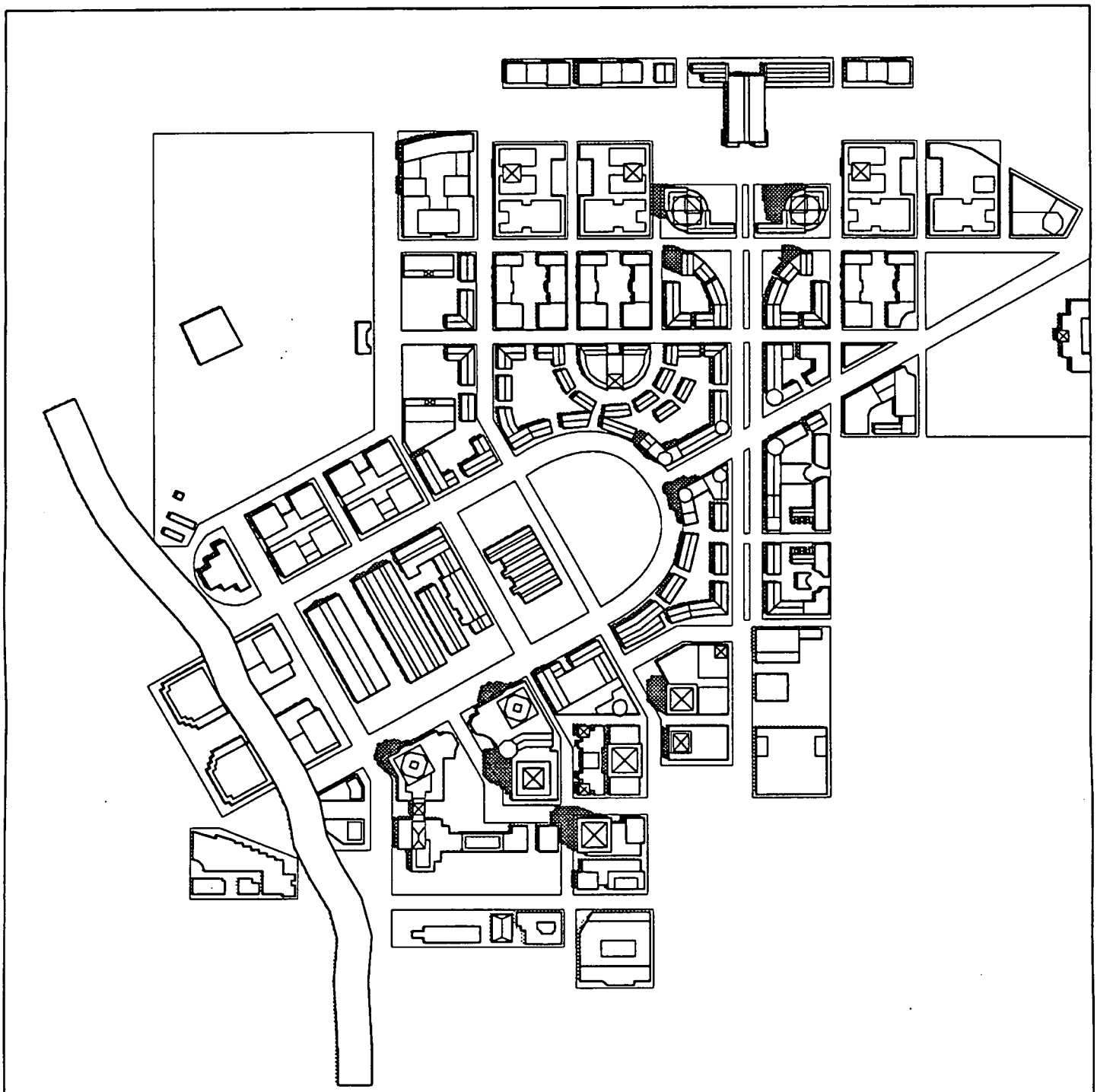
Source: CADP, 1992.

FIGURE 4.3-33

RAILYARDS AREA SHADOW STUDY

JUNE 21, 10:00 AM

01155



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

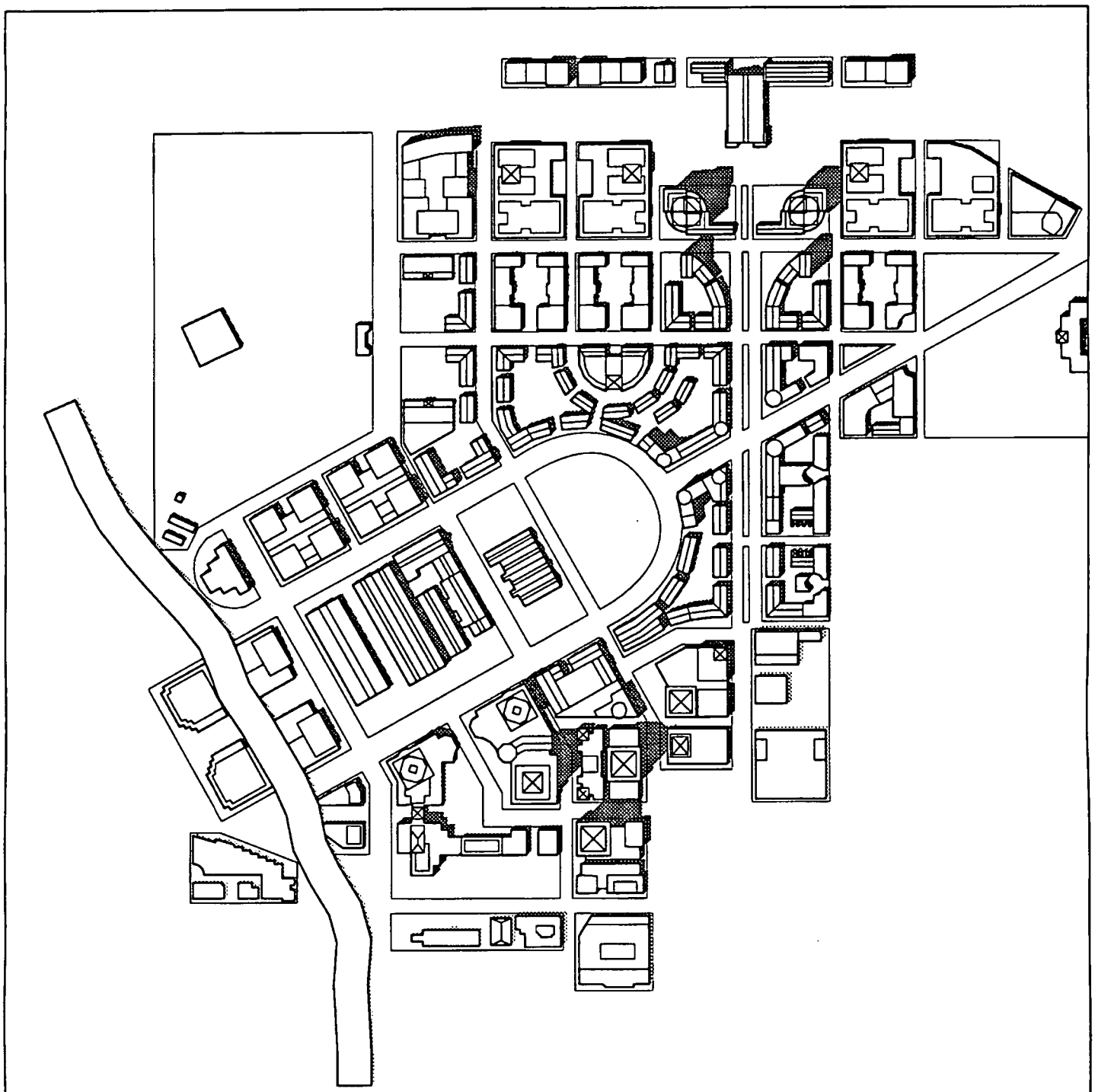
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-34

RAILYARDS AREA SHADOW STUDY

JUNE 21, 12:00 NOON



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

Scale: 1" = 600'

Source: CADP, 1992.

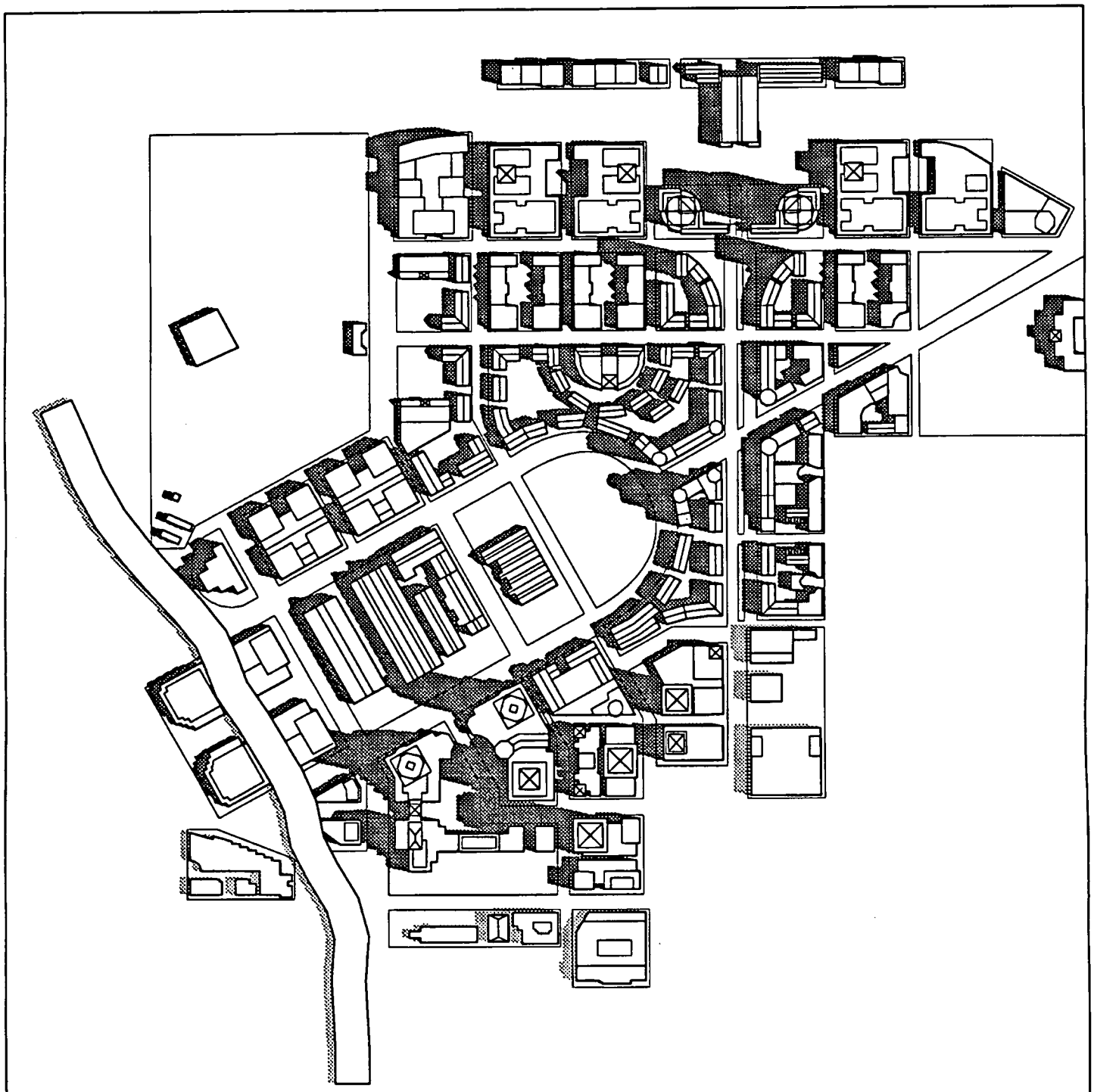
FIGURE 4.3-35

RAILYARDS AREA SHADOW STUDY

JUNE 21, 3:00 PM

eip

91155



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

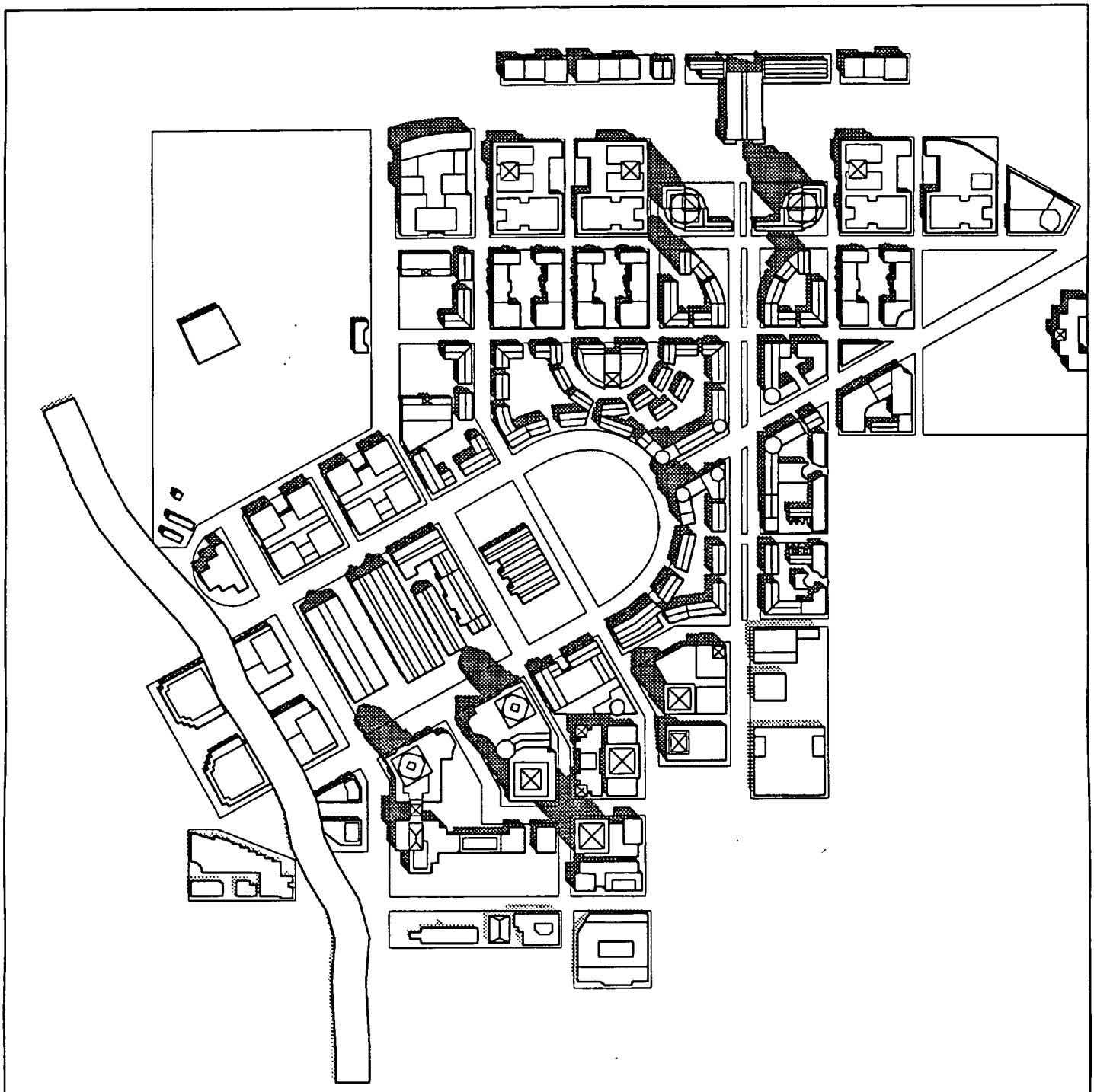
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-36

RAILYARDS AREA SHADOW STUDY

SEPT. 21, 10:00 AM



LEGEND

Existing Shadow

Future Shadow

0 200 400 600

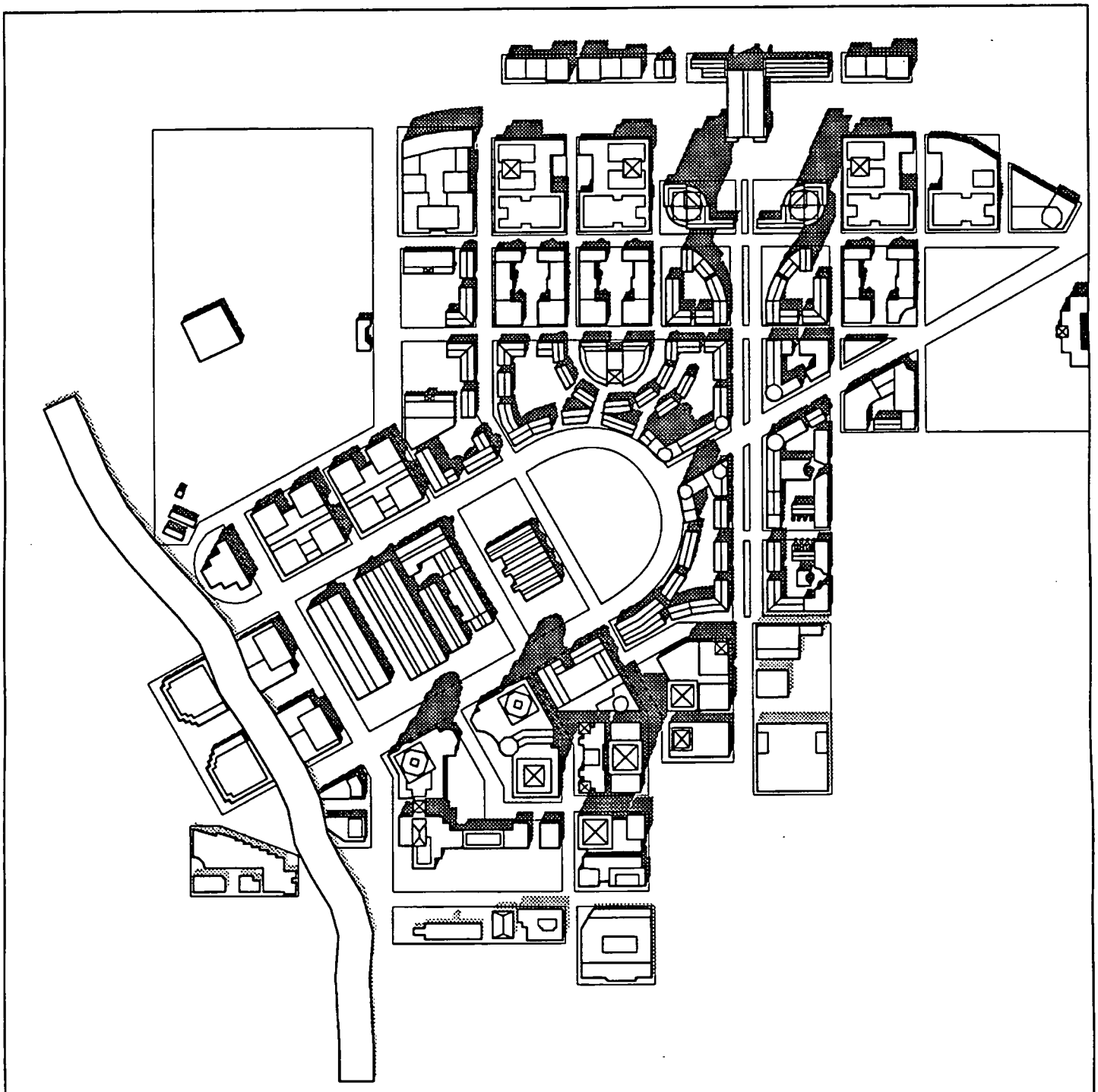
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-37

RAILYARDS AREA SHADOW STUDY

SEPT. 21, 12:00 NOON



LEGEND

Existing Shadow

Future Shadow

0 200 400 600

Scale: 1" = 600'

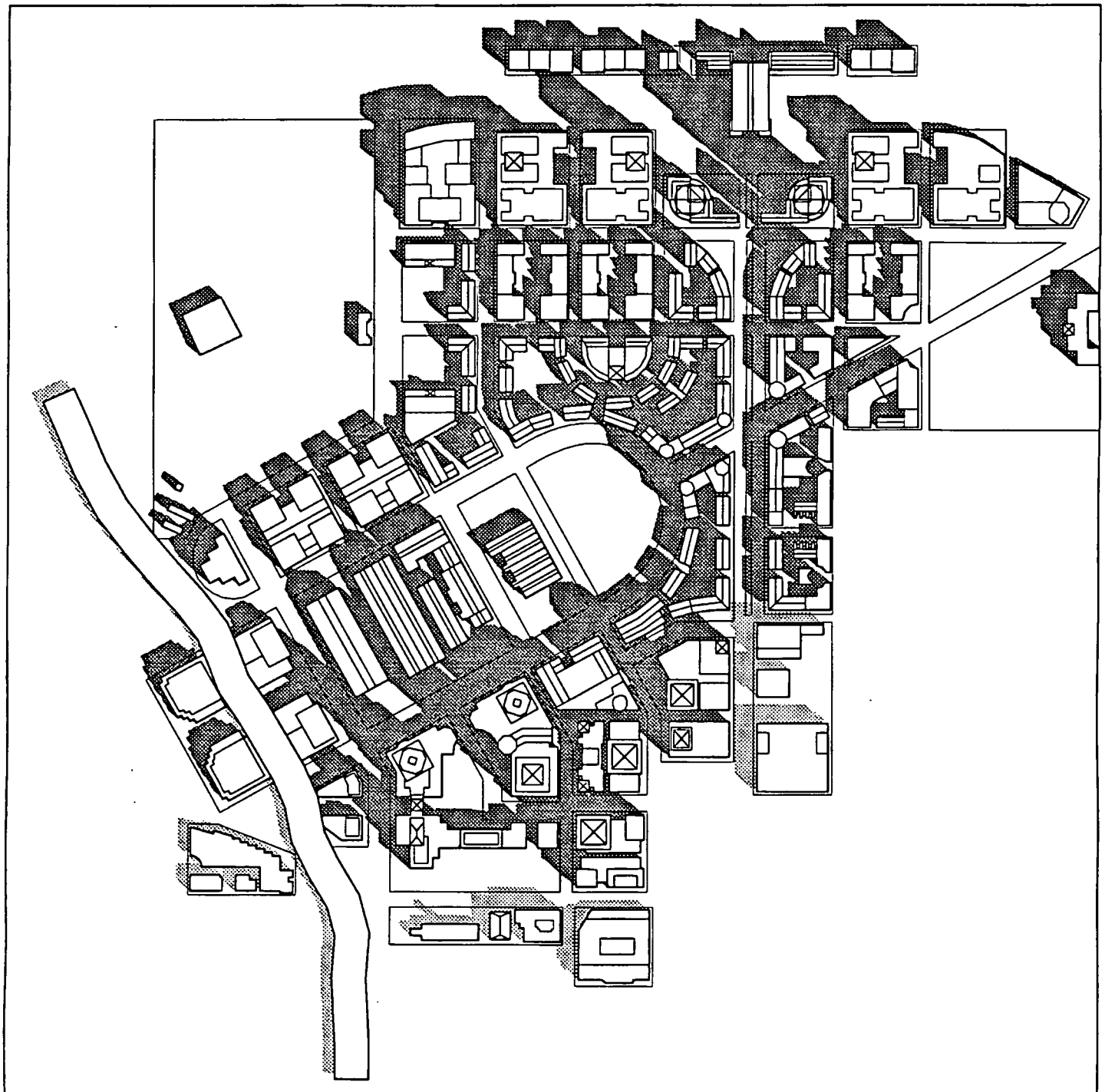
Source: CADP, 1992.

FIGURE 4.3-38

RAILYARDS AREA SHADOW STUDY

SEPT. 21, 3:00 PM

91155



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

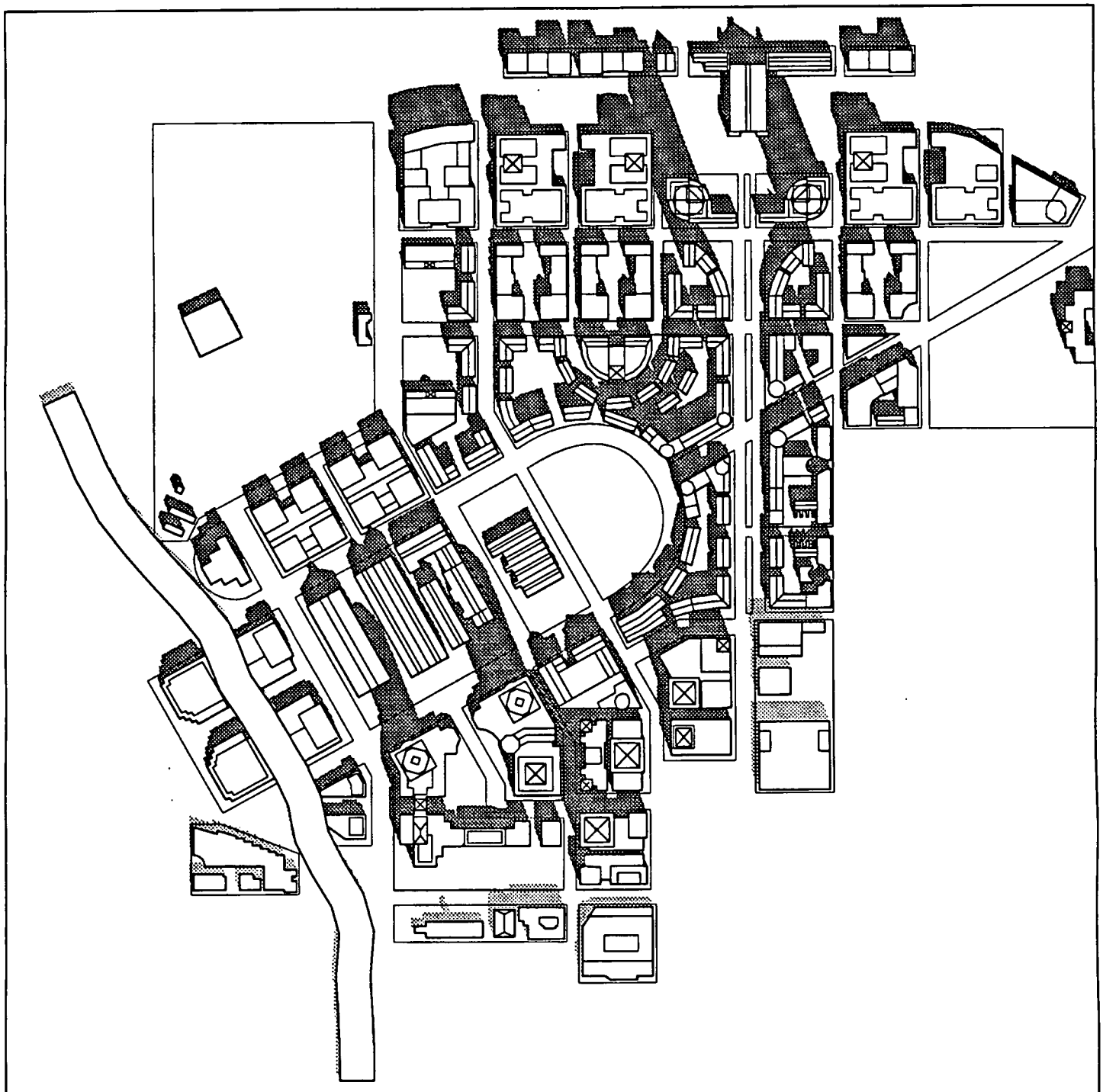
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-39

RAILYARDS AREA SHADOW STUDY

DEC. 21, 10:00 AM



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

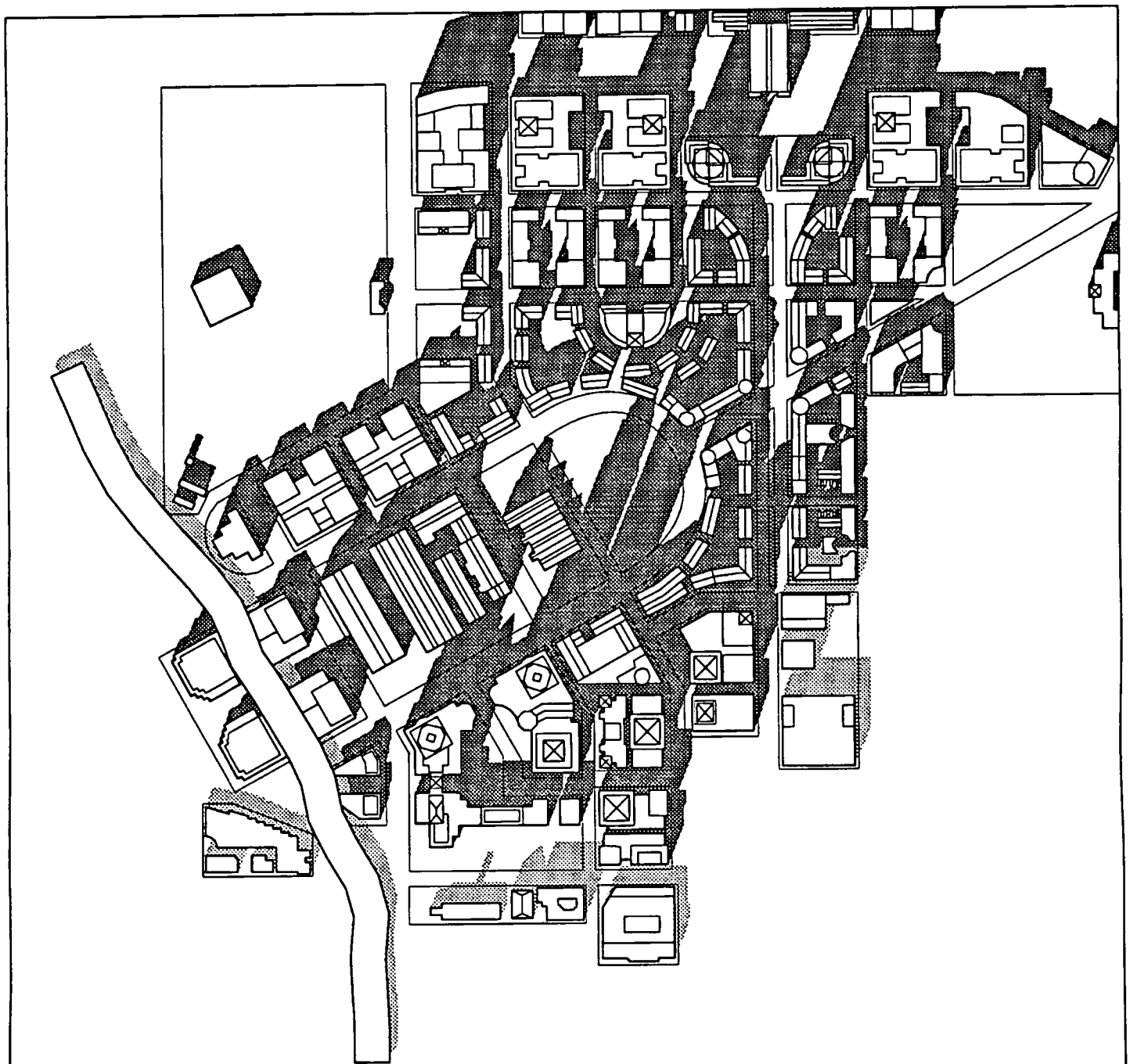
Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-40

RAILYARDS AREA SHADOW STUDY

DEC. 21, 12:00 NOON



LEGEND

Existing Shadow

Future Shadow

N

0 200 400 600

Scale: 1" = 600'

Source: CADP, 1992.

FIGURE 4.3-41

RAILYARDS AREA SHADOW STUDY

DEC. 21, 3:00 PM

91155

Mitigation Measures

Implementation of either Mitigation Measure 4.3-10 would reduce this impact to a *less-than-significant level.*

4.3-10(a) Any towers in the vicinity of the *Intermodal Transit Station Plaza shall* be designed to avoid shadow coverage in excess of 50 percent of the park between the hours of 11 am and 2 pm, September through March. *This mitigation measure would be required for Alternatives 2, 3, 4, 6, and 7.*

The twin towers of the Intermodal Transit Station and the two 250-foot towers south of the plaza compose the primary source of shadow coverage affecting the Intermodal Transit Station Plaza. By moving the Intermodal Transit Station towers to the northern edge of the space or narrowing the tower profile as seen from the open space, shadow coverage would be reduced during morning and afternoon hours.

4.3-11 Implementation of the Alternatives would not substantially affect shadow coverage of Crescent Park or the Community Playfield.

A-1 Under Alternative 1, development of Crescent Park and the Community Playfield would not occur; consequently shadow coverage of these areas would not be an issue. This is considered to be a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 would generate shadow coverage of less than 50 percent at Crescent Park and the Community Playfield. This is considered to be a ***less-than-significant impact.***

Under Alternatives 2 through 7, very little shadow would cover any portion of these open spaces at any time. Under Alternative 2, the Southern Pacific Central Shops structures would be removed, creating a large open space area in their present location and effectively eliminating any substantial shadow coverage of Crescent Park during afternoon hours. Under the remaining Alternatives, some shadow coverage, less than 50 percent, could occur at Crescent Park during morning and afternoon hours of December 21. Very little shadow would be likely to cover any portion of the Community Playfield under any of these Alternatives at any time.

Mitigation Measures

4.3-11 *None required.*

Cumulative Impacts

4.3-12 Implementation of most of the Alternatives, in conjunction with cumulative development, would contribute to an intensification of residential and office uses within the Central City area.

A-1 Alternative 1, in combination with cumulative development, would not substantially affect the existing visual character of the Planning Area vicinity. This is considered to be a ***less-than-significant impact.***

Under Alternative 1, no additional residential development would occur within the Planning Area. Although cumulative development in the Central City area would provide an additional 9,000 residential units and 8,587,000 square feet of office space, the existing visual character of the area would not be affected by development within the Planning Area.

A-2 through A-7

Alternatives 2 through 7, in combination with cumulative development, would substantially affect the existing visual character of the Planning Area vicinity. This is considered to be a ***significant and unavoidable impact.***

Under Alternatives 2 through 7, Planning Area development in conjunction with cumulative development in the downtown area would contribute to an intensification of land uses in downtown Sacramento and its vicinity. This cumulative intensification would be visible as development of buildings on a scale similar to current downtown structures within the Planning Area as well as the downtown area, resulting in a substantially different aesthetic perception of downtown Sacramento.

In addition, development of this scale in conjunction with cumulative development would expand the boundary of downtown Sacramento to include much of the Planning Area.

Mitigation Measures

4.3-12 *None required for Alternative 1. None available for Alternative 2 through 7.*

4.4 MICROWAVE, RADAR, AND RADIO TRANSMISSION

4.4 RADIO, RADAR AND MICROWAVE TRANSMISSIONS

INTRODUCTION

This section addresses the potential impacts of construction of buildings within the Planning Area on weather radar and communications systems.

SETTING

Within the City of Sacramento there are numerous radio and microwave communications systems in operation. Several systems are located within or adjacent to the Planning Area.

The construction of new high-rises in downtown Sacramento over the past 10 years has had significant impacts on public safety communications. For the most part these communications systems use antennas located on the rooftops of older public buildings. The construction of taller high-rise structures has in several cases blocked communications or created communication "shadows" where communications are degraded. This has resulted in the relocation of communication equipment to unaffected sites outside the downtown area at considerable cost to the public agencies involved. In some cases, individual projects (Renaissance Tower, for example) have had to include replacement facilities to mitigate the loss of communications.

The City of Sacramento and County of Sacramento operate radio and microwave communications systems near the Planning Area. City police and fire communications systems antennas are located at 111 Bercut Avenue within the Richards Area and south of the Railyards Area at 813 6th Street.[1] The County system has antennas at 700 H Street and the Main Jail at 607 I Street.[2]

The County of Sacramento Water Resources Division maintains a system of remote rain and stream gauges throughout the county used in operational flood forecasting. These remote gauges are linked to offices at 827 7th Street via a line-of-sight radio communication system.[3] These same gauges and other rain and stream gauge communications links are received and used by the National Weather Service and State of California flood forecasting centers located at 1416 9th Street.[4]

The National Weather Service operates a weather radar in Sacramento located at 1416 9th Street. The existing radar is scheduled to be replaced by a new system located in Davis in 1994.[5]

IMPACTS AND MITIGATION MEASURES

Standards of Significance

For the purposes of this EIR, an impact is considered significant if there is a reasonable expectation that project construction would interrupt, compromise or impede public safety communications or data acquisition systems used by City, County, state or federal agencies.

Method

Public safety communication and data acquisition systems in proximity to the site were identified. Knowledgeable staff persons were contacted to evaluate the severity of the impact and identify operational changes that would occur if one of the Alternatives were built.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.4-1 Buildings exceeding 250 feet in height would intercept the radar beam from the National Weather Service offices at 1416 9th Street, effectively blinding the system to events and data within the affected portion of the beam's arc.

The construction of new buildings within the Planning Area would affect the numerous telecommunications and data acquisition systems operating in the vicinity. Since no specific information is available on the location, height, shape or number of buildings to be built, exact description of impacts on each telecommunication/data acquisition system cannot be made at this time. The generalized impacts of construction of buildings within the height limits applicable to each Alternative are addressed below.

A-1 and A-2

Alternatives 1 and 2 would not involve construction of buildings 250 feet in height or greater, so they would have no effect on the National Weather Service radar. Therefore, this is considered a ***less-than-significant impact.***

A-3 through A-7

Alternatives 3 through 7 would result in construction of buildings greater than 250 feet in height, and would reduce the effectiveness of the National Weather Service radar. This radar system, however, is expected to be replaced by a new system at Davis in 1994 that would be unaffected by construction within the Planning Area.[6] This impact is considered ***less-than-significant.***

Mitigation Measures

4.4-1 *None Required.*

4.4-2 Buildings greater than 180 feet in height would potentially block communications between flood control agencies in downtown Sacramento and remote stream and rain gauges and other communication links.

A-1 No buildings are expected to be over 180-feet tall under this Alternative. Therefore, this is considered a ***less-than-significant impact.***

A-2 through A-7

The extent of impact is partially determined by the nature of the communication system and the geometry of structures with respect to transmitters and receivers. So the severity of impacts depends upon the design and location of each building. This impact is considered ***potentially significant.***

Mitigation Measures

Implementation of the following mitigation measure would reduce this impact to a *less-than-significant level.*

4.4-2 *Approval shall not be given to any building exceeding 180 feet in height until it has been shown that no County, state and federal flood agency telecommunications links would be blocked by construction or that any blocked communications links have been replaced or alternative means of communication have been provided. Written confirmation that the impacts have been mitigated would be required from all affected agencies. This mitigation measure would be required for Alternatives 2 through 7.*

4.4-3 Buildings greater than 100 feet in height would affect City and County public safety (police, fire, emergency) communications.

A-1 Alternative 1 would probably not result in construction of buildings of greater than 100 feet in height, and would not affect City and County public safety communications. Therefore, this is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 would result in numerous structures exceeding 100 feet in height and would affect public safety communications. The exact impact of a given structure would depend on location, height, shape, distance to the antenna and other factors currently unknown. Each structure could affect different systems and even different channels within the same system differently. The cumulative effect of construction within the Planning Area would be the loss of communications within certain areas. For the City communications system the problems would develop east of the Planning Area. For the County communications system problems would occur north and west of the Planning Area.

Signal blockage effects resulting from high-rise construction in the Planning Area could eventually require construction of new antennas for public safety communications.[7,8] The impact of Alternatives 2-7 on public safety communications is considered to be ***significant.***

Mitigation Measure

The implementation of the following mitigation measure would reduce project impacts to a level considered *less-than-significant.*

4.4-3 *The City of Sacramento shall, in conjunction with the State of California, Sacramento County, and the City of West Sacramento, design and implement a replacement safety communications antenna. A funding mechanism shall be established through which high-rise developments within the Planning Area pay fair-share costs for the eventual replacement of affected City and County public safety communications antennas. This mitigation measure would be required for Alternatives 2 through 7.*

Cumulative Impacts

4.4-4 Development in the Planning Area in conjunction with cumulative development in the downtown area would increase the likelihood of buildings that could block radar and communication signals.

A-1 through A-7

Development within the downtown Sacramento area will increase the likelihood of buildings over 100 feet. As discussed above, buildings exceeding 250 feet in height would intercept the radar beam from the National Weather Service offices at 1416 9th Street. Buildings greater than 180 feet in height would potentially block communications between flood control agencies in downtown Sacramento and remote stream and rain gages and other communication links. Buildings greater than 100 feet in height would affect city and county public safety (police, fire, emergency) communications. This is considered to be a ***significant impact.***

Mitigation Measures

The implementation of the following mitigation measures would reduce project impacts to a *less-than-significant level.*

4.4-4 *Implement Mitigation Measures 4.4-2 and 4.4-3. This mitigation measure would be required for all alternatives.*

ENDNOTES

1. Ron Costa, Communications Systems Manager, City of Sacramento, personal communication, 3 February 1992.

2. Andrew Hobson, Chief of Telecommunications, County of Sacramento, personal communication, 31 January 1992.

3. Brett Forrester, Senior Associate Engineer, County of Sacramento Water Resources Division, personal communication, 31 January 1992.

4. Todd Mendell, Deputy Hydrologist-in-Charge, National Weather Service Northern California and Nevada Flood Forecasting Center, personal communication, 29 January 1992.

5. Roger Pappas, Meteorologist-in-Charge, National Weather Service Sacramento Office, personal communication, 29 January 1992.

6. Roger Pappas, Meteorologist-in-Charge, National Weather Service Sacramento Office, personal communication, 29 January 1992.

7. Ron Costa, Communications Systems Manager, City of Sacramento, personal communication, 3 February 1992.

8. Andrew Hobson, Chief of Telecommunications, County of Sacramento, personal communication, 31 January 1992.

4.5 MICROCLIMATE

4.5 MICROCLIMATE

INTRODUCTION

This section examines the potential for high-rise buildings in the Planning Area to create uncomfortable and/or hazardous wind accelerations at ground level.

SETTING

Climate

The Planning Area lies within the Sacramento Valley, which is bounded by the coastal ranges to the west and the Sierra Nevada to the east. A sea level gap in the Coast Range, the Carquinez Strait, is located 50 miles southwest of the Planning Area, and the intervening terrain is very flat. Sacramento exhibits a climate typical of inland valleys in California. Summers are hot, with maximum temperatures frequently approaching or exceeding 100 degrees Fahrenheit. Winters are typically cool and wet.

Wind

Wind direction and speed data taken at the Sacramento Executive Airport is shown below in Table 4.5-1. Winds with a southerly component predominate and are strongest on average. During winter, when the sea breeze diminishes, northerly winds occur more frequently, but southerly winds still predominate.

Sacramento's climate includes three wind regimes that have the greatest potential for adversely affecting outdoor comfort. Table 4.5-1 shows that the predominant wind direction is southwest, reflecting the orientation of the Sacramento Valley and the effect of marine breezes reaching Sacramento through the Carquinez Straits. Winds from this direction are the highest on average. These winds are most dominant during the summer months when temperatures are normally quite warm; these sea breezes have a profound effect on comfort outdoors.

Table 4.5-1 shows another relative maximum in frequency for south-southeast winds. Winds from this direction occur primarily in winter during storm conditions. The highest winds measured in Sacramento typically occur from this wind direction.

The third wind regime affecting outdoor comfort is strong, dry winds from a north or north-northwesterly wind direction. These winds typically occur in the fall and winter months when high pressure dominates the Great Basin. Cold temperatures and low humidity are associated with this wind regime.

TABLE 4.5-1

WIND DIRECTION, FREQUENCY AND AVERAGE SPEED
IN MILES PER HOUR

Direction	Frequency (%)	Mean Speed (MPH)
North	4	7.8
North Northeast	1	6.3
Northeast	2	4.8
East Northeast	1	5.4
East	3	5.8
East Southeast	3	7.3
Southeast	10	9.4
South Southeast	10	11.4
South	10	9.6
South Southwest	11	11.7
Southwest	15	11.7
West Southwest	4	8.7
West	3	6.1
West Northwest	3	7.0
Northwest	8	8.9
North Northwest	9	10.8
Calm	5	—

SOURCE: California Department of Water Resources, *Wind in California*, Bulletin No. 185, 1978

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Standards of significance for microclimate impacts have been established by several large cities, primarily for wind, which is the single most important climatic factor affecting human comfort in an urban environment and one of the few controllable variables in an urban setting. Sacramento has not established wind or comfort criteria.

At the Master Plan level, little quantified data can be generated on the impacts of a project on microclimate. The effects of buildings on the wind environment are site- and project-specific, so impact discussions are by necessity qualitative. For the purposes of this EIR, a significant impact on microclimate is defined as the creation of structures in excess of 100 feet in height, as buildings of this height could potentially generate wind accelerations at ground level that could adversely affect the comfort and/or safety of pedestrians. The 100-foot threshold was selected as a reasonable threshold based upon experience from wind studies of high-rise buildings in Sacramento and other cities, and consideration of the topography and wind characteristics of the region. Such impacts are considered to be *potentially* significant, since building height, shape, orientation and relationship to other structures all influence wind.

Method

The potential for adverse wind impacts was evaluated based on the potential number of buildings that could exceed 100 feet in total height. Probable building heights were derived from Floor Area Ratios allowed under each Alternative.

Impacts and Mitigation Measures

Impacts Due to the Development in the Planning Area

4.5-1 Structures greater than 100 feet in height have the potential to generate uncomfortable and/or hazardous wind accelerations at ground level.

A-1 Alternative 1 would unlikely result in the construction of buildings greater than 100 feet in height, and would not have the potential to result in significant wind or microclimate impacts. Therefore, this is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 would result in the construction of numerous buildings exceeding 100 feet in height, and would have a ***potentially significant*** impact on microclimate and pedestrian comfort. The area affected would not extend more than a few hundred yards from the buildings in question, and would not extend beyond the boundaries of the Planning Area.

Mitigation Measures

The implementation of the following measures would reduce this impact to a level that is *less-than-significant.*

4.5-1(a) *Proposed structures within the Planning Area between 100 feet and 150 feet in height shall be reviewed to determine whether the bulk, massing, orientation and relationship to existing structures indicates a potential for uncomfortable and/or hazardous wind accelerations at ground level. If so, approval of the building shall be contingent on modification of the project to reduce or eliminate these adverse wind impacts. This mitigation measure would be required for Alternatives 2 through 7.*

4.5-1(b) *Proposed structures within the Railyards and Richards Areas over 150 feet in height shall be subject to wind tunnel testing to determine ground-level wind impacts. Approval of the building shall be contingent on the modification of the project to reduce or eliminate identified wind impacts according to City guidelines. This mitigation measure would be required for Alternatives 2 through 7.*

4.6 CULTURAL RESOURCES

4.6 CULTURAL RESOURCES

INTRODUCTION

This section documents all known existing cultural resources on or in the vicinity of the Planning Area, and identifies any archaeological resources that are currently listed on or are potentially eligible for listing on the National Register of Historic Places. Based upon the results of previous cultural resources assessments, important archaeological resource types are described and the potential for finding additional cultural resources during Planning Area development is discussed. Procedures for the identification and evaluation of archaeological resources and measures to mitigate adverse effects are recommended.

SETTING

Location

Sacramento is located in the upper Central Valley of California at the confluence of the Sacramento and American Rivers. Prior to being filled, the Planning Area contained two bodies of water. The northern body was known as Willow Lake, the southern as Sutter Lake, Sutter Slough, or China Lake. These lakes, their banks, and adjacent marshlands made up the entire Railyards Area. Both lakes were attached to the Sacramento River by narrow channels through which flood water flowed, creating lakes during periods of high water and a marsh the remainder of the time. Low-lying marshes bordered Sutter Lake to the north, while woodlands encompassed the lakes on all other sides.[1]

This freshwater marsh community, called "tulares" by the early explorers, has now disappeared, but was once covered by stands of tules, with cattails, sedges, rushes, and stands of willows on slightly more elevated areas. The valley grassland existed at a higher elevation than the tulares, and was dominated by various perennial bunchgrasses and a number of annuals with occasional scattered oaks along intermittent drainages.

Prehistory

The wide range of ecological zones present within the lower Sacramento Valley provided an abundant resource base. The seeds, leaves, stems, roots, and fruit of many of the plants in the valley served a multitude of subsistence and utilitarian purposes to prehistoric occupants of the area. Native anadromous fish (including king salmon and steelhead trout), large sturgeon and other freshwater fish, migratory waterfowl, tule elk and deer herds, along with a variety of smaller fur-bearing mammals, were abundant in this portion of the valley. The fishery, along

with large and small game resources, may have provided an ample food supply to early inhabitants at one time. All three of the primary food staples of aboriginal California populations - acorns, game animals and fish - were available within the rich environments of the lower Sacramento Valley,[2] and served to sustain some of the highest hunter-gatherer population densities on the North American continent.

Early archaeological studies by Lillard, Heizer and Fenenga (1939), Beardsley (1948), Heizer (1949) and others form the basis of Sacramento Valley prehistory. This cultural chronology, which extends back nearly 4500 years, can be summarized as follows:

1800 A.D.	Late Horizon, Phase III (historic)
1700-1800 A.D.	Late Horizon, Phase II
500-1700 A.D.	Late Horizon, Phase I
1500 B.C. - 500 A.D.	Middle Horizon
2500-1500 B.C.	Early Horizon

Basic criteria for assigning sites to these time periods have been defined primarily on the basis of funerary patterns and ornamental or ritual artifact styles. Early Horizon sites are characterized by fully extended burials on the ventral side with western orientation. Typical artifacts include large projectile points (made primarily of slate and chert), olive shell spiral-lobed beads, abalone shell pendants, the mortar/pestle and metate/mano, quartz crystals, baked clay items, and charmstones. Middle Horizon sites contain tightly flexed burials positioned on the side or back and occasional cremations. Smaller projectile points fashioned of obsidian are introduced. Mortars and pestles outnumber metates and manos, and paint mortars and pestles are present. Bone artifacts are prevalent, as are shell spoons and adzes. Olive shell spiral-loped beads continue, but rectangular shell bead forms are introduced. Abalone shell pendants occur with serrated edges. Quartz crystals are rare but a new form of charmstone appears. Goods intended as grave furnishings are ritually "killed."

The Late Horizon burials are flexed and cremations are common. Projectile points become smaller and are mostly of obsidian. Abalone shell, banjo-shaped religious ornaments are introduced, along with new forms of olive shell beads. Clam shell beads, magnetite beads and turquoise disc beads also appear. Elaborate baked clay objects, incised bird-bone tubes, curve-shaped objects made of obsidian with serrated edges ("Stockton curves"), and wooden fish hooks are present.

A large number of sites from the Middle and Late time periods are known. These extend over a much wider area than sites from earlier time periods. Unlike the earlier component, middle and late components are represented as occupation mounds, which are characterized as middens containing abundant artifacts, ecofacts and culturally altered soils. Early period components are not as commonly uncovered as later components, as they have been deeply buried under alluvial deposits and are not typically subject to archaeological detection. As such, current site inventories may not accurately represent the intensity of early occupation of the Sacramento area.

In 1972, Ragir offered a new interpretation of this cultural sequence, favoring the term "culture" over "horizon", and so designated the Early Horizon as the Windmiller Culture, the Middle Horizon as the Cosumnes Culture, and the Late Horizon as the Hotchkiss Culture. Furthermore, in a still more recent critical assessment of the prevailing central California cultural chronology, Bennyhoff and Hughes (n.d.) have presented a review of uncorrected radiocarbon dates, which suggests an altered cultural chronology in which the Early period date may last until 500 B.C., the Middle period temporal span may be shortened to 1100 B.C. to A.D. 100, and the Late period may not begin until A.D. 900.

Native American Period

The end of the prehistoric period coincides with the beginning of the ethnohistoric era, the time after which written descriptions of the area's native population become available. At the time of Euroamerican contact, the lower American and Sacramento River Basins were within the territory of the Valley Nisenan, a branch of the Maidu group of the Penutian language family. The Nisenan controlled the drainages of the Yuba, Bear and American Rivers, along with the lower portion of the Feather River. The Plains Miwok, the Nisenan's neighbors to the south, may have had increasing control of areas along the south bank of the American River during the early historic period.[3]

Settlements were concentrated along waterways on old river terraces or on isolated elevated mounds of land. One historic period village, referred to as Momol and located on the south side of the American River at its confluence with the Sacramento River[4] may be located somewhere within the Planning Area. The village of Pusune appears to be the recorded site CA-Sac-26, located north of the project within present-day Discovery Park. A satellite site of this major village (CA-Sac-31) is due east of this site, along the north bank of the present location of the American River. Another major village in proximity to the Planning Area is Sutamasina, a major village on the north side of the American River near its confluence with the Sacramento.[5] The largest known historic settlement was at the village of Sama[6], located near the Planning Area on the east bank of the Sacramento River.[7] Villages the size of Sama probably had well over 100 inhabitants.[8] The last Indian occupants of the former Nisenan village of Sama were Plains Miwok.[9]

The Nisenan lived by hunting and gathering, subsisting on a wide variety of plants and animals. They ate large quantities of acorns, grass seeds, fish, freshwater clams, tule elk, deer, antelope, and waterfowl. The processing of gathered seeds and acorns is represented by archaeological remains of milling tools, which include mortars, pestles, manos and metates. Hunting related artifacts comprise stone projectile points, scrapers and knives. Fishing technology (including weirs, traps, nets, spears, harpoons and hook and lines) was fashioned of perishable materials and artifacts often do not survive into the archaeological record, with the exception of bone hooks and harpoon points or stone net weights.

Nisenan population in pre-contact times is thought to have numbered around 9,000.[10] Euroamerican penetration into the Sacramento Valley during the latter half of the 19th century initiated a series of changes, which were later to prove devastating to Native American

populations. The first recorded Spanish expedition into the Planning Area vicinity was led by Gabriel Moraga between 1806 and 1808, in order to scout new mission sites, return runaway Indians, and punish Indians hostile to Spanish rule. Beaver and other fur resources were exploited in the Sacramento Valley by the Hudson Bay Company. In 1827 and 1828, Jedediah Smith led a trapping foray into the project vicinity. These and other trappers set up temporary camps in Nisenan territory and relationships were friendly. In 1833, a great malaria epidemic swept through the Sacramento Valley, killing an estimated 75 percent of the Valley Nisenan population.[11]

The first permanent European settler in the Sacramento Valley was Captain John Sutter, who set up operations in the present downtown area of Sacramento in 1839. Sutter initially employed the Nisenan to help him in his operations but later he imported large numbers of Plains Miwok from the Cosumnes River tribelets as laborers.[12] Sutter's relations with these villages - both Miwok and Nisenan - were essentially feudal.[13] With the discovery of gold and the subsequent influx of a large Euroamerican mining population after 1849, Maidu numbers were further reduced by disease and genocide. Survivors who were not either sickened or murdered were ultimately forced to vacate their ancestral homes. By the 1920s, when University of California anthropologists sought Native American informants who could testify concerning aboriginal lifeways in the areas, only two elderly individuals could be located who retained any knowledge of Sacramento's native heritage.[14]

History

In 1841, Sutter was granted 11 leagues of land by the Mexican government. His settlement of New Helvetia, located within present-day Sacramento and later known as Sutter's Fort, also served as a trading post and a place of refuge for immigrants. With the discovery of gold at his mill in Coloma, Sutter's plans for New Helvetia as an independent state were ruined and his ranching empire was overrun by gold seekers.

Sacramento became an off-loading point for those destined for the northern mines and it profited greatly from the mining trade. Sacramento was situated at a crucial transshipment point and soon came to dominate commercial activity in the interior of the state. The subsequent history is an example of urban growth based on its control over transportation.[15] Sacramento became the state capitol in 1854 and continues as the State's political center to the present day.

Early development centered around the downtown central business district. The Planning Area encompasses a small portion of this historic commercial core area within its southern extremity, which is bounded by 3rd and I streets on the southwest and 10th and I streets on the southeast. By 1880, saloons, grocery stores and gold merchandising existed within the Planning Area.[16]

The rapidity of Sacramento's growth provided the economic incentive to transform this tent community quickly to a city of wood-frame and brick structures. More permanent structures served to reduce the damage caused by a series of devastating fires.[17]

Increasingly efficient flood control measures protected the town from inundation and subsequent sewage problems generated by periodic flooding of the Sacramento and American Rivers. Undertakings to prevent flooding included restrengthening levees, rechanneling the American River, and raising streets in the main business district some 12 feet.[18,19] Levees constructed as of 1860 traversed the Railyards Area. In 1868, the "S" curve of the American River was by-passed by digging an entirely new channel, which joined the Sacramento River north of the Planning Area, and reduced the frequency of flooding that once occurred within the present-day Richards Area. Major street raising occurred in the 1860s, including the area of the project bounded by I Street and 3rd through 11th streets.[20] Many building owners opted to raise their buildings to the new street grades; others converted their first floors into cellars. Praetzellis and Praetzellis found several blocks to have been filled over and paved.[21]

The often swampy character of the Richards Area limited its potential growth and consequent value during the 19th and early 20th centuries, and the area became a focus for a variety of industrial uses after unsuccessful efforts to use it for farming. In the early 1920s the City constructed a large water filtration plant on Bercut Drive. The Bercut-Richards Cannery, a major cannery and canning manufacturer, opened in the area in 1932.

The general area lying north of the Southern Pacific Railyards and along the Sacramento River, which falls within the north and west portion of the Richards Area, was originally known as Slater's Addition. Theodoratus has described historic events surrounding Slater's Addition.[22] It was surveyed with streets and parcels laid out on the 1848 plat at the same time as the rest of Sacramento. It was criss-crossed by a number of streets (Sycamore, First, Broad, Lake) that no longer exist.[23] Lying between Sutter Lake and the original confluence of the American River, the area was altered greatly by extensive flood control efforts, until 1868 when the confluence was rechanneled farther upstream and north of Slater's Addition.[24] The many ships anchored off Slater's Addition gave rise to the name of Jibboom Street for its waterfront area. This area did not develop as rapidly as the business district between I and M streets. The first assessors map available shows that in October 1852 most of Slater's Addition was undeveloped property, with about half belonging to J. R. Snyder and most of the rest belonging to P. B. Cornwall.[25] Comparison of the value of the plots in this section, in relation to other portions of Sacramento, shows that lots were generally of lower value ($10) than undeveloped parcels elsewhere in the city (valued at $22.50 to $40).[26]

The Sacramento City Gas Works was established in 1854 with the main plant in Slater's Addition.[27] Service to the city commenced in 1855.[28,29] The Gas Plant occupied a triangular block between First, Union and Sacramento streets[30] and included improvements worth $35,000.[31] Flour mills were also established near the mouth of the American River in Slater's Addition. The first were the Eureka Mills, built by Col. Wilson in 1850, and subsequently burned in 1856.[32,33] The Levee Mills, later named Pioneer Mills, were built on the riverfront in 1853.[34] These mills are shown in Koch's 1870 lithograph, "A Bird's Eye View of the City of Sacramento."

The most important development in Slater's Addition was the establishment of the Central Pacific Railroad (CPRR) maintenance yards adjacent to the Gas Works and contiguous to the Planning

Area. That Sacramento became the western home of the CPRR, which was also owned by Sacramento businessmen, insured its domination of commerce in the interior of the state. The Sacramento-based CPRR incorporated in 1861 for the purposes of building a railroad across the Sierra Nevada and joining the Union Pacific rails mid-continent, to tie the East and West Coasts together into one system. In 1862, the City of Sacramento granted the company right of way into the city as well as to Sutter Lake. The equipment for the transcontinental railroad was built in the CPRR shops at this location,[35] and the assessed value was $113,000.[36] As shown in Koch's 1870 lithograph, the tracks followed out of Sacramento on the north edge of town along B Street (along the southern boundary of the Planning Area), then turned north past the 31st Street levee and crossed the river. At this time there was scattered development south of the tracks past 12th Street. Areas north of the tracks and within the Richards Area consisted only of farm or overflow lands during this time. According to Theodoratus, there is no documentary evidence that any historical developments preceded the CPRR development in any of the immediate area north of the tracks, and this stretch of track is the initial historic development in the area.[37]

Praetzellis and Praetzellis have summarized historic events surrounding the CPRR (now Southern Pacific) Railyards.[38,39] Through the 1860s, the CPRR maintenance and repair shops grew. At one time, the railyards contained a body of water variously known as Sutter Lake, Sutter Slough, and China Lake. An island in Sutter Lake is depicted on early maps. It was linked to I Street by a plank bridge known as the "Bridge of Sighs," because of the sighs of disgust emitted by those who crossed the polluted lake. The buildings on the island may have been Chinese-occupied laundries and/or fishing stations.[40] By 1869, the CPRR had filled in 20 acres of the lake. Filling was completed by 1910.[41,42] The Southern Pacific Railyards grounds appear to have been filled to a depth of at least 10 to 15 feet on the south side (where it is contiguous to I Street), six to eight feet along the east side, adjacent to 7th Street, and to an undetermined depth elsewhere.

I Street, between 3rd and 7th streets, became the focus of Sacramento's Chinese community by 1850.[43] As of 1880, Chinese populations were still concentrated in this vicinity, around the southern periphery of Sutter Lake within the Planning Area.[44] The first record of Chinese involvement in commercial trading dates to late in 1852 with the establishment of Chinese laundries around Sutter Lake.[45] As of 1880, other Chinese laundries are shown on the southwest and northwest corners of I and 6th, and on the southwest corner of I and 5th within the Planning Area.[46] Chinese merchants took advantage of unused street frontage on the north side of the I Street levee to build a row of frame buildings, illustrated in 1855 by Barber and Baker under the title of "I Street, Chinadom". Two half blocks located in the southern extremity of the Planning Area contained a number of Chinese-occupied, wood-framed commercial and residential buildings, which continued to be inhabited for much of the remainder of the 19th century.[47]

Previous Archaeological Investigations

A review of records housed at the North Central California Information Center Archaeological Site Inventory, California State University, Sacramento (NCIC-CSUS) disclosed that several areas

within and surrounding Planning Area have received prior archaeological survey. The first major organized archaeological work in the Planning Area vicinity was undertaken by the Sacramento Junior College in the 1930s.[48] Most cultural sites within one mile of the Planning Area were recorded during these early efforts prior to 1940. Other archaeological sites have become known in later years, usually as they were discovered in the process of urban development. A few sites in proximity to the Planning Area have undergone limited excavation. One site, CA-Sac-26 (also known as the "Joe Mound") is a large village mound located within the boundaries of Discovery Park. This appears to be the ethnographic village of Pujune[49] but its exact location remains unconfirmed.[50] Site CA-Sac-31, just outside the project's northern boundary, was tested by Peak in 1975 and found to contain prehistoric milling equipment, lithics, bone and shell artifacts, beads, and related objects, up to a depth greater than four meters.[51,52]

During the past two decades, downtown Sacramento has been the scene of many large-scale historic site archaeological excavations. This area encompasses the extreme southern periphery of the Planning Area. Most studies have been conducted in the "Old Sacramento" district (California Historic Landmark 812).[53,54,55] Schulz et al (1980) suggest that this area may be "the most intensively investigated 19th century urban site in the western United States." Schulz, Hastings and Felton (1980) provided a survey of historical archaeology in Sacramento. Brienes, West and Schulz (1981) have compiled an overview of cultural resources in historic Sacramento's central business district. The focus of these investigations has shifted increasingly to the structure of 19th century life, rather than 19th century buildings, and investigators today are at least as concerned with the urban development of the later Victorian era as with the gold rush boom that gave Sacramento its start.[56]

Block studies in the vicinity of the Downtown commercial core area have been undertaken at I-J-8-9 [57,58,59,60,61] at J-K-12-13,[62] at I-J-5-6[63,64] and at 12th and I Street.[65]

An initial survey of the Southern Pacific Railyards[66] and a subsequent study on the existing conditions at the Southern Pacific Railyards[67] were reported upon as part of the RSP. Research and a field reconnaissance revealed that no previously recorded archaeological sites were known to exist in the Planning Area, nor are any sites listed at this location in the Native American Heritage Commission Sacred Lands File. However, the Southern Pacific Railyards is of significance in that it is the largest railroad complex west of the Mississippi.[68] There are several buildings of historical importance within that site, many of which are concentrated in the southwest corner of the Railyards.[69] The shop area is recognized as historically important and as including many individual buildings that contribute to the area's cultural values. It is believed that buildings located in the Southern Pacific Railyards (other than the Southern Pacific Depot) are eligible for, although not listed on, the NRHP.

Several cultural resource assessment reports pertaining to lands adjacent to the northern boundary of the Richards Area and within the American River corridor have been conducted. These include Peak's survey of Discovery Park (1978) and the American River Parkway (1973), and MacBride's overview of the American River Parkway (1976).

A limited amount of survey has been completed on lands located directly within the Richards Area. As part of Sacramento's proposed rapid transit line, Lindström (1990) surveyed areas located north of the Southern Pacific Railyards, including the industrial railroad spur lines and areas bordering the south side of the American River. An historic artifact scatter containing Chinese brownware fragments, dark olive green bottle fragments, ceramic ware, and recent trash (designated as Isolated Find 12) was recorded along a spur railroad line in the vicinity of 7th and 8th streets. This area may be outlying refuse from historic activities that took place along the north shore of Sutter Lake (now filled as part of the Southern Pacific Railyards). In a 1987 survey of the proposed Sacramento to Roseville Pipeline Project, Theodoratus examined an east-to-west alignment through the center of the Richards Area. No cultural resources were identified. An historic structure evaluation of the Old Sacramento County Jail, the Sacramento County Court House Annex, the Sacramento County Sheriff's Building and Jail, and the Sacramento Hall of Justice (located on the north half of the H-I-6-7 block) was completed by Historic Environment Consultants in 1990. Holman surveyed a proposed extension of Richards Boulevard between Highway 160 (North 16th Street) and Business Interstate 80 in 1988. No evidence of prehistoric or historic materials was noted. Johnson examined a small locale on the east bank of the Sacramento River in 1974.

Inventory of Cultural Resources

Previously recorded prehistoric and historic sites inventoried within and in proximity to the Planning Area are shown on the cultural resource location map contained in the confidential appendix. (In order to protect cultural resources, the locations of sensitive areas are not disclosed in the public report.) Only one prehistoric cultural site, the unconfirmed ethnohistoric village site of Momol, may be directly located within the Planning Area. Five other prehistoric sites, CA-Sac-26, 31, 32, 306, and 316, are located within the American River floodplain, in the vicinity of Discovery Park and within one mile of the Planning Area. The unconfirmed location of CA-Sac-40 is under or in the city dump, due east of the Planning Area.[70]

Recorded sites of historic interest in the Planning Area include John Sutter's landing place on the American River (California Historic Landmark 591). The landing place is not, however, the location of his subsequent settlement or fort, and as such is not considered a location of historical remains. The route of the first transcontinental railroad (now the Southern Pacific railroad alignment) forms part of the Planning Area boundary (California Historic Landmark 780). The Southern Pacific Depot is listed on the National Register of Historic Places (NRHP) and is designated as State Historic Landmark 594, which marks the former location of China Slough. The I Street Bridge and the U.S. Post Office, Courthouse and Federal Building at 801 I Street are also listed on the NRHP. The Old Sacramento State Historic Park (SHP), owned and operated by the State Department of Parks and Recreation, is contiguous to the Planning Area's extreme southwestern boundary. The SHP also owns two abandoned buildings in the City-operated bikeway corridor, which is parallel to Jibboom Street in the Planning Area, and bounded by the Sacramento River and I-5. These are former gasworks buildings built in the 1890s. The SHP sold a third building in the Jibboom Street part of the Planning Area to the State Department of Water Resources in 1988 for future interpretive purposes. This building was used between 1912 and 1950 as a PG&E electrical generating facility. The building is eligible for

inclusion, but is not listed, on the NRHP. The SHP also leases a few small parcels within the Planning Area in association with the railroad museum access, maintenance and storage facilities.

The preceding inventory of known cultural resources is meant to provide a fairly comprehensive list of the known archaeological sites of potential significance within the Planning Area vicinity. An inventory of the "built environment" within the Planning Area is listed under separate cover in Appendix E. Little of the Planning Area has been subjected to systematic survey and the short list of inventoried cultural sites does not reflect its true archaeological sensitivity. In some cases, the locations of known sites are only roughly plotted, and their actual locations may be in areas other than specified. This list represents only a partial inventory and many more sites are likely to exist.

Overall, it can be concluded that the Planning Area's likelihood to contain both prehistoric and historic archaeological resources that meet the criteria for legal significance is substantial. Areas encompassing the County Government Center and Alkali Edge are particularly sensitive, especially in their likelihood to contain historic remains. The remainder of the Planning Area has a moderate to high sensitivity to contain potentially significant prehistoric and historic archaeological resources. Prehistoric remains are most likely to be deeply buried, occurring upon past land surfaces which were once elevated within the American River Corridor. Scatters of historic artifacts, refuse-filled features, and both commercial and residential remains consisting of structural footings associated with domestic and industrial buildings, as well as remains of the industrial activities that were carried out within them, may occur in the form of buried layers and features dating from the early 1840s to the early 20th century. The earliest historic living and building surfaces, which predate the major flood control efforts and rechannelization of the American River in 1868, could be deeply sealed by floodplain deposits. Historic remains post-dating 1868 should consist of more shallow deposits. Archaeological sensitivity increases in the vicinity of previously inventoried prehistoric and historic sites and features.

As discussed above, the Southern Pacific Railyards contains a number of structures that are of historic significance when taken singly but are of even greater value when considered as a group.

The buildings considered to form a "core" of historic structures are:

- Erecting Shop (formerly the Machine Shop)
- Locomotive Wheel Shop (formerly the Car Shop and Planing Mill)
- Governor and Injector Shop (originally the Paint Shop)
- Rotating Equipment Shop
- Air Room
- Passenger Car Truck Shop

- Repair Gang Shop/Machine Shop
- Locomotive Wheel Shop Annex
- Electric Shop/Traction Motor Shop
- Locomotive Truck/Fabrication Shop
- Water Closet

The location of these buildings is shown on Figure 4.6-1.

The Roundhouse, begun in 1867 and demolished in the 1950s, was the first permanent building constructed on the site. The northeast corner of the Erecting Shop and the Locomotive Wheel Shop were built in 1868. Construction continued, with additions to existing buildings and the construction of new ones. A core grouping of interacting shop structures, primarily brick but also wood frame and corrugated metal, evolved. Several of these buildings have survived to the present time, with early twentieth century modifications. A number of buildings have been added and removed, over time, according to shop production needs. All contributed to the productivity and functions of the complex and the evolution of the railroad.

In 1868 the northeastern portion of the Erecting Shop was built. Approximately 100 feet by 204 feet in size and 30 feet in height, it was built of brick on a pile foundation. The structure was extended in 1875 to 400 feet in length with 14 pits. In 1888, a 124-foot section was added to the length. In 1905, the brick office structure adjacent on the west was removed and this large building extended in that direction. This long section contains bays for 25 locomotives and enlarged the building to 520 feet long and 180 feet wide.

Construction of the Locomotive Wheel Shop was begun in late 1867. The building was initially 90 feet by 130 feet and two stories in height, with a one-story, 46-foot by 90-foot "L" on the southeast. The sawmill was on the first floor where freight and passenger cars were constructed. The second floor contained the Pattern Shop, Cabinet Shop and the first Mechanical Offices. The second floor later housed the Upholstery Shop and Pattern Shop. This portion of the building was completed in 1869 but added onto in 1872 and 1888.

The Governor and Injector Shop extended from the southeast section of the Planing Mill in 1869. The building was subsequently extended to include the Rotating Equipment Shop and the Air Room in 1872, and the Passenger Car Truck Shop in 1888, which included in the addition of a second floor. In this shop, the completed cars from the adjacent Car Shop Mill were painted. In 1888, a second story was added where rugs were made for passenger cars.

In 1898 a fire destroyed large portions of the northern end of the Locomotive Wheel Shop and part of the Locomotive Wheel Shop Annex. These portions were rebuilt in 1898 and reflect that construction date. In 1917, another fire damaged the central portion of the building.

The Machine Shop, now called the Repair Gang Shop/Machine Shop, was originally built as the Blacksmith Shop in 1869. Various forged and rolled iron parts were manufactured in this shop.

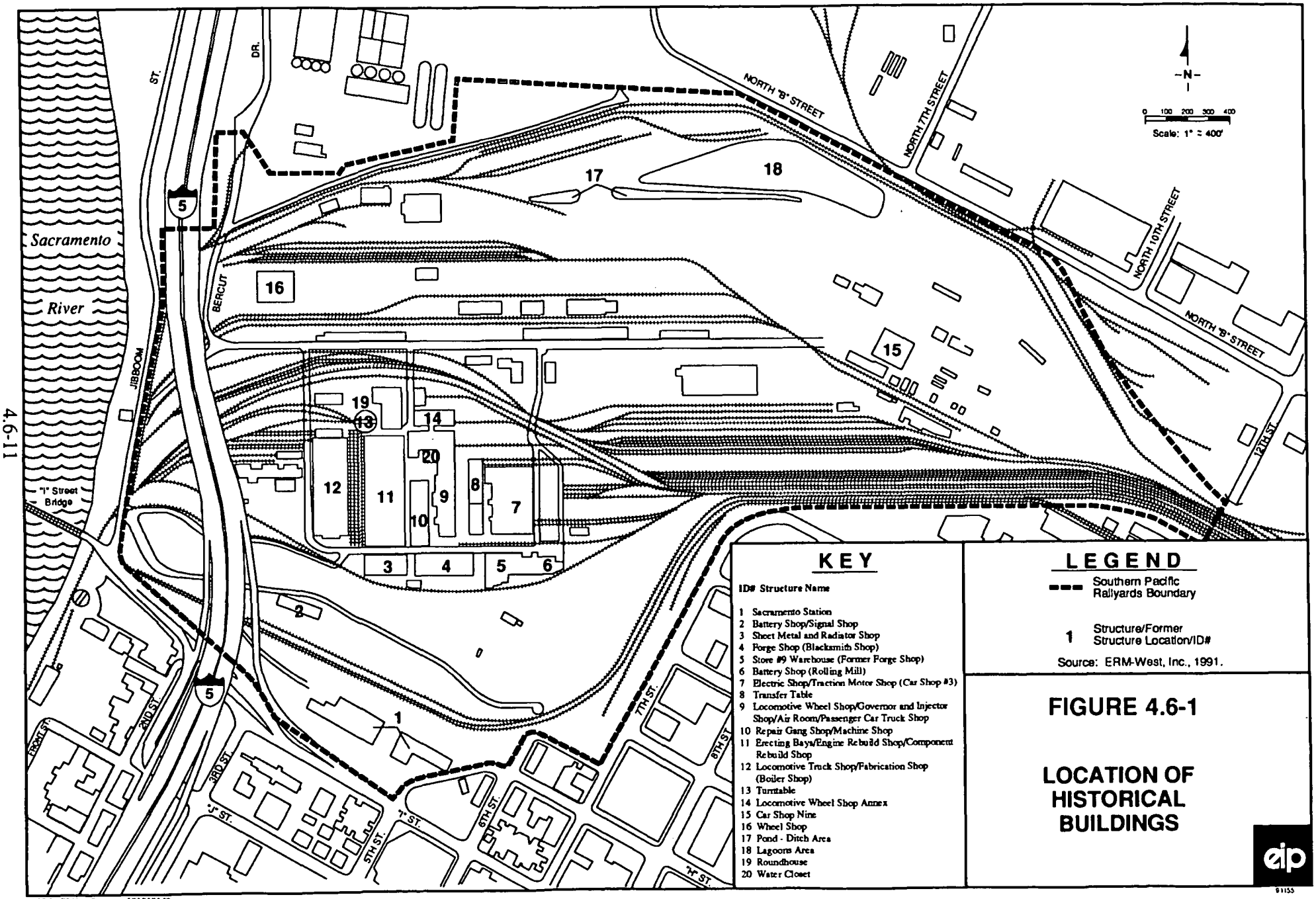


FIGURE 4.6-1

LOCATION OF HISTORICAL BUILDINGS

Steam locomotive frames were reconditioned and small parts, such as brakebeams, spikes and coupling links were made. The brick walls were replaced by concrete sometime after 1915, but the original roof was retained. The Locomotive Wheel Shop Annex was the Car Machine Shop when built in 1888. The first floor was used to make up car wheelsets. The second floor housed the Plating Room, the Brass Room and Upholstery Shop. By the 1940s, the second floor also housed a small machine shop, rug cleaning area and shot blast equipment.

In 1873, the Electric Shop/Traction Motor Shop was constructed. The brick building was initially built as 225 feet long and 70 feet wide, with five wings 23 feet by 70 feet. A second story was built over the north wing to serve as offices for the shops. The five wings were used for the final painting, lettering and varnishing of passenger cars and cabooses and were enclosed away from the paint shop. In 1892, the paint shop was widened to 180 feet, the wings removed and the building made one structure. In 1894, the building was extended to its present length.

The present Locomotive Truck/Fabrication Shop was constructed as the second Boiler Shop sometime after 1888, to replace the old Boiler Shop which had become too small.

The three-story brick Water Closet was constructed in 1878 and served workers concentrated in the core area of shop activities.

There are two transfer tables located between principal buildings that served to move locomotives and cars from one stage of construction to another.

These existing structures form the essential core of original shop buildings responsible for the construction of the railroad cars, locomotives, ferries, engines and machinery that allowed the Central Pacific Railroad to successfully function and grow during its early years.

Preservation of Shop Structures

The preserved Central Shops complex could be used in a number of different manners. For example, the complex could contain a mixture of cultural and commercial/recreational uses, such as exhibit space, performance spaces, galleries, schools and related facilities, a public market and museum space. Interspersed throughout the historic district could be shops, cafes, restaurants and entertainment-related uses.

The major constraints for historic preservation are:

1. The physical condition of individual buildings;

2. The level of contamination in and under the buildings; and,

3. The costs of renovation.

Additional constraints would include the availability of funds for renovation and hazardous material remediation, as well as the demand for the sort of historic district envisioned in the Railyards Area.

Physical Condition

In March, 1990, Nolte and Associates conducted a visual survey and qualitative engineering study of the primary historic buildings on the Railyards Area. Their report appears as Section B of the September 1990 "Existing Conditions" report prepared by ROMA Design Group for the Railyards. A summary of their findings is presented below.

For their survey, Nolte examined the following buildings:

- Electric Shop
- Traction Motor Shop
- Passenger Car Truck Shop
- Air Room
- Rotating Equipment Shop
- Governor and Injection Shop
- Locomotive Wheel Shop
- Locomotive Wheel Shop Annex
- Erecting Shops

Generally, these buildings were found to be masonry structures typical of the late 1800s and early 1900s. These buildings are vulnerable to damage during a seismic event due to:

- A lack of joist anchors between floors or roofs and walls.
- A lack of shear transfer between diaphragms and reaction walls.
- Out-of-plane bending failure of walls.
- Shear failure of masonry pilasters.
- Excessive diaphragm distortion.
- Inadequate foundations.

In addition, portions of the Railyard are located on a former lake, so that soil liquefaction could occur during an earthquake.

Nolte recommends a number of improvements that would make the Shops more consistent with existing seismic code requirements, including installing roof joist and floor joist anchors and shear transfer connections; reinforcing walls, and possibly pilasters and door frames, by Centercoring; modifying floor and roof diaphragms; installing interior steel braced frames; and evaluating foundations to determine whether they need to be reinforced.

The estimated costs of the above structural improvements range from $600,000 for the Governor and Injection Shop to $2.3 million for the Erecting Shop.

Hazardous Materials

Soil and Groundwater Contamination

The Central Shops house a variety of functions dependent on solvents, lubricants and other potentially hazardous materials. The most significant concentrations of volatile organic

compounds (VOCs) in the Railyards Area are located in the Central Shops area from about five feet below the surface, down to the water table. Acetone is widely distributed in soils below five feet underlying the Central Shops site, as is 2-butanone, both nonchlorinated solvents. Toluene, also a nonchlorinated solvent, has also been identified in this area. The Central Shops site is the source of a large groundwater plume, contaminated with chlorinated solvents which extends in a southerly direction beyond the site boundaries. Phenol, a semi-volatile organic compound, has been detected in the groundwater underlying the Central Shops area. Naphthalene has also been detected in the soil and groundwater beneath the area. Phthalates and hydrocarbons have been identified in the soils underlying the Central Shops. Additional characterization is currently under way to more accurately determine the levels of contamination underlying the Central Shops area. For a discussion of the use and effects of these chemicals, please see Table 4.13-3 in Section 4.13 Hazardous Materials.

Remediation

Removal and disposal of contaminated soils, capping, and soil vapor extraction may be used as part of a remediation Alternative at this site. Other remediation methods may be incorporated depending on the results of further site characterization.

Asbestos

In addition to soil and groundwater contamination, any structure built prior to the 1970s is likely to have asbestos-containing materials, which could be found in pipe insulation, or in floor tiles, ceilings and walls. Asbestos is a known carcinogen that is only a health risk when contained in small airborne fibers. These fibers are most often a risk when buildings are demolished or renovated. Consequently, any structural improvements or refurbishment of the Central Shops could pose a health risk due to exposure to asbestos fibers.

Costs of Renovation

Initial costs associated with renovation would be for structural improvements and hazards remediation. These costs, especially the latter, could be quite high. In addition, there would be costs associated with restoring the buildings to their original appearance and refurbishing them for new uses.

Variations in the Level of Historic Preservation[71]

Given the potential costs of renovation and the potential that hazards remediation may be impossible for some structures, it is possible a desicsion to preserve some buildings and destroy others may be required.

Under the Alternatives, the principal shop structures in the central core could be retailed and become a major focus for the project. Other structures on the site could potentially be removed. Were an historic district established in the Railyards Area, this activity would substantially diminish its size. According to State Office of Historic Preservation staff, however, demolition of a portion of the structure would not necessarily preclude the designation of a Central/Southern Pacific Shops Historic District.

The Central Shops structures and Depot buildings are significant in that they are associated with the beginnings and the evolution of the particularly vital, aggressive, and innovative railroad industry. These structures form a grouping that appears to meet eligibility criteria for listing in the National Register of Historic Places as an Historic District under the following guidelines:

- Criterion A, as an outstanding example of an industrial complex and business enterprise that affected the growth of the state;
- Criterion B, due to its associations with important historic figures; and
- Criterion C, for its outstanding collection of architecturally important industrial buildings.

An evaluation of the property in terms of criteria for listing in the National Register of Historic Places differs somewhat from an evaluation of the property for potential development, reinterpretation, and reuse in a new urban context.

National Register criteria require the delineation of Historic District boundaries based upon historic uses and boundaries of the property during its designated "Period of Significance," as well as the physical integrity of structures located in the District and their relationship to each other. This delineation can include structures within a District that have contributed to its original functions or activities, or were simply part of the property at the time it became important. All such structures are considered to contribute to the District unless they have been so substantially altered they no longer reflect their role in the District, have lost substantial original fabric, or were constructed outside of the time span chosen as the Period of Significance for the District. New construction would need to be compatible with existing design. This category therefore considers a combination of historical, architectural, and cultural values in its determination of boundaries and contributing structures.

It should be noted that it is largely the variety, number and grouping of structures that lend the District its primary importance. The shops and auxiliary buildings were an integrated unit that functioned as a whole. A major aspect of their importance is how they all interacted to make the railroad function. In this regard, the total is considerably more than the sum of its parts. When integral aspects of those functions are removed, an understanding of the whole is diminished.

Based on the above criteria, the historic central core shops grouping would constitute a significant and cohesive architectural and historic complex, in place during the earliest years of railroad operation and still retaining much of its original configuration as well as a strong sense of time and place. If the existing complex or grouping retains these important properties, as the core group of shop structures do, then the nucleus or central shops buildings core would appear to remain eligible for listing in the National Register of Historic Places as its own historic district, even with the removal of the remainder of the Railyards.

A key observation is the fact that the existing Central Shops buildings are, in large part, the most significant historic buildings, as well as the best architectural examples on the railyards property. In terms of their contribution to the evolution of Sacramento and the state, they equal Sutter's

Fort and the State Capitol in significance. Their retention is not only critical to an understanding of the railroad and the activities it generated to develop Sacramento, the State, and the West, but would serve as a unique and irreplaceable focus for development that ties Sacramento past and present to its future with continuity, respect and grace.

Determining Which Buildings to Retain

While the retention of all structures potentially contributing to an Historic District delineated as the existing Railyard site is desirable according to National Register of Historic Places criteria and historic preservation concerns, current planning activities and potential future development may preclude this.

If the core shops area cannot be retained in toto, or if some structures must wait for rehabilitation, several points should be considered when determining which buildings are most necessary to retain. These considerations include:

1. The extent to which the visual character, materials, and the design of the building are original. Most of the shops are constructed of the original unreinforced masonry. However, some, such as the Machine Shop/Repair Gang Shop and Boiler Shop have had their walls replaced.

2. The role played by the structure in the operation of the Railyards and the railroad industry.

3. The visual and spatial relationship of a structure to others in the core shops area. For example, The Locomotive Truck Shop/Fabrication shop and the Erecting Shop are long buildings that form an important visual relationship with the Transfer Table.

Expected Archaeological Sensitivity and Resource Types

The floodplain along the American River contains documented prehistoric village sites, such as those recorded within and adjacent to Discovery Park (CA-Sac 26, 31, 32, 306, 316).

Expected historic resource types and their locations within the Railyards Area have been delineated by Praetzellis and Praetzellis.[72] As many of these historic resource types can be also be expected to occur within the Richards Area, the typology has relevance to the Richards Area as well, and is summarized below. All these resource types are sources of assemblages of historic artifacts and features and may have legal significance stemming from their research potential.

1. Discrete, domestic, refuse-filled hollow features, which generally occur in association with dwellings, to include wells, cisterns, subterranean basements, outhouse pits, and lined, reusable garbage pits.

2. Diffuse domestic deposits consist of widely broadcast refuse, which was commonplace before the days of organized refuse collection and disposal. A good example of this

historic resource type, Isolated Find 12, was inventoried by Lindström in 1990 and occurs along a spur railroad line as a diffuse scatter of historic glass, ceramic ware and Chinese brownware. It is possible that layers of sequential episodes of dumping may have been preserved intact, especially in light of periodic flooding of portions of the area before flood control mechanisms were put into place.

3. Domestic architectural remains of residences and outbuildings are represented in the archaeological record by brick footings or wooden pilings that supported stilt-mounted buildings to avoid flooding.

4. Industrial and commercial architecture are also represented in the archaeological record by foundations. The range of industrial activities carried out within the Planning Area has not been defined and may be considerable.

5. Industrial features and artifacts represent various industrial processes carried out within the Planning Area, as distinct from the buildings in which these processes were housed.

6. Environmental remains may be contained within a portion of Willow Lake, one of many oxbow lakes attached to the Sacramento River, which flowed through the Planning Area. The anaerobic conditions that prevail in these wet environments are receptacles for paleoenvironmental information that are ideal for preservation. The extraction and analysis of such data could provide clues of past climatic and vegetation changes in the Central Valley.

Since much of the Planning Area is located within an urban setting and has been subjected to the long-term practice of leveling, filling and soil disturbance, surface archaeological manifestations may be nonexistent. Here, archaeological sites are likely to be more or less invisible, being buried under modern created land surfaces and unable to be detected through an intensive pedestrian survey. Extensive subsurface deposits are present at many sites as demonstrated at CA-Sac-26 with a recorded depth of 20 feet. Because successive episodes of fluvial deposition may have buried earlier prehistoric components to considerable depths, the likelihood of encountering prehistoric sites is still a possibility, despite historic and modern urban development. As such, the potential for finding both undiscovered historic and prehistoric resources during excavation for project development is high. Conditions involving the relative archaeological sensitivity of a particular area are further enhanced if a parcel was occupied during a transitional episode, such as before and after a flood or fire or the installation of city public utilities. Prospects for important data recovery increase if the parcel may be associated with an archaeologically important resource type that can be reliably linked to the documentary record or, on the other hand, if the parcel was occupied from an early undocumented era.[73]

Future development proposed in the vicinity of the County Government Center and the Alkali Edge, closest to Sacramento's downtown area, is likely to encounter both shallow and deeply buried subsurface prehistoric and historic remains. For expected historic sites, archaeological sensitivity is underscored by the extensive archaeological remains encountered during previous excavations of selected portions of the Old Sacramento district and elsewhere in the commercial district.[74,75,76,77,78] This portion of the Planning Area lies at a higher elevation, and would have been less subject to inundation and periodic floodplain deposits. Archaeological sensitivity

increases in the vicinity of previously inventoried historic sites and features. Archaeological remains are likely to occur within the Transcontinental Railroad corridor and in areas contiguous to the Southern Pacific Railyards, within the Alkali Flat Historic District, at the unconfirmed locale of Sutter's Landing, at historic buildings in the vicinity of 8th and I streets, at the Jibboom Street Gas Works, and in the vicinity of the refuse scatter containing Chinese artifacts along the railroad spur in the vicinity of 7th and 8th streets (Figure 4.6-2).

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Prehistoric and historic archaeological resources are evaluated according to their significance, as defined by the four criteria of eligibility for inclusion in the National Register of Historic Places (NRHP). Important considerations focus upon a cultural property's uniqueness and integrity, relative to other cultural resources similar in kind, and its potential to contribute important information towards scholarly research, which can then be conveyed to the ultimate beneficiaries of this knowledge, the American people. The criteria, summarized below, provide legal and professional guidelines.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

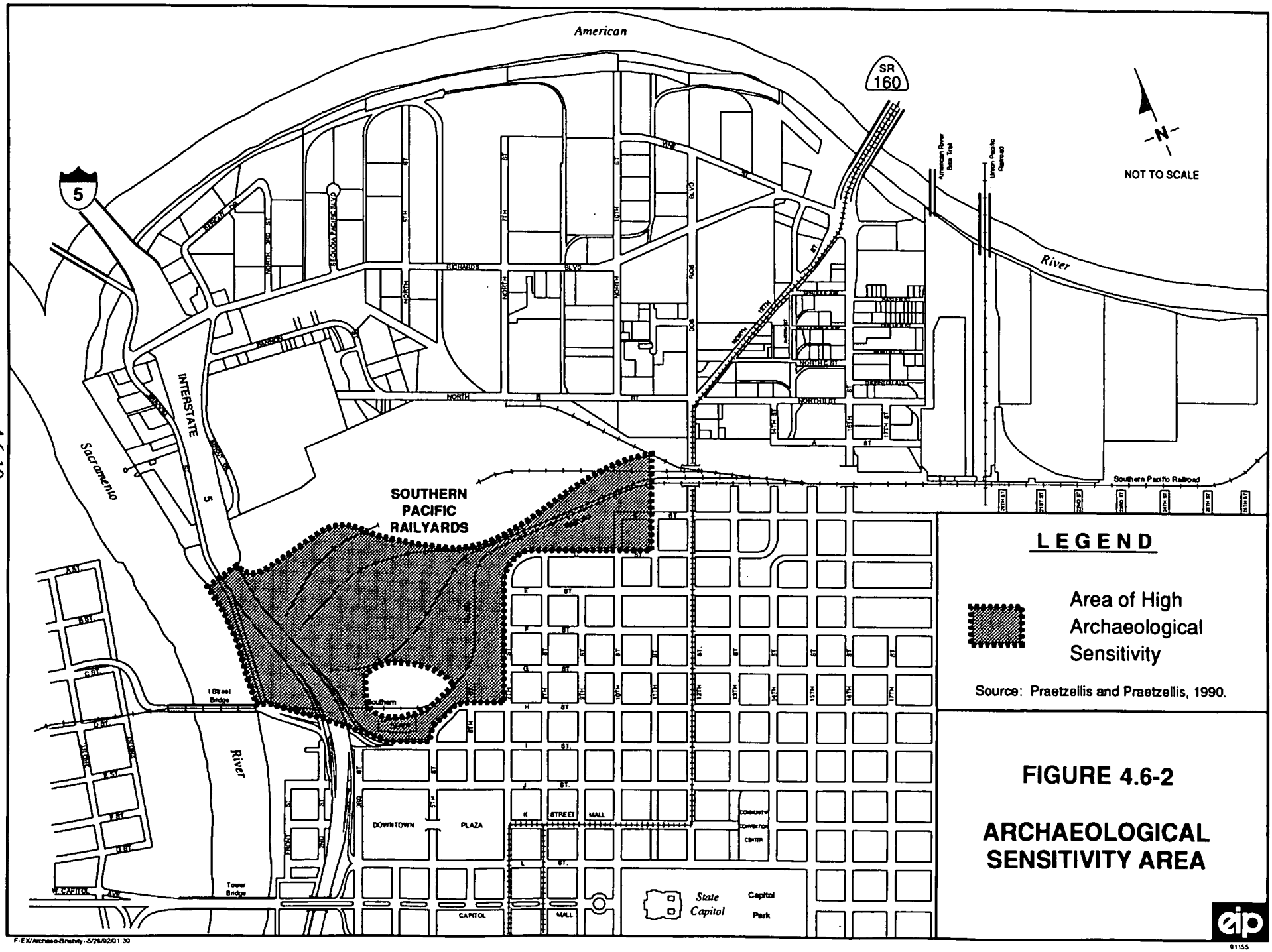
C. That embody the distinctive characteristics of a type, period, or method of construction, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

CEQA (Appendix K) incorporates these four basic NRHP criteria into its guidelines. For the purposes of CEQA, an important archaeological resource is one which:

A. Is associated with an event or person of:

1. Recognized significance in California or American history, or
2. Recognized scientific importance in prehistory.


American
River
SR 160
5
INTERSTATE 5
Sacramento
River
SOUTHERN PACIFIC RAILYARDS
Southern Pacific Railroad
NOT TO SCALE
N
I Street Bridge
Tower Bridge
DOWNTOWN PLAZA
K STREET MALL
CAPITOL MALL
State Capitol
Capitol Park
LEGEND
Area of High Archaeological Sensitivity
Source: Praetzellis and Praetzellis, 1990.
FIGURE 4.6-2
ARCHAEOLOGICAL SENSITIVITY AREA

B. Can provide information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions;

C. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;

D. Is at least 100 years old and possesses substantial stratigraphic integrity; or

E. Involves important research questions that historical research has shown can be answered only with archaeological methods.

If a cultural resource is determined significant, effects of development on the cultural property must be assessed. A property is said to be adversely affected if development activities will diminish the integrity of a property's location, design, setting, materials, workmanship, feeling, association, or the quality of data suitable for scientific analysis. Typical development-related effects result from the ground disturbance caused by the demolition, removal or alteration of buildings and structures to make way for new construction and/or the general changes in land use that may affect the integrity of the setting of cultural properties. CEQA protects cultural resources discovered during construction, in that ground disturbance must halt in the vicinity of the resource until the situation has been assessed and its evaluation has been completed.

Method

Pre-Historic Resources

A literature review and "windshield" field tour of the Planning Area was conducted during July and August 1990 by Susan Lindström, consulting archaeologist to EIP Associates of Sacramento. The main data source consulted during the pre-field research phase of this investigation was the North Central California Information Center, Archaeological Site Inventory, California State University, Sacramento (NCIC-CSUS). Other research contacts include Laurie Warner, Archaeologist for Sacramento County, Dick Hastings, Principal Planner and Design Review Historic Preservation staff person for the City of Sacramento, and Larry Meyers, Executive Secretary for the Native American Heritage Commission in Sacramento. Additional research and analysis conducted by Adrian and Mary Praetzellis of the Sonoma State University Academic Foundation was incorporated into this analysis, as was an historical and architectural resources survey completed by Paula Boghosian of Historic Environment consultants.

Historic Resources

The initial research phase involved a review and evaluation of existing information and reports regarding each of the two Planning Areas. The history of the Railyards and Richards Areas were then researched and a complete field survey of each Area was conducted.

The Railyards Area was evaluated as a complex of structures that may be eligible for listing in the National Register of Historic Places as an historic district. The entire complex is related to the uses, evolution and function of the railroad. Each of the structures in the Railyards Area was

noted. Detailed descriptions of structures were prepared and photographs taken. Map locations for properties were cited. Alterations and construction materials were described.

The Richards Area was surveyed and evaluated according to the criteria adopted by the City for the preparation of the Survey of Significant Non-Residential Structures, prepared for the City in 1980. Structures meeting the criteria for the Sacramento Register were described and photographed.

To locate potential archaeological deposits, 19th and 20th century city maps, insurance maps, and bird's eye views were consulted (Baker 1854; Koch 1870; Sanborn Company 1895, 1915). Additional secondary sources used to document land use and to develop research themes for the Planning Area include Brienes, West & Schulz's overview for the Central Business District, and research designs for nearby blocks.

The west edge of the Alkali Flat neighborhood was surveyed for potential additional resources and impacts as a result of development.

All noted resources were researched, as were their immediate and surrounding areas. Information was compiled and analyzed with respect to criteria and design integrity. Noted resources were evaluated as to applicable criteria, and potential for listing in the National Register of Historic Places noted. The summary report was prepared and properties meeting criteria for listing either locally or in the National Register of Historic Places were mapped, described with text and photographs, and evaluated.

A major aspect of the overall process was participation in the community meetings held to involve the public in the planning process.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.6-1 Potentially significant buried cultural resources may be located in the Planning Area, which could be damaged or destroyed by development or redevelopment activities involving any of the Alternatives.

A-1 Cultural resources probably would not be substantially damaged or destroyed by the No Project Alternative, because little new development and few redevelopment activities would occur in the Planning Area. This is considered to be a ***less-than-significant impact.***

A-2 through A-7

Cultural resources could be damaged or destroyed by the Alternatives during excavation and construction activities associated with redevelopment and/or the general changes in land use, which may effect the integrity of the setting of cultural properties. This is considered a ***significant impact.***

Mitigation Measures

The implementation of the following measures would reduce the impact to a *less-than-significant level.*

4.6-1(a) *Prior to development, each subarea within the Planning Area shall be subjected to a cultural resource evaluation involving archival research, an archaeological field reconnaissance, and pertinent architectural evaluations. Qualified professionals shall analyze the significance of the resources and recommend necessary preservation and mitigation measures in consultation with appropriate federal, state, and local agencies and the local Native American community.*

4.6-1(b) *Depending on the recommendation of the survey archaeologist, the presence of a qualified archaeologist during earthmoving, excavating or other construction phases, or the completion of pre-project test excavations may be required for developments located in portions of the Planning Area previously identified as archaeologically sensitive.*

4.6-1(c) *Contractors making infrastructural improvements and sponsors of development projects shall be required to implement the specific preservation measures recommended by the survey archaeologist subsequent to concurrence of the City Planning Director. Those preservation measures shall be imposed as conditions of project approval.*

4.6-1(d) *The project construction team shall become familiar with the indicators of historic and prehistoric archaeological sites. In the event that subsurface archaeological or historical remains are discovered during development or construction of specific projects, work in the area shall stop immediately and a qualified archaeologist and a representative of the Native American Heritage Commission shall be consulted to develop, if necessary, further mitigation measures to reduce any archaeological impact to a less-than-significant level before construction continues.*

4.6-1(e) *The approved Alternative shall include a goal to preserve properties of archaeological and/or architectural significance that are located in the Planning Area.*

4.6-1(f) *Monitoring of these mitigation measures shall be coordinated with the historic preservation staff of the City Planning Department, the State Office of Historic Preservation, and the Curator of the California State Railroad Museum of the Old Sacramento State Historic Park, due to the significance of Planning Area buildings in the context of railroad and transportation history.*

4.6-1(g) *The City of Sacramento shall not disclose the location of cultural sites within and surrounding the Planning Area; however, cultural resource management guidance shall be provided to development interests, so that developers can be informed of the generally high cultural resource sensitivity of the Plannning Area, and be*

prepared to budget for cultural resources studies at the earliest stages of planning.

These mitigation measures would be required for Alternatives 2 through 7.

Impacts Due to Development in the Railyards Area Only

Loss of Potential Historic District

4.6-2 Implementation of the Alternatives could result in the loss of historic resources in the Railyards Area, which could constitute a historic district eligible for listing in the National Register of Historic Places and the Sacramento Register.

The Railyards Area possesses historic, cultural and architectural distinction that appears to qualify the area for listing in the National Register of Historic Places at either of two levels: (1) the complete Railyards property, or (2) the historic core area of the Railyards. The Railyards Area and its structures comprise a district that represents the full development and evolution of the historic Central Pacific/Southern Pacific locomotive works complex and its contributing elements, from the mid-1860s to the present. The historic core consists of a group of key masonry buildings as follows: the Erecting Shop, the Locomotive Wheel Shop/Governor and Injector Shop/Rotating Equipment Shop/Air Room/Passenger Car Truck Shop, the Repair Gang Shop/Machine Shop, the masonry water closet, and the Electric Shop/Traction Motor Shop.

In addition to structures that formed a central core of construction activity, a wide variety of other structures on the site contributed significantly to the functioning of the railroad. Some of these include the several forge and foundry buildings that were critical to the manufacturing of items out of steel, iron, copper, and brass. Machinery to handle the size and volume of Southern Pacific projects included enormous hammers, forges and rolling mills. Perhaps partly as a result of the switch to diesel power, major forge and foundry activities no longer take place on this site, and many of the structures that formerly housed these activities have been modified for other uses, combined with other buildings, or removed. At the present time, these former activities are represented by the Sheet Metal Shop. The Sheet Metal Shop appears to have combined several of the smaller foundries under one irregular and interconnected roof, including the large Forge Shops (which still contains hooded venting stacks), the Blacksmith Shop, and the former Rolling Mill. However, the Southern Pacific Railroad Foundry on 6th Street is gone, along with its companion buildings. Also gone are several smaller Shops that worked with metal, like the Spring Works, silver plating, and the Bolt Shop.

Another category of the structure whose use has diminished in recent years are the "stores." Originally, each department of the Shops had its own store, or repository of parts and pieces necessary to the construction or repair of equipment and machinery, and the production of new equipment involved with that specific department and its tasks. These stores have now been consolidated, and some of the smaller structures associated with different departments for that purpose dismantled. The stores, forges, small utility buildings, storage sheds, and the myriad of special use buildings all contributed at one time to the function of the yard, and as such, contribute to the potential designation of an historic district.

A-1 Alternative 1 may cause the removal of some of the Railyards Area structures, but would not affect the retention of the historic core Central Shops buildings and any core district designation. Although the Central Shops complex would be retained, the loss of other ancillary structures may constitute an adverse impact to the potential overall historic district designation of the Railyards property. This is considered a ***significant and unavoidable impact.***

A-2 Alternative 2 would result in the removal of all structures from the historic Railyards property. The Alternative would result in the removal of an historic complex significant in the industrial and railroad history and settlement of the West, and the loss of important information regarding railroad construction machinery, techniques, equipment and practices. Demolition of the Railyards structures, with the exception of the Depot, would also cause a loss of data and setting regarding former lifestyles, economic activities, and cultural values that have contributed to the development of the Sacramento region, California, and the West. This constitutes a ***significant and unavoidable impact.***

A-3 Alternative 3 would result in the removal of all Railyards structures except three or four of the most important historic buildings, and would substantially diminish and possibly preclude the establishment of any potential historic district. The loss of almost all of this historic complex constitutes a ***significant and unavoidable impact.***

A-4 through A-7

Alternatives 4 through 7 would retain the historic Central Shops buildings. Five or six of the oldest and historic Central Shops structures would be retained and rehabilitated for a variety of new, largely public and cultural uses. If all six of the principal structures are retained and rehabilitated in compliance with the Secretary of the Interior Rehabilitation Standards, there would be no adverse impacts to the listed core structures and district as a result of this Alternative. Although the Central Shops Complex would be retained, the loss of other ancillary structures may constitute an adverse impact on the potential historic district designation of the Railyards Area. This is considered a ***significant and unavoidable impact.***

Mitigation Measures

The adverse impact of the loss of some or all of the structures within a potential historic district eligible for listing in the National Register of Historic Places may be lessened with the following mitigation measures, but not to a *less-than-significant level*:

4.6-2(a) *All existing structures and objects of historical significance on the Railyards property shall be recorded through mapping, photography, textual description, and drawings. A complete illustrated history of the Railyards occupation in Sacramento and its role in the development of California and the West shall be prepared as part of the recordation. This mitigation measure would be required for all Alternatives.*

4.6-2(b) *Designate all remaining structures as an historic district listed in the National Register of Historic Places. This mitigation measure would be required for Alternatives 1, 4, 5, 6, and 7.*

4.6-2(c) *Restore any remaining historic Central Shops structures. Rehabilitation and restoration work must be in compliance with the Secretary of the Interior Rehabilitation Standards. This mitigation measure would be recommended for Alternatives 1, 3, 4, 5, 6, and 7.*

4.6-2(d) *A nomination to the National Register of Historic Places shall be prepared and processed for the structures. This mitigation measure is required for Alternatives 2 and 3, and recommended for Alternatives 1, 4, 5, 6, and 7.*

4.6-2(e) *Selected artifacts, machinery, tools, and other important interpretive elements contained within the Railyards shall be conveyed to the Sacramento History Museum and Archives Center upon removal for documentation, interpretation, archival and display activities. This mitigation measure is required for all Alternatives.*

4.6-3 Implementation of the Alternatives could result in the loss of the Locomotive Wheel Shop Annex, and the reconstruction and modification of the Locomotive Truck Shop/Fabrication Shop.

A-1 The Locomotive Wheel Shop Annex and the Locomotive Truck Shop/Fabrication Shop would be unaffected under this Alternative. This is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 would result in the demolition of the Locomotive Wheelshop Annex and the demolition, or demolition and reconstruction, of the Locomotive Truck Shop/Fabrication Shop. Removal of and modification to these structures is considered a ***significant impact.***

The removal of the Locomotive Wheel Shop Annex would be necessary in order to create Crescent Drive, around the Central Shops structures. This structure is one of the few existing historic masonry buildings remaining on the Railyards property, and is an element of the potential historic core district eligible for listing in the National Register of Historic Places.

In Alternatives 4, 5, 6, and 7, the Locomotive Truck Shop/Fabrication Shop would be rebuilt in the same location, and would appear visually like the existing structure, but without the center section. The existing building is constructed of wood framing sheathed with metal paneling. The framework of the structure is probably original to its construction. The reconstruction and remodeling of the original building design would eliminate the original fabric and design of the building and its contribution as a

supporting element to the potential district. Proposed changes to its appearance are not historically appropriate.

Historically, the metal clad buildings experienced changes of sheathing but retained their structural framework. This building may be the only representative of its type to become a permanent part of the complex. Historically commonplace, such structures are often considered less significant than their masonry counterparts, but importantly reflect the critical functions they housed more effectively than brick, such as forges and foundries.

Mitigation Measures

The adverse impacts of the loss or re-creation/modification of an historic building, potentially eligible for listing in the National Register of Historic Places may be mitigated to *a less-than-significant level* as follows:

4.6-3 *Implement Mitigation Measures 4.6-2(a) and (e). This mitigation measure is required for Alternatives 2 through 7.*

4.6-4 Implementation of the Alternatives could result in the loss of the Electric Shop/Traction Motor Shop.

A-1, A-4, A-5, and A-6

These Alternatives would not require removal of the Electric/Traction Motor Shop. Therefore, this is considered a ***less-than-significant impact.***

A-2, A-3, and A-7

The removal of the Electric Shop/Traction Motor Shop would be required with implementation of Alternatives 2 and 3. Alternative 7 may require removal of the structure. Loss of this building would constitute a ***significant impact.***

The removal of the Electric/Traction Motor Shop would be necessary in order to create open space for an appropriate balance with proposed buildout. The structure is one of the few existing historic masonry buildings remaining on the Railyards property, and is an element of the potential historic core district eligible for listing in the National Register of Historic Places.

Mitigation Measures

Implementation of Mitigation Measure 4.6-4 would reduce the above impact to a *less-than-significant level.*

4.6-4 *Implement Mitigation Measures 4.6-2(a) and (e). This mitigation measure would be required for Alternatives 2, 3 and 7.*

4.6-5 The widening of 7th Street could result in impacts on several historic resources, including a listed National Register of Historic Places Historic District and individual historic properties.

A-1 This Alternative would not require the widening of 7th Street. Therefore, this is considered a ***less-than-significant impact.***

A-2 through A-7

The implementation of Alternatives 2 through 7 would affect the existing neighborhood and National Register Historic District as a result of the extension of 5th, 6th and 7th streets to Richards Boulevard, construction of the Intermodal Transit Station on 7th Street (except in Alternative 5), and substantial residential and/or commercial buildout on the west and northwest edges of the Railyards Area. The location of the Intermodal Transit Station at 7th Street at North B Street would result in the widening of 7th Street, adversely affecting the Sentry House, located on the corner of 7th and E streets (701 E Street), which is listed in the National Register of Historic Places. The widening of 7th Street would affect other local resources, including structures at 709 E Street, 515, 521 and 523-25 7th Street, and 705 F Street, which would either be removed or be severely affected by the expansion of the street. Of these, only 523-523 7th Street is listed in the Sacramento Register. The loss of historic structures is considered a ***significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant level.*

4.6-5(a) *The Sentry House at 701 E Street shall be relocated to another site to avoid demolition as a result of the widening of 7th Street. This mitigation measure would be required for Alternatives 2 through 7.*

4.6-5(b) *A specially designated area should be set aside in the Railyards Area to accommodate the relocation of important historic buildings that must be moved as a result of the project. The structures noted above on E, 7th, and F Streets could be relocated to other sites in the vicinity, or to this specially designated area, set aside for the preservation of structures affected by development in the Planning Area. This mitigation measure would be required for Alternatives 2 through 7.*

4.6-5(c) *Implement Mitigation Measures 4.6-2(a) and (e). This mitigation measure would be required for Alternatives 2 through 7.*

4.6-6 Implementation of the Alternatives could result in impacts on the Alkali Flat Historic Districts, listed in the National Register of Historic Places.

A-1 Implementation of Alternative 1 would not adversely affect the existing neighborhood and would, therefore, be considered a ***less-than-significant impact.***

A-2 through A-7

The implementation of Alternatives 2 through 7 could affect the West Alkalai Flat National Register Historic District as a result of the extension of 5th, 6th and 7th streets to Richards Boulevard, construction of the Intermodal Transit Station on 7th Street, the extension of 12th Street to Crescent Drive, and substantial residential and/or commercial development on the east and northeast edges of the Railyards Area. Secondary impacts could occur to the Central and North Alkali Flat National Register of Historic Places Historic Districts. This adverse effect on historical structures is considered a ***potentially significant impact.***

The extension and widening of 7th Street and location of the Intermodal Transit Station at North B Street could affect the setting and character of the West Alkali Flat Historic District, portions of which are located a half block east of 7th Street between E and F streets. In conjunction with this expanded use of 7th Street, 8th Street would serve as a companion corridor south of F Street. The increased traffic on 8th Street could affect the character and setting of the West Alkali Flat Historic District whose southeast corner would be affected.

The extension of 12th Street/Highway 160 and substantial new residential and commercial construction just north and west of Alkali Flat may alter the character and setting of the historic neighborhood, its predominantly older housing, and mixed composition. Expanded traffic and peripheral activity spin-off may create more street activity, noise, and air pollution. Such activities often affect the desirability of older downtown neighborhoods, and aging historic structures may suffer as a result. While efforts have been made in formulating the Plan to protect the neighborhood qualities of this area, the proposed development and expanded circulation patterns may have an adverse impact upon the important resources of this historic area.

Although the effects of increased activity in the vicinity of the Alkalai Flat Historic Districts may have adverse impacts, there is a possibility that such activity could have beneficial effects on the Districts. Increased economic value and activity in the area could provide greater incentives for the preservation and maintenance of historic structures; such incentives do not exist at this time due to limited accessibility to the area. Further, the movement of the rail line to accommodate the Intermodal Transit Station could have a positive effect on this area by eliminating any potential conflict between rail uses and historic structures.

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.6-6(a) *New development adjacent to the Central and North Alkali Flat Historic Districts shall be designed to be conducive with the historic character of the adjacent neighborhood through landscaping, street patterns and layout. This mitigation measure would be required for Alternatives 2 through 7.*

4.6-6(b) *New development adjacent to the Central and North Alkali Flat Historic Districts shall be of a similar scale, character and increment to the existing historic structures, not exceeding three floors or 35 feet in height and not having a frontage greater than 50 feet. This mitigation measure would be required for Alternatives 2 through 7.*

4.6-6(c) *Restoration/Preservation incentives shall be developed to ensure the protection and retention of neighborhood qualities and historic resources. Such provisions could provide special interest rates for rehabilitation loans, lowered assessments, tax credits, etc. Additionally, preservation provisions should be strengthened to protect existing resources from inappropriate rehabilitation, demolition, and non-contributing new construction. Notable resources should be identified by plaque or similar device that would generate awareness of their value. This mitigation measure would be required for Alternatives 2 through 7.*

4.6-7 Implementation of the Alternatives would affect the Railroad Express Building which lies adjacent to the Southern Pacific Railroad Depot and is listed in the National Register of Historic Places.

A-1 Implementation of this Alternative would not adversely affect the Railroad Express Building and would, therefore, be considered a ***less-than-significant impact.***

A-2 through A-7

The extension of 5th Street to Richards Boulevard is an aspect of Alternatives 2 through 7. Extension of 5th Street would result in the removal of the loading dock of the Railroad Express Building (a National Register property), which stands adjacent to the Depot on the east. The loading dock structure is an important adjunct to the Depot, using the same style, scale and design treatment. This would be a ***significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.6-7(a) *Implement Mitigation Measures 4.6-2(a) and (e). This mitigation measure would be required for Alternatives 2 through 7.*

4.6-7(b) *Any new construction that may occur adjacent to or near the Depot and remaining portion of the Railroad Express Building shall be compatible in design, style,*

scale and materials to the existing historic Southern Pacific Railroad Depot. This mitigation measure would be required for Alternatives 2 through 7.

4.6-8 Implementation of the Alternatives would alter the historic main line track location.

A-1 Implementation of this Alternative would not result in the relocation of the railroad main line and would, therefore, be considered a ***less-than-significant impact.***

A-2 through A-7

Implementation of these Alternatives would result in the relocation of the railroad main line, historically located on its present site, and eligible to the National Register of Historic Places as part of a potential historic district. This is a considered ***significant impact.***

Implementation of the following Mitigation Measures would reduce impacts to a *less-than-significant level.*

Mitigation Measures

4.6-8(a) *Implement Mitigation Measures 4.6-2(a) and 4.6-4(e). These mitigation measures would be required for Alternatives 2 through 7.*

4.6-9 Extensive delays in the adaptive reuse of the historic Central Shops structures could result in their continued deterioration and ultimate demise.

A-1 Implementation of this Alternative could result in deterioration and loss of the Central Shops structures and therefore would be considered a ***significant and unavoidable impact.***

The Southern Pacific Transportation Company has indicated its intention to relocate the Sacramento Locomotive Works to other locations in the West. The relocation of some activities has been completed at this time. Alternative 1 could result in the permanent abandonment of the Central Shops structures, with no economic use or incentive for reuse. Such abandonment would cause a slow but steady deterioration of the structures, ultimately to a point beyond which reuse would be economically or physically infeasible.

A-2 through A-7

The phasing of development as currently planned would result in rehabilitation and reuse of the Central Shops buildings in Phase 3, beyond Year 2010. After current uses cease, the Central Shops buildings would be closed and initial development nearby would occur, including the construction of the infrastructure for the Intermodal Transit Station and Crescent Drive. The Central Shops structures would remain vacant, unused, and

physically isolated for at least 20 years before their rehabilitation/conversion to Cultural Park/commercial/professional office uses.

Currently in need of maintenance, the buildings would fall further into disrepair and could deteriorate through vandalism, fires, or decay to a point at which they would be economically and/or physically unfit for rehabilitation. This is considered a ***significant impact.***

Mitigation Measures

4.6-9(a) *A specific Interim Program shall be developed for the structures including interim upgrading and uses and an ongoing maintenance program.*

The Program should include the following elements:

a. Delineate responsibilities for program development and resource protection including establishment of responsible oversight group or entity.

b. Establish existing conditions of Shop structures.

c. Develop viable interim uses for Shop structures.

d. Establish an ongoing maintenance plan to avoid degradation of existing structures.

This mitigation measure would be required for Alternatives 2 through 7.

The Interim Program should be developed in conjunction with, or by representatives from, the Sacramento Architectural Review/Preservation Board, Sacramento Housing and Redevelopment Agency, the Sacramento business community, the California Office of Historic Preservation, California State and Sacramento Offices of Tourism and the National Trust for Historic Preservation.

4.6-9(b) *Implement Mitigation Measure 4.6-2(d). This measure would be required for Alternatives 2 through 7.*

Impacts Due to Development in the Richards Area Only

4.6-10 Implementation of the Alternatives in the Richards Area could result in the loss of several industrial structures eligible for listing in the National Register of Historic Places or the Sacramento Register.

A-1 through A-7

Several masonry structures associated with industrial activities in the Richards Area have been identified as candidates for listing in the Sacramento Register, or the National

Register of Historic Places, due to representation of their type and architectural values. These buildings include the Sacramento Pipe Works facility, the warehouse at North 16th and A streets, structures at 1400 and 1500 North C Street, McDonald's Food Equipment Company, Crest Carpet Company, Capitol Sheet Metal, Maryhouse at 301 North 12th Street, the Produce Terminal Building, and the Bercut-Richards Cannery. It should be noted that although the cannery was originally constructed in 1932 and can be considered significant for its role in the development of the agricultural and canning industries in the region, only a small portion of the original 1932 structure remains. The rest of the cannery is not 50 or more years of age at present, as required for listing in the NRHP.

These structures would require upgrading, seismic retrofit, repair and ongoing maintenance that may not be economically feasible for planned uses around or in them. As a result of economic neglect, the structures may deteriorate and be demolished. The structures would probably survive more successfully if the surrounding uses were more market driven and allowed a mixture of live/work/ commercial space. This is considered a ***significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.6-10(a) *The RBAP shall include policies to encourage the preservation of historic structures in the Richards Area. The policies could include, but may not be limited to, the following:*

1) *Exempt listed historic or contributing structures from any proposed zoning limitations in this area under "Gateway" entitled activities. This mitigation measure would be required for all Alternatives.*

2) *Create a special incentive zone overlay for these structures. Incentives could take the form of special interest rate loans, tax credits, etc. This mitigation measure would be required for all Alternatives.*

4.6-10(b) *In the event of potential resource loss, existing structures of importance should be recorded. The structures should be photographed, described, and necessary recordation drawings completed. This mitigation measure would be required for all Alternatives.*

Cumulative Impacts

4.6-11 Implementation of the Alternatives, in conjunction with the cumulative development throughout the region, could result in the continued loss of historic structures throughout the Sacramento region.

A-1 through A-7

Implementation of all of the Alternatives, in conjunction with cumulative development, would continue the incremental loss of historic structures and other cultural resources. Rapid expansion of urbanization and redevelopment activities throughout the region would result in the demolition of historically important structures and other features that provide the historical character of the region. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.6-11(a) *The City and other jurisdictions in the region shall develop an economic incentive program for older structures. This mitigation measure would be required for all Alternatives.*

4.6-11(b) *The City and other jurisdictions in the region shall strengthen the existing ordinances for the protection of significant structures. This mitigation measure would be required for all Alternatives.*

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4.7 POPULATION, EMPLOYMENT AND HOUSING

4.7 POPULATION, EMPLOYMENT AND HOUSING

INTRODUCTION

This chapter presents an evaluation of the impacts related to changes in population, employment and housing anticipated with the implementation of the Alternatives in the Planning Area.

It should be noted that, in general, the physical environmental effects of increases in population and employment described in this chapter are evaluated in other chapters of this EIR (for example, traffic, air quality, water, wastewater, etc.). The information presented in the Setting section of this chapter is an amalgamation of information available from the 1990 Census, SACOG, the City of Sacramento General Plan, background studies prepared for the Southern Pacific Railyards planning process, and the Sacramento Central City Housing Strategy Study.

This analysis includes estimated permanent employment and interim construction-related employment created through development in the Planning Area. This chapter of the EIR does not estimate indirect employment growth. Since it is assumed that indirect employment growth is a function of economic activity in the region, it would not be caused by implementation of the development in the Planning Area. A further discussion of indirect employment growth and project-related redistribution of employment in the region is included in Chapter 5.1, Growth Inducement.

Section 15131 of the CEQA Guidelines (Guidelines) states that the economic or social effects of a project shall not be treated as a significant effect on the environment. According to the Guidelines, an EIR may trace a chain of cause and effect from the proposed decision on a project or, as in this case, a plan, through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic social changes.

In the past City environmental documents have attempted to trace that chain of cause and effect and point out how individual office projects create environmental impacts that are related to the housing demand they generate. The analysis has relied on the premise that office development generates a demand for housing by bringing new employees to the City. Since these employees require a place to live, the housing demand was assumed to be an environmental impact. Indeed, it is not uncommon that the line between social and economic impacts and physical, environmental impacts becomes blurred. This is probably due to the desire to use the EIR as a full disclosure document, making certain that all impacts are identified, and in so doing, sometimes the distinction between social and economic issues and physical environmental impacts is lost.

The City has continued to analyze the characteristics of the housing issue and has determined the link between housing demand and a physical environmental impact is not clear. The 1988 Sacramento General Plan is programmed to contain a balance of land uses that have taken into consideration adequate housing for the population. The question may be how to guarantee that this housing will be built, but that is an economic concern not a physical impact on the environment.

The main premise of this chapter is that housing demand created by the project is an economic and social issue not an environmental impact. However, even though something such as shortage in the supply of affordable low-income housing is not considered a physical, environmental impact, secondary physical impacts associated with the construction of housing (e.g. air quality or traffic congestion) can be evaluated under CEQA. An example of this type of secondary impact would be the impact that the lack of nearby housing might have on air quality or transportation/circulation impacts caused by employees of the project who might commute great distances to the site. Such an analysis would require far-reaching assumptions as to where employees would live, how far they would commute, and what mode of travel they would use. While such data collection may be realistic for the preparation of the City's Housing Element to substantiate the need for a jobs housing ratio, such assumption-making and data collection is unreasonable for the analysis of the Alternatives.

SETTING

Population

Planning Area

In 1990, the population of the Planning Area was 1,646 persons. This represents an increase of 741 persons over the 1980 population of 905. Without the adoption of plans that are now being considered for the Planning Area, the population of the Richards Area has been projected to decline slightly during the next 20 years. It should be noted that the projections for the Planning Area assume continuation of existing land use patterns, and do not assume the type of substantial redevelopment activity anticipated in Alternatives 2 through 7. Such projections are not sensitive to recent policy decisions to concentrate social services (including associated group quarters) in the Richards Area. Historic, existing and projected population for the Planning Area and surrounding neighborhoods are shown on Table 4.7-1.

Of the 1990 population, approximately 820 people (50 percent of the population) were housed in group quarters. Due in part to the presence of a number of social service facilities, the Richards Area also is home to a number of homeless people. Approximately 75 people were counted as being homeless in the Richards Area during the 1990 census.[1]

Despite an increase in population of 740 people for the Richards Area in the past decade, the number of housing units has declined from 300 in 1980 to 270 in 1990. The increase in population is due to the many Planning Area residents who are housed in group quarters that have

TABLE 4.7-1
HISTORIC, EXISTING, AND PROJECTED POPULATION BY AREA[1]

Neighborhood	1980	1990	2000	2005	2010
Richards[2]	905	1,646	1,049	1,036	1,014
Alkali Flat[3]	974	931	1,076	1,059	1,050
Central City	28,956	33,294	31,973	31,782	31,440
City of Sacramento	275,740	369,365	412,500	437,300	445,146

[1] These projections did not anticipate substantial redevelopment activity in the Planning Area. As such, they can be considered to reflect the No Project scenario.
[2] Census Tract 53.
[3] Census Tract 6.

SOURCE: *SACOG Growth Projections by Community Area*, 1989; U.S. Bureau of Census, 1990; *Sacramento General Plan Update DEIR*.

located to the Richards Area during the 1980s. Of the 1990 population, the Census identified 593 people in emergency shelters for the homeless, 11 people in other group quarters, and 74 people without shelter. There is also a Sacramento County Work Release Facility which houses 217 persons. Persons housed in group quarters account for 54 percent of the Planning Area's total population.[2]

Alkali Flat

The Railyards Area includes the Alkali Edge, comprising the westernmost two blocks of the Alkali Flat neighborhood, which encompasses 15 blocks between 7th, D, G and 12th streets. Population in the Alkali Flat neighborhood has remained relatively constant in the last decade and is projected to experience only marginal growth in the future.

Central City

The Central City Community Plan Area, bounded on the north by the American River, on the east by Alhambra Boulevard, on the south by Broadway, and on the west by the Sacramento River, encompasses both the Richards and the Alkali Flat neighborhoods. In 1990, population in the Central City was 33,294, an increase of 8.5 percent from the 1985 population of 30,697.[3] Most of the Central City population lives in the Midtown neighborhood, east of 16th Street and west of 29th Street. The population of the Central City is projected by the Sacramento Area Council of Governments (SACOG) to remain relatively stable during the next 20 years.

City of Sacramento

In 1990, the population of the City of Sacramento was 369,365, an increase of 93,625, or 34 percent, over the 1980 population of 275,740.[4] In the past decade, Sacramento has experienced an average annual population growth rate of 3 percent. The growth rate between 1980-1990 was substantially higher than that of the previous decade when the growth rate averaged 0.72 percent each year.[5] The growth rate for the City is expected to be lower between 1990 and 2000, about 1.1 percent per year, resulting in a projected year 2000 population of 412,500. Between 2000 and 2010, City population is expected to continue steady growth, resulting in a projected population of 445,146 in 2010.

The City of Sacramento accounted for 36 percent of the County's population in 1990, a slight increase over the 1980 distribution (35 percent) of population between the City and the County.

Demographic Characteristics

Tables 4.7-2 and 4.7-3 describe the population's age by sex and ethnic composition in the Planning Area, the Central City, and the whole City of Sacramento based on 1990 Census data. Other demographic characteristics, such as income and educational levels, have not yet been released from the 1990 Census.

Employment in the Planning Area

Richards Area

Existing employment in the Richards Area has been estimated by SACOG to be about 9,000 jobs, primarily in non-retail sectors (See Table 4.7-4).[6] Employment density is low, about one employee per 1,000 square feet of built space; this is generally reflective of a relative underutilization of built space in the area. Potential employment in the Richards Area is much higher, as can be demonstrated by applying standard employment density assumptions from the City General Plan.[7] Using this approach, potential employment in the Richards Area totals about 17,500 jobs, as summarized on Table 4.7-5.

Several primary employment centers are located in the Richards Area. The largest of these is the Blue Diamond almond processing plant located at the eastern portion of the Richards Area. Another large food processing plant is the Sierra Pacific Cannery located on 7th Street, north of Richards Boulevard. There are three smaller scale manufacturing businesses located in the Richards Area that involve fabrication of products. Two of these, Martin Sprocket and Gear and Firestone Tire, are located north of Vine Street. The Sacramento Pipe Works is located on North B and 16th streets.

TABLE 4.7-2
AGE AND SEX CHARACTERISTICS OF THE POPULATION

Neighborhood	Female			Male			Total
	To 19	20-59	60+	To 19	20-59	60+	
Richards	179	334	58	187	830	58	1,646
Alkali Flat	115	221	52	108	340	95	931
Downtown[1]	84	814	884	184	2,219	540	4,725
Midtown[2]	2,274	7,904	2,376	2,304	9,332	1,802	25,992
Total	**2,652**	**9,273**	**3,370**	**2,783**	**12,721**	**2,495**	**33,294**

[1] Census Tracts 7, 8, 9, and 10.
[2] Census Tracts 11, 12, 13, 14, 19, 20, 21, 4, and 5.
SOURCE: U.S. Bureau of the Census, 1990.

TABLE 4.7-3
ETHNIC ORIGIN CHARACTERISTICS OF THE POPULATION

Neighborhood	Non-Hispanic White	Hispanic	Afro-American	Asian	American Indian	Other	Total
Richards	618	368	374	220	63	3	1,646
Alkali Flat	402	397	112	6	13	1	931
Downtown[1]	583	2,802	885	369	78	8	4,725
Midtown[2]	5,042	14,343	2,588	3,499	452	68	25,992
Total (Central City)	**6,645**	**17,910**	**3,959**	**4,094**	**606**	**80**	**33,294**

[1] Census Tracts 7, 8, 9, and 10.
[2] Census Tracts 4, 5, 11, 12, 13, 14, 19, 20, 21.
SOURCE: U.S Bureau of the Census, 1990.

TABLE 4.7-4

EXISTING EMPLOYMENT IN THE PLANNING AREA

	Richards[1] Area	Railyards[2] Area	Total
Retail	1,190	-0-	1,190
Non-Retail	7,815	350	8,165
TOTAL	**9,005**	**350**	**9,355**

[1] Sacramento Area Council of Governments, employment estimates for centroid zones #779, 781, 783, and 250, August 1991.
[2] Estimates by Southern Pacific Transportation Company, November 1991.

SOURCE: EIP Associates

TABLE 4.7-5

POTENTIAL EMPLOYMENT IN THE RICHARDS AREA UNDER EXISTING CONDITIONS

	Developed square feet (in thousands)	Potential Employment
Office	850	3,400
Highway Commercial/Retail	260	867
Heavy Commercial/Light Industrial	6,000	12,000
Hotel	1,250[1]	1,250
TOTAL	**8,360**	**17,517**

[1] Number of rooms

SOURCE: City of Sacramento Planning and Development Department, 1989.
Roma Design Group, 1991.

A concentration of highway commercial uses, such as restaurants, motels, and automobile service stations, are near the I-5/Richards Boulevard interchange. There are also several large retail businesses located on 16th Street, including a Ford automobile dealership. Other employment-generating uses in the Richards Area include offices and warehouse/distribution facilities. Office uses, including the California State Lottery administrative offices, are located in scattered locations north of Richards Boulevard. Warehouse and distribution facilities pervade the entire Richards Area.

Railyards Area

Existing employment on the Railyards Area includes approximately 350 employees of Southern Pacific Locomotive Works and a few employees who work at the Amtrak station. In the past, Southern Pacific Transportation Company employed as many as 4,000 employees at the Railyards. Rail support works have been transferred to, or consolidated into, other Southern Pacific facilities elsewhere in the Western states. Southern Pacific Transportation Company has indicated that they may close the Sacramento Railyards Locomotive Works within the next couple of years.

Employment in the Central City

The Central City area is characterized by large concentrations of commercial (retail/service) and office space, many retail establishments and a variety of residential neighborhoods, as compared to the warehouse/industrial space that generally characterizes the Planning Area. In 1989, there were an estimated 80,400 jobs in the Central City (including the Planning Area).[8] Approximately 30 percent of the City's entire inventory of developed retail and service space (48.9 million square feet) and office (56.7 million square feet) space is found in the Central City.

Over the past decade, the Central City has experienced rapid employment growth, and it has been projected that such growth will be sustained during the next 20 years. Current projections for the Year 2010 indicate that there will be an employment increase of nearly 28 percent over existing employment in the Central City. Existing and projected employment for the Central City until 2010 is shown on Table 4.7-6.

Employment in the City of Sacramento

The City of Sacramento is located at the intersection of several major transportation facilities, including highways, railroads, waterways, and airports, which contribute to its status as a regional employment and trade center. The historic economic base of the City includes government services, wholesale trade, and agriculture.[9] The predominant employment and trade opportunities in the City of Sacramento occur within the government, services, retail trade, finance/insurance/real estate and manufacturing sectors.

TABLE 4.7-6
EXISTING AND PROJECTED EMPLOYMENT
FOR THE CENTRAL CITY 1990-2010

Year	Retail Employment	Other[1]	Total Employment
1990	9,008	73,546	82,554
2000	9,985	84,031	94,016
2010	10,957	94,513	105,470

[1] Other sectors include industrial, office, services, government

SOURCE: SACOG, 1991

Employment information concerning City residents from the 1990 census is not yet available. The 1980 census showed that City residents were employed in the following occupations: 35 percent technical, sales, and administrative support; 25 percent managerial and professional; 15 percent service; 12 percent operators, fabricators, and laborers; 10 percent precision production, craft, and repair; and 2 percent farming, forestry, and fishing.

County and Regional Employment

Employment growth in Sacramento County was rapid during the 1980s. Between 1983 and 1988 over 100,000 jobs were added in the County. Forty percent of these jobs were in finance, insurance, and real estate (FIRE), and other service industries. According to the State Employment Development Department (EDD) employment in the County has been growing at an average annual rate of 5.4 percent over the past five years.

The employment centers of Sacramento County draw from the labor pool of people who live in Sacramento, El Dorado, south Placer, and Yolo Counties. The recent employment growth in Sacramento County has exceeded the expansion of the region's labor force. Over the same five-year period (1983 - 1988), the labor force in the rest of the region increased at an average annual rate of 3.7 percent, adding just over 82,300 people. As a result, the unemployment rate in the region fell from 10 percent in 1983 to a low of 4.0 percent in 1989.

Like many other parts of the state and nation, employment growth in Sacramento County has slowed considerably during the past year. This slowed growth is reflected in the trends toward increased unemployment rates shown on Table 4.7-7. The Sacramento region has, however, fared better than the state average in terms of income, employment, and population gains. With the exception of San Diego, the Sacramento area is expected to recover economically at a faster pace than other metropolitan areas in California. Historical and forecasted employment by sector for the County is shown on Table 4.7-8.

TABLE 4.7-7

SACRAMENTO COUNTY UNEMPLOYMENT RATES
(Civilian Labor Force)

	1989	1990	1991
January	5.4	4.6	6.6
February	5.4	4.4	6.9
March	4.6	4.0	7.0
April	5.0	4.3	6.5
May	5.1	4.5	6.5
June	5.5	4.6	7.1
July	5.6	5.0	7.1
August	4.4	4.1	5.7
September	4.9	4.8	N/A
October	4.3	4.6	N/A
November	4.0	5.6	N/A
December	4.0	5.8	N/A

N/A -- Not available.

SOURCE: Employment Development Department, 1991 (NOTE: Rohmer, Liisa. Labor Market Analyst, Employment Development Department, Sacramento, personal communication, October 1991.)

TABLE 4.7-8

EXISTING AND PROJECTED EMPLOYMENT
IN SACRAMENTO COUNTY
(By Industrial Sector)

Industry	Historical 1989	Forecast 1996	Absolute Change 1989-1996
Total, all industries	**457,000**	**537,600**	**80,600**
Total agriculture	3,000	3,300	300
Total nonagriculture	454,000	534,300	86,300
Mining	200	300	100
Construction	25,600	33,100	7,500
Manufacturing	28,700	31,500	2,800
Nondurable goods	12,600	15,000	2,400
Food and kindred	5,000	5,700	700
Printing and publishing	5,600	6,900	1,300
Other nondurable goods	2,000	2,400	400
Durable goods	16,100	16,600	500
Lumber and wood products	2,800	3,000	200
Stone, clay and glass products	800	1,100	300
Primary and fabricated metals	1,900	1,900	0
Other durable goods	10,600	10,600	0
Transportation and public utilities	18,200	21,600	3,400
Wholesale trade	22,100	26,600	4,500
Retail trade	83,600	96,100	12,500
Finance, insurance and real estate	31,500	39,700	8,200
Services	103,800	140,000	36,200
Government[2]	140,200	145,500	5,100
Federal	27,800	26,100	-1,700
State and local	112,500	119,300	6,800

March 1990 Benchmark

[1] Employment is reported by place of work and excludes self-employed persons, unpaid family workers, and those involved in labor-management trade disputes. Data contained in this table are based on 1987 Standard Industrial Classifications. Annual average industry detail may not add to totals because of independent rounding.

[2] Includes all civilian government employees regardless of the activities in which they are engaged.

SOURCE: Employment Development Department, 1991.

In 1991, EDD projected that economic growth would produce 80,600 new jobs in Sacramento County over the 1989-1996 forecast period.[10] Continuing the trends of the 1980s, the service industries and retail trade were expected to provide about one half of these new jobs while construction, manufacturing, finance, insurance, real estate, and government would account for most of the remainder.[11]

Relevant Policies of the General Plan

The Commerce and Industry Land Use Element of the City of Sacramento General Plan addresses land uses that relate to economic development in the City. Many of those policies are evaluated in Chapter 4.1, Land Use. A variety of Economic Development and Employment Opportunities policies are included in the Element and are discussed below.

URBAN GROWTH POLICIES

Policy 3 - Economic Development and Employment Opportunities

It is the policy of the City to actively promote the continued vitality and diversification of the local economy, and to expand employment opportunities for City residents.

Each of the Alternatives would respond to this policy in that they each would result in expansion of employment in the Planning Area. The No Project Alternative would allow for the smallest expansion of employment with the greatest employment growth potential under Alternative 6. The Alternatives that maximize housing development in the Planning Area would generate about 50,000 jobs, while Alternatives 4, 5, and 7 would generate about 70,000 to 80,000 new jobs.

Policy 3a - Downtown Sacramento

It is the policy of the City to provide continued support of private and public efforts that promote the Central City's role as the region's commercial office, employment, and cultural center; at the same time provide close-by housing within identifiable residential neighborhoods.

Economic analyses prepared for the City suggest that substantial redevelopment in the Planning Area would result in an increase in downtown Sacramento's overall capture of the region's future office market. Alternative 1, the No Project Alternative, would not provide this increased capture. Alternative 4, in the middle of the Alternatives in terms of amount of office development, would increase downtown's capture of the region's office market from about 20 percent to about 30 percent.

Policy 5 - Urban Conservation and Infill Areas

It is the policy of the City to promote the reuse and rehabilitation of existing urban development as a means to meet projected growth.

Goal A

Expand local industrial base through diversification and increased manufacturing activities.

Of the Alternatives evaluated in this EIR, only Alternatives 1 and 4 provide potential for significant expansion of industrial and manufacturing activities in the Planning Area. Both of those Alternatives allow for continuation and expansion of existing heavy commercial and light industrial activities in the Planning Area. Alternatives 2, 3, 5, 6, and 7 would not respond to this goal of the General Plan.

Goal B

Provide expanded employment opportunities for City residents, particularly the unemployed and economically disadvantaged.

Policy 1

Strongly encourage major employers to incorporate local hiring preferences.

The RSP and the RBAP are long-range land use plans that do not address specific issues of business operations that are the concern of this policy. In this manner, none of the Alternatives respond to this policy.

Policy 3

The City shall study methods for encouraging major employers to incorporate child care facilities and/or programs to help attract and maintain a productive work force.

None of the Alternatives specifically designate land for the development of child care facilities. However, the Facilities Element and the RBAP have policies that either call for or allow the development of child care facilities in the Planning Area. In the Facilities Element, which addresses development throughout both subareas of the Planning Area, Policy 1.14 requires the provision of child care in all major developments at a level meeting the requirements of the City's Public Sector Child Care Resolution. Further, child care or day care facilities are allowable as conditional uses in a number of land use designations, including heavy commercial and industrial, office, and residential zones.

Cumulative Employment in the Central City

Cumulative development in the Central City would generate employment growth. In Chapter 4.1, Land Use, the scenarios for cumulative development in the Central City were presented (see page 4.1-29). Table 4.7-9, Cumulative Employment Generation in the Central City, presents the range of cumulative employment scenarios that correspond to the cumulative land use scenarios. It should be noted, again, that an assumption has been made that the Central City will capture a maximum of about 30 percent of the regional office market, including the development of the Planning Area. As such, the cumulative downtown office employment scenarios vary depending on the amount of office development in the Planning Area (see Table 4.7-9).

TABLE 4.7-9
CUMULATIVE EMPLOYMENT GENERATION IN THE CENTRAL CITY
(Not Including the Planning Area)

Alternative	1990-2000 Addition	2000-2010 Addition	1990-2010 Change
OFFICE			
Alternative 1	15,424	18,924	34,348
Alternative 2	15,684	15,784	31,468
Alternative 3	14,764	14,504	29,268
Alternative 4	16,076	13,356	29,432
Alternative 5	16,416	14,544	30,960
Alternative 6	6,764	0	6,764
Alternative 7	13,156	7,956	21,112
RETAIL			
	1,333	2,583	3,917

SOURCE: EIP Associates, 1992; Economic and Planning Systems, *Cumulative Development Scenario, Southern Pacific Railyards/Richards Boulevard Projects*, November 1991; City of Sacramento Planning and Development Department, 1991.

Housing

Existing Housing in the Planning Area

Railyards Area

There are currently approximately 15 residential units located in the Alkali Edge portion of the Railyards Area. There are no residential units on the Southern Pacific Railyards site.

Richards Area

There are three small residential neighborhoods present in the Richards Area. They are the Bannon/North B area, in the western part; the Dos Rios area, focused in the area immediately south of Richards Boulevard, east of Dos Rios Boulevard and west of North 12th Street; and the Basler/Dreher area, in the area east of 16th Street and north of North C Street (see Figure 4.7-1).

There are currently 272 housing units in the Richards Area. The Dos Rios housing complex, with 218 units, is the largest housing development in the Planning Area. The other large housing structure in the area is a shelter on North C Street that provides housing to homeless people. The remaining housing units are located in two areas. Approximately 16 units are located on Bannon

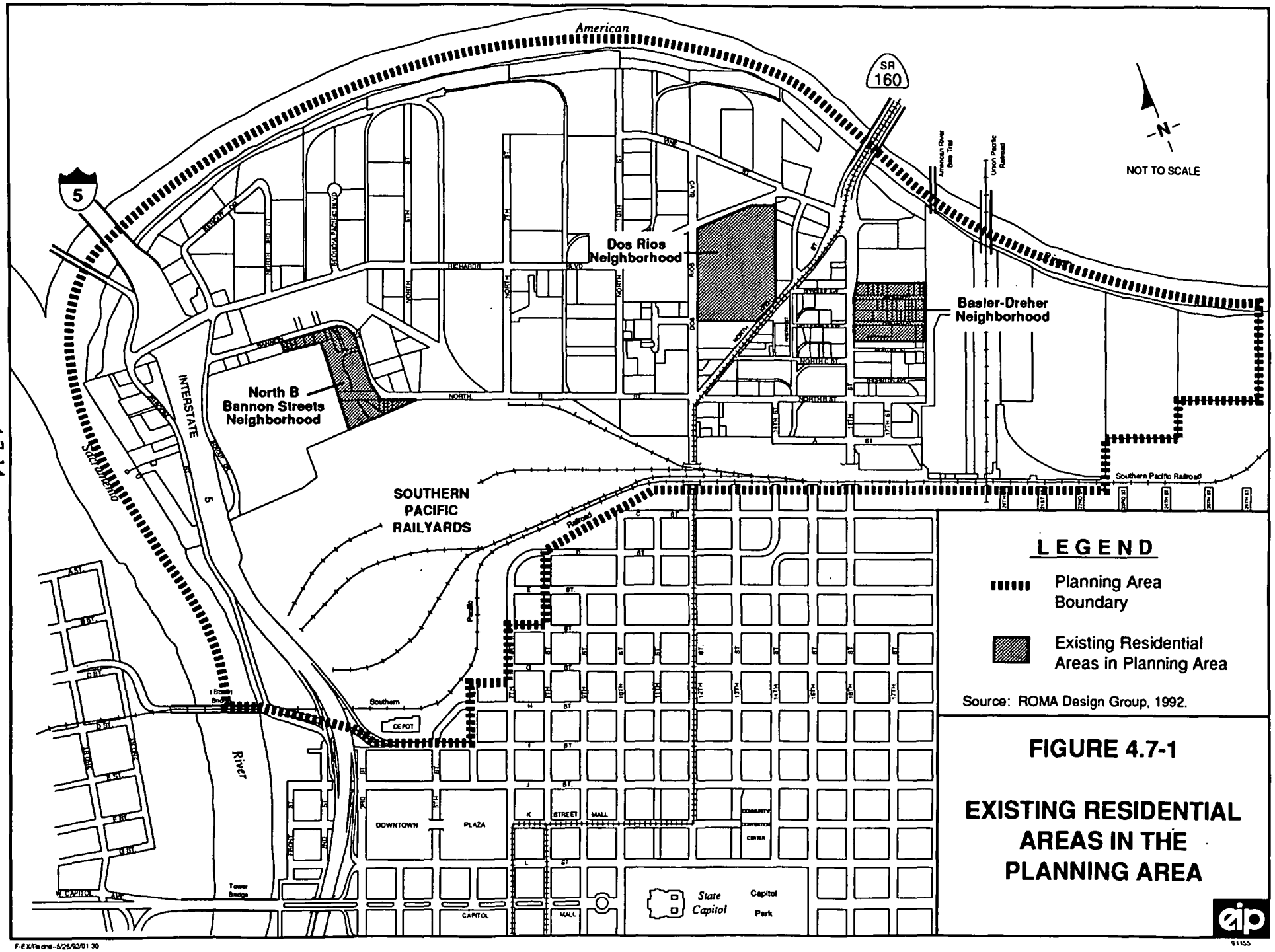


FIGURE 4.7-1

EXISTING RESIDENTIAL AREAS IN THE PLANNING AREA

and North B Streets. Of these, nine are single-family units and eight are duplexes. At the eastern end of the Richards Area, on Basler and Dreher streets, there are approximately 31 residential units of which 19 are single family. Figure 4.7-1 depicts the major concentrations of housing in the Planning Area.

About 80 percent of the housing units in the Richards Area are located in the 218-unit Dos Rios housing complex. Single-family homes account for 9 percent of the units, duplexes for 8 percent, triplexes for 2 percent, and fourplexes for about 1 percent. Housing units in the Richards Area occupy the equivalent of about nine Central City blocks; the overall residential density is just over 14 units per acre (see Table 4.7-10).

TABLE 4.7-10
HOUSING UNITS IN THE PLANNING AREA

Type of Structure	Number of Units	Owner	Renter	Vacant
Single-family	84	23	58	3
Duplex	79	1	68	10
Triplex or Fourplex	93	0	91	2
Five or More Units	9	1	7	1
Other	7	1	6	0
TOTAL	**272**	**26**	**230**	**16**

SOURCE: U.S. Bureau of the Census, 1990, Housing data for Census Tract 53.

Nearly one-half of the housing units in the Planning Area were built before 1940. Over 90 percent were built by 1960. The majority of the Dos Rios housing complex (168 units) was built in 1942 with the remaining 50 units constructed 20 years later, in 1962.

The Redevelopment Agency of the City of Sacramento adopted Resolution No. 90-061 in July 1990 intended to preserve housing uses at the Dos Rios Housing Complex and the Basler/Dreher Street neighborhood.[12]

Condition of Existing Housing Stock in the Richards Area

In October 1990, the Rural California Housing Corporation surveyed housing conditions of over 19,000 Central City housing units by conducting walk-by inspections. Since the units were evaluated from the outside, exterior conditions only were rated. Analyses and classification of the condition of exterior features such as foundation, roof, siding, windows, and doors were the primary subject of the evaluation. Definitions of housing condition classifications are shown in Table 4.7-11.

TABLE 4.7-11
CENTRAL CITY HOUSING STRATEGY STUDY
HOUSING CONDITIONS CLASSIFICATIONS

Classification	Rating Score	Description
Standard/Sound	0-9	Units that are structurally sound, do not need any repair and do not show signs of deferred maintenance.
Need Minor Rehabilitation	10-15	Units that appear structurally sound but show signs of deferred maintenance or upkeep. The house may need a roof replacement or new windows and exterior paint.
Need Moderate Rehabilitation	16-34	Units that require the repair of more than one rated system. This category varies widely, from a unit that needs a replacement floor and new siding to a unit that needs the replacement of the roof, electrical system, windows, and doors.*
Need Substantial Rehabilitation	35-55	Units that require replacement of several major systems, such as complete or partial foundation work, repair or replacement of exterior siding, reconstruction of roof rafters and deck prior to replacing shingles, and complete replumbing.*
Dilapidated	56 or more	Units that are in such serious disrepair that all rated systems need repair, and compliance with the Uniform Building Code would not be cost effective.

* Only exterior elements are surveyed in the system used for this report, but scores in this range generally indicate that interior maintenance/repair needs will be present as well.

Source: Sacramento Central City Housing Strategy Study, Rural California Housing Corporation; Mundie and Associates, December 1991, *Draft Report 1A: Housing Conditions and Vacant Land Inventory*, p.4.

On the average, housing units in the Richards Area are in good condition as compared to the entire Central City housing stock. There is however, a higher percentage of units in the Richards Area that are considered dilapidated; that is, in such serious disrepair that improvements to bring them up to code would not be cost effective, than in the Central City as a whole. Survey results for the Richards Area indicated that over 77.5 percent of the housing units are of standard quality, as compared to 62 percent of the overall Central City housing stock (see Table 4.7-12). Fourteen percent of the units in the Planning Area are in need of moderate rehabilitation, 3.6 percent need minor rehabilitation, 2.0 percent need substantial rehabilitation, and 2.6 percent are classified as dilapidated. According to the Sacramento Central City Housing Strategy Study, housing units in the Dos Rios area are generally in standard condition or in need of minor rehabilitation. Units on Bannon, Basler, and Dreher streets are considered to require moderate rehabilitation. Most of the dilapidated units and units needing major rehabilitation in the Richards Area are located on North B Street.[13]

Household Size

The 1990 U.S. Census reported an average of 2.94 persons per household in the Richards Area (see Table 4.7-13). In the Central City, the average household is size substantially smaller at 1.67 persons per household and in the entire City of Sacramento the average household consists of 2.5 people.[14]

Housing Supply in the Central City

There are about 19,000 existing housing units in the Central City, of which approximately 20 percent are in need of moderate or substantial rehabilitation. The housing supply in the Central City has been eroded during the past few decades by commercial and office development, lack of maintenance, and the perception that the Central City is not safe. The majority (63.5 percent) of housing units in the Central City are contained in structures with five or more units. The number of housing units by type of structure is shown on Table 4.7-14.

The Central City Housing Strategy Study concluded that the existing supply of housing units in the Central City is subject to further reduction for the following reasons:

- Neighborhoods are divided by commercial strips;
- Residential areas are made less attractive by incompatible commercial development;
- Residential land is subject to speculation for office development;
- The Central City is perceived by many as unsafe;
- Low maintenance and other types of disinvestment; and
- Uncertainty about the City's basic commitment to housing.

The Sacramento City Council has taken two significant actions which indicate its intention to encourage housing in the Central City. In policy decisions related to development in the R Street corridor and the Central City Housing Strategy, the Council took strong positions in sup-port of existing and new housing. Table 4.7-15 describes anticipated cumulative housing supply

TABLE 4.7-12
CONDITION OF HOUSING UNITS IN THE CENTRAL CITY
(in percentages)

Neighborhood	Units in Standard Condition	Units Needing Minor Rehab.	Units Needing Moderate Rehab.	Units Needing Substantial Rehab.	Dilapidated Units	Total
Alhambra	57.9	24.0	11.2	2.9	4.1	100.0
Alkali Flat	58.0	7.8	25.2	8.5	0.5	100.0
Broadway	31.7	41.0	15.1	10.8	1.4	100.0
Capitol Area	81.5	14.4	4.1	0.0	0.0	100.0
CBD	56.0	21.2	22.7	0.1	0.0	100.0
Fremont School	62.9	13.8	23.0	0.3	0.0	100.0
Marshall School	52.3	21.9	24.9	0.8	0.2	100.0
Midtown	73.4	7.7	18.2	0.6	0.0	100.0
Newton Booth	70.5	20.0	7.6	1.6	0.3	100.0
R Street	57.3	20.5	22.1	0.2	0.0	100.0
Richards Boulevard	77.5	3.6	14.2	2.0	2.6	100.0
Southside Park	52.2	10.3	22.6	12.4	2.5	100.0
Washington School	61.2	16.1	19.2	3.5	0.0	100.0
William Land School	59.8	19.8	18.5	1.9	0.0	100.0
TOTAL	**61.9**	**17.0**	**18.7**	**2.1**	**0.3**	**100.0**

Source: Sacramento Central City Housing Strategy Study, Draft Report 1A: *Housing Conditions and Vacant Land Inventory*, p.9.; Mundie & Associates, 1991.

TABLE 4.7-13

PERSONS PER HOUSEHOLD BY NEIGHBORHOOD

Neighborhood	Persons per Household
Richards Boulevard	2.94
Alkali Flat	1.92
Central City	1.67
City of Sacramento	2.50

Source: U.S. Bureau of Census, 1990.

TABLE 4.7-14

UNITS BY TYPE OF STRUCTURE IN THE CENTRAL CITY

Single Family	Duplex	Triplex	Fourplex	5 + Units	Total
2,507	1,390	783	2,212	11,988	18,880

Source: Sacramento Central City Housing Strategy Study, Draft Report 1A: *Housing Conditions and Vacant Land Inventory*; Mundie and Associates, December 1990, p.7.

TABLE 4.7-15
CUMULATIVE CITY HOUSING SUPPLY AT BUILDOUT
(Including the Planning Area)

Alternative	Planning Area	Remainder of Central City	City
Alternative 1	272	1,100 - 6,700	76,062
Alternative 2	11,900	1,100 - 6,700	87,690
Alternative 3	11,600	1,100 - 6,700	87,390
Alternative 4	6,930	1,100 - 6,700	82,720
Alternative 5	6,400	1,100 - 6,700	82,190
Alternative 6	3,700	1,100 - 6,700	79,490
Alternative 7	6,960	1,100 - 6,700	82,750

Source: EIP Associates, 1992; City of Sacramento Planning and Development Department, 1991; City of Sacramento Population and Housing *Data by Community Plan Area*, City of Sacramento, March 1991.

in the Central City by alternative, including both housing development in the Planning Area, and in the balance of the City.

The estimate of 1,100 to 6,700 residential units in the Central City outside of the Planning Area is based on analysis by the City and the Central City Housing Strategy. Of the 6,700, 2,000 would be in the R Street Corridor and the remainder would be in the rest of the Central City, excluding the Planning Area, resulting from implementation of the Central City Housing Strategy recommendations.

Other Housing Resources in Proximity to the Planning Area

The Central City provides the most immediate residential context for the redevelopment of the Planning Area. Other areas in close proximity to the Planning Area may be affected by the housing supply and demand characteristics of the Planning Area in the future. Depending upon the future actions related to the extension of light rail and other modes of transit, housing resources in these areas may be critical to the ability of the Planning Area to meet the goals for alternative modes of travel stated in the RSP and the RBAP.

It should be noted that other areas close to the Planning Area may provide substantial housing resources over the life of the redevelopment activity. These areas would include the South Natomas Community Planning Area (about 4,200 units), the North Natomas Community Planning Area (about 25,000 units), and West Sacramento (about 7,000 units).

West Sacramento

Neighborhoods in West Sacramento, immediately across the Sacramento River, include several thousand housing units and may be the site of substantial housing development in the future. In addition, substantial housing development is being planned for the Southport area.

Broderick/Bryte

The City of West Sacramento incorporated in 1987, and included the communities of Broderick and Bryte. Two major developments, Lighthouse Marina and Raley's Landing, are planned in the Broderick/Bryte area. The existing developed portions of the two communities, include over 4,200 existing residential units. With construction of new planned units, the total housing supply in the northeastern portion of the City of West Sacramento will rise to over 7,000 units (see Table 4.7-16).

TABLE 4.7-16
EXISTING AND FUTURE HOUSING SUPPLY
IN WEST SACRAMENTO NEIGHBORHOODS
(In Close Proximity to the Planning Area)

Neighborhood	Existing Units	Future Units	Total Units
Old Broderick/Bryte	3,204	400	3,604
Lighthouse Marina	158	1,881	1,963[1]
Broderick Reuse Area	867	882	1,280[2]
Raley's Landing	0	218	218
TOTAL	**4,229**	**3,381**	**7,065**

[1] This total assumes a loss of 76 existing units.
[2] This total assumes a loss of 469 existing units.

SOURCE: City of West Sacramento, *General Plan Environmental Impact Report*, 1990, Appendix E, Final General Plan Buildout Calculations, p. E-1.

West Sacramento Triangle Specific Plan Area

The West Sacramento Triangle Specific Plan Area consists of approximately 175 acres along the waterfront, south of Tower Bridge. The Specific Plan is currently under preparation and will be released later this year. It is expected that the Specific Plan for this area will allow for a major residential component of several thousand units.

Southport

Southport is a 7,120-acre area located at the southern end of the existing City of West Sacramento. The area is generally in agricultural use, with approximately 1,700 existing residential units. A major planning effort under way in Southport area would result in the urbanization of the entire area; Southport would become a major new residential community. Although plans for Southport are not finalized, the West Sacramento General Plan identifies the potential for a total of about 12,500 units in Southport[15]. Recent planning studies prepared for Southport indicate the potential for as many as 15,000 units.

South and North Natomas Community Planning Areas

The South and North Natomas Community Planning Areas are located immediately to the north of the Planning Area, across the American River. Together, they constitute a major residential resource within a few minutes of the Planning Area. South Natomas has been extensively developed, especially to the east of I-5. At buildout, the South Natomas Community Planning Area is planned to accommodate about 19,000 residential units. The North Natomas Community Planning Area is largely unbuilt at this time. Residential uses in North Natomas are planned, in large part, for the lands north of Del Paso Boulevard. The development of the lands north of Del Paso Road is tied to 50 percent completion of the Arco Sports Park. There is currently a moratorium on residential development in both North and South Natomas tied to flood control and levee improvements.

Within the South and North Natomas Community Planning Areas there are about 3,300 acres of residential land that have yet to be developed. These residences, when built, may serve as a major residential resource that would be tied by light rail transit to the Planning Area.

Housing Affordability

Housing affordability is a function of housing supply, demand, cost, and resident incomes. According to the U.S. Department of Housing and Urban Development, the 1991 median family income in Sacramento County was $39,700.[16]

Median housing prices in the Central City during 1991 range between a $125,500 low in January to a peak of $162,500 in March (see Table 4.7-17).[17]

In an effort to address the housing needs issue, the State requires each regional area government to project housing needs by income group over a five-year period for all local government jurisdictions within the region. Future housing needs are divided into income categories so that each community's share of future housing needs can be distributed regionally by income category. Based largely on the existing income distribution, the future needs distribution is adjusted to avoid concentrations of low or very low income households in a single jurisdiction.

Income categories for a family of four are defined by the U.S. Department of Housing and Community Development as:

TABLE 4.7-17
1991 MEDIAN HOUSING PRICES
IN THE CENTRAL CITY

Month	Median Housing Price
January	$125,500
February	138,000
March	162,500
April	150,000
May	147,000
June	145,000
July	140,000
August	166,200

Source: Sacramento Association of Realtors, 1991

- Very low income - less than 50 percent of median county income
- Low income - less than 80 percent of median county income
- Moderate income - less than 120 percent of median county income
- Above moderate income - greater than 120 percent of median county income

Estimated need for additional housing through 1996 is shown on Table 4.7-18. SACOG has estimated that a total of 16,751 housing units will be needed in the next five years to fulfill the City of Sacramento's share of regional housing needs. Based on the share of housing by income for each jurisdiction in the region, the total housing need for the City would be distributed as follows: 27 percent very low, 17 percent low, 20 percent moderate, and 36 percent above moderate.[18]

The Alternatives would generate demand for housing in the region that would exceed the supply of housing provided in the Planning Area under any of the Alternatives. The addition of such demand in the housing market could lead to increased competition for an increasingly limited number of units. The result, in conjunction with increased demand generated by other employment growth in the region, could be increased housing prices in throughout the region.

TABLE 4.7-18
CITY OF SACRAMENTO HOUSING NEEDS ALLOCATION

Income Category	Estimated Households 1989	% of 1989 Total	Projected Households 1996	% of 1996 Total	1989-96 Increase	% of Increase	Basic Construction Need
Very Low	39,690	28.5	42,092	27.1	2,402	15.0	2,519
Low	23,691	17.0	26,354	17.0	2,663	16.7	2,793
Moderate	27,202	19.5	31,109	20.0	3,907	24.9	4,098
Above Moderate	48,830	35.0	55,830	35.9	7,000	43.8	7,341
Total	**139,413**	**100.0**	**155,385**	**100.0**	**15,972**	**100.0**	**16,751**

SOURCE: Sacramento Area Council of Governments, 1989

Housing Plans and Policies

Housing Element Policies

The Housing Element in the City of Sacramento General Plan contains the following applicable goals and policies concerning the jobs/housing link, affordable housing, special needs housing, and all existing and new housing.

A. EXISTING HOUSING

Goal

Maintain and improve the existing housing stock.

Policy 1

Target housing rehabilitation and preservation programs to those residential neighborhoods most in need of restoration.

Information on housing conditions in the Richards Area, collected as part of the Central City Housing Strategy Study, suggest that substantial numbers of existing housing units in the Planning Area are in need of rehabilitation or replacement. Under Alternatives 2, 3, 5, and 7, policies and land use designations in the Richards Area would provide incentives for such rehabilitation, or for replacement. Alternatives 1 and 6 would not provide these incentives for rehabilitation, and new construction, of housing in the Richards Area. Alternative 4 would

provide for the long-term availability of residential land in the Richards Area to support long-term desires for new construction. The continuation of existing heavy commercial and light industrial businesses in the Richards Area under Alternative 4 could result in the continued deterioration of residential resources in the area.

Policy 3

Remove unsafe housing that is beyond the rehabilitation stage.

Under all of the Alternatives, with the exception of the No Project Alternative, dilapidated housing units would, in the long term, likely be replaced or renovated to meet standards. Under the No Project Alternative such replacement would be unlikely.

Policy 5

Preserve the stock of Single Room Occupancy units (SROs) and replace those which are removed.

In the Richards Area, the development of alternative housing types, such as live/work housing, SROs, senior housing, and transitional housing would be allowed and supported. Such uses are permitted as conditional uses in all residential areas, and are targeted to the area situated between 12th and 16th streets. These alternative residential uses are encouraged in all Alternatives with the exception of Alternative 1 and Alternative 6.

Policy 9

Upgrade established neighborhoods experiencing decline in order to preserve existing housing stock.

The RBAP encourages the preservation and strengthening of the Dos Rios and the Basler/Dreher neighborhoods, while calling for the removal of residential units in the Bannon/North B Street area due to environmental considerations in the vicinity. Policy 5.1 explicitly states that residential uses in the Dos Rios and Basler/Dreher areas should be preserved and in both cases expanded. These policies are compatible with Alternatives 2, 3, 4, 5, and 7. Alternative 1 does not specifically call for the removal of any existing housing units, but does not provide land use designations to support the long term viability of those neighborhoods. Alternative 6, while allowing for the continued presence of the Dos Rios neighborhood, would expand industrial uses into the area immediately adjacent to the Basler/Dreher neighborhood.

B. HOUSING-JOBS-TRANSPORTATION LINK

Goal

Conduct further studies to examine the possibilities and implications of increasing the ratio of housing to jobs in the City of Sacramento.

Policy 1

Refine and implement a jobs-housing balance policy that provides an adequate supply of housing within reasonable commute distance to meet the needs generated by employment growth. This should be done by requiring that sufficient land for residential uses be planned for upon approval of non-residential development.

The current jobs/housing balance in the Central City is 5.7:1. Only Alternatives 2 and 3 would provide a jobs/housing relationship equal to, or superior to, the existing condition. Alternatives 4, 5, and 7 would provide jobs/housing balances ranging from 9.4:1 to 11.1:1. The jobs/ housing relationship in Alternative 6 would be about 27:1, and in Alternative 1 about 82:1.

C. NEW HOUSING

Goal

Meet new housing needs for all income groups.

Policy 2

Grant density bonuses for projects with 25 percent or more of the units set aside for low-income households.

The RBAP and RSP contain housing affordability targets, shown on Table 4.7-19. Density bonuses are not proposed specifically for the Railyards Area or Richards Area. In the RBAP, the residential densities for alternative residential used would be up to 100 units per acre, substantially higher than existing residential developments in the Central City. Given the high residential densities proposed in the Alternatives, density bonuses would not be likely to a feasible method of encouraging the construction of affordable housing in those areas.

TABLE 4.7-19
HOUSING AFFORDABILITY TARGETS

Income Range	Railyards Area	Richards Area	Planning Area Total
Very Low	200	400	600
Low	870	1,020	1,840
Moderate	1,730	2,780	4,510
TOTAL	**2,800**	**4,200**	**7,000**

SOURCE: ROMA Design Group, 1992.

Policy 6

Consider a program to guarantee adequate reserve land for housing where economic forces would otherwise preclude such use, e.g., the downtown core or urban fringe land facing expensive infrastructure improvement costs.

The RSP addresses the issue of the preservation of residential land by a traditional zoning mechanism which would ensure the development of such uses on portions of the Railyards Area. In the Richards Area, the RBAP includes a residential reserve zone that would allow existing uses to continue while preserving land for future residential development.

D. AFFORDABLE HOUSING

Goal

Provide affordable housing for all income groups.

Policy 1

Maintain an adequate reserve of land for housing to suppress inflation which is exacerbated by limited supply.

See discussion above under New Housing, Policy 6. The RSP and RBAP contain affordability targets for the provision of a range of affordable housing (see Table 4.7-19). Strategies for provision of affordable housing in the area focus on subsidy with public funds including tax increment and Housing Trust Fund monies.

Policy 4

Increase residential densities where possible as part of all community plan updates as a way of providing more affordable housing.

In the RSP and the RBAP, and for all Alternatives which include residential designations, permitted densities exceed those anywhere in the City. Production of housing in the area will be more expensive than in other areas and increasing densities would not in itself feasibly reduce housing costs in the area to affordable levels.

E. QUALITY HOUSING

Goal

Provide quality housing that is safe and attractive.

Policy 1

Continue to promote well designed housing through Design Review Board review and the use of established residential design criteria.

The RSP and the RBAP provide residential design criteria addressing a wide range of architectural issues, including setbacks, open space, landscaping, lighting, fenestration and building materials.

F. MIXED HOUSING

Goal

Provide a mixture of housing types and styles throughout the city.

Policy 1

Encourage a mixture of housing types (Single-Family Attached/Detached, Duplex/Halfplex, Condos/Townhouses, Garden/Conventional Apartments, Group Quarters) through current Zoning Ordinance and community planning practices.

The RSP and the RBAP include residential land use designations that could provide a range of housing density and product types. It is not anticipated that single-family detached homes would be developed in any part of the Planning Area. To the extent that some of the Alternatives, including Alternatives 1 and 6, substantially reduce the potential new housing developed, they do not encourage a broadening of the mix of housing types available in the Central City.

Policy 2

Disperse subsidized and special needs housing developments throughout the City wherever possible by giving highest priority to approval of those projects outside neighborhoods with already high concentrations of low income housing.

Alternative residential uses, including the social services campus, which would be included in Alternatives 2, 3, 4, 5 and 7, would allow for a range of housing types which may serve special needs residents. State law requires that 20 percent of tax increment revenues accrued in redevelopment areas be dedicated to low-income housing programs.

Policy 3

Support the Regional Fair Share Housing Allocation Plan annually prepared by SACOG to meet and equitably distribute housing for various income groups.

The RSP and the RBAP do not provide plans or programs for meeting the Regional Fair Share Housing Allocation Plan. Alternatives 2 and 3, which provide a much greater number of housing units, would likely provide greater opportunity meeting the fair share housing allocation. Alternatives 1 and 6 would significantly restrict the City's ability to meet the fair share in the Planning Area.

G. SPECIAL NEEDS HOUSING

Goal

Prevent housing discrimination and provide accessibility and housing opportunities for special needs groups.

Policy 2

Encourage, promote and assist in developing housing for the elderly.

Senior housing, including residential care facilities, is allowed as a conditional use in all residential zones in the Richards Area. Increased density is allowed in the RBAP and could assist in the provision of housing for the elderly.

Policy 5

Construct additional SRO units as needed.

See discussion above under Existing Housing Policy 5.

Policy 6

Promote housing facilities that provide for needs of limited income single parent households, particularly those with conjunctive child care facilities.

See discussion above under Mixed Housing Policy 1. It should also be noted that in the Richards Area, child care facilities would be allowable as conditional uses in all residential zones.

Policy 7

The RBAP identifies an opportunity for the provision of alternative types of housing in the vicinity of the planned social services campus at 12th and A streets. Alternative housing types would include single room occupancy units (SROs), transitional cottage housing aimed at low- and very-low income groups, and live-work housing, possibly in existing warehouse structures.

Provide permanent emergency shelters to meet short-term needs of the homeless.

The RBAP identifies an opportunity for the provision of alternative types of housing in the vicinity of the planned Social Services Campus at 12th and A streets. Alternative housing types would include single room occupancy units (SRO), transitional cottage housing aimed at low- and very-low income groups, and live-work housing, possibly in existing warehouse structures.

Recommended Housing Strategy for the Central City

In 1991, the SHRA published a Draft Sacramento Central City Housing Strategy. The strategy focuses on the needs of the Central City's existing and future residential population and includes a set of policies, such as planning and zoning changes, to promote housing production and preserve existing housing in the Central City. On December 17, 1991 the City Council took action on the strategy, at which time it supported many policies as recommended in the strategy, supported others with modifications, supported others in concept but deferred consideration to a later date, and chose not to support a few policies. Table 4.7-20 summarizes the policy direction of the City Council on the Central City Housing Strategy.

TABLE 4.7-20
CENTRAL CITY HOUSING STRATEGY
FINAL COUNCIL ACTION ON RECOMMENDATIONS

Supported as Recommended	
HP3	Create Transit Station Incentive Zones
HP4	Increase housing capacity of Southern Pacific Railyards site (Council added: with understanding that land use designations should drive the toxics clean-up)
HP5	Increase housing capacity of Richards Boulevard plan
HP6	Adopt architectural and urban design guidelines
HP7	Prepare master EIR for all future residential development
HP8	Streamline the development review process
HP12	Modify zoning regulations for units in rear yards
HP16	Set permit fees for rear yard units at residential rates
HP18	Assemble sites for housing development
HP19	Land cost write downs
HP20	Participate in construction of demonstration projects
HP21	Technical assistance for mixed-use project design
HP23	Loan guarantee program for mixed-use projects
HP24	Require 20 percent affordable housing for projects receiving financial assistance
HP25	Expand first-time buyer loan program target area to include entire Central City
HP26	Continue implementation of SHRA homeless programs
EH2	Adopt new regulations assuring future residential use of R-O sites
EH3	Implement SRO preservation and production plan
EH4	Expand rehab loans program to include above-moderate income households
EH6	Designate entire Central City as target area for CDBG-funded housing rehab
EH7	Publicize and facilitate use of FHA Sec. 203(K) mortgage program
EH8	Adopt guidelines for housing additions
EH9	Use design review to ensure compatibility of new housing units
RIA1	Improve residential street lighting
RIA2	Zone R Street site C-1 for future neighborhood shopping center
RIA4	Maintenance and planting of street trees
RIA5	Provide public mini-park spaces
RIA9	Work with school district to assure no other school sites are sold
RIA11	Support of Entertainment and Cultural District program
RIA13	Promote neighborhood identity through signage
RIA14	Work with apartment owners to finance and implement a marketing program
RIA17	Sponsor street and crafts fairs
RIA18	Facilitate outdoor performances and farmers' markets in parks
RIA19	Improve visual and physical linkages
F1	Allocate up to 50 percent of future TI to housing
F2	Continue implementing Housing Trust Fund Ordinance
C2	Require submittal of annual housing progress report

TABLE 4.7-20
CENTRAL CITY HOUSING STRATEGY
FINAL COUNCIL ACTION ON RECOMMENDATIONS

Supported with Modifications	
HP1	Residential rezoning moratorium - modify to no net loss within Merged Downtown Redevelopment Area
HP2	Rezone per map changes (see Appendix C)
HP9	Designate entire Central City as infill area for water fee waiver - modify to apply to residential sites
HP10	Fund infrastructure improvements for residential projects - as funding allows
HP11	Support voluntary parking reduction - on case-by-case basis
HP22	Require housing for new redevelopment projects - suggest making housing a stated priority
EH1	Rezone R-O sites to R-3A - suggest higher densities for specific sites
EH5	Increase loan limit for rehab to $45,000
RIA3	Facilitate construction of shopping center - work with private developers to accomplish
RIA6	Retain existing streets and alleys in public use - evaluate on case-by-case basis
RIA12	Sponsor neighborhood improvement competition - support limited program
F5	Adopt jobs housing policy based on current 5.7:1 jobs/housing ratio - for the Old City only
F6	Adopt new housing linkage program - suggest modified approach based on jobs/housing balance; study linkage program in FY1992-93
C1	New Central City housing coordinator - new Associate Planner position located in City Planning and Development Department to implement strategy
Deferred for Further Study	
HP13	Modify zoning regulations to allow lot splits for alley units
HP14	Modify R-1B zone regulations to allow an additional unit
HP17	Waive construction-related fees for rear lot projects
HP27	Property tax abatement
RIA7	Study feasibility of conversion of one-way streets in residential neighborhoods to two-way
RIA8	Study feasibility of free transit zone in Central City
RIA15	Add park in R Street Corridor - defer to R Street Implementation Plan and future development within the Corridor
F3	Commit HTF monies to Central City - defer pending lawsuit
F4	Designate entire Central City as CDBG target area
F7	Adopt new development fee similar to HTF - defer pending lawsuit; suggest modifying existing HTF Ordinance build option
F8	Establish FAR and height restrictions in C-3 zone to create housing incentives - defer to Capitol View Protection Study
Did not Support	
HP15	Discontinue alley repaving
RIA10	Provide police "kobans"
RIA16	Acquire half-block segments adjacent to Union Pacific railroad tracks for strip park

In addition, an Historic Preservation Element was added to the Strategy as recommended by both the City Planning and Sacramento Housing & Redevelopment Commissions.
SOURCE: City of Sacramento Planning and Development Department, 1991.

Jobs/Housing Relationship

A jobs/housing relationship measures the relative balance or imbalance of jobs in relation to the housing resources within a given commuting area. Jobs/housing balance describes a condition in which the housing supply of a geographic area accommodates the persons employed within that area. Balance between employment opportunities and resident workers is indicative of an overall land use is characterized by (1) an adequate residential population to serve as the customer base for area businesses, (2) an adequate production and trade capacity to meet the consumption needs of residents, and (3) an adequate tax base to support local government services.

The ratio of number of jobs to number of housing units is a measure of jobs/housing balance that is crude, at best. Key variables involved in defining and determining jobs/housing balance include the boundaries of the analysis area, its transportation characteristics, the composition of its households, and the characteristics of its housing stock.

The larger the region, the greater the likelihood that it provides job opportunities for its residents and housing opportunities for its workers in proportion to each other. That condition applies, for example, to the State of California as a whole, since the vast majority of the state's job holders live here, and the vast majority of the state's employed residents work here. However, the smaller the analysis area and the more specialized its land use pattern, the less likely that jobs-housing balance can be achieved.

The City of Sacramento has established a goal of seeking a relative balance between jobs and housing in the City. The intent of this goal is to address a wide range of environmental considerations that are generally associated with an imbalance of jobs and housing. It is generally believed that with a balance of jobs and housing, City residents can more easily use alternative travel modes to commute to work and shop. Such alternative travel modes can include walking, riding transit, etc., and can be expected to lead to a reduction in traffic congestion as the number of people needing to drive to work, and the length of work commute trips, decreases. Similarly, impacts on air quality can be reduced through a jobs/housing balance by reducing the number of automobile trips and the length of those trips.

An optimal jobs/housing ratio is possible when the number and type of job opportunities in an area are in balance with the number, type and cost of housing units that are located within a reasonable commuting distance from employment centers. Achieving a jobs/housing balance between 0.75 and 1.50 could result in a match between jobs and resident workers that benefits both workers and the environment.

Existing Jobs/Housing Ratio in the Central City

In 1989, the City of Sacramento Planning and Development Department reported that there were 80,400 jobs and 18,461 housing units in the entire downtown area, resulting in an imbalance between jobs and housing in the Central City. The jobs/housing ratio for the Central City was calculated as being 5.7 jobs per housing unit in the *Recommended Housing Strategy for the Central City* (see Table 4.7-21).

Since the Central City is the principal job center for the region, it is to be expected that employment would be significantly greater than housing. However, the City has established a policy to increase housing opportunities in the Central City, to reduce commuting and to increase the diversity of activities in the Downtown area.

TABLE 4.7-21
EXISTING JOBS/HOUSING BALANCE IN THE CENTRAL CITY

		City Planning Dept Estimates	
	U.S. Census 1980	1989	Revision 1990
Housing Units	19,116	18,461	19,139
Households	16,816	17,538[1]	
Population	29,465	30,692[2]	33,493
Employed Residents	11,924	12,452[3]	
Employed Residents per Household	0.71	0.71[4]	
People per Household	1.75	1.75[4]	
Jobs	NA	80,400	105,721[5]
Jobs per Housing Unit	NA	4.4	5.7
Jobs per Household	NA	4.6	6.0
Jobs per Employed Resident	NA	6.5	8.5

[1] Based on an estimated 5 percent vacancy rate.
[2] Based on 1980 people per household and 1989 household estimate.
[3] Based on 1980 employed residents per household and 1989 household estimate.
[4] Assumes 1980 proportion.
[5] The 1990 revision to the number of jobs was suggested by the City Department of Planning and Development due to a low 1989 estimate.

SOURCE: *Recommended Housing Strategy for the Central City*; Mundie & Associates, May 1991.

The current jobs/housing balance for the City of Sacramento was calculated by using the most recent figures available concerning employment, housing, and the number of employed residents per household.[19] The future jobs/housing balance was estimated for the Planning Area for each Alternative and phase by using the employment density assumptions provided by the General Plan and an average household size of 1.19.

Under the Alternatives, a range of 19,600-110,080 new jobs and 283-11,900 new housing units would be generated in the Planning Area over a minimum 35 year period. Table 4.7-22 shows the future number of housing units, employed residents, jobs, and jobs/housing ratio for each Alternative and phase. As an area that now contains land uses that are primarily oriented to employment rather than residential uses, the jobs/housing ratio has a higher imbalance than the Central City as a whole.

According to the 1980 U.S. Census, there were an average of 0.71 workers per household in the Central City as a whole.[20] In the General Plan calculation of the jobs/housing balance, jobs were matched to housing units rather than to the number of workers per household. For this analysis, the number of workers per household was calculated by subtracting the expected number of school children and retirees from the average Central City household size of 1.67, resulting in 1.19 workers per household.[21] This figure has been used in this EIR for estimates of employment-generated housing demand.

Balancing Jobs and Housing in the Central City

As the principal job center for the region, the Central City is not considered an appropriate geographic area in which to attempt a standard jobs/housing range of 0.75:1 to 1.50:1. However, to minimize the problems associated with a jobs/housing imbalance, such as traffic congestion and decreased air quality, the City has established a policy to increase housing opportunities along with employment growth. For this reason, the *Recommended Housing Strategy for the Central City* report (adopted in December 17, 1991) states the maintenance of the existing jobs/housing ratio of 5.7:1 should be the goal for the "Old City" portion of the Central City.

Jobs/Housing Balance Policies

Some California communities are designed with extremely high jobs/housing ratios. The cities of Emeryville, Sand City, Commerce, and Industry, for example, are intended to produce high tax base employment-oriented "communities." Other cities are designed primarily as "bedroom communities."

Intended to aid in the long-range land use planning, State planning law (Government Code Section 65913.1) requires municipalities to zone "sufficient vacant land for residential use...in relation to zoning for non-residential use..." Additionally, State housing element law (Government Code Article 10.6) requires that population and employment projections be considered in estimating housing need.

TABLE 4.7-22

JOBS/HOUSING RATIOS BY PHASE AND ALTERNATIVES

	2000				2010				BUILDOUT			
	Housing Units	Resident Employees[4]	Jobs[1]	Jobs/ Employed Resident Ratio	Housing Units	Resident Employees[4]	Jobs[2]	Jobs/ Employed Resident Ratio	Housing Units	Resident Employees[4]	Jobs[3]	Jobs/ Employed Resident Ratio
Alt 1	272	324	23,850	73.6:1	272	324	25,233	77.9:1	272	324	324	78.5
Alt 2	2,282	2,716	21,840	8:1	5,882	7,000	44,355	6.3:1	11,900	14,161	55,300	3.9:1
Alt 3	2,082	2,478	25,127	10.1:1	5,632	6,702	48,972	7.3:1	11,600	13,804	62,967	4.6:1
Alt 4	272	324	22,082	68.2:1	3,072	3,656	46,507	12.7:1	6,930	8,247	77,673	9.4:1
Alt 5	1,272	1,514	21,154	14:1	3,272	3,894	43,909	11.3:1	6,380	7,592	76,794	10.1:1
Alt 6	1,782	2,121	27,727	13.1:1	3,702	4,405	69,980	15.9:1	3,700	4,403	117,670	26.7:1
Alt 7	1,402	1,668	22,702	13.6:1	4,102	4,881	53,643	11:1	6,960	8,282	92,106	11.1:1

[1] Includes Existing to Remain Jobs and all jobs created in the Planning Area by Year 2000.
[2] Includes Existing to Remain jobs and all jobs created in the Planning Area by Year 2010.
[3] Includes Existing to Remain jobs and all jobs created in the Planning Area by Buildout.
[4] Assumes 1.19 workers per household; see page 4.7-9 for the derivation of this figure.

SOURCE: EIP Associates, 1992.

The City of Sacramento has chosen to encourage the location of housing near jobs within a reasonable commute distance. With the exception of North Natomas, specific ratios have not been adopted, pending further studies.

A number of planning policy documents adopted by the City address the issue of jobs/housing relationship. The overall jobs/housing policies of the General Plan are:

- Residential uses should be located near employment centers;
- Central City residential neighborhoods should be used as a housing resource near downtown employment centers;
- Further studies should be conducted to enhance the ratio of housing to jobs, i.e., to reduce the jobs/housing ratio;
- Sufficient residential land uses should be planned upon approval of non-residential development.

Policy 2: Population and Housing Growth

It is the policy of the City that adequate housing opportunities be provided for all income households and that projected housing needs be accommodated.

The location of residential land use in relationship to employment centers may be a significant factor in reducing traffic and meeting local housing needs.

Policy 3a: Downtown Sacramento

It is the policy of the City to provide continued support of private and public efforts that promote the Central City's role as the region's commercial office, employment, and cultural center; and at the same time provide close-by housing within identifiable residential neighborhoods.

Residential neighborhoods within the Central City can provide needed housing options for those choosing to be near the employment and activity hub, will offer contrasting land use to stimulate variety in the urbanscape, and afford many the opportunity to reduce dependency on auto usage.

General Plan: Residential Land Use Element

Goal E:

Provide adequate residential opportunities to meet the City's required fair share of the region's housing needs.

Policy 3:

Since the City is a major employment center, it is expected that housing of many workers will be located within the City. In an effort to minimize commute time, efforts to provide housing opportunities within a reasonable distance of employment centers should be considered.

General Plan: Housing Element

Goal B:

Conduct further studies to examine the possibilities and implications of increasing the ratio of housing to jobs in the City of Sacramento.

Policy 1:

Refine and implement a jobs/housing balance policy that provides an adequate supply of housing within reasonable commute distance to meet the needs generated by employment growth. This should be done by requiring that sufficient land for residential uses be planned for upon approval of non-residential development.

North Natomas Community Plan

The North Natomas Community Plan (1986) does include an objective of achieving a jobs/housing balance (page 13). For the City portion of the North Natomas Plan area, the jobs/housing ratio is 1.8 (52,855 employees/29,284 dwelling units), resulting in a 66 percent housing/jobs "balance." [Table 5 on p. 14 shows that, including the County portion, the Community Plan area would generate 66,865 employees and 32,618 housing units, expressed in the Plan as a 58 percent housing/jobs "balance."] The Plan further states that the jobs for Phase 1 development (south of Del Paso Boulevard) should be linked to housing development on residential vacant land in North Sacramento.

Housing Trust Fund

The City enacted a Housing Trust Fund Ordinance which assess a fee against employment-generating projects. The revenue from this fee is to be used for subsidizing low income housing. The justification for this fee is based on the linkage between increased commercial development and the need for low income housing. Moreover, a requirement of the Ordinance is to cause construction of the housing within 7 miles of the employment site. In lieu of paying the fee, developers may choose the option of constructing housing.

Mixed Use Policies in the General Plan

The General Plan addresses mixed-use development as one appropriate method of contributing to a positive jobs to housing relationship.

Policy 2 - Population and Housing Growth

There are locations where a mixture of residential, neighborhood related commercial/office, and employment opportunities should be provided. The percentage of each type of use should be determined in a manner where each type of use adequately supports other land use components.

Residential Land Use Element, Goal E, Policy 3:

Establish guidelines for mixed use projects and allow these uses in urbanized areas of the City where intensive development is planned.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The adverse environmental implications of changes to population, employment and housing are characterized by increased traffic congestion, transit crowding, air pollution, demand for water, wastewater generation, and so on. These impacts are evaluated and described in other sections of this EIR.

Population

The focus of the population analysis in this EIR is to compare the amount and type of growth under the Alternatives with the policies of the City's planning documents. For the purposes of this EIR, the increase in population is identified for each Alternative and compared to planned growth in the area.

Employment

Similarly, the focus of this employment analysis is to compare the amount and type of employment growth under the Alternatives with the type of employment growth anticipated under City policies.

Housing

The housing analysis assesses consistency with housing plans in the region, the potential displacement of residents through the redevelopment process, and effects on housing affordability due to changes in housing supply and demand. Significant impacts on housing are identified where:

- the housing components of any Alternative would be unsupportive of the general direction of the City's, SHRA's, and SACOG's housing plans;
- implementation of the Alternatives may result in the potential displacement of existing residential units or group quarters; or
- the increased demand for housing affordable to very-low-income households may not be matched by the increased supply of housing affordable to very low income households.

Method

Population

Population that would be generated by implementation of the proposed Alternatives was compared to the existing population of the Planning Area and the Central City Community Plan

Area, as well as to projections for the Planning Area and the Central City Community Plan Area by the City of Sacramento and SACOG. Estimated population for each Alternative (by phase) is shown on Table 4.7-23.

TABLE 4.7-23
ESTIMATED POPULATION INCREASES IN THE PLANNING AREA BY PHASE

Alternative	Existing	Projected Change 1990-2000	Projected Change 2000-2010	Projected Change 2010-Buildout	Net Change 1990-Buildout
1	1,646	-597	-35	N/A	-632
2	1,646	3,357	6,012	10,053	19,422
3	1,646	3,023	5,929	9,970	18,921
4	1,646	0	4,309	6,814	11,123
5	1,646	1,670	3,340	5,210	10,220
6	1,646	2,522	3,206	0	5,728
7	1,646	1,887	4,509	4,776	11,172

Source: ROMA Design Group; U.S. Bureau of Census; *City of Sacramento General Plan;* EIP Associates, 1992.

Employment

Employment that would be generated by implementation of the Alternatives was compared to the existing employment in the Planning Area and the Central City Community Plan Area, as well as to projections for the Planning Area prepared by the City of Sacramento and SACOG. Employment generation factors for the project were derived from the City of Sacramento General Plan and are shown on Table 4.7-24. These employment generation factors were applied to projected increases in land uses within the Planning Area. Estimated employment generation for each Alternative (by landuse type) is shown on Table 4.7-25. Change in Planning Area employment over time is shown on Table 4.7-26.

TABLE 4.7-24
EMPLOYMENT GENERATION FACTORS

Employment-Generating Use	Employment Density (per employee)
Office	250 sq. ft.
Highway Commercial/Retail	300 sq. ft.
Heavy Commercial/Light Industrial	500 sq. ft.
Hotel	1 room
Cultural/Institutional	200 sq. ft.

SOURCE: City of Sacramento General Plan Technical Appendix, Appendix 1, Assumptions for Existing Uses and Vacant Land, pages 1-10.

Interim construction employment generated by development in the Planning Area is assumed to be equal to one person-year of construction-related employment for every $90,000 of construction value. This estimate is based on an evaluation of data published by the U.S. Department of Commerce, and has been adjusted to reflect higher costs in California. Construction costs are assumed to equal $80 per square foot of office and retail/highway commercial development, $50 per square foot of warehouse/heavy commercial space, and $100 per square foot for hotel and residential space. This EIR assumes that each hotel room would be equal to approximately 1,000 square feet (to account for meeting rooms and lobby space) and each residential unit would be equal to approximately 1,200 square feet.

Housing

Housing Supply and Demand

Housing supply that would be generated by implementation of the Alternatives was compared to the existing housing demand generated by new and existing employment in the Planning Area. The analysis of increased housing supply and demand was prepared for the Planning Area, the City and the region. Information developed for the Central City Housing Strategy provides direction as to the potential demand for housing within the Central City, but it would be highly speculative to attempt to determine housing demand in 2010 in a small geographic subarea such as the Central City. The Central City Housing Strategy Study suggests that anywhere from 10 to 21 percent of those employed in the Central City would be interested in living in the Planning Area. Further, it estimates that approximately 37 percent of downtown employees would be interested in living in the Central City, if it were as affordable as where they live now. Approximately 8 percent of those employed in the Central City now live there.

TABLE 4.7-25
EMPLOYMENT GENERATION IN THE PLANNING AREA
(By Phase and Use)

	Office	Highway Commercial	Heavy Commercial/ Industrial	Cultural/ Institutional	Hotel	Total
Existing to Remain						
Alternative 1	3,400	867	13,200	0	1,250	18,717
Alternative 2	3,400	167	2,700	0	1,250	7,517
Alternative 3	3,400	167	2,700	0	1,250	7,517
Alternative 4	3,400	167	4,000	0	1,250	8,817
Alternative 5	3,400	867	2,700	0	1,250	8,217
Alternative 6	3,400	167	0	0	1,250	4,817
Alternative 7	3,400	167	2,700	0	0	6,267
1990 - 2000						
Alternative 1	4,000	133	1,000	0	0	5,133
Alternative 2	13,240	833	0	0	250	14,323
Alternative 3	14,160	500	0	0	250	14,910
Alternative 4	12,848	417	0	0	0	13,265
Alternative 5	12,520	167	0	0	250	12,937
Alternative 6	22,160	500	0	0	250	22,910
Alternative 7	15,768	417	0	0	250	16,435
2000 - 2010						
Alternative 1	0	133	1,000	0	250	1,383
Alternative 2	20,040	1,400	0	325	750	22,515
Alternative 3	21,320	1,400	0	375	750	23,845
Alternative 4	22,468	1,357	0	850	750	25,425
Alternative 5	21,280	300	0	425	750	22,755
Alternative 6	39,320	1,333	0	850	750	42,253
Alternative 7	27,868	1,473	0	850	750	30,941
2010 - Buildout						
Alternative 1	0	200	0	0	0	200
Alternative 2	8,880	1,600	0	325	140	10,945
Alternative 3	11,880	1,600	0	375	140	13,995
Alternative 4	27,276	1,750	0	750	390	30,166
Alternative 5	31,960	500	0	425	0	32,885
Alternative 6	45,200	1,600	0	750	140	47,690
Alternative 7	35,956	1,617	0	750	140	38,463

SOURCE: EIP Associates, 1992

TABLE 4.7-26

EMPLOYMENT CHANGE IN THE PLANNING AREA
(By Phase and Alternative)

Alternative	Existing	Year 2000[1]	Change from Existing[2]	Year 2010[3]	Change From Year 2000	Buildout[4]	Change From Year 2010	Change From Existing
Alt. 1	9,355	23,850	14,495	25,233	1,383	25,433	200	16,078
Alt. 2	9,355	21,840	12,485	44,355	22,515	55,300	10,945	45,945
Alt. 3	9,355	25,127	15,722	48,972	23,845	62,967	13,995	53,612
Alt. 4	9,355	22,082	12,727	46,507	24,425	76,673	30,166	67,318
Alt. 5	9,355	21,154	11,799	43,909	22,755	76,794	32,885	67,439
Alt. 6	9,355	27,727	18,372	69,980	42,253	117,670	47,690	108,315
Alt. 7	9,355	22,702	13,347	53,643	30,941	92,106	38,463	82,751

[1] Existing to remain plus Phase 1 development.
[2] Year 2000 minus Existing (9,355).
[3] Year 2000 plus Phase 2 development.
[4] Year 2010 plus Phase 3 development.

SOURCE: EIP Associates, 1992.

Estimated housing supply for each alternative by phase is shown on Table 4.7-27. (Estimated employment generated-housing demand for each alternative is shown in Table 4.7-28.)

As is described in Table 4.7-29, all of the Alternatives would result in a deficit of housing supply in relation to employment-generated housing demand. The No Project Alternative would result in the smallest overall deficit, despite the fact that it would generate no new housing, because it would generate the lowest overall level of new employment. Of the Alternatives that result in significant redevelopment activity in the Planning Area, Alternatives 2 and 3 would generate the lowest deficit, although even with those Alternatives the demand for housing would exceed housing available in the Planning Area by about 40,000 units.

Housing demand from the Planning Area would represent a substantial element of regionwide housing demand during the planning period. Although employees from the Planning Area would choose to live throughout the Sacramento region, it should be noted that demand from the Planning Area represents from about 40 percent to about 80 percent of the increased residential holding capacity accounted for in the proposed Sacramento County General Plan Update.

TABLE 4.7-27
PROJECTED HOUSING UNITS IN THE PLANNING AREA BY PHASE

Alternative	Existing to Remain	1990-2000	2000-2010	2010-Buildout	Total	Overall Density[1]
Alternative 1	272	0	0	0	272	0.2
Alternative 2	272	2,010	3,600	6,020	11,900	9.0
Alternative 3	272	1,810	3,550	5,970	11,600	8.8
Alternative 4	272	0	2,580	4,080	6,930	5.3
Alternative 5	272	1,000	2,000	3,120	6,390	4.8
Alternative 6	272	1,510	1,920	0	3,700	2.8
Alternative 7	272	1,130	2,700	2,860	6,960	5.3

[1] Units per acre.

SOURCE: EIP Associates, 1991; ROMA Design Group, 1991.

TABLE 4.7-28
EMPLOYMENT-GENERATED HOUSING DEMAND[1] BY ALTERNATIVE

Alternative	Existing to Remain	1990-2000	2000-2010	2010-Buildout	Total
Alternative 1	15,700	4,300	1,200	200	21,400
Alternative 2	6,300	12,000	18,900	9,200	46,400
Alternative 3	6,300	12,500	20,000	11,800	50,600
Alternative 4	7,400	11,100	21,400	25,300	65,200
Alternative 5	6,900	10,900	19,100	27,600	64,500
Alternative 6	4,000	19,300	35,500	40,100	98,900
Alternative 7	5,300	13,800	26,000	32,300	77,400

[1] Assumes 1.19 employees per household.

SOURCE: EIP Associates, 1992.

TABLE 4.7-29
PROJECTED HOUSING SUPPLY/DEMAND

Alternative	Housing Supply	Housing Demand	Surplus/ (Deficit)
Alternative 1	272	21,400	(21,130)
Alternative 2	11,900	46,400	(34,500)
Alternative 3	11,600	50,600	(39,000)
Alternative 4	6,930	65,200	(58,270)
Alternative 5	6,400	64,500	(58,100)
Alternative 6	3,700	98,900	(95,200)
Alternative 7	6,960	74,400	(67,440)

Source: EIP Associates, 1992, Tables 4.7-27 and 4.7-28.

Although the housing demand generated by the Alternatives would exceed the housing supplied in the Planning Area, the Sacramento region is expected to undergo substantial residential development during the period of redevelopment of the Planning Area. Housing choice patterns of the future employees in the Planning Area would cause the housing demand to be spread throughout the region, including elsewhere in Sacramento County, south Sutter County, El Dorado County, Placer County, and West Sacramento and other locations in Yolo County.

Housing Affordability

The housing affordability analysis in this EIR was prepared using two different methodologies, one prepared by the City, which serves as the basis of the Housing Trust Fund, and another prepared by the planning team for the RSP and RBAP. The first analysis presented in the EIR was prepared using the City's *Commercial and Industrial Development and Very Low Income Housing Nexus Analysis*, developed for the City by Keyser Marston Associates. This study analyzed income and household sizes by type of employment, resulting in factors for demand for housing affordable to very-low-income households resulting from commercial and other non-residential development. These factors are presented in Table 4.7-30.

Table 4.7-31 shows the estimated demand for housing affordable to Very Low Income Households.

TABLE 4.7-30
EMPLOYMENT-GENERATED VERY LOW INCOME HOUSEHOLDS
(Based on City Nexus Study)

Type of Use	Very Low Income Households per 100,000 SF
Office	18.4
R at D	13.4
Manufacturing	10.7
Warehouse	3.3
Retail	33.7
Hotel	15.2

Source: *Sacramento Commercial and Industrial Development and Very Low Income Housing Nexus Analysis* prepared for the City of Sacramento Housing and Redevelopment Agency by Keyser Marston Associates Inc., November 25, 1987.

TABLE 4.7-31
EMPLOYMENT-GENERATED VERY LOW INCOME HOUSING DEMAND
(Based on City Nexus Study)

Alternative	Existing to Remain	1990-2000	2000-2010	2010-buildout	Total
Alternative 1	1,100	300	100	0	1,400
Alternative 2	400	700	1,100	600	2,900
Alternative 3	400	700	1,200	0	3,100
Alternative 4	0	600	1,300	1,500	3,980
Alternative 5	500	600	1,100	1,500	3,700
Alternative 6	300	1,100	2,000	2,300	5,700
Alternative 7	300	800	1,500	1,900	4,500

SOURCE: *Sacramento Commercial and Industrial Development and Very Low Income Housing Nexus Analysis* prepared for the City of Sacramento Housing and Redevelopment Agency by Keyser Marston Associates Inc., November 25, 1987; EIP Associates, 1992.

An alternate approach to the analysis of housing affordability was prepared by Economic and Planning Systems (EPS) as part of the housing feasibility analysis for the RSP and RBAP. The EPS analysis used a different approach to the assessment of affordability which allows the differentiation between demand for housing by all income groups. The analysis prepared by EPS draws conclusions very different from the City's approach and is provided here for informational purposes only.

The EPS analysis made different assumptions about workforce compositions and income levels, making its results not comparable to the City Nexus study methodology. For example, the EPS study divided office employees into FIRE (Finance, Insurance, and Real Estate) and Business Service, making different assumptions about the percentages of professionals and managers for the two categories. The City Nexus study assumes that 46 percent of all office workers are professional/technical, while the EPS study assumed for FIRE workers (assumed to be 50 percent of all office workers) that 25 percent would be professionals/managers. Another significant difference is that the Nexus study accounts for employees living outside the City and for two-income households. The EPS study estimated the percentage distribution of project employees by income shown on Table 4.7-32. Applying these percentages to the Alternatives, a comparison of the potential demand for housing at all ranges of affordability is possible (see Table 4.7-33).

TABLE 4.7-32
EMPLOYEE INCOME LEVEL DISTRIBUTION
(EPS Study Method)

Income Level	Employee Distribution
Very Low Income	15.0%
Low Income	18.4%
Moderate Income	22.2%
Above Moderate Income	44.4%
TOTAL	**100%**

Source: *Housing Feasibility Analysis for the Richards Boulevard Redevelopment Area*, Economic and Planning Systems, February 1992

[redacted]

2 through 7 would generate population increases in excess of the total increase in resident population projected for the Central City under current City and regional plans. The environmental impacts associated with this increase in population, such as increased air emissions and traffic congestion, are identified elsewhere in this document. The impact associated solely with the increase in population is considered to be less-than-significant.

Mitigation Measures

4.7-1 *None required.*

4.7-2 Population increases in the Planning Area under the Alternatives could contribute to population growth in the City of Sacramento.

A-1 Alternative 1 would result in a net reduction in the population in the Planning Area (see Table 4.7-1). This is considered to be a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 would increase the overall residential population holding capacity of the City, potentially increasing the population of the City of Sacramento. This is considered to be a ***less-than-significant impact.***

SACOG projections for the City show a substantial increase in population between 1990 and 2010 (see Table 4.7-1). The SACOG projections do not account for the projected increases in Planning Area population due to redevelopment activity. Increases in residential units in the Planning Area may allow for increased population in the City beyond that previously projected by SACOG. However, it is likely that the population of the region will not increase since the housing proposed in the Planning Area is not likely to attract new residents to the region who would not otherwise choose to live here. As such, the effect of the Alternatives may be to cause some redistribution of population but not an absolute increase in population.

Mitigation Measures

4.7-2 *None required.*

Employment

Permanent Employment Growth

4.7-3 Implementation of the Alternatives would result in an increase to existing employment opportunities in the Planning Area.

Existing and potential employment in the Planning Area are shown on Tables 4.7-4 and 4.7-5. At present, the majority of job opportunities occur in the warehousing and heavy commercial

sectors of employment. Except for Alternative 1 (No Project Alternative), this kind of employment would be greatly reduced under development of the Alternatives. Because the City of Sacramento has designated large areas of vacant land in the North Natomas and North Sacramento Community Plan Areas for heavy commercial warehouse and industrial uses, such uses in the Planning Area could be relocated to those areas. Employment opportunities that would potentially occur as a result of the proposed project are shown on Tables 4.7-25 and 26. As the development of employment-generating uses will be market driven, an impact associated with employment opportunities creating a labor shortage is not expected to occur. There is no Alternative that would cause employment levels to exceed employment projected for the City of Sacramento. Total employment potential and location of the employment-generating uses for each Alternative and phase are summarized below.

Table 4.7-34 describes cumulative employment growth in the Central City under each Alternative. Under the Alternatives, the Planning Area would generate from 30 to 90 percent of future employment growth in the downtown area.

A-1 Implementation of Alternative 1 would result in an increase of about 6,700 jobs over existing jobs in the Planning Area. During Phase 1 of Alternative 1 there would be an increase of 5,000 jobs in the Planning Area. Implementation of Phases 2 and 3 of Alternative 1 would result in very small growth in new job opportunities in the Planning Area, with the addition of only about 1,600 jobs during the period. With Alternative 1, the Planning Area would generate 30 percent of the total cumulative employment total of about 54,350 employees. This is considered to be a ***less-than-significant impact.***

A-2 Implementation of Phase 1 of Alternative 2 would result in development of an additional 12,500 job opportunities in the Planning Area. Under Phase 1 of Alternative 2, existing commercial and industrial development would be replaced with office space, and new highway commercial/retail space. In the Railyards Area, employment growth would be substantial, rising from about 350 jobs today to about 8,500 in year 2000, an increase of over 8,100 jobs. In the Richards Area, there would be an increase of about 4,000 jobs during Phase 1. Implementation of Phases 2 and 3 of Alternative 2 would result in development of an additional 33,500 job opportunities in the Planning Area between the year 2000 and buildout, for a total increase of 46,000 jobs over existing conditions. More than one-half of the post-year 2000 growth would take place in the Richards Area, which would experience an increase of about 18,000 jobs. A total of 55,300 job opportunities would occur at buildout. The remaining 15,000 jobs would develop in the Railyards Area. With Alternative 2, the Planning Area would generate 56 percent of the total cumulative employment total of about 81,350 employees. This is considered a ***less-than-significant impact.***

TABLE 4.7-34

TOTAL CUMULATIVE EMPLOYMENT IN THE CENTRAL CITY
(Including the Planning Area)

Alternative	Planning Area		Remainder of Downtown		Total
	Sq. Ft.	Percent	Sq. Ft.	Percent	
Alternative 1	16,078	30%	38,265	70%	54,343
Alternative 2	45,945	56%	35,385	44%	81,330
Alternative 3	53,612	62%	33,185	38%	86,797
Alternative 4	67,318	67%	33,349	33%	100,667
Alternative 5	67,439	66%	34,877	24%	102,316
Alternative 6	108,315	91%	10,681	9%	118,996
Alternative 7	82,751	77%	25,029	23%	107,780

Source: EIP Associates, 1992; Economic and Planning Systems, *Cumulative Development Scenario, Southern Pacific Railyards/Richards Boulevard Projects*, November 1991; City of Sacramento Planning and Development Department, 1991.

A-3 Implementation of Phase 1 of Alternative 3 would result in development of an additional 13,100 job opportunities in the Planning Area. In the Railyards Area, employment growth would rise to about 9,700 in the year 2000, an increase of over 9,300 jobs. In the Richards Area, there would be an increase of about 3,700 jobs during Phase 1. Implementation of Phases 2 and 3 of Alternative 3 would result in development of an additional 37,840 job opportunities in the Planning Area between the year 2000 and buildout, for a total increase of 50,900 jobs over existing conditions. Post-year 2000 growth would be split fairly evenly between the Planning Area. A total of about 60,267 job opportunities would occur at buildout. With Alternative 3, the Planning Area would generate 62 percent of the total cumulative employment total of about 86,800 employees. This is considered a ***less-than-significant impact.***

A-4 Implementation of Phase 1 of Alternative 4 would result in development of an additional 12,700 job opportunities in the Planning Area. In the Railyards Area, employment growth would rise to about 9,600 in the year 2000, an increase of over 9,200 jobs. In the Richards Area, there would be an increase of about 3,500 jobs during Phase 1 for a total of 12,500 jobs. Implementation of Phases 2 and 3 of Alternative 4 would result in development of an additional 55,600 job opportunities in the Planning Area between the

year 2000 and buildout, for a total increase of 68,300 jobs over existing conditions. About two-thirds of the post-year 2000 growth would take place in the Railyards Area which would account for an increase of about 33,000 new jobs; about 22,600 new jobs would be generated in the Richards Area. A total of about 77,700 job opportunities would occur at buildout. With Alternative 4, the Planning Area would generate 67 percent of the total cumulative employment total of about 100,700 employees. This is considered a ***less-than-significant impact.***

A-5 Implementation of Phase 1 of Alternative 5 would result in development of an additional 11,800 job opportunities in the Planning Area. In the Railyards Area, employment growth would rise to about 9,400 in the year 2000, an increase of over 9,000 jobs. In the Railyards Area, there would be an increase of about 2,800 jobs during Phase 1. Implementation of Phases 2 and 3 of Alternative 5 would result in development of an additional 55,600 job opportunities in the Planning Area between the year 2000 and buildout, for a total increase of 67,400 jobs over existing conditions. The majority of the new jobs created after the year 2000 would be generated in the Railyards Area (about 40,000 jobs) with lesser amounts (about 15,000 jobs) created to the north in the Richards Area. A total of about 76,800 job opportunities would occur at buildout. With Alternative 5, the Planning Area would generate 66 percent of the total cumulative employment total of about 102,300 employees. This is considered a ***less-than-significant impact.***

A-6 Implementation of Phase 1 of Alternative 6 would result in development of an additional 18,400 job opportunities in the Planning Area. In the Railyards Area, employment growth would rise to about 9,700 in the year 2000, an increase of over 9,300 jobs. In the Richards Area, there would be an increase of about 9,000 jobs during Phase 1. Implementation of Phases 2 and 3 of Alternative 6 would result in development of an additional 89,900 job opportunities in the Planning Area between the year 2000 and buildout, for a total increase of 108,300 jobs over existing conditions. Post-year 2000 growth would be split fairly evenly between the Planning Areas, although overall growth in this period would far exceed employment growth projected under any other Alternative. A total of about 117,670 job opportunities would occur at buildout. With Alternative 6, the Planning Area would generate 91 percent of the total cumulative employment total of about 119,000 employees. This is considered a ***less-than-significant impact.***

A-7 Implementation of Phase 1 of Alternative 7 would result in development of an additional 13,300 job opportunities on the Planning Area. In the Richards Area, employment growth would rise to about 9,300 in the year 2000, an increase of over 9,600 jobs. In the Richards Area, there would be an increase of about 6,700 jobs during Phase 1. Implementation of Phases 2 and 3 of Alternative 7 would result in development of an additional 69,400 job opportunities in the Planning Area between the year 2000 and buildout, for a total increase of 82,800 jobs over existing conditions. Post-year 2000 growth would be split fairly evenly between the Planning Areas. A total of about 92,100 job opportunities would occur at buildout. With Alternative 7, the Planning Area would generate 77 percent of the total cumulative employment total of about 107,800 employees. This is considered a ***less-than-significant impact.***

Mitigation Measures

4.7-3 *None required.*

Interim Construction-Related Employment Growth

4.7-4 Implementation of the Alternatives would generate interim construction-related employment throughout the construction period.

Interim construction-related employment for each alternative is shown in Table 4.7-35. Information is provided for total person-years of construction related employment as well as average annual number of construction jobs during each phase for each alternative.

A-1 Implementation of Alternative 1 would result in generation of about 1,850 person years of construction-related employment over the construction period for the planning area. During Phase 1 of Alternative 1, there would be an average of about 90 construction-related jobs generated each year. During Phase 2, the average number of construction-related jobs would be about 30, and during Phase 3 the average annual construction-related employment would be about 4. This is considered a ***less-than-significant impact.***

TABLE 4.7-35
CONSTRUCTION GENERATED EMPLOYMENT
(In The Planning Area)

Alt.	Phase 1		Phase 2		Phase 3		Total
	Person Years	Average Annual Jobs	Person Years	Average Annual Jobs	Person Years	Average Annual Jobs	
1	1,202	120	591	59	53	4	1,847
2	6,180	618	10,216	1,022	2,940	196	19,336
3	5,971	597	10,558	1,056	11,249	750	27,778
4	2,966	297	9,779	978	12,535	836	25,280
5	4,438	444	8,384	838	11,471	765	24,293
6	7,349	735	12,451	1,245	10,760	717	30,560
7	5,400	540	10,892	1,089	12,524	835	28,816

Notes: Assumptions for construction valuation: office/retail = $80/sf; warehouse/heavy commercial = $50/sf; hotel/residential = $100/sf. Assumption for size of rooms/units: hotel = 1,000 sf/room; residential = 1,200 sf/unit. Assumptions for annual employment generation: $90,000 per job.
Source: EIP Associates, 1992.

A-2 Implementation of Alternative 2 would result in generation of about 19,300 person years of construction-related employment over the construction period for the Planning Area. During Phase 1 of Alternative 2, there would be an average of about 600 construction-

related jobs generated each year. During Phase 2, the average number of construction-related jobs would increase to about 1,000, and during Phase 3 the average annual construction-related employment would be about 200. This is considered a ***less-than-significant impact.***

A-3 Implementation of Alternative 3 would result in generation of about 27,800 person years of construction-related employment over the construction period for the Planning Area. During Phase 1 of Alternative 3, there would be an average of about 600 construction-related jobs generated each year. During Phase 2, the average number of construction-related jobs would be about 1,100, and during Phase 3 the average annual construction-related employment would be about 700. This is considered a ***less-than-significant impact.***

A-4 Implementation of Alternative 4 would result in generation of about 25,300 person years of construction-related employment over the construction period for the Planning Area. During Phase 1 of Alternative 4, there would be an average of 600 construction-related jobs generated each year. During Phase 2, the average number of construction-related jobs would be about 850, and during Phase 3 the average annual construction-related employment would be 630. This is considered a ***less-than-significant impact.***

A-5 Implementation of Alternative 5 would result in generation of about 24,300 person years of construction-related employment over the construction period for the Planning Area. During Phase 1 of Alternative 5, there would be an average of about 450 construction-related jobs generated each year. During Phase 2, the average number of construction-related jobs would be about 840, and during Phase 3 the average annual construction-related employment would be about 770. This is considered a ***less-than-significant impact.***

A-6 Implementation of Alternative 6 would result in generation of about 30,500 person years of construction-related employment over the construction period for the Planning Area. During Phase 1 of Alternative 6, there would be an average of about 740 construction-related jobs generated each year. During Phase 2, the average number of construction-related jobs would be about 1,240, and during Phase 3 the average annual construction-related employment would be about 700. This is considered a ***less-than-significant impact.***

A-7 Implementation of Alternative 7 would result in generation of about 28,800 person years of construction-related employment over the construction period for the Planning Area. During Phase 1 of Alternative 7, there would be an average of about 540 construction-related jobs generated each year. During Phase 2, the average number of construction-related jobs would be about 1,100, and during Phase 3 the average annual construction-related employment would be about 840. This is considered a ***less-than-significant impact.***

Mitigation Measures

4.7-4 *None required.*

Housing

Loss of Existing Housing Units in the Richards Area

4.7-5 Implementation of the Alternatives would result in the loss of existing residential units in the Richards Area and displacement of residents.

There are three notable concentrations of housing units in the Richards Area and none in the Railyards Area, including the Dos Rios housing complex, the Basler/Dreher neighborhood, and the Bannon/North B Street area. Under all Alternatives, the approximately 15 units in the Bannon/North B Street area would be removed. Under all Alternatives low income housing would exist on the Dos Rios site. The Basler/Dreher neighborhood would be treated differently under the Alternatives.

A-1 Under the No Project Alternative, no policies would be implemented to either preserve or remove any existing housing resources in the Richards Area. Existing housing units would remain at current locations and densities. This is considered to be a ***less-than-significant impact.***

A-2 through A-5, and A-7

Under Alternatives 2, 3, 4, 5 and 7, housing resources in the Dos Rios and Basler/Dreher neighborhood would be supported by substantial new residential development in the surrounding areas, however, the housing units in the Bannon/North B Street area would be removed and replaced in other parts of the Richards Area. Because of the number of housing units created by these Alternatives far exceeds the number removed, the removal of these units is considered to be a ***less-than-significant impact.***

A-6 Under Alternative 6, the Dos Rios neighborhood would be preserved and expanded with additional housing in the vicinity. Housing units in the Basler/Dreher neighborhood, while not explicitly designated for removal, could be ultimately removed due to encroachment by adjacent industrial uses which would expand north from the Blue Diamond area. The housing units in the Bannon/North B Street area would be removed and replaced in other parts of the Richards Area. Because of the number of housing units created by these Alternatives far exceeds the number removed, the removal of the Bannon/North B Street units, and the potential loss of the Basler/Dreher units is considered to be a ***less-than-significant impact.***

For all Alternatives, relocation benefits would be available to all displaced residents who qualify under the California Administrative Code, Title 25, Chapter 6, "The California Relocation Assistance and Real Property Acquisition Guidelines". Further, if housing units at the Dos Rios housing project are replaced, they will be replaced such that the number of units affordable to

very-low- and low-income households on the site is not reduced, as is required for this property which is owned by the Housing Authority.

Mitigation Measures

4.7-5 *None required.*

Affordable Housing

4.7-6 Implementation of the Alternatives would generate a net deficit of affordable housing.

A-1 through A-7

Employment growth under the Alternatives would generate demand for between 1,400 and 5,700 housing units affordable to very-low-income households, based on the City Nexus study method. The demand for affordable housing generated by any of the Alternatives would exceed the amount of affordable housing provided. The significance of these numbers relates to the magnitude of demand and supply, and not to location. It is not possible to assess how many of the employees would actually want to live in the Planning Area. Analysis of affordable housing demand based on projected employment types and income levels has indicated that the majority of those employed on the Planning Area could not afford to live there without subsidy. In addition, the amount of affordable housing targeted for subsidy would satisfy less than half of the demand. This is considered a ***significant and unavoidable impact.***

It should be noted that the City is exploring ways to increase the availability of affordable housing, including adopting an inclusionary housing policy in the RSP and RBAP requiring that 10 percent of all housing be affordable to moderate-income households.

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impacts but not to a *less-than-significant level.*

4.7-6(a) *The City shall draft and adopt, and private developers within the Planning Area shall comply with, an affordable housing implementation program. A critical element of this program will be measures that ensure the efficient use of available funding, including the 20 percent tax increment set-aside for affordable housing and the City Housing Trust Fund. Other subsidy programs that should be evaluated and adopted, where feasible and appropriate, would include, but may not be limited to, the following:*

- *Landowner subsidies, including the acquisition and/or co-ownership of land by a public agency with the intention of land banking or turning the land over for housing uses;*

- *Developer subsidy programs such as restricted land title transfers or leases at less than market prices, or deed restrictions that can be purchased and which provide cash to the developer, effectively subsidizing the construction cost of housing; and*

- *Homeowner and renter subsidies such as vouchers, low-interest first deeds, or partially or fully subsidized second deeds.*

This measure would be required for Alternatives 1 through 7.

4.7-6(b) *Private developers of individual projects within the Planning Area shall be required to pay housing fees in accordance with the City's Housing Trust Fund (Ordinance No. 2550). This money would be used to subsidize the construction of or rehabilitation of housing units in the City. This measure would be required for Alternatives 1 through 7.*

Cumulative Impacts

4.7-7 Any of the Alternatives would contribute to a significant cumulative lack of affordable housing.

The employment-generated total housing demand from the project would represent from 11 percent to 50 percent of cumulative citywide demand (see Table 4.7-17). Housing supply on the site would represent from less than 1 percent to 14 percent of cumulative citywide supply (see Table 4.7-16). Citywide demand for housing affordable to very-low-income households is projected to be 2,402 for the period 1989-1996 (see Table 4.7-19). By comparison, the project-generated demand for housing affordable to very-low-income households for the period 1990 to 2000 is estimated to be from 300 to 1100 units, depending on the alternative (see Table 4.7-36), and the total number of very-low-income units to be provided at project buildout would be 600.

Any of the Alternatives would contribute a significant portion of the cumulative demand for affordable housing and a small portion of the supply, thus contributing to a significant cumulative impact on affordable housing. This impact would be significant for all alternatives.

Implementation of the following mitigation measures would reduce this impact, but not to a less-than-significant level. This is considered a ***significant and unavoidable impact.***

TABLE 4.7-36
CUMULATIVE REGIONAL HOUSING DEMAND
GENERATED BY EMPLOYMENT GROWTH AT BUILDOUT
(Including the Planning Area)

Alternative	Planning Area	Remainder of Central City	City
Alternative 1	21,400	32,200	188,900
Alternative 2	46,500	29,800	188,900
Alternative 3	50,600	27,900	188,900
Alternative 4	65,300	28,000	188,900
Alternative 5	64,500	29,300	188,900
Alternative 6	98,900	9,000	188,900
Alternative 7	77,400	21,000	188,900

SOURCE: EIP Associates, 1992; EPS; Williams Kubelbeck; City of Sacramento, 1991.

Mitigation Measures

4.7-7 *Implement Mitigation Measures 4.7-6(a), (b), and (c). This measure would be required for all Alternatives.*

Compliance with Housing Plans and Policies

4.7-8 Implementation of the Alternatives could be unsupportive goals and policies of the Housing Element of the General Plan.

The policies of the Housing Element of the City General Plan address a wide range of housing issues, including Existing Housing, Housing-Jobs-Transportation Link, New Housing, Affordable Housing, Quality Housing, Mixed Housing, and Special Needs Housing. To varying degrees, different Alternatives for the Planning Area would be consistent with some policies and inconsistent with others due to varying types of housing designations included in each Alternative. The analysis below attempts to depict the supportiveness of the Alternatives to the general direction of the body of housing policies contained in the City's Housing Element.

A-1 The No Project Alternative would appear to be largely unsupportive of most of the policies of the Housing Element, since it would not encourage the development of any new housing resources. This is considered to be a ***significant and unavoidable impact.***

A-2 and A-3

By making the strongest commitment to housing among the Alternatives, Alternatives 2 and 3 would be supportive of most of the policies of the Housing Element. Although not expressly indicated, the magnitude of housing resources created with these alternatives would likely provide a wide range of housing types and household income levels. This is considered to be a ***less-than-significant impact.***

A-4 Alternative 4 would allocate lands in the Planning Area for residential use and, as a result, would be supportive of most of the policies of the Housing Element. This is considered to be a ***less-than-significant impact.***

A-5 Under Alternative 5, many of the policies of the Housing Element would be successfully implemented. It should be noted that while under Alternatives 2, 3, 4, and 7 substantial housing uses are designated in both the Railyards Area, and the Richards Area under Alternative 5 only 300 high-density residential units would be constructed in the Railyards Area, with the Richards Area providing the remainder of all of the new housing units under this Alternative. This is considered to be a ***less-than-significant impact.***

A-6 Under Alternative 6, only two residential enclaves are proposed in the Planning Area, including the area north and east of the Dos Rios housing complex, and at the eastern end of the Crescent loop in the Railyards Area. The total residential units in the Planning Area would be 3,700 units. Although this would represent a substantial increase of residential uses in the Planning Area, this Alternative is not supportive of the intent of the policies of the Housing Element. This is considered to be a ***less-than-significant impact.***

A-7 Alternative 7 would be supportive of most of the policies of the Housing Element, similar to Alternatives 2, 3, 4, and 5. This is considered to be a ***less-than-significant impact.***

Mitigation Measures

4.7-8 *No mitigation measures are available for Alternative 1. None are required for Alternatives 2 through 7.*

ENDNOTES

1. U.S. Bureau of Census, 1991.

2. Ibid.

3. City of Sacramento, Planning and Development Department, 1991. *Population and Housing Data by Community Plan Area.*

4. U.S. Bureau of Census, 1991.

5. City of Sacramento, 1987. *General Plan Update Draft Environmental Impact Report, Population Element.*

6. Sacramento Area Council of Governments; *Employment Estimates for Centroid Zones 781, 783, 779, and 250*; August 1991.

7. For the purposes of this analysis, the following assumptions were used: one employee per 250 square feet of office space; one employee per 300 square feet of commercial/retail; one employee per 1,000 square feet of heavy commercial/light industrial; and one employee per hotel room.

8. Mundie and Associates, 1991. *Sacramento Central City Housing Strategy Study, Draft Report 1A: Housing Conditions and Vacant Land Inventory.*

9. City of Sacramento, 1988. *City of Sacramento General Plan*, Commerce and Industry Land Use Element.

10. Employment Development Department, 1991. *Annual Planning Information*, Sacramento, California.

11. Ibid.

12. Redevelopment Agency of Sacramento, 1990. Resolution No. 90-061, July 17, 1990.

13. Mundie and Associates, 1991. *Sacramento Central City Housing Strategy Study, Draft Report 1A: Housing Conditions and Vacant Land Inventory.*

14. U.S. Bureau of Census, 1990.

15. City of West Sacramento, General Plan Environmental Impact Report, May 1990, *Appendix E, Final West Sacramento General Plan Buildout Calculations*, page E-6.

16. Rattan, Ram. Analyst, U.S. Department of Housing and Urban Development, personal communication, October 1991.

17. Rupp, Susie. Director of Communications, Sacramento Association of Realtors, personal communication, October 1991.

18. Sacramento Area of Governments, 1990. *Final Regional Housing Needs Plan for the SACOG Region.*

19. The 1980 census showed that in the City of Sacramento there were a total of 112,859 households and a total of 113,333 employed residents.

20. Appendix E.

21. Children per household: 0.23. Retirees per household: 0.25.

4.8 TRANSPORTATION

4.8 TRANSPORTATION

SETTING

Site Location

The 260-acre Railyards Area is located at the northwest corner of the downtown street grid of the City of Sacramento. The 1,050-acre Richards Area is located north of the Southern Pacific Railyards and main line tracks. Figure 3-2, in Chapter 3, Project Description, shows the regional location of the Planning Area. On this figure are the rivers, rail lines and highway facilities, many of which are of statewide significance, which converge at Sacramento and are considered in transportation plans for an environmental assessment of impacts associated with development at the Planning Area.

Figure 3-3 in Chapter 3, Project Description, shows the Planning Area and the immediate surrounding locale in downtown Sacramento. The Planning Area is bordered to the west by the Sacramento River, to the north by the American River, to the south by the downtown street grid and to the east by the midtown area. The double-track Southern Pacific main line and Passenger Depot separates the site physically from the downtown to the south; to the north, additional trackage constructed on a levee separates the Railyards Area from the balance of the Richards Area.

Roadway Facilities

This section describes regional highway and local roadway facilities that serve downtown Sacramento and the Planning Area.

Regional Access

The City of Sacramento is served by a network of regional freeway facilities which radiate from the downtown area (refer to Figure 4.8-1). The greater downtown is bounded by the Sacramento River to the west and by the American River to the north, limiting highway access to bridge crossings which primarily occur on major freeway facilities. (The I Street bridge is a notable exception.) The core is bounded to the west, south and east by freeways, which carry through trips, and distribute access trips from the region to various ramp facilities along downtown streets. Local arterial roadways provide additional access, primarily to areas south and east of downtown, where there are no topographic constraints to connections.

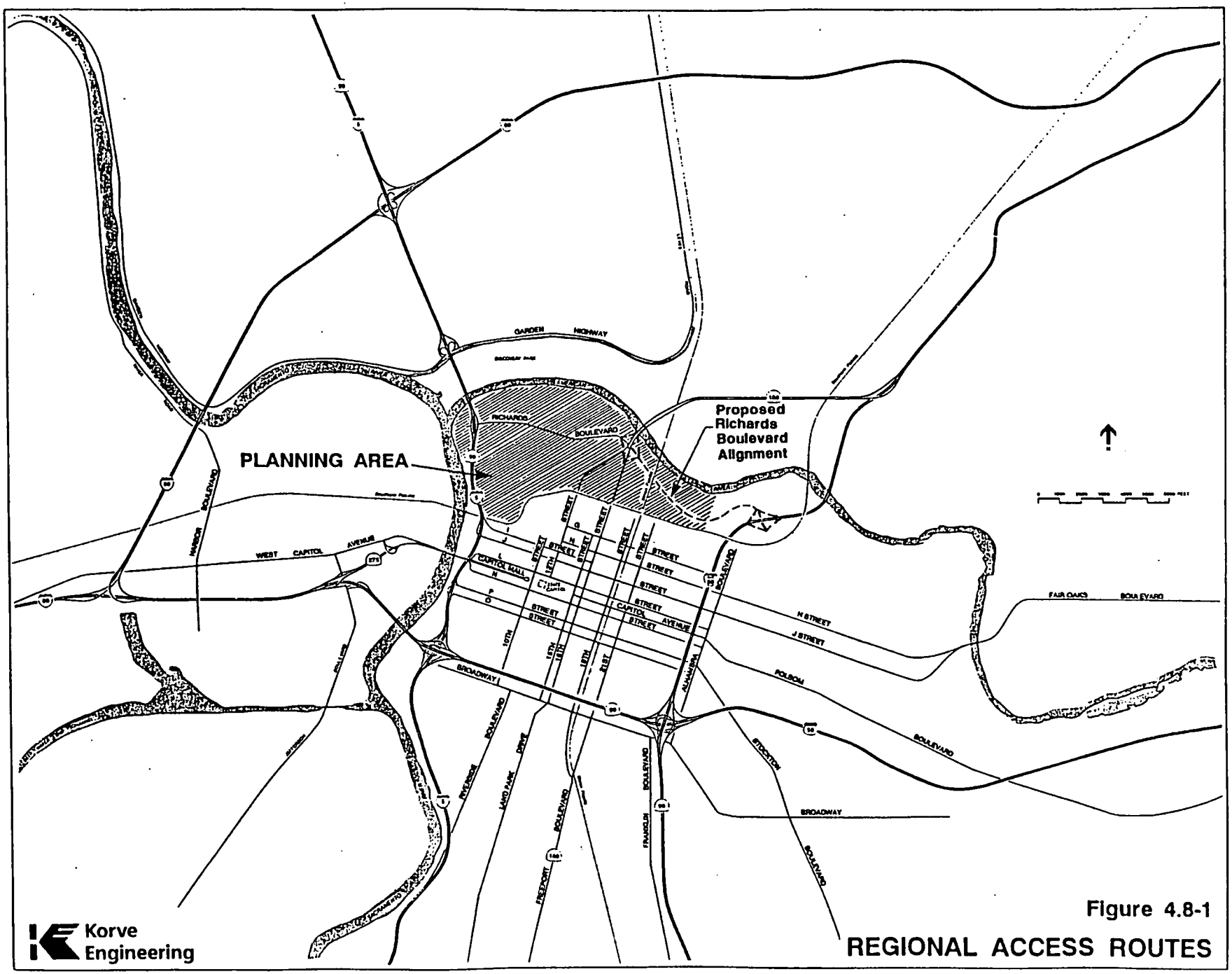


Figure 4.8-1

REGIONAL ACCESS ROUTES

Regional Highway Facilities

The regional roadway network radiates from the downtown in six directions. This network provides access to five external counties (Solano, Yolo, Sutter, Placer, and El Dorado) within 15 miles, and the remainder of the greater Sacramento urbanized areas in Sacramento and Placer Counties within 40 miles. This regional freeway network comprises four major freeway routes:

- Interstate 5
- State Route 99
- U.S. 50
- Interstate 80

These major routes are supplemented by a number of shorter connectors such as State Route 160 and State Route 275. Table 4.8-1 indicates the number of lanes and major direction of travel for each of the facilities, listed clockwise from the north.

It is important to note that through traffic between the Bay Area and Nevada along the I-80 corridor can by-pass the downtown distribution system; however, the downtown freeway "box" formed by I-5 to the west, the "W-X" (Bus 80/US 50) to the south and the "29-30th" (Bus 80) freeway to the east is subjected to through trips in a north-south direction (along I-5 and the 29-30th routes, as well as in the east-west direction) for traffic bound from I-80 west of downtown to US 50 to the east. The downtown freeway box is also subject to through trips between various radial destinations (for example, traffic between Davis and Stockton would use the W-X through downtown).

River Bridges and Railroad Grade Crossing Separations

Regional connections to the west and north occur on bridges and at grade separated crossings of the Southern Pacific mainline. West of the downtown, the Sacramento River forms a topographic barrier; north of the downtown, the Southern Pacific main line and its embankment as well as the American River limit roadway connections. Facilities below are listed clockwise beginning with the Pioneer Bridge on Business 80:

- Pioneer Bridge (Business 80) -- Located immediately west of the "W-X" freeway, this high-level fixed span carries Business 80 across the Sacramento River to West Sacramento to a junction with Interstate 80 in West Sacramento. Eight through lanes are provided on twin steel deck span structures, with an auxiliary lane in the westbound direction only.

- Tower Bridge (State Route 275) -- Located six blocks south of the Planning Area at the western end of the Capitol Mall, Tower Bridge provides two lanes of traffic and a sidewalk in each direction across the Sacramento River. With a total length of approximately 700 feet, the Tower Bridge has a 200-foot center lift span. At the east end of the bridge, driveway connections are provided to Old Sacramento.

TABLE 4.8-1

REGIONAL FREEWAY ROUTES
PROVIDING ACCESS TO DOWNTOWN SACRAMENTO

Route	Number of Lanes	Direction	Comments
State Route 160	6	Northeast	Connects to Business 80 near Arden Way
Business 80	8	Northeast	Uses W-X and 29-30th freeways near downtown; reduced to 6 lanes at American River Bridge; connects to Interstate 80 near Del Paso Heights
US 50	8	East	Uses W-X freeway near downtown
State Route 99	8	South Southeast	Uses W-X and Interstate 5 freeways near downtown
Interstate 5	8	South Southeast	Parallels Sacramento River
Business 80	6	Southwest	Connects to Interstate 80 in West Sacramento
State Route 275	4	West	Connects to Interstate 80 in West Sacramento via Tower Bridge
Interstate 5	8	Northwest	Provides access to Sacramento County Metropolitan Airport
State Route 99	4	North	Accessed from downtown via Interstate 5

SOURCE: Korve Engineering, Inc.

Additional ramps provide direct connections to the L-N couplet, on either side of Capitol Mall. West of the bridge, State Route 275 provides a limited access connection to Business 80.

- I Street Bridge -- The I Street bridge at the southwestern corner of the Planning Area is a 300-foot center pivot swing bridge. Constructed in 1911, this bridge is maintained and operated by the Southern Pacific Transportation Company (SPTC). The double-track main line uses the lower deck of this steel girder bridge, while the upper level accommodates one lane of arterial roadway travel and a sidewalk in each direction. Immediately east of the bridge is an elevated intersection which connects to the Jibboom Street viaduct to the north and to I and J streets via ramps to the east.

- Jibboom Street Viaduct -- Jibboom Street runs parallel to the Sacramento River from the I Street Bridge on a viaduct that carries it over the Southern Pacific tracks. Jibboom is a 2-lane frontage road paralleling the Interstate 5 freeway along the Sacramento River.

- Jibboom Street Bridge -- Formerly the state highway bridge over the American River, this steel truss bridge has been superseded by Interstate 5. The Jibboom Street Bridge is a two lane bridge. This bridge provides access to Discovery Park and does not carry through trips across the river.

- Interstate 5 Bridges -- Interstate 5 spans the American River with two pre-cast concrete spans with a total of six traffic lanes.

- 12th & 16th Street Bridges -- On the American River, these twin bridges each carry three traffic lanes of State Route 160 in each direction. The westerly bridge (12th Street) also carries the LRT transit line between downtown and Watt/I-80.

- 12th & 16th Street Undercrossings -- The State Route 160 couplet on 12th and 16th Streets passes beneath the elevated Southern Pacific main line at what would be considered to be B Street (no roadway present). Each undercrossing is four lanes wide, with a center pillar.

- Business 80 Undercrossing and River Bridges -- Business 80 is the eastern regional highway facility exiting the downtown to the north. The freeway crosses under the Southern Pacific main line twice before crossing the American River on a pair of 3-lane structures.

Downtown Freeway Access

US 50 provides access to points east of the downtown, while State Route 99 and Interstate 5 provide access to the south, completing the radial network serving downtown:

- US 50 -- This freeway facility provides access to locations east of the downtown as well as points northeast at additional bridge crossings of the American River. In the vicinity of downtown, US 50 traverses the W-X freeway.

- State Route 99 -- Until construction of Interstate 5, this facility provided the only principal north-south highway in California's Central Valley and continues to provide the most direct connection to many Valley cities. Within metropolitan Sacramento, State Route 99 provides access to points north, south and east of the downtown.

- Interstate 5 -- The Interstate 5 freeway provides the fastest long-distance service to the Central Valley. Within the metropolitan area, Interstate 5 parallels the Sacramento River, providing access to points due north and south of downtown.

Downtown Arterial Connections

As noted previously, the I Street Bridge across the Sacramento River to the west provides the only local roadway connection to the west or north of the downtown. To the south and east, a number of arterials carry traffic into the downtown area. Major routes are listed below clockwise, beginning with H Street:

- H Street -- This 2- and 4-lane arterial connects to the Fair Oaks bridge across the American River near California State University, Sacramento, and provides access to downtown from neighborhoods immediately east and northeast of the downtown. Within downtown, the traffic load on H Street is shared on the G Street (westbound) and H Street (eastbound) couplet.

- J Street -- A 4-lane arterial paralleling H Street, J Street also connects to the Fair Oaks bridge. Within downtown, J Street is one-way eastbound. In the vicinity of the 29-30th freeway, I Street is discontinuous, and inbound traffic from J Street shifts to K and L streets.

- Folsom Boulevard -- Folsom Boulevard provides a 4-lane surface arterial parallel to the US 50 freeway facility, serving points to the east. Folsom ties into Capitol Avenue at Alhambra Boulevard immediately east of the 29-30th freeway.

- Stockton Boulevard -- Stockton provides a 4-lane surface arterial connection to locations southeast of downtown, parallel to but east of the State Route 99 freeway facility. At the downtown, Stockton connects to the P (westbound) and Q (eastbound) Street couplet.

- Broadway -- Broadway is a 4-lane arterial, which provides access to points south and east of downtown. At the downtown, Broadway parallels the W-X freeway, connecting to numerous north-south streets. Broadway also connects to Alhambra, providing access to downtown locations along the 29-30th freeway.

- Franklin Boulevard -- This 4-lane arterial closely parallels the State Route 99 freeway. This route, which terminates at Broadway, has no direct connection to the downtown grid.

- 21st Street & Freeport Boulevard -- Freeport Boulevard is a major 4-lane arterial, which provides access to points directly south of downtown between the Interstate 5 and State Route 99 freeways. South of downtown, traffic is split between 21st Street (northbound) and 19th-Freeport (southbound).

- Land Park Drive -- This two-lane roadway, which connects directly to northbound 16th Street at Broadway, carries significant volume between downtown and points to the immediate south.

- Riverside Boulevard -- A 4-lane arterial, Riverside Boulevard connects directly to 11th Street at Broadway; however, the 9th/10th couplet (which continues across entire downtown) is immediately to the west. Riverside extends to the Pocket community south of downtown.

Local Street System

Downtown Street Grid

Local roadway facilities in the vicinity of the Planning Area are shown in Figure 4.8-2. Downtown Sacramento is laid out on a 440-foot grid, which provides 12 blocks to the mile. (Block lengths are typically approximately 320 feet, exclusive of sidewalks and streets.) In an east-west direction, numbered north-south streets extend from Front Street at the Sacramento River to Alhambra, just east of the 29/30th freeway, in an unbroken pattern. North and south streets, designated from C Street to X Street, continue in an unbroken pattern to Broadway immediately south of the W-X freeway (25 blocks).

Within the most heavily built-up area, a series of one-way streets has been designated. In the east-west direction, one-way streets are provided between G Street and Q Street (excepting K Street, Capitol Mall-Capitol Avenue, and O Street). A less regular system of one-way streets has been designated on the north-south numbered streets -- primarily located between 3rd Street and 12th Street. Other one way couplets are provided on 15th/16th Streets and 19th/21st Streets.

The typical one-way street section provides three travel lanes as well as sidewalks and parking on each side of the street. At major intersections, parking is omitted to provide supplementary turning lanes. Intersections are controlled with two-phase signals, which are convenient for pedestrians and efficient for vehicles.

Tables 4.8-2 and 4.8-3 list downtown grid streets for north-south and east-west streets, respectively, within the vicinity of the Planning Area, and indicate the direction of flow (if one-way), number of lanes and other relevant information.

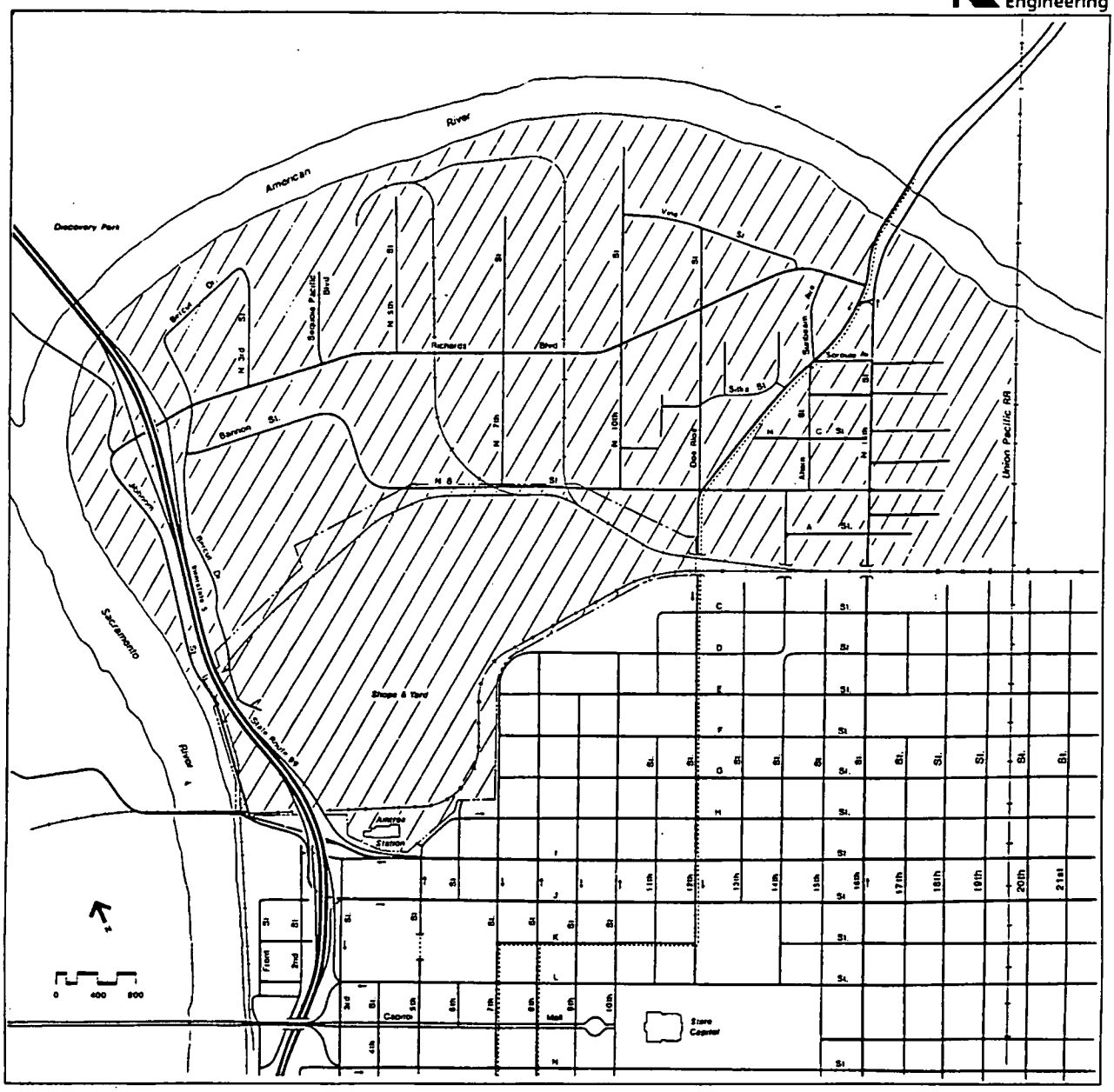


Figure 4.8-2
DOWNTOWN STREETS NEAR PLANNING AREA

TABLE 4.8-2

DOWNTOWN STREETS NEAR PLANNING AREA
NORTH-SOUTH STREETS

Street Name	Direction	Number of Lanes	Notes
Front Street	2-way	2	Discontinuous; cobblestone in Old Sacramento
2nd Street	2-way	2	Discontinuous; Old Sacramento
3rd Street	SB S. of L Street	3	5-leg intersections at J Street & L Street
4th Street[1]	2-way	2	Discontinuous; stub access to garage off J Street
5th Street	NB	3	Parking on S. side except PM peak
6th Street[1]	2-way	4	Garage exit S. leg at J Street
7th Street	SB S. of E Street	3	Limited parking on E. side; LRT S. of K Street
8th Street	NB S. of E Street	3	LRT S. of K Street; limited parking on W. side
9th Street	SB	3	
10th Street	NB	3	
11th Street[2]	2-way	2	Signed bike route S. of Capitol Park
12th Street[1,2]	SB	3-4	LRT E. side, American River to K Street
13th Street[1,2]	2-way	2	
14th Street[2]	2-way	2	Bike lanes N. of Capitol Park
15th Street	SB	3-4	
16th Street	NB	3-4	Limited parking E. side

Notes:
1. Discontinuous at K Street Mall.
2. Discontinuous at Capitol Park (L to N Street).

SOURCE: Korve Engineering, Inc.

TABLE 4.8-3

DOWNTOWN STREETS NEAR PLANNING AREA
EAST-WEST STREETS

Street Name	Direction	Number of Lanes	Notes
C Street	2-way	2	
D Street	2-way	2	
E Street	2-way	2	
F Street	2-way	2	
G Street	WB	3	
H Street	EB	3	Limited parking both sides
I Street	WB	3	PM Parking restrictions
J Street	EB	3	Limited parking N. side
K Street	2-way	2	Discontinuous; ped. mall W. of 13th; LRT 7th-12th
L Street	WB	3	
Capitol Mall	2-way	6	Wide landscaped median

SOURCE: Korve Engineering, Inc.

Planning Area

The Planning Area is located in the Richards Redevelopment Project Area, which lies immediately north of the downtown street grid. This area of the City is currently served by a sparse grid of streets laid out to serve industrial uses. The primary roadway in this area is Richards Boulevard, which connects Jibboom Street along the Sacramento River with State Route 160 in an east-west alignment. In a north-south orientation, the Interstate 5 frontage roads of Jibboom Street (west of freeway) and Bercut Drive (to the east) are at the extreme west end of the area, and the State Route 160 couplet of North 12th Street (southbound) and North 16th Street (northbound) are to the east. Between these streets, there are a limited number of cross streets extending from the spine of Richards Boulevard.

Additional descriptions of roadways in the Richards area are noted below:

- Richards Boulevard -- Richards Boulevard is the primary arterial in the area between the American River and the Planning Area. Richards links Jibboom Street, I-5 and SR 160. At the present time, Richards Boulevard has four traffic lanes between Jibboom and North 3rd Street, and two traffic lanes between North 3rd Street and State Route 160. The interchange with Interstate 5 is a tight diamond facility, with very limited left-turn capacity under the bridge. Richards Blvd. connects directly to the southbound lanes of State Route 160 at North 12th Street, but does not connect to North 16th Street. Therefore, traffic exiting the Richards area to the north must use Sunbeam and Sproule Avenues or North B Street to turn onto North 16th Street.

- North B Street -- This is the only other significant east-west arterial in the Richards Area. The roadway is two lanes wide west of North 12th Street and four lanes wide east of North 12th Street.

- Bannon Street -- Bannon Street is a two lane roadway running east and west between North B Street and Bercut, roughly paralleling Richards Boulevard. It has been proposed that Bannon Street be redesigned so that it separates the water filtration plant from the private property to the north. Bannon Street has been identified as a potential candidate for closure in order to facilitate the assemblage of larger parcels suitable for commercial development[1].

- Jibboom Street -- Jibboom Street is a two-lane collector, which serves as the west frontage road to Interstate 5. Parallel to the Sacramento River, Jibboom runs across the Planning Area north from the I Street Bridge on a viaduct over the Southern Pacific tracks. In the northern end of the Planning Area, Jibboom runs at grade to an intersection with Richards near the Interstate 5 interchange. North of Richards, Jibboom provides access to Discovery Park, crossing the American River on a bridge to connect with trailheads on the north side of the river.

- Bercut Drive -- Bercut Drive is a two-lane collector road that serves as a frontage road on the east side of Interstate 5. Bercut begins at a gate at the north side of the Planning Area (near the Sacramento Filtration Plant) and crosses Richards to

connect with North 3rd Street. At Richards, the median is closed, which prohibits through or left turns from Bercut (although left turns are allowed into Bercut from Richards). This measure has been accomplished to prevent queues from backing up into the Interstate 5 interchange on Richards.

- 12th/16th Street Couplet -- Northeast of the Planning Area, State Route 160 crosses the American River providing access between the downtown and North Sacramento. Within the Richards Area, the couplet diverges from the twin bridges crossing the American River to a four-block spacing at North B Street. Three through lanes are provided each way on the American River bridges and four through lanes are provided at signalized intersections to the south.

  The Regional Transit (RT) Light Rail Transit (LRT) system operates on the east side of 12th Street. A double-tracking project between downtown and a point south of the American River bridge was recently completed. The North 12th Street segment has suffered from operational conflicts between drivers pulling across the LRT trackage from driveways, especially where limited sight distance exists due to abutting structures.

Existing Traffic Volumes

Regional System

Figure 4.8-3 indicates recent two-way Average Daily Traffic (ADT) volumes on regional facilities in the vicinity of downtown Sacramento. These volumes were obtained from Caltrans and from the City of Sacramento.

Table 4.8-4 characterizes the current peak hourly outbound LOS (levels of service) on eight state and federal corridors and bridges radiating from the Central City area, as well as existing levels of service on freeway ramps.

Peak Period Intersection Conditions

Traffic service has been characterized by examining peak period operations. Operations have been described in terms of the peak hour Volume to Capacity (V/C) ratio, as well as Level of Service (LOS). The V/C ratio indicates the amount of capacity utilized, with 1.0 representing 100 percent utilization. The LOS provides a letter grade that describes the quality of flow, ranging from the best condition (LOS A) through extreme congestion associated with at or over-capacity conditions (LOS F).

Within the downtown, traffic conditions relating to movements to or from the Planning Area are best characterized by the peak hour LOS at signalized intersections, since signalized intersections generally have more limited capacity than midblock roadway sections.

The intersection LOS has been computed using the "Planning Methodology" from Transportation Research Board Circular 212, which is widely used in EIRs and is the method currently preferred

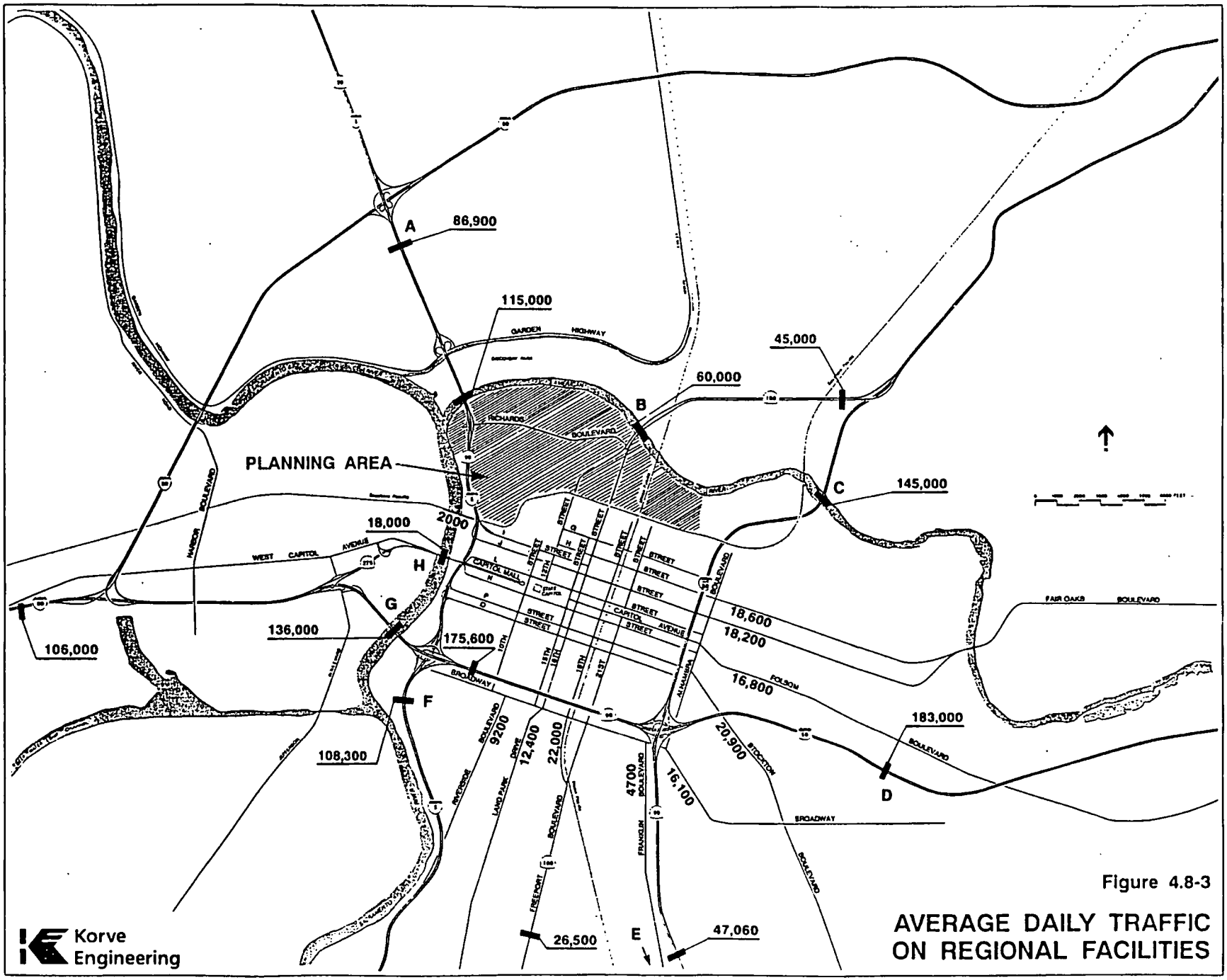


Figure 4.8-3

AVERAGE DAILY TRAFFIC ON REGIONAL FACILITIES

Korve Engineering

TABLE 4.8-4

OUTBOUND FREEWAY AND RAMP LEVELS OF SERVICE (LOS)

Location Note: Locations correspond to ADT count locations on Figure 4.8-5	Existing # of Out Bound Lanes	Existing Peak Hour Out Bound Capacity[1]	Existing Peak Hour Out Bound Volumes	Existing Peak Hour V/C Outbound	LOS
(A) I-5 N.of CBD - NB[2]	4	8000	4900	0.61	B
(B) SR 160 N. of CBD - NB[2]	3	6000	3500	0.58	B
(C) Bus. I-80 NW.of CBD - NB[2]	3	6000	6000+	>1.00	F
(D) U.S. 50 E. of CBD - EB	4	8000	8100	1.01	F
(E) SR 99 SE. of CBD - SB	4	8000	2200	0.28	A
(F) I-5 S. of CBD - SB	4	8000	7000	0.88	E
(G) Bus. I-80 W. of CBD - WB	4	8000	6600	0.83	C
(H) SR 275, Tower Bridge - WB	2	4000	900	0.23	A

EXISTING RAMP LOS

Location	AM LOS	PM LOS
I-5 & RICHARDS - SB Off Ramp	C/C	B/B
I-5 & RICHARDS - NB On Ramp	C/C	C/E
I-5 & RICHARDS - SB On Ramp	C/C	C/E
I-5 & RICHARDS - NB Off Ramp	C/D	C/B
I-5 & J St. - SB Off Ramp	C/E	C/B
I-5 & I St. - NB On Ramp	C/C	C/D
I-5 & J St. - NB Off Ramp	C/F	B/C
I-5 & I St. - NB Off Ramp	D/D	D/F

[1] Peak hour freeway capacity = 2000 vehicles per lane.

[2] Estimated from Caltrans 1988 Daily Traffic Counts

SOURCE: Counts and peak hour directional factors obtained from Caltrans Hourly Traffic Volumes, May 9-10-11, 1989.

by the City of Sacramento. This method provides generally conservative estimates of intersection capacity. Table 4.8-5 indicates the V/C and delay ranges associated with each level of service, and provides verbal descriptions of anticipated conditions at each grade.

The City of Sacramento has a current policy to maintain LOS C conditions where possible. This policy is more conservative than other jurisdictions, which may accept LOS D conditions (or LOS E at intersections affected by regional traffic such as freeway ramps).

Table 4.8-6 summarizes the computed AM and PM peak hour V/C ratios and LOS, as noted further below.

As expected, the most congested freeway segments serve the eastern suburbs of Sacramento along I-80 and U.S. 50. Both of these freeways are operating at or near their designed capacity. The California Department of Transportation has identified these corridors as having frequent congestion induced delays (see Figure 4.8-4). The freeways serving the western sectors of Sacramento, along and on the opposite side of the Sacramento River, are typically less congested. Currently, the I-5 corridor leading to the north of Sacramento is the least congested Interstate freeway in the city, and provides the most preferable routing in and out of the Planning Area and CBD.

Downtown Roadways

Figure 4.8-5 indicates recent two-way ADTs on City streets in the vicinity of the Planning Area. These were obtained from recent counts by the City of Sacramento and from current counts by Korve Engineering. Table 4.8-7 summarizes the daily and peak hour (peak direction where applicable) traffic volumes counted in 1990 by Korve Engineering.

PM Peak Hour: With existing conditions, two of the intersections evaluated exceed the City's service level standard -- the Interstate 5 off-ramps intersection at 3rd and J Street (LOS E) and the 12th and North B Street (LOS D). The 3rd/J Street location is nearly at capacity using the Circular 212 methodology, with a V/C ratio of 0.97. The 12th/North B Street location marginally exceeds the LOS C threshold, with a V/C of 0.82.

PM Peak Hour: Two of the intersections studied (both in the Richards Area) presently exceed the City's LOS C threshold. The Richards/Northbound Interstate 5 ramps intersection and 16th/North B Street intersections both were marginally in the LOS D range with V/C ratios of 0.81.

Regardless of current traffic conditions, continued development of downtown Sacramento can be expected to lead to more congested cumulative traffic conditions along key access routes.

Heavy Rail Facilities

Figure 4.8-6 indicates principal heavy rail routes through Sacramento. Sacramento is served by two class 1 railroads, the Southern Pacific Transportation Company, recently acquired by the Denver & Rio Grande Western, and the Union Pacific, formerly the Western Pacific.

TABLE 4.8-5

LEVEL OF SERVICE DEFINITION
SIGNALIZED INTERSECTIONS

Level of Service	Volume to Capacity Ratio	Typical Delay (Seconds/ Vehicle)	Typical Traffic Condition
A	0.00 - 0.60	$\leq$ 5.0	**Insignificant Delays:** No approach phase is fully utilized and no vehicle waits longer than one red indication.
B	0.61 - 0.70	5.1 - 15.0	**Minimal Delays:** An occasional approach phase is fully utilized. Drivers begin to feel restricted.
C	0.71 - 0.80	15.1 - 25.0	**Acceptable Delays:** Major approach phase may become fully utilized. Most drivers feel somewhat restricted.
D	0.81 - 0.90	25.1 - 40.0	**Tolerable Delays:** Drivers may wait through more than one red indication. Queues may develop but dissipate rapidly, without excessive delays.
E	0.91 - 1.00	40.1 - 60.0	**Significant Delays:** Volumes approaching capacity. Vehicles may wait through several signal cycles and long queues of vehicles form upstream.
F	N.A.	$\geq$ 60.0	**Excessive Delays:** Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.

SOURCES: Highway Capacity Manual, Highway Research Board, Special Report No. 87, Washington, D.C., 1965; *Interim Materials on Highway Capacity,* Circular 212, Transportation Research Board, 1980; Korve Engineering.

TABLE 4.8-6

LEVELS OF SERVICE AND VOLUME/CAPACITY RATIOS
SELECTED DOWNTOWN INTERSECTIONS NEAR PLANNING AREA

Map Ref	Intersection	AM Peak Hour LOS	AM Peak Hour V/C	PM Peak Hour LOS	PM Peak Hour V/C
1	8th & G Streets	A	0.37	A	0.25
2	7th & G Streets	A	0.15	A	0.27
3	7th & H Streets	A	0.36	A	0.53
4	3rd & I Streets	A	0.13	A	0.16
5	12th & North B / Dos Rios	D	0.82	B	0.68
6	5th & I Streets	A	0.44	A	0.58
7	16th & North B Streets	A	0.33	D	0.81
8	Richards Blvd. & I-5 SB Ramps	B	0.63	B	0.68
9	Richards Blvd. & I-5 NB Ramps	B	0.63	D	0.81
10	Jibboom St. & I Street Bridge	A	0.16	A	0.47
11	3rd & J Streets / I-5 Off-ramps	E	0.97	B	0.62

V/C = Volume to Capacity
LOS = Level of Service
SOURCE: Midweek AM and PM peak period counts, April, 1990, Korve Engineering.

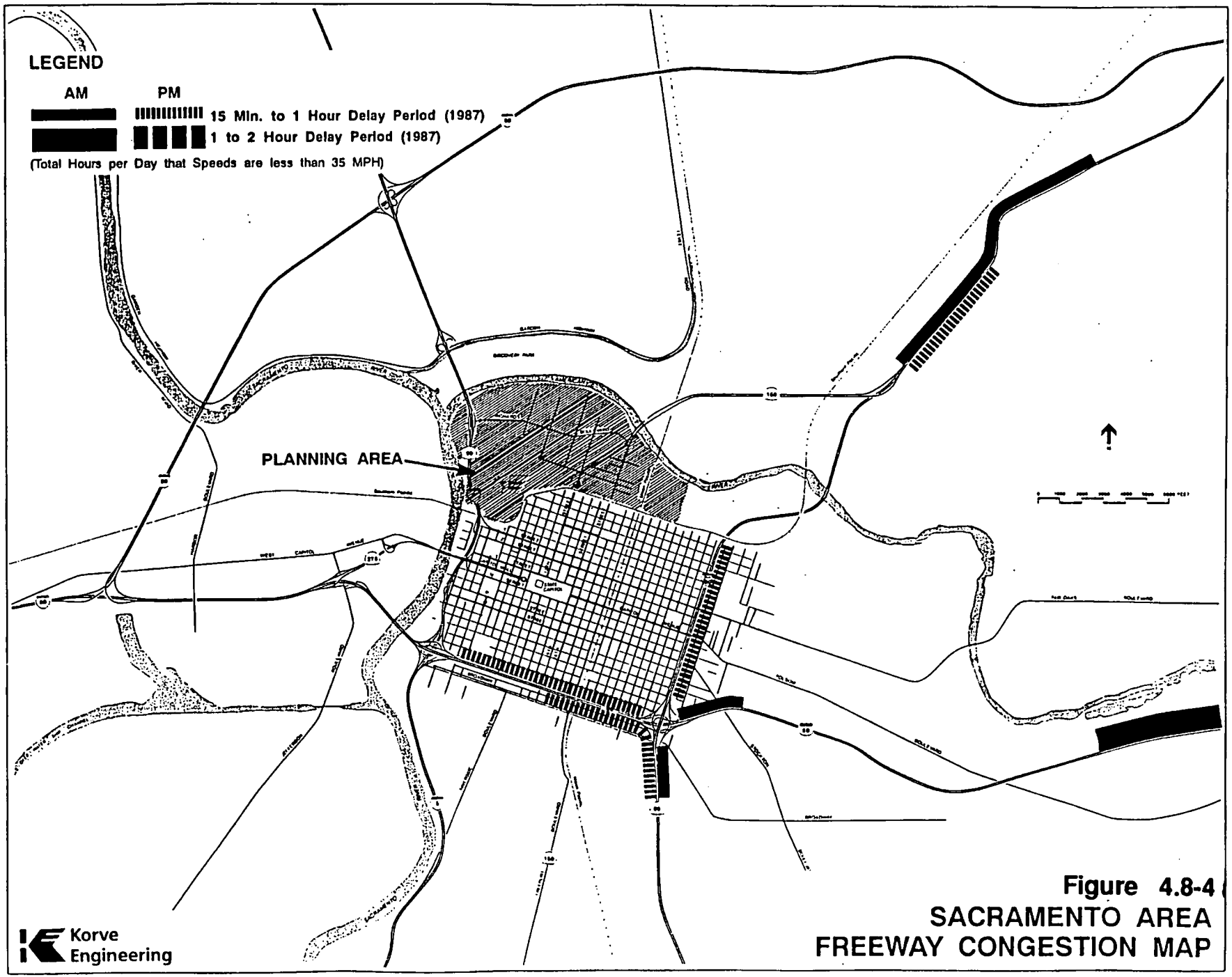
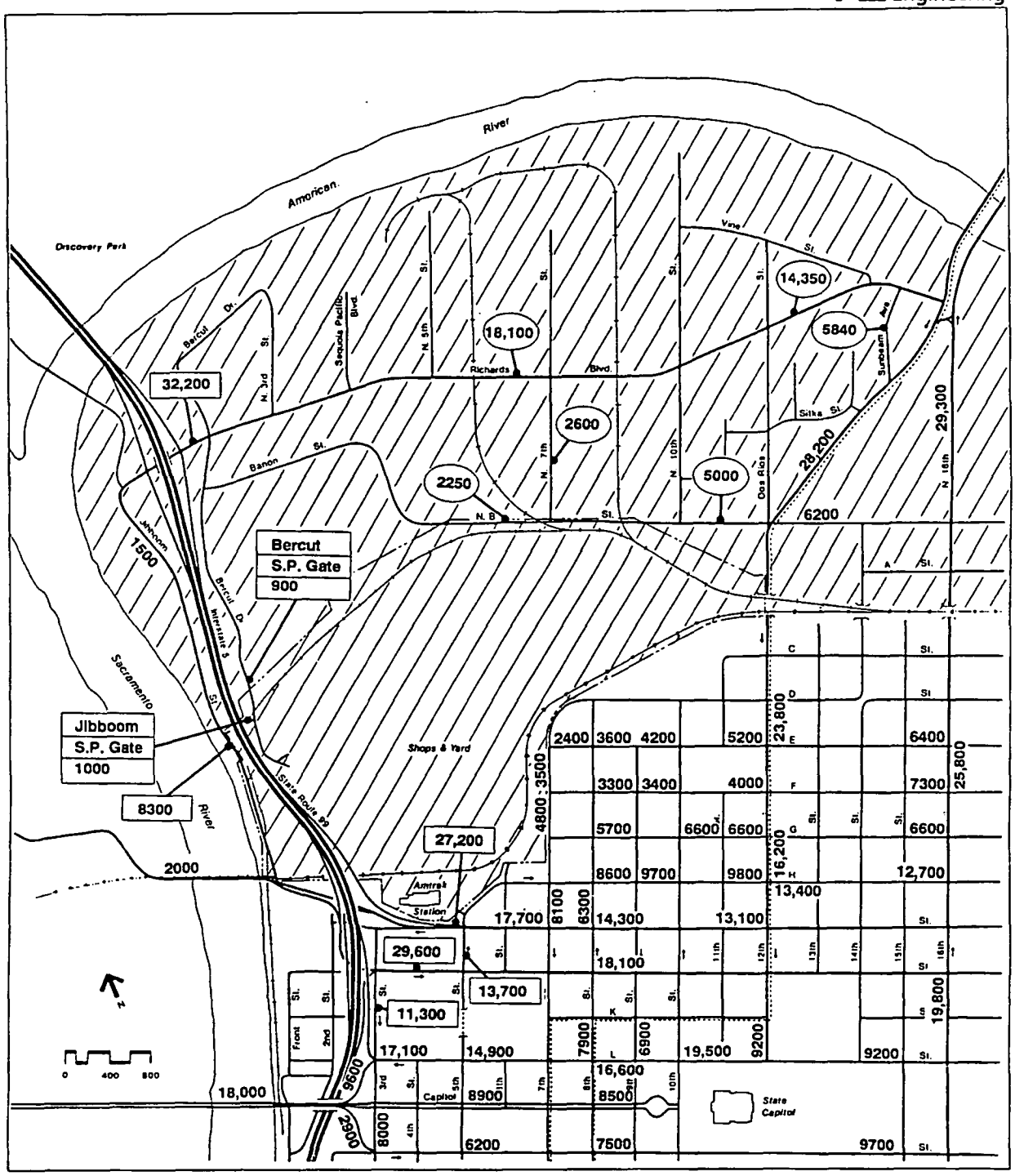


Figure 4.8-4
SACRAMENTO AREA
FREEWAY CONGESTION MAP



LEGEND

- Freeway
- Local Roadway
- Southern Pacific Main Line
- Southern Pacific Spur
- LRT on Street

SOURCES:

9700	City of Sacramento
(5000)	Richards Development Plan Implementation Strategy
11,300	Korve Engineering, Inc.

Figure 4.8-5

AVERAGE DAILY TRAFFIC VOLUMES ON DOWNTOWN STREETS

TABLE 4.8-7

EXISTING ROADWAY VOLUMES
VICINITY OF PLANNING AREA

Roadway Link	Weekday Volume	AM Peak Hour (Direction) Volume		PM Peak Hour (Direction) Volume	
Richards Blvd. W. of Bercut	32,200	(EB)	1,700	(WB)	1,600
Southern Pacific Jibboom Gate	1,000	(EB)	70	(NB)	261
Jibboom S. of Southern Pacific Gate	8,300	(NB)	400	(NB)	1,200
I Street W. of 5th to (1-way WB)	27,200	(WB)	800	(WB)	1,700
J Street E. of 3rd (1-way EB)	29,600	(EB)	2,800	(EB)	2,000
3rd St. S. of J (1-way)	11,300		700		500
5th St. S. of I (1-way NB)	13,700		1,100		900
7th St. N. of H (1-way SB)	11,400		800		1,300
Southern Pacific Bercut Gate	900	(SB)	150	(NB)	75

EB = Eastbound
WB = Westbound
NB = Northbound
SB = Southbound

SOURCE: Korve Engineering, Inc.

The Southern Pacific's original transcontinental, Donner Pass, or "Overland" route continues to be a strategic link in the nation's freight and passenger train network. The Southern Pacific trackage enters the downtown area from the west on the lower deck of the I Street bridge. The main line splits at the Elvas Wye east of the downtown with one leg continuing north through Roseville to Truckee and points farther east, and the other leg continuing south to Stockton and points farther south in the Central Valley. The Southern Pacific mainline is grade separated at all major downtown streets. Additional connections accessible to the south of the Elvas Wye include a line to Placerville and the R Street line, which has been abandoned west of Alhambra.

The Union Pacific main line runs north and south in the Valley between Stockton and Oroville. Running in a north-south alignment between 19th and 20th Streets, the Union Pacific trackage crosses all of the east-west streets at grade. The Union Pacific mainline crosses beneath the Southern Pacific mainline between 19th and 20th Streets, north of C Street.

Both lines are major east-west arteries, carrying perishable, high-value goods and commodities. Dedicated, regularly scheduled container trains are common on both lines. Only the Southern Pacific has regularly scheduled passenger trains (operated by Amtrak) running through Sacramento.

Sacramento Railyards

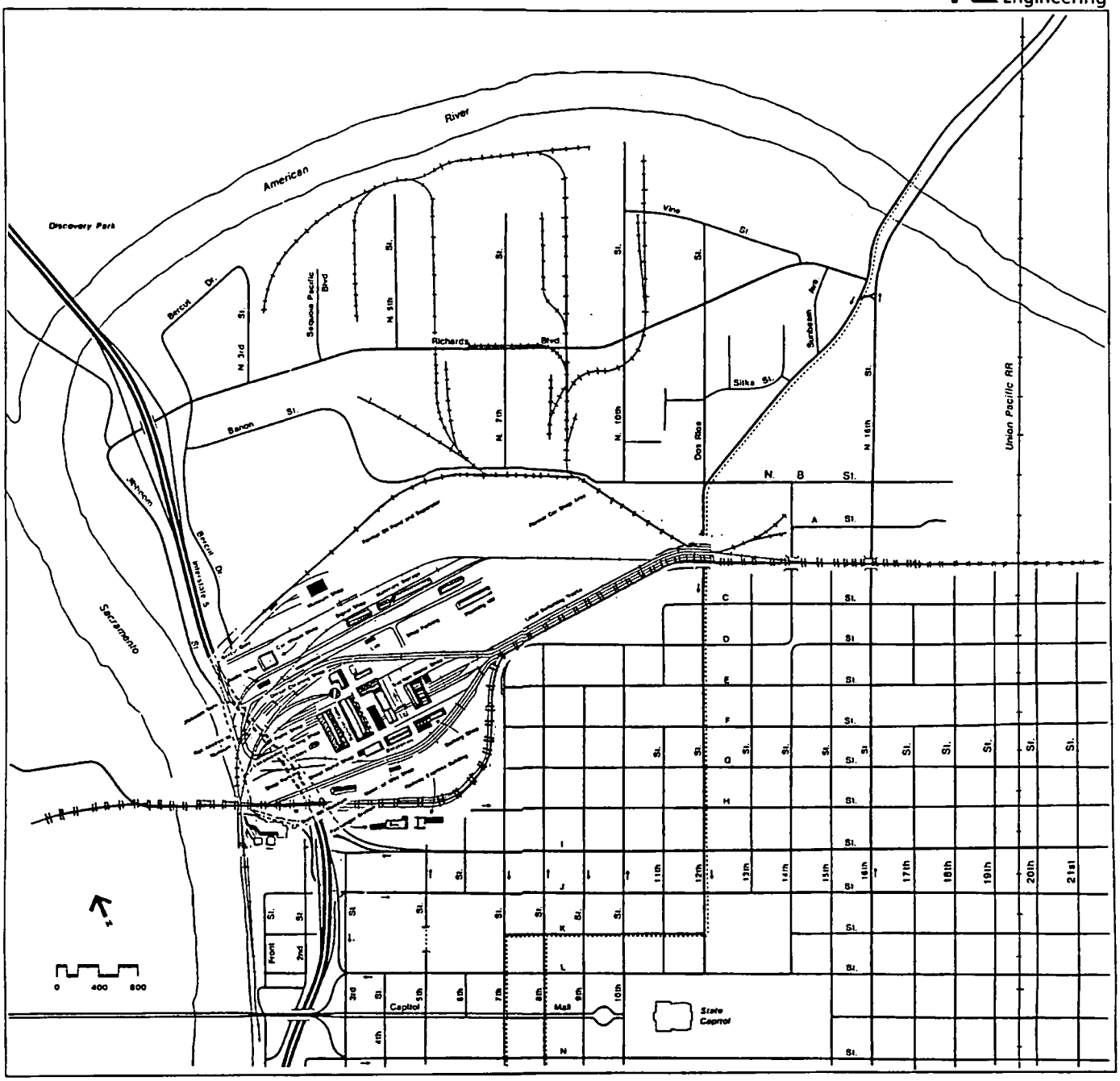
Sacramento is located at milepost 89 (starting from the Ferry Building in San Francisco) on what used to be the Roseville Subdivision, of the Sacramento Division, of the Southern Pacific Transportation Company. Sacramento's role in the day to day railroad operations has been eclipsed by Roseville, located 15 miles to the northeast. The Southern Pacific is currently moving activities from the downtown Sacramento site to Roseville, one of the largest classification yards west of the Rockies, and eventually intends to phase out all non-essential rail operations from the site, relocating key operations in Roseville.

Southern Pacific Main Line

Figure 4.8-6 indicates the alignment of the Southern Pacific main line through the Railyards site. The double-tracked main line enters the Planning Area from the west on the lower deck of the I Street bridge, and exits to the east along an embankment on the B Street levee, with grade separations over 12th and 16th Streets. In addition to the two main lines, the levee top trackage east of the yards site has a yard lead (feeder track) and several storage tracks. Ruling grade (maximum rate of ascent) is maintained at 1 percent but speeds are limited due to a 10 mph limit on the I Street bridge and a 25 mph limit for the 10 degree (about 600-foot radius) curve east of the passenger depot.

Passenger Depot

There are currently three tracks on the Southern Pacific main line that serve the two platforms at the existing passenger depot. A pedestrian subway provides access to the trains. Current Amtrak operating practices have the westbound and southbound trains loaded and unloaded from the northern side, towards the shops. Eastbound and northbound trains are loaded from the south



LEGEND

- Freeway
- Local Roadway
- Southern Pacific Main Line
- Southern Pacific Spur
- LRT on Street

Figure 4.8-6
RAIL FACILITIES IN PLANNING AREA

side, towards the depot. At the present time the Southern Pacific holds freight traffic while passenger trains are stopped.

AMTRAK Passenger Service

Sacramento Service

At present Amtrak operates two interstate "basic system" lines providing four daily trains through Sacramento. These two "long haul" lines, the California Zephyr and the Coast Starlight, are operated by Amtrak. In addition to these two trains, the State-supported San Joaquin serves Sacramento via dedicated buses that connect with the train in Stockton. Table 4.8-8 shows the number of passengers using the Sacramento Station between 1987 and 1991.

TABLE 4.8-8
SACRAMENTO AMTRAK BOARDINGS

Year	Passengers	% Change From Previous Year
1991	137,738	(1.66)
1990	140,061	12.17
1989	124,867	1.83
1988	122,617	0.64
1987	121,838	

SOURCE: Korve Engineering, Inc.

Amtrak's Capitol Corridor Service

The Capitol Corridor Service provides three round-trip runs between Sacramento and San Jose, or six daily trains. The Capitol Corridor Service is in its infancy. Early ridership numbers were in the range of 16,000 boardings per month.

There are an increasing number of passengers using the Sacramento station. Sacramento was Amtrak's 39th busiest station (out of 537 nationwide) in 1989.

Amtrak and the State of California initiated the "Capitol Corridor" inter-city passenger service between Sacramento and San Jose in December, 1991. The passenger service provides three daily runs (six total trains), which operate seven days a week. The one-way fare is $23 and the round trip fare is $30 between Sacramento and San Jose. Daily trains leave the Sacramento Depot at 7:15 AM, 11:40 AM, and 5:05 PM.

Amtrak's Long Haul Interstate Service

Amtrak currently operates two trains daily through the Sacramento station in each direction. It should be noted that these two trains are among Amtrak's most popular routes. The California Zephyr, which operates between Oakland and Chicago via Sacramento, Salt Lake City and Denver, has the highest patronage of any Amtrak long distance route in the nation, with 54,858 passengers carried in February, 1990. The Coast Starlight, operating between Los Angeles and Seattle, via Santa Barbara, Oakland, Redding and Portland, was second in the nation with 39,485 long haul passengers that same month.

Amtrak's San Joaquin Service

The San Joaquin service currently consists of three daily round trip trains running between Oakland and Bakersfield via Martinez, Stockton and Fresno. Unlike the Zephyr and Starlight, Amtrak's San Joaquin service has been partially state-funded since October 1, 1979. Since then, the performance and ridership of the San Joaquin has improved considerably due, in part to the State's increased marketing efforts and a program of operational improvements.

Late in 1980, the State instituted a series of dedicated bus connections, beginning with a Sacramento to Stockton and Bakersfield to Los Angeles connection. The success of these buses has led to other "feeders", and has contributed to the overall success of the train. Trips that use the rail mode exclusively have remained relatively unchanged since 1981. Bus connecting trips now make up virtually 50% of the total ridership. Sacramento now accounts for approximately 11% of San Joaquin's total ridership.

According to Caltrans figures, even though served only by connecting bus, Sacramento is the 9th busiest station on the line. In the fiscal year 1989-90, the average daily San Joaquin related ridership at Sacramento was 116.

Freight Service

Freight Spurs

Spur tracks extend from the Railyards site north to industries in the Richards Boulevard industrial area, as well as south along the Sacramento River to the California State Railroad Museum and points beyond. The museum spur crosses the main line immediately east of the I Street bridge at an approximate right-angle crossing, and connects to trackage running along the levee along the north boundary of the site. Connection to the main line occurs in the vicinity of 12th Street east of the site. Spurs into the Richards Area also diverge from the main line at this location, serving Applegate Drayage, the State Printing Office, a cannery, and a scrap yard through leads along the 5th Street and 8th Street alignments.

Freight Services

Southern Pacific currently operates about 15 freight trains through the site each day. This includes a local freight run located in the yard east of the passenger platforms on-site. Freight

service would continue to be provided through the site, which includes the Southern Pacific main line between the Bay Area and transcontinental points east.

In addition to through freight service, local switching operations occur on spurs that connect to the main line at the Railyards. The museum spur used to bring rolling stock to the museum is rarely used. Other industries in the Richards Area generate a limited number of freight carloads. If direct freight service were discontinued, alternate means of providing access to the railhead would be needed. Generally, goods would be moved by truck. Service to the scrap yard, immediately northeast of the site, would be the most difficult to replace with truck access, due to the volume and nature of loads.

Steam Excursion Trains

The Sacramento Southern Railroad runs excursion trains (seasonal service) South on the trackage along the levee to Miller Park. Equipment is occasionally moved onto these tracks through the California State Railroad Museum property.

Transit Facilities

Transit Systems

A variety of transit operators provide local and regional transit service in the Sacramento area. The following operators provide services to downtown Sacramento in the vicinity of the Planning Area:

- Sacramento Regional Transit District (RT) -- The RT currently provides integrated light-rail transit (RT Metro) and bus service throughout Sacramento County.

- The Yolo County Transit Authority: (Yolobus) -- Yolobus provides service to and from downtown Sacramento from the Yolo County Communities of West Sacramento, Davis and Woodland. A total of seven bus routes serve the Sacramento downtown area. During the AM peak hour, 10 express buses serve downtown Sacramento. On average, each bus carries 31 people (69 percent load factor). Seven peak period local buses carry approximately 31 passengers each (69 percent load factor). Fourteen passenger dial-a-ride vehicles make two or three trips into Sacramento each day, depending on service demand.

- Greyhound -- Greyhound currently operates 10-80 regularly scheduled buses a day out of its station at 7th and L streets. In 1989, ridership averaged between 2,000 and 5,000 passengers a day with a holiday peak of 7,000. Greyhound recently signed a five-year lease to remain in their current station facility. It is anticipated that Greyhound will relocate to another facility when that lease expires.

- Folsom Stage Lines -- The City of Folsom currently has a contract with Grayline to provide three buses each way between Folsom and downtown Sacramento. According to the City, the buses frequently run at capacity, and there is a waiting list. A fourth bus is scheduled to be added this summer. Inbound morning

service runs via U.S. 50, Business 80 and P Street to the run's terminus at 8th and I streets. In the afternoon, the coaches leave from 7th and H Street. A one hour running time is scheduled in both directions.

- Airport Shuttle -- The Yellow Cab Company operates a regularly scheduled airport shuttle van service every 1/2 hour from the downtown Holiday Inn and 12th and L street. Fare for the 1/2 hour ride is $7.25.

- Amador Stage Lines -- Amador Stage lines operates a daily charter bus from Berkeley to Sacramento in the AM with a return trip in the PM. According to an Amador representative, this bus serves a group of approximately 38 persons (primarily state employees).

Figure 4.8-7 indicates transit routes serving downtown Sacramento as a whole; routes in the vicinity of the Planning Area are shown on Figure 4.8-8. Figure 4.8-9 shows the newly adopted route for the free Downtown shopper shuttle bus.

Regional Transit

Regional Transit (RT) carries 81,900 persons each weekday, of which 23,800 are on the light-rail (LRT) system. During the off-peak hours it operates 120 buses and during the peak hours 160 buses. During the off-peak, RT operates eight two-car LRT trains at 15 minute headways. During the peak hours the LRT system operates eight four-car trains.

Light Rail Routes

Opened in 1987, Sacramento's LRT (RT Metro) operates a 18.3 mile (29.4-km) surface system. Sacramento employed a wide variety of existing alignments and right of ways to build its system. Single track sections currently compose 55 percent of Sacramento's total trackage. Mixed traffic segments, located primarily in the downtown area, comprise 10 percent of the total line. RT plans to double-track the entire system gradually, allowing it to cut peak headways from the current 15 minutes.

The existing LRT system is "boomerang shaped", extending from the northeast suburbs (Watt/I-80) through the downtown area, southeast of the Southern Pacific Passenger Station, out to the southeast suburbs (Butterfield). From the current northeastern median terminus at Watt Avenue, the LRT operates in the median of Interstate 80 for 1.7 miles. The LRT then runs for 4.8 miles in a right of way (ROW) cleared for a freeway that was never built. The LRT then runs on portions of the former Sacramento Northern Railroad, and along the side of Del Paso Boulevard. At the American River, the LRT operates on the eastern side of the southbound State Route 160 bridge on a double-track section that extends along North 12th Street south to G Street.

There are two existing and one proposed LRT stations in the vicinity of the Planning Area:

- St. Rose of Lima Park -- Located on K street, two separate platforms a block apart serve the Watt/I-80 and Butterfield trains. These platforms are approximately a three-block walk from the Southern Pacific passenger station.

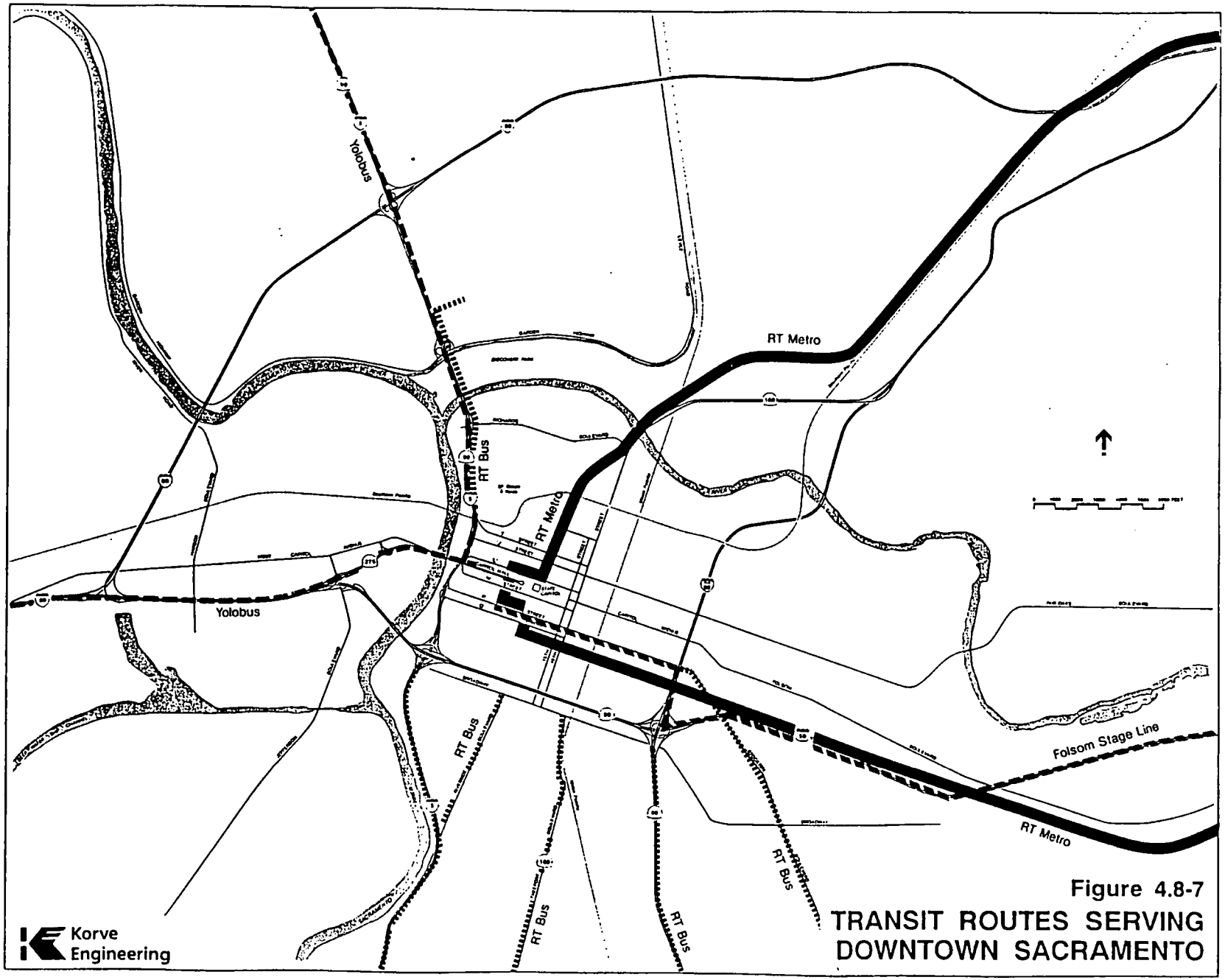
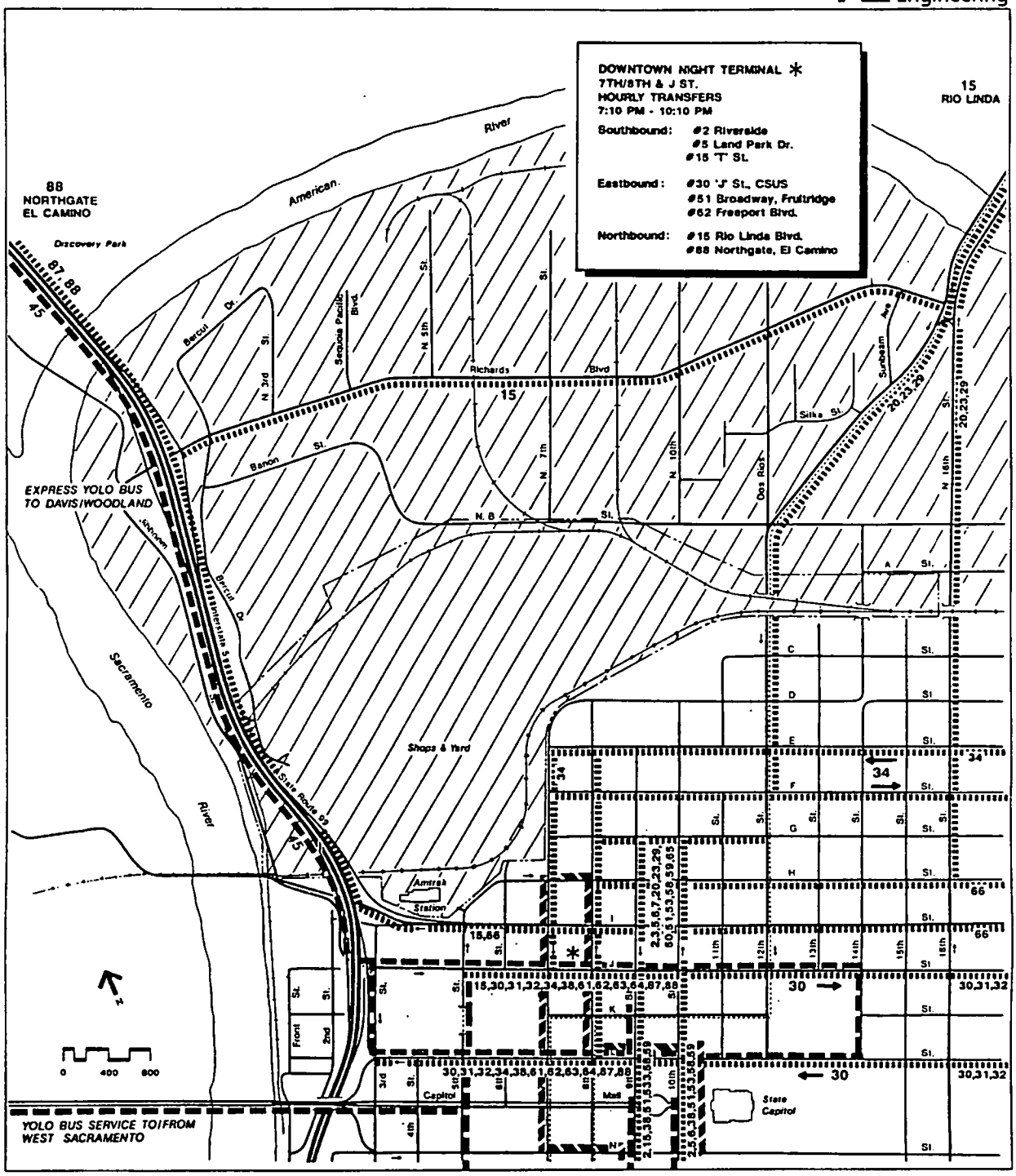


Figure 4.8-7
TRANSIT ROUTES SERVING DOWNTOWN SACRAMENTO

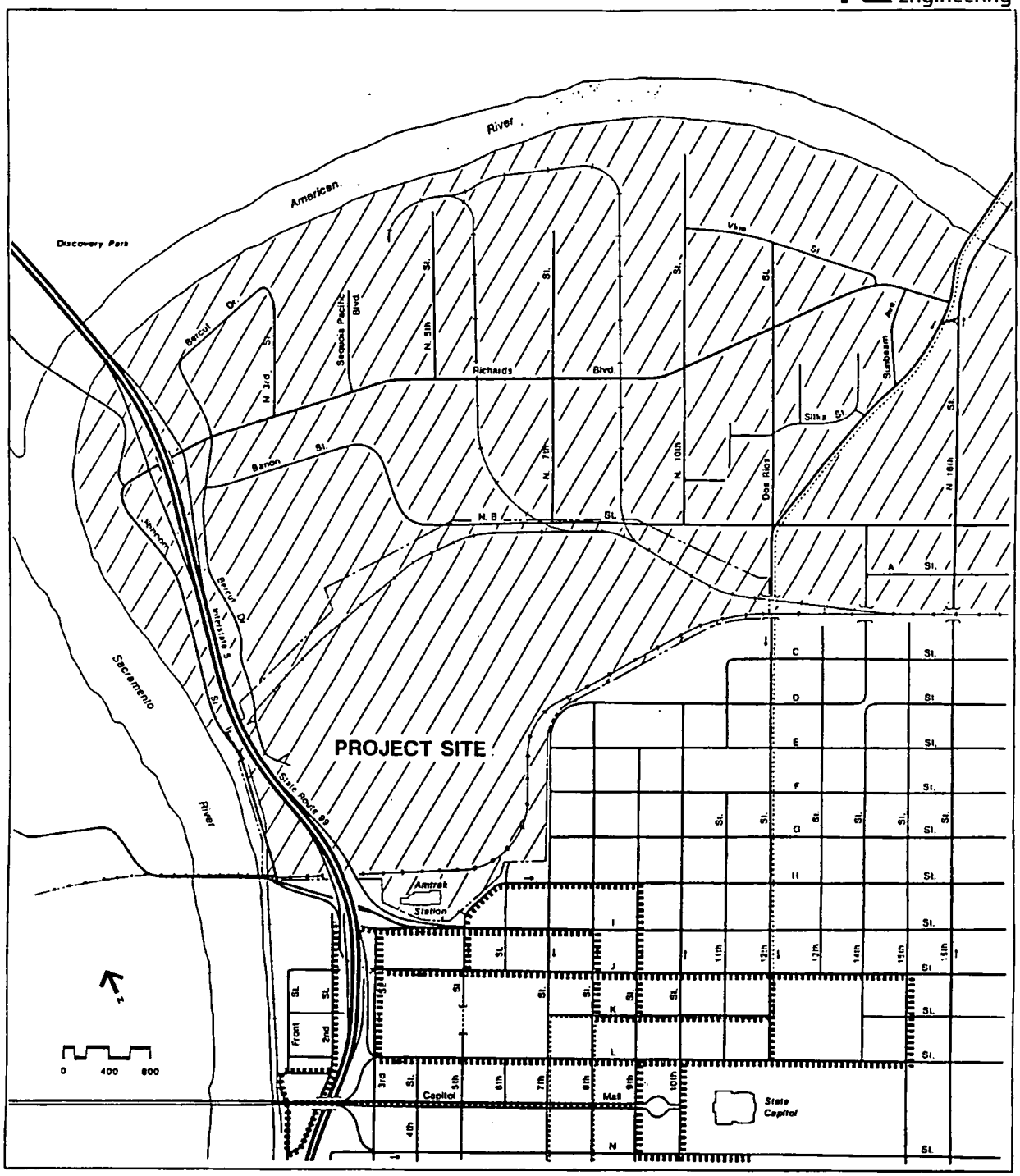


LEGEND

- Freeway
- Local Roadway
- Southern Pacific Main Line
- Southern Pacific Spur
- RT Light Rail
- SACRAMENTO RT BUS
- YOLO BUS
- FOLSOM STAGE LINE

Figure 4.8-8

TRANSIT ROUTES IN VICINITY OF PROJECT SITE



LEGEND

- Freeway
- Local Roadway
- Southern Pacific Main Line
- Southern Pacific Spur
- LRT on Street
- Downtown Shuttle

Figure 4.8-9

DOWNTOWN SHUTTLE ROUTE

- Alkali Flat -- The Alkali Flat Station is just south of the Southern Pacific overpass on 12th Street. Running on the north side of the street at this point, access to the platform from the Planning Area necessitates crossing 12th street and the LRT tracks. With the double tracking, the Alkali Flat station will be modified to a center platform configuration.

- Dos Rios Station -- At the present time, the Sproule/Richards area to the northeast of the Planning Area is 0.6 miles from the Alkali Flat Station, and 0.8 miles from the Globe Station north of the River. The proposed center platform station site is located at the southern end of the SR 160 bridges, just south of that point where the single track over the bridge will split.

RT Metro runs with one- to four-car trains, depending on the time of day and load factor. During peak periods, there are typically two, three and four-car trains operating. During midday, two-car trains are used, while at night single car trains can serve the demand. Each LRT car seats 64 passengers and has a standing capacity of 111 passengers. The addition or reduction of cars in a "trainset" allows RT Metro to be flexible to meet varying travel demands throughout the day.

LRT service begins at 4:36 AM and runs until 1:24 AM. During the AM and PM rush hour peaks, and during midday, LRT runs at frequencies of 15 minutes. At night, the LRT operates on a 30-minute frequency. Connecting night bus service from the "Downtown Night Terminal" at 7th and J Street commences at 7:10 PM and continues at 10 minutes past the hour, until 10:10 PM. Dedicated buses connect to and from the following downtown radial routes; 2, 5, and 62 southward. Bus routes 15 and 88 run northward past the Planning Area, and bus routes 30 and 51 run to the east.

On the Watt/I-80 line at the American River, the average load during peak periods is 97 passengers per car. During the off peak periods the average load is 33 passengers per car.

On the southeastern, "Butterfield" leg of the system, the average load during peak periods is 106 passengers per car. During the off-peak periods the average load is 36 passengers per car.

Bus Routes

The Planning Area is directly served by Routes 15, 20, 23, and 29. Route 15 provides service along Richards Boulevard, while the other three routes provide service along 12th and 16th Streets (SR 160). A majority of RT Metro's downtown bus routes are within a four block walk of the project passenger station. J Street and 9th Streets are major passenger drop off and collector streets.

Existing service direct to the Planning Area is limited to Route 15, which circles the Planning Area, serving it from the south on I Street and from the north on Richards Boulevard. Route 15 is primarily a north-south route that provides an alternate connection between the Watt/I-80 and Butterfield LRT routes.

RT Bus Cordon Analysis

Table 4.8-9 provides RT service and patronage data on a cordon line around the downtown core of Sacramento, broken down by screenlines across the north, east and south. The northern screenline was defined at the American River, the eastern screenline at 30th Street and the southern screenline at X Street.

Existing Downtown Mode Split Evaluation

Using a similar cordon line technique on a line drawn around the core area within downtown Sacramento, the mode split of peak hour travel was computed by a coordinated set of auto occupancy and vehicle volume counts collected by the City of Sacramento in March, 1990. Table 4.8-10 summarizes the mode split results.

Bicycle Facilities

The City and County of Sacramento, in cooperation with state agencies, have actively promoted bicycle commuting in the central Sacramento area. In the downtown area, there are designated bike lanes and routes, and numerous public bike parking areas (see Figure 4.8-10). In addition to these urban street facilities, there is a system of off-road bike trails and paved paths located in and around the Planning Area. Bike lanes and routes are typically placed on those roadways where there will be a minimum of vehicular and transit conflicts.

The following facilities exist in the vicinity of the Planning Area:

- Bike Lanes -- Class II painted bike lanes are located on E Street between 7th and Alhambra, 15th Street north of Capitol Park, M Street east of Capitol Park, on Front Street south of O Street, and on Riverside south of X street.

- Bike Routes -- Class III preferred bicycle routes are signed around the perimeter of Capitol Park, west along N Street from the park to Front Street, and south from the park on 11th to X streets. The Tower Bridge on Capitol Mall provides the recommended bike connection to West Sacramento.

- Off-Road Trails -- A paved path along the east bank of the Sacramento River extends across the edge of the Southern Pacific Railyards site, providing a connection between Old Sacramento and the Jedediah Smith National Recreation Trail on the north bank of the American River. The American River is crossed on the Jibboom Street bridge, which is restricted to auto through trips.

  A second bike path extends north from the end of North B Street and crosses the American River on the old Sacramento Northern interurban bridge. This latter path passes through an underpass under the Southern Pacific main line on 14th Street, connecting with bike lanes on 14th Street which lead to the State Capitol.

  Other off-road bike trails radiate south along the Sacramento River toward Sutterville and north to Rio Linda.

TABLE 4.8-9

RT TRANSIT SERVICES
CROSSING DOWNTOWN CORDON

Direction From	Route Number	Peak Hour[1] Frequency	Off Peak[2] Frequency	Average[3] Passengers Per Peak Hour	Average[4] Passengers Per Midday Hour
N	15	30	30M/60N	21	15
N	20x	2 TRIPS AM	--	20	N/A
N	23x	4 TRIPS AM 1 TRIP PM	--	40	N/A
N	29x	2 TRIP AM	--	24	N/A
N	67	30	30M/60N	11	11
N	68	30	30M/60N	8	7
N	67	30	30M/60N	20	15
N	88	30	30M/45N	25	9
E	15	30	30	12	6
E	30	15	30	8	13
E	31	15	60	27	20
E	32	60	60	16	14
E	34	15	15	6	6
E	38	20	20M/60N	6	8
E	50	30	60	32	19
E	86	30	30	3	3
S	2	30	30M/60N	25	14
S	3x	3 TRIPS AM	--	45	N/A
S	5	45	60	18	9
S	6	50	60	16	8
S	7x	3 TRIPS AM	--	31	N/A

TABLE 4.8-9 (Cont.)

RT TRANSIT SERVICES
CROSSING DOWNTOWN CORDON

Direction From	Rt. #	Peak Hour[1] Frequency	Off Peak[2] Frequency	Peak Load[3] Factor	Off Peak[4] Load Factor
S	38	20	40	5	6
S	51	30	30M/60N	14	16
S	53	30	30M	12	13
S	58x	2 TRIPS AM	--	39	N/A
S	59x	3 TRIPS AM	--	32	N/A
S	61	30	30M/60N	17	18
S	62	30	30	14	20
S	63	30	60	13	10
S	64	40	6	18	13
S	65	2 TRIPS AM	--	33	N/A

[1] The peak hour frequency indicates how often buses arrive at stops along the route during the AM and/or PM peak hours. For example, "30" indicates that buses pass every 30 minutes and "2 Trips AM" is a designation for express buses that indicates two buses pass during the AM peak period (2-1/2 hours).

[2] The off-peak frequency indicates both mid-day and night time bus headways. The "M" designation indicates mid-day buses arrive every 30 minutes and the "N" designation indicates night time buses arrive every 60 minutes on Route 15.

[3] The peak load factor indicates the average number of passengers per bus during the peak period of the day for the given bus route per data provided by Regional Transit.

[4] The off-peak load factor indicates the average number of passengers per bus throughout the mid-day period for the given bus route per data provided by Regional Transit.

N/A - Not available.

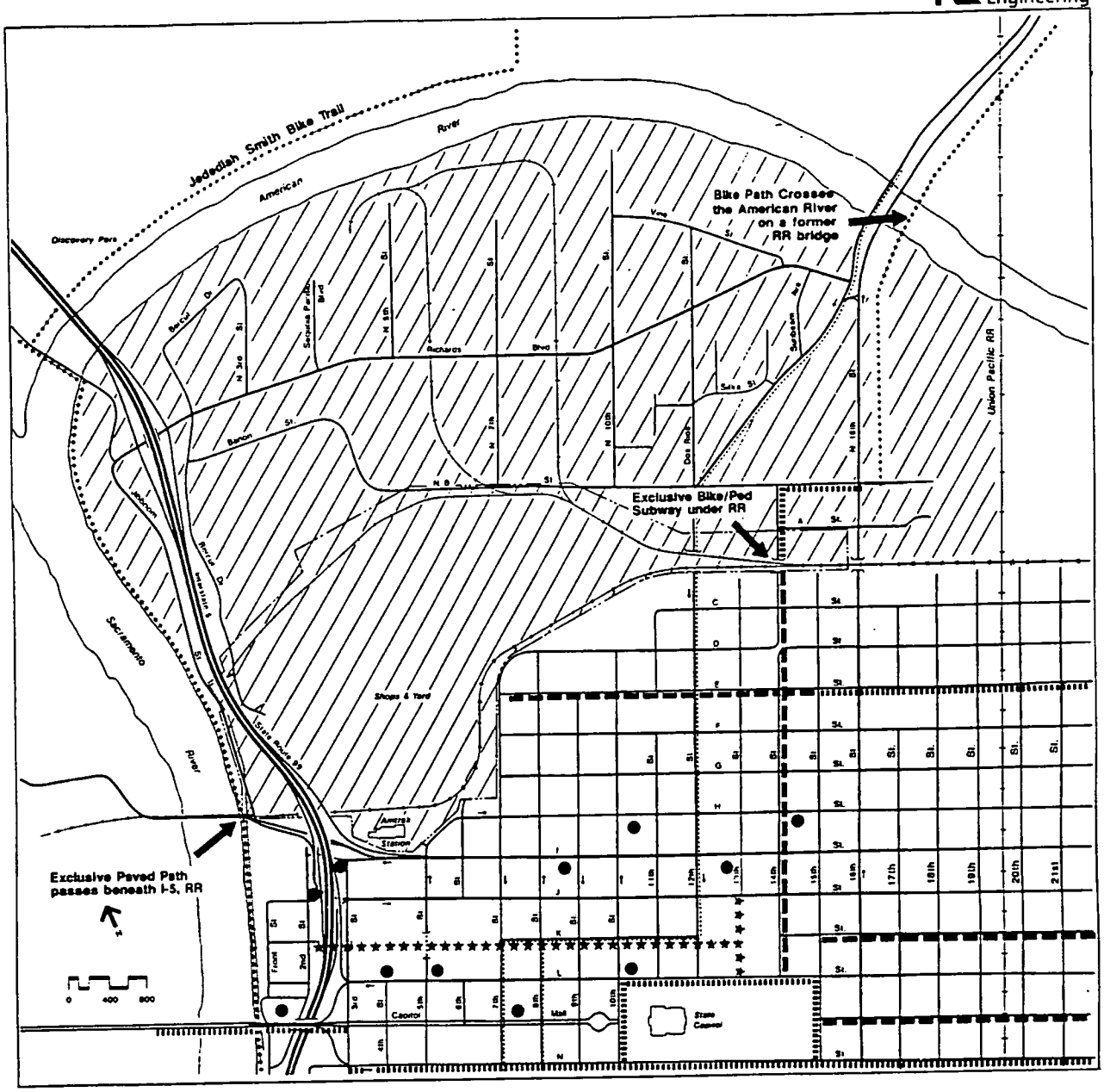
SOURCE: Sacramento Regional Transit District

TABLE 4.8-10

MODE SPLIT OF TRAVEL OF DOWNTOWN EMPLOYEES
March 1990, AM Peak Hour

Mode	Person Trips	Percent
Auto:		
Drive Alone	28,392	54.3
Shared Ride (2 persons)	13,388	25.6
Shared Ride (3+ persons)	2,847	4.10
Subtotal: Auto	44,627	85.3
Transit:		
Bus	3,599	6.9
Light Rail Transit	4,090	7.8
Subtotal Transit	7,689	14.7
TOTAL	**52,316**	**100**

SOURCE: City of Sacramento Department of Public Works, Transportation Division. March 7, 1990 6:30 AM to 9:00 AM.



LEGEND

- Freeway
- Local Roadway
- Southern Pacific Main Line
- Southern Pacific Spur
- LRT on Street
- Trail
- Bike Route
- Bike Lane
- Public Bike Parking
- ★★★ Pedestrian Mall

Figure 4.8-10

EXISTING BIKE AND PEDESTRIAN FACILITIES

The southern levee of the American River is currently unpaved and public access is inconvenient; access via North 10th street is unsigned and unimproved. It has been suggested that access to this area be improved and that the crown of the levee be paved to better accommodate bicyclists.[2]

Parking Facilities

There are currently no public parking facilities in the Planning Area. Parking conditions near the Railyards Area vary depending upon the neighborhood: The central district south of G Street has the greatest number of stalls due to the presence of numerous garage and lot facilities. However, no major off-street facilities are within convenient walking distance of the Station or southeastern portion of the Railyards Area. Occupancy levels are also the highest in the downtown zone, with on-street occupancies exceeding 80 or 90 percent on most block faces. North of G Street in the Alkali Flat residential neighborhood there are few off-street facilities. North of the site in the Richards Boulevard Redevelopment district, most businesses provide off-street parking on site; parking was not cited as a concern in the Redevelopment studies. Existing monthly parking is provided in the Planning Area in the vicinity of the passenger depot and along 7th Street. This parking is heavily occupied at mid-day. Separate parking lots accessible from Jibboom Street and Bercut are provided in the shops area for employees.

Planned Improvements

A variety of roadway projects are under consideration that would affect traffic conditions pertaining to the Planning Area. These improvements include major regional facilities areawide, as well as smaller projects of significance due to their proximity to the Planning Area.

Projects that are shorter-term in nature are generally included in the Regional Transportation Plan (RTP). These projects have been identified in various planning studies and environmental documents. Specific improvements include:

- Richards Boulevard Connector and Interchange Improvements;
- High Occupancy Vehicle (HOV) Lanes Projects;
- Improvements to Interstate 5 at J Street.
- Various LRT Extensions

Full or partial funding has been identified for some but not all of these improvements.

Longer-term projects were identified in the 1988 Metro Study prepared by SACOG. Further studies have been accomplished or are under way on the Metro Study improvements, including a Systems Planning Study by Sacramento Regional Transit and studies of the proposed Beltway facility.

Roadway Projects

Short-Term Improvements

Proposed Richards Boulevard Improvements

The proposed Richards Boulevard Connector project would extend Richards Boulevard from SR 160 to Business 80 in an alignment paralleling the American River at the extreme north edge of downtown Sacramento. The proposed alignment is indicated in Figure 4.8-10; Figure 4.8-11 shows the proposed reconstruction of the State Route 160 interchange. Improvements would be made to provide a full-access interchange at SR 160 (the current segment of Richards provides a direct connection only to the southbound leg of SR 160), as well as at Business 80, where a new interchange would be constructed. Environmental studies accomplished in conjunction with the Richards Boulevard project indicated the need for eight through lanes for the entire length of Richards (extension plus existing portion).

The Richards/Route 51 (Business 80) interchange project is included in the RTP but full funding has not been assured. The Richards/Route 160 interchange project has assured funding, but the project was not included in the RTP. The Richards Boulevard Connector is not included in the RTP, and full funding is not assured.

Route 160 and Route 51 (Business 80)

Various improvements along Routes 160 and 51 (Business 80) north of the American River have been studied and included in the RTP. These include the Route 160/Exposition Boulevard interchange, Exposition Boulevard Extension, and ramp improvements at the Exposition and

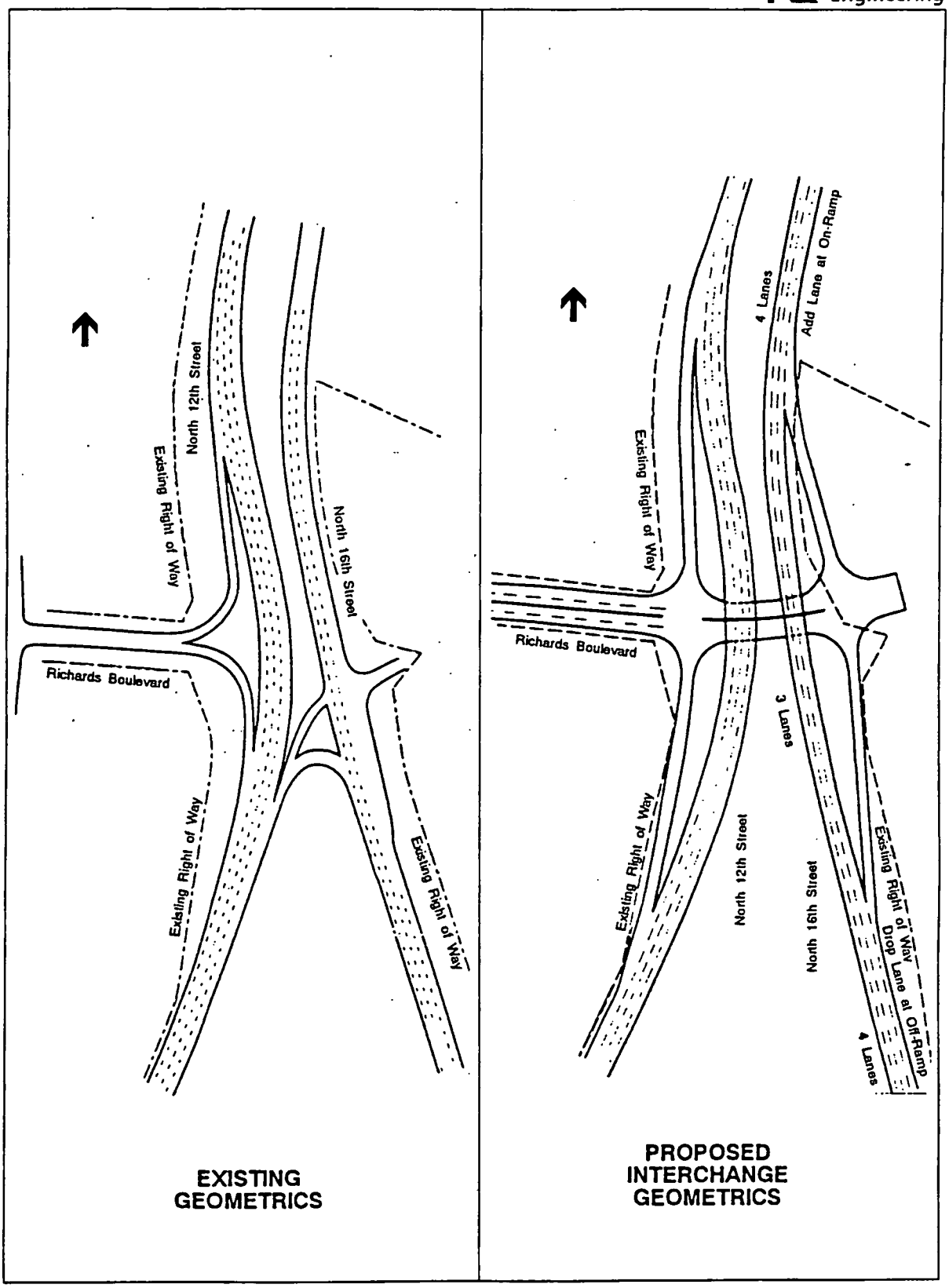
Route 160 interchanges on Route 51. These projects are not fully funded, but the Exposition Boulevard Extension has been nominated for 50 percent funding in the 1992 State Transportation Improvement Program (STIP).

Interstate 5/J Street Interchange

A proposed short-term improvement to the Interstate 5/J Street interchange would widen the northbound off-ramp from two to three lanes. This improvement is included in the RTP and is partially funded. A longer-term project would entail reconstruction of the L Street on-ramp and the J Street off-ramp to provide a four-lane off-ramp to J Street with significantly improved storage. A Project Study Report (PSR) has been completed for this improvement, but assured funding has not been identified.

HOV Lane Projects

A High Occupancy Vehicle (HOV) lane study was recently accomplished by the Sacramento Area Council of Governments (SACOG). The study resulted in a list of about 20 projects that would provide for freeway widenings concurrent with the implementation of HOV lanes. Projects have been grouped into five-year implementation timeframes based upon year of need degree of reconstruction involved (see Figure 4.8-12). The HOV lanes would be designated for

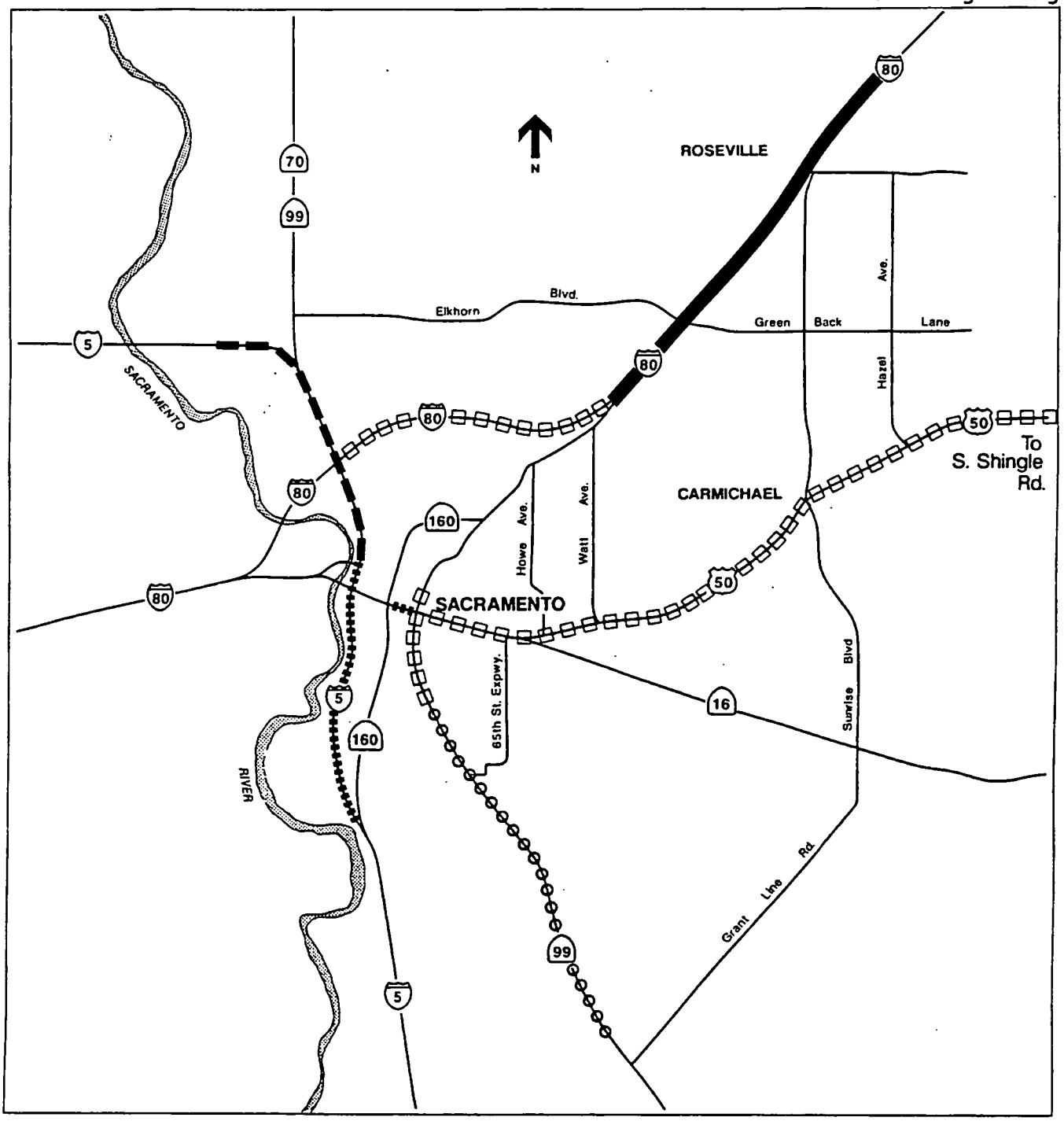


Source: OMNI-MEANS (1988)

Figure 4.8-11

RICHARDS BOULEVARD IMPROVEMENTS

Korve Engineering



LEGEND

- Existing
- 1993-1994
- 1995 - 1999
- 2000 - 2004
- 2005 - 2009

Figure 4.8-12
HOV LANES PROJECTS

and vehicles carrying two or more persons on a permanent (24-hour) basis. These projects are being incorporated into the Regional Transportation Improvements Plan (RTIP), and the highest priority group of projects is expected to be implemented in the near term.

Near-term projects included in the 1990 RTIP include widening and provision of HOV lanes on Route 99 between Mack Road and Elk Grove Boulevard[3] (funded by Measure A) on US 50 between Route 51 (Business 80) and the El Dorado County line, on Interstate 80 between Interstate 5 and Rocklin Road as well as between Chiles Road in Davis and the US 50 junction in West Sacramento.

Long-Term Improvements

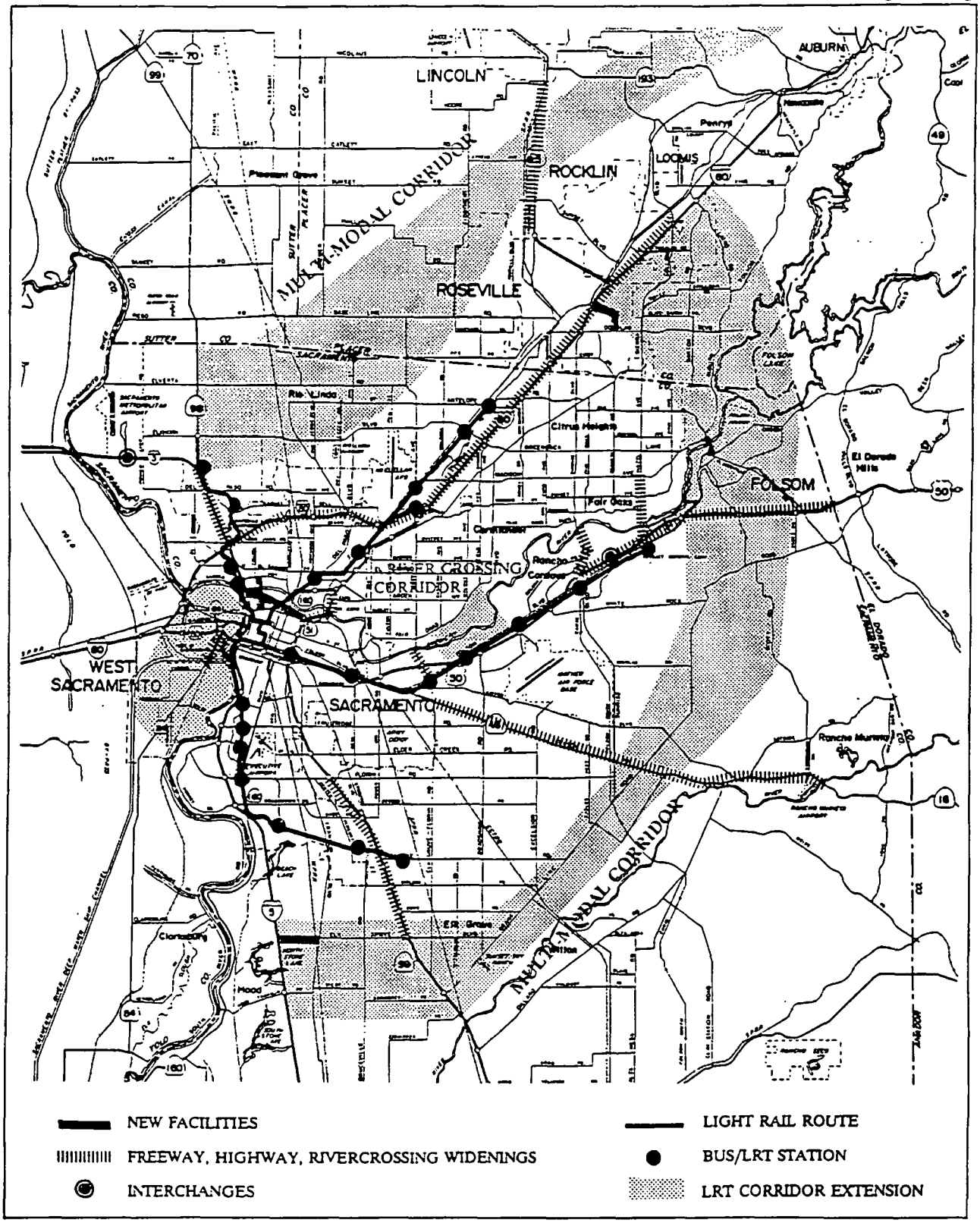
Longer-term projects, such as the lanes shown on Interstate 5, represent widenings that have not been funded, and there is no assurance that such improvements will be funded at this time.

Metro Study

The 1988 Metro Study by SACOG studied regional transportation needs through 2010, and recommended a wide ranging set of improvements which included (see Figure 4.8-13):

- Four Light-Rail Transit Extensions
  - I-80 Corridor to Antelope Road
  - SR 50 Corridor to Hazel Avenue
  - North through Natomas to Airport
  - South to Meadowview and Calvine Roads
- Two New Major Freeways and/or Transitways
  - SR 102 (beltway) parallel to I-80 between I-5 and Auburn
  - SR 65/148 (beltway) connecting I-5, SR 99, SR 50 and I-80
- Additional Bridges across the American River
  - North of Downtown Sacramento at Truxel Road
  - East of Downtown between Watt and Sunrise
  - In Folsom, at Auburn/Folsom Road and at Oak Avenue Parkway
- Extensive List of Supplementary Freeway and Surface Street Improvements
- Reduction of Trips through use of Transportation Control Measures (TCMs).

Due to the long-range nature of many of these projects, it is uncertain which projects will ultimately be built. The Truxel Avenue bridge, which would provide significant additional vehicular capacity to the Richards Area, has encountered opposition due to concern for impacts on the American River Canyon and residential neighborhoods north of downtown Sacramento. The beltway projects have been designated as "multi-modal corridors," and will require further



Source: Sacramento Metropolitan Area Transportation Study (1988)

Figure 4.8-13
METRO STUDY IMPROVEMENTS

study to determine the appropriate type and sizing of highway and/or transit facility that would be provided. The LRT extensions are being studied further in the System Planning effort currently under way by Regional Transit (RT).

Caltrans Traffic Operations System (TOS)

Caltrans has studied potential system attributes and costs for a Traffic Operations System (TOS), which would provide an integrated system for management of incidents on segments of the state highway system. The TOS would include hardware for real-time acquisition of visual and pavement detector data to identify problems on the highway system, staffing of a central control center, radio communications with incident response units in the field, and variable message signs to inform motorists. Since studies have indicated that significant portions of regional transportation capacity are lost due to non-recurrent incidents, better response to incidents would effectively increase the capacity of the highway system. At this point in time, Caltrans has not yet finalized the scope of the system nor a firm implementation timetable. Regardless of the status of the TOS, Caltrans is in the process of designing and installing freeway on-ramp metering along the US 50 corridor east of downtown Sacramento.

Heavy Rail Projects

Caltrans has identified four short-term improvements for the San Joaquin service in their 1990 "Rail Passenger Development Plan 1990-95":

- Extend train service directly to Sacramento.
- Reroute the trains onto the Southern Pacific line between Stockton and Fresno. Currently, the service runs on the Santa Fe line bypassing Modesto.
- Add a fourth daily train.
- Provide checked baggage.

Transit Projects

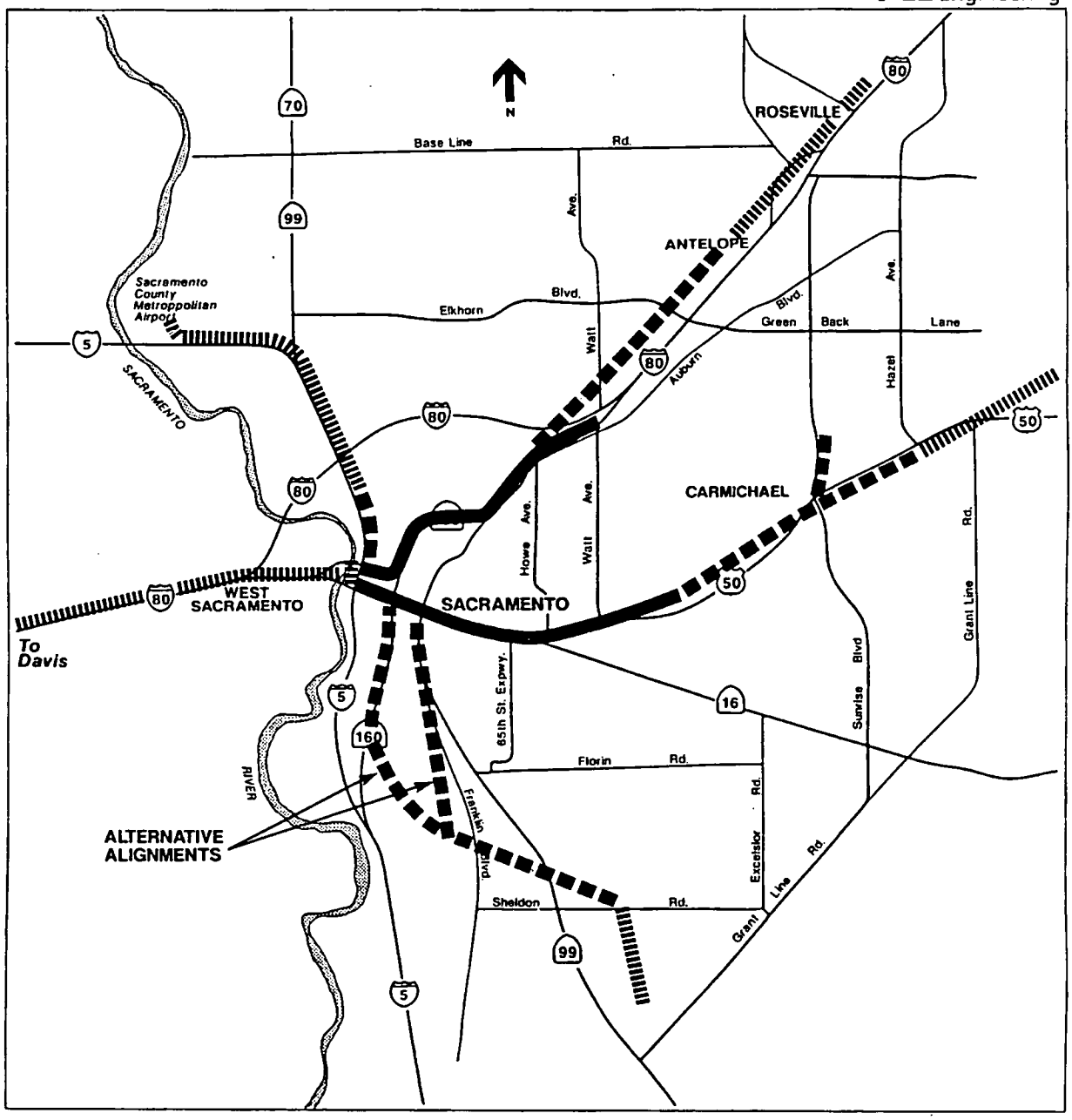
Planned RT Improvements

Systems Planning Study

RT has recently completed a comprehensive Systems Planning Study which evaluated long range LRT and bus transit alternatives. The study recommends the completion of seven light-rail extensions by the year 2010. This includes the Sunrise and Folsom (US 50 corridor), Antelope (I-80 corridor), South Sacramento, Downtown-Natomas-Airport, and Davis extensions. Figure 4.8-14 shows the Central California Traction (Southeast) proposed implementation plan. Some but not all of the extensions are funded.

Downtown-Natomas-Airport Line

This corridor is approximately 12 miles in length and includes the CBD, the Planning Area, the largely residential community of South Natomas, the North Natomas area with ARCO Arena and the planned Arco Sports Park, and the Sacramento Metropolitan Airport with its environs.



Existing Service
New Service by 2000
New Service by 2010

Figure 4.8-14

LIGHT RAIL EXTENSION IMPROVEMENTS

The recommended alignment identified in the RT Systems Planning Study runs north through the Railyards Area, along 7th Street, and west along the north side of the Richards Boulevard before crossing the American River via a new bridge. Route alternatives east and west of Interstate 5 have been identified; the alignment east of Interstate 5 along Truxel Avenue is recommended if rapid development north of Interstate 80 is to take place.

Study LRT Assumptions

The Year 2010 analysis includes the construction of the Downtown-Natomas-Airport Extension, the South Line, the Folsom (US 50) Extension, and the Roseville (I-80) Extension. These extensions were included because funding is available on portions of each alignment and, as such, their construction is reasonably assured. The build-out scenario incorporates the construction of additional extensions as identified in the Systems Planning Study for the Year 2010. This includes the Davis Extension, the Central California Traction Extension, and the Sunrise Extension.

Programmed Project Improvements

The project improvements for the Planning Area are described in the Facility Element (May 1992). These improvements are summarized below for the Year 2000, Year 2010, and Buildout scenarios.

Year 2000 Project Improvements

- Relocation of Southern Pacific Railroad Main Line track to the north portion of the Railyards Area.
- Extension of Light Rail north to Richards Boulevard (i.e., Phase 1 of the Downtown-Natomas-Airport Extension).
- Construction of the Phase 1 Intermodal Transit Station.
- Extension of 7th Street north to Richards Boulevard.
- Widening of Richards Boulevard to five lane cross-section from I-5 to Sunbeam.
- Extension of 5th Street, 6th Street, G Street and H Street by one block in the south portion of the Southern Pacific Railyards area.
- Extension of 6th Street as a two-way street north to Richards Boulevard.
- Phase 1 improvements to the I-5/J Street interchange.
- Phase 1 improvements to the I-5/Richards Boulevard interchange.

Year 2010 Project Improvements

- Construction of Phase 2 Intermodal Transit Station Improvements.
- Construction of 7th Street East and 7th Street West around Intermodal Transit Station.
- Extension of 5th Street north to Richards Boulevard and designation of 5th Street/6th Street couplet.
- Construction of Gateway Boulevard as two-way facility between Crescent Park and the State Route 160 crossing of the American River.
- Phase 2 Improvements to the I-5/Richards Boulevard Interchange.
- Construction of Richards Boulevard Couplet between I-5 and 7th Street.
- Construction of B Street/North B Street couplet between 5th Street and Gateway Boulevard.
- Construction of the State Route 160/Riverfront Drive Interchange.
- Construction of the I-5/Crescent Drive Interchange (e.g., I-5 braided ramps).
- Widening of the I-5 Bridge at the American River.
- Construction of a new rail bridge across the Sacramento River.

Buildout Project Improvements

- Widening of the State Route 160 Bridge at the American River.
- Construction of Richards Boulevard Couplet between 7th Street and State Route 160.

City of Sacramento General Plan

The City's Circulation Element contains a number of goals and policies for roadways, bicycle and pedestrian circulation, transit and rail services. Those most pertinent to the development of the Planning Area are given below.

Streets and Roads

Goal A

Create a street system which will ensure the safe and efficient movement of people and goods within and through communities and to other areas in the City and region.

Policy 4

Through the community, specific, and redevelopment planning process, identify major street improvements for inclusion in the Capitol Improvements Program.

The RSP has a primary objective to "Complete the Central City arterial system in a manner which relieves existing congestion and serves future land use needs." As described, all of the Alternatives address this objective with the exception of the No Project Alternative which would not allow for the extension of the downtown street network north to Richards Boulevard. Similarly, in the Richards Area the improvement of east-west connections through the Richards Area would be supportive of the circulation improvements provided through the Railyards Area. The overall circulation network proposed in the Facility Element would be supportive of the intent of this policy.

Transportation Systems Management

Goal A

Increase the commute vehicle occupancy rate by fifty percent.

Policy 1

Encourage and support programs that increase vehicle occupancy.

None of the land use alternatives address this policy directly. However, the No Project Alternative would not include the transit improvements to the Planning Area that would be envisioned with each of the other redevelopment Alternatives (i.e., it would not include the Intermodal Transit Station and would not facilitate extension of the LRT line north into the Richards Area). The Facility Element contains a set of policies related to Transportation Systems Management that are supportive of the basic stated objective to "develop Transportation Systems Management (TSM) programs which discourage single-occupancy vehicle trips and maximize transit use." These policies are primarily aimed at decreasing overall vehicle trips, rather than being specifically aimed at increasing vehicle occupancy.

Policy 2

Support actions/ordinances/development agreements that reduce peak hour trips.

As discussed above, the Transportation Systems Management policies of the Facility Element provide strong direction to decrease vehicle trips. Policy 6.2 requires the establishment of a Transportation Management Association for the Planning Area and the hiring of a Transportation Coordinator. Among the responsibilities of the Transportation Coordinator would be the encouragement of programs to reduce peak hour vehicle trips through measures such as telecommuting, the use of staggered work hours, or the use of a compressed work week.

Goal B

Increase the capacity of the transportation system.

Policy 1

Support programs to improve traffic flow.

The wide range of circulation policies in the RSP, the RBAP and the Facility Element would provide greater capacity to the roadway network, greater capacity to the transit system, and increased capacity to the pedestrian and bicycle circulation system.

Central City Transportation

Goal A

Provide a street system within the Central City which ensures the safe and efficient movement of people and goods consistent with other transportation needs.

Policy 1

Improve the street circulation system in order to provide access to new development.

Policy 2

Provide specific street improvements which will support downtown development and the Central City Urban Design Plan.

In all of the Alternatives except the No Project Alternative, the Central City street system would be extended to accommodate new growth in the Planning Area. The extension of the street system would be accomplished with the following steps: (1) extension of 5th, 6th and 7th Streets from downtown to Richards Boulevard, (2) establishment of a new Gateway Boulevard along the 12th Street corridor, (3) improvement of the east-west vehicular connections through the Richards Area with the creation of one-way couplets, and (4) the creation of local-serving east-west streets within the Richards Area through the extension of Vine Street and the construction of a new Riverfront Drive along the American River Parkway.

Goal C

Develop a balanced transportation system which will encourage the use of public transit, multiple occupancy of the private automobile, and other forms of transportation.

Policy 1

Encourage the use of light rail transit and other alternative methods of transportation to facilitate the circulation in the downtown core.

With the exception of the No Project Alternative, each of the Alternatives accommodates a new Intermodal Transit Station that would include facilities for heavy rail, light rail, and bus transit services. As is discussed above, the Facility Element includes a wide range of policies regarding the support of transit improvements in the Planning Area, as well as the support of those transit improvements through the implementation of a Transportation Systems Management program.

Policy 3

Consider the use of pedestrian pathways that can support the efficient movements of people, new development, and adopted Central City Design Concepts.

The Circulation Element of the Facility Element includes an objective to "create a street system which extends the unique qualities of downtown neighborhood streets, gives structure and orientation to the downtown experience, and enhances the pedestrian environment." Policies that support this objective include the extension of the downtown small block pattern into the Railyards Area, the design of the extension of 7th Street with attention to pedestrian linkages from downtown to the American River, the creation of a pedestrian way that links Old Sacramento, Downtown Plaza, and Chinatown with the heart of the Railyards Area, improvement to the pedestrian circulation and access to the American and Sacramento Rivers, and the improvement of pedestrian circulation between the planned Social Services campus and downtown. Each of Alternatives 2, 3, 4, 5, 6, and 7 would support these policies. The No Project Alternative would not.

Goal D

Provide an adequate amount of parking to support continued downtown development prosperity, alternative modes of transportation, and the Central City Urban Design Plan.

Through its Transportation Systems Management policies, the Facility Element addresses the issue of the provision of parking. The Facility Element attempts to balance the need for parking in the short term with the long-term desire to encourage a greater use of transit. Policy 6.1 encourages the short-term provision of parking and the use of "interim" surface parking lots which would eventually be developed into other uses. Also, the policy encourages shared parking programs to maximize the utility of available parking resources.

Goal E

Create a multi-modal transportation center in the Central City.

All of the Alternatives except Alternative 1 would provide a new Intermodal Transit Station, as called for in the above policy.

Transit

Goals, Policies, Actions for Transit

Goal A

Promote a well designed and heavily patronized lightrail and transit system.

Policy 1

Provide transit service in newly developing areas at locations which will support its highest usage.

Policy 3

Support a well designed light rail system which will meet future needs and compliment the regional transit system.

With the exception of Alternative 1, all of the Alternatives provide for the extension of LRT lines into the Planning Area. In addition to accommodating the Intermodal Transit Station and the RT Downtown-Natomas-Airport (DNA) line, the Facility Element provides a trunk bus line and allows for the possibility of a new east-west light rail alignment connecting the DNA line with the Watt Avenue line that extends north-south along State Route 160.

Pedestrianways

Goals, Policies, Action for Pedestrianways

Goal A

Increase the use of the pedestrian mode as a mode of choice for all areas of the city.

Policy 1

Require new subdivisions and planned unit developments to have safe pedestrian walkways that provide direct links between streets and major destinations such as bus stops, schools, parks, and shopping centers.

Policy 4

Encourage mixed use developments to generate greater pedestrian activity.

Alternatives 2 through 7 would improve pedestrian flow between downtown and the Richards Area, and on to the Sacramento and American Rivers. Alternative 5, while allowing increased north-south pedestrian flow, would require pedestrians to cross over or under the main line rail tracks, since they would not be elevated as proposed in Alternatives 2, 3, 4, 6 and 7. Under Alternative 1, no improvement in pedestrian flow could be expected. As growth continues, pedestrian flow conditions would worsen for Alternative 1. As is described above, the Facility Element includes a set of policies aimed at increasing the level of pedestrian activity and flow on the street system through the Planning Area.

Bikeways

Goals, Policies, Actions for Bikeways

Goal A

Develop bicycling as a major transportation and recreational mode.

As with pedestrian flow described above, Alternatives 2, 3, 4, 5, 6, and 7 would allow for improved bicycle flow through the Planning Area. This improved flow would be facilitated by the extension of the downtown street system north to Richards Boulevard. The Facility Element

also includes a set of policies on bicycle circulation that respond to the overall objective to "extend and improve the existing system of bicycle circulation in downtown Sacramento." The policies provide direction to (1) "provide a Class I bicycle path along the Sacramento and American River Parkways", (2) "provide Class II bicycle lanes that improve bike circulation within the street system of the Planning Area", (3) "establish Class III bicycle routes along important north-south and east-west corridors in order to provide direct bicycle connections for commuters", and (4) "include facilities for bicyclists in new office development and at transit stations." Alternative 1 would not provide improved bicycle circulation within the Planning Area.

Railroads

Goals, Policies, Actions for Railroads

Goal A

Maintain railroads as movers of goods and people to and from the City.

A major component of all of the Alternatives with the exception of Alternative 1 is the development of an Intermodal Transit Station that would accommodate at one location a variety of rail and non-rail modes of travel. Alternatives 2, 3, 4, 6, and 7 locate the Intermodal Transit Station at the intersection of Seventh and North B Streets. In Alternative 5, the Intermodal Transit Station is located immediately south of the Central Shops buildings, to the north of the existing Depot building. The Facility Element includes a set of policies aimed at improving the availability of rail service in the Central City for commuter and intercity service. Policy 1.1 calls for the establishment of "a regional intermodal transportation center which brings together intercity rail, commuter rail, light rail, local and intercity bus services in a manner which facilitates the convenient transfer between various modes of transit." Policy 1.2, which would apply to Alternatives 2, 3, 4, 6 and 7, calls for the relocation of "the Southern Pacific main line tracks to the northern boundaries of the Railyards Planning Area." As part of the realignment of the tracks, the Facility Element also identifies the need for a new rail bridge across the Sacramento River that would provide three tracks across the river; these three tracks would allow for relatively free flow of freight, intercity, and commuter rail traffic into and out of the Intermodal Transit Station.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

A circulation impact on local roadways is deemed to be significant when the level of service deteriorates below "C" conditions, or an increase in V/C ratio of 0.02 occurs at study intersections operating below "C" conditions.

An impact to the regional highway system is deemed to be significant when the service level deteriorates below "D" conditions. An impact on public transit is considered significant if Planning Area demand will exceed anticipated capacity. Parking demand in excess of anticipated supply is considered a significant impact. Pedestrian and bikeway impacts are considered

significant if the circulation system would not provide adequate bike lanes and walkways for movement throughout the Planning Area.

Methods

Overview

Development in the Planning Area would occur over many years. In accordance with this anticipated timing, impacts have been analyzed in three horizon years: Year 2000, Year 2010, and a buildout year after Year 2010. In this analysis, these horizons are referred to as "Near Term", "Long Term" and "Buildout," respectively.

In accordance with the programmatic nature of the EIR, the focus of the investigation is on the areawide impacts of buildout of the Planning Area; additional environmental studies would be necessary to identify localized impacts associated with individual development projects implemented within the Planning Areas. This is especially true regarding localized circulation and parking impacts.

The impact topics addressed include:

- Traffic Impacts to Downtown Intersections
- Traffic Impacts to Freeway Ramps
- Traffic Impacts to Freeway Main Lines
- Parking Impacts
- Transit Impacts
- Bicycle and Pedestrian Impacts

Seven alternatives are evaluated for each of the analysis years. This includes the No Project alternative and the six "project" alternatives. The travel forecasts for each of the seven alternatives incorporates trips generated by both project and cumulative development. The baseline against which significant impacts are measured for each of the seven alternatives are existing conditions.

The following analysis of transportation impacts does not differentiate between cumulative and project impacts. A single cumulative scenario cannot be developed due to the size of the Planning Area and its impacts on regional growth, as well as the extent of circulation improvements associated with development of the Alternatives.

- The size of the Planning Area is such that, should development occur as projected, it represents a significant portion of the future cumulative employment growth estimated for the Sacramento region. To accurately represent the impact of growth in the Planning Area on the transportation system, future regional employment levels were held constant and growth was reallocated from other areas within the region to the Planning Area for each alternative based on economic forecasts. The various alternatives would also affect the level of future downtown development, reversing the trend in the Central City of a decreasing share of the regional market for commercial growth. A single, fixed cumulative

land use scenario is therefore not possible for the No Project and the six "project" alternatives.

- A substantial level of new transportation infrastructure is identified to support development of the Planning Area. These improvements would not be constructed under a cumulative "without project" scenario. Since the distribution of future traffic generated by cumulative growth would change with the significant infrastructure changes, and an evaluation of this future roadway network without "project" traffic would be meaningless, the evaluation of the circulation system is developed based on the addition of both cumulative and "project" traffic.

In accordance with the level of uncertainty inherent in land use projections for development beyond the Year 2010, no downtown intersection impacts have been studied for the buildout scenario.

Technical Approach

The large scale and long-range nature of the alternatives requires the use of a regional tool for analysis of transportation impacts. The overall assessment of traffic and transit impact was performed using the Sacramento Metropolitan (SACMET) travel model developed by the Sacramento Regional Transit District (RT) for testing regional fixed-guideway alternatives. The RT SACMET model was provided by SACOG and was modified to include the land use changes and roadway and transit facilities proposed in the Planning Area.

The SACMET model was not designed to analyze individual turning movements at downtown intersections. Therefore, a Local Traffic Impact (LTI) model was developed for analysis of intersection impacts. Inputs into the LTI model included existing downtown intersection turning movements and street geometry, specific identified downtown developments, and regional roadway volumes extracted from the SACMET model.

SACMET Model

The SACMET model is a multi-modal, regional network-based model which is performs the following functions:

- Trip Generation
- Trip Distribution
- Mode Split (Highway/Transit)
- Trip Assignment

The model area covers the full SACOG "Metro area", which includes Sacramento County as well as eastern Yolo County (including Davis and Woodland), southeastern Sutter County, southwestern Placer County (including Auburn) and western El Dorado County (including Placerville).

Inputs to the model include:

- Regional Land Use (by zone)
- Socioeconomic Characteristics (by zone)
- Highway Network
- Transit Networks (Bus & Light Rail lines)

Outputs include:

- Trip Tables (showing zone-to-zone travel volumes for highway and transit users)
- Daily vehicle trips assigned to each highway link
- AM peak period transit link loadings and boardings

Model Adaptations

In order to utilize the SACMET model, changes to the land use data and highway and transit networks were accomplished. These were necessary to properly represent the changes to land use and circulation which would accompany each of the seven study alternatives.

Land Use

A total of 70 new zones were added to the model in the Planning Area to represent the land use alternatives. (In the original SACMET model, all of the land use was placed into 3 large zones.) The specific land use coded into the model is described in Chapter 3, Project Description.

Inclusion of substantial additional commercial land use in downtown Sacramento would most likely result in a modified absorption of office space within the region. Accordingly, an analysis of regional land use impacts was performed and the results were incorporated into the SACMET model. Table 4.8-11 indicates existing and future commercial office development levels that were assumed for travel forecasting purposes in the long term and buildout scenarios.

Roadway Network

Two roadway networks were used in the SACMET model:

- No Project (Alternative 1) -- Year 2010 Base Network

- Build (Alternatives 2 - 7) -- Year 2010 Base Network modified to include roadway infrastructure proposed within Planning Area zones.[4] (Refer to Figure 8, Regional Freeway Access Concept, and Figure 9, Proposed Roadways, in Railyards Area & Richards Boulevard Area Facility Element, Administrative Draft, November, 1991.)

TABLE 4.8-11

REGIONAL LAND USE ASSUMPTIONS
Gross Square Feet of Office Space (thousands)

Regional Submarket	Existing Inventory	Absorption, 1990-2010	
		Without Alternatives	With Alternatives
Downtown: Existing	N/A	9,587	7,358
Planning Area	N/A	0	8,829
Total	7,395	9,587	16,187
Highway 50	5,965	16,125	14,500
Natomas/Northgate	2,745	7,500	5,875
Point West	2,073	1,000	1,000
Roseville/Rocklin	942	4,750	4,025
West Sacramento	289	5,875	3,750
Other	10,634	9,300	8,800
TOTAL	**30,043**	**54,137**	**54,137**

N/A - Not Applicable.

SOURCE: Economic & Planning Systems, Technical Memorandum, October 15, 1991.

Transit Network

Transit services for the year 2010 and buildout scenarios were coded into the SACMET "Alternative 8" transit network, which represents an expanded RT Metro service with seven extensions regionwide. In Alternative 1, the Natomas-Airport Light Rail Transit (LRT) line would be extended through the Planning Area with one stop south of the Planning Area (7th and 8th streets between G Street and H Street) and one stop along Richards Boulevard. Alternative 1 would also include the proposed new station at Dos Rios on the Watt/Interstate 80 line. Alternatives 2-7 would include additional stops at Gateway Boulevard and at the proposed Intermodal Transit Station on 7th refer to Figure 6, Light Rail Concept, in the Facility Element.)[5] In addition to the LRT route and new stations, a comprehensive bus system which would allow for extension of existing routes north into the Planning Area, connecting with the proposed Intermodal Transit Station, as well as new east-west routes, including a trunk route from South Natomas through the Richards area to Business 80 were included (refer to Figure 7, Future Bus Access Concept, in the Facility Element). The intercity rail line, which would not significantly change AM peak period travel patterns was not coded and would draw from beyond zones beyond the reach of the SACMET model.

Trip Generation

No changes were made to the trip generation rates contained in the SACMET model. The trip generation in the model is based upon the following variables:

- Single Family Dwelling Units by Number of Autos Owned
- Multifamily Dwelling Units by Number of Autos Owned
- Retail Employment
- Other Employment

Adjustments are included for special generators such as colleges, hospitals and the Sacramento Metropolitan Airport.

Typical daily trip ends are: single family dwelling with 2 or more autos owned, 9.4 trips; multifamily dwelling with one vehicle owned, 5.3; retail employment, 22.4 (trip ends/employee) and other employment, 5.1 (trip ends/employee).

The resulting trip generation incorporated in the SACMET model is shown in Table 4.8-12.

Trip Distribution

The trip distribution generated by the SACMET model is based upon a "gravity modeling" process which matches trip attractors (such as employment uses) within the Planning Area zones with trip producers (such as residential uses) areawide and vice versa. The matching of trip productions and attractions takes into account the travel time between zones (using congested highway speeds) as well as the relative sensitivity to trip lengths. The resulting distribution developed by the model is contained in a "trip table" showing interchanges between each of the

TABLE 4.8-12

TRIP GENERATION

Alternative	Daily Vehicle Trips Assigned to Roadway Network					
	Year 2010			Buildout		
	TOTAL	Railyards Area	Richards Area	TOTAL	Railyards Area	Richards Area
Alternative 1	**79,000**	35,000	44,000	**82,000**	37,000	45,000
Alternative 2	**205,000**	93,000	112,000	**270,000**	121,000	149,000
Alternative 3	**214,000**	121,000	93,000	**269,000**	116,000	153,000
Alternative 4	**173,000**	103,000	70,000	**308,000**	183,000	125,000
Alternative 5	**175,000**	91,000	84,000	**281,000**	146,000	135,000
Alternative 6	**287,000**	101,000	186,000	**428,000**	151,000	277,000
Alternative 7	**215,000**	105,000	110,000	**375,000**	183,000	192,000

SOURCE: Korve Engineering, Inc.

more than 800 travel analysis zones. Table 4.8-13 indicates percentages of travel assigned to each of five major directions of travel based upon the model travel distribution.

Mode Split

The SACMET model performs a "mode split" analysis, which determines the number of transit riders and deducts these persons from the trips assigned to the highway network. The mode split analysis provides an estimate of the potential number of transit riders based upon a "disutility" analysis which takes into account the following factors:

- Relative Highway versus Transit Travel Time
- Median Household Income
- Parking Cost

Thus, the SACMET model tests the likelihood of generation of transit riders given current behavior patterns and projected relative travel time and cost factors. Table 4.8-14 presents the resulting mode split (percentage of person trips made on transit) for each alternative.

In addition to transit riders, the SACMET model also projects "shared ride" auto trips separately from "single-occupant" autos trips. The projected auto occupancy, taking into account all highway trips, is about 1.30 persons per vehicle.

Traffic Management Plan (TMP)

Implementation of an aggressive Traffic Management Plan (TMP), especially in conjunction with parking supply restrictions within the Planning Area could lead to significantly higher levels of transit usage. Aggressive TMP objectives have been identified for the Planning Areas. Although early stages of development would provide parking at the same rate as current downtown office uses, in future years the parking ratios would decline, as a further disincentive to auto usage. The TMP goals are shown in Table 4.8-15.

It should be noted that the Facility Element goals are supportive of RT's goals as well as with the Capitol Area Transportation Plan.

In accordance with typical practice, the traffic impact analysis evaluates potential highway impacts based upon the travel model volumes. Both "hard" mitigations, such as roadway improvements, as well as the TMP, are evaluated in terms of their ability to mitigate traffic impacts.

Local Traffic Impact Model

To evaluate impacts to intersections within the Planning Area as well as at nearby off-site locations in downtown Sacramento, a Local Traffic Impact (LTI) model was developed. The LTI was used to evaluate Years 2000 and 2010, respectively. The LTI was based upon the following input:

TABLE 4.8-13
PLANNING AREA HIGHWAY TRAVEL DISTRIBUTION

Travel Direction	Land Use					
	Office	Industrial	Commercial	Residential	Hotel	Cultural/ Institutional
Interstate 5, North	21%	16%	22%	19%	23%	24%
Route 160, North	20%	25%	22%	25%	20%	20%
Richards Blvd, East	7%	11%	12%	5%	12%	13%
Interstate 5, South	22%	20%	22%	26%	20%	15%
Downtown, South	17%	16%	17%	12%	15%	15%
Downtown, East	13%	12%	5%	13%	10%	13%

SOURCE: Korve Engineering, Inc.

TABLE 4.8-14
YEAR 2010 MODE SPLIT

Alternative	Percent Transit[1]
Alternative 1	9
Alternative 2	6
Alternative 3	6
Alternative 4	8
Alternative 5	6
Alternative 6	6
Alternative 7	6

[1] Proportion of total daily person trips for all land uses in the Planning Area.

SOURCE: Korve Engineering, Inc.

TABLE 4.8-15

MODE SPLIT COMPARISON
(Existing, Modeled and TMP Targets)

Mode	Current[1]	2010 Model[2]	2000 Goal[3]	2010 Goal[3]	Buildout Goal[3]
Transit	5%	8%	30%	40%	50%
Single Occupant Auto	75%	60%	40%	33%	25%
Shared Ride Auto	17%	32%	25%	22%	20%
Other Modes	3%	-	5%	5%	5%

[1] Based upon survey data for existing office uses in downtown Sacramento.

[2] For all uses in Planning Area zones for Alternative 4, without TMP.

[3] Goals established for office uses only in Facility Element.

SOURCE: Korve Engineering, Inc.

- Trip generation data based on General Plan Update rates adjusted to reflect existing mode split as identified in recent studies for the Year 2000 scenario. Trip generation data based on SACMET model vehicle generation output for the Year 2010 scenario.

- Trip distribution based on analysis of SACMET model cordon data.

The local traffic impact model involves a manual assignment of traffic to the roadway network serving the Planning Areas. The local impact model is used to develop turning movement assignments at local intersections for the purposes of determining internal roadway and intersection lane configuration needs. Cumulative and project traffic are assigned to the Planning Area roadway network based on the trip generation and distribution data as described above.

The Year 2000 and 2010 assignments for the No Project and project Alternatives involve the assignment of cumulative and project trips to the near-term and long-term roadway networks. The Year 2010 trip generation assumptions for the cumulative and project development are based on the daily vehicle trip assignment from the SACMET model for the Planning Areas. The daily vehicle trip assignments were then converted into peak hour volume assignments for each project zone based on the individual land use assumptions. The Year 2000 trip generation assumptions

for the cumulative and project development are based on trip rates from the General Plan Update studies adjusted to reflect current mode split data for transit use in the downtown area.

The distribution assumptions for both the Year 2000 and Year 2010 assignments were developed in an iterative process and confirmed on the basis of cordon forecasts from the SACMET model. Initially, a series of distribution assumptions were applied for new trips generated by cumulative and project development. The resulting local intersection forecasts were compared to SACMET forecasts at the cordon of the Planning Area network. The distribution assumptions were then revised iteratively until the local traffic impact forecasts provided similar results as the SACMET forecasts at the Planning Area cordon points.

Intersection Service Level Calculations

The impact on downtown intersections of future cumulative and alternative development traffic is determined by the calculation of service levels. The service levels referred to in this report for intersections are calculated based on the methodology outlined in Transportation Research Board *Circular No. 212*. This methodology is used for all traffic studies conducted for the City of Sacramento.

The impact of planned light-rail operations along 7th Street and Richards Boulevard is also incorporated into the service level calculations for three study intersections under the Year 2010 scenario. This includes the intersections of Richards Boulevard North/7th Street, Richards Boulevard North/6th Street, and Richards Boulevard North/5th Street. At the intersection of Richards Boulevard North/7th Street, the light-rail transitions in an angled fashion from the median on 7th Street to the north side of Richards Boulevard. This would require the provision of an "all-red" signal phase, effectively stopping traffic on all four approaches, at this location to allow the passage of light-rail vehicles. At the intersections of Richards Boulevard North/6th Street and Richards Boulevard North/5th Street, the side-running light rail operations would result in periodic increases in delays for southbound traffic along 6th Street and 5th Street. These impacts are incorporated into the service level results identified in the following sections.

The intersection service level methodology used for this report does not evaluate the impact of traffic conditions on pedestrian movements. All of the Planning Area arterials, with the exception of Gateway Boulevard and 7th Street, would have roadway widths that are similar to existing downtown streets. Since all of the Planning Area intersections are designed to maintain service level C conditions and the roadway widths are not measurably greater than existing downtown streets, pedestrian crossing times and signal cycle lengths would be similar to those presently experienced in the Central City. Gateway Boulevard and 7th Street are designed with very wide medians to provide distinct landscaped corridors that would accommodate light rail. It is expected that pedestrians would generally require two signal cycles to cross these wide streets, using the median as a waiting area between cycles.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

The following section identifies the transportation impacts associated with the seven study alternatives. Service levels are shown for 11 study intersections for the Year 2000 scenario and 35 intersections for the Year 2010 (see Table 4.8-16 for intersection LOS descriptions). Service levels are also calculated for the freeway mainline conditions for all three future scenarios on Interstate 5 and State Route 160. Future ramps conditions for the year 2000 and 2010 scenarios are evaluated along I-5 at the existing I/J interchange, the future Crescent Drive interchange, and the Richards Boulevard interchange.

Parking and transit impacts are also described. The parking impacts indicate the demand for parking based on future estimates of the proportion of auto trips to the Planning Area. The demand levels are compared to parking supply requirements outlined in the Facility Element. Transit impacts are described in terms of the overall impacts to light rail and bus ridership. In addition, an assessment of light rail utilization by line at the downtown cordon is presented.

The lane configurations and intersection turning movement forecasts for Alternatives 1 and 4 are shown in Figures 4.8-15 through 4.8-21. All intersections on the following figures are oriented with North towards the top of the page.

4.8-1 For Year 2000, implementation of most of the Alternatives would result in unacceptable levels of service at some intersections.

Tables 4.8-17 and 4.8-18 show the LOS for AM and PM peak hours.

A-1 The No Project Alternative would not result in any study intersections below LOS C. Therefore, this is considered a ***less-than-significant impact.***

A-2 Alternative 2 would result in cumulative and project impacts at one intersection during the AM peak hour and three intersections during the PM peak hour. Mitigations would reduce the impact to a less-than-significant level at all but two locations. Future conditions at the intersections of Richards Boulevard/I-5 Southbound on/off and Richards Boulevard/I-5 Northbound would be considered ***significant unavoidable impacts.***

A-3 Alternative 3 would result in cumulative and project impacts at two intersections during the AM peak hour and three intersections during the PM peak hour. Mitigations would reduce the impact to a less-than-significant level at all but two locations. Future conditions at the intersections of Richards Boulevard/I-5 Southbound on/off and Richards Boulevard/6th Street would be considered ***significant unavoidable impacts.***

TABLE 4.8-16

LEVEL OF SERVICE DESCRIPTION
Signalized Intersection Evaluation

Level of Service	Volume to Service Capacity Ratio	Description
A	0 - 0.59	Excellent operation. All approaches to the intersection are open, turning movements easily made and all drivers find freedom of operation.
B	0.60 - 0.69	Very good operation. Many drivers begin to feel restricted within platoons of vehicles. This represents stable flow. Intersection approaches occasionally fill up, queues begin to form.
C	0.70 - 0.79	Good operation. Occasionally drivers may have to wait for more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D	0.80 - 0.89	Fair operation. Drivers are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues. This is the level of service typically associated with design practice for peak periods.
E	0.90 - 0.99	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.
F	> than 1.00	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes. Volumes carried are not predictable. Potential for "stop-and-go" type traffic flow.

SOURCE: Korve Engineering, Inc.

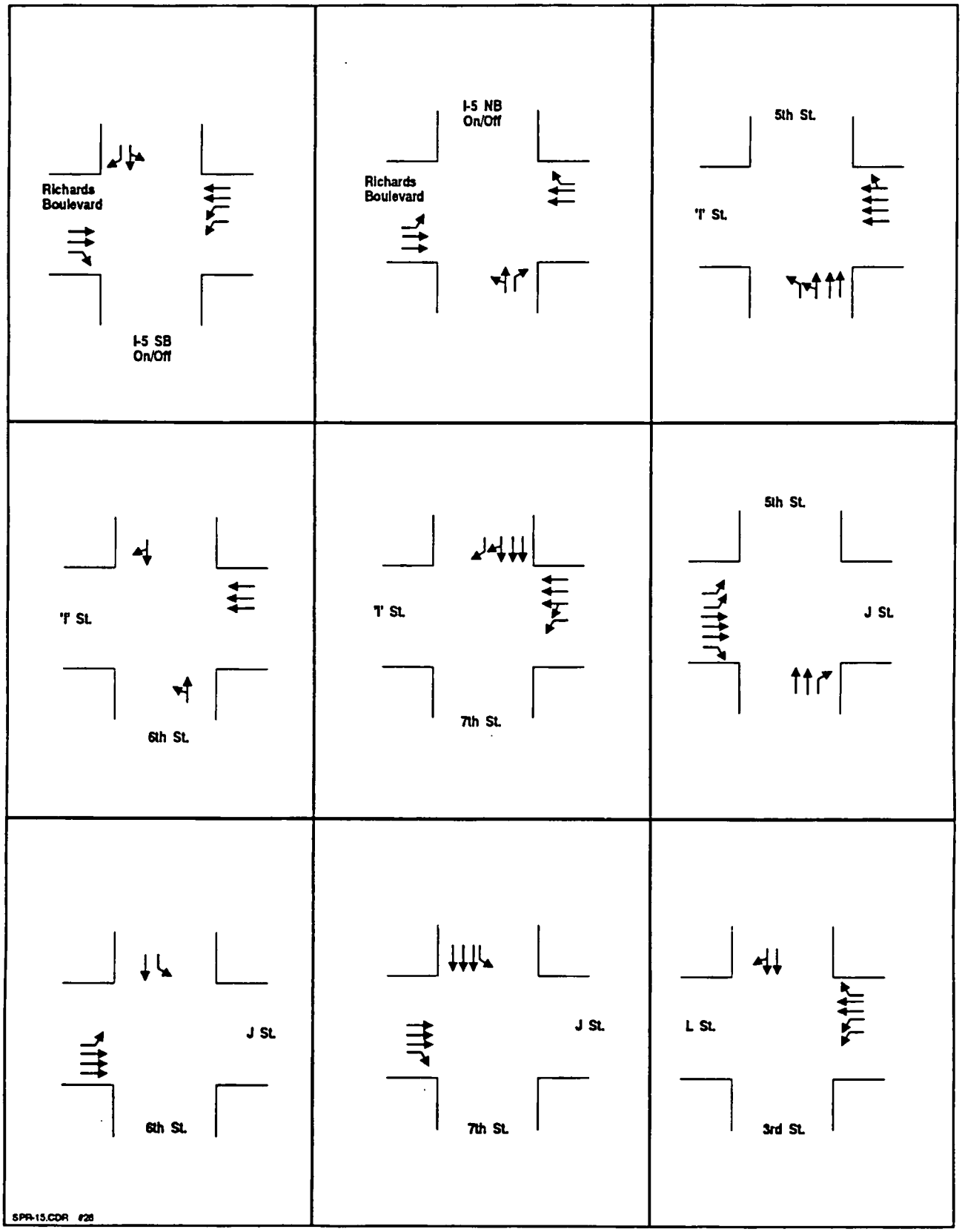


Figure 4.8-15

YEAR 2000 NO PROJECT LANE CONFIGURATIONS

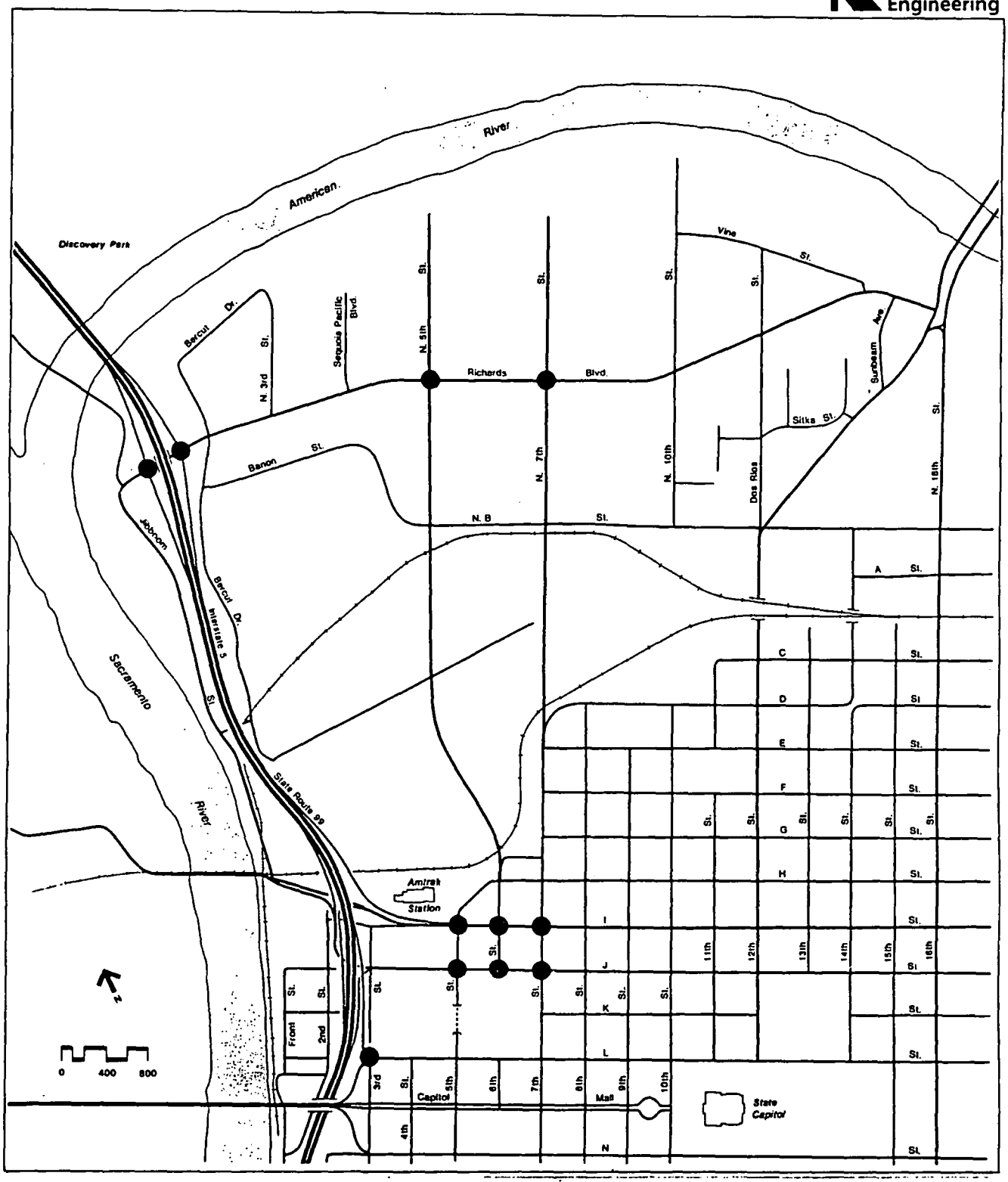


Figure 4.8-16

YEAR 2000 STUDY INTERSECTIONS

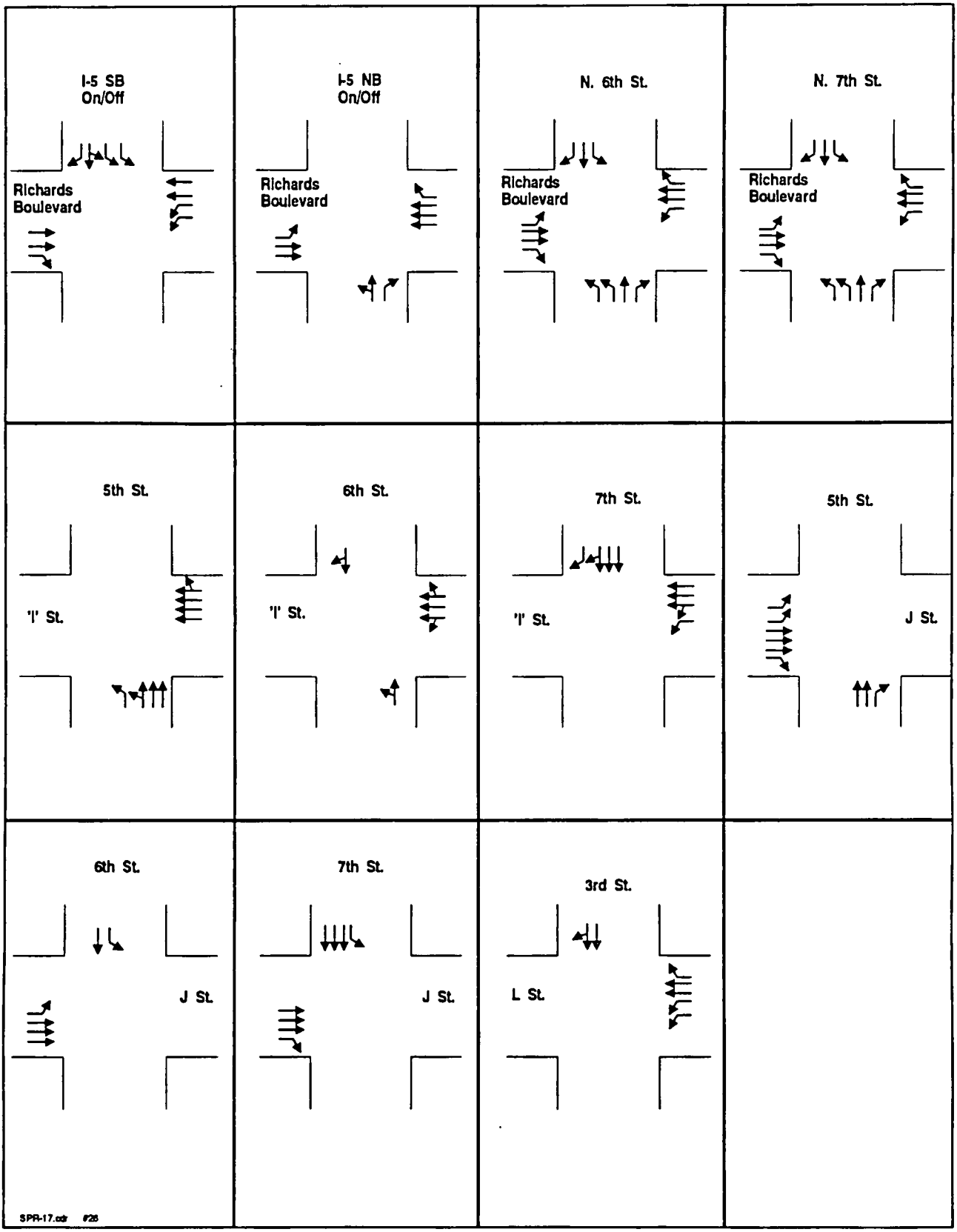
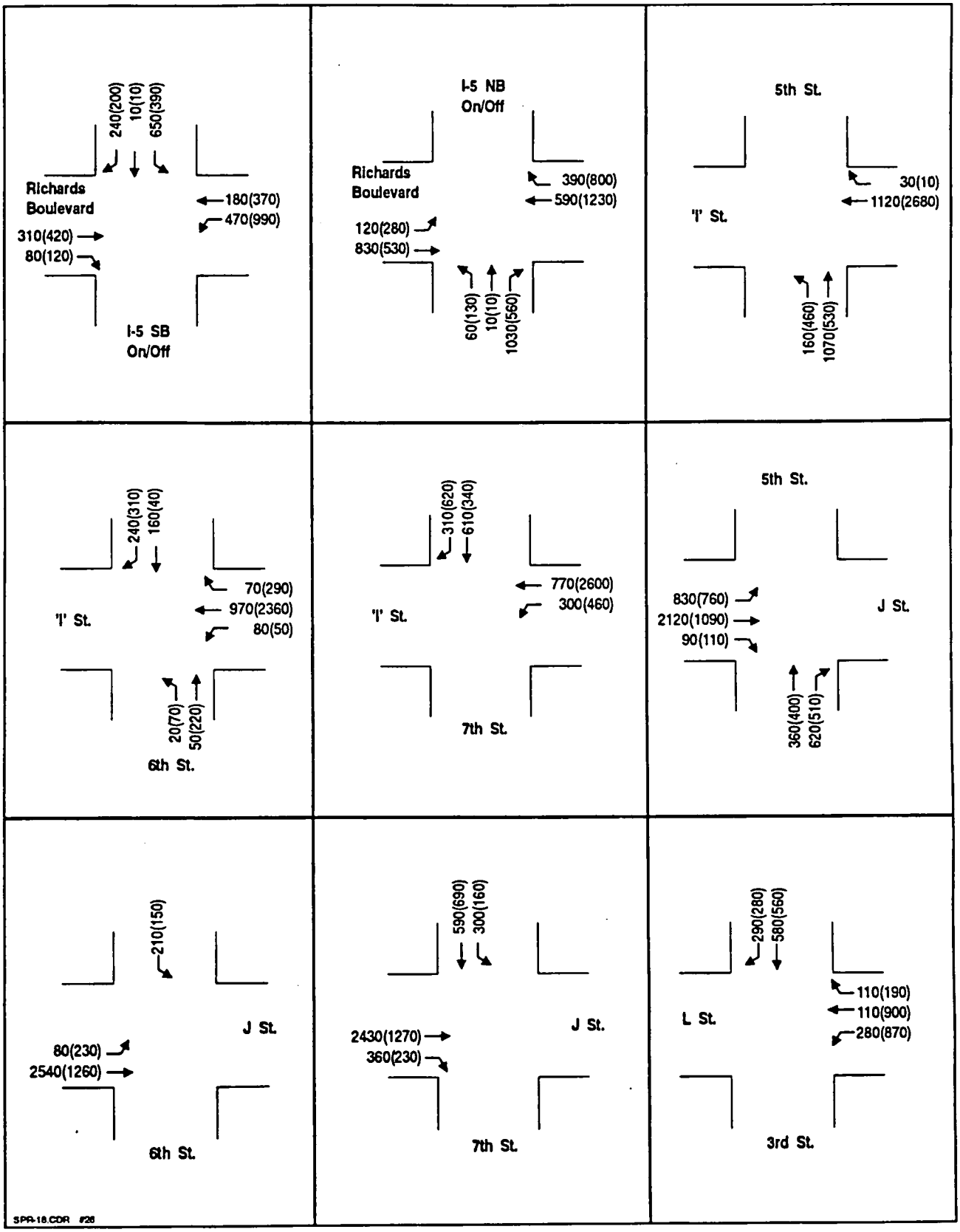


Figure 4.8-17

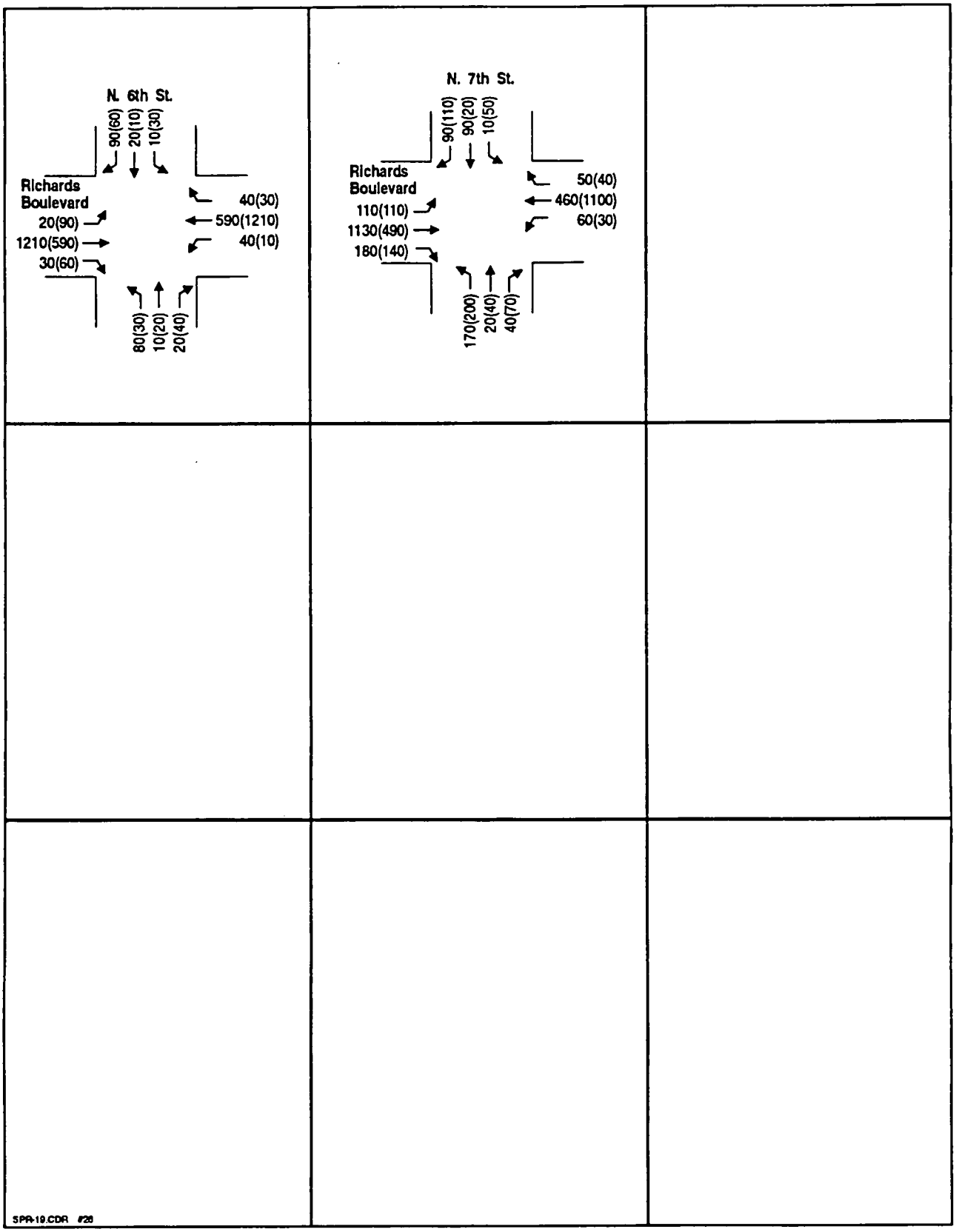
YEAR 2000 PROJECT LANE CONFIGURATIONS



AM(PM)

Figure 4.8-18

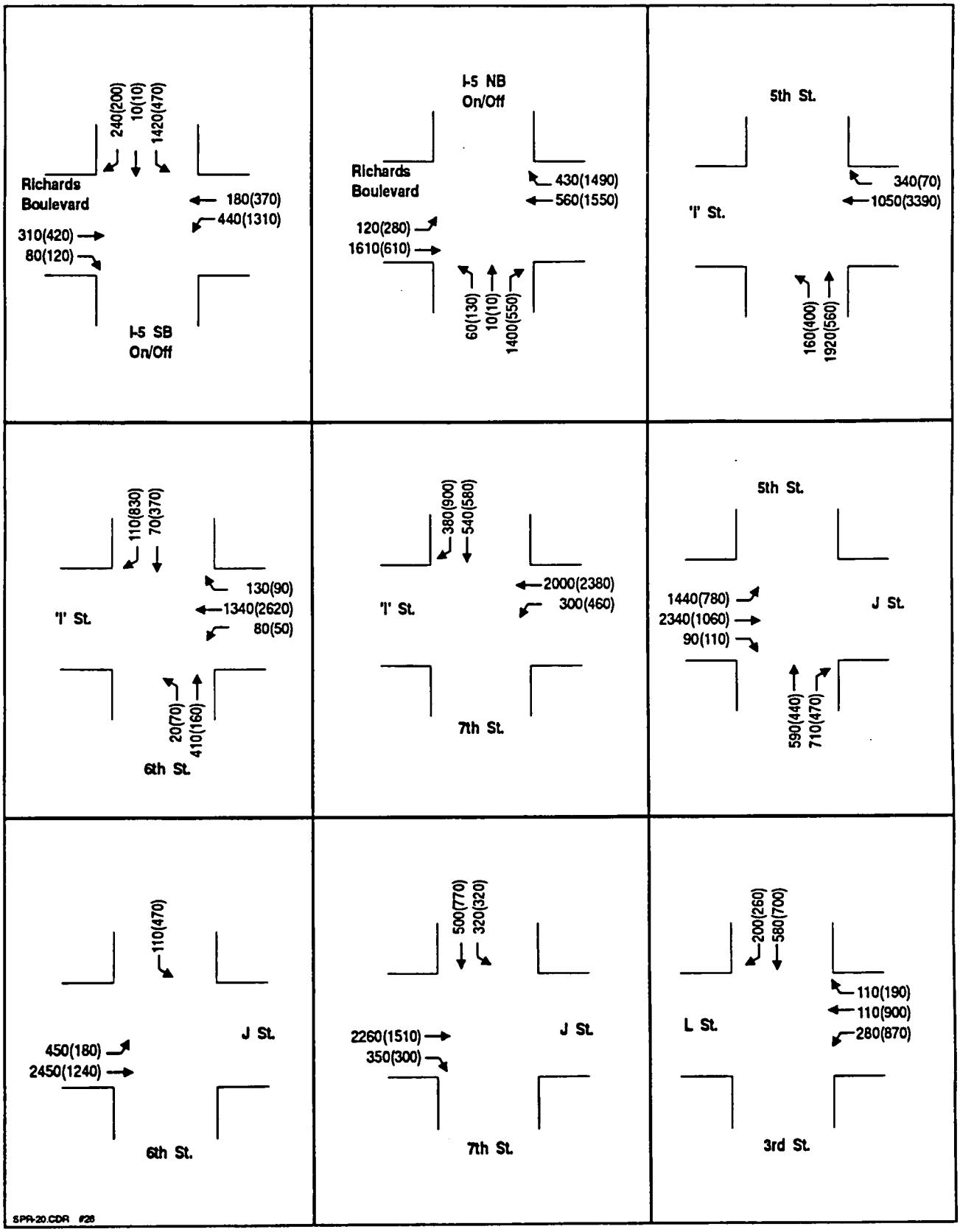
YEAR 2000 NO PROJECT INTERSECTION VOLUMES



AM(PM)

Figure 4.8-19

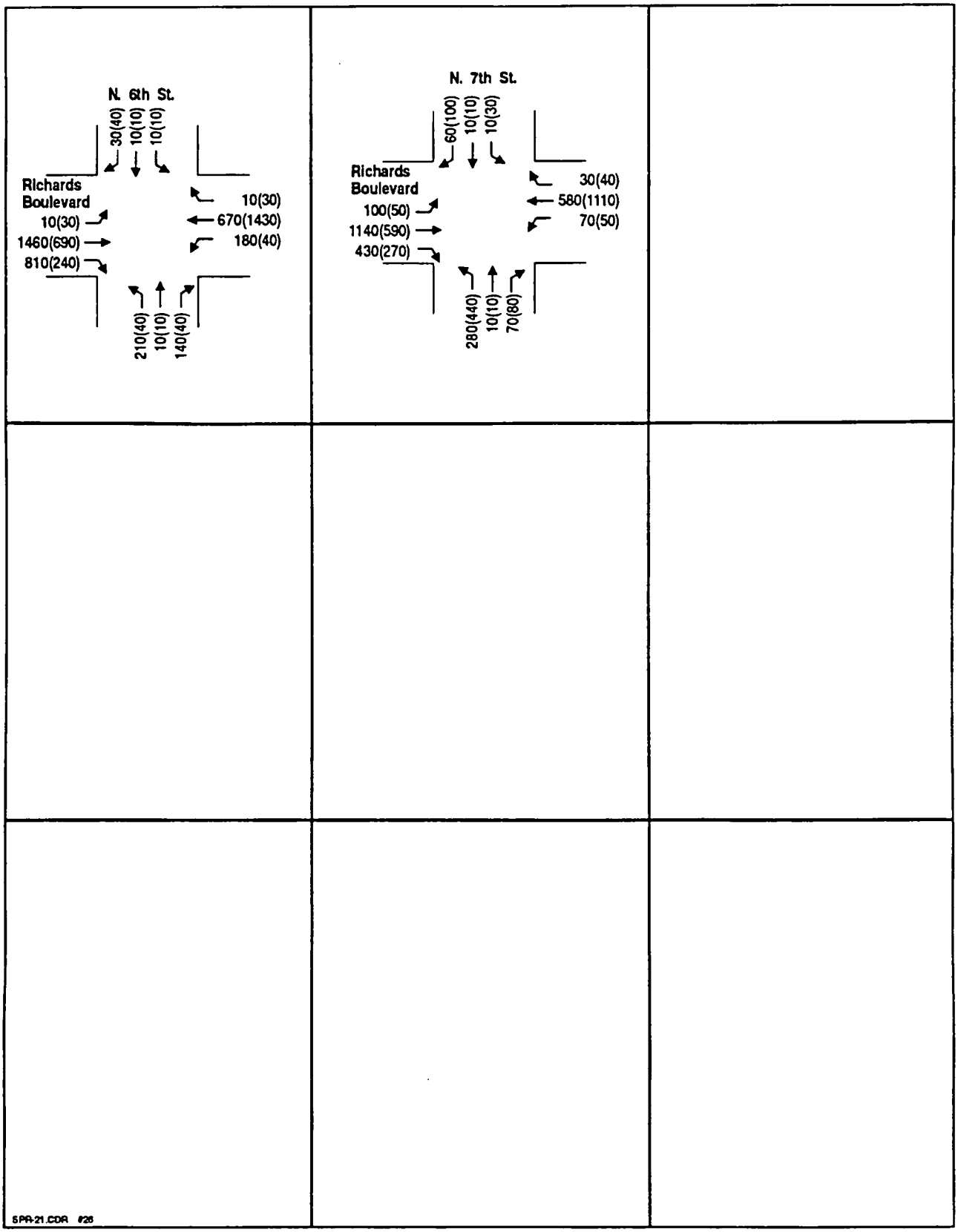
YEAR 2000 NO PROJECT INTERSECTION VOLUMES



AM(PM)

Figure 4.8-20

YEAR 2000 PROJECT INTERSECTION VOLUMES



AM(PM)

Figure 4.8-21

YEAR 2000 PROJECT INTERSECTION VOLUMES

TABLE 4.8-17

YEAR 2000 SERVICE LEVEL COMPARISON
AM PEAK HOUR

Intersection	Existing		ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
SB I-5 Off & Richards	B	O.63	C	0.73	B	0.63	B	0.66	B	0.60	A	0.57	C	0.76	B	0.66
NB I-5 On & Richards	B	0.63	A	0.33	B	0.61	B	0.69	B	0.60	B	0.61	D	0.81	C	0.73
5th & I St*	A	0.33	A	0.43	A	0.52	B	0.66	B	0.66	B	0.65	B	0.67	B	0.66
6th & I St	A	0.22	A	0.39	C	0.77	D	0.81	B	0.65	B	0.67	F	1.01	D	0.80
7th & I St	A	0.23	A	0.33	A	0.38	A	0.42	A	0.40	A	0.40	A	0.45	A	0.42
5th & J St	A	0.48	B	0.60	B	0.69	C	0.75	C	0.72	C	0.72	C	0.79	C	0.75
6th & J St	A	0.46	C	0.70	C	0.76	B	0.64	B	0.62	B	0.64	B	0.68	B	0.63
7th & J St	A	0.46	C	0.74	C	0.77	C	0.73	C	0.71	C	0.71	C	0.73	C	0.72
3rd & L St	A	0.32	A	0.38	A	0.38	A	0.36	A	0.35	A	0.36	A	0.35	A	0.35
N 6th & Richards	N/A		A	0.52	D	0.89	D	0.84	C	0.75	C	0.74	E	0.96	D	0.84
N & 7th & Richards	N/A		A	0.58	B	0.64	B	0.62	A	0.57	B	0.61	B	0.63	A	0.58

* Assumes an effective westbound lane utilization of 2.5.

Note: Shaded LOS indicate significant impacts.

SOURCE: Korve Engineering, Inc.

TABLE 4.8-18

YEAR 2000 SERVICE LEVEL COMPARISON
PM PEAK HOUR

Intersection	Existing		ALT 1 LOS	V/C	ALT 2 LOS	V/C	ALT 3 LOS	V/C	ALT 4 LOS	V/C	ALT 5 LOS	V/C	ALT 6 LOS	V/C	ALT 7 LOS	V/C
SB I-5 Off & Richards	B	0.68	C	0.76	D	0.88	D	0.83	C	0.72	C	0.72	E	0.94	D	0.84
NB I-5 On & Richards	D	0.81	C	0.72	D	0.84	C	0.75	B	0.65	C	0.71	D	0.83	C	0.79
5th & I St*	A	0.50	B	0.60	C	0.74	C	0.78	C	0.74	C	0.76	C	0.79	C	0.76
6th & I St	A	0.36	C	0.63	C	0.77	D	0.83	C	0.79	D	0.81	D	0.86	D	0.83
7th & I St	A	0.42	B	0.55	B	0.65	B	0.63	A	0.59	B	0.60	B	0.67	B	0.62
5th & J St	A	0.35	A	0.38	A	0.41	A	0.46	A	0.38	A	0.38	A	0.40	A	0.39
6th & J St	A	0.33	A	0.38	A	0.54	B	0.60	B	0.59	B	0.61	B	0.60	B	0.61
7th & J St	A	0.34	A	0.44	A	0.58	A	0.59	A	0.55	A	0.56	B	0.62	A	0.59
3rd & L St	A	0.50	A	0.57	B	0.60	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62
N 6th & Richards	N/A		A	0.54	F	1.01	F	1.00	D	0.83	D	0.85	F	1.14	E	0.96
N & 7th & Richards	N/A		A	0.57	C	0.73	C	0.71	B	0.60	B	0.61	C	0.74	B	0.66

* Assumes an effective westbound lane utilization of 2.5.

Note: Shaded LOS indicate significant impacts.

SOURCE: Korve Engineering, Inc.

A-4 Alternative 4 would result in cumulative and project impacts at none of the intersections during the AM peak hour and one intersection during the PM peak hour. This is considered a ***significant impact.***

A-5 Alternative 5 would result in cumulative and project impacts at none of the intersections during the AM peak hour and two intersections during the PM peak hour. This is considered a ***significant impact.***

A-6 Alternative 6 would result in cumulative and project impacts at three intersections during the AM peak hour and four intersections during the PM peak hour. Mitigations would reduce the impact to a less-than-significant level at all but three locations. Future conditions at the intersections of Richards Boulevard/I-5 Southbound, Richards Boulevard/6th Street and I Street/6th Street would be considered ***significant unavoidable impacts.***

A-7 Alternative 7 would result in cumulative and project impacts at two intersections during the AM peak hour and three intersections during the PM peak hour. Mitigations would reduce the impact to a less-than-significant level at all but one location. Future conditions at the intersection of Richards Boulevard/I-5 Southbound would be considered ***significant unavoidable impacts.***

Mitigation Measures

A significant impact would occur at the intersection of Richards Boulevard and North Sixth Street during the PM peak hour for Alternatives 2, 3, and 6. A significant impact would occur at the intersection of Richards Boulevard and I-5 southbound ramps during the PM peak hour for Alternatives 2, 3, 6, and 7. A significant impact would occur at the intersection of Sixth Street and I Street during the AM peak hour for Alternative 6. These impacts are the result of cumulative and project traffic and are considered to be ***significant unavoidable impacts.***

Levels of service for mitigated conditions are shown in Tables 4.8-19 and 4.8-20.

Figure 4.8-22 shows mitigations for various intersections and alternatives.

4.8-1(a) *Implement a Transportation Management Plan. This measure is required for all Alternatives.*

The current Transportation Management Program (TMP) of 35 percent for projects in the downtown area is based on the regional goals of a 15 percent reduction in vehicle trips in conjunction with an existing downtown alternative mode usage of 20 percent. It is reasonable to assume that development in the Planning Area could achieve significant further reductions in the proportion of office employees driving along to work based on the implementation of several alternative mode policies. These are summarized as follows.

TABLE 4.8-19

YEAR 2000 MITIGATED SERVICE LEVEL COMPARISON
AM PEAK HOUR

Int No.	Intersection	Existing		ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	SB I-5 Off & Richards	C	0.73	A	0.43	B	0.63	B	0.66	B	0.60	A	0.57	C	0.76	B	0.66
2	NB I-5 On & Richards	B	0.63	A	0.33	B	0.61	B	0.69	B	0.60	B	0.61	A	0.56	C	0.73
3	5th & I St*	A	0.33	A	0.43	A	0.52	B	0.66	B	0.66	B	0.65	B	0.67	B	0.66
4	6th & I St	A	0.22	A	0.39	C	0.77	C	0.72	B	0.65	B	0.67	E	0.91	C	0.71
5	7th & I St	A	0.23	A	0.33	A	0.38	A	0.42	A	0.40	A	0.40	A	0.45	A	0.42
6	5th & J St	A	0.48	B	0.62	C	0.71	C	0.77	C	0.74	C	0.74	C	0.79	C	0.77
7	6th & J St	A	0.46	C	0.70	C	0.76	B	0.64	B	0.62	B	0.64	B	0.68	B	0.63
8	7th & J St	A	0.46	C	0.74	C	0.77	C	0.73	C	0.71	C	0.71	C	0.73	C	0.72
9	3rd & L St	A	0.32	A	0.38	A	0.38	A	0.36	A	0.35	A	0.36	A	0.35	A	0.35
10	N 6th & Richards	N/A		A	0.52	C	0.70	B	0.64	C	0.75	C	0.74	C	0.75	B	0.67
11	N & 7th & Richards	N/A		A	0.58	B	0.64	B	0.62	A	0.57	B	0.61	B	0.63	A	0.58

* Assumes an effective westbound lane utilization of 2.5.

Note: Shaded LOS indicate significant and unavoidable impacts.

SOURCE: Korve Engineering, Inc.

TABLE 4.8-20

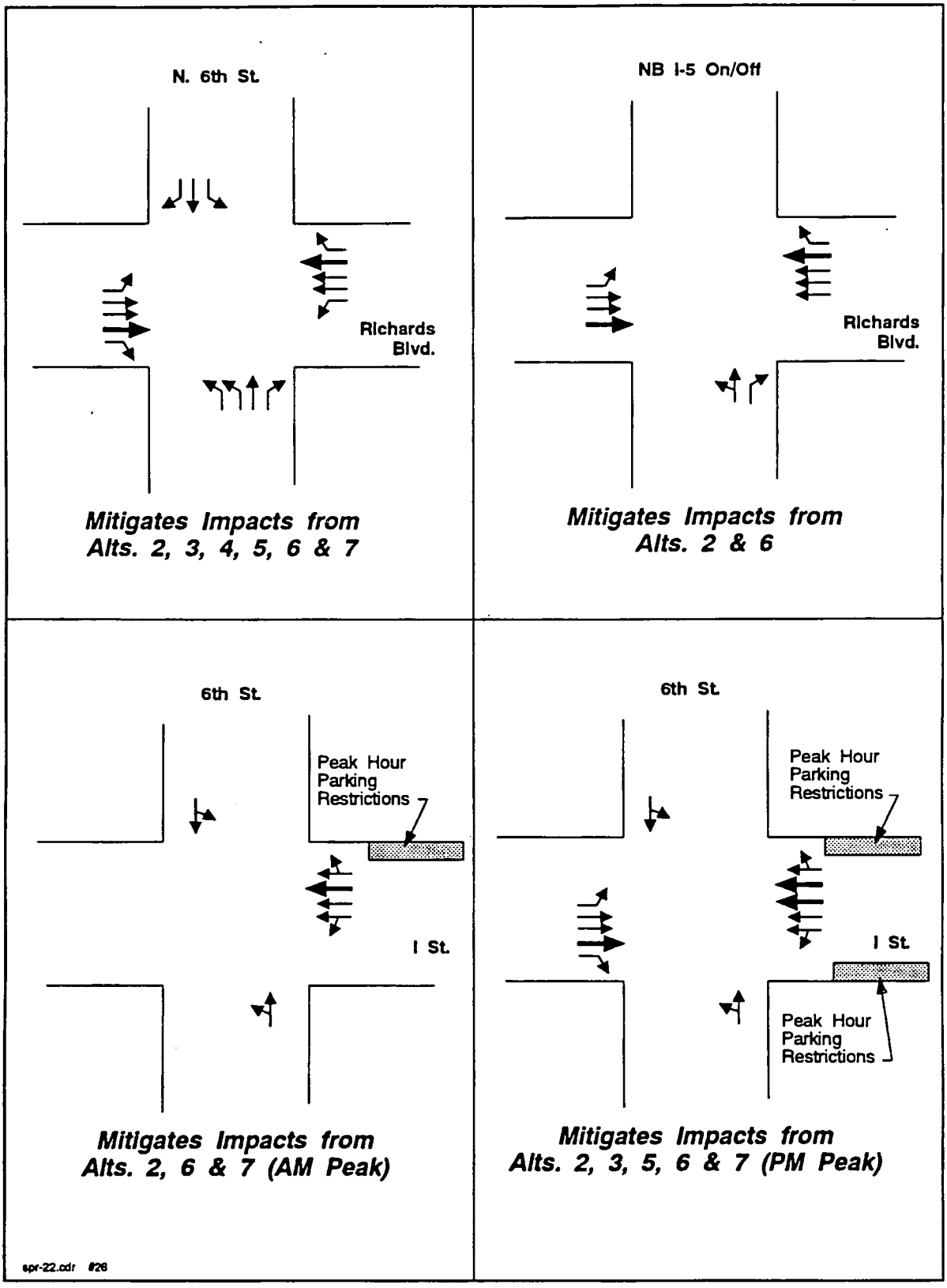
YEAR 2000 MITIGATED SERVICE LEVEL COMPARISON
PM PEAK HOUR

Intersection	Existing		ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
SB I-5 Off & Richards	C	0.76	A	0.58	D	0.88	D	0.83	C	0.72	C	0.72	E	0.94	D	0.84
NB I-5 On & Richards	D	0.81	A	0.58	C	0.73	C	0.75	B	0.65	C	0.71	C	0.71	C	0.79
5th & I St*	A	0.50	B	0.60	C	0.74	C	0.78	C	0.74	C	0.76	C	0.79	C	0.76
6th & I St	A	0.36	C	0.63	C	0.77	C	0.73	C	0.79	C	0.71	C	0.75	C	0.72
7th & I St	A	0.42	B	0.55	B	0.65	B	0.63	A	0.59	B	0.60	B	0.67	B	0.62
5th & J St*	A	0.35	A	0.40	A	0.43	A	0.43	A	0.41	A	0.43	A	0.43	A	0.42
6th & J St	A	0.33	A	0.38	A	0.54	B	0.60	A	0.59	B	0.61	B	0.60	B	0.61
7th & J St	A	0.34	A	0.44	A	0.58	A	0.59	A	0.55	A	0.56	B	0.62	A	0.59
3rd & L St	A	0.50	A	0.57	B	0.60	B	0.62	B	0.62	B	0.62	B	0.62	B	0.62
N 6th & Richards	N/A		A	0.54	D	0.81	D	0.81	B	0.65	B	0.67	E	0.93	C	0.77
N & 7th & Richards	N/A		A	0.57	C	0.73	C	0.71	B	0.60	B	0.61	C	0.74	B	0.66

* Assumes an effective westbound lane utilization of 2.5.

Note: Shaded LOS indicate significant and unavoidable impacts.

SOURCE: Korve Engineering, Inc.



← Existing Lane

← Mitigation Lane

Figure 4.8-22

YEAR 2000 PROJECT MITIGATIONS

1. Enhancement of Transit System
2. Location of Employment Density at Transit Stations
3. Development of Pedestrian Corridors Linked to Transit Stations
4. Restriction of On-site Parking Supply
5. Provision of Carpooling/Vanpooling Incentives

The enhancement of the transit system includes Planning Area improvements to heavy rail, light rail, inter-regional bus service, RT bus, other area bus providers, and internal shuttle bus service. The development of an Intermodal Transit Station would provide a key linkage between all of these transit services at the center of the Planning Area. This is provided in Alternatives 2, 3, 4, 6, and 7. An Intermodal Transit Station is not provided in Alternatives 1 (No Project Alternative) or 6, which would have the rail station at its present location without any connection to the Downtown-Natomas-Airport Light-Rail Extension along 7th Street. In addition to expansion of transit service in the Planing Area, the completion of regional transit improvements such as the completion of light-rail extensions to South Sacramento, Folsom, Roseville, and the Airport are important as they provide for increased access to transit for downtown employees.

The location of the higher density employment centers at or near transit stations is a key policy as it provides a greater market for transit within short walking distances of stations. Improved pedestrian linkages between these employment centers and the adjacent transit stations would be provided to reinforce transit use.

The implementation of a maximum on-site parking rate of 1.0 spaces per 1,000 square feet would provide additional incentives for use of alternative modes such as transit, carpooling/vanpooling, bicycle and walk. In the early phases of the Facility Element, additional parking could be provided at off-site lots to maintain a level of parking supportive of today's parking requirement in the downtown area of 1.6 parking spaces per 1,000 square feet. Over time, the off-site parking lots would be replaced by new projects and the on-site parking limit would apply to all buildings. Maximum on-site parking rates of 1.0 per 1,000 square feet or less for office buildings are currently applied in the downtown areas of San Francisco, San Diego, Portland and Seattle. While there is currently no maximum parking rate, office projects in downtown Oakland currently provide between 0.75 and 1.00 parking spaces per 1,000 square feet.

The provision of carpooling/vanpooling incentives would include the assignment of a Transportation Management Coordinator for the Planning Area who would develop a matching program for employees in the area, allocation of preferred on-site parking spaces for carpool/vanpool drivers, and reduced parking rates for carpool/vanpool drivers.

The mode split goals identified in the Facility Element, which are based on the implementation of the above TMP policies, would result in a reduction in vehicle trips of 35 to 40 percent below those identified for the project Alternatives. This would result in reduced volumes on the Planning Area highways, ramps, and intersections. This could result in reduced impacts at locations where project impacts have been identified and alleviate the need for physical mitigations such as highway/roadway widening and/or intersection improvements. At other locations where impacts are the result of cumulative traffic volumes, such as typically occurs on the freeway main line and ramps, the reduction in project vehicle trips would translate into reduced peak period congestion. Although implementation of the TMP would reduce traffic, it would not fully offset impacts associated with the Alternatives.

Richards Boulevard/North Sixth Street

Implementation of Mitigation Measure 4.8-1(b) would reduce impacts for Alternatives 2, 3, 6, and 7 in the AM peak hour, and Alternatives 4, 5, and 7 in the PM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-1(b) would reduce impacts for Alternatives 2, 3, and 6 in the PM peak hour but *not to a less-than-significant level.*

4.8-1(b) *Add a third lane at the intersection of Richards Boulevard and North Sixth Street in the eastbound and westbound directions.*

Richards Boulevard/I-5 Northbound Ramps

Implementation of Mitigation Measure 4.8-1(c) would reduce impacts for Alternatives 2 and 6 in the PM peak hour, and Alternative 6 in the AM peak hour to a *less-than-significant level.*

4.8-1(c) *Add a third eastbound through lane and a fourth westbound through lane at the intersection of Richards Boulevard and I-5 Northbound Ramps.*

Sixth Street/I Street

Implementation of Mitigation Measure 4.8-1(d) would reduce impacts from Alternatives 3 and 7 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-1(d) would reduce impacts for Alternative 6, but not to a *less-than-significant level.*

4.8-1(d) *Add a fourth lane in the westbound direction at the intersection of Sixth Street/I Street. This mitigation would require a mandatory parking restriction on the north side of I Street from I-5 to 8th Street during the AM peak hour, as well as additional striping.*

Sixth Street/I Street

Implementation of Mitigation Measure 4.8-1(e) would reduce impacts from Alternatives 3, 5, 6, and 7 during the PM peak hour to a *less-than-significant level.*

4.8-1(e) *Add a fifth lane in the westbound direction at the intersection of Sixth Street/I Street. This mitigation would require mandatory parking restrictions on the north and south side of I Street from I-5 to 8th Street during the AM and PM peak hours, as well as additional striping.*

4.8-2 For Year 2010, implementation of any of the Alternatives will result in lower service levels at some intersections.

The Year 2010 intersection analysis assumes the implementation of a significant number of highway/roadway improvements for Alternatives 2 through 7 based on the Facility Element. This includes interchange improvements on I-5 at Richards Boulevard and Crescent Drive, interchange improvements along SR 160 at Riverfront Drive, construction of Gateway Boulevard,

development of a Richards Boulevard couplet, development of a 5th/6th Street couplet, and extension of 7th Street to the American River. It also includes transit improvements, such as the Intermodal Transit Station, the Downtown-Natomas-Airport Light-Rail Extension, enhanced RT bus service, and shuttle bus service. As such, improved service level conditions over the Year 2000 scenario are projected at a number of the study intersections.

The planned construction of a new rail bridge across the Sacramento River along the Southern Pacific Railroad mainline corridor would result in a revised alignment in West Sacramento between 4th Street and the river levee. The cost for constructing a new rail bridge, as identified in the Facility Element, includes the replacement of existing structures in West Sacramento to maintain existing circulation patterns. As such, the construction of the rail bridge would have no impact on traffic conditions in this area upon its completion. Traffic control plans would be required to maintain local access during construction.

I-5 and State Route 160 are projected to operate at service level F conditions by the Year 2010 in the vicinity of the planning area. This would result in the potential for queues extending from the freeway facilities onto the local downtown street system during the PM peak hour. All future interchanges along I-5 in the planning area incorporate a new on-ramp design that would provide both a High Occupancy Vehicle (HOV) bypass lane and storage for vehicles waiting to enter the freeway. This design would provide adequate capacity to store vehicles without creating queues on downtown streets. The present queuing of traffic at signalized intersections along State Route 160, which presently operate at service level D conditions during the PM peak hour, would be minimized through the construction of Gateway Boulevard which would provide additional parallel capacity to 16th Street.

The junction of Gateway Boulevard and 16th Street at the American River Bridge would result in a merging of outbound traffic from the Central City. Physically, this would involve the merging northbound lanes on Gateway Boulevard and 16th Street from four lanes to two lanes beginning at Richards Boulevard North. (An individual lane transition could be accomplished within a distance of approximately 320 feet, assuming a design speed of 40 MPH.) The operation of this merge could be managed and metered through the development of a traffic control plan for the signalized intersections along both streets. This would be accomplished by developing timing patterns that would create platoons of through traffic along Gateway Boulevard and 16th Street that would arrive at the American River Bridge merge at different times, thereby minimizing queues at this location.

Figure 4.8-23 shows the intersections analyzed for the Year 2010. Figures 4.8-24 through 4.8-29 show lane configurations and intersection volumes.

Tables 4.8-21 and 4.8-22 show levels of service for AM and PM peak hours.

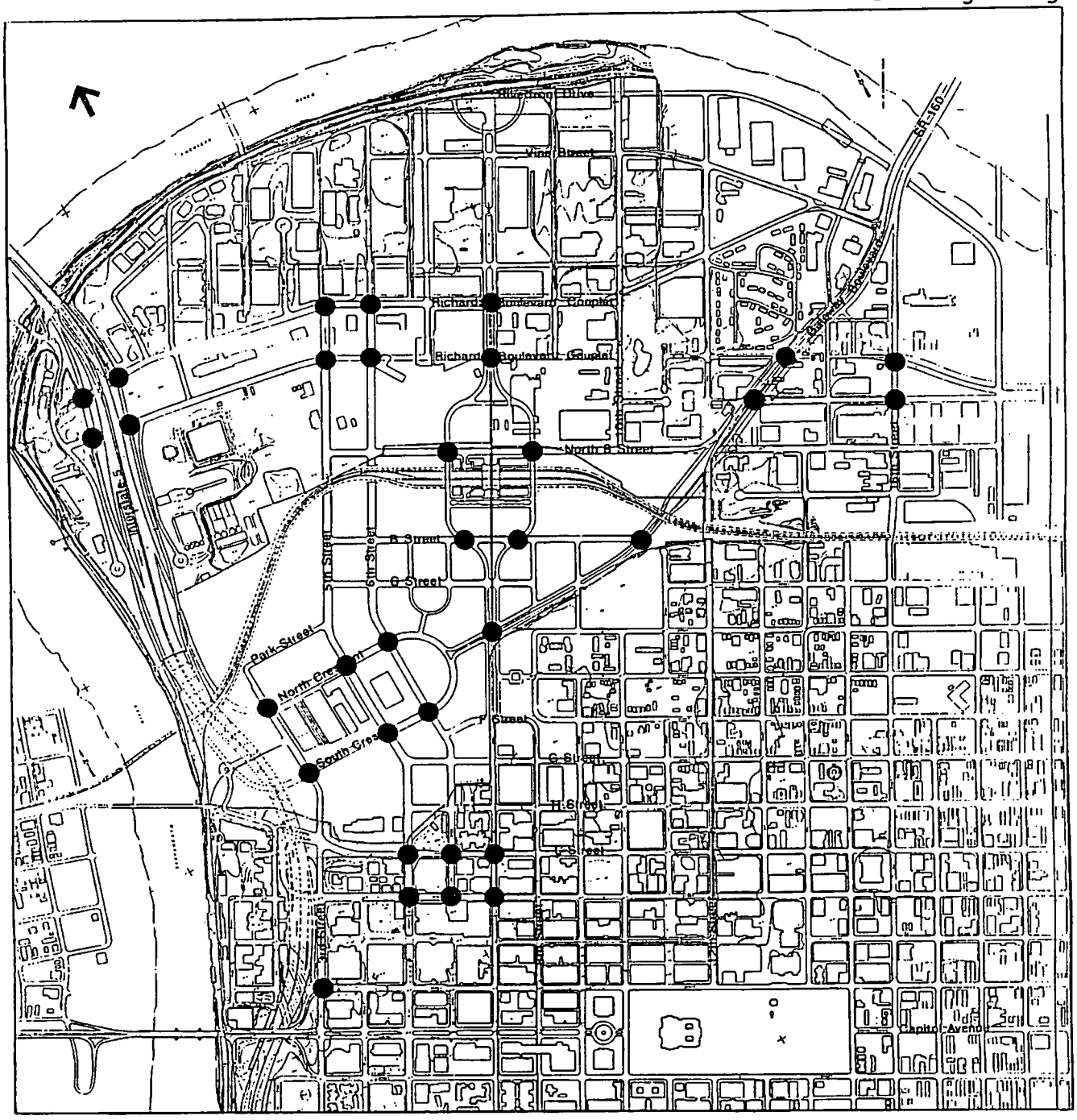


Figure 4.8-23

YEAR 2010 PROJECT STUDY INTERSECTIONS

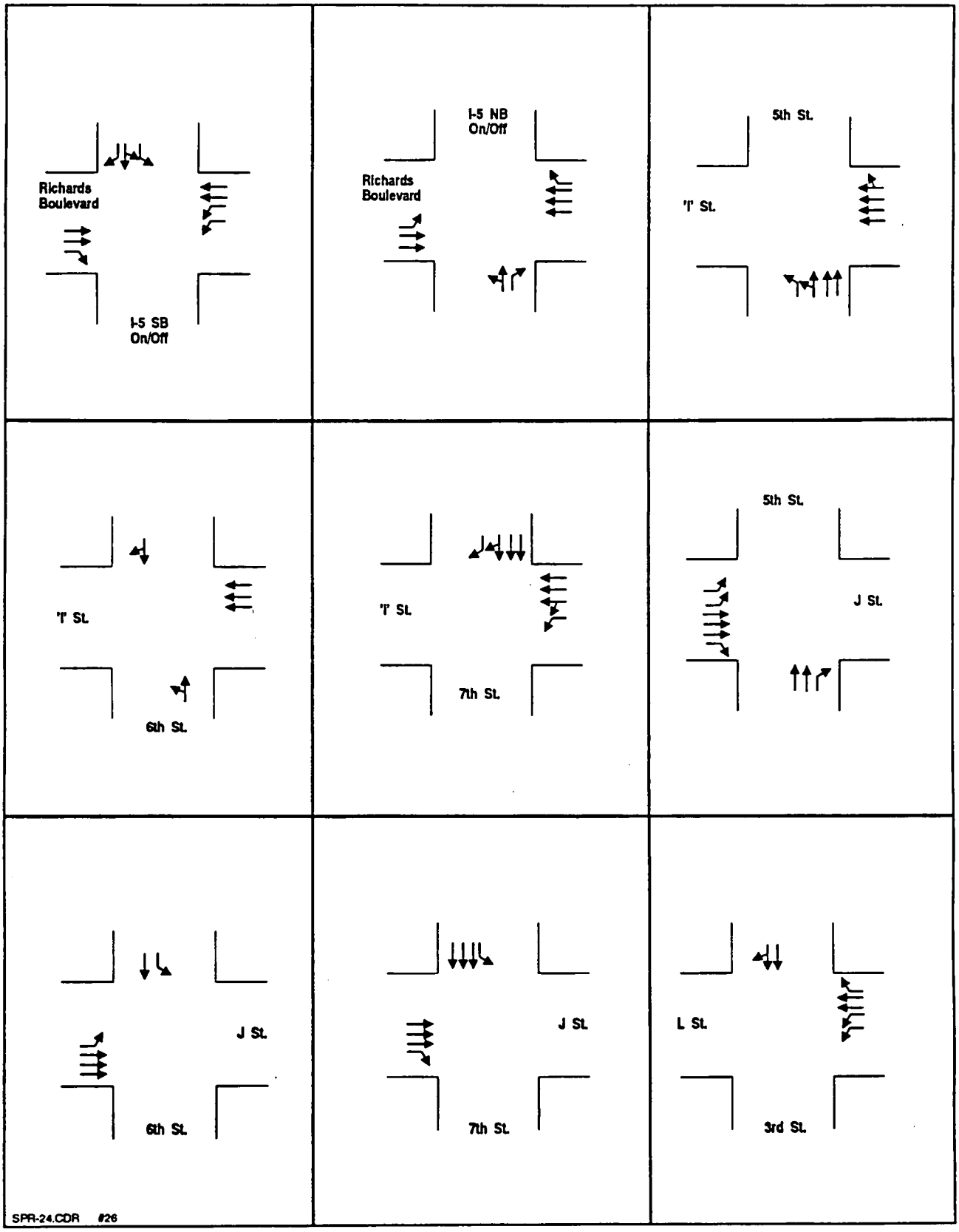


Figure 4.8-24

YEAR 2010 NO PROJECT LANE CONFIGURATIONS

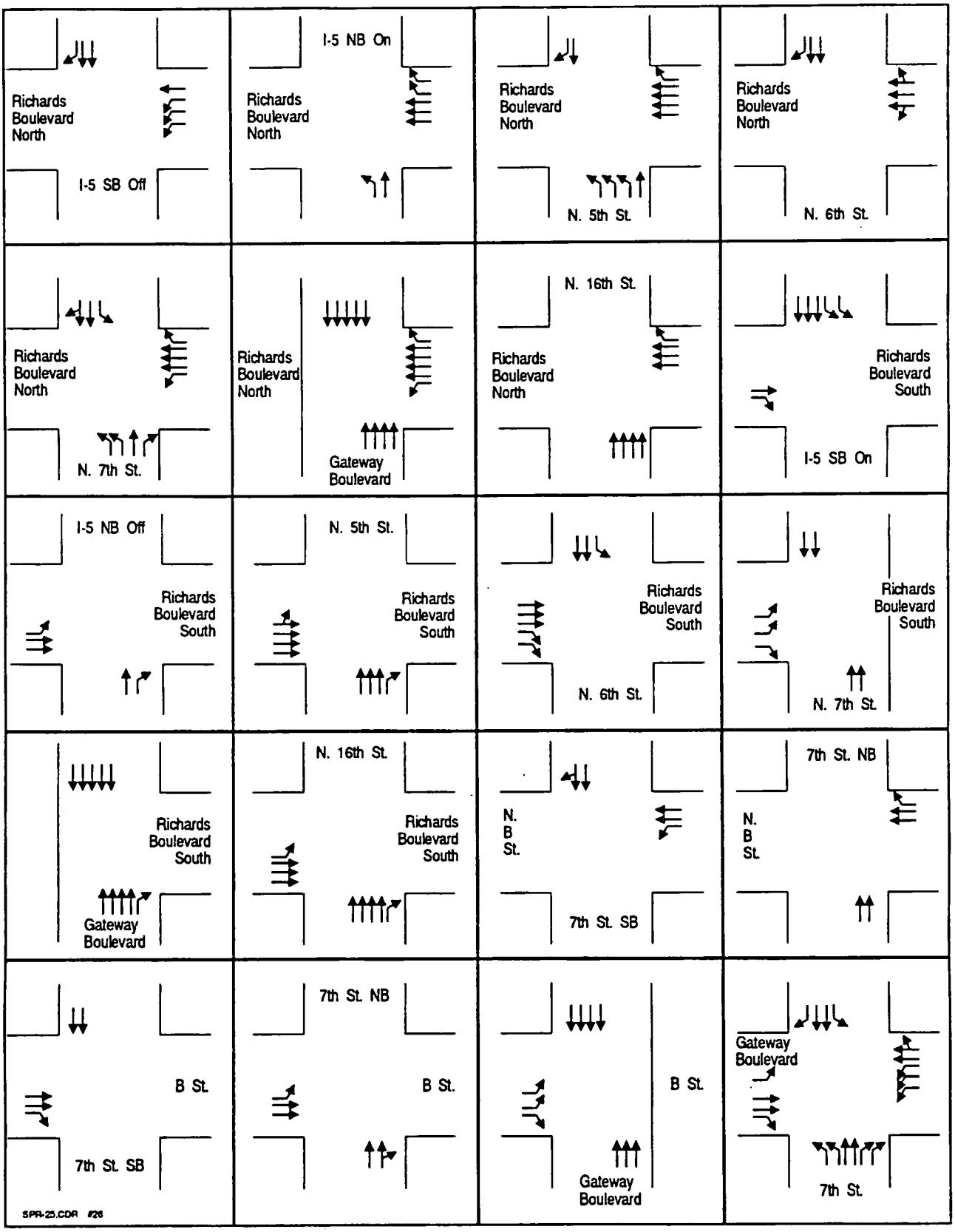


Figure 4.8-25

YEAR 2010 PROJECT LANE CONFIGURATIONS

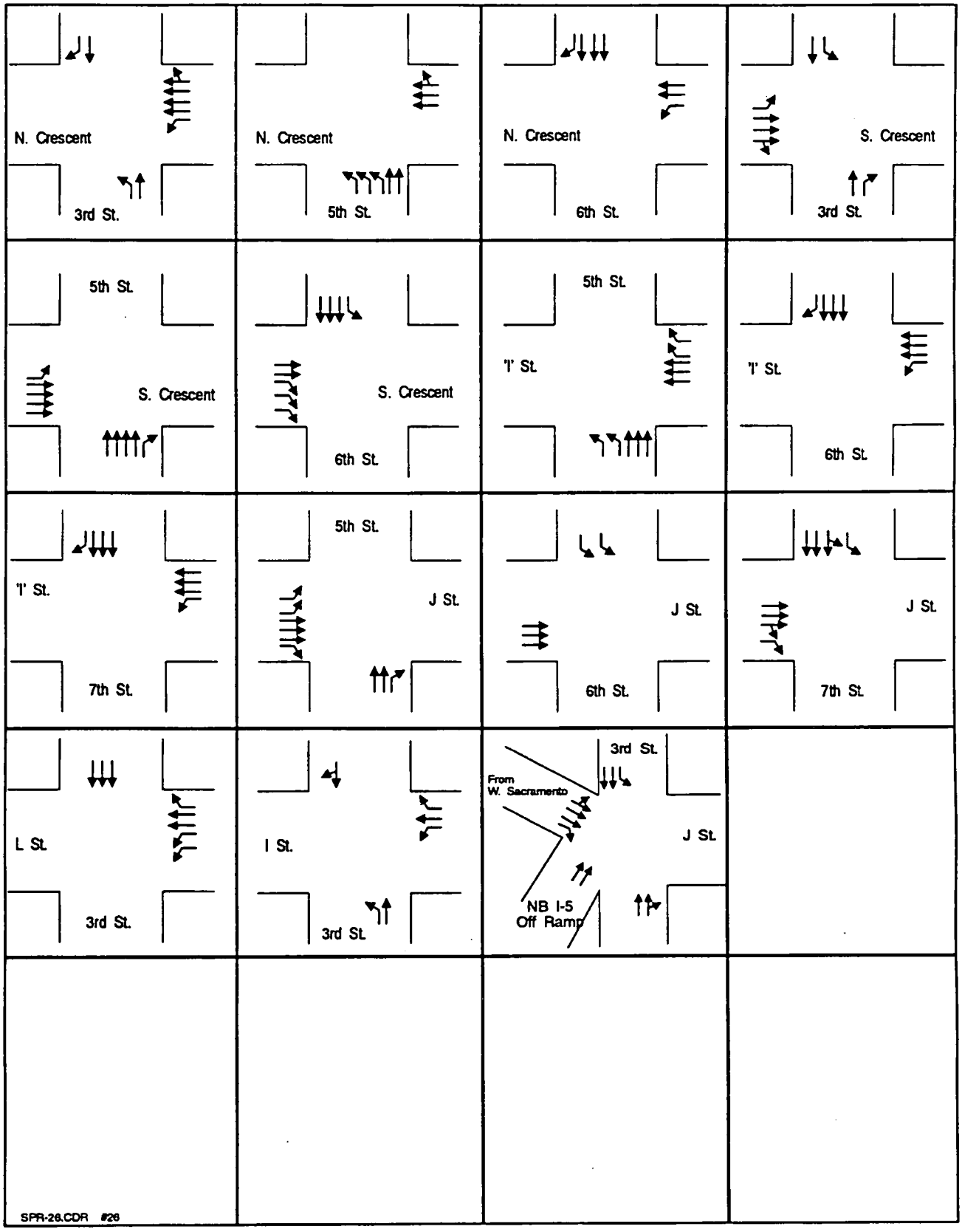
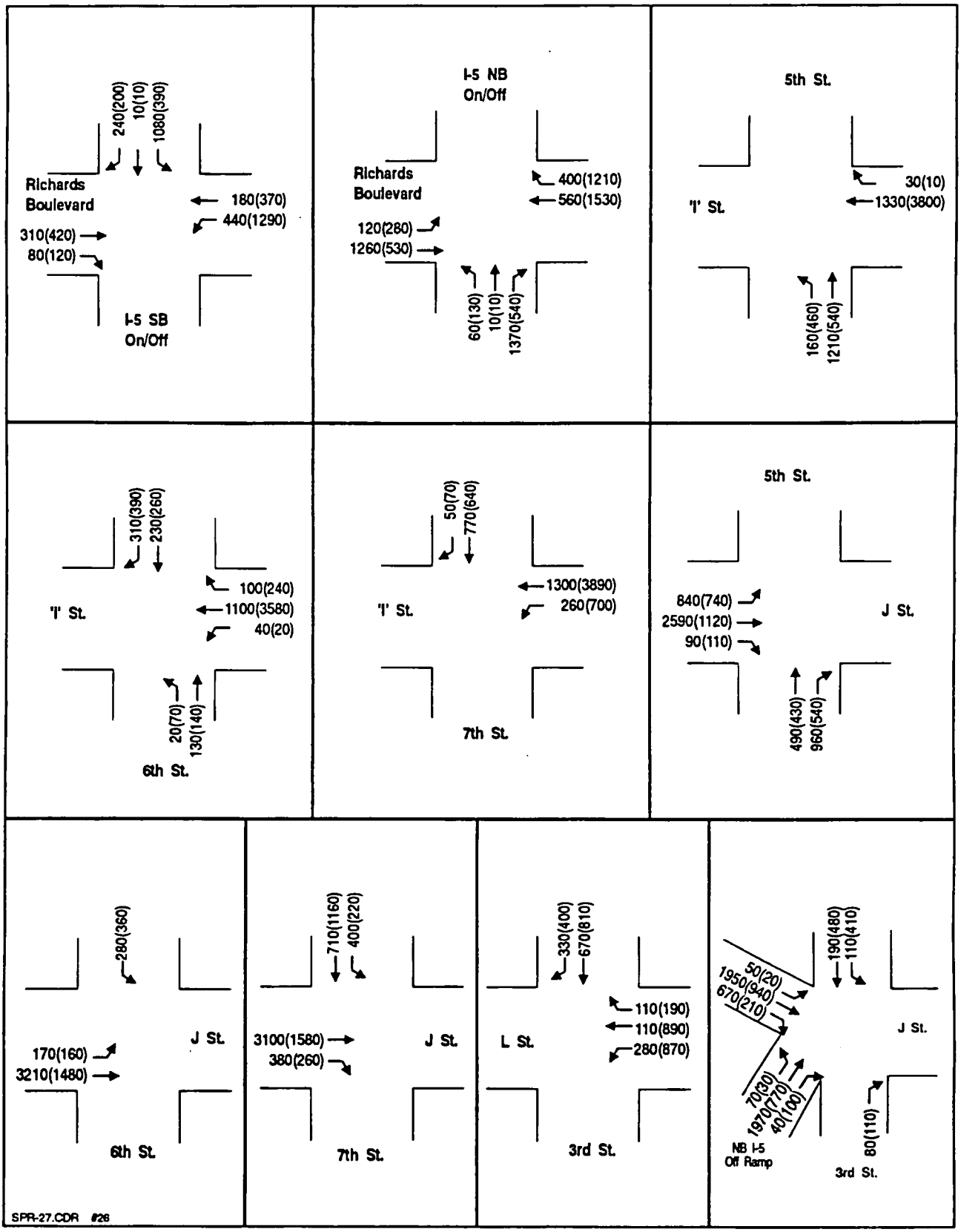


Figure 4.8-26

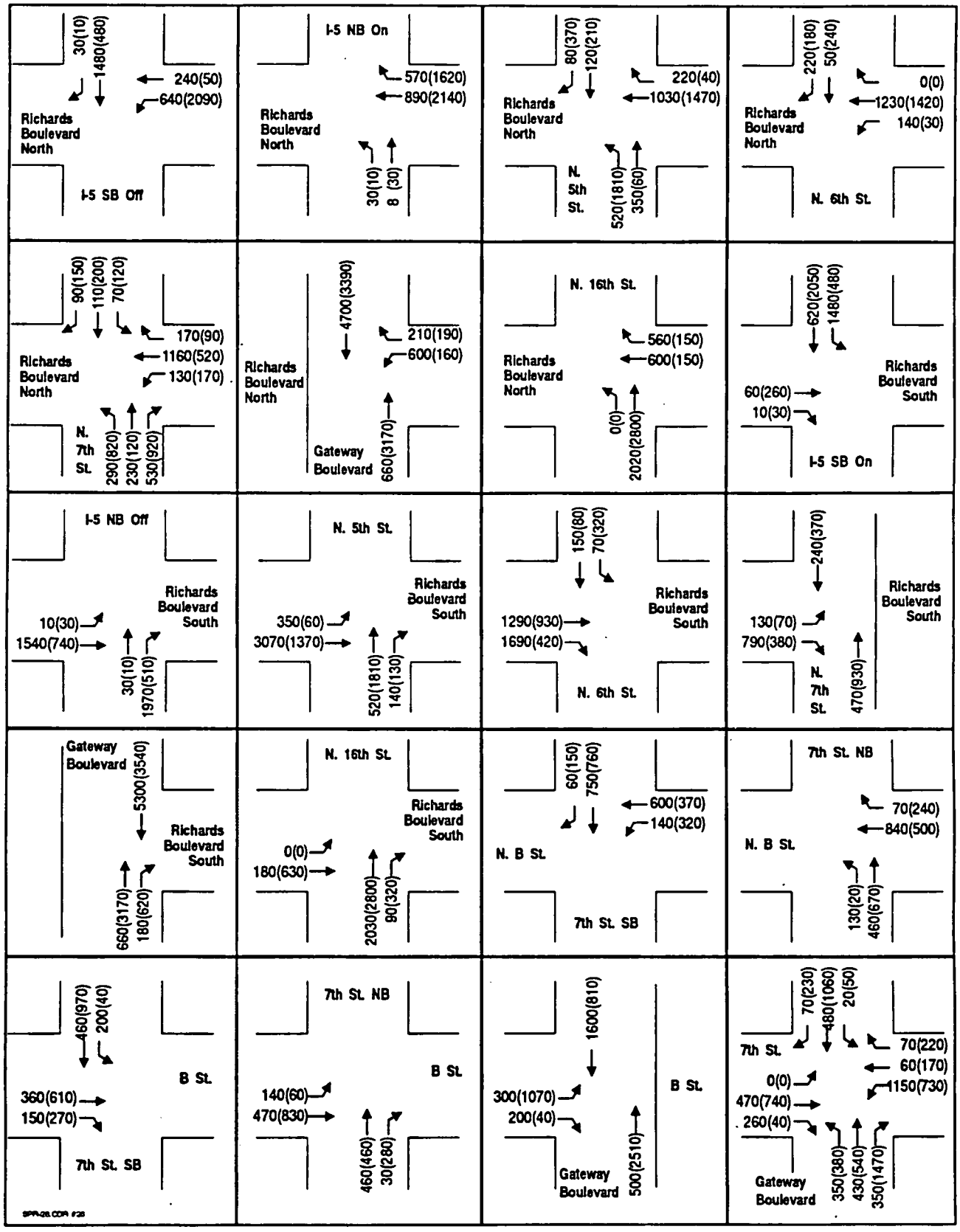
YEAR 2010 PROJECT LANE CONFIGURATIONS



AM(PM)

Figure 4.8-27

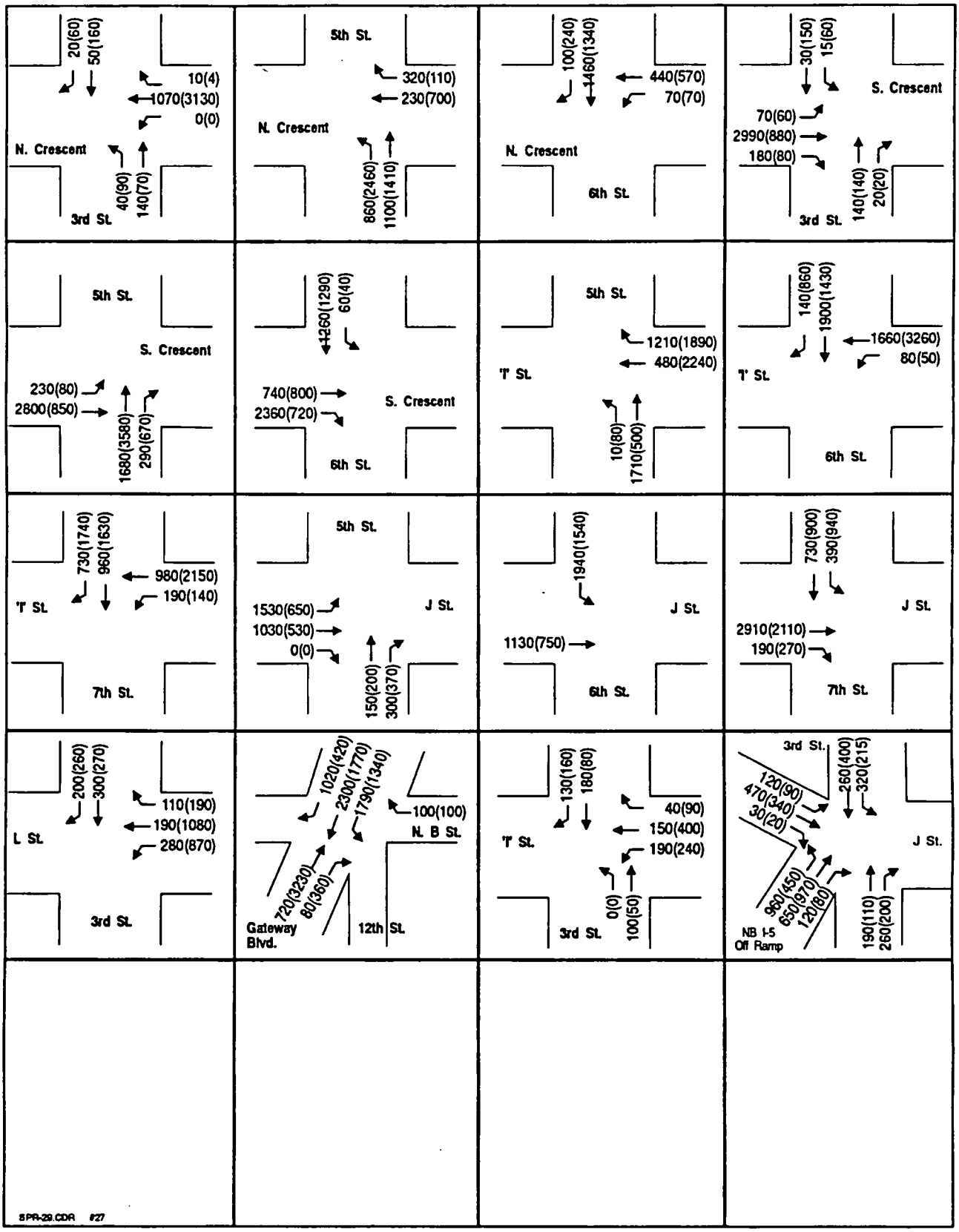
YEAR 2010 NO PROJECT INTERSECTION VOLUMES



AM(PM)

Figure 4.8-28

YEAR 2010 PROJECT INTERSECTION VOLUMES



AM(PM)

Figure 4.8-29

YEAR 2010 PROJECT INTERSECTION VOLUMES

TABLE 4.8-21
YEAR 2010 SERVICE LEVEL COMPARISON
AM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS/VC	ALT 4 LOS/VC	ALT 5 LOS/VC	ALT 6 LOS/VC	ALT 7 LOS/VC
Richards Blvd. No./I-5 SB Off	B 0.64	D 0.82	D 0.82	B 0.65	B 0.64	F 1.16	B 0.69
Richards Blvd. No./I-5 NB On	A 0.48	A 0.29	A 0.28	A 0.22	A 0.21	A 0.40	A 0.24
Richards Blvd. No./No. 5th ST	N/A	A 0.49	A 0.49	A 0.41	A 0.46	B 0.69	A 0.42
Richards Blvd. No./No. 6th ST	N/A	A 0.43	A 0.43	A 0.32	A 0.30	C 0.71	A 0.34
Richards Blvd. No./No. 7th ST	N/A	C 0.73	C 0.71	A 0.56	A 0.47	F 1.14	A 0.54
Richards Blvd. No./Gtwy. Blvd.	N/A	D 0.84	D 0.81	D 0.83	D 0.81	F 1.00	D 0.86
Richards Blvd. No./No. 16th ST	N/A	A 0.52	A 0.51	A 0.47	A 0.46	B 0.68	A 0.49
Richards Blvd. So./I-5 SB On	N/A	B 0.66	B 0.66	A 0.53	A 0.52	E 0.93	A 0.56
Richards Blvd. So./I-5 NB Off	N/A	B 0.66	B 0.66	A 0.53	A 0.52	E 0.93	A 0.57
Richards Blvd. So./No. 5th ST	N/A	C 0.78	C 0.76	B 0.69	B 0.66	F 1.09	C 0.73
Richards Blvd. So./No. 6th ST	N/A	A 0.51	A 0.52	A 0.34	A 0.32	D 0.81	A 0.37
Richards Blvd. So./No. 7th ST	N/A	A 0.47	A 0.47	A 0.35	A 0.33	D 0.84	A 0.38
Richards Blvd. So./Gtwy. Blvd.	N/A	C 0.71	C 0.70	C 0.71	C 0.70	D 0.84	C 0.73
Richards Blvd. So./No. 16th ST	N/A	A 0.43	A 0.43	A 0.38	A 0.37	A 0.57	A 0.39
North B Street/SB 7th Street	N/A	B 0.69	B 0.62	A 0.47	A 0.46	C 0.78	A 0.50
North B Street/NB 7th Street	N/A	B 0.67	B 0.62	A 0.48	A 0.48	D 0.86	A 0.51
B Street/SB 7th Street	N/A	A 0.53	A 0.48	A 0.34	A 0.33	B 0.61	A 0.36
B Street/NB 7th Street	N/A	A 0.43	A 0.40	A 0.32	A 0.31	A 0.56	A 0.35

Shaded LOS indicate significant impact.

TABLE 4.8-21 (Cont.)
YEAR 2010 SERVICE LEVEL COMPARISON
AM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS V/C	ALT 4 LOS V/C	ALT 5 LOS/VC	ALT 6 LOS V/C	ALT 7 LOS V/C
Gateway Blvd/B Street	N/A	A 0.38	A 0.37	A 0.45	A 0.44	A 0.53	A 0.48
Gateway Blvd/7th Street	N/A	C 0.72	B 0.66	C 0.72	B 0.67	D 0.80	C 0.73
WB Crescent/3rd Street	N/A	A 0.27	A 0.27	A 0.27	A 0.27	A 0.28	A 0.28
WB Crescent/5th Street	N/A	A 0.57	A 0.51	A 0.44	A 0.44	C 0.70	A 0.48
WB Crescent/6th Street	N/A	A 0.42	A 0.36	A 0.47	A 0.46	A 0.52	A 0.50
EB Crescent/3rd Street	N/A	C 0.71	B 0.69	C 0.79	C 0.79	C 0.76	D 0.82
EB Crescent/5th Street	N/A	C 0.72	C 0.71	C 0.75	C 0.74	D 0.81	C 0.77
EB Crescent/6th Street	N/A	A 0.47	A 0.45	A 0.53	A 0.50	A 0.55	A 0.55
I Street/3rd Street	A 0.45	A 0.42	A 0.42	A 0.42	A 0.42	A 0.42	A 0.42
I Street/5th Street*	A 0.50	A 0.47	A 0.44	A 0.49	A 0.50	A 0.51	A 0.51
I Street/6th Street	A 0.47	C 0.76	C 0.76	C 0.79	C 0.79	D 0.84	D 0.80
I Street/7th Street	A 0.39	A 0.51	A 0.51	A 0.40	A 0.49	A 0.55	A 0.55
J Street/3rd Street	D 0.87	E 0.91	F 1.00	D 0.89	E 0.92	E 0.93	E 0.94
J Street/5th Street	C 0.74	A 0.50	A 0.46	A 0.56	A 0.55	A 0.56	A 0.59
J Street/6th Street	D 0.89	D 0.89	D 0.88	E 0.90	E 0.90	E 0.93	E 0.90
J Street/7th Street	E 0.95	D 0.86	D 0.84	D 0.83	D 0.83	D 0.87	D 0.84
L Street/3rd Street	A 0.31	A 0.22	A 0.22	A 0.22	A 0.22	A 0.22	A 0.22

* Assumes effective lane utilization of 2.5.
Shaded LOS indicate significant impacts.

SOURCE: Korve Engineering, Inc.

TABLE 4.8-22
YEAR 2010 SERVICE LEVEL COMPARISON
PM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS/VC	ALT 4 LOS/VC	ALT 5 LOS/VC	ALT 6 LOS/VC	ALT 7 LOS/VC
Richards Blvd. No./I-5 SB Off	C 0.74	C 0.70	B 0.69	B 0.63	B 0.60	F 1.07	B 0.67
Richards Blvd. No./I-5 NB On	D 0.83	A 0.56	A 0.55	A 0.50	A 0.48	D 0.83	A 0.53
Richards Blvd. No./No. 5th ST	N/A	D 0.86	D 0.85	C 0.79	C 0.79	F 1.21	D 0.84
Richards Blvd. No./No. 6th ST	N/A	A 0.56	A 0.56	A 0.40	A 0.38	D 0.82	A 0.43
Richards Blvd. No./No. 7th ST	N/A	D 0.89	D 0.87	A 0.59	A 0.56	F 1.31	B 0.63
Richards Blvd. No./Gtwy. Blvd.	N/A	B 0.61	A 0.59	A 0.58	B 0.61	C 0.70	B 0.61
Richards Blvd. No./No. 16th ST	N/A	A 0.52	A 0.51	A 0.50	A 0.50	A 0.58	A 0.51
Richards Blvd. So./I-5 SB On	N/A	C 0.72	C 0.71	B 0.63	B 0.61	F 1.00	B 0.67
Richards Blvd. So./I-5 NB Off	N/A	A 0.31	A 0.31	A 0.25	A 0.25	A 0.42	A 0.26
Richards Blvd. So./No. 5th ST	N/A	B 0.65	B 0.64	B 0.64	B 0.62	E 0.97	B 0.68
Richards Blvd. So./No. 6th ST	N/A	A 0.54	A 0.55	A 0.42	A 0.40	D 0.83	A 0.46
Richards Blvd. So./No. 7th ST	N/A	E 0.91	E 0.91	B 0.62	A 0.59	F 1.40	B 0.67
Richards Blvd. So./Gtwy. Blvd.	N/A	B 0.61	A 0.53	A 0.53	A 0.52	B 0.64	A 0.55
Richards Blvd. So./No. 16th ST	N/A	B 0.62	B 0.61	B 0.61	A 0.60	C 0.71	B 0.62
North B Street/SB 7th Street	N/A	B 0.70	B 0.70	A 0.51	A 0.50	E 0.94	A 0.53
North B Street/NB 7th Street	N/A	A 0.55	A 0.51	A 0.39	A 0.38	A 0.58	A 0.41
B Street/SB 7th Street	N/A	C 0.75	B 0.69	A 0.54	A 0.53	F 1.02	A 0.58
B Street/NB 7th Street	N/A	B 0.70	B 0.63	A 0.53	A 0.52	C 0.78	A 0.57

Shaded LOS indicate significant impacts.

TABLE 4.8-22 (Cont.)
YEAR 2010 SERVICE LEVEL COMPARISON
PM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS V/C	ALT 4 LOS V/C	ALT 5 LOS/VC	ALT 6 LOS V/C	ALT 7 LOS V/C
Gateway Blvd/B Street	N/A	E 0.92	D 0.88	E 0.92	E 0.91	F 1.05	E 0.95
Gateway Blvd/7th Street	N/A	D 0.81	D 0.81	D 0.84	D 0.81	D 0.88	D 0.88
WB Crescent/3rd Street	N/A	B 0.62	B 0.60	B 0.69	B 0.68	B 0.66	C 0.70
WB Crescent/5th Street	N/A	B 0.64	B 0.61	C 0.73	C 0.72	C 0.70	C 0.75
WB Crescent/6th Street	N/A	A 0.59	A 0.52	A 0.49	A 0.47	C 0.72	A 0.53
EB Crescent/3rd Street	N/A	A 0.35	A 0.34	A 0.35	A 0.34	A 0.35	A 0.35
EB Crescent/5th Street	N/A	B 0.62	B 0.62	C 0.74	C 0.73	B 0.69	C 0.76
EB Crescent/6th Street	N/A	A 0.57	A 0.53	A 0.55	A 0.54	C 0.71	B 0.60
I Street/3rd Street	A 0.42	A 0.44	A 0.45	A 0.48	A 0.47	A 0.50	A 0.49
I Street/5th Street*	C 0.72	A 0.57	B 0.63	C 0.71	C 0.70	C 0.72	C 0.74
I Street/6th Street	C 0.77	D 0.85	D 0.83	D 0.87	D 0.87	E 0.94	D 0.89
I Street/7th Street	B 0.68	F 1.05	F 1.05	F 1.02	F 1.01	F 1.12	F 1.04
J Street/3rd Street	B 0.65	B 0.61	B 0.68	A 0.59	B 0.62	B 0.63	B 0.63
J Street/5th Street	A 0.42	A 0.29	A 0.28	A 0.28	A 0.28	A 0.29	A 0.29
J Street/6th Street	A 0.55	B 0.69	B 0.65	B 0.68	B 0.68	C 0.79	C 0.71
J Street/7th Street	B 0.61	D 0.83	C 0.79	C 0.78	C 0.77	E 0.95	D 0.81
L Street/3rd Street	A 0.56	A 0.55	A 0.55	A 0.55	A 0.55	A 0.55	A 0.55

* Assumes effective lane utilization of 2.5.
Shaded LOS indicate significant impacts.

SOURCE: Korve Engineering, Inc.

A-1 The No Project Alternative would result in significant cumulative and project impacts at three intersections during the AM peak hour and one intersection during the PM peak hour. These would be considered ***significant impacts.***

A-2 Alternative 2 would result in significant cumulative and project impacts at five intersections during the AM peak hour and seven intersections during the PM peak hour. Mitigations would reduce impacts to a less-than-significant level at all but one locations. Future conditions at the intersection of Gateway Boulevard and Richards Boulevard North and Richards Boulevard North/North 7th Street would be considered ***significant unavoidable impacts.***

A-3 Alternative 3 would result in significant cumulative and project impacts at five intersections during the AM peak hour and six intersections during the PM peak hour. Mitigations would reduce impacts to a less-than-significant level at all but two locations. Future conditions at the intersections of J Street/3rd Street, Gateway Boulevard/Richards Boulevard North and Richards Boulevard North/North 7th Street would be considered ***significant unavoidable impacts.***

A-4 Alternative 4 would result in significant cumulative and project impacts at four intersections during the AM peak hour and four intersections during the PM peak hour. These would be considered ***significant impacts.***

A-5 Alternative 5 would result in significant cumulative and project impacts at four intersections during the AM peak hour and four intersections during the PM peak hour. These would be considered ***significant impacts.***

A-6 Alternative 6 would result in significant cumulative and project impacts at 16 intersections during the AM peak hour and 16 intersections during the PM peak hour. Mitigations would reduce impacts to a less than significant level at only two locations. Future conditions at the intersections of Richards Boulevard North/I-5 SB off, Richards Boulevard North/5th Street, 5th Street/EB Crescent, Richards Boulevard North/7th Street, Gateway Boulevard and Richards Boulevard North, I Street/6th Street, Richards Boulevard South/I-5 SB on, Richards Boulevard South/5th Street, Richards Boulevard South/7th Street, Gateway Boulevard/Richards Boulevard South, Richards Boulevard South/16th Street, Gateway Boulevard/North 7th Street, I Street/7th Street, and J Street/7th Street would be considered ***significant unavoidable impacts.***

A-7 Alternative 7 would result in significant cumulative and project impacts at six intersections during the AM peak hour and six intersections during the PM peak hour. Mitigations would reduce impacts to a less-than-significant level at all but two locations. Future conditions at the intersections of I Street/6th Street and J Street/3rd Street would be considered ***significant unavoidable impacts.***

Mitigation Measures

Tables 4.8-23 and 4.8-24 show mitigated service levels for Year 2010 AM and PM peak hours.

Figures 4.8-30 through 4.8-33 show mitigations for various alternatives and intersections.

Implementation of Mitigation Measure 4.8-2(a) would reduce the above impacts, *but not to a less-than-significant level.*

4.8-2(a) *Implement Mitigation Measure 4.8-1(a).*

I Street/6th Street

Implementation of Mitigation Measure 4.8-2(b) would reduce the impacts of Alternative 6 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(b) would reduce the impacts of Alternative 7 during the AM peak hour *but not to a less-than-significant level.*

4.8-2(b) *Add a fourth through lane in the westbound direction at the intersection of I Street/6th Street, which would require the implementation of peak hour parking restrictions on the north side of I Street between 8th Street and I-5.*

I Street/6th Street

Implementation of Mitigation Measure 4.8-2(c) would reduce the impacts of Alternatives 2-5, and 7 during the PM to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(c) would reduce the impacts of Alternative 6 during the PM peak hour *but not to a less-than-significant level.*

4.8-2(c) *Add a fifth through lane in the westbound direction at the intersection of I Street/6th Street, which would require the implementation of peak hour parking restrictions on both sides of I Street between 8th Street and I-5.*

I Street/7th Street

Implementation of Mitigation Measure 4.8-2(d) would reduce the impacts of Alternatives 2 and 7 during the PM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(d) would reduce the impacts of Alternative 6 during the PM peak hour *but not to a less-than-significant level.*

4.8-2(d) *Add a fourth through lane in the westbound direction at the intersection of I Street/7th Street and a second exclusive right-turn lane in the southbound direction, which would require the implementation of peak hour parking restrictions on the north side of I Street between 8th Street and I-5.*

TABLE 4.8-23
YEAR 2010 MITIGATED SERVICE LEVEL COMPARISON
AM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS/VC	ALT 4 LOS/VC	ALT 5 LOS/VC	ALT 6 LOS/VC	ALT 7 LOS/VC
Richards Blvd. No./I-5 SB Off	B 0.64	B 0.62	B 0.62	B 0.65	B 0.64	D 0.87	B 0.69
Richards Blvd. No./I-5 NB On	A 0.48	A 0.29	A 0.28	A 0.22	A 0.21	A 0.40	A 0.24
Richards Blvd. No./No. 5th ST	N/A	A 0.49	A 0.49	A 0.41	A 0.46	B 0.69	A 0.42
Richards Blvd. No./No. 6th ST	N/A	A 0.43	A 0.43	A 0.32	A 0.30	C 0.71	A 0.34
Richards Blvd. No./No. 7th ST	N/A	C 0.57	B 0.60	A 0.46	A 0.38	E 0.91	A 0.43
Richards Blvd. No./Gtwy. Blvd.	N/A	D 0.84	D 0.81	C 0.76	C 0.75	E 0.91	C 0.78
Richards Blvd. No./No. 16th ST	N/A	A 0.52	A 0.51	A 0.47	A 0.46	B 0.68	A 0.49
Richards Blvd. So./I-5 SB On	N/A	B 0.66	B 0.66	A 0.53	A 0.52	B 0.64	A 0.56
Richards Blvd. So./I-5 NB Off	N/A	B 0.66	B 0.66	A 0.53	A 0.52	B 0.63	A 0.57
Richards Blvd. So./No. 5th ST	N/A	C 0.78	C 0.76	B 0.69	B 0.66	F 1.09	C 0.73
Richards Blvd. So./No. 6th ST	N/A	A 0.51	A 0.52	A 0.34	A 0.32	C 0.76	A 0.37
Richards Blvd. So./No. 7th ST	N/A	A 0.47	A 0.47	A 0.35	A 0.32	B 0.67	A 0.38
Richards Blvd. So./Gtwy. Blvd.	N/A	C 0.71	C 0.70	C 0.71	C 0.70	D 0.84	C 0.73
Richards Blvd. So./No. 16th ST	N/A	A 0.43	A 0.43	A 0.38	A 0.37	A 0.57	A 0.39
North B Street/SB 7th Street	N/A	B 0.69	B 0.62	A 0.47	A 0.46	C 0.78	A 0.50
North B Street/NB 7th Street	N/A	B 0.67	B 0.62	A 0.48	A 0.48	C 0.79	A 0.51
B Street/SB 7th Street	N/A	A 0.53	A 0.48	A 0.34	A 0.33	B 0.61	A 0.36
B Street/NB 7th Street	N/A	A 0.43	A 0.40	A 0.32	A 0.31	A 0.56	A 0.35

Shaded LOS indicate significant unavoidable impact.

TABLE 4.8-23 (Cont.)
YEAR 2010 MITIGATED SERVICE LEVEL COMPARISON
AM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS V/C	ALT 4 LOS V/C	ALT 5 LOS/VC	ALT 6 LOS V/C	ALT 7 LOS V/C
Gateway Blvd/B Street	N/A	A 0.38	A 0.37	A 0.45	A 0.44	A 0.53	A 0.48
Gateway Blvd/7th Street	N/A	C 0.72	B 0.66	C 0.72	B 0.67	D 0.80	C 0.73
WB Crescent/3rd Street	N/A	A 0.27	A 0.27	A 0.27	A 0.27	A 0.28	A 0.28
WB Crescent/5th Street	N/A	A 0.57	A 0.51	A 0.44	A 0.44	C 0.70	A 0.48
WB Crescent/6th Street	N/A	A 0.42	A 0.36	A 0.47	A 0.46	A 0.52	A 0.50
EB Crescent/3rd Street	N/A	C 0.71	B 0.69	C 0.79	C 0.79	C 0.76	C 0.77
EB Crescent/5th Street	N/A	C 0.72	C 0.71	C 0.75	C 0.74	D 0.81	C 0.77
EB Crescent/6th Street	N/A	A 0.47	A 0.45	A 0.53	A 0.50	A 0.55	A 0.55
I Street/3rd Street	A 0.42	A 0.42	A 0.42	A 0.42	A 0.42	A 0.42	A 0.42
I Street/5th Street*	A 0.50	A 0.47	A 0.44	A 0.49	A 0.50	A 0.51	A 0.51
I Street/6th Street	A 0.47	C 0.76	C 0.76	C 0.79	C 0.79	C 0.74	D 0.80
I Street/7th Street	A 0.39	A 0.51	A 0.51	A 0.40	A 0.49	A 0.55	A 0.55
J Street/3rd Street	D 0.87	C 0.78	D 0.85	C 0.78	C 0.79	C 0.79	D 0.80
J Street/5th Street	C 0.74	A 0.50	A 0.46	A 0.56	A 0.55	A 0.56	A 0.59
J Street/6th Street	C 0.79	B 0.67	B 0.67	B 0.68	B 0.68	C 0.70	B 0.68
J Street/7th Street	B 0.67	B 0.63	B 0.60	B 0.60	B 0.60	B 0.64	B 0.65
L Street/3rd Street	A 0.31	A 0.22	A 0.22	A 0.22	A 0.22	A 0.22	A 0.22

* Assumes effective lane utilization of 2.5.
Shaded LOS indicate significant unavoidable impacts.

SOURCE: Korve Engineering, Inc.

TABLE 4.8-24
YEAR 2010 MITIGATED SERVICE LEVEL COMPARISON
PM PEAK HOUR

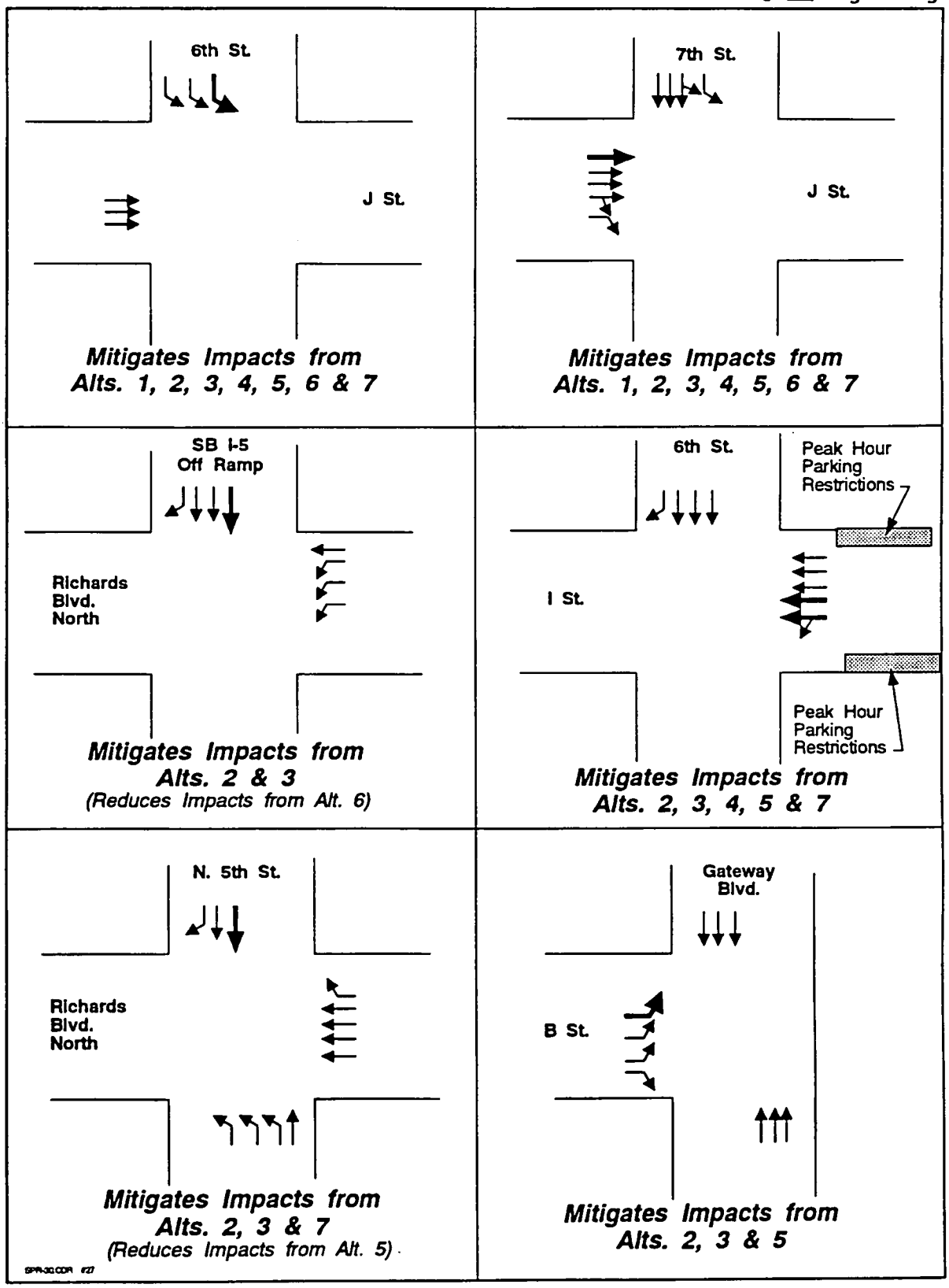
Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS/VC	ALT 4 LOS/VC	ALT 5 LOS/VC	ALT 6 LOS/VC	ALT 7 LOS/VC
Richards Blvd. No./I-5 SB Off	C 0.74	C 0.70	B 0.69	B 0.63	B 0.60	D 0.89	B 0.67
Richards Blvd. No./I-5 NB On	D 0.83	A 0.56	A 0.55	A 0.50	A 0.48	B 0.63	A 0.53
Richards Blvd. No./No. 5th ST	N/A	C 0.79	C 0.78	C 0.79	C 0.79	F 1.13	C 0.77
Richards Blvd. No./No. 6th ST	N/A	A 0.56	A 0.56	A 0.40	A 0.38	B 0.62	A 0.43
Richards Blvd. No./No. 7th ST	N/A	C 0.77	C 0.75	A 0.53	A 0.50	E 0.96	A 0.56
Richards Blvd. No./Gtwy. Blvd.	N/A	B 0.61	A 0.59	A 0.58	B 0.61	C 0.70	B 0.61
Richards Blvd. No./No. 16th ST	N/A	A 0.52	A 0.51	A 0.50	A 0.50	A 0.58	A 0.51
Richards Blvd. So./I-5 SB On	N/A	C 0.72	C 0.71	B 0.63	B 0.61	F 1.00	B 0.67
Richards Blvd. So./I-5 NB Off	N/A	A 0.31	A 0.31	A 0.25	A 0.25	A 0.42	A 0.26
Richards Blvd. So./No. 5th ST	N/A	B 0.65	B 0.64	B 0.64	B 0.62	D 0.85	B 0.68
Richards Blvd. So./No. 6th ST	N/A	A 0.54	A 0.55	A 0.42	A 0.40	C 0.71	A 0.46
Richards Blvd. So./No. 7th ST	N/A	C 0.78	C 0.78	B 0.62	B 0.59	F 1.15	B 0.67
Richards Blvd. So./Gtwy. Blvd.	N/A	B 0.61	A 0.53	A 0.53	A 0.52	B 0.64	A 0.55
Richards Blvd. So./No. 16th ST	N/A	B 0.62	B 0.61	B 0.61	A 0.60	C 0.71	B 0.62
North B Street/SB 7th Street	N/A	B 0.70	B 0.70	A 0.51	A 0.50	C 0.72	A 0.53
North B Street/NB 7th Street	N/A	A 0.55	A 0.51	A 0.39	A 0.38	A 0.58	A 0.41
B Street/SB 7th Street	N/A	C 0.75	B 0.69	A 0.54	A 0.53	C 0.79	A 0.58
B Street/NB 7th Street	N/A	B 0.70	B 0.63	A 0.53	A 0.52	C 0.78	A 0.57

Shaded LOS indicate significant unavoidable impacts.

TABLE 4.8-24 (Cont.)
YEAR 2010 MITIGATED SERVICE LEVEL COMPARISON
PM PEAK HOUR

Intersections	ALT 1 LOS/VC	ALT 2 LOS/VC	ALT 3 LOS V/C	ALT 4 LOS V/C	ALT 5 LOS/VC	ALT 6 LOS V/C	ALT 7 LOS V/C
Gateway Blvd/B Street	N/A	C 0.77	C 0.74	B 0.66	C 0.78	C 0.74	B 0.68
Gateway Blvd/7th Street	N/A	C 0.76	C 0.75	C 0.75	C 0.73	D 0.88	C 0.79
WB Crescent/3rd Street	N/A	B 0.62	B 0.60	B 0.69	B 0.68	B 0.66	C 0.70
WB Crescent/5th Street	N/A	B 0.64	B 0.61	C 0.73	C 0.72	C 0.70	C 0.75
WB Crescent/6th Street	N/A	A 0.59	A 0.52	A 0.49	A 0.47	C 0.72	A 0.53
EB Crescent/3rd Street	N/A	A 0.35	A 0.34	A 0.35	A 0.34	A 0.35	A 0.35
EB Crescent/5th Street	N/A	B 0.62	B 0.62	C 0.74	C 0.73	B 0.69	C 0.76
EB Crescent/6th Street	N/A	A 0.57	A 0.53	A 0.55	A 0.54	C 0.71	B 0.60
I Street/3rd Street	A 0.42	A 0.44	A 0.45	A 0.48	A 0.47	A 0.50	A 0.49
I Street/5th Street*	C 0.72	A 0.57	B 0.63	C 0.71	C 0.70	C 0.72	C 0.74
I Street/6th Street	C 0.77	C 0.74	C 0.72	C 0.75	C 0.75	D 0.83	C 0.77
I Street/7th Street	B 0.68	C 0.76	C 0.75	C 0.72	C 0.71	D 0.83	C 0.73
J Street/3rd Street	A 0.54	A 0.52	A 0.57	A 0.51	A 0.53	A 0.53	A 0.54
J Street/5th Street	A 0.42	A 0.29	A 0.28	A 0.28	A 0.28	A 0.29	A 0.29
J Street/6th Street	A 0.55	B 0.69	B 0.65	B 0.68	B 0.68	C 0.79	C 0.71
J Street/7th Street	B 0.61	B 0.69	C 0.79	C 0.78	C 0.77	D 0.82	B 0.65
L Street/3rd Street	A 0.56	A 0.55	A 0.55	A 0.55	A 0.55	A 0.55	A 0.55

* Assumes effective lane utilization of 2.5.
Shaded LOS indicate significant unavoidable impacts.
SOURCE: Korve Engineering, Inc.

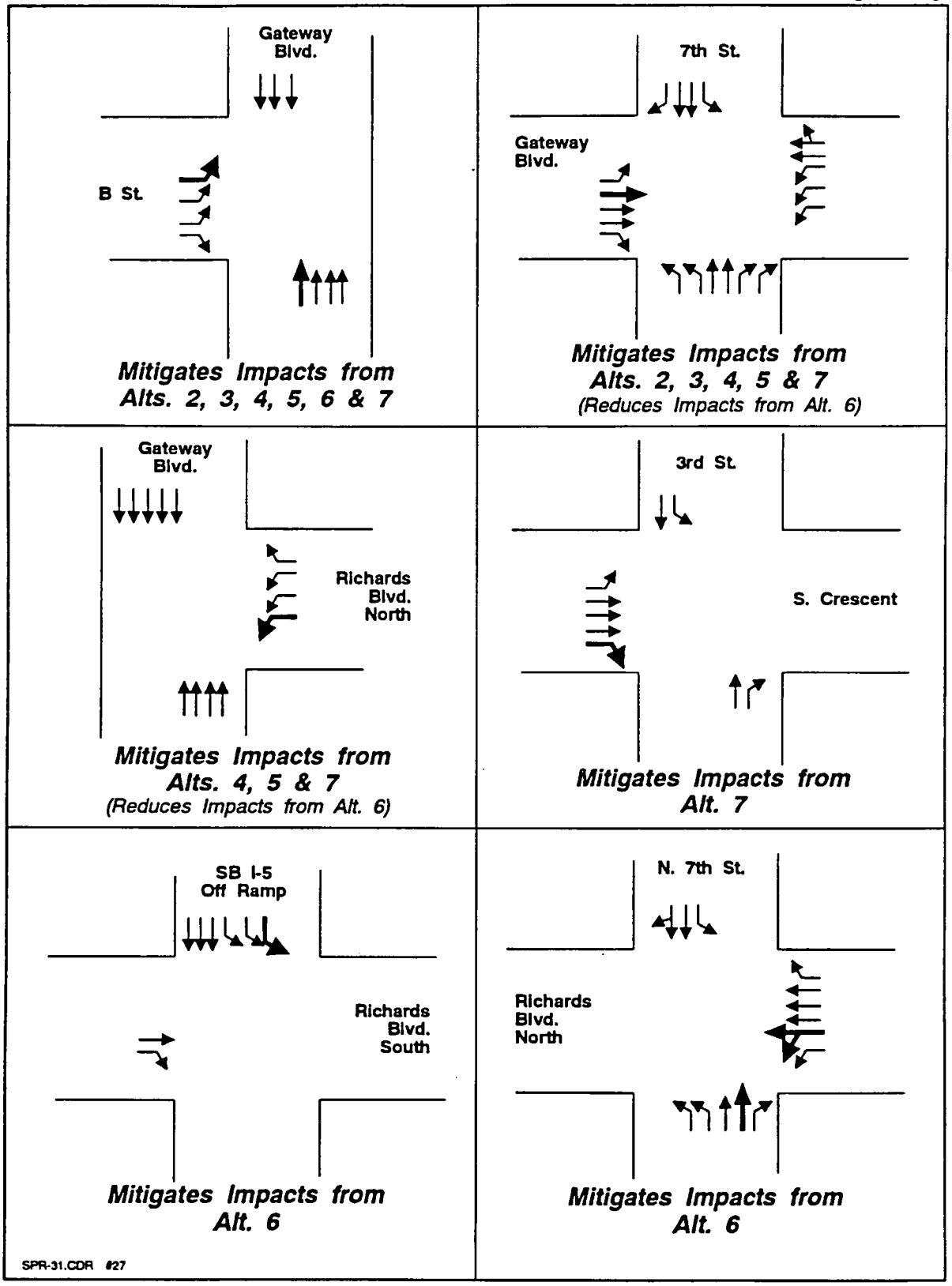


← Existing Lane

← Mitigation Lane

Figure 4.8-30

YEAR 2010 PROJECT MITIGATIONS

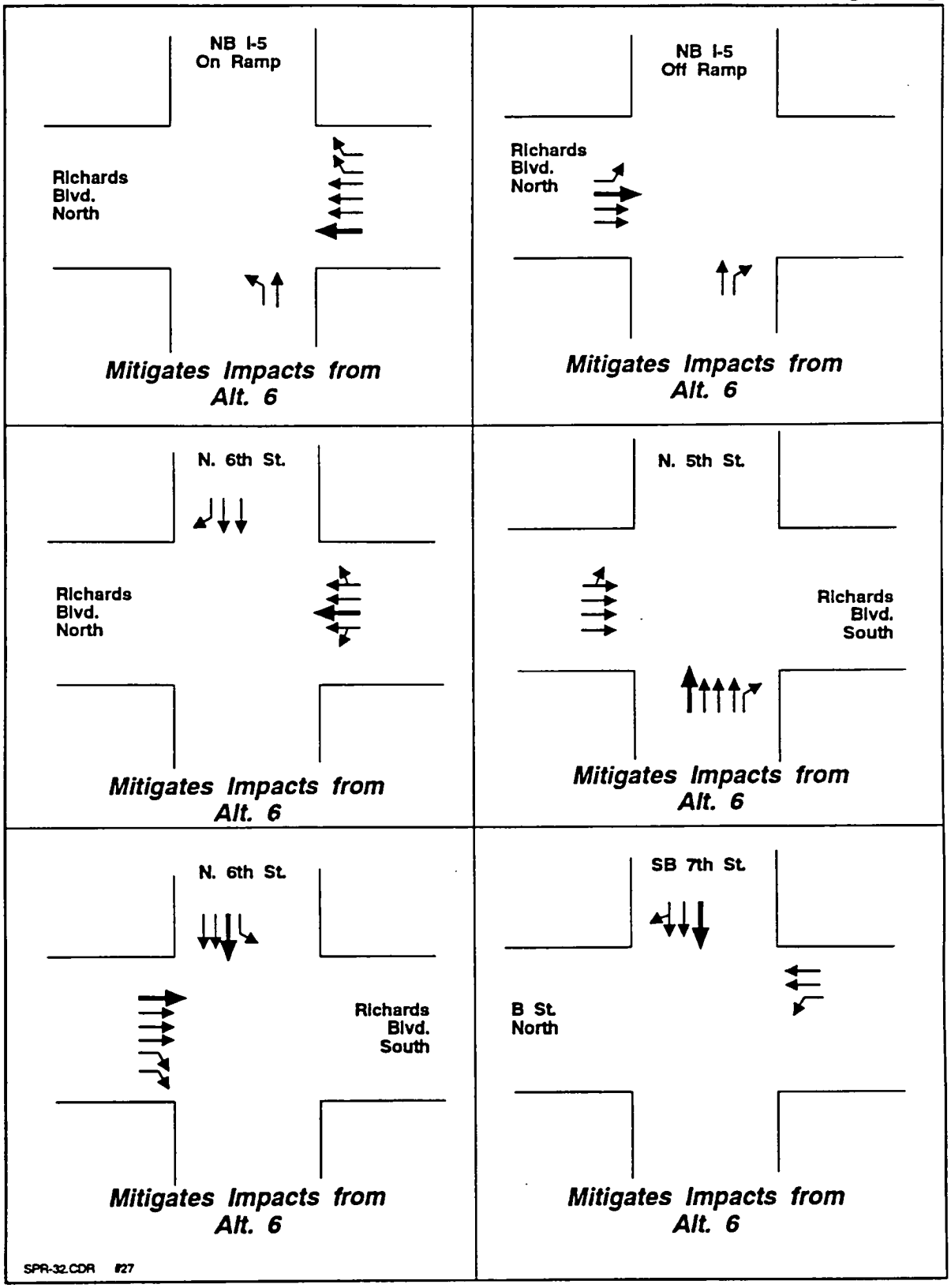


← Existing Lane

⟵ Mitigation Lane

Figure 4.8-31

YEAR 2010 PROJECT MITIGATIONS

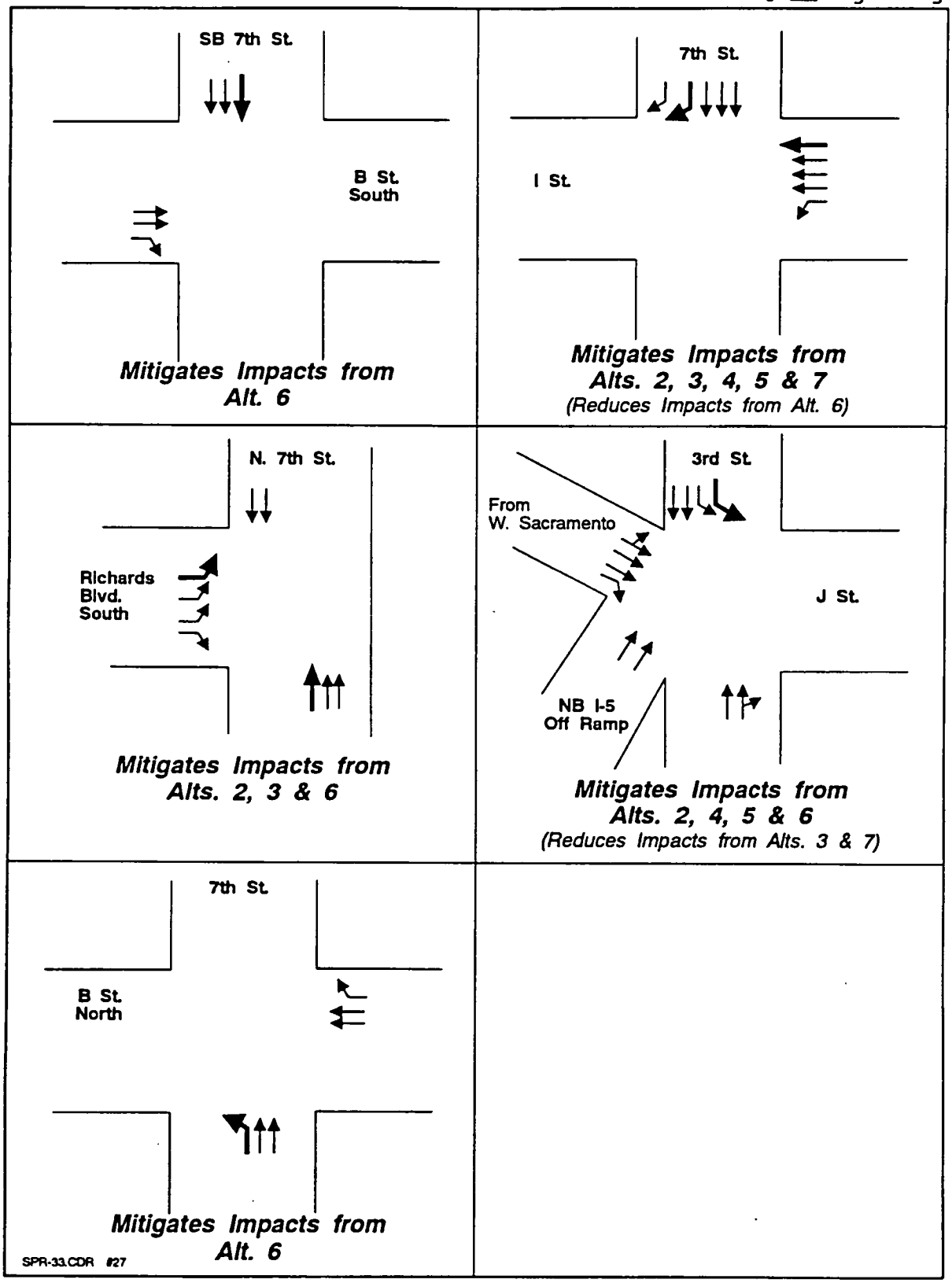


← Existing Lane

◀— Mitigation Lane

Figure 4.8-32

YEAR 2010 PROJECT MITIGATIONS



← Existing Lane

← Mitigation Lane

Figure 4.8-33

YEAR 2010 PROJECT MITIGATIONS

J Street/6th Street

Implementation of Mitigation Measure 4.8-2(e) would reduce the impacts of Alternatives 2-7 during the AM peak hour to a *less-than-significant level.*

4.8-2(e) *Add a third left-turn lane in the southbound direction at the intersection of J Street/6th Street.*

J Street/7th Street

Implementation of Mitigation Measure 4.8-2(f) would reduce the impacts of Alternatives 2-7 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(f) would reduce the impacts of Alternative 6 during the PM peak hour, *but not to a less-than-significant level.*

4.8-2(f) *Add a fourth through lane in the westbound direction at the intersection of J Street/7th Street, which would require the implementation of peak hour parking restrictions on the north side of J Street between 8th Street and I-5.*

Richards Boulevard North/North 5th Street

Implementation of Mitigation Measure 4.8-2(g) would reduce the impacts of Alternative 2, 3, and 7 during the PM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(g) would reduce the impacts of Alternative 6 during the PM peak hour, but not to a *less-than-significant level.*

4.8-2(g) *Add a second through lane in the southbound direction at the intersection of Richards Boulevard North/North 5th Street.*

Richards Boulevard North/North 6th Street

Implementation of Mitigation Measure 4.8-2(h) would reduce the impacts of Alternative 6 during the PM peak hour to a *less-than-significant level.*

4.8-2(h) *Add a fourth through lane in the eastbound direction at the intersection of Richards Boulevards North/North 6th Street.*

Richards Boulevard South/North 5th Street

Implementation of Mitigation Measure 4.8-2(i) would reduce the impacts of Alternative 6 during the AM and PM peak hours, *but not to a less-than-significant level.*

4.8-2(i) *Add a fourth through lane in the northbound direction at the intersection of Richards Boulevard South/North 5th Street.*

Richards Boulevard South/North 6th Street

Implementation of Mitigation Measure 4.8-2(j) would reduce the impacts of Alternative 6 during the AM peak hour to a *less-than-significant level.*

4.8-2(j) *Add a third through lane in the southbound direction at the intersection of Richards Boulevard South/North 6th Street.*

Richards Boulevard South/North 6th Street

Implementation of Mitigation Measure 4.8-2(k) would reduce the impacts of Alternative 6 during the PM peak hour to a *less-than-significant level.*

4.8-2(k) *Add a fourth through lane in the eastbound direction at the intersection of Richards Boulevard South/North 6th Street.*

Richards Boulevard South/North 7th Street

Implementation of Mitigation Measure 4.8-2(l) would reduce the impacts of Alternative 6 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(l) would reduce the impacts of Alternative 6 during the PM peak hour, *but not to a less-than-significant level.*

4.8-2(l) *Add a third exclusive left-turn lane in the eastbound direction at the intersection of Richards Boulevard South/North 7th Street.*

Gateway Boulevard/B Street

Implementation of Mitigation Measure 4.8-2(m) would reduce the impacts of Alternatives 2, 3, and 5 during the PM peak hour to a *less-than-significant level.*

Implementation of Mitigation Measure 4.8-2(m) would reduce the impacts of Alternative 6 during the PM peak hour, *but not to a less-than-significant level.*

4.8-2(m) *Add a third exclusive left-turn lane in the eastbound direction at the intersection of Gateway Boulevard/B Street.*

Gateway Boulevard/B Street

Implementation of Mitigation Measure 4.8-2(n) would reduce the impacts of Alternative 6 during the PM peak hour to a *less-than-significant level.*

4.8-2(n) *Add a third exclusive left-turn lane in the eastbound direction, and a fourth through lane in the northbound direction at the intersection of Gateway Boulevard/B Street.*

Gateway Boulevard/Richards Boulevard North

Implementation of Mitigation Measure 4.8-2(o) would reduce the impacts of Alternatives 4, 5, and 7 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(o) would reduce the impacts of Alternatives 2, 3, and 6 during the AM peak hour, *but not to a less-than-significant level.*

4.8-2(o) *Add a third exclusive left-turn lane in the eastbound direction, and a fourth through lane in the northbound direction at the intersection of Gateway Boulevard/Richards Boulevard North.*

Crescent Drive Eastbound/3rd Street

Implementation of Mitigation Measure 4.8-2(p) would reduce the impacts of Alternative 7 during the AM peak hour to a *less-than-significant level.*

4.8-2(p) *Add an exclusive right-turn lane in the eastbound direction at the intersection of Crescent Drive Eastbound/3rd Street*

Richards Boulevard North/North 7th Street

Implementation of Mitigation Measure 4.8-2(q) would reduce the impacts of Alternative 6 during the AM and PM peak hours, *but not to a less-than-significant level.*

4.8-2(q) *Add a fourth shared through and left lane in the westbound direction and a through lane in the northbound direction at the intersection of Richards Boulevard North/North 7th Street.*

Richards Boulevard North/Northbound I-5 On Ramp

Implementation of Mitigation Measure 4.8-2(r) would reduce the impacts of Alternative 6 during the PM peak hour to a *less-than-significant level.*

4.8-2(r) *Add a fourth through lane in the westbound direction at the intersection of Richards Boulevard North/Northbound I-5 On Ramp.*

Richards Boulevard North/Southbound I-5 Off Ramp

Implementation of Mitigation Measure 4.8-2(s) would reduce the impacts of Alternatives 2 and 3 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(s) would reduce the impacts of Alternative 6 during the AM and PM peak hour, *but not to a less-than-significant level.*

4.8-2(s) *Add a third through lane in the southbound direction at the intersection of Richards Boulevard North/Southbound I-5 Off Ramp.*

Richards Boulevard South/Northbound I-5 Off Ramp

Implementation of Mitigation Measure 4.8-2(t) would reduce the impacts of Alternative 6 during the AM and PM peak hours to a *less-than-significant level.*

4.8-2(t) *Add a third through lane in the eastbound direction at the intersection of Richards Boulevards South/Northbound I-5 On Ramp.*

Richards Boulevard South/Southbound I-5 On Ramp

Implementation of Mitigation Measure 4.8-2(u) would reduce the impacts of Alternative 6 during the AM peak hour to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(u) would reduce the impacts of Alternative 6 during the PM peak hour, *but not to a less-than-significant level.*

4.8-2(u) *Add a third left-turn lane in the southbound direction at the intersection of Richards Boulevard South/Southbound I-5 On Ramp.*

North B Street/Southbound 7th Street

Implementation of Mitigation Measure 4.8-2(v) would reduce the impacts of Alternative 6 during the PM peak hour to a *less-than-significant level.*

4.8-2(v) *Add a third through lane in the southbound direction at the intersection of North B Street/Southbound 7th Street.*

B Street/Southbound 7th Street

Implementation of Mitigation Measure 4.8-2(w) would reduce the impacts of Alternative 6 during the PM peak hour to a *less-than-significant level.*

4.8-2(w) *Add a third through lane in the southbound direction at the intersection of B Street/Southbound 7th Street.*

North B Street/Northbound 7th Street

Implementation of Mitigation Measure 4.8-2(x) would reduce the impacts of Alternative 6 during the AM peak hour to a *less-than-significant level.*

4.8-2(x) *Add an exclusive left turn lane in the northbound direction at the intersection of North B Street/Northbound 7th Street.*

J Street/3rd Street

Implementation of Mitigation Measure 4.8-2(y) would reduce the impacts of Alternative 2, 4, 5 and 6 to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(y) would reduce the impacts of Alternatives 3 and 7, but *not to a less-than-significant level.*

4.8-2(y) Add an exclusive left turn lane in the southbound direction at the intersection of 3rd Street/J Street.

Gateway Boulevard/7th Street

Implementation of Mitigation Measure 4.8-2(z) would reduce the impacts of Alternatives 2, 3, 4, 5 and 7 to a *less-than-significant level.* Implementation of Mitigation Measure 4.8-2(z) would reduce the impacts of Alternative 6, but *not to a less-than-significant level.*

4.8-2(z) Add a third through lane in the eastbound direction at the intersection of Gateway Boulevard/7th Street.

4.8-3 At buildout, intersections will be adversely affected by implementation of any of the Alternatives.

The increase in vehicle trips generated by development in the Planning Areas between the Year 2010 and buildout conditions ranges between 4 percent and 78 percent. The greatest increase in vehicle trips would occur for Alternatives 4 through 7 where growth in trips ranges from 50 to 78 percent. The impacts of this additional growth would occur at intersections located adjacent to freeway interchanges along I-5 at I/J Streets, Crescent Drive, and Richards Boulevard. It is projected that intersections along I Street, J Street, Crescent Drive, and Richards Boulevard in the Planning Area would degrade to service level D conditions with the addition of project and cumulative traffic generated by Alternatives 2 through 7. No significant impact on intersection conditions is expected to result from the increase in traffic generated by the No Project Alternative.

A-1 The No Project Alternative would not result in any study intersections below LOS C. Therefore, this is considered a ***less-than-significant impact.***

A-2 through A-7

The addition of project traffic would result in significant impacts between four and 12 locations during the AM and PM peak hours. This is considered a ***significant impact.***

Mitigation Measure

Implementation of the following measures would reduce the above impacts to a *less-than-significant level.*

4.8-3(a) *Implement Mitigation Measure 4.9-1(a). This measure is required for Alternatives 2 through 7.*

4.8-3(b) *Designation of AM and PM peak hour parking restrictions on I Street, J Street, Crescent Drive, and the Richards Boulevard couplet will provide additional capacity. In addition, the implementation of the TMP program will encourage the use of transit and other alternative transportation modes designed to reduce the impacts on the transportation system. This measure is required for Alternatives 2 through 7.*

4.8-4 For Year 2000, regional highways would be affected by any of the Alternatives.

Projected traffic volumes along I-5 and State Route 160 would increase by approximately 50 percent in the Planning Area by the Year 2000, due to the addition of cumulative and project traffic. The increased density of mainline traffic on these highways during peak hour conditions would create lower speeds for motorists, resulting in poor service levels. The high volume of traffic also results in poor conditions at the freeway ramp connections, where entering or exiting ramps is difficult due to mainline congestion.

Table 4.8-25 shows freeway service levels for Year 2000.

A-1 The No Project Alternative would result in seven highway segments being significantly affected during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-2 Alternative 2 would result in eight highway segments operating at unacceptable levels during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-3 Alternative 3 would result in seven highway segments operating at unacceptable levels during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-4 Alternative 4 would result in seven highway segments operating at unacceptable levels during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-5 Alternative 5 would result in seven highway segments operating at unacceptable levels during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-6 Alternative 6 would result in seven highway segments operating at unacceptable levels during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-7 Alternative 7 would result in seven highway segments operating at unacceptable levels during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

TABLE 4.8-25

FREEWAY MAINLINE SERVICE LEVEL COMPARISON
YEAR 2000

Intersection	HR	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
I-5 N of Richards Blvd	AM	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	PM	E	D	E	F	E	D	E	D	E	D	F	D	E	D
I-5 S of I/J Street	AM	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	PM	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Route 160 NE of Project	AM	B	F	B	F	B	F	B	F	B	F	B	F	B	F
	PM	F	B	F	B	F	B	F	B	F	B	F	B	F	B

Note: Shaded LOS indicate significant and unavoidable impacts.

SOURCE: Korve Engineering, Inc.

Mitigation Measures

Physical constraints along Interstate 5 in the downtown area also make any further widening infeasible. Implementation of Mitigation Measure 4.8-4 would reduce the impacts, but not to a *less-than-significant level.*

4.8-4 *Implement Mitigation Measure 4.8-1(a).*

Necessary improvements would include the widening of State Route 160 from four lanes to six lanes east of Del Paso Boulevard and would require the reconstruction of interchanges at Canterbury Road, Royal Oaks Drive, and Tribute Road. The modification of the interchanges would involve the reconstruction of the three bridge structures to provide a longer span allowing for the widening of State Route 160. The cost of replacing these structures and widening State Route 160 between the Del Paso Boulevard interchange and Business 80 ranges between $30 and $40 million (Note: This cost does not include any improvement to the existing ramps at the interchanges along State Route 160). The replacement of the interchange overcrossing structures along State Route 160 would also result in the disruption of access to businesses along the corridor. As a result, it does not appear to be feasible to widen State Route 160.

4.8-5 For Year 2010, regional highways would be affected by development of any of the Alternatives.

The analysis of regional highway impacts for the Year 2010 scenario includes the widening of Interstate 5 over the American River Bridge as included in the implementation plan. This results in improved service levels on Interstate 5 north of the Richards Boulevard interchange. The projected daily traffic volumes on the regional highway network for the Year 2010 and buildout scenarios are shown in Figure 4.8-34.

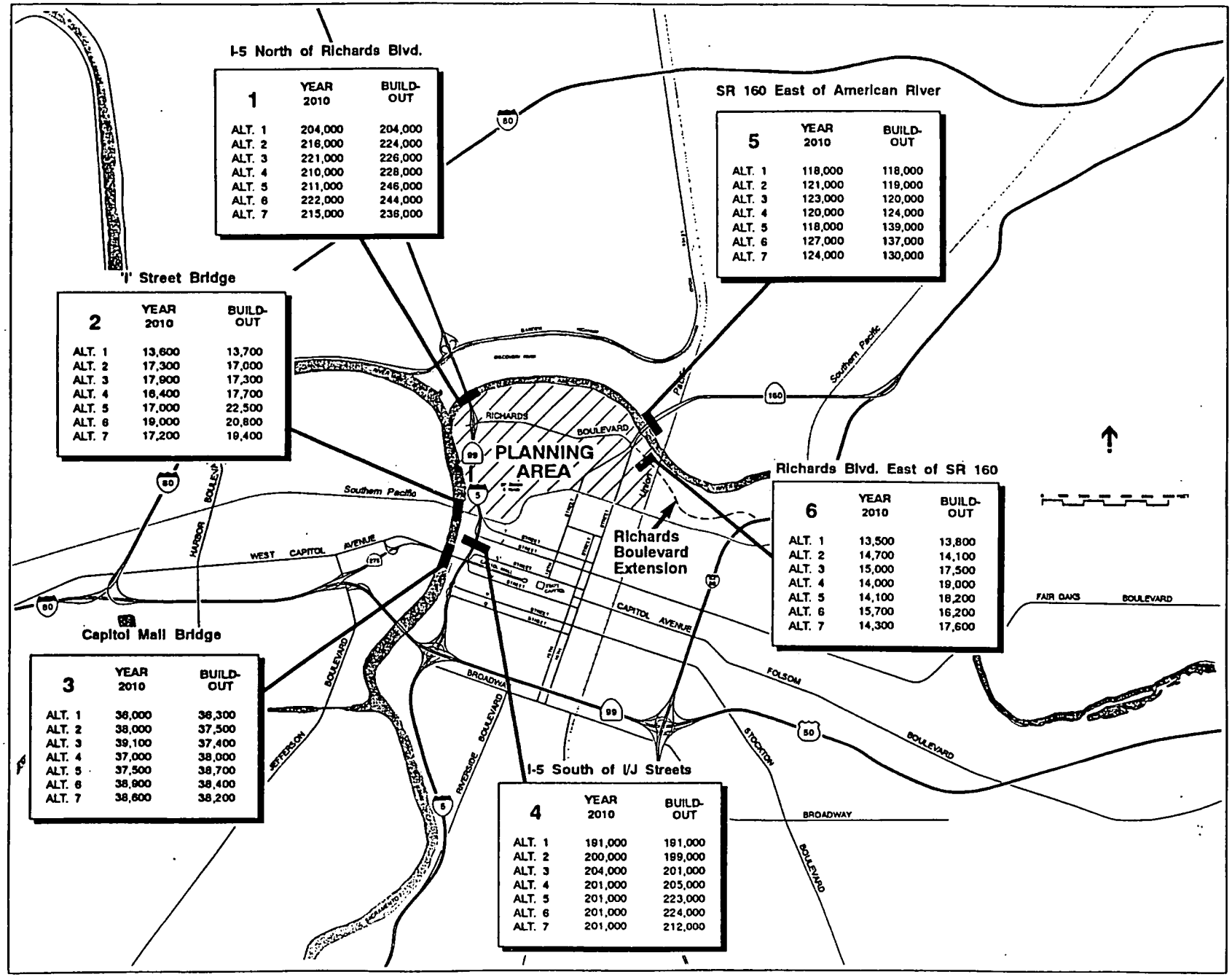
An impact to the regional highway system is deemed to be significant when the service level deteriorates below "D" conditions.

Table 4.8-26 shows freeway service levels for Year 2010.

A-1 The No Project Alternative would result in 10 highway segments being significantly affected during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***

A-2 Alternative 2 would result in 10 highway segments operating at unacceptable levels during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***

A-3 Alternative 3 would result in 10 highway segments operating at unacceptable levels during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***



Korve Engineering

Figure 4.8-34

FUTURE ADT ON REGIONAL FACILITIES

TABLE 4.8-26

FREEWAY MAINLINE SERVICE LEVEL COMPARISON WITH SPEEDS
YEAR 2010

Segment	HR	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
I-5 N of Richards Blvd	AM	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *
	PM	F *	F *	E 35	E 43	E 32	E 42	E 39	D 44	E 39	D 44	F *	E 39	E 36	D 43
I-5 S of I/J Street	AM	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *
	PM	F *	E 36	F *	E 30	F *	F *	F *	F *	F *	F *	F *	F *	F *	F *
Route 160 NE of Project	AM	C 51	F *	C 51	F *	C 50	F *	C 50	F *	C 51	F *	C 50	F *	C 50	F *
	PM	F *	C 48	F *	C 48	F *	D 48	F *	D 48	F *	D 46	F *	D 46	F *	D 47

* Speed not applicable for LOS F or worse conditions.

SOURCE: Korve Engineering, Inc.

A-4 Alternative 4 would result in nine highway segments operating at unacceptable levels during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***

A-5 Alternative 5 would result in nine highway segments operating at unacceptable levels during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***

A-6 Alternative 6 would result in 10 highway segments operating at unacceptable levels during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***

A-7 Alternative 7 would result in nine highway segments operating at unacceptable levels during the AM and PM peak hours. This is considered a ***significant and unavoidable impact.***

Mitigation Measures

As discussed for the Year 2000 freeway mitigations, the widening of State Route 160 is not considered feasible due to cost issues and local land use impacts. Physical constraints along Interstate 5 in the downtown area also make any further widening infeasible. Implementation of Mitigation Measure 4.8-1(a) would reduce traffic impacts, *but not to a less-than-significant level.*

4.8-5 *Implement Mitigation Measure 4.8-1(a). This measure would be required for all Alternatives.*

4.8-6 At buildout, regional highways will be adversely affected by implementation of any of the Alternatives.

An impact to the regional highway system is deemed to be significant when service levels deteriorates below "D" conditions.

Table 4.8-27 shows service levels for regional highways at buildout.

A-1 The No Project Alternative would result in nine highway segments being significantly affected during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-2 Alternative 2 would result in 10 highway segments operating at unacceptable levels during both the AM and PM peak hour. These are considered ***significant and unavoidable impacts.***

A-3 Alternative 3 would result in 10 highway segments operating at unacceptable levels during both the AM and PM peak hour. These are considered ***significant and unavoidable impacts.***

TABLE 4.8-27

REGIONAL HIGHWAY SERVICE LEVEL COMPARISON
BUILDOUT SCENARIO

Segment	HR	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
I-5 N of Richards Blvd	AM	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	PM	E	D	F	E	F	E	F	E	F	F	F	F	F	E
I-5 S of I/J Street	AM	F	F	F	F	F	F	F	F	F	F	F	F	F	F
	PM	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Route 160 NE of Project	AM	C	F	C	F	C	F	C	F	D	F	C	F	C	F
	PM	F	C	F	D	F	D	F	D	F	D	F	D	F	D

SOURCE: Korve Engineering, Inc.

A-4 Alternative 4 would result in 10 highway segments operating at unacceptable levels during both the AM and PM peak hour. These are considered ***significant and unavoidable impacts.***

A-5 Alternative 5 would result in 10 highway segments operating at unacceptable levels during both the AM and PM peak hour. These are considered to be ***significant and unavoidable impacts.***

A-6 Alternative 6 would result in 10 highway segments operating at unacceptable levels during both the AM and PM peak hour. These are considered to be ***significant and unavoidable impacts.***

A-7 Alternative 7 would result in 10 highway segments operating at unacceptable levels during both the AM and PM peak hour. These are considered ***significant and unavoidable impacts.***

Mitigation Measure

The widening of State Route 160 from four lanes to six lanes east of Del Paso Boulevard would require the modification of interchanges at Canterbury Road, Royal Oaks Drive, and Tribute Road. No widening of SR 160 was proposed in the initial phase of the "Route 51/80 and Route 160 Transportation Improvement Study", which has been discontinued. As such, the widening of SR 160 would not be feasible. Physical constraints along Interstate 5 in the downtown area also make any further widening infeasible. Implementation of Mitigation Measure 4.8-6 would reduce traffic impacts *but not to less-than-significant levels.*

4.8-6 *Implement Mitigation Measure 4.8-1(a). This mitigation measure would be required for all Alternatives.*

4.8-7 For Year 2000, freeway ramps would be affected by implementation of any of the Alternatives.

Table 4.8-28 shows service levels for freeway ramps for Year 2000.

A-1 The No Project Alternative would result in significant impacts at four of the eight study freeway ramps during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-2 Alternative 2 would result in significant impacts at seven of the six study freeway ramps during the AM peak hour and seven of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-3 Alternative 3 would result in significant impacts at six of the eight study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. ***These are considered significant and unavoidable impacts***

TABLE 4.8-28
YEAR 2000 RAMP SERVICE LEVELS

LOCATION	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-5 & Richards: SB Off Ramp	D-E	C-C	E-F	C-E	F-F	C-D	E-F	C-D	E-F	C-D	F-F	C-D	F-F	C-D
I-5 & Richards: NB On Ramp	C-D	C-E	D-E	E-F	D-E	E-F	C-D	E-F	C-D	E-F	C-D	F-F	C-D	E-F
I-5 & Richards: SB On Ramp	C-D	C-E	C-D	D-F	C-D	D-F	C-D	D-F	C-D	D-F	C-D	D-F	C-D	D-F
I-5 & Richards: NB Off Ramp	C-E	C-D	D-F	C-E	D-F	C-D	D-F	C-C	D-F	C-D	E-F	C-D	D-F	C-D
I-5 SB: J ST Off Ramp	F-F	C-E	F-F	C-E	F-F	C-E	F-F	C-E	F-F	C-E	F-F	C-E	F-F	C-E
I-5 NB: I St On Ramp	C-C	C-D	C-E	E-F	C-E	E-F	C-E	E-F	C-E	E-F	C-E	E-F	C-E	E-F
I-5 NB: J St Off Ramp	D-F	B-C	E-F	C-D	E-F	C-D	E-F	C-D	E-F	C-D	E-F	C-D	E-F	C-D
I-5 SB: I ST On Ramp	B-C	D-F	C-C	E-F	C-C	E-F	C-C	E-F	C-C	E-F	C-C	E-F	C-C	E-F

NOTE: First LOS describes Initial Merge/Diverge; Second LOS describes Secondary Merge/Diverge.
Shaded LOS indicate significant and unavoidable impacts.

SOURCE: Korve Engineering, Inc.

A-4 Alternative 4 would result in significant impacts at five of the eight study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-5 Alternative 5 would result in significant impacts at five of the eight study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-6 Alternative 6 would result in significant impacts at five of the eight study freeway ramps in both the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-7 Alternative 7 would result in significant impacts at five of the eight study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

Mitigation Measures

Congested conditions on the freeway main line are the principal factor in poor conditions at the junction of the freeway ramps and the main line. The widening of I-5 through the downtown area is not feasible. Implementation of Mitigation Measure 4.8-7 would reduce the above traffic impacts, *but not to a less-than-significant level.*

4.8-7 *Implement Mitigation Measure 4.8-1(a). This measure would be required for all Alternatives.*

4.8-8 For Year 2010, freeway ramps would be affected by development of any of the Alternatives.

Table 4.8-29 shows service levels for freeway ramps for Year 2010.

A-1 The No Project Alternative would result in significant impacts at five of the study freeway ramps during the AM and PM peak hours. These are considered ***significant and unavoidable impacts.***

A-2 Alternative 2 would result in significant impacts at six study freeway ramps during the AM peak hour and six of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-3 Alternative 3 would result in significant impacts at six study freeway ramps during the AM peak hour and seven of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-4 Alternative 4 would result in significant impacts at six study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

TABLE 4.8-29
RAMP SERVICE LEVEL COMPARISON
YEAR 2010

LOCATION	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5		ALT 6		ALT 7	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-5 (w/HOV Lane) & Richards: SB Off Ramp	C-F	B-C	D-F	B-C	E-F	B-C	C-F	B-C	C-F	B-C	E-F	C-D	D-F	B-C
I-5 (w/HOV Lane) & Richards: NB On Ramp	C-C	D-F	C-D	E-F	C-D	E-F	C-C	D-F	C-C	D-F	C-E	F-F	C-D	D-F
I-5 & Richards: SB On Ramp	C-D	C-F	C-D	E-F	C-D	E-F	C-D	D-F	C-D	D-F	C-E	F-F	C-D	D-F
I-5 & Richards: NB Off Ramp	E-F	C-D	F-F	C-E	F-F	C-E	F-F	C-D	F-F	C-D	F-F	D-F	F-F	C-D
I-5 SB: Gateway Off Ramp	N/A	N/A	F-F	C-D	F-F	C-E	F-F	C-D	F-F	C-D	F-F	C-D	F-F	C-D
I-5 NB: Gateway On Ramp	N/A	N/A	D-F	F-F	D-F	F-F	D-F	F-F	D-F	F-F	D-F	F-F	D-F	F-F
I-5 NB: J St Off Ramp	F-F	C-E	F-F	D-F	F-F	D-F	F-F	D-F	F-F	C-F	F-F	D-F	F-F	D-F
I-5 SB: I ST On Ramp	C-D	E-F	C-E	F-F	D-E	F-F	D-E	F-F	D-E	F-F	D-E	F-F	D-E	F-F

Note: First LOS describes Initial Merge/Diverge; Second LOS describes Secondary Merge/Diverge.

SOURCE: Korve Engineering, Inc.

A-5 Alternative 5 would result in significant impacts at six study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-6 Alternative 6 would result in significant impacts at all eight study freeway ramps during the AM and six of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

A-7 Alternative 7 would result in significant impacts at six study freeway ramps during the AM peak hour and five of the eight ramps during the PM peak hour. These are considered ***significant and unavoidable impacts.***

Mitigation Measures

Congested conditions on the freeway main line are the principal factor in poor conditions at the junction of the freeway ramps and the main line. Implementation of Mitigation Measure 4.8-8 would reduce impacts, *but not to a less-than-significant level.*

4.8-8 *Implement Mitigation Measure 4.8-1(a). This measure would be required for all Alternatives.*

4.8-9 Implementation of any of the alternatives would create demand for parking in excess of supply.

The analysis of parking impacts is focused on office uses in the Planning Area since this represents the primary land use, other than residential, and it is the one land use where parking supply limits are being implemented in order to reduce vehicle trips to the downtown area. The proposed office parking requirement through the Year 2000 is 1.6 parking stalls per 1,000 square feet. This is the same requirement that currently exists for other office uses in the downtown area. The actual parking demand for office uses, based on a vehicle mode split of 80 percent, is 2.6 parking spaces per 1,000 square feet. As such, any office projects built through the year 2000 would result in a deficit of 1.0 spaces per 1,000 square feet.

A-1 The No Project Alternative, with the addition of 1.0 million square feet of office space, would result in a parking deficit of 1,000 parking spaces. This is considered a ***significant impact.***

A-2 Alternative 2, with the addition of 3.31 million square feet of office space, would result in a parking deficit of 3,300 parking spaces. This is considered a ***significant impact.***

A-3 Alternative 3, with the addition of 3.54 million square feet of office space, would result in a parking deficit of 3,500 parking spaces. This is considered a ***significant impact.***

A-4 Alternative 4, with the addition of 3.21 million square feet of office space, would result in a parking deficit of 3,200 parking spaces. This is considered a ***significant impact.***

A-6 Alternative 6, with the addition of 5.54 million square feet of office space, would result in a parking deficit of 5,500 parking spaces. This is considered a ***significant impact.***

A-7 Alternative 7, with the addition of 3.94 million square feet of office space, would result in a parking deficit of 3,900 parking spaces. This is considered a ***significant impact.***

Mitigation Measure

Implementation of the following mitigation measure would reduce impacts to a *less-than-significant level.*

4.8-9 *Implement Mitigation Measure 4.8-1(a). This measure would be required for all Alternatives.*

The application of the TMP is expected to shift approximately 1,050 employees from the automobile mode to the transit mode for Alternative 1; 3,470 employees for Alternative 2; 3,680 employees for Alternative 3; 3,360 employees for Alternative 4; 3,260 employees for Alternative 5; 5,780 employees for Alternative 6; and 4,100 employees for Alternative 7. The respective reduction by the TMP would greater than the parking deficit identified for each alternative.

4.8-10 For Year 2010, parking would be affected by implementation of any of the Alternatives.

The analysis of parking impacts is focused on office uses in the Planning Area since this represents the primary land use, other than residential, and it is the one land uses where parking supply limits are being implemented in order to reduce vehicle trips to the downtown area. The proposed office parking requirement through the Year 2010 is 1.3 parking stalls per 1,000 square feet. This is the same requirement that currently exists for other office uses in the downtown area. The actual parking demand for office uses, based on a vehicle mode split of 70 percent, is 2.3 parking spaces per 1,000 square feet. As such, any office projects built through the year 2010 phase would result in a deficit of 1.0 spaces per 1,000 square feet.

A-1 The No Project Alternative, with the addition of 1.0 million square feet of office space, would result in a parking deficit of 1,000 parking spaces. This is considered a ***significant impact.***

A-2 Alternative 2, with the addition of 8.32 million square feet of office space, would result in a parking deficit of 8,300 parking spaces. This is considered a ***significant impact.***

A-3 Alternative 3, with the addition of 8.87 million square feet of office space, would result in a parking deficit of 8,900 parking spaces. This is considered a ***significant impact.***

A-4 Alternative 4, with the addition of 8.83 million square feet of office space, would result in a parking deficit of 8,800 parking spaces. This is considered a ***significant impact.***

A-5 Alternative 5, with the addition of 8.45 million square feet of office space, would result in a parking deficit of 8,500 parking spaces. This is considered a ***significant impact.***

A-6 Alternative 6, with the addition of 15.37 million square feet of office space, would result in a parking deficit of 15,400 parking spaces. This is considered a ***significant impact.***

A-7 Alternative 7, with the addition of 10.91 million square feet of office space, would result in a parking deficit of 10,900 parking spaces. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4-8-10 would reduce the above impacts to a *less-than-significant level.*

4.8-10 *Implement Mitigation Measure 4.8-1(a). This measure would be required for all Alternatives.*

Implementation of a Transportation Management Plan (TMP), as outlined in the Facility Element, would reduce the project parking impacts for Alternatives 1-7. The application of the TMP is expected to shift approximately 1,000 employees from the automobile mode to the transit mode for Alternative 1; 8,300 employees for Alternative 2; 8,900 employees for Alternative 3; 8,800 employees for Alternative 4; 8,500 employees for Alternative 5; 15,400 employees for Alternative 6; and 10,900 employees for Alternative 7.

4.8-11 At buildout, implementation of any of the alternatives would result in demand for parking in excess of supply.

The analysis of parking impacts is focused on office uses in the Planning Area since this represents the primary land use, other than residential, and it is the one land uses where parking supply limits are being implemented in order to reduce vehicle trips to the downtown area. The proposed office parking requirement through buildout is 1.0 parking stalls per 1,000 square feet. This is the same requirement that currently exists for other office uses in the downtown area. The actual parking demand for office uses, based on a vehicle mode split of 60 percent, is 2.0 parking spaces per 1,000 square feet. As such, any office projects built through the buildout phase would result in a deficit of 1.0 spaces per 1,000 square feet.

A-1 The No Project Alternative, with the addition of 1.0 million square feet of office space, would result in a parking deficit of 1,000 parking spaces. This is considered a ***significant project impact.***

A-2 Alternative 2, with the addition of 11.39 million square feet of office space, would result in a parking deficit of 11,400 parking spaces. This is considered a ***significant project impact.***

A-3 Alternative 3, with the addition of 12.69 million square feet of office space, would result in a parking deficit of 12,700 parking spaces. This is considered a ***significant project impact.***

A-4 Alternative 4, with the addition of 16.50 million square feet of office space, would result in a parking deficit of 16,500 parking spaces. This is considered a ***significant project impact.***

A-5 Alternative 5, with the addition of 17.29 million square feet of office space, would result in a parking deficit of 17,300 parking spaces. This is considered a ***significant project impact.***

A-6 Alternative 6, with the addition of 27.52 million square feet of office space, would result in a parking deficit of 27,500 parking spaces. This is considered a ***significant project impact.***

A-7 Alternative 7, with the addition of 20.75 million square feet of office space, would result in a parking deficit of 20,800 parking spaces. This is considered a ***significant project impact.***

Mitigation Measure

The respective reduction per Alternative by the TMP would reduce the identified parking impacts to a *less-than-significant level.*

4.8-11 *Implement Mitigation Measure 4.8-1(a). This measure would be required for all Alternatives.*

The implementation of a Transportation Management Plan (TMP), as outlined in the Facility Element, would reduce the project parking impacts for Alternatives 1-7. The application of the TMP is expected to shift approximately 1,000 employees from the automobile mode to the transit mode for Alternative 1; 11,400 employees for Alternative 2; 12,700 employees for Alternative 3; 16,500 employees for Alternative 4; 17,300 employees for Alternative 5; 27,500 employees for Alternative 6; and 20,800 employees for Alternative 7.

4.8-12 For Year 2010, public transit would be affected by implementation of any of the Alternatives.

Table 4.8-30 shows transit use expected under each Alternative for Year 2010.

TABLE 4.8-30
REGIONAL TRANSIT TRIP COMPARISON
YEAR 2010 - AM PEAK PERIOD

Alternative	Total Transit Trips
1	107,000
2	131,000
3	130,000
4	130,000
5	131,000
6	131,000
7	131,000

SOURCE: Korve Engineering, Inc.

A-1 The No Project Alternative would result in a total of 107,000 total AM peak period regional transit trips by the Year 2010. This is considered a ***less-than-significant impact.***

A-2 Alternative 2 would result in a total of 131,000 total AM peak period regional transit trips, or an increase of 24,000 daily transit trips over the No Project Alternative, by the Year 2010. This is considered to be a ***less-than-significant project impact.***

A-3 Alternative 3 would result in a total of 130,000 total AM peak period regional transit trips, or an increase of 23,000 daily transit trips over the No Project Alternative, by the Year 2010. This is considered to be a ***less-than-significant project impact.***

A-4 Alternative 4 would result in a total of 130,000 total AM peak period regional transit trips, or an increase of 23,000 daily transit trips over the No Project Alternative, by the Year 2010. This is considered to be a ***less-than-significant project impact.***

A-5 Alternative 5 would result in a total of 131,000 total AM peak period regional transit trips, or an increase of 24,000 daily transit trips over the No Project Alternative, by the Year 2010. This is considered to be a ***less-than-significant project impact.***

A-6 Alternative 6 would result in a total of 131,000 total AM peak period regional transit trips, or an increase of 24,000 daily transit trips over the No Project Alternative, by the Year 2010. This is considered to be a ***less-than-significant project impact.***

A-7 Alternative 7 would result in a total of 131,000 total AM peak period regional transit trips, or an increase of 24,000 daily transit trips over the No Project Alternative, by the Year 2010. This is considered to be a ***less-than-significant project impact.***

Mitigation Measures

4.8-12 *None required.*

4.8-13 Bicycle and pedestrian circulation would be adversely affected by implementation of some of the Alternatives.

The No Project Alternative would result in significant pedestrian and bicycle impacts as a result of the limited ability of the current system to accommodate added pedestrian/bicycle demand. This would exacerbate current conditions in the northern portion of the Central City where pedestrian/bicycle activity is restricted due to the lack of facilities. The only bicycle facility in the Planning Area is the north-south connection between the bike lane on 14th Street and the bike path crossing of the American River Bridge east of State Route 160. No east-west bicycle facilities currently exist in either the Railyards Area or Richards Area. Very limited pedestrian facilities exist in the Planning Area also. State Route 160 is the only major roadway facility in the Planning Area with continuous sidewalks.

Alternatives 2 through 7 would implement an extensive pedestrian and bicycle system. This includes the development of a small block pattern of streets north from the downtown to the American River. These streets would have sidewalks ranging from seven feet to 30 feet in width. Bicycle paths would also be added along 7th Street, the south bank of the American River, and H Street to enhance both direct connections to the downtown as well as recreational access.

The location of the Southern Pacific Railroad main line tracks in Alternative 5, immediately north of the existing alignment to facilitate development of a new station close to the existing facility, would result in the need to create grade-separated underpasses at the 5th Street, 6th Street, and 7th Street junctions. These roadways would be depressed in order to cross under the railroad tracks, which would be at-grade. Pedestrian facilities for handicapped persons travelling along 5th Street, 6th Street, and 7th Street would have to be specially designed in these underpasses. The 7th Street tunnel would have to be designed to provide adequate width to serve both pedestrians and bicycles.

Gateway Boulevard and 7th Street are designed with very wide medians to provide distinct landscaped corridors which would accommodate light rail. It is expected intersections along these corridors would require longer cycle lengths and that pedestrians would generally require two signal cycles to cross these wide streets, using the median as a waiting area between cycles. This is not considered to be a significant impact as there would be sufficient area within the median for waiting pedestrians.

A-1 The No Project Alternative would result in significant impacts for pedestrian and bicycle traffic in the Planning Area. The limited facilities would provide a disincentive for pedestrian and bicycle use to access projects and therefore increase the dependence on

automobiles. Transit use would also be discouraged due to the poor pedestrian linkages between bus stops/LRT stops and new projects. These are considered ***significant impacts***.

A-2 through A-4; A-6 and A-7

As a result of the implementation of a new system of pedestrian and bicycle facilities, a ***less-than-significant impact*** would occur.

A-5 Alternative 5 would result in significant impacts for pedestrian and bicycle traffic in the Planning Area. The underpasses at 5th, 6th, and 7th Streets would provide a disincentive for pedestrian and bicycle use. Access to transit in the vicinity of the rail crossings would be limited. Specially designed pedestrian facilities would be required to serve handicapped persons. This is considered a ***significant impact.***

Mitigation Measure

The following mitigation measure would reduce the above impact *to a less-than-significant level.*

4.8-13 *Implement improved pedestrian crossing facilities at the intersection of I Street/5th Street in the Railyards Area. Implement a continuous sidewalk and bicycle path along Richard Boulevard as well as sidewalks along the frontage of any new projects in the Richards Area. Special pedestrian facilities should be constructed along the 5th Street, 6th Street, and 7th Street underpasses at the Southern Pacific Railroad mainline under Alternative 5 to provide adequate handicapped access both along these north-south roadways and to buildings on adjacent parcels. This measure would be required for Alternatives 1 and 5.*

4.8-14 Cumulative increases in trains on the Southern Pacific main line, in conjunction with increased roadway traffic in West Sacramento could cause conflicts at the at-grade railroad crossing on 3rd Street.

A-1 through A-7

Projected increases in intercity rail traffic on the Southern Pacific mainline tracks and additional vehicle traffic on 3rd Street generated by the Raley's Landing and Lighthouse developments may result in rail/car conflicts at the 3rd Street at-grade crossing. This is considered a ***significant impact.***

The construction of the new three-rail railroad bridge across the Sacramento River will result in the relocation of the main line tracks in West Sacramento between 4th Street and the river levee. The current grade-separated connection between the upper level of the I Street bridge and the intersection of 3rd Street/C Street for motorists will be reconstructed. The existing at-grade railroad crossing on 3rd Street will be maintained.

A total of about 22 trains per day currently use the Southern Pacific main line between the Railyards and West Sacramento. That figure is projected to increase to as many as

77 trains per day by the year 2010. This estimate assumes up to 48 inter-city trains per day and could be conservative given current funding levels. However, in conjunction with increased traffic flows on the north-south connectors in West Sacramento, especially on 3rd Street, increased conflicts could occur at the 3rd Street at-grade railroad crossing.

The new rail bridge would provide three rail lines across the Sacramento River, where only two exist today on the I Street Bridge. While the new rail bridge itself would not cause the increase in rail traffic (this is more closely tied to funding and public support), the new rail bridge could facilitate shortened rail headways as rail traffic increases. Without the new bridge, rail headways would continue to be long as trains wait outside of the urban area for clearance to use the tracks. The new rail bridge would only affect rail traffic on Alternatives 2, 3, 4, 6 and 7. Alternatives 5 and 1 would not include such a bridge and would assume continued use of the I Street Bridge.

Mitigation Measures

The following mitigation measure would reduce the above impacts to a *less-than-significant level.*

4.8-14 *The City of Sacramento, in conjunction with the City of West Sacramento and Southern Pacific, should pursue funding sources for construction of the new rail bridge and related physical improvements on the east and west sides of the river. Part of those funds, if made available, may be used to construct a 3rd Street underpass in West Sacramento. This measure would be required for all Alternatives.*

4.8-15 For Year 2010, implementation of the Alternatives, in conjunction with cumulative development, would result in unacceptable levels of traffic along some neighborhood streets.

The addition of cumulative and project traffic in the Central City area would result in increases along east-west streets in the Midtown area ranging between 11 and 86 percent over existing conditions.

A-1 The No Project Alternative would result in cumulative and project impacts due to a projected 11 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***less-than-significant impact.***

A-2 Alternative 2 would result in cumulative and project impacts due to a projected 60 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***significant impact.***

A-3 Alternative 3 would result in cumulative and project impacts due to a projected 63 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***significant impact.***

A-4 Alternative 4 would result in cumulative and project impacts due to a projected 52 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***significant impact.***

A-5 Alternative 5 would result in cumulative and project impacts due to a projected 63 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***significant impact.***

A-6 Alternative 6 would result in cumulative and project impacts due to a projected 86 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***significant impact.***

A-7 Alternative 7 would result in cumulative and project impacts due to a projected 69 percent increase in traffic along the east-west streets in the Midtown neighborhood based on increases in daily traffic. This would be considered a ***significant impact.***

Mitigation Measures

A significant impact would occur along the east-west streets in the Midtown neighborhood for all alternatives. Implementation of Mitigation Measure 4.8-15(a) would reduce the above impacts to a *less-than-significant level.*

4.8-15 *Develop and implement measures designed to limit traffic on neighborhood streets and divert it to parallel arterial facilities. This measure is required for Alternatives 2 through 7.*

ENDNOTES

1. *Richards Boulevard Redevelopment Plan Implementation Strategy,* January 1990.

2. Richards Boulevard Redevelopment Plan Implementation Strategy, January 1990.

3. HOV lanes have recently been placed in service between Martin Luther King, Jr., Boulevard and Mack Road.

4. Specifically including proposed modifications to Interstate 5 ramp facilities, extension of 7th Street, construction of Gateway Boulevard, the Richards Couplet, and all other roadway extensions and modifications within the project area.

5. The proposed east-west LRT/Busway corridor along Richards Boulevard was not included in the model since this is indicated as a corridor rather than a developed facility in the Facilities Plan.

5.1

City of Sacramento
Planning and Development Department
Environmental Services Division

DRAFT ENVIRONMENTAL IMPACT REPORT (VOLUME 3)

RAILYARDS SPECIFIC PLAN

RICHARDS BOULEVARD AREA PLAN

Prepared by:

EIP Associates
Sacramento, California

June 10, 1992

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4.9 AIR QUALITY

INTRODUCTION

This section addresses the air quality impacts associated with development of the Planning Area. Air quality impacts are evaluated on a local basis and in a regional context.

SETTING

Climate

The primary factors determining local air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Regional and local climate are also important. Atmosphere conditions, such as wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersion of air pollutants.

Topography

Regional meteorological conditions are greatly influenced by the topography of Sacramento Valley. Wind directions and speeds reflect the channeling effect of the mountain ranges that exist on three sides of the Air Basin. In summer, marine air from San Francisco Bay enters Sacramento Valley through the Carquinez Strait and the Cordelia Gap in the Coastal Ranges. This relatively cool marine air mass often extends into Sacramento County. Inversion characteristics in the region are influenced by the marine air's path.

Climate

The climate of the Sacramento Valley is characterized by hot, dry summers and cool rainy winters. During the winter, the North Pacific storm track intermittently dominates valley weather. Fair weather alternates with periods of extensive clouds and precipitation. Also characteristic of valley winter weather are periods of dense and persistent low-level fog, which is most prevalent between storms. The frequency and persistence of heavy fog in the valley diminishes with the approach of spring, when the days lengthen and the intensity of the sun's rays increase.

During summer, Sacramento Valley becomes nearly isolated from the Pacific storm track, and cool marine air can penetrate into the Valley. In later summer and early fall, the strength of the marine air influx into the valley diminishes.

The highest frequency of atmospheric stagnation occurs in autumn, after the characteristic summer flow ceases and before the season of winter storms has begun. Light winds and calm conditions intensify the air pollution potential in the valley, since several days' emissions can then accumulate in the stationary air mass. Reduced daytime surface heating effectively shuts off the influx of marine air and inhibits vertical air movement. The prevailing up-valley (southerly winds) give way to diurnal flow, which is down-valley. Therefore, during daytime, up-valley air flows could reverse due to evening downslope cold air drainage from the adjacent hills, with the result that pollutants are not dispersed. As winter approaches, occasional weak frontal systems enter the Valley, creating a "pre-frontal inversion". Considerable atmospheric stagnation may occur under these conditions.

The Carquinez Strait is the major corridor for westerly flow of air moving out of the San Francisco Bay Area Air Basin into Sacramento Valley. The influx of cool marine air into the huge, relatively level Central Valley, which includes both Sacramento and San Joaquin Valleys, occurs year-round, but is most persistent in summer, when it is the controlling factor in the weather of this region. The strength of the marine influx varies from day to day, with a pronounced diurnal cycle. The influx is weakest during morning lulls, which are usually of short duration. On about 86 percent of all summer days, the influx increases in the afternoon, often with an increase in the westerly flow during the night. The air quality in the Valley is greatly dependent on the duration and depth of penetration of the sea breeze. On days when it weakens to a trickle, air pollution concentrations build up.

Inversions

Vertical air movement is important in the dispersion of air pollutants. A temperature inversion, which may be described simply as a layer, or layers, of warm air above a cooler layer above the ground, acts as a nearly impenetrable lid to the vertical mixing of the atmosphere, and inhibits the dilution of air from sources of pollution near the ground.

Inversions occur with great frequency in all seasons. The most severe conditions, as far as ventilation is concern, occur in the late summer and autumn, when a comparatively large number of deep, strong inversions occur. During this period, the upper air is warmer than in the spring and summer, and daytime surface heating is diminished. The result is, in meteorological terms, a "stable" atmosphere that severely limits dispersion of air contaminants.

Winds

Wind direction determines the direction in which pollutants are carried. The speeds of winds determine the amount of air available for diluting emissions (light winds limit the dilution resulting from transport away from pollution sources). Prevailing winds, which are defined as winds blowing from the most frequently occurring direction, generally blow either up or down Sacramento Valley. Surface wind speeds and directions in Sacramento, based on 17 years of meteorological data, are summarized in Table 4.9-1.

TABLE 4.9-1

SACRAMENTO SURFACE WIND SUMMARY

	Predominant Winds by Season				
	Winter	Spring	Summer	Fall	Annual
Predominant Winds					
Direction:	SSE	SSW	SSW	SSW	SSW
Speed:	0.7	3.7	6.1	1.8	3.0
Persistence Ratio:	0.12	0.45	0.73	0.29	0.42
Secondary Predominant Winds					
Direction:	NNW	NW	SE	NNW	SE
Speed:	9.0	10.9	5.5	8.8	6.7
Persistence Ratio:	23.2	17.9	15.3	20.9	19.2

Notes:
SSE = South-Southeast
SSW = South-southwest
NNW = North-northwest
NW = Northwest
SE = Southeast

SOURCE: California Air Resources Board

The meteorological station where the wind data presented in Table 4.9-1 were recorded is on the western side of Sacramento. As shown in Table 4.9-2, Sacramento winds are calm only 4.9 percent of the time in the summer, and the predominate wind direction is south to southwest 59 percent of the time.

During winter, the prevailing air flow pattern often is the reverse of the summer pattern, and air flows down the Valley, converging with the air stream from San Joaquin Valley and continuing westward through the Carquinez Strait. Also, during prolonged intervals of dominant high pressure between storms, moderate air stagnation can develop. Cold, dense air tends to move downslope along water courses and mountain canyons to form pools of stagnant air in topographical depressions.

Temperature

Patterns of summer and winter pollution potential are likely to resemble the patterns of summer-maximum and winter-minimum temperature (see Table 4.9-3). In summer, areas with high average maximum temperatures (approximately 110°F) tend to be in sheltered inland valleys, which have abundant sunshine and light winds. In winter, the potential for air pollution is related to the minimum nighttime temperature. Low minimum temperatures (approximately 21°F) are associated with strong inversions, caused by nighttime radiative cooling near the ground, which occurs on clear nights in inland valleys.

Because of a high frequency of clear sky conditions and an absence of precipitation, inland areas like Sacramento Valley are prone to photochemical pollution in summer. In the presence of sunlight and warm temperatures, hydrocarbons and oxides of nitrogen can react and form secondary photochemical pollutants, including ozone. During the winter, the combination of cool weather, atmospheric inversions, and low wind speeds in the Sacramento area could contribute to high concentrations of CO in the vicinity of congested intersections, especially during the evening peak traffic hours.

Precipitation

Monthly precipitation values at the Sacramento meteorological monitoring station, averaged over a 30-year period from 1951 to 1980, are shown in Table 4.9-4. Most of the precipitation in the Sacramento area occurs during the winter; approximately 90 percent of the annual precipitation falls between November and April. A high potential for air pollution exists during summer and autumn when lack of precipitation, inversions, light winds and bright sunshine can occur in combination.

TABLE 4.9-2
SACRAMENTO SURFACE WIND SUMMARY (MPH)

	Winter		Spring		Summer		Fall		Annual	
Direction	% of Time	Mean Speed	% of Time	Mean Speed	% of Time	Mean Speed	% of Time	Mean Speed	% of Time	Mean Speed
N	6.0	7.6	3.2	9.5	1.6	7.4	5.6	8.2	4.1	8.2
NNE	1.7	5.0	0.7	5.5	0.3	4.6	1.1	5.4	1.0	5.2
NE	1.5	4.3	0.7	4.8	0.3	4.4	1.0	4.6	0.9	4.5
ENE	1.7	4.2	0.7	4.6	0.2	4.0	1.0	4.1	0.0	4.2
E	3.8	4.6	2.1	4.7	0.6	4.6	2.2	4.4	2.2	4.6
ESE	5.2	5.4	3.6	5.4	2.0	4.9	4.0	4.9	3.7	5.2
SE	10.5	7.5	7.4	6.3	5.9	5.2	7.7	6.1	7.9	6.4
SSE	9.8	9.6	6.4	7.5	7.4	6.0	6.7	7.3	7.6	7.8
S	9.0	7.8	12.4	8.2	20.6	8.4	10.5	7.1	13.1	8.0
SSW	4.1	8.5	13.8	10.7	23.0	10.0	9.8	9.4	12.7	10.3
SW	3.5	8.0	15.6	10.8	18.1	10.8	9.0	9.4	11.6	10.3
WSW	1.9	5.8	4.5	8.6	3.8	7.6	3.3	6.4	3.4	7.4
W	2.0	5.2	2.7	7.1	2.3	6.7	2.3	5.7	2.3	6.2
WNW	2.8	6.1	3.5	8.2	2.4	7.0	2.5	6.0	2.8	6.9
NW	6.5	8.0	6.2	10.7	3.4	8.2	5.9	7.6	5.5	8.7
NNW	10.7	10.3	8.2	12.2	3.1	8.0	9.4	9.8	7.8	10.5
CALM	19.2		8.2		4.9		17.9		12.4	
ALL		6.2		8.4		8.4		6.2		7.3

SOURCE: Engineering-Science Inc.

TABLE 4.9-3

MONTHLY TEMPERATURE EXTREMES AT MATHER AFB[1]

	Temperature (°F)				Mean Number of Days			
					Maximum		Minimum	
Month	Extreme Maximum	Mean Daily Maximum	Mean Daily Minimum	Extreme Minimum	> 90	> 80	< 32	< 0
JAN	70	53	38	21	0	0	8	0
FEB	76	59	41	25	0	0	2	0
MAR	84	63	43	29	0	#	1	0
APR	92	71	47	34	#	6	0	0
MAY	102	78	51	38	3	13	0	0
JUN	111	86	56	41	10	22	0	0
JUL	109	92	60	49	21	30	0	0
AUG	110	91	59	50	19	29	0	0
SEP	111	87	57	44	23	24	0	0
OCT	101	77	52	31	3	11	#	0
NOV	85	64	44	28	0	1	1	0
DEC	71	54	40	24	0	0	4	0
ANNUAL	111	73	49	21	36	67	16	0

[1] Based on data collected from 1941 - 1967.

Note: # indicates data unavailable.

SOURCE: Department of Water Resources, *Climatic Summaries for Military Bases, January 1978.*

TABLE 4.9-4

MEAN MONTHLY PRECIPITATION AT SACRAMENTO WSO

Month	Precipitation (Inches)
January	3.73
February	2.80
March	2.17
April	1.54
May	0.51
June	0.10
July	0.01
August	0.05
September	0.19
October	0.99
November	2.13
December	3.12
ANNUAL	17.22

SOURCE: Department of Water Resources, California Rainfall Summary, Monthly Total Precipitation 1849 - 1980, July 1982.

Existing Environmental and Regulatory Conditions

Regulatory Context

The Federal Clean Air Act (CAA) of 1977 directed the Environmental Protection Agency (EPA) to establish national ambient air quality standards (NAAQS) (see Table 4.9-5). Primary standards are requisite to protect public health. Secondary standards are requisite to protect public welfare associated with the presence of contaminants in the ambient air. The NAAQS set by the EPA limit ambient concentrations of six pollutants: ozone (O_3), carbon monoxide (CO), respirable particulate matter (particulates with diameter of less than 10 microns, or PM_{10}), nitrogen dioxide (NO_2), lead (Pb), and sulfur dioxide (SO_2). Because of the health-based criteria identified in setting the standards, these air pollutants are termed "criteria" air pollutants. States that contain areas that exceed the standards must submit plans for attainment of the standards in those areas. The most crucial condition of the plans, called state implementation plans (SIPs), is that they provide for attainment of primary NAAQS within three years from the date of the approval of the plan.

The Sacramento Air Quality Maintenance Area (SAQMA), which is made up of Sacramento County, Yolo County, and parts of Placer and Solano Counties, adopted individual programs to reduce air pollution. These locally adopted programs, along with the programs of county Air Pollution Control Districts (APCDs) and requirements for restrictions on automobiles by the Air Resources Board (ARB), formed the Air Quality Plan for the Air Basin required by the CAA Amendments of 1977.[1] The Plan established air pollution control strategies intended to attain federal air quality standards by the December 31, 1987 deadline, as specified in the CAA Amendments. That deadline now has passed, and the Sacramento Metropolitan area remains a federal non-attainment area for O_3 and CO. A ban on construction of all new pollution sources emitting 100 tons per year of particulates or expansion of existing sources by more than 40 tons per year of any primary pollutant has been imposed in the Sacramento Air Quality Maintenance Area.

In light of the deadline for attainment of the federal NAAQS and the severe air quality problems in the region, the Sacramento Area Council of Governments (SACOG) coordinated a series of meetings among cities and counties in the region, the EPA, the ARB, APCDs, and the California Department of Transportation (Caltrans), to discuss future air quality planning. The result of these meetings was the development of, and agreement on, a long-term air quality planning program to be coordinated by SACOG.

The air quality planning process under way includes three major activities. The first activity, a consultant study, was completed in the summer of 1988. It recommended creation of an air quality model for the SAQMA. The second activity, completed in early 1990, involved preparation of an interim Regional Air Quality Plan (RAQP) to provide a new emissions inventory through 2010, evaluate emission-control strategies, and serve as a basis for the adoption by cities and counties of emissions control measures. The final activity, expected to be complete by 1992, will be computer modeling of air quality in the Sacramento area, and updating of the interim RAQP based on the results. Although not required by statute, and having no regulatory

authority, the RAQP represents local initiative on the part of the cities and counties in the affected region to devise strategies for solving their air quality problems.

While the SACOG planning process was proceeding, the California Clean Air Act (CCAA) and AB 4355 (Connelly) became effective on January 1, 1989. AB 4355 provided the Sacramento County APCD with increased authority to regulate land use, transportation, and area wide sources of air pollution as a means of implementing the requirements of the CCAA. The Act also changed the name of the Sacramento County APCD to the Sacramento Metropolitan Air Quality Management District (SMAQMD), effective July 1, 1989.

The CCAA provides a planning framework for attainment of California Air Quality Standards (see Table 4.9-5). Local APCDs and AQMDs in violation of State standards are required to prepare air quality attainment plans. The Act provides for the designation of Air Basins into three classes: moderate, defined as an area that can attain State and federal air quality standards by December 31, 1994; serious, defined as an area that can attain the standards by December 31, 1997; and severe, defined as an area that cannot specify an attainment date.

Under the ambient air quality standards set by the State of California, the Sacramento Valley Air Basin was designated a State non-attainment area for O_3 and PM_{10}, and Sacramento County was designated a non-attainment area of CO, by the Air Resources Board on June 9, 1989. Under the federal NAAQS, the entire County of Sacramento is classified as non-attainment for CO and O_3, and attainment for nitrogen oxides (NO_x, SO_x, and lead (Pb)). The EPA is expected to designate the area for non-attainment of PM_{10} standards sometime during the first half of 1992. State standards generally are stricter than federal standards.

For each class, the Act specifies air quality management strategies that must be adopted. For all classes, attainment plans are required to demonstrate a 5 percent per year reduction in emissions of air pollutants or their precursors, unless the ARB determines that all feasible air pollutant control measures are being employed. The classifications required by the CCAA will not be fully decided until all APCD/AQMD attainment plans have been completed and approved. Only then will estimates of the time required to reach attainment be estimated. The Sacramento Metropolitan Air Quality Management District's attainment plans were submitted to the ARB in July of 1991. The California Air Resources Board (ARB) will hold a public hearing on the plan in May of 1992. It is required that the plan be updated every three years.

The CCAA recognizes that pollution does not respect political boundaries, and must be managed on a regional basis. The Act requires the ARB to assess the transport of air pollutants from one air district to another. The ARB has determined that on some days the Broader Sacramento Area emissions were the main cause of violations of the ozone air quality standard in the upper Sacramento Valley. Because the Sacramento area is a source of non-attainment for another airshed, the air quality plan must meet the most stringent requirements imposed by the ARB. These requirements include the application of Best Available Retrofit Control Technology (BARCT) and a permitting system for new and modified sources that achieves no net increase in ozone precursors. These mitigation requirements apply to sources of Reactive Organic Gases (ROG) and to sources of nitrogen oxides.

The CCAA requires that local air pollution control districts implement Transportation Control Measures (TCMs) to reduce air pollutant emissions. Specific transportation performance standards are part of the California Clean Air Act requirements, including:

- Substantially reduce the rate of increase in passenger vehicle trips and vehicle miles travelled;
- Achieve a 1.5-person vehicle occupancy rate during the peak travel periods by 1999; and
- Provide for no net increase in vehicle emissions beyond the year 1997.

The current attainment plan for Sacramento County under the CCAA addresses ozone and carbon monoxide.[1]

The key policies of the *Sacramento 1991 Air Quality Attainment Plan* are:

- Provide for 5% per year reductions in non-attainment emissions, or include "every feasible measure" in the AQAP.
- Establish a permitting program that achieves no net increase in stationary source emissions.
- Develop a strategy to reduce vehicle trips, use, and miles travelled.
- Reduce population exposure to non-attainment pollutants by 25% by December 31, 1994.
- Establish Best Available Retrofit Control Technology (BARCT) requirements for all permitted sources.
- Develop indirect and area source programs.

In June of 1990, voters approved Propositions 111 and 108, which increased funding for California's transportation system. With this new funding came the requirement that urbanized counties prepare an annual Congestion Management Plan (CMP) to improve the relationship between transportation, land use and air quality.

While the CMP is an independent requirement separate from the CCAA, it requires appropriate land use, transportation, and air quality agencies to integrate their planning process, share information and develop a coordinated approach in response to congestion and air quality problems.

There are numerous references to air quality in the CMP legislation. Some references outline consultive roles and cooperative processes that transportation, land and air quality agencies should follow in developing the CMP. Other aspects of the legislation require direct links between, or even overlap with the CCAA. These are:

- The requirement that cities and counties adopt and implement trip reduction ordinances, also required by the California Clean Air Act.

- The Capitol Improvement Program Element of the CMP must determine that projects "conform to transportation-related emissions air quality mitigations." That is, the CIP must be consistent with the TCMs included in the state mandated Clean Air Plan and federal mandated State Implementation Plan.

- Deficiency plans required under the CMP must contribute to a "significant improvement in air quality."

General Plan Goals and Policies

The City of Sacramento General Plan does not contain an Air Quality Element, but the General Plan does contain a set of related goals and policies for Transportation Systems Management, Transit, Pedestrianways and Bikeways within the Circulation Element. These goals and policies are presented in Chapter 4.8, Transportation.

Toxic Air Contaminants

In addition to criteria air pollutants, other air pollutants have been found to be highly injurious, even in small quantities. Because they are relatively uncommon, however, these air pollutants have not gone through the lengthy and costly process needed to set National Ambient Air Quality Standards. Instead, these pollutants are controlled through the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), emissions limits that have been promulgated by EPA for asbestos, beryllium, mercury, vinyl chloride, benzene, radionucleides and coke oven gas.

Emissions of hazardous air pollutants in California are governed by the 1983 Toxic Air Contaminants law, also known as the Tanner Act. The Toxic Air Contaminant law establishes a two-part scheme; it provides for the identification of toxic air contaminants, and it provides for the adoption of controls on emissions of air toxics so identified.

The State has implemented additional requirements for the potential release of asbestos fibers. California is one state that contains serpentine rock structures, a naturally occurring source of asbestos fibers. Any construction activities that may unearth or disturb serpentine rock must be performed carefully and in accordance with State guidelines. In addition, guidelines have been put in place dealing with the demolition of existing structures that may contain materials that have asbestos in them. If at all possible, asbestos-containing materials should be removed from a structure before it is destroyed to prevent the release of asbestos fibers into the ambient air.

The Federal Clean Air Act Amendments (CAAA), enacted in November 1990, provide strict guidelines for the attainment of NAAQS. The most extensive provisions of Title I of the CAAA relate to areas that have failed to attain ambient standards for ozone. The SMAQMD will have to implement many new controls on volatile organic compounds and oxides of nitrogen. A new attainment plan will have to be developed for each pollutant in the region whose concentration

exceeds the NAAQS (CO, O_3, and PM_{10}). Major new sources must use Best Available Control Technology (BACT) and provide 100 to 150 percent offsets of any new emissions. A 15 percent reduction in volatile organic compounds (VOC) emissions must be achieved in six years, with additional emissions reductions of 3 percent per year until attainment is reach. Once attainment is demonstrated, the State will have to submit a "maintenance plan" to EPA, demonstrating how air quality will be retained over the next 10 years despite anticipated population growth and development.

Existing Air Quality

Major sources of air pollutants in the Sacramento area are vehicle exhausts, solvent use, pesticide application, petroleum processing, transfer and storage, industrial processes, and agricultural and waste burning. The automobile is the largest single source category for carbon monoxide, hydrocarbons and oxides of nitrogen. The major sources of particulate matter are automobiles, construction and demolition.

The Sacramento Metropolitan Air Quality Management District and the California Air Resources Board maintain several air quality monitoring sites in the Sacramento area. The closest monitoring sites to the Planning Area are the 1309 T Street monitoring site in downtown Sacramento and the Del Paso Manor site, located several miles east of the Planning Area. Criteria pollutants monitored at these sites are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide and particulate matter.

Most of the standards shown in Table 4.9-5 are met in Sacramento. Recorded levels for ozone, carbon monoxide (8-hour) and 24-hour and annual particulate matter (PM_{10}) have been exceeded. A summary of ozone and carbon monoxide standard violations at the T Street and Del Paso Manor sites is shown in Table 4.9-6 for the years 1987 through 1990.

Ozone

Table 4.9-6 shows that the standards for ozone are frequently exceeded in the Planning Area. Ozone is a regional problem affecting the entire Sacramento Valley Air Basin. Near metropolitan Sacramento, the severity of the ozone problem is worst east and north of the city, and least severe west and south of the city.[2]

Ozone is not emitted directly into the atmosphere, but is a secondary pollutant produced through photochemical reactions of non-methane volatile organic compounds (VOCs) and NO_x. Non-methane VOCs and NO_x are often referred to as O_3 precursors, because they are basic ingredients, along with sunlight, for a complex chain reaction that ultimately produces O_3. High levels of O_3 cause eye irritation, can impair respiratory functions, and cause vegetation damage.

Ozone is the most significant air quality problem in the District. For the 1990s, a constant population influx is anticipated, with its consequent increases in vehicles and vehicular emissions. A characteristic of ozone is to proliferate on a regional scale, which makes ozone an especially complex problem. All of the monitoring sites in Sacramento County have exceeded federal and

TABLE 4.9-5
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standard[1]	Federal Standards[2]	
			Primary[5]	Secondary[6]
Ozone	1-hour	0.09 ppm (180 ug/m^3)	0.12 ppm (235 ug/m^3)	0.12 ppm (235 ug/m^3)
Carbon Monoxide	1-hour	20.00 ppm (23 mg/m^3)	35.00 ppm (40 mg/m^3)	35.00 ppm (40 mg/m^3)
	8-hour	9.00 ppm (10 mg/m^3)	9.00 ppm (10 mg/m^3)	9.00 ppm (10 mg/m^3)
Nitrogen Dioxide	1-hour	0.25 ppm (470 mg/m^3)	--- ---	--- ---
	Annual Average	--- ---	0.053 ppm (100 ug/m^3)	0.053 (100 mg/m^3)
Sulfur Dioxide	1-hour	0.25 ppm (655 mg/m^3)	--- ---	--- ---
	3-hour	--- ---	--- ---	1300 ug/m^3 (0.5 ppm)
	24-hour	0.05 ppm (131 ug/m^3)	365 ug/m^3 (0.14 ppm)	--- ---
	Annual Average	--- ---	80 ug/m^3 (0.03 ppm)	--- ---
Suspended Particulate Matter (PM_{10})	24-hour	50 ug/m^3	150 ug/m^3	150 ug/m^3
	Annual Geometric Mean	30 ug/m^3	---	---
	Annual Arithmetic Mean	---	50 ug/m^3	50 ug/m^3
Sulfates	24-hour	25 ug/m^3	---	---
Lead	30 Day Average	1.5 ug/m^3	---	---
	Calendar Quarter	---	1.5 ug/m^3	1.5 ug/m^3
Hydrogen Sulfide	1-hour	0.03 ppm (42 ug/m^3)	--- ---	--- ---
Vinyl Chloride	24-hour	0.010 ppm (26 ug/m^3)	--- ---	--- ---
Visibility[9] Reducing Particles	1 Observation	Visibility < 10 miles	---	---

[1] California standards for ozone, carbon monoxide, sulfur dioxide (1 hr), nitrogen dioxide, and particulate matter - PM_{10}, are values that are not to be exceeded. The sulfates, lead, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates standards are not be equaled or exceeded.

[2] National standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentration above the standard is equal to or less than one.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.

[7] Reference method as described by the EPA. An "equivalent method" of measurement may be used by must have a "consistent relationship to the reference method" and must be approved by the EPA.

[8] At locations where the state standards for ozone and/or suspended particulate matter are violated. National standards apply elsewhere.

[9] Prevailing visibility is defined as the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.

SOURCE: California Air Resources Board, 1989.

TABLE 4.9-6

SUMMARY OF AIR QUALITY DATA FOR GASEOUS POLLUTANTS
1987-1990

Pollutant (Standard)	Year	Number of Days Exceeding Standard at:	
		Del Paso Manor	"T" Street
Carbon Monoxide (8-hour federal and state)	1987	0	--
	1988	1	--
	1989	13	7
	1990	4	4
Ozone (Federal 1-hour)	1987	5	--
	1988	19	--
	1989	0	0
	1990	4	1
Ozone (State 1-hour)	1987	40	--
	1988	63	--
	1989	10	2
	1990	21	4

SOURCE: California Air Resources Board, *California Air Quality Data Annual Summary*, Vols. XIX-XXII, 1988-1991.

State heath-based standards, and the area has been officially declared non-attainment by the United States Environmental Protection Agency and the ARB.

Carbon Monoxide (CO)

Carbon monoxide is generally a local pollutant. CO concentrations normally follow closely the spatial and temporal distributions of CO's primary source, motor vehicles. High concentrations of CO can impair oxygen transport in the bloodstream; aggravate cardiovascular disease; impair central-nervous-system functioning; and cause fatigue, headache, confusion, and dizziness. Sacramento County has been designated a non-attainment area for carbon monoxide (CO) by the EPA and the ARB. On-road vehicles account for approximately 70 percent of all Sacramento's CO emissions, with the problem being primarily in the inner-city, busy intersections, main thoroughfares, and freeway corridors.

Carbon monoxide is also a problem in certain areas of Sacramento. Carbon monoxide is a very localized pollutant, and the area exceeding the State and federal ambient air quality standards has been centered on the El Camino/Watt Avenue area east of downtown Sacramento.

Respirable Particulate Matter (PM_{10})

Typical sources of suspended particulate matter are fuel combustion, wind and mechanical erosion of local soil, construction, demolition, industrial processes, and photochemical reactions. Those suspended particles with a diameter less than 10 micrometers are respirable particulate matter (PM_{10}). Ambient PM_{10} standards are designed to prevent respiratory disease and protect visibility. PM_{10} is monitored at both the Sacramento-Del Paso Manor and Citrus Heights stations. Ambient PM_{10} concentrations have regularly exceed the State 24-hour standard during the past five years. The California Air Resources Board has declared Sacramento County to be non-attainment for PM_{10}. The EPA is expected to designate the area as non-attainment for Federal standards some time in the first half of 1992. The preliminary PM_{10} work program is being prepared, but has not yet been approved, and thus, is not included in Sacramento 1991 Air Quality Attainment Plan.

Other Criteria Pollutants

The other criteria air pollutants are NO_2, SO_2, and lead (Pb). The ambient air quality standards for NO_2 have as their objective prevention of respiratory disease, odor, and creation of ozone. Those for SO_2 are designed to prevent health risks and improve visibility. The standards for ambient Pb concentrations are set to protect against toxic health effects of this substance. The adverse environmental effects of SO_2 and NO_2 go beyond public health, odor, and visibility impacts. Their ability to react with atmospheric water vapor to create acid rain results in accelerated weathering of stone and masonry structures and facilities, enhanced leaching of nutrients and toxic substances in soils, and direct damage of vegetation and aquatic biota. Monitored NO_2 (monitored at Folsom), SO_2, and Pb concentrations have not exceeded State or federal standards in the past five years.

Stationary Sources of Air Pollutants

Emission sources are divided into three categories: stationary sources, mobile sources, and area sources. The stationary source includes major and minor sources and classifies emissions into six broad subcategories: fuel combustion, waste burning, solvent use, petroleum processes, industrial processes and miscellaneous processes.

A major source of emissions is a facility that emits 10 or more tons per year of an individual pollutant. Emission estimates are based on data collected by the District through surveys, inspection reports, and permit applications. Emissions are calculated as the product of a process rate and an emission factor, obtained primarily from the EPA, ARB or source testing of similar equipment.

Minor sources are small sources individually emitting less than 10 tons per year of a pollutant. Gasoline stations, dry cleaners, and auto body repair facilities represent examples of minor sources. Emission estimates for minor sources are calculated using methodologies developed by the ARB, demographic data provided by the Department of Finance and socioeconomic data compiled by the Data Resources, Inc.

The stationary sources of air pollutants in Sacramento County are listed in Table 4.9-7 for 1989, the most recent year for which an emissions inventory was available from ARB. Within Sacramento County, fuel combustion accounts for more than 50 percent of the total stationary CO sources.

Mobile Sources of Air Pollutants

The mobile source category includes on-road mobile sources and other mobile sources.

On-road motor vehicles are classified by vehicle type: light-duty autos, light- and medium-duty trucks (Gross Vehicle Weight (GVW) < 8500lbs.), heavy-duty trucks (GVW > 8500lbs), motorcycles, and heavy-duty buses. Emissions from motor vehicles include tailpipe emissions of ROG, NO_x, and CO, and evaporative ROG emissions from crankcases and vehicle fuel tanks. Emission estimates for on-road motor vehicles are the product of vehicle activity data and emission factors. Emission factors were estimated using the ARB's EMFAC7PC computer program, the 1990 mix of motor vehicles estimated by the ARB, and the vehicle travel speeds.

Other mobile sources include trains, aircraft, industrial equipment, farm equipment, utility equipment and off-road vehicles, such as snowmobiles and recreational boats. Emission estimates for this category are made by the ARB, with the exception of those for aircraft, which are based on information provided to the District by the military and civilian airport personnel.

Light-duty autos, light-duty trucks, and medium-duty trucks are the major sources, with 1989 emissions of 34 ton/day of total organic gases (TOG), 230 tons/day of carbon monoxide (CO) and 28 ton/day of NO_x. Heavy-duty diesel trucks emitted 3.0 ton/day of SO_x and 3.2 ton/day of PM_{10} during 1989. The emissions from other mobile sources in 1989 are 12 tons/day of TOG, 63 tons of CO, 19 tons/day of NO_x, 1.8 tons/day of SO_x, and 11 tons/day of PM_{10}.

Area Sources of Air Pollutants

Area sources include wind-blown soils, entrained paved road dust, and fugitive emissions from construction activities. Emissions are calculated using emission factors developed by the EPA and ARB. Emission factors are based upon actual measurements of similar sources. Area sources are a major contributor of PM_{10}. Entrained road dust from paved and unpaved roads contributes 66 percent of the total PM_{10} generated daily in the county. The next largest source of PM_{10}, 23 tons per day, is construction and demolition activities.

TABLE 4.9-7

STATIONARY SOURCES 1989 EMISSIONS
IN SACRAMENTO COUNTY
(Tons/day)

Source	TOG	CO	NO_x	SO_x	PM_{10}
Fuel Combustion	0.9	16	5.6	0.4	0.7
Waste Burning	1.6	12	0.1	---	1.6
Solvent Use	29	---	---	---	---
Petroleum Process, Storage & Transfer	3.9	0.2	1.4	---	---
Industrial Processes	1.9	---	---	---	1.7
Miscellaneous Processes	100	0.8	---	---	120
Total Stationary Sources	140	29	7.2	0.5	124

SOURCE: California Air Resources Board

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Appendix F of the CEQA Guidelines establishes that a project will normally have a significant impact on air quality if it will "violate any air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations."

For the purposes of this EIR a significant impact on local air quality is defined as predicted carbon monoxide levels that exceed State or federal standards (9 ppm 8-hour average, and 20.0 ppm 1-hour average). For regional air quality, the following incremental emission increases are considered significant, as recommended by the Sacramento Metropolitan Air Quality Management District: an increase in emissions of ozone precursors (ROG or NO_X) of 50 pounds per day, or an increase in PM_{10} emissions of 80 pounds per day.

Method

Local Scale Analysis

On the local scale, the most significant pollutant generated by the Alternatives would be carbon monoxide released by project-related auto traffic. Carbon monoxide is an odorless, colorless, poisonous gas that is a health concern because it combines readily with hemoglobin in the blood, reducing the amount of oxygen in the bloodstream. Carbon monoxide air quality problems are normally a local problem near areas of heavy auto traffic and congestion. Since idling vehicles emit relatively large amounts of carbon monoxide, highest concentrations are found near intersections.

The CALINE-4 computer dispersion model was applied to 11 intersections (six existing and five new) in the vicinity of the Planning Area for PM peak traffic. While some intersections may actually have higher traffic during the AM peak traffic period, peak carbon monoxide concentrations in urban areas typically occur in the evening peak period. The methods and assumptions used in estimating carbon monoxide concentrations are described in Appendix F.

The 11 intersections studied were selected based on congestion levels. All selected intersections would operate at Level of Service C or worse in the PM peak hour for at least one Alternative. Predictions of carbon monoxide concentrations were made for Year 2000 and Year 2010 conditions for each Alternative.

Estimated worst-case carbon monoxide 1-hour and 8-hour concentrations in the Year 2000 are shown in Tables 4.9-8 and 4.9-9 respectively. Worst-case 1-hour and 8-hour concentrations in the Year 2010 are shown in Tables 4.9-10 and 4.9-11, respectively. The predicted concentrations are to be compared to the most stringent State or federal ambient air quality standards of 20 PPM for the 1-hour averaging time and 9 PPM for the 8-hour averaging time.

Regional Analysis

The Alternatives would increase regional travel, and therefore would have an effect on total emissions over the greater Sacramento area. The URBEMIS-3 emissions model was used to estimate the increase in regional emissions generated by the Alternatives. The resulting estimated additional regional emissions associated with each Alternative in the Years 2000, 2010 and buildout are shown in Table 4.9-12.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.9-1 For Year 2000, traffic generated by the Alternatives would contribute to continued carbon monoxide problems in downtown Sacramento.

Table 4.9-8 shows that projected 1-hour concentrations at all six intersections studied would be below the most stringent standard. Projected 8-hour concentrations in 2000 (Table 4.9-9) would exceed the most stringent standards at four of the studied intersections in the year 2000. By the Year 2010, concentrations would decrease to the point that the 8-hour standard would be met, with the exception of one intersection for one Alternative.

A-1 through A-7

Table 4.9-9 shows that concentrations of carbon monoxide near several downtown Sacramento intersections are projected to exceed the State/ federal 8-hour standard in the year 2000. This continuation of an existing air quality problem is considered to be a ***significant and unavoidable impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.9-1(a) and 4.9-1(b) would reduce the above impacts, *but not to a less-than-significant* level.

4.9-1(a) *Implement Phase Two of the Circulation Element of the Facility Element, as depicted in Figure 3-12. This mitigation measure would be required for Alternatives 2 through 7.*

The Circulation Plan (as shown in Figure 3-12) identifies intersection and road improvements necessary to handle projected traffic volumes and improve levels of service in the vicinity of the proposed project. Because vehicle idling increases as congestion increases, these same measures would have a positive effect on carbon monoxide concentrations near these intersections.

TABLE 4.9-8

PREDICTED YEAR 2000 WORST-CASE CARBON MONOXIDE CONCENTRATIONS FOR THE 1-HOUR AVERAGING TIME[1]
(In Parts Per Million)

Intersection	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
SB I-5 OFF/ Richards	11.9	13.8	13.4	12.7	12.9	13.9	13.5
North 7th/ Richards	11.2	11.9	11.8	11.4	11.5	12.0	11.6
5th Street/ "I" Street	13.8	14.3	14.5	14.3	14.4	14.6	14.4
6th Street/ "I" Street	14.0	14.3	14.0	13.7	13.8	14.3	14.0
7th Street/ "I" Street	15.0	15.3	15.2	14.6	14.9	15.6	15.1
7th Street/ "J" Street	11.9	12.7	12.8	12.6	12.7	12.7	12.7

[1] The 1-hour federal standard is 35 PPM; the state standard is 20 PPM.

SOURCE: Donald Ballanti, Certified Consulting Meteorologist

TABLE 4.9-9

PREDICTED YEAR 2000 WORST-CASE
CARBON MONOXIDE CONCENTRATIONS
FOR THE 8-HOUR AVERAGING TIME[1]
(In Parts Per Million)

Intersection	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
SB I-5 OFF/Richards	8.3	9.7	9.4	8.9	9.0	9.7	9.5
North 7th/Richards	7.8	8.3	8.3	8.0	8.1	8.4	8.1
5th Street/"I" Street	9.7	10.0	10.7	10.0	10.1	10.2	10.1
6th Street/"I" Street	9.8	10.0	9.8	9.6	9.7	10.0	9.8
7th Street/"I" Street	10.5	10.7	10.6	10.2	10.4	10.9	10.6
7th Street/"J" Street	8.3	8.9	8.9	8.8	8.9	8.9	8.9

[1] The federal and state 8-hour standards are both 9 PPM. Concentrations exceeding this standard are underlined.

SOURCE: Donald Ballanti, Certified Consulting Meteorologist

4.9-1(b) *The Planning Area shall be developed under a vehicle-trip reduction requirement applicable to all proposed land uses. The availability of transit, proximity to downtown Sacramento, potential for mixed land uses and other aspects of the sites provide a high potential for non-auto travel modes. This mitigation measure would be required for all Alternatives.*

4.9-2 For Year 2010, traffic generated by the Alternatives would contribute to continued carbon monoxide violations in downtown Sacramento.

A-1 through A-5; A-7

By the Year 2010, concentrations would be reduced by increasingly effective emission controls on vehicles. As shown in Tables 4.9-10 and 4.9-11, concentrations at all intersections would be below the State/federal ambient air quality standards, and carbon monoxide impacts of development in the Planning Area would be ***less than significant.***

A-6 By the Year 2010, concentrations would be reduced by increasingly effective emission controls on vehicles. Concentrations at one intersection (Gateway/B Street) intersections would remain above the state/federal ambient air quality standards. In 2010, the carbon monoxide impacts of the Planning Area would remain a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.9-2 would reduce the above impact to a *less-than-significant level.*

4.9-2 *Implement Mitigation Measure 4.9-1(b). This measure would be required for Alternative 6.*

4.9-3 At buildout, traffic generated by development in the Planning Area could contribute to carbon monoxide violations in downtown Sacramento.

A-1 through A-5 and A-7

Concentrations of carbon monoxide at buildout have not been analyzed using the CALINE-4 model, as was done for the Years 2000 and 2010, because of insufficient detail regarding traffic flows at the intersections selected for study and the high uncertainty of emission rates for vehicles at buildout. Traffic volumes at the six intersections would increase between the Year 2010 and buildout. The least increase would occur for Alternative 1, the greatest for Alternatives 4 and 7 (up to 25 percent). Current projections are that carbon monoxide emission rates for vehicles will decrease by only a small amount during the same period, so that increased concentrations may occur at the six intersections considered. This is considered a ***potentially significant impact.***

TABLE 4.9-10

PREDICTED YEAR 2010 WORST-CASE CARBON MONOXIDE CONCENTRATIONS FOR THE 1-HOUR AVERAGING TIME[1]
(In Parts Per Million)

Intersection	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
SB I-5 OFF/Richards	10.1	11.0	11.0	10.7	10.6	12.7	10.9
North 7th/Richards	9.5	10.1	10.0	9.4	9.3	11.0	9.5
5th Street/I Street	11.3	11.7	11.7	12.0	12.0	12.0	12.1
6th Street/I Street	11.3	11.3	11.3	11.7	11.7	11.7	11.8
7th Street/I Street	12.3	12.9	12.9	12.6	12.5	12.6	12.7
7th Street/J Street	10.4	11.3	11.3	11.2	11.2	11.9	11.3
Sequoia/WB Richards	---	10.3	10.3	10.0	9.9	11.3	10.1
Gateway/EB Richards	---	11.8	11.9	11.6	11.5	13.0	11.7
Gateway/B Street	---	10.8	10.8	10.6	10.5	11.6	10.7
Sequoia/WB Crescent	---	10.8	10.8	11.9	11.8	11.4	12.1
5th Street/EB Crescent	---	10.7	10.8	11.7	11.6	11.2	11.8

[1] The 1-hour federal standard is 35 PPM; the State standard is 20 PPM.

SOURCE: Donald Ballanti, Certified Consulting Meteorologist

TABLE 4.9-11

PREDICTED YEAR 2010 WORST-CASE CARBON MONOXIDE CONCENTRATIONS FOR THE 8-HOUR AVERAGING TIME[1]
(In Parts Per Million)

Intersection	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
SB I-5 OFF/Richards	7.1	7.7	7.7	7.5	7.4	8.9	7.6
North 7th/Richards	6.6	7.1	7.0	6.6	6.5	7.7	6.7
5th Street/I Street	7.9	8.2	8.2	8.4	8.4	8.4	8.5
6th Street/I Street	7.9	7.9	7.9	8.2	8.2	8.2	8.3
7th Street/I Street	8.6	9.0	9.0	8.8	8.8	8.8	8.9
7th Street/J Street	7.3	7.9	7.9	7.8	7.8	8.3	7.9
Sequoia/WB Richards	N/A	7.2	7.2	7.0	6.9	7.9	7.1
Gateway/B Street	N/A	8.3	8.3	8.1	8.1	9.1	8.2
Gateway/EB Richards	N/A	7.6	7.6	7.4	7.4	8.1	7.5
Sequoia/WB Crescent	N/A	7.6	7.6	8.3	8.3	8.0	8.5
5th Street/EB Crescent	N/A	7.5	7.6	8.2	8.1	7.8	8.3

[1] The federal and State 8-hour standards are both 9 PPM. Concentrations exceeding this standard are underlined.

N/A: Not applicable

SOURCE: Donald Ballanti, Certified Consulting Meteorologist

A-6 Concentrations of carbon monoxide at buildout have not been analyzed using the CALINE-4 model, as was done for the Years 2000 and 2010, because of insufficient detail regarding traffic flows at the intersections selected for study, and the high uncertainty of emission rates for vehicles at buildout. Traffic volumes at the six intersections would be expected to increase between the Year 2010 and buildout, from 15 percent to 30 percent. Current projections are that carbon monoxide emission rates for vehicles will decrease by a small amount during the same period, so that increased concentrations may occur at the six intersections considered. Because of the difficulties of predicting emission levels at buildout, this is considered a ***potentially significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.9-3 would reduce the above impact to a *less-than-significant level.*

4.9-3 *Implement Mitigation Measure 4.9-1(b). This mitigation measure would be required for all Alternatives.*

4.9-4 The traffic generated by the Alternatives would increase regional emissions and cause a deterioration in regional air quality.

A-1 through A-7

All Alternatives would increase substantially regional emissions of Reactive Organic Gases (ROG), Oxides of Nitrogen (NO_X) and PM_{10}, as shown in Table 4.9-12. The most significant of these emissions would be Reactive Organic Gases and Nitrogen Oxides, which are precursors of ozone, the major regional problem in Sacramento. Substantial decreases in regional emissions will be necessary if the ozone and PM_{10} standards are to be met in Sacramento. This impact is considered ***significant and unavoidable.***

Mitigation Measures

The following mitigation measures would reduce the above impacts, but not to a *less-than-significant level.*

4.9-4(a) *Implement Mitigation Measure 4.9-1(a). This mitigation measure would be required for all Alternatives.*

4.9-4(b) *All development within the Planning Area shall be required to participate in a Transportation Management Association, whose purpose would be the reduction in vehicle trips. This mitigation measure would be required for all Alternatives.*

TABLE 4.9-12
REGIONAL EMISSIONS BY PHASE IN POUNDS PER DAY

	2000			2010			Buildout		
	ROG	NOX	PM_{10}	ROG	NOX	PM_{10}	ROG	NOX	PM_{10}
Alternative 1									
Railyards	44.1	58.6	5.7	81.2	115.3	11.2	80.9	115.1	11.1
Richards	77.1	106.4	10.4	113.0	166.9	16.5	139.0	206.5	20.2
Total	121.2	165.0	16.1	194.2	282.2	27.7	219.9	321.6	31.3
Alternative 2									
Railyards	316.1	434.7	43.0	704.0	1033.3	102.8	874.2	1289.7	127.2
Richards	249.8	346.8	34.4	719.5	1063.8	106.1	1498.9	2218.9	219.7
Total	565.9	781.5	77.4	1423.5	2097.1	208.9	2373.1	3508.6	345.0
Alternative 3									
Railyards	272.3	373.9	36.9	677.4	993.4	98.6	907.9	1337.6	131.7
Richards	237.8	327.9	32.6	599.6	885.3	88.2	1456.0	2153.8	219.7
Total	510.1	701.8	69.5	1277.0	1878.7	186.8	2363.9	3491.4	302.6
Alternative 4									
Railyards	245.1	336.4	33.1	712.0	1043.5	103.5	1059.0	1555.9	152.6
Richards	103.9	143.4	14.1	431.2	637.3	63.4	1027.7	1520.3	345.0
Total	349.0	479.8	47.2	1143.2	1680.8	166.9	2086.7	3076.2	302.6
Alternative 5									
Railyards	190.1	259.7	25.4	432.2	629.6	61.8	810.4	1620.0	158.1
Richards	174.3	240.7	24.0	500.1	735.9	73.6	969.9	1430.3	141.7
Total	364.4	500.4	49.4	932.3	1365.5	135.4	1780.3	2612.1	256.5
Alternative 6									
Railyards	272.3	373.9	36.9	687.4	1006.1	99.5	1105.7	1620.0	158.1
Richards	318.0	436.7	43.1	843.0	1238.4	122.7	1234.1	1815.4	177.6
Total	590.3	810.6	80.0	1530.4	2244.5	222.2	2339.8	3435.4	335.7
Alternative 7									
Railyards	245.1	336.4	33.1	712.0	1043.5	103.5	1059.0	1555.9	152.6
Richards	202.1	278.4	27.5	620.4	914.4	90.8	1256.3	1852.7	182.0
Total	447.2	614.8	60.6	1332.4	1957.9	194.3	2315.3	3408.6	334.6

SOURCE: Donald Ballanti, Certified Consulting Meteorologist

4.9-4(c) *All employment-generating uses shall be required to develop a Commute Management Plan, adopting programs using parking management/fees, transit incentives and amenities, alternative work schedules, telecommuting or other strategies to reduce employee commuting. The transportation performance standards of the California Clean Air Act would be adopted as minimum targets for trip reduction. This mitigation measure would be required for all Alternatives.*

4.9-4(d) *All development proposals within the Planning Area shall be required to use land use mix and densities, provision of transit/bicycle/pedestrian amenities, and provision of on-site amenities (day care, restaurants) to reduce the need for vehicle trips. This mitigation measure would be required for all Alternatives.*

The adoption of the above measures would have the potential to reduce the regional impacts of the Alternatives by 15-30 percent, a figure that is much higher than could be expected at sites without transit access and more distant from downtown Sacramento. Even with these substantial reductions, however, regional emission increases associated with development of the Planning Area would be considered to be a significant and unavoidable impact.

4.9-5 Construction activities, such as clearing, excavation and grading operations, construction vehicle traffic on unpaved ground and wind blowing over exposed earth, would generate dust and particulate matter.

Construction dust would affect local and regional air quality at various times during development of the Planning Area. The dry, windy climate of the area during the summer months, combined with the fine, silty soils of the region, create a high potential for dust generation.

Where construction is occurring upwind of previously-completed portions of the Planning Area, a potential for dust nuisance would be created. The effects of construction activities would be increased dustfall and locally elevated levels of particulate matter. Dustfall would soil exposed surfaces, requiring more frequent washing during the construction period.

The emission of particulate matter from construction is often considered a temporary source that has local effects but not regional effects. Given the large size and long buildout period for the Planning Area, however, construction is likely to affect regional air quality as well.

A-1 Alternative 1 would result in intermittent and temporary dust impacts within the Richards Area over the buildout period of that area. This would be a ***significant impact.***

A-2 through A-7

Alternatives 2 through 7 would result in intermittent and temporary dust impacts within the Planning Area over the buildout period of the two areas. This would be a ***significant impact.***

Mitigation Measures

Normal construction dust practices (occasional watering) would not be effective in reducing the local and regional dust and PM_{10} impacts of project construction in the Planning Area. The low humidity and high winds typical of the site much of the year would make this control method ineffectual. The severity of construction impacts can be reduced to a level that is *less than significant* through application of the following mitigation measure.

4.9-5 *To ensure that construction mitigation is used, final approval shall not be given to any development within the Planning Area until the developer submits a construction dust mitigation plan satisfactory to the City. This plan should specify the methods of control that will be used to control dust and particulate matter, demonstrate the availability of needed equipment and personnel, and identify a responsible individual who, if needed, can authorize the implementation of additional measures. This mitigation measure would be required of all Alternatives.*

The construction dust mitigation plan should, at a minimum, include the following:

- *Suspend earthmoving or other dust-producing activities during periods of high winds when dust control measures are unable to prevent visible dust plumes.*
- *Provide equipment and staffing for watering of all exposed or disturbed soil surfaces at least twice daily, including weekends and holidays. An appropriate dust palliative or suppressant, added to water before application, should be used.*
- *Water or cover stockpiles of debris, soil, sand or other materials that can be blown by the wind.*
- *Sweep construction area and adjacent streets of all mud and debris, since this material can be pulverized and later re-suspended by vehicle traffic.*
- *Limit the speed of all construction vehicles to 15 miles per hour while on-site.*
- *All materials transported by truck will be covered or wetted down.*
- *All inactive portions of the site will be watered with an appropriate dust suppressant, covered or seeded.*

4.9-6 Air quality would decrease as a result of construction-related activities.

A-1 through A-7

Construction activities would temporarily increase NO_x, Reactive Organic Compounds (ROC) and CO concentrations in the project vicinity. These activities have the potential to affect residents of nearby homes. Construction equipment and vehicles generate dust during clearing, excavation, and grading operations. Construction vehicle traffic on unpaved surfaces also generates dust, as would wind blowing over exposed earth. Construction equipment and vehicles also generate air contaminants from exhaust.

The primary sources of construction-related ROC and NO_x emissions are gasoline and diesel-powered heavy duty mobile construction equipment, such as scrapers and motor graders. Table 4.9-13 presents emission factors that can be used to estimate ROC and NO_x emissions. The emission factors presented are in pounds per hour. To obtain an estimate of daily emissions associated with the anticipated heavy-duty construction equipment, the appropriate emission factors should be multiplied by the number of hours of operation per day. To estimate construction-related ROC and NO_x emissions in tons per year, multiply the daily emission rate by the estimated number of days of project construction. Decreased air quality as a result of construction-related activities constitutes a ***significant short-term impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.9-6 will reduce project impacts to a *less-than-significant level.*

4.9-6 *Implement Mitigation Measure 4.9-5. This mitigation measure would be required for all Alternatives.*

TABLE 4.9-13

EMISSION FACTORS FOR HEAVY-DUTY DIESEL AND GASOLINE POWERED CONSTRUCTION EQUIPMENT (POUNDS/HOUR)

Equipment Type	Reactive Organic Compounds (ROC)	Nitrogen Oxides (NOx)
Diesel		
Tracked Tractor	0.12	1.26
Wheeled Tractor	0.19	1.27
Wheeled Dozer	0.19	4.16
Scraper	0.28	3.84
Motor Grader	0.04	0.71
Wheeled Loader	0.25	1.89
Tracked Loader	0.10	0.83
Off-Highway Truck	0.19	4.17
Roller	0.07	0.86
Miscellaneous	0.15	1.69
Gasoline		
Wheeled Tractor	0.50	0.43
Motor Grader	0.56	0.32
Wheeled Loader	0.70	0.52
Roller	0.80	0.36
Miscellaneous	0.73	0.41

SOURCE: *Compilation of Air Pollution Emission Factors*, Fourth Edition, AP-42, EPA, 1985.

ENDNOTES

1. Sacramento Metropolitan Air Quality Management District, 1991. *Sacramento 1991 Air Quality Attainment Plan*, July 1991.

2. Sacramento Area Council of Governments, 1990. *Regional Air Quality Plan 1990.*

4.10 NOISE

4.10 NOISE

INTRODUCTION

This section examines the effects of Planning Area traffic and rail noise on existing and future sensitive receptors, such as residential areas.

SETTING

Noise Criteria

The following is a discussion of the various noise criteria and guidelines that are applicable to development in the Planning Area. Both the City and State guidelines are discussed.

City of Sacramento

Noise Element

The City of Sacramento's noise and land use compatibility guidelines are contained in the Noise Element of the General Plan (see Table 4.10-1). These guidelines contain indoor and outdoor noise criteria for residential development. The indoor noise standards are consistent with the State of California Noise Insulation Standards. Although the State has no outdoor standard, the City has an outdoor residential noise standard of 60 dB L_{dn}. (Readers unfamiliar with the fundamental concepts of environmental acoustics are referred to Appendix G.) This standard should be applied to outdoor use areas, such as back yards in single-family residential developments, and common areas, such as pools and playgrounds in multifamily residential developments.

The Noise Element also contains criteria for maximum interior noise levels from railroad activity measured in A-weighted decibels. This scale approximates the varying sensitivity to sound of human hearing from 0 dB to about 140 dB. The maximum instantaneous A-weighted noise level from train passbys should not exceed 50 dB in bedrooms and 55 dB in other habitable rooms for both single-family and multifamily residential developments. These limits also should also be applied to noise from light-rail vehicle passbys.

The above City and State criteria are requirements for new development. However, these noise criteria do give an indication of the noise sensitivity of existing land uses.

TABLE 4.10-1
MAXIMUM ACCEPTABLE INTERIOR AND EXTERIOR NOISE LEVELS FOR NEW DEVELOPMENT WITHOUT MITIGATION

Noise Source	Land Use	Applicable Area		State Requirements[1]	Noise Element Requirements
		Interior	Exterior		
Traffic or fixed source (industrial, plants, etc.)	Single-family	x		None	$L_{dn} \leq 45$ dB[2]
	Single-family		x	None	$L_{dn} \leq 60$ dB in backyards
	Multifamily[3]	x		$L_{dn} \leq 45$ dB	$L_{dn} \leq 45$ dB
	Multifamily		x	None	$L_{dn} \leq 60$ dB in common outdoor use areas
	Schools	x		None	Noisiest hourly $L_{eq} \leq 40$ dB during school day
	Schools		x	None	$L_{dn} \leq 60$ dB
	Libraries	x		None	Noisiest hour $L_{eq} \leq 45$ dB
	Libraries		x	None	None
Aircraft	Single-family	x		None	$L_{dn} \leq 45$ dB and maximum instantaneous levels of ≤ 50 dBA in bedrooms and $\leq$ 55 dBA in other habitable rooms[2]
	Single-family		x	CNEL $\leq$ 65 dB (State Aeronautics Noise Standards) requirement does not apply to Mather and McClellan AFB	CNEL $\leq$ 60 dB for Metro Airport CNEL $\leq$ 65 dB for all others
	Multifamily	x		$L_{dn} \leq 45$ dB	$L_{dn} \leq 45$ dB and maximum instantaneous levels of ≤ 50 dBA in bedrooms and $\leq$ 55 dBA in other habitable rooms[2]
	Multifamily		x	CNEL $\leq$ 65 dB (State Aeronautics Noise Standards) requirement does not apply to Mather and McClellan AFB	CNEL $\leq$ 60 dB for Metro Airport CNEL $\leq$ 65 dB for all others
	Schools	x		None	Noisiest hourly $L_{eq} \leq 40$ dBA during school day
	Schools		x	CNEL $\leq$ 65 dB (State Aeronautics Noise Standards) requirement does not apply to Mather and McClellan AFB	CNEL $\leq$ 60 dB for Metro Airport CNEL $\leq$ 65 dB for all others
	Libraries	x		None	Noisiest hour $L_{eq} \leq 45$ dB
	Libraries		x	None	None
Rail traffic	Single-family	x		None	$L_{dn} \leq 45$ dB and maximum instantaneous levels of ≤ 50 dBA in bedrooms and $\leq$ 55 dBA in other habitable rooms[2]
	Single-family		x	None	$L_{dn} \leq 60$ dB
	Multifamily	x		$L_{dn} \leq 45$ dB unless there are less than 4 trains per day between 7 AM and 10 PM and there are no trains between 10 PM and 7 AM	$L_{dn} \leq 45$ dB and maximum instantaneous levels of ≤ 50 dBA in bedrooms and $\leq$ 55 dBA in other habitable rooms[2]
	Multifamily		x	None	$L_{dn} \leq 60$ dB
	Schools	x		None	Noisiest hourly $L_{eq} \leq 40$ dB during school day
	Schools		x	None	Maximum instantaneous levels $\leq$ 85 dBA
	Libraries	x		None	Noisiest hour $L_{eq} \leq 45$ dB
	Libraries		x	None	None

[1] Projects for which U.S. Department of HUD financing is requested are subject to HUD noise requirements. The noise element requirements listed in this table are at least as stringent as the HUD requirements.
[2] The requirement for interior noise exposure is triggered when the exterior L_{dn} exceeds 60 dB.
[3] Multifamily includes hotels, motels, apartment houses and dwellings other than detached single-family dwellings as defined by Title 24, Part 2, California Administrative Code.
SOURCE: City of Sacramento General Plan, 1987

All of the Alternatives evaluated in this EIR would result in increased traffic noise, which could affect existing sensitive receptors. Under Alternatives 2 through 7, new sensitive receptors, primarily residences, would be placed in proximity to roads and rail lines.

Noise Ordinance

The City also has adopted a Noise Ordinance, Chapter 66 of the Sacramento City Code. This ordinance contains exterior and interior noise standards. These standards are applied to fixed noise sources, such as mechanical equipment, to limit their intrusive nature. The standards will be applied to mechanical equipment associated with the new buildings for industrial uses in the Planning Area. Construction noise is exempt from the noise ordinance between the hours of 7 AM and 6 PM on Monday through Saturday and between 9 AM and 6 PM on Sunday. This exemption does have restrictions on internal combustion engines. Internal combustion engines will be exempt only if they are equipped with suitable exhaust and intake silencers.

The ordinance does not allow certain noisy construction activities, such as pile driving and pneumatic hammers, between the hours of 10 PM and 7 AM. Also, the Director of Building Inspections may permit work to be done during hours not exempt from the ordinance.

Health and Safety Element

The City General Plan also includes a Health and Safety Element with noise-related policies that include:

> Goal A
>
> Future development should be compatible with the projected year 2016 noise environment.
>
> Policy 1
>
> Require an acoustical report for any project which would be exposed to noise levels in excess of those shown as normally acceptable in Figure 1 [Table 4.10-1]. The contents of the acoustical report shall be as described in Section IV. No acoustical report shall be required where City staff has an existing acoustical report on file which is applicable.
>
> Policy 2
>
> Require mitigation measures to reduce noise exposure to the "Normally Acceptable Levels" (Figure 1) except where such measures are not feasible.
>
> Goal C
>
> Eliminate or minimize the noise impacts of future development on existing land uses in Sacramento.

As stated above, all of the Alternatives would result in additional noise in the Planning Area. In some instances, noise would exceed acceptable levels unless mitigated, as discussed under Impacts and Mitigation Measures.

State of California

Noise Insulation Standards for Multifamily Housing

State standards (Title 24, Part 2, California Code of Regulations) require a detailed acoustical analysis for new multifamily residential (including hotels and transient lodging) projects on sites that are exposed to a Day-Night Average Sound Level (L_{dn}) of 60 dB or greater. The acoustical analysis must show how the project will provide interior L_{dn} of 45 dB or less. The State Code applies to all noise sources including airports, trains, roadways, and industrial sites.

The detailed acoustical analysis required by Title 24 usually includes a site-specific noise measurement program and calculations of noise exposure based on the traffic volume information. Measures such as sound-rated windows and doors are usually recommended to meet the State's interior requirement of 45 dB L_{dn}. The State also requires that an alternate form of ventilation (i.e., mechanical ventilation) be provided if the windows need to be closed to meet the indoor standard.

Caltrans: Federal Highway Noise Abatement Criteria

Caltrans also has noise standards for new highways or modifications to existing highways. These standards are contained in the Federal Highway Aid Program Manual (FHPM 7-7-3). For residential development, Caltrans considers a peak hour L_{eq} of 67 dB to be the maximum acceptable outdoor noise level. For commercial uses, an outdoor peak hour L_{eq} of 72 dB is considered acceptable. These criteria are used by Caltrans to determine when noise mitigation (e.g., freeway walls) should be considered. Caltrans usually provides mitigation where new freeway development occurs adjacent to existing residential development. If new residences are developed adjacent to existing freeways, it is the developer's responsibility to meet the City's noise standards, which are usually more stringent than those of Caltrans.

Existing Noise Environment

The major noise sources in the Planning Area are vehicular traffic on Interstate 5 and railroad activity. Although both of these noise sources are quantified with the same noise descriptor (L_{dn}), the character of the noise differs dramatically. Traffic noise on major roads, such as freeways and arterials, is relatively steady. The highest noise levels are generated during the morning and afternoon peak hours. The quietest noise levels occur during the nighttime and early morning, and are typically 10 dB less than peak hour noise levels. The railroad, on the other hand, is virtually silent most of the time, but during train passbys, very high noise levels occur. Train noise components are the diesel-electric locomotive, the wheel/rail interface, and sometimes a whistle blast. Since highway noise is steady, the 24-hour noise level (L_{dn}) can usually be determined by measuring for short periods of time. The L_{dn} due to train activity depends not only on the noise level of a train passby, but on how many trains occur during a 24-hour period and especially on how many trains occur at night. Since the L_{dn} descriptor penalizes nighttime noise levels by 10 dB, one nighttime passby has the same noise exposure contribution as 10 daytime passbys.

To quantify the existing noise environment in the Planning Area, a series of 24-hour and short-term (10 to 15-minute) noise measurements were conducted. The locations of these measurements are shown in Figure 4.10-1. Noise measurements were conducted using a Larson-Davis Laboratories Model 700 sound level meter. For the long-term measurements, the meter was secured to a telephone or a light pole. The short-term noise measurements were performed at approximately 5-1/2 feet above ground level. The results of the noise measurements are discussed in the following sections.

Traffic Noise

Figure 4.10-2 shows the traffic noise contours for the existing conditions. The contours were developed based on noise measurements and calculations using existing traffic volumes.

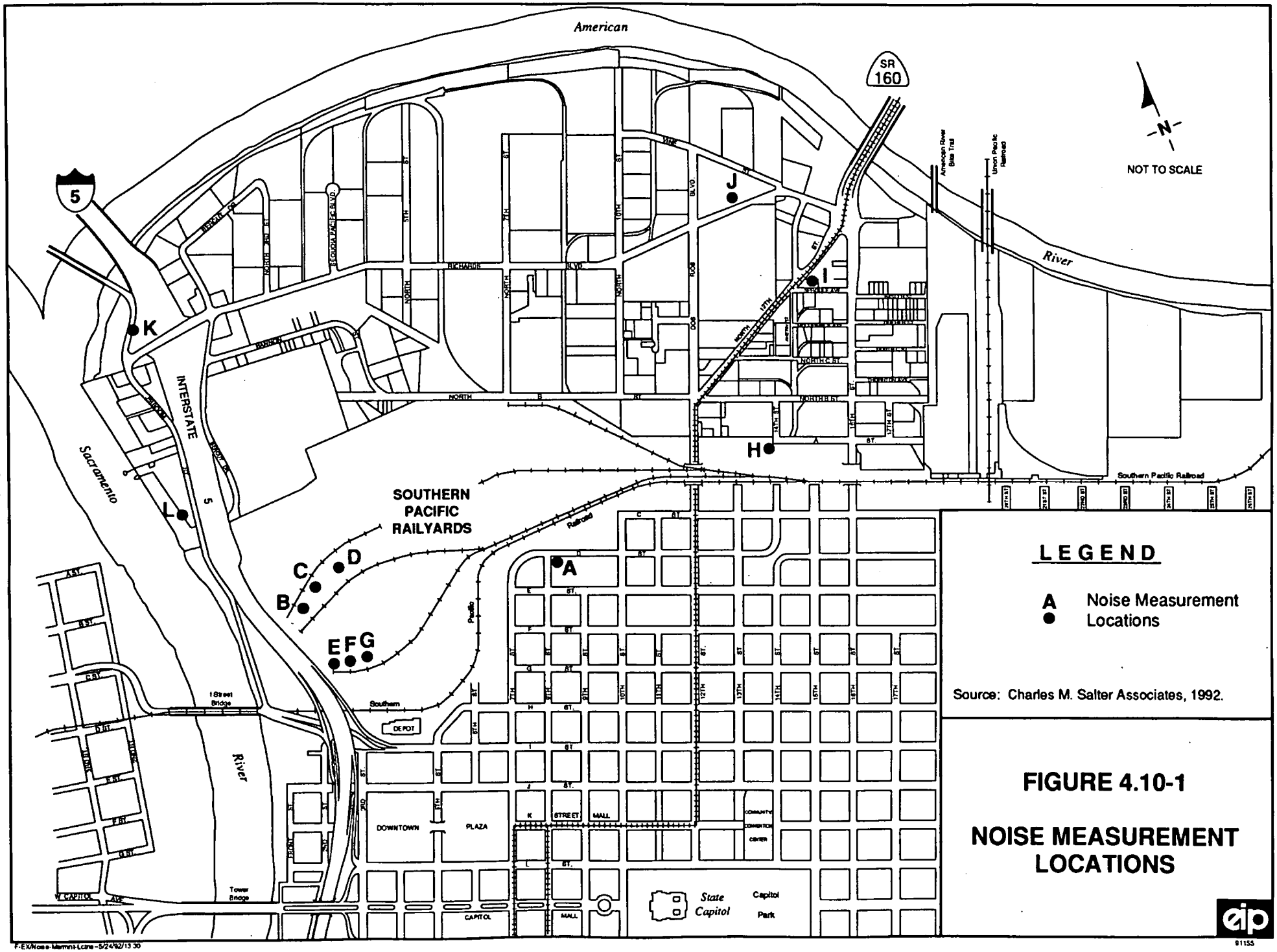
Freeway Noise

I-5 is elevated 30 to 37 feet on a structure as it passes through the Planning Area. The edge of the roadway provides acoustical shielding because it blocks the line-of-sight between the traffic and a receiver standing on the ground. The noise contours represent ground floor noise exposure. Based upon calculations using the Federal Highway Administration's Noise Prediction Model (FHWA RD-77-108), this shielding reduces the ground floor noise exposure by 5 to 10 dB. If the receiver were elevated to the freeway level or higher, as in a high-rise building, the noise exposure would be higher.

One 24-hour measurement was conducted along the freeway north of Richards Boulevard at Location K. The L_{dn} at this location was 74 dB. Short-term measurements were conducted at seven other locations near the freeway to quantify the extent of the freeway noise exposure. At these locations (B through G and Location L), the average noise level (L_{eq}) ranged from 58 to 66 dB.

Railroad Noise

Noise contours for main-line railroad operations are shown in Figure 4.10-3. Noise from on-site switching and maintenance activities is not included in the contours. The Southern Pacific main line runs east/west through the site on the southeastern boundary. According to information used in the preparation of the City's Noise Element of the General Plan, there are an average of 20 through operations per day with eight to 10 of these occurring during nighttime hours (10 PM to 7 AM). Generally, the through trains travel at approximately 10 miles per hour when on the railyard site. These operations include freight, local, and passenger trains. The Union Pacific main line runs north/south through the east end of the Planning Area. There are an average of 15 operations per day with five of these occurring during nighttime hours. These trains travel at about 20 miles per hour. The noise contours were prepared using train noise estimation procedures described in "Assessment of Noise Environments Around Railroad Operations" (Wyle, 1973). The contours do not take into account acoustical shielding provided by the terrain or existing buildings.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River
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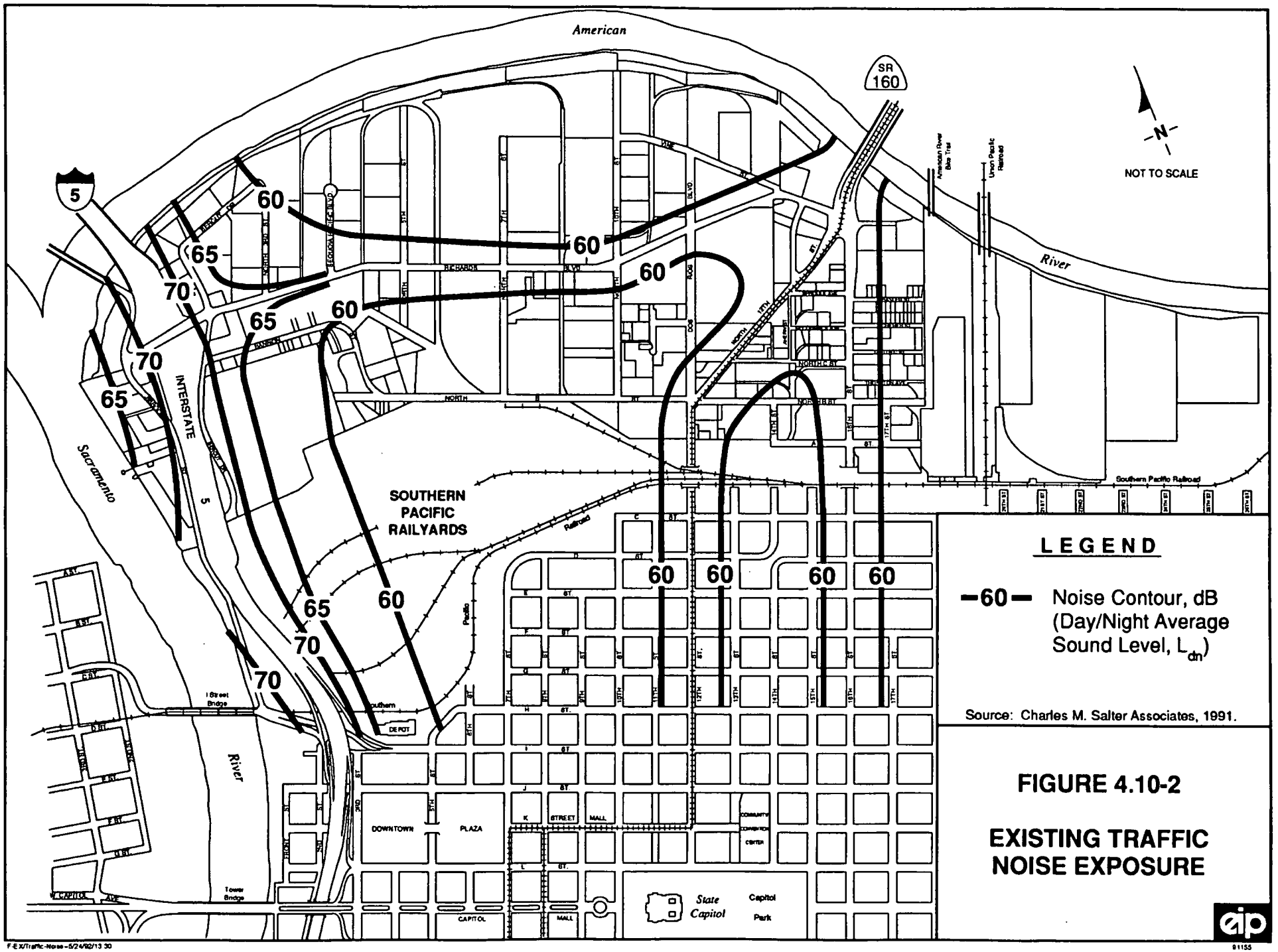
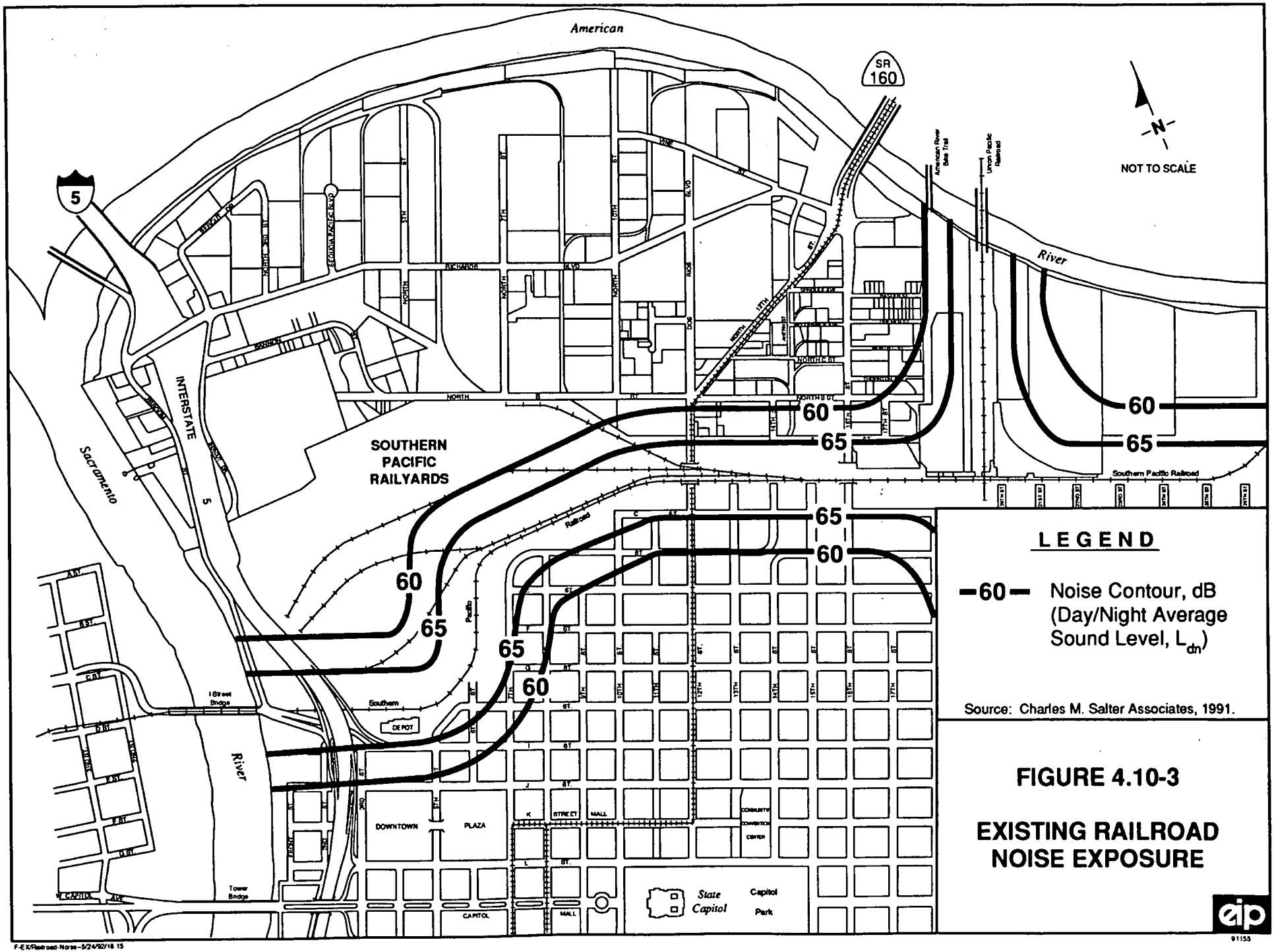
B
C
D
E
F
G
H
I
J
K
L
DOWNTOWN PLAZA
K STREET MALL
CAPITOL MALL
State Capitol
Capitol Park
DEPOT
Tower Bridge
I Street Bridge
W. CAPITOL AVE
LEGEND
A Noise Measurement Locations
Source: Charles M. Salter Associates, 1992.
FIGURE 4.10-1
NOISE MEASUREMENT LOCATIONS


American
River
SR 160
NOT TO SCALE
5
60
65
70
INTERSTATE
Sacramento
SOUTHERN PACIFIC RAILYARDS
Southern Pacific Railroad
I Street Bridge
Tower Bridge
DEPOT
DOWNTOWN
PLAZA
K STREET MALL
CAPITOL
MALL
State Capitol
Capitol Park
LEGEND
60 Noise Contour, dB (Day/Night Average Sound Level, L_{dn})
Source: Charles M. Salter Associates, 1991.
FIGURE 4.10-2
EXISTING TRAFFIC NOISE EXPOSURE


American
River
SR 160
5
INTERSTATE 5
Sacramento
SOUTHERN PACIFIC RAILYARDS
Southern Pacific Railroad
American River Bike Trail
Union Pacific Railroad
NOT TO SCALE
60
65
65
60
60
65
65
60
I Street Bridge
Tower Bridge
River
DOWNTOWN PLAZA
K STREET MALL
CAPITOL MALL
State Capitol
Capitol Park
DEPOT
LEGEND
-60- Noise Contour, dB (Day/Night Average Sound Level, L_{dn})
Source: Charles M. Salter Associates, 1991.
FIGURE 4.10-3
EXISTING RAILROAD NOISE EXPOSURE
91155

To quantify the effect of railroad operations on existing adjacent noise-sensitive land uses, one long-term noise measurement was made at the multifamily residential land use on the corner of D Street and Eighth Street (Location A). This location is about 200 feet from the main line Southern Pacific tracks. During the measurement period, (3 PM on 5 April 1990 to 9 AM on 6 April 1990), there were 11 train passbys. Typical train passbys generated maximum A-weighted sound levels of 82 dB. The Day/Night Average Sound Level (L_{dn}) at the measurement location was 69 dB.

A 24-hour noise measurement was conducted at Location H along North 14th Street, approximately 300 feet north of the Southern Pacific tracks. The measured L_{dn} at this location was 68 dB. Typical train passbys generated a maximum A-weighted sound level of 78 dB. There were approximately 23 trains over the 24-hour period.

Other noise sources in the Railyards Area include maintenance and switching activities. During our site visit, we measured noise from rail grinding operations. The rail grinding generated a steady A-weighted sound level of 81 dB at a distance of 100 feet. Other activities, such as switching, generate impulsive sounds of short duration.

Light-Rail Noise

The RT Metro light-rail system travels through the Planning Area along the east side of 12th Street. The light-rail vehicles are propelled by electric motors, which are relatively quiet compared to diesel engines. The major noise source is associated with the wheel/rail interface. A 24-hour noise measurement was conducted on the east side of 12th Street approximately 50 feet from the centerline of the light-rail tracks (Location I). At this location, the noise environment was dominated by vehicular traffic on 12th Street and the light-rail vehicle passbys. The L_{dn} at the this location was 70 dB, including both vehicular and light-rail traffic. Maximum A-weighted noise levels from light-rail vehicle passbys were approximately 78 to 80 dB. According to the RT schedule, there are 106 daytime passbys and 26 passbys before 7 AM or after 10 PM.

Sensitive Receivers

There are three residential neighborhoods within the Richards Area. The Basler/Dreher neighborhood is somewhat removed from the major transportation noise sources in the Planning Area, except for those homes along 16th Street. The Dos Rios neighborhood is exposed to noise levels above those considered "normally acceptable" from both Richards Boulevard and North 12th Street. There are some single-family and multifamily housing areas southeast of the Railyards Area around 8th and D Streets (Alkali Flat). These homes are exposed to noise levels above "normally acceptable" due to rail activity on the Southern Pacific main line. There are also some homes to the north, along Bannon Street. There are a number of hotels and motels along Interstate 5 in the Richards Area. These uses are exposed to high noise levels due to the freeway traffic.

The Dos Rios Elementary School is located along Richards Boulevard. According to noise measurements on the site (Location J), the schoolyard is exposed to an L_{dn} of 62 dB at a distance

of 100 feet from the centerline of Richards Boulevard. The noise exposure at this level begins to interfere with speech communication in a normal voice outdoors.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Significant impacts are identified when existing or future sensitive land uses are exposed to noise greater than that considered "normally acceptable." A day/night average sound level (L_{dn}) of 60 dB is used as the limit of "normally acceptable" noise exposure for residential, hotel, and school land uses. This is based on the City's Noise and Land Use Compatibility Guidelines contained in the Noise Element of the General Plan. Impacts on existing noise-sensitive land uses were based on a policy in the City's Noise Element to assess the potential for a project to generate "community response." Exposure to an increase in L_{dn} of 5 dB or more is considered a significant impact, based on the potential for the community to respond with complaints regarding the increased noise exposure.

Method

This section presents future noise levels predicted for the various noise sources in the Planning Area. Traffic noise is predicted using the traffic volumes projected for the various Alternatives. These calculations use the Federal Highway Administration's Traffic Noise Prediction Model (FHWA-RD-77-108), which has been modified to reflect the vehicle noise emissions standardized by the California State Department of Transportation (CALVENO). The calculations of future traffic noise levels assume that the current travel speeds and truck percentages will remain relatively constant. For new roads, the travel speeds are estimated to be 35 miles per hour and heavy trucks are assumed to make up approximately 2 percent of the total traffic. The future traffic noise predictions do not take into account acoustical shielding provided by existing or future buildings. This provides a worst case noise level for impact assessment purposes. The tables indicate the noise level at a distance of 75 feet from the center of the road. This traffic noise level would be expected to drop off approximately 4.5 dB for each doubling of distance from the road. The estimated LRT and railroad noise is based upon on-site noise measurements discussed in the Setting Section and calculations using the total daily number of operations. The noise generated by these rail facilities is projected to new areas when the alignments change as part of an Alternative.

Impacts and Mitigation Measures

4.10-1 New noise-sensitive uses may be incompatible with the Year 2000, Year 2010, and buildout noise environments.

Future traffic noise levels have been calculated for the freeways arterials and major roads in the Planning Area based on the traffic volumes projected for each Alternative. The day/night average noise level (L_{dn}) for each roadway segment for the year 2000 is shown in Table 4.10-2. Tables 4.10-3 and 4.10-4 show the traffic noise levels for the year 2010 and buildout, respectively. Res-

TABLE 4.10-2
L_{DN} AT 75 FEET FROM ROADWAY CENTERLINE
YEAR 2000

LOCATION	ALTERNATIVE						
	1	2	3	4	5	6	7
Third Street							
south to L	64	64	65	65	63	65	65
Sixth Street							
I to Crescent (eb)	62	63	64	64	64	65	64
Crescent (wb) to North B (wb)	N/A	65	65	63	63	66	64
Seventh Street							
L to F	63	65	65	64	64	66	65
Richards (eb) to Richards (wb)	60	63	63	62	62	64	63
L Street							
3rd to 7th	66	66	66	66	66	66	66
J Street							
3rd to 5th	64	66	66	66	66	66	66
5th to 6th	64	65	64	64	64	64	64
6th to 7th	64	65	65	65	65	65	65
I Street							
6th to 7th	67	67	67	67	67	67	67
7th to 10th	68	67	67	67	67	67	67
Richards Boulevard (westbound)							
I-5 to 6th	66	69	68	68	68	69	68
6th to 12th	65	66	66	65	65	66	66

N/A: Not Applicable

SOURCE: Charles Salter and Associates, 1992.

TABLE 4.10-3 (Cont)
L_{dn} AT 75 FEET FROM ROADWAY CENTERLINE
YEAR 2010

LOCATION	ALTERNATIVE						
	1	2	3	4	5	6	7
Third Street							
south to L	63	64	65	64	65	64	65
to I	**	69	70	69	69	67	69
to Crescent (n)	**	69	70	70	70	67	69
Fifth Street							
south to G	64	63	64	64	63	64	64
to Crescent (n)	**	64	65	64	64	66	64
to B (eb)	**	63	65	62	62	64	63
to Richards (eb)	**	60	63	60	60	62	60
to Richards (wb)	**	63	65	63	63	65	63
Sixth Street							
I to Crescent (eb)	**	65	66	65	65	55	65
to Crescent (wb)	**	62	63	60	60	64	61
to North B (wb)	**	64	65	63	63	65	63
to Richards (eb)	**	62	63	60	60	62	61
to Richards (wb)	**	56	60	53	53	59	56
Seventh Street							
L to F	**	67	66	67	66	66	67
to Gateway	**	72	71	72	71	71	72
to B (eb)	**	69	69	68	68	69	66
Seventh Street (sb)	**	63	63	62	60	63	62
Seventh Street (nb)	**	61	62	60	59	63	61
Seventh Street							
Richards (eb) to Richards (wb)	**	67	68	66	66	68	67
to north	**	63	65	56	56	65	63
Eighth Street							
L to J	63	63	63	63	63	63	63
to F	66	65	65	65	65	65	65
Ninth Street							
L to J	62	62	62	62	62	62	62
to H	66	66	66	66	66	66	66
to D	63	62	63	63	62	63	62
Tenth Street							
L to J	62	63	63	63	63	63	63
to I	66	66	66	66	66	66	66
to G	63	64	64	64	63	63	63
to D	62	57	59	57	59	57	57

TABLE 4.10-3 (Cont)
L_{dn} AT 75 FEET FROM ROADWAY CENTERLINE
YEAR 2010

LOCATION	ALTERNATIVE						
	1	2	3	4	5	6	7
Twelfth Street							
L to J	68	66	66	66	66	66	66
to H	63	61	62	61	61	61	61
to D	66	64	65	64	64	64	64
to North B (wb)	69	68	68	68	68	68	68
Sixteenth Street							
J to I	69	69	69	69	70	70	70
to Richards	67	66	66	66	67	67	67
to Route 160	68	68	69	66	69	66	69
L Street							
3rd to 7th	66	65	66	65	65	65	65
to 9th	65	64	65	64	64	64	64
J Street							
3rd to 5th	68	66	67	67	67	67	67
to 6th	67	65	65	65	65	65	65
to 7th	67	66	66	66	66	66	66
to 10th	68	68	68	68	68	68	68
to 14th	68	66	66	66	66	66	66
I Street							
3rd to 6th	67	67	68	67	67	67	67
to 7th	66	65	65	65	65	65	65
to 10th	67	65	66	66	66	66	66
to 14th	65	65	64	65	65	65	65
H Street							
5th to 7th	64	63	63	63	62	64	63
to 9th	64	66	66	66	66	66	66
to 12th	62	64	64	64	63	64	64
to 14th	65	66	66	65	65	66	66
G Street							
5th to 6th	**	62	63	62	61	63	62
to 10th	**	64	65	64	64	64	64
to 16th	**	63	64	63	63	64	64
F Street							
7th to 8th	**	65	65	65	65	65	65
D Street							
9th to 12th	69	66	66	66	66	66	66
to 14th	67	66	66	66	66	67	66
to 16th	70	66	66	66	66	67	66

TABLE 4.10-3 (Cont)
L_{dn} AT 75 FEET FROM ROADWAY CENTERLINE
YEAR 2010

LOCATION	ALTERNATIVE						
	1	2	3	4	5	6	7
Crescent (eastbound)							
3rd to 6th	**	66	66	66	66	67	66
to Gateway	**	63	64	63	63	64	64
Crescent (westbound)							
3rd to 5th	**	66	66	66	66	66	66
to 6th	**	64	65	64	64	65	64
to Gateway	**	62	63	62	63	63	62
Gateway Boulevard							
Crescent to 7th	**	69	69	69	69	69	69
to B Street (wb)	**	69	72	72	72	72	72
to North B (wb)	**	73	73	73	73	73	73
to Route 160	71	73	73	75	73	76	73
B Street							
5th to 7th (sb)	**	62	63	60	59	62	61
5th to 7th (nb)	**	59	61	59	53	62	57
7th to Gateway	**	63	64	64	63	64	64
North B							
5th to 6th	**	**	53	**	**	53	**
to 7th	**	61	63	60	60	63	60
to 10th	**	57	60	57	56	61	57
to Gateway	53	60	62	59	57	64	60
Richards Boulevard (eastbound)							
I-5 to 5th	**	68	68	67	67	68	67
to 7th	**	65	65	65	65	66	65
to 10th	**	64	64	64	64	65	64
to 12th	**	66	66	66	66	68	66
to east	**	67	67	67	67	67	68
Richards Boulevard (westbound)							
I-5 to 6th	70	67	68	67	67	68	67
to 12th	68	65	65	65	64	66	65
to Richards	**	67	64	64	66	64	66
1st North of Richards Boulevard							
6th to 7th	**	64	65	63	65	66	65
to end	**	66	67	66	67	67	66
Route 160	79	80	80	80	79	80	80
Interstate 5	82	81	81	82	82	82	81

SOURCE: Salter and Associates, 1992

TABLE 4.10-4 (Cont)
L_{dn} AT 75 FEET FROM ROADWAY CENTERLINE
BUILDOUT

LOCATION	ALTERNATIVES						
	1	2	3	4	5	6	7
Third Street							
south to L	64	64	64	64	65	65	64
to I	**	70	70	71	71	72	71
to Crescent (n)	**	70	70	71	72	72	71
Fifth Street							
south to G	64	65	65	65	65	65	65
to Crescent (n)	**	66	66	66	68	67	67
to B (eb)	**	65	65	66	67	66	65
to Richards (eb)	**	63	63	63	65	64	63
to Richards (wb)	**	65	65	65	68	67	66
Sixth Street							
I to Crescent (eb)	**	67	67	66	67	67	67
to Crescent (wb)	**	64	64	63	64	64	65
to North B (wb)	**	65	65	66	66	66	66
to Richards (eb)	**	63	63	66	66	64	63
to Richards (wb)	**	60	60	59	59	60	60
Seventh Street							
L to F	**	66	66	66	67	67	67
to Gateway	**	72	71	71	73	72	72
to B (eb)	**	69	69	69	71	71	69
Seventh Street (sb)	**	63	63	63	65	65	63
Seventh Street (nb)	**	62	63	63	65	64	63
Seventh Street							
Richards (eb) to Richards (wb)	**	65	65	65	66	66	65
to north	**	65	65	65	69	67	66
Eighth Street							
L to J	64	63	63	63	64	64	64
to F	66	66	66	66	66	66	66
Ninth Street							
L to J	62	63	63	62	63	63	63
to H	66	66	66	65	66	66	66
to D	62	62	62	62	61	62	61
Tenth Street							
L to J	62	63	63	63	64	64	63
to I	66	66	66	66	66	66	66
to G	63	64	64	63	64	64	64
to D	62	57	57	57	57	57	57

TABLE 4.10-4 (Cont)
L_{dn} AT 75 FEET FROM ROADWAY CENTERLINE
BUILDOUT

LOCATION	ALTERNATIVES						
	1	2	3	4	5	6	7
Twelfth Street							
L to J	67	67	67	67	67	67	67
to H	63	62	62	62	61	62	62
to D	66	65	65	65	63	65	64
to North B (wb)	69	68	68	68	68	68	68
Sixteenth Street							
J to I	68	68	69	69	68	69	69
to Richards	67	67	66	66	67	67	67
to Route 160	67	66	66	66	68	68	67
L Street							
3rd to 7th	66	66	66	66	66	66	66
to 9th	66	65	65	65	65	65	65
J Street							
3rd to 5th	68	67	67	67	68	68	68
to 6th	66	65	65	65	65	65	65
to 7th	66	67	67	67	67	67	67
to 10th	68	67	67	67	67	68	68
to 14th	67	66	66	66	67	67	67
I Street							
3rd to 6th	67	68	67	68	68	69	68
to 7th	66	65	65	65	65	65	65
to 10th	66	66	66	66	66	66	67
to 14th	65	64	65	65	65	65	66
H Street							
5th to 7th	64	64	64	64	65	65	65
to 9th	64	66	66	65	67	67	67
to 12th	62	64	64	64	66	65	65
to 14th	65	66	66	66	67	67	66
G Street							
5th to 6th	**	63	63	63	64	64	63
to 10th	**	65	65	66	66	67	66
to 16th	**	63	64	64	65	65	64
F Street							
7th to 8th	**	66	66	65	66	66	66
D Street							
9th to 12th	69	66	66	66	65	65	65
to 14th	67	66	66	66	67	67	66
to 16th	69	66	66	67	67	67	66

TABLE 4.10-4 (Cont)
L_{dn} AT 75 FEET FROM ROADWAY CENTERLINE
BUILDOUT

LOCATION	ALTERNATIVES						
	1	2	3	4	5	6	7
Crescent (eastbound)							
3rd to 6th	**	67	67	67	67	68	67
to Gateway	**	64	64	64	65	65	64
Crescent (westbound)							
3rd to 5th	**	67	67	67	69	68	68
to 6th	**	64	65	66	67	66	66
to Gateway	**	63	63	63	64	64	63
Gateway							
Crescent to 7th	**	69	69	69	70	70	70
to B Street (wb)	**	72	72	72	72	72	72
to North B (wb)	**	73	74	74	74	74	74
to Route 160	71	75	76	76	76	76	76
B Street							
5th to 7th (sb)	**	63	62	63	65	64	63
to 7th (nb)	**	60	62	63	65	64	61
to Gateway	**	64	65	66	67	66	65
North B							
5th to 6th	**	53	53	53	56	56	53
to 7th	**	62	63	63	63	64	63
to 10th	**	60	61	61	64	64	62
to Gateway	**	53	63	63	66	66	65
Richards (eastbound)							
I-5 to 5th	**	68	68	68	70	69	69
to 7th	**	66	66	66	68	66	66
to 10th	**	65	65	65	66	65	65
to 12th	**	67	67	67	68	68	68
to east	**	67	68	68	68	67	69
Richards (westbound)							
I-5 to 6th	70	68	68	68	70	69	68
to 12th	68	65	65	65	66	66	66
to Richards	**	64	64	64	64	66	66
1st n/o Richards							
6th to 7th	**	65	65	65	65	66	65
to end	**	67	67	67	68	68	67
Route 160	79	80	80	80	80	80	80
Interstate 5	82	81	82	82	81	82	82

SOURCE: Salter and Associates, 1992

identical and mixed-use developments are proposed in different geographic areas under the different Alternatives. The following discussion identifies the major roadways that could generate a noise impact on the new noise-sensitive land uses. The noise levels shown in the tables are given for a distance of 75 feet from the center of the roadway. This distance is a typical setback for residential development. The L_{dn} generated by the major roads is almost always greater than 60 dB and, therefore, would represent a significant impact at the new noise-sensitive sites.

A-1 The hotel development in the Riverfront/I-5 area of the Richards Area would be exposed to freeway noise. The L_{dn} generated by I-5 would exceed 60 dB up to 2,000 feet from the freeway. The Social Services projects in the 12th and North B Street area would be exposed to noise from traffic on 12th Street at levels as high as 71 L_{dn} in 2010 and buildout. This is considered to be a ***significant impact.***

A-2 The new residential area north of Richards Boulevard would be exposed to noise from Richards Boulevard westbound. Traffic noise from Gateway would affect the adjacent residential and mixed use areas, including social service projects. New residential development in the Railyards Area would be exposed to noise from traffic on Gateway, 5th, 6th and 7th streets at levels as high as 71 L_{dn} at 2010 and 72 L_{dn} at buildout. This is considered to be a ***significant impact.***

A-3 The new residential area north of Richards Boulevard would be exposed to noise from Richards Boulevard westbound. Traffic noise from Gateway would affect the adjacent residential and mixed use areas, including the Social Service projects. New residential development in the Railyards Area would be exposed to noise from traffic on Gateway, 5th, 6th and 7th streets at levels as high as 72 L_{dn} in 2010 and at buildout. This is considered to be a ***significant impact.***

A-4 New residential development would take place as part of the residential overlay for Alternative 4 in the Richards Area. This development would be exposed to noise from Richards Boulevard, Gateway, 12th Street, 14th Street and State Route 160. In the Railyards Area, the new residential area would be exposed to noise from Gateway, B, 5th, 6th and 7th streets at levels as high as 72. The mixed-use area on either side of Gateway would be exposed to noise from Gateway and Richards Boulevard at levels as high as 75 L_{dn} in 2010 and 76 L_{dn} at buildout. This is considered to be a ***significant impact.***

A-5 The new low-density residential area north of Richards Boulevard would be exposed to noise from Richards Boulevard and Gateway at levels as high as 73 L_{dn} in 2010 and 76 L_{dn} at buildout. The new mixed-use land use east of Gateway would be exposed to noise from Gateway, Richards Boulevard and 16th Street. In the Railyards Area, the 300-unit high-density residential development would be exposed to noise from 5th, 6th, H and I streets at levels as high as 65 L_{dn} in 2010 and 68 L_{dn} at buildout. This is considered to be a ***significant impact.***

A-6 In the Richards Area, the new residential area west of Gateway would be exposed to noise from Gateway at levels as high as 76 L_{dn} in 2010 and at buildout. The new mixed-use area east of Gateway would be exposed to noise from Gateway and 16th Street at

levels as high as 76 L_{dn}. In the Railyards Area, the new residential development would be exposed to noise from B, 6th and 7th streets at levels as high as 69 L_{dn} in 2010 and 72 L_{dn} at buildout. This is considered to be a ***significant impact.***

A-7 New mixed-use areas north of Richards Boulevard would be exposed to noise from Richards Boulevard and Gateway at levels as high as 65 L_{dn} in 2010 and 66 L_{dn} at buildout. The mixed-use area east of Gateway would be exposed to noise from Gateway and 16th street at levels as high as 73 L_{dn} in 2010 and 76 L_{dn} at buildout. In the Railyards Area, the new residential area would be exposed to noise from Gateway B, 5th, 6th and 7th streets at levels as high as 72 L_{dn}. The mixed-use area south of Gateway would be exposed to noise from Gateway, 7th Street and I-5 at levels as high as 69 L_{dn} in 2010 and 72 L_{dn} at buildout. This is considered to be a ***significant impact.***

Mitigation Measures

The following mitigation measure would reduce the above impacts to *less-than-significant levels.*

4.10-1 *As required by the City's Noise Element policy, a site-specific acoustical study should be performed for each new noise-sensitive use. The developer shall demonstrate that the building design satisfies the City's noise level policies. This mitigation measure would be required for all Alternatives.*

All new residential projects are required by policies in the City's Noise Element to achieve an interior noise level of 45 dB L_{dn} and an exterior noise level goal of 60 dB L_{dn} if feasible. The exterior noise level goals can be met in outdoor use areas by various methods including noise barriers and site planning which locates the outdoor use area farther from the roadway or behind other buildings. The interior noise goal can be met by controlling the noise transmission through the exterior facade. This typically involves using sound-rated windows and doors.

4.10-2 Existing noise-sensitive areas may be exposed to significantly increased traffic noise.

Tables 4.10-5 and 4.10-6 present the increase in Day-Night Average noise levels (L_{dn}) for the existing residential areas under each Alternative for the years 2010 and buildout. The increases for the year 2000 would be expected to be somewhat smaller than the year 2010 increases.

These tables are based on the traffic volumes generated by the transportation analysis for this EIR. It should be noted that the purpose of the transportation models is to identify regional traffic impacts. This level of detail may not be adequate to assess the increase in traffic noise along streets in the Alkali Flat residential area. Existing and future traffic information is not available for the streets with existing residential development (D, E, 8th and 10th). The table presents noise increases estimated for F, G, and H streets, which are near the neighborhoods but are not residential streets. The increase in noise on these streets, however, does indicate the possibility for noise impact on the Alkali Flat neighborhood.

An increase in traffic noise levels from existing to future conditions of 5 dB or more is noticeable and would begin to generate community response.

A-1 No residential areas would be exposed to traffic noise increases of 5 dB or more. Therefore, this is considered to be a ***less-than-significant impact.***

A-2, A-3, and A-7

The Dos Rios neighborhood would be exposed to an increase of North 12th Street traffic noise (renamed Gateway) of 6 dB in Year 2010 and 8 dB at buildout. Portions of the Alkali Flat neighborhood would be exposed to increased traffic noise of 8 dB in Year 2010 and at buildout. This is considered to be a ***significant impact.***

A-4 The Dos Rios neighborhood would be exposed to an increase of North 12th Street traffic noise (renamed Gateway) of 8 dB in Year 2010 and 9 dB at buildout. Portions of the Alkali Flat neighborhood would be exposed to increased traffic noise of 8 dB in Year 2010 and at buildout. This is considered to be a ***significant impact.***

A-5 The Dos Rios neighborhood would be exposed to an increase of North 12th Street traffic noise (renamed Gateway) of 6 dB in Year 2010 and 9 dB at buildout. Portions of the Alkali Flat neighborhood would be exposed to increased traffic noise of 8 dB in Year 2010 and at buildout. This is considered to be a ***significant impact.***

A-6 The Dos Rios neighborhood would be exposed to an increase of North 12th Street traffic noise (renamed Gateway) of 9 dB in Year 2010 and 9 dB at buildout. Portions of the Alkali Flat neighborhood would be exposed to increased traffic noise of 8 dB in Year 2010 and at buildout. This is considered to be a ***significant impact.***

Mitigation Measures

The following mitigation measures would reduce the above impact to a *less-than-significant level.*

4.10-2(a) *The increase in traffic on North 12th Street/Gateway would involve a roadway widening and improvement project. Gateway Boulevard would connect directly to State Route 160. This roadway improvement shall include noise mitigation measures along the frontage of the Dos Rios neighborhood in order to reduce the noise exposure to an L_{dn} of 60 dB or less in outdoor use areas. This measure would be required of Alternatives 2 through 7.*

This can be accomplished by using a noise barrier or realigning the roadway so that it is farther from the residential land use. If Caltrans is involved with the roadway project, they would consider noise mitigation as a part of their policies and noise abatement criteria.

4.10-2(b) *Existing traffic counts shall be made and compared with future neighborhood-specific traffic projections. If the traffic volumes increase by a factor of 3 or more, or if there is to be a significant increase in truck percentages or travel*

TABLE 4.10-5
PROJECTED TRAFFIC NOISE INCREASES FOR 2010

Sensitive Receiver	Existing L_{dn} (dB) at 75 ft from Roadway Centerline	Increase in L_{dn} (dB) Year 2010 Alternative 1	2	3	4	5	6	7
Dos Rios Gateway/N. 12th Street	67	4	6	6	8	6	9	6
Dos Rios Elementary School Old Richards Boulevard	64	0	1	2	1	2	2	1
Basler/Dreher N. 16th Street Richards to Rte 160	67	1	1	1	-1	1	-1	1
Alkali Flat								
G Street - 6th to 10th	60	--	3	4	4	3	4	4
10th to 16th	61	--	2	3	2	2	3	3
H Street - 7th to 9th	62	2	4	4	4	3	4	4
9th to 12th	63	-1	1	1	1	0	1	1
F Street - 7th to 8th	57	--	8	8	8	8	8	8
Hotels along I-5	79	2	2	2	2	2	2	2
SOURCE: Charles Salter and Associates, 1992.								

TABLE 4.10-6
PROJECTED TRAFFIC NOISE INCREASES FOR BUILDOUT

Sensitive Receivers	Existing L_{dn} (dB) at 75 ft from Roadway Centerline	Increase in L_{dn} (dB) Buildout Alternative 1	2	3	4	5	6	7
Dos Rios Gateway/N. 12th Street	67	4	8	8	9	9	9	8
Dos Rios Elementary School Old Richards Boulevard	64	0	2	2	2	3	3	2
Basler/Dreher N. 16th Street Richards to Rte 160	67	0	-1	-1	-1	0	0	0
Alkali Flat								
G Street - 6th to 10th	60	--	4	4	5	6	6	6
10th to 16th	61	--	2	3	3	4	4	3
H Street - 7th to 9th	62	2	4	4	3	5	5	5
9th to 12th	63	0	1	2	2	3	3	2
F Street - 7th to 8th	57	--	8	8	8	9	8	8
Hotels along I-5	79	3	2	2	2	2	2	2
SOURCE: Charles Salter and Associates, 1992.								

speeds, mitigation measures shall be developed to ensure compliance with city noise standards. These measures could include noise barriers to shield outdoor use areas from traffic noise, or the design of the new roadway network, such that through traffic would be routed away from these residential streets. This mitigation measure would be required for Alternatives 2 through 7.

The increases of traffic volumes on streets around the Alkali Flat neighborhood indicate a potential for noise impact due to increased traffic noise. As the design of the new roadway network proceeds, more detailed analysis of the residential streets in the Alkali Flat area should be conducted.

4.10-3 Light-rail noise could affect noise-sensitive land uses.

The existing RT metro light-rail system travels through the project along the east side of North 12th Street. Under Alternatives 2 through 7, this roadway would be renamed Gateway and would be widened and extended. The light-rail would still use this corridor. Under all Alternatives, a new light-rail alignment would be built through the Planning Area along 7th Street from downtown. At Richards Boulevard, the alignment would turn west and travel along Richards toward I-5. The alignment would turn north again before reaching the freeway and travel across the American River on a new bridge. Under Alternatives 2 through 7, the new light-rail would access the Intermodal Transit Station.

Based on noise measurements of the LRT operations on the existing North 12th Street alignment, the light-rail vehicles generate a maximum A-weighted noise level of 78 to 80 dB at a distance of 50 feet from the tracks (see Figure 4.10-3). At the current frequency of operations, this corresponds to an L_{dn} of 62 dB at a distance of 50 feet. Sensitive development along the existing and new light-rail alignments would be affected by noise from both the light-rail vehicles and vehicular traffic on the major roads.

A-1 The proposed Social Services Area is located on the east side of North 12th Street, south of North B Street. Residential facilities associated with the Social Services area could be affected by light-rail activity on North 12th Street/Gateway. This is considered to be a ***significant impact.***

A-2 through A-7

Residential facilities associated with the Social Services Area could be affected by light-rail activity on North 12th Street/Gateway.

The new mixed-use area east of Gateway and the existing Basler/Dreher neighborhood west of Gateway would be exposed to light-rail vehicle noise along the Gateway alignment. The new residential use area north of Richards Boulevard westbound would be exposed to LRT noise along the new Richards Boulevard alignment, which travels directly through the residential area before it crosses the American River. The new

residential area in the Railyards Area would be exposed to light-rail noise along 7th Street. This is considered to be a ***significant impact.***

Mitigation Measures

The following mitigation measure would reduce the above impacts to a *less-than-significant level.*

4.10-3 *The noise insulation specified in a site-specific acoustical study shall be used for individual residential projects to achieve City standards. This mitigation measure would be required for all alternatives.*

For most new residential projects, vehicular traffic will be the dominant noise source requiring control to comply with City outdoor noise standard as set forth in the General Plan. For residential development along the LRT alignments, the maximum level criteria set forth by the City's General Plan regarding rail noise would likely dictate the amount of noise insulation required of the exterior facade. A site-specific acoustical study is required by the Noise Element of the General Plan. Achieving the indoor noise level requirements for light-rail vehicle passbys would minimize the potential for speech and sleep interference indoors.

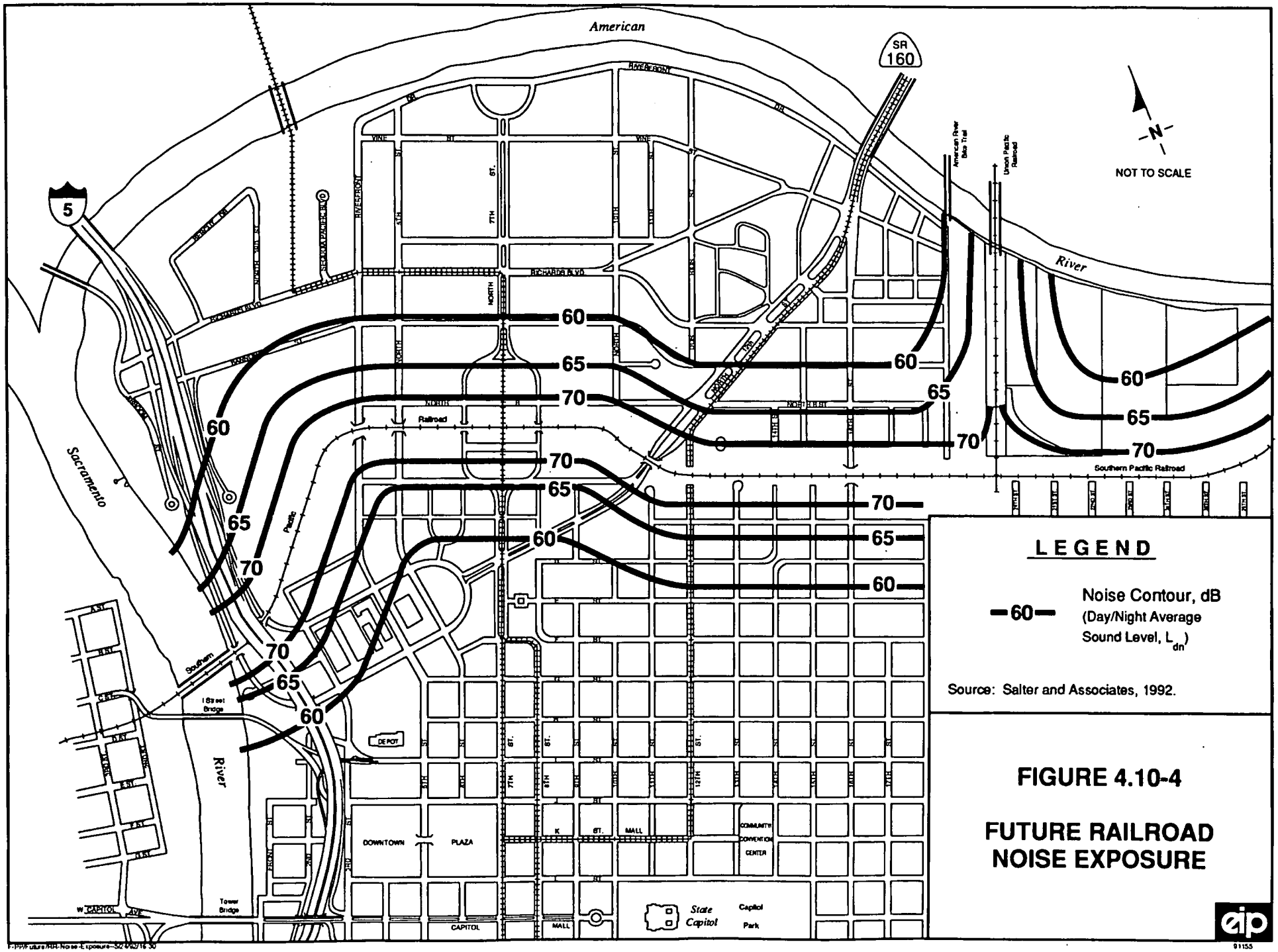
4.10-4 Railroad noise may affect new noise-sensitive land uses.

Impacts on noise sensitive receptors may occur as a result of changes in land use and in the realignment of the Southern Pacific Railroad main line. There are an average of 22 operations per day with 8 to 10 of these occurring during nighttime hours. Based on noise measurements, the typical maximum level due to the train passbys is 82 dB at a distance of 200 feet from the tracks. Based on calculations, the L_{dn} is 60 dB at a distance of approximately 730 feet from the tracks. Future changes in activity on the Southern Pacific line are not expected to increase this noise exposure. Future railroad noise exposure is shown in Figure 4.10-4. The following is a discussion of the potential impacts associated with noise-sensitive land use adjacent to the Southern Pacific main line.

A-1 Under this Alternative, the main line Southern Pacific tracks would remain in their current alignment. The existing Alkali Flat neighborhood is within approximately 200 feet of these tracks. This neighborhood is currently, and would continue to be, significantly affected by noise from the Southern Pacific main line. The new social services area east of North 12th Street would be on the north side of the main line Southern Pacific tracks. New residential development associated with the social services would be significantly affected by the railroad noise. Therefore, this is considered to be a ***significant impact.***

A-2 through A-4; A-6 and A-7

Under this Alternative, the main line Southern Pacific tracks would be relocated to the northern edge of Railyards Area. The Intermodal Transit Station would be located on the main line at 7th Street. This will provide a beneficial impact for the Alkali Flat residential


American
River
SR 160
5
NOT TO SCALE
Sacramento
Railroad
Southern Pacific Railroad
River
60
65
70
LEGEND
60
Noise Contour, dB
(Day/Night Average
Sound Level, L_{dn})
Source: Salter and Associates, 1992.
FIGURE 4.10-4
FUTURE RAILROAD
NOISE EXPOSURE

neighborhood, which is currently exposed to railroad noise from the Southern Pacific main line. The new residential development in the Railyards Area would be set back and buffered by commercial and open space land so that train noise would not generate a significant impact. The mixed use and Social Services Area west of North 12th Street would be north of and adjacent to the Southern Pacific mainline. Train noise could affect any residential projects in this mixed use and Social Services Area. Therefore, this is considered to be a ***significant impact.***

A-5 Under this Alternative, the Southern Pacific main line would be relocated to the center of the Railyards Area just south of the existing shops where the new Intermodal Transit Station would be. The Alkali Flat neighborhood would continue to be affected by railroad noise from the Southern Pacific main line. Residential development in the mixed-use and Social Services Area west of Gateway could potentially be affected by railroad noise on the Southern Pacific mainline to the south. Other residential development would be set back enough so that railroad noise would not generate unacceptable noise levels. Due to the effect on Gateway area sensitive receptors, this is considered a ***significant impact.***

Mitigation Measure

Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.10-4(a) *Implement noise attenuation measures as part of all residential development projects in the Gateway area, to ensure that interior levels for single event noise do not exceed 50 dB in bedrooms and 55 dB in other rooms. The indoor noise requirements can be met using sound-rated windows and doors. This mitigation measure would be required for all Alternatives.*

Closer than 200 feet to the tracks, the requirements for sound-rated windows and doors become much more stringent and would be likely to add significant cost and require special exterior wall design requirements for the project. Outdoor noise barriers may be difficult to implement because the new railroad alignment will be elevated on fill. The noise barriers would need to be very tall (at least 15 feet) to block the line-of-sight from the train to the receiver.

4.10-4(b) *To the extent feasible, the design for the social service campus shall minimize exterior noise levels.*

City guidelines call for exterior noise levels of 60 L_{dn} in residential areas, where feasible. Due to train traffic and switching operations near SR 160, the proposed social service campus area would be subject to noise levels above 60 L_{dn}. This noise level can be reduced somewhat through project design. Because the standard is only a guideline, noise levels above 60 L_{dn}, if not feasibly mitigable, would not preclude development adjacent to this portion of the tracks.

4.10-5 Development of any of the Alternatives would cause temporary increases in construction noise levels in and around the Planning Area over the entire period of construction.

A-1 through A-7

Construction noise has the greatest potential for disturbing residents and employees in and near the construction sites. Table 4.10-7 shows outdoor noise levels experienced from different pieces of equipment with and without feasible noise control. Actual noise levels would involve several pieces of many kinds of equipment. Blasting may be necessary during construction. When blasting occurs, noise in excess of 100 dBA within 50 feet of detonation would be expected. Since noise from localized sources typically falls off by about 6 dBA with each doubling of distance from source to receptor, outdoor receptors within 1,600 feet of construction sites, and which have an uninterrupted view of the construction site would experience noise greater than 60 dBA when noise on the construction site exceeds 90 dBA. Since at this time, the number, type, and location of each kind of equipment being used is not known, it is not possible to accurately predict noise levels. Noise insulation provided by the walls, windows, and doors of the buildings would partially abate construction noise (e.g., a 20 dBA reduction is typical of most residential structures, provided that the windows are closed), but the State Title 24 limit on allowable interior noise (i.e., L_{dn} < 45 dBA) could be exceeded during the course of construction. This is considered to be a ***short-term significant impact.*** Implementation of the following mitigation measures would reduce construction impacts to a *less-than-significant level.*

Mitigation Measures

4.10-5(a) *The contractor shall limit construction from 7 AM to 7 PM, Monday through Saturday and shall prohibit construction on Sundays, unless the City grants a special permit, in order to minimize disruption to residences adjacent and near the project. This mitigation measure would be required for all alternatives.*

4.10-5(b) *The contractor shall use mufflers, enclosure panels, or other noise suppression attachments on all equipment as appropriate and turn off equipment when not in use. This mitigation measure would be required for all alternatives.*

The contractor should be required to employ the quietest among alternative equipment or to muffled/control noise from available equipment. The U.S. General Services Administration has determined that the noise reductions shown in Table 4.10-7 are attainable without undue difficulty or expense. Assuming the use of properly muffled equipment, estimated noise levels can be reduced from 100 dBA at 50 feet to 90 dBA at 50 feet.

4.10-5(c) *If blasting occurs, it shall be performed in accordance with City of Sacramento imposed conditions. Property owners within a minimum one-quarter-mile radius shall be notified in advance as to the time and location of the blasting, and all*

TABLE 4.10-7
CONSTRUCTION EQUIPMENT NOISE LEVELS[1]
BEFORE AND AFTER MITIGATION

EQUIPMENT TYPE	NOISE LEVEL AT 50 FEET	
	Without Noise Control	With Feasible Noise Control[2]
Earthmoving		
Front Loaders	79	75
Backhoes	85	75
Dozers	80	75
Tractors	80	75
Scrapers	88	80
Graders	85	75
Trucks	91	75
Pavers	89	80
Materials Handling		
Concrete Mixers	85	75
Concrete Pumps	82	75
Cranes	83	75
Derricks	88	75
Stationary		
Pumps	76	75
Generators	78	75
Compressors	81	75
Impact		
Pile Drivers	101	95
Jack Hammers	88	75
Rock Drills	98	80
Pneumatic Tools	86	80
Other		
Saws	78	75
Vibrators	76	75

[1] Taken from *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, prepared by Bolt, Beranek, and Newman for the U.S. Environmental Protection Agency, December 31, 1971.

[2] Estimated levels obtainable by selecting quieter procedures or machines and implementing noise control features requiring no major redesign or extreme cost.

SOURCE: Salter and Associates, 1992

reasonably recognized precautions to minimize impacts to the surrounding areas shall be used. This mitigation measure would be required for all alternatives.

If blasting during construction is required, the City will be petitioned and appropriate conditions will be established to allow blasting. If the activity is required in the proximity of existing development, property owners will be notified in advance as to the time and location of the blasting, and all reasonably recognized precautions to minimize surrounding impacts shall be used. The radius for notification of blasting would be dependent upon such considerations as the type and extent of blasting proposed and site characteristics. Specific distances must be identified by the engineer performing the blasting. This distance should be no less than one-quarter mile from the blasting site.

Cumulative Impacts

Cumulative traffic-generated noise impacts are addressed in impacts 4.10-1 and 4.10-2.

4.10-6 Cumulative changes in rail traffic and operations could result in noise above normally acceptable levels at existing sensitive receptors.

A-1 through A-7

There is an average of 22 operations per day along the Southern Pacific Railroad main line. Activity on the Southern Pacific main line may increase to approximately 77 trains per day by buildout. This increase in railroad activity is due primarily to the new inter-city rail (Sacramento to San Jose) and commuter rail (Colfax to Davis). These new railroad operations will be concentrated during daytime hours (7 am to 10 pm). There are assumed to be a total of 63 daytime trains and 14 nighttime trains. This increased activity will increase the train-generated L_{dn} by 3 dB along the Southern Pacific main line. This increase is less than the 5 dB threshold at which a significant impact is assessed.

The Alkali Flat neighborhood is adjacent to the existing Southern Pacific main line. Under all Alternatives except the no-project, the main line would be moved farther to the north, reducing the train noise impact at these homes, even considering the increase in train activity.

Because of the uncertainty of future rail operations, these impacts are considered potentially significant impacts. The City of Sacramento does not have jurisdiction over rail operations, so this impact is considered to be a ***significant impact***.

Mitigation Measures

Implementation of one or a combination of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.10-6(a) *Use soundwalls and/or other noise attenuation measures to achieve City noise standards at residences near rail tracks. This mitigation measure would be required for all Alternatives.*

and/or

4.10-6(b) *Implement Mitigation Measures 4.10-4(a) and (b). This mitigation measure would be required for all Alternatives.*

Reducing noise impacts at existing residential areas along the railroad tracks involves the use of noise barriers, such as sound walls. However, the noise barriers may not be effective if the tracks are elevated unless the base of the noise barriers is at the elevation of the tracks. Another alternative is to improve the sound insulation of the home by installing sound-rated windows and doors.

4.11 GEOLOGY AND SOILS

4.11 GEOLOGY AND SOILS

INTRODUCTION

This section addresses the effects of geologic hazards and soil constraints on development in the Planning Area. Geologic hazards evaluated include seismic conditions such as fault movement and liquefaction. Soil constraints evaluated include erosion, shrink-swell potential, depth to hardpan, and permeability.

SETTING

Regional Geology

The Sacramento area is located within the Great Valley geomorphic province, a relatively flat alluvial plain comprised of deep sediments. The Great Valley is bounded on the west by the California Coast Ranges and on the east by the Sierra Nevada Mountains. Erosion of the Coast Ranges and the Sierras has produced the sediments deposited in the Great Valley. Deposition in the Valley was mainly marine until Pliocene time (approximately five million years ago) when the Valley's seas were drained through the Carquinez Strait and were replaced by freshwater rivers and lakes. Today the Valley is drained by the Sacramento River from the north and the San Joaquin River from the south. Geographically and topographically the Valley has been shaped by the Sacramento River and its tributaries (including the American River). The Sacramento and the San Joaquin Rivers meet approximately 35 miles south of Sacramento and discharge into the Pacific Ocean through the Delta into the San Francisco Bay.

General Stratigraphy

The deepest layer of rock underlying the Planning Area is composed of Paleozoic age Mesozoic intrusive igneous rocks extending from the Sierra Nevada Mountains. Overlying the igneous rock are siltstone, claystone and sandstone sedimentary rocks at least 10,000 feet thick and of predominantly marine origin. Overlying the sedimentary rock layer is an approximately 3000 foot thick layer of fluvial-deposited sediments eroded from the mountains to the north and east. The two uppermost deposits of these fluvial sediments are categorized as the Laguna and Victor formations.[1]

The Laguna formation comprises approximately 200 to 300 feet of silt clay and sand deposits with lenses (layers) of gravel, which slope and thicken toward the west. The Victor formation overlies the Laguna formation and is up to approximately 100 feet thick. The Victor formation is also heterogeneous laterally and vertically, consisting of channel sands and gravels, and

overbank deposits of silt and clay. It is estimated that the American riverbed may have been as wide as 8,000 feet during the time of deposition of the Victor formation.[2]

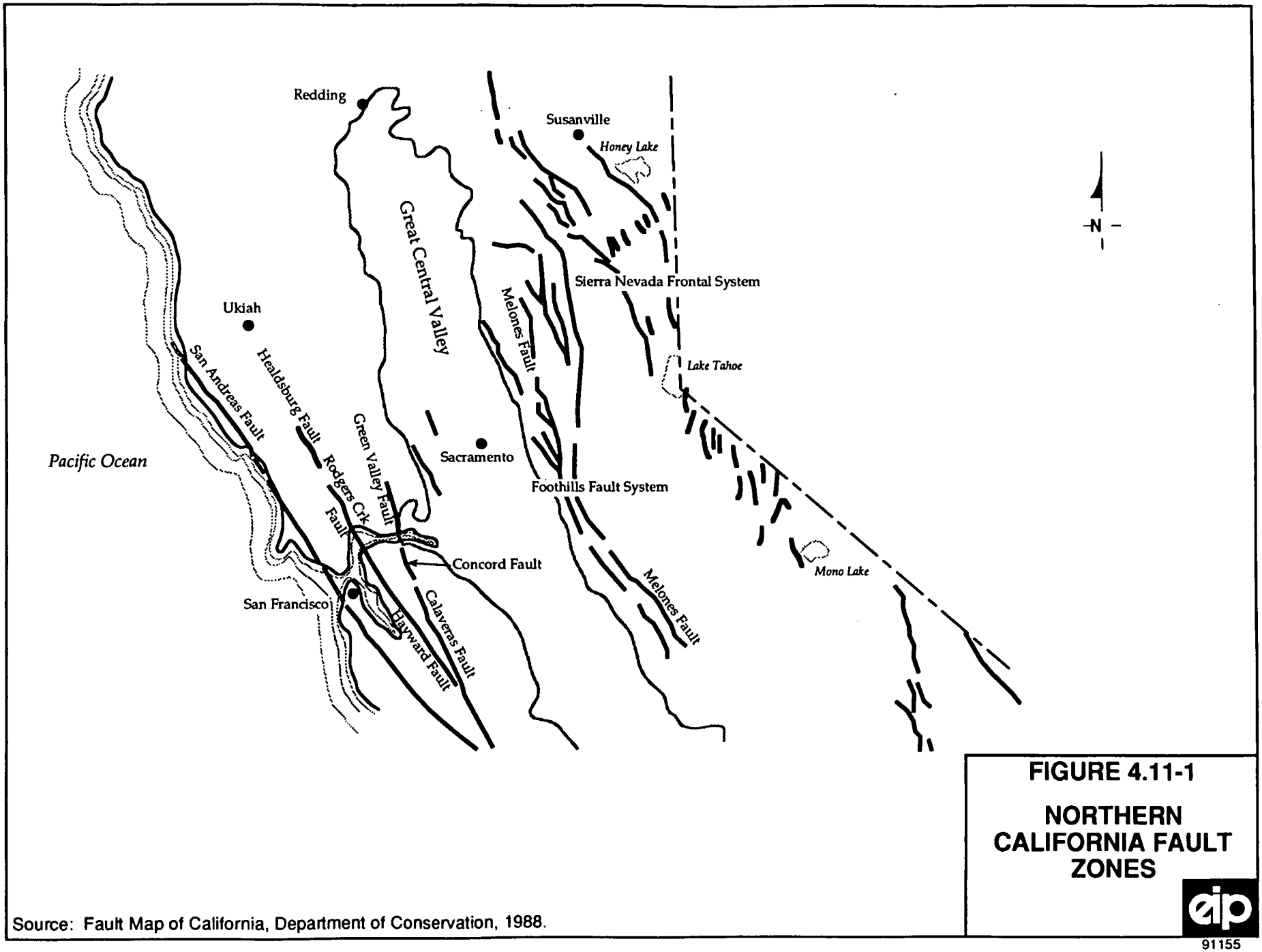
Seismic Conditions

California is the most seismically active area in the United States. It is located in the circum-Pacific earthquake zone, which is the result of the process of plate tectonics. Plate tectonics refers to the fact that the earth's mantle is composed of several large plates that move relative to each other. The San Andreas rift system is a zone of faulting about 40 miles wide at the junction of two such plates. The Pacific Plate, on the west side of the zone, is moving north relative to the North American Plate on the east side. One of the results of this movement is the regional rock deformation that provides the general northwest-southwest trend of valleys and ridges in the Coast Ranges and the Great Valley.

No known active faults occur in or adjacent to the City of Sacramento.[3] During the past 150 years, there has been no documented movement on faults within Sacramento County. However, the region has experienced numerous instances of ground shaking originating from faults located to the west and east.

The closest known active fault mapped by the California Divisions of Mines and Geology is the Dunnigan Hills fault, located approximately 19 miles northwest of the Sacramento area (see Figure 4.11-1). The closest branches of the seismically active San Andreas fault system are the Antioch (42 miles southwest) and Green Valley and Concord faults (45 miles southwest). The San Andreas fault is located approximately 80 miles to the southwest. As shown on Table 4.11-1, other major active faults within 100 miles of the Sacramento area include the Hayward and Calaveras faults, both located approximately 66 miles to the southwest; the Healdsburg-Rogers Creek fault (56 miles to the west); the Bear Mountain fault (22 miles to the east); and the New Melones fault (40 miles east). The Stockton and Greenville faults are located approximately 47 and 43 miles to the south. It should also be noted that the inactive Midland fault is located about 22 miles west of Sacramento.

According to the *Preliminary Map of Maximum Expectable Earthquake Intensity in California*, prepared by the California Department of Mines and Geology (see Figure 4.11-2), Sacramento is located near the border between the "low" and "moderate" severity zones, representing a probable maximum earthquake intensity of VII on the Modified Mercalli Scale (see Table 4.11-2). In Sacramento, the greatest intensity earthquake effects would come from the Dunnigan Hills fault, Midland fault, and the Foothill Fault System. Earthquakes on these faults could generate ground accelerations up to 0.2 g (0.2 times the acceleration of gravity) within the Sacramento area. This corresponds to a probable maximum intensity of VIII on the Modified Mercalli Scale.[4] The approximate relationship between earthquake magnitude (Richter Scale) and intensity (Modified Mercalli Scale) is shown in Table 4.11-3.



Source: Fault Map of California, Department of Conservation, 1988.

FIGURE 4.11-1

NORTHERN CALIFORNIA FAULT ZONES

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TABLE 4.11-1
FAULTS WITHIN 100 MILES OF SACRAMENTO

Name	Fault Type	Distance From Sacramento (Miles)	Maximum Creditable Earthquake[1] (Magnitude)
Dunnigan Hills	Subsurface Normal	19	6.25[2]
Midland	Subsurface Normal	22	7.03[3]
FOOTHILL FAULT SYSTEM			
Bear Mountain	Vertical	22	6.5
New Melones	Vertical	40	6.5
Stockton	Subsurface	47	5.0
SAN ANDREAS FAULT SYSTEM			
Antioch	Strike-Slip Right Lateral	42	7.0[4]
Greenville	Same	43	6.5
Concord	Same	45	6.9
Green Valley	Same	45	6.9
Healdsburg/Rogers Creek	Same	56	7±1/4
Hayward	Same	66	7±1/4
Calaveras	Same	66	7±1/4
San Andreas	Same	80	8.3

[1] Maximum Credible Earthquake. The term maximum credible earthquake (MCE) is defined as the largest earthquake which is likely to be generated along an active fault zone (Slemmons & Chung 1982). The magnitude of the MCE is estimated from the geologic character and earthquake history of the fault. Most workers, when calculating the MCE for the strike-slip faults of the Coast Ranges, estimate the potential length of surface rupture, then use empirical relations which equate rupture length with earthquake magnitude. As a minimum, the MCE must equal the largest historic earthquake on a fault.

[2] Wesnouski, S.G., 1986, *Earthquakes, Quaternary Faults, and Seismic Hazard in California*, Journal of Geophysical Research, Vol. 91, No. B12.

[3] Maximum expected earthquake magnitude from Greensfelder, 1974.

[4] Burke, D.B. and Helley, E.L., 1973, map showing evidence for recent fault activity in the vicinity of Antioch, Contra Costa County, California: U.S. Geological Survey Miscellaneous Field Studies Map, MF-533.

SOURCE: *North Central Roseville Specific Plan Draft EIR*, July 1989

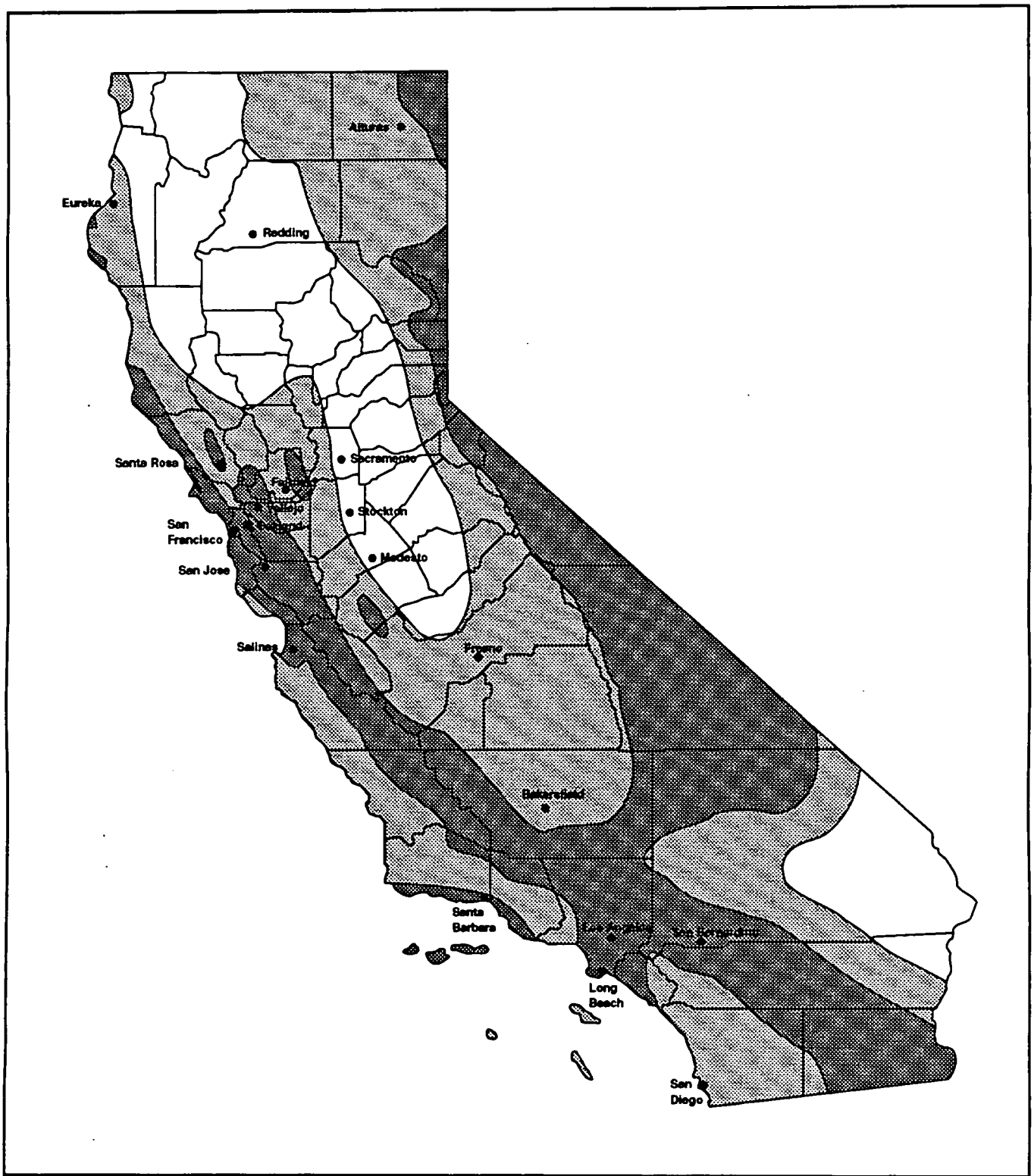

FIGURE 4.11-2

PRELIMINARY MAP OF MAXIMUM EXPECTABLE EARTHQUAKE INTENSITY IN CALIFORNIA

F:\Other-Maps\State-Calif-Erthquak-Intnsty-Zones--5/25/92/21:30

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TABLE 4.11-2
MODIFIED MERCALLI SCALE OF EARTHQUAKE INTENSITY

Scale	Effects
I.	Earthquake shaking not felt.
II.	Shaking felt by those at rest.
III.	Felt by most people indoors; some can estimate duration of shaking.
IV.	Felt by most people indoors. Objects swing, windows and doors rattle, wooden walls and frames creak.
V.	Felt by everyone indoors; many estimate duration of shaking. Standing autos rock. Crockery clashes, dishes rattle, and glasses clink. Doors close, open, or swing.
VI.	Felt by everyone indoors and most people outdoors. Many now estimate not only the duration of the shaking, but also its direction and have no doubt as to its cause. Sleepers awaken. Liquids disturbed, some spilled. Small unstable objects displaced. Weak plaster and weak materials crack.
VII.	Many are frightened and run outdoors. People walk unsteadily. Pictures thrown off walls, books off shelves. Dishes or glasses broken. Weak chimneys break at roofline. Plaster, loose bricks, unbraced parapets fall. Concrete irrigation ditches damaged.
VIII.	Difficult to stand. Shaking noticed by auto drivers, waves on ponds. Small slides and cave-ins along sand or gravel banks. Stucco and some masonry walls fall. Chimneys, factory stacks, towers, elevated tanks twist or fall.
IX.	General fright. People thrown to the ground. Steering of autos affected. Branches broken from trees. General damage to foundations and frame structures. Reservoirs seriously damaged. Underground pipes broken.
X.	General panic. Conspicuous cracks in ground. Most masonry and frame structures destroyed along with their foundations. Some well-built wooden structures and bridges are destroyed. Serious damage to dams, dikes, and embankments. Railroads bent slightly.
XI.	General panic. Large landslides. Water thrown out of banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flatland. General destruction of buildings. Underground pipelines completely out of service. Railroads bent greatly.
XII.	General panic. Damage nearly total, the ultimate catastrophe. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

SOURCE: California Division of Mines and Geology, 1973.

TABLE 4.11-3

APPROXIMATE RELATIONSHIPS BETWEEN
EARTHQUAKE MAGNITUDE AND INTENSITY

Richter Scale Magnitude	Maximum Expected Intensity (MM)*	Distance Felt (Kilometers)
2.0 - 2.9	I - II	0
3.0 - 3.9	II - III	15
4.0 - 4.9	IV - V	80
5.0 - 5.9	VI - VII	150
6.0 - 6.9	VII - VIII	220
7.0 - 7.9	IX - X	400
8.0 - 8.9	XI - XII	600

* Modified Mercalli Intensity Scale.

SOURCE: United States Geologic Survey, *Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093*, 1977.

Liquefaction

Liquefaction is the loss of soil strength due to seismic forces acting on water-saturated, granular soil, which leads to a "quicksand" condition generating various types of ground failure. The potential for liquefaction must account for soil types, soil density, and groundwater table, and the duration and intensity of groundshaking. Liquefaction is most likely to occur in low-lying areas of poorly consolidated to unconsolidated water-saturated sediments or similar deposits of artificial fill. The Planning Area is underlain with alluvial deposits containing silt and sand as well as areas of fill material, which could be subject to liquefaction during seismic events.

Settlement

Settlement is the compaction of soil and alluvium caused by groundshaking. Such settlement may range from a few inches to several feet, and be in part controlled by bedrock surfaces, old lake, slough, swamp and stream beds. Settlement can occur due to increased static loads such as those imposed by foundations for structures, or due to liquefaction and densification of silts and loose sands (like those that underlie the Planning Area) as a result of seismic loads. Landfill areas undergo settlement primarily due to decomposition of the landfill material, and it occurs over a very long period of time without additional loads. In general, settlements of landfill areas are an order of magnitude greater than settlements of most natural soil.

Lateral Spreading

Lateral spreading is the horizontal movement or spreading of soil toward an open face such as a stream bank, the open side of a fill embankment, or the sides of levees. Artificial fill areas that have been improperly engineered or that have steep, unstable banks are the most likely to be affected. Lateral spreading is also likely to occur in areas of high groundwater.[5]

Site Geology

Railyards Area

The Railyards Area is situated on alluvial deposits of the Sacramento and American Rivers with an elevation of approximately 25 feet above Mean Sea Level (msl). The dominant geomorphic feature at the site was Sutter Lake (Sutter Slough or China Lake), which existed prior to 1910.

The Railyards Area also contained another lake (Willow Lake) on the north end of the property. The two lakes and associated marshland covered the entire Railyards Area. Dredging and filling of the site continued until 1913 when the entire area was filled. Fill material consists of river sand, coarse gravel, cobbles and granite brought from Rocklin, California, as well as discarded railroad equipment such as broilers and odd pieces of iron.[6] Near the surface and to a depth of 30 to 50 feet are deposits of silt and sand, (commonly referred to as the upper sand unit) including fill placed over the area in the past 130 years. Underlying the upper sand unit is a layer of sandy gravel. The top of the gravel unit is found at a depth of 60 to 80 feet below ground surface. Both the upper sand and gravel unit are water-bearing units.

Groundwater Resources

Previous investigations of the Railyards Area have identified three water-bearing zones within less than 100 feet of the surface, the Silty Sand and Clay zone, the Sand zone, and the Gravel zone. Well logs have not indicated the presence of aquitards (zones that are sufficiently permeable to vertically transmit water to or from a confined aquifer) between zones; therefore, the zones are probably hydrologically interconnected. A fourth water-bearing zone, the Interbedded zone, underlies the Gravel separated by clay layer. Groundwater flow in these shallow zones is generally in a east-southeast direction.[7] These shallow zones are also hydraulically connected with the Sacramento River. Depth to groundwater is approximately 20 feet, but water levels have historically fluctuated in the area from less than five feet to greater than 15 feet on an annual basis.[8] As the surface water elevation of the Sacramento and American Rivers rise and fall, groundwater levels near the banks also fluctuate. When the Sacramento River is high, the river recharges the groundwater and results in an easterly gradient under the area. When the water stage levels are lower, the river is being recharged by groundwater, resulting in a westerly gradient.[9]

Richards Area

The Richards Area is relatively level, with elevations ranging from approximately 20 to 40 feet above msl. Levees higher than adjacent grade are located along the Sacramento and American Rivers.[10] The uppermost soil layers underlying the site are very heterogeneous. In general, they consist of 10 to 20 feet of loose to medium dense sand and silty sand fill, underlain by medium stiff silt and clays, loose to medium dense sand, five to 30 feet thick, and dense gravel, zero to 20 feet thick. It can be assumed that the underlying soils nearest the rivers would contain more sand, and that areas further from the rivers would contain predominately silts and clays.[11] Groundwater was identified in the Richards Area at a depth of approximately 15 to 30 feet below grade.[12]

Groundwater Resources

Groundwater was identified in the Richards Area at a depth of approximately 15 to 30 feet below grade.[13] Depths as shallow as six feet have been identified.[14] As with the Railyards Area, groundwater elevation will fluctuate due to the vicinity of the Sacramento and American Rivers. Groundwater generally flows toward the river during periods of low flow, and away from the river during periods of high flow. On the central portion of the site, groundwater generally flows to the southwest.[15]

Soil Types

The US Soil Conservation Service (SCS) has identified and mapped soil in Sacramento County in the June 1991 preliminary draft *Soil Survey of Sacramento California.* Each identified soil has characteristics that affect soil behavior. Characteristics discussed include:[16]

Permeability - the ability of a soil to transmit water or air. Permeability is considered in the design and construction of soil drainage systems, where the rate of water movement under saturated conditions affects behavior.

Available water capacity - the quantity of water that the soil is capable of storing for use by plants.

Runoff - the amount of water that runs off the surface of the land.

Erosion - the susceptibility of a soil to water and/or wind erosion.

Shrink-swell potential - the potential for volume change in a soil with a loss or gain in moisture. If the shrink-swell potential is rated moderate to high, damage to buildings, roads, and other structures can occur.

Soil characteristics may or may not make them particularly suitable for accommodating uses such as shallow excavations, dwellings with basements, small commercial buildings, local roads and streets, and lawns and landscaping. Soil limitations can include slow or very slow permeability, limited ability to support a load, high shrink-swell potential, moderate depth to hardpan, low depth to rock, and frequent flooding. These limitations are considered[17]:

Slight if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome;

Moderate if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and

Severe if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The following discussion is a summary of the soil types and their characteristics underlying the Planning Area.

Railyards Area

The SCS has mapped the occurrence of two soil units in the Railyards Area (see Figure 4.11-3).

Orthents-Urban Land Complex, 0 to 2 percent slopes

This soil unit is on filled areas of low flood plains. These areas were filled to elevate the land surface and reduce the flood hazard. It underlies approximately 98 percent of the Railyards Area. The unit is 50 percent Orthents and 35 percent Urban land with the remaining 15 percent consisting of small areas of soil types not associated with fill. Orthents soil is very deep, poorly

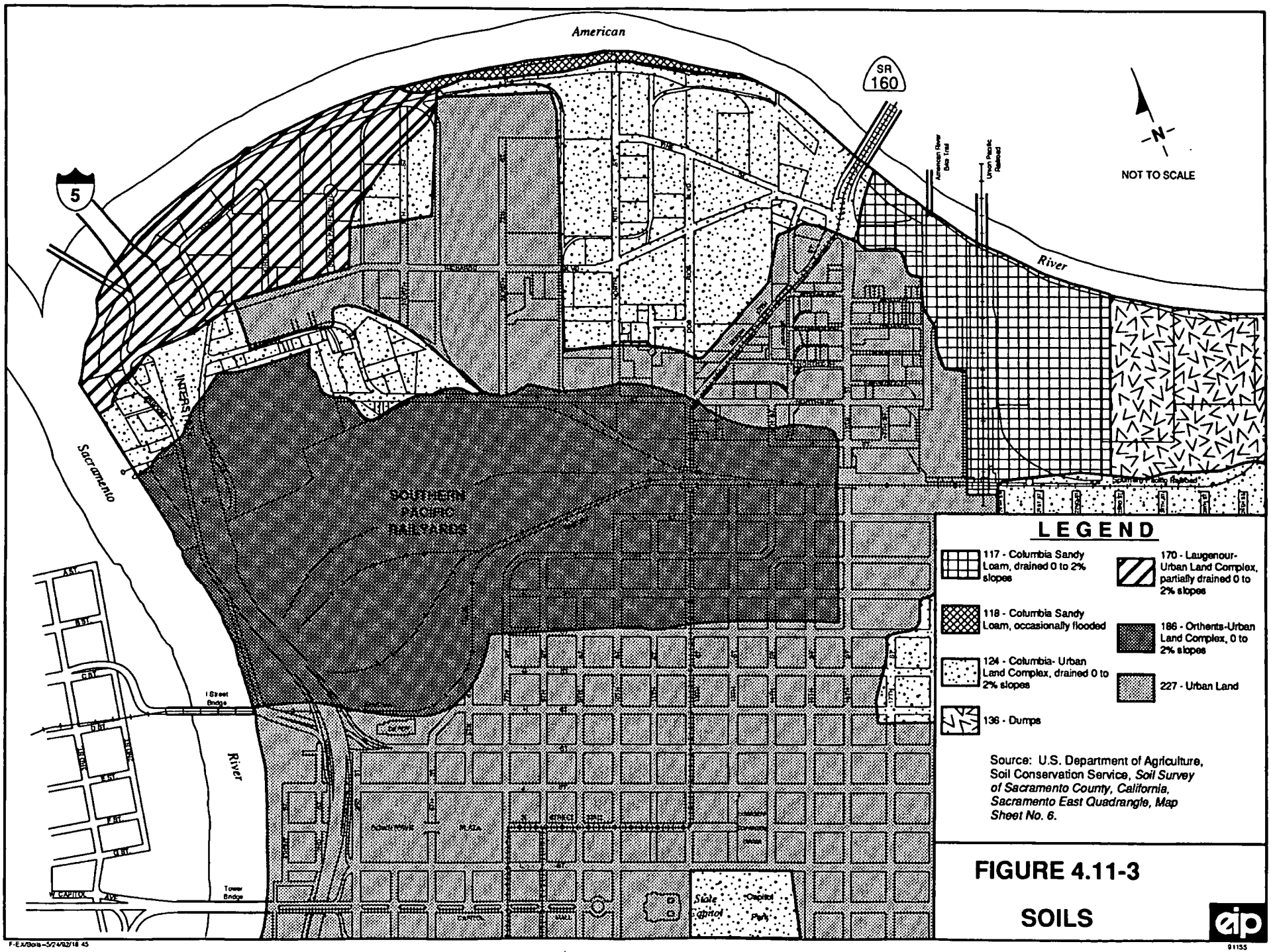

FIGURE 4.11-3

SOILS

to well drained and altered. It formed in fill material derived from nearby soil and sediments of mixed origin. The texture, color, and thickness of the layers of fill in this soil vary from one area to another. Permeability is moderately slow to moderately rapid, the water capacity is low to high, runoff is low, and the hazard of water erosion is slight.

Urban land consists of areas covered by impervious surfaces such as roads, driveways, sidewalks, buildings and parking lots. Soil material characteristics under the impervious surfaces are similar to that of Orthents soil.

Primary development limitations include depth to a seasonal high water table limiting shallow excavations (such as trenches and holes) and the hazard of loading. Other limitations include inadequate drainage for deep rooted trees and shrubs. In summer, irrigation is needed to maintain landscaping.

Urban Land

Comprising the remaining two percent of the Railyards Area, this unit consists of areas covered by up to 90 percent impervious surfaces. The soil material under these impervious surfaces may have been altered during construction, and are generally similar to the soil that occurs near the Urban land. In this case, the characteristics would probably be similar to those associated with the adjacent Orthents (please see previous discussion).

Richards Area

The SCS has mapped seven soil units in the Richards Area (see Figure 4.11-3).

Urban Land

This unit underlies approximately 30 percent of the Richards Area. Please refer to previous discussion for this unit.

Columbia-Urban Land Complex, drained, 0 to 2 percent slopes

This unit is located on natural levees on low flood plains of rivers. The construction of a levee system and large upstream dams has reduced the hazard of flooding. Levees, closed drains, and pumping of drainage water are used to lower the water table and alter the drainage of this unit, which comprises approximately 30 percent of the Richards Area. This unit is primarily Columbia soil (60 percent) and Urban land (30 percent). Columbia soil is very deep and somewhat poorly drained. The drainage has been altered. The permeability is moderately rapid above the clayey substratum, and slow in the clayey substratum, which occurs at a depth of 40 to 60 inches. Available water capacity is moderate, runoff is very slow to slow, and the hazard of water erosion is none to slight.

As previously discussed, Urban land consists of areas covered by impervious surfaces. The material under these surfaces is similar to that of the Columbia soils.

Where the unit is used for urban development, the main limitations are slow permeability in the clayey substratum, depth to seasonal high water table, and the hazard of sloughing. Shallow excavations are limited by the seasonal high water table. In the summer, irrigation is needed to maintain landscaping.

Columbia Sand Loam, drained, 0 to 2 percent slopes

This very deep, somewhat poorly drained and flood protected soil, is on narrow low flood plains along rivers and streams, and comprises approximately 20 percent of the soils underlying the Richards Area. This unit also includes areas subject to occasional flooding. Permeability is moderately rapid, available water capacity is moderate, runoff is very slow to slow. The hazard of water erosion is none or slight, and the hazard of wind erosion is slight. The shrink-swell potential is low.

Where this unit is used for urban development, severe limitations include shallow excavations, and flooding, which affect construction of dwellings and small commercial buildings. Moderate limitations include flooding effects to roads and the need to irrigate to maintain landscaping during summer months.

Laugenour-Urban Land Complex, partially drained, 0 to 2 percent slopes

This flood-protected unit is on low flood plains and natural levees. Levees, open and closed drains, and pumping of drainage water are used to lower the water table, and have altered the drainage of this soil. The construction of a levee system and large upstream dams have reduced the hazard of flooding. This unit comprises approximately 8 percent of the soil underlying the Richards Area. This soil unit is 55 percent Laugenour soils and 30 percent Urban land. Laugenour soil is very deep and poorly drained. Permeability is moderate, available water capacity is high, runoff is low and the hazard of water erosion is slight. The shrink-swell potential is low.

As previously stated, Urban land consists of areas covered by impervious surfaces, and the material under these surfaces is similar to that of the Laugenour soil.

Where the unit is used for urban development, the main limitations are the depth to a seasonal high water table limiting shallow excavations, and the hazard of flooding affecting dwellings and small commercial structures. Adequate drainage should be provided in areas where deep rooted trees and shrubs are planted in the Laugenour soil. During summer months, irrigation is needed to maintain landscaping.

Dumps

This unit consists of open land sites used for solid waste disposal, and comprises approximately 5 percent of the Richards Area. Slopes are complex, and the unit tends to be highly irregular varying from area to area in natural drainage, permeability, erosion hazard and available water capacity. General limitations to development have not been classified for this unit due to its inherent variability.

Orthents-Urban Land Complex, 0 to 2 percent slopes

This soil unit is found on filled areas of low flood plains. These areas were filled to elevate the land surface and reduce the flood hazard. The unit underlies approximately 5 percent of the Richards Area. For a description of the characteristics and the development limitations, please refer to the discussion for the Railyards Area for this unit, above.

Columbia Sandy Loam, drained, 0 to 2 percent slopes, occasionally flooded

This unit is very deep, somewhat poorly drained found on narrow, low floodplains of rivers and streams. Groundwater overdraft has altered the drainage of this soil, which was formed in alluvium derived from mixed rock sources. This unit comprises approximately 2 percent of the Richards Area. Permeability is moderately rapid, water capacity is moderate, runoff is very slow or slow, the hazard of water erosion is none or slight, and the hazard of soil blowing is slight. This soil is subject to occasional flooding for very brief to brief periods during prolonged, high-intensity storms. Channeling and deposition are common along streambanks. The shrink-swell potential is low.

Where this unit is used for urban development, severe limitations include shallow excavations and flooding, which affect construction of dwellings and small commercial buildings. Moderate limitations include flooding effects to roads and the need to irrigate vegetation during summer months to maintain landscaping.

General Plan Goals and Policies

The following are relevant City of Sacramento General Plan goals and policies that apply to the Alternatives.

Goals and Policies for Seismic Safety

Goal A

Protect lives and property from unacceptable risk of hazards due to seismic and geologic activity to the maximum extent feasible.

Policy 1

Prohibit construction of structures for permanent occupancy across faults, should any be designated.

Development in the Planning Area would not occur across any currently identified fault.

Policy 2

Continue to require soils reports and geological investigations for determining liquefaction, expansive soils and subsidence problems on sites for new subdivision and/or multiple-story buildings in the City of Sacramento.

A geotechnical evaluation to identify liquefaction, expansive soils, subsidence, and other potential geologic hazards shall be performed prior to the initiation of construction in the Planning Area.

Policy 3

Continue to implement the Uniform Building Code requirements that recognize State and Federal earthquake protection standards in the construction or repair of buildings.

The Uniform Building Code requirements shall be implemented in structures proposed in the Planning Area.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

For the purpose of this EIR, an impact was considered significant if one or more of the following conditions would result from implementation of the Alternatives:

- Exposure of people or structures to geologic hazards, such as earthquakes, landslides, mudslides or ground failure;
- Construction on substrate that consists of material subject to liquefaction, or other secondary seismic hazards in the event of groundshaking, including ground settlement and lateral spreading;
- Increase in wind or water erosion of soil, either on or off site; or
- Deformation of foundations by expansive soil (those characterized by shrink-swell potential).

Method

In general, the geotechnical characteristics of sites determine the potential for structural and safety hazards that can occur with the development of a project. Various site assessment studies have been undertaken for the Railyards Area to characterize the extent and nature of the hazardous materials contamination. These studies were reviewed to collect any relevant geotechnical data. A preliminary geotechnical study was prepared for the Richards Area. These reports, in conjunction with available topographical and seismic maps, Soil Conservation reports, and other studies that included relevant geologic data, were used to determine geological impacts that would occur from project development in the Planning Area.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

Faulting and Seismicity

4.11-1 Development of the Planning Area would be subject to potentially damaging seismically induced groundshaking.

A-1 through A-7

Alternative 1 would result in the development of additional office, highway commercial/ retail, heavy commercial/light industrial and hotel uses, but would not result in additional residential development in the Planning Area. Under Alternatives 2, 3, 4, 5, 6, and 7, additional office, highway commercial/retail, heavy commercial/light industrial, residential, hotel and cultural/industrial uses would be constructed in the Planning Area.

The Sacramento area (including the Planning Area) is located within approximately 20 miles of the Dunnigan Hills and Midland faults. An earthquake along these faults could be of a maximum credible magnitude of 7.0, and generate ground accelerations of up to 0.2 g. Ground accelerations of this magnitude could cause damage to structures and infrastructure, exposing people to the associated hazards. The intensity of the vibration or shaking and its potential impacts are determined by several factors:[18]

- The nature of the underlying materials, including rocks and soils;
- The structural characteristics of a building;
- The quality of materials and workmanship used in its construction;
- The location of the epicenter and the magnitude of the earthquake; and
- The duration and character of the ground motion.

Alternatives 3 through 7 include not only construction of new structures, but the restoration of historic structures, which may not be in conformance with current Uniform Building Code Standards for structures located with Seismic Zone 3 (which applies to Sacramento). The City of Sacramento General Plan requires that construction or repair of buildings conforms with the Uniform Building Code requirements that recognize state and federal earthquake protection standards. Even though Alternatives 1 and 2 do not propose the construction of high rise buildings, the effects of seismic groundshaking and recommended mitigation are the same regardless of building height. Therefore, this is considered to be a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.11-1 would reduce the above impacts to a *less-than-significant level.*

4.11-1 *New structures, the restoration of existing structures, and the development of project infrastructure shall be designed and built in conformance with the Uniform Building Code (with California amendments) standards for Seismic Zone 3. This mitigation measure would be required for all Alternatives.*

4.11-2 Development of the Planning Area could be exposed to seismically induced hazards such as liquefaction, settlement and the lateral spreading of underlying materials.

A-1 through A-7

Alternative 1 would result in the development of additional office, highway commercial/retail, heavy commercial/light industrial and hotel uses, but would not result in additional residential development in the Planning Area. Alternatives 2, 3, 4, 5, 6, and 7 would result in the development of additional office, highway commercial/retail, heavy commercial/light industrial, residential, hotel and cultural/industrial uses in the Planning Area.

The Planning Area is underlain with alluvial deposits containing silt and sand as well as areas of fill material, which could be subject to liquefaction, settlement, or lateral spreading during seismic events. The expected degree of groundshaking would likely not generate significant liquefaction, but the Sacramento area is within the liquefaction opportunity zone of maximum credible earthquakes on several faults, including Dunnigan Hills, Midland, Bear Mountain, and the San Andreas fault systems.

Settlement would likely occur in areas of fill material located within the Planning Area. The risk of settlement would be greater in the Railyards Area at the site of the previous Sutter lakebed.

Lateral spreading could occur along the Sacramento and American River levees leading to damage to any structures located near the levees, as well as their potential failure, releasing floodwater into developed areas. Lateral spreading could also occur in areas underlain with fill material.

Even though Alternatives 1 and 2 do not propose the construction of high rise buildings, the effects of seismically induced hazards and recommended mitigation are the same regardless of building height. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.11-2(a) and (b) would reduce the above impacts to a *less-than-significant level.*

4.11-2(a) *Prior to construction, site-specific geotechnical evaluations shall be performed by a Certified Engineering Geologist, or a Licensed Geotechnical Engineer to assess*

seismic conditions including probability associated with liquefaction, settlement, and lateral spreading using a maximum probable and credible earthquake. The evaluation shall identify specific geotechnical recommendations for development foundation design to mitigate for seismically induced hazards, as well as recommendations for adequate building design including excavation and fill requirements for any identified soil constraints. The evaluation will also include an analysis of levee stability under static and seismic conditions in coordination with the US Army Corps of Engineers. This mitigation measure would be required for all Alternatives.

4.11-2(b) *Design of foundations and drainage facilities shall conform with Title 24 of the California Code of Regulations, the Uniform Building Code and recommendations contained in the site-specific geotechnical evaluations prepared by a Certified Engineering Geologist, or a Licensed Geotechnical Engineer/Geologist as specified in Mitigation Measure 4.11-2(a). This mitigation measure would be required for all Alternatives.*

Soil

4.11-3 Development of the Planning Area would involve site preparation activities that could expose soil to erosion.

A-1 through A-7

Alternative 1 would result in the construction of additional office, highway commercial/ retail, heavy commercial/light industrial and hotel uses in the Planning Area. Alternatives 2, 3, 4, 5, 6, and 7 would result in the construction of additional office, highway commercial/retail, heavy commercial/light industrial, residential, hotel and cultural/industrial uses in the Planning Area.

The soil underlying the Planning Area is not subject to significant erosion, therefore, no measures are required to mitigate erosion hazards. However, should development occur during the rainy season, water quality may be affected by sedimentation (please refer to Section 4.12 Hydrology and Water Quality for a discussion of mitigation measures to reduce adverse effects to water quality). This is considered to be a ***less-than-significant impact.***

Mitigation Measure

4.11-3 *None required.*

4.11-4 Development of the Planning Area would occur on soils that exhibit expansive characteristics, which could expose people to geologic hazard by damage building foundations and slabs.

A-1 through A-7

Alternative 1 would result in the development of additional office, highway commercial/ retail, heavy commercial/light industrial and hotel uses, but would not result in additional residential development in the Planning Area. Alternatives 2, 3, 4, 5, 6, and 7 would result in the development of additional office, highway commercial/retail, heavy commercial/light industrial, residential, hotel and cultural/industrial uses in the Planning Area.

All soils exhibit certain engineering properties and characteristics such as shrink-swell potential that determine suitability and constraints for building sites, roads, grading and drainage. Expansive soil "expands" when it absorbs water, and "shrinks" when it dries out. In general, the Planning Area contains soil characterized as having low shrink-swell potential. However, without site-specific geotechnical analysis to accurately characterize underlying soils, especially in areas containing fill material, the extent of hazards associated with expansive soils cannot be fully determined. Therefore, this is considered to be a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.11-4 would reduce the above impacts to a *less-than-significant level.*

4.11-4 *Implement Mitigation Measures 4.11-2(a) and 4.11-2(b). This mitigation measure would be required for all Alternatives.*

Groundwater

4.11-5 Development of the Planning Area could occur in areas where groundwater could be encountered during the construction phase of the project.

A-1 through A-7

Alternative 1 would result in the development of additional office, highway commercial/ retail, heavy commercial/light industrial and hotel uses but would not result in additional residential development in the Planning Area. Under Alternatives 2, 3, 4, 5, 6, and 7, additional office, highway commercial/retail, heavy commercial/light industrial, residential, hotel and cultural/industrial uses would be constructed in the Planning Area.

Below-grade construction activities of 10 feet or greater may encounter the shallow groundwater table underlying the Planning Area. This groundwater table may be as shallow as five feet below the surface. Excavations for foundations, deep basements, elevator pits or other deep below-grade structures may require dewatering activities to maintain adequate construction conditions. While development of buildings in Alternative 1 and 2 would not involve high rise construction, the groundwater table might still be

encountered. This is considered to be a ***significant impact.*** (Exposure of construction workers to contaminated groundwater, either through direct contact or inhalation of vapors, is evaluated in Chapter 4.13, Hazardous Materials).

Mitigation Measures

Implementation of Mitigation Measures 4.11-5(a) through (e) would reduce the above impacts to a *less-than-significant level.*

4.11-5(a) *If below-grade construction is proposed, site-specific geotechnical investigation will be undertaken prior to the start of excavation to determine the depth to the groundwater for the entire Planning Area, and the need for subsurface drainage and the potential for caving of excavation walls. This investigation and subsequent analysis shall be made by a Certified Engineering Geologist. This mitigation measure would be required for all Alternatives.*

4.11-5(b) *If dewatering of a construction site is required, subdrains, reinforced concrete retaining walls and waterproofing methods shall be used as necessary to eliminate the effects of subsurface groundwater conditions. The subdrain plan shall form part of the final plans for the project, and would be prepared with the recommendations of a Certified Engineering Geologist. This mitigation measure would be required for all Alternatives.*

4.11-5(c) *Dewatering shall comply with applicable requirements established by the Central Valley Regional Water Quality Control Board and any applicable local permit requirements, and shall be coordinated with the City's Flood Control and Sewers Division. This mitigation measure would be required for all Alternatives.*

4.11-5(d) *Moisture barriers around foundations shall be used where applicable to prevent moisture changes from adversely affecting soils beneath a structure. This mitigation measure would be required for all Alternatives.*

4.11-5(e) *Where required due to high groundwater, excavations shall be shored as required by the Office of Safety and Health Administration (OSHA) to preclude slope failures during the construction period. Shoring shall use standard stabilizing methods, such as tiebacks, as necessary to retain excavation areas. This mitigation measure would be required for all Alternatives.*

Impacts Due to Development in the Railyards Area Only

4.11-6 Construction of the proposed new railroad crossing over the Sacramento River could be affected by unstable bank and river bottom conditions.

A-1 and A-5

Implementation of the proposed new railroad bridge across the Sacramento River is not proposed as part of Alternative 1 or Alternative 5. Therefore, this is considered to be a ***less-than-significant impact.***

A-2 through 4, A-6 and A-7

Implementation of Alternatives 2, 3, 4, 6 and 7 include the construction of a new railroad crossing over the Sacramento River. The construction of the bridge could require the placement of pilings in the river channel bottom, and could also require anchoring into the river bank. Unstable geologic conditions could compromise the integrity of the bridge structure. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.11-6(a) and 4.11-6(b) would reduce the above impact to a *less-than-significant level.*

4.11-6(a) *Implement Mitigation Measure 4.11-2(a). This mitigation measure applies to Alternatives 2, 3, 4, 6 and 7.*

4.11-6(b) *Required further environmental documentation shall be performed upon development of design to ensure that all environmental impacts associated with the proposed river crossing are evaluated in compliance with all applicable federal, state, and local regulations. This mitigation measure applies to Alternatives 2 through 4, 6 and 7.*

Cumulative Impacts

4.11-7 On a regional basis, cumulative development in Downtown Sacramento, including the Planning Area, would increase the number of people working and living within structures who would be exposed to hazards associated with seismic activity.

A-1 through A-7

Growth within the downtown Sacramento area will increase development and the number of people who would be exposed to hazards associated with seismic activity such as groundshaking, liquefaction, settlement, and lateral spreading. The risk associated with this hazard can be reduced by implementation of seismic safety standards, and specific building design measures. This is considered to be a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.11-7 would reduce the project-specific contribution to the above impacts to a *less-than-significant level.*

4.11-7 *The City of Sacramento shall continue to require development to comply with General Plan Goals and Policies for Seismic Safety, including Policies 1 through 3, or the equivalent. This mitigation measure is required for all Alternatives.*

ENDNOTES

1. Harding Lawson Associates. 1990. *Draft Preliminary Geotechnical Evaluation Richards Boulevard Redevelopment Area Sacramento, California,* October 17, 1990.

2. Ibid.

3. City of Sacramento. 1987. *City of Sacramento General Plan Update Environmental Impact Report* , March 1987.

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6. ERM West, Inc. 1991. *Overall Site Remedial Investigation/Feasibility Study, Shell Work Plan, Sacramento Railyard, Sacramento, California,* ERM-West Inc., July 1, 1991.

7. Woodward-Clyde Consultants. 1989. *Lagoon Study Area Sampling and Analysis Plan, Sacramento Rail Yard, Sacramento, California*, October 21, 1989.

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15. Ibid.

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4.12 HYDROLOGY AND WATER QUALITY

4.12 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section addresses impacts of development of the Alternatives on the hydrologic characteristics of the proposed Planning Area and the surrounding water features. These characteristics include surface water flow, groundwater resources, flooding and water quality. Evaluation of impacts associated with contaminated groundwater underlying the Planning Area is discussed in Section 4.13, Hazardous Materials.

SETTING

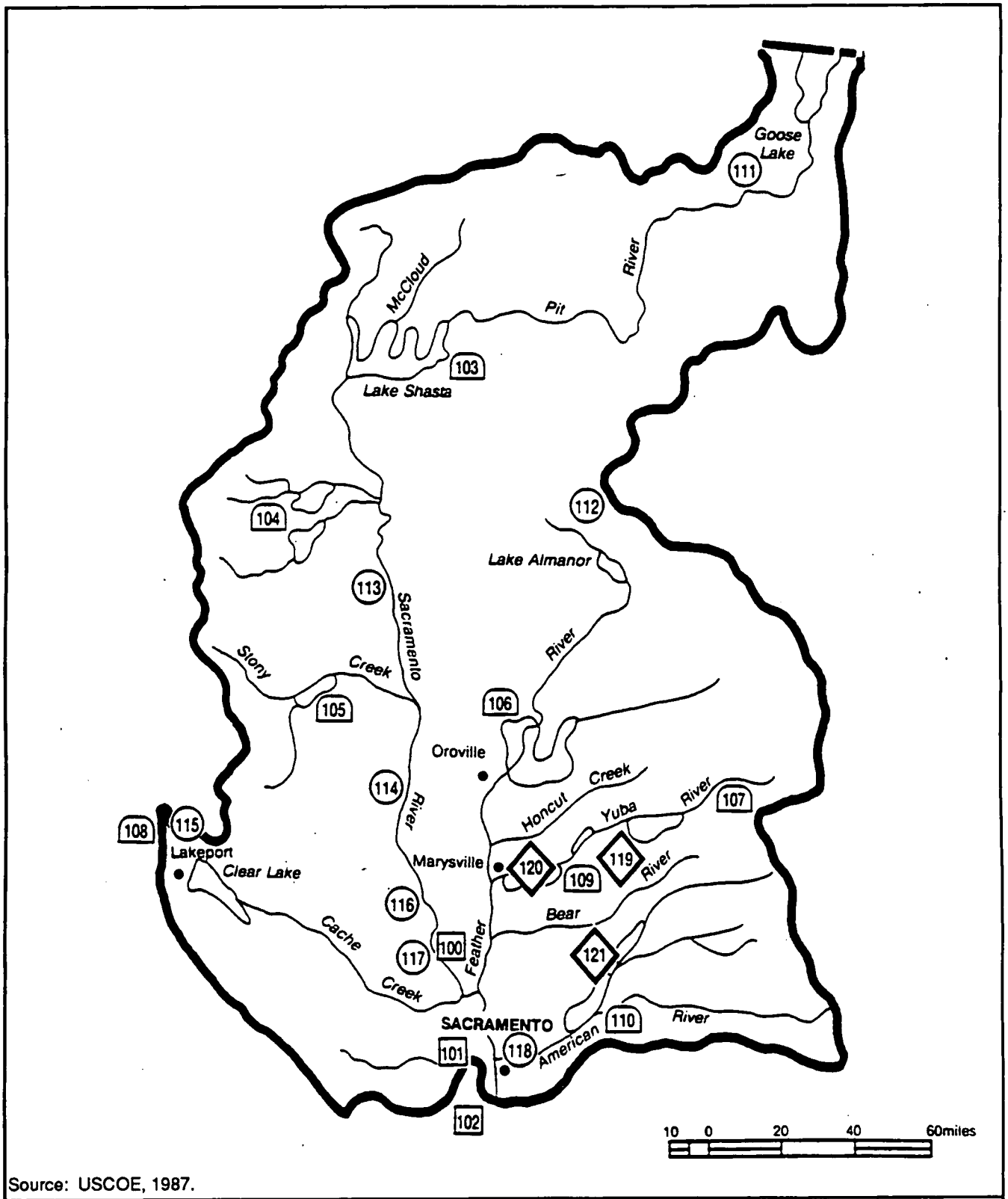
General Hydrology

Surface Water Resources

The confluence of two major rivers is located in close proximity to the Planning Area. The Sacramento River is located along the western boundary of the Planning Area, and the American River is located along the northern boundary.

The Sacramento River Basin encompasses about 26,500 square miles and is bounded by the Sierra Nevada Mountains to the east, the Coast Ranges to the west, the Cascade Range and Trinity Mountains to the north, and the Delta-Central Sierra area to the south (see Figure 4.12-1). The Sacramento River is the principal stream in the basin. Its major tributaries are the Pit and McCloud Rivers, which join the Sacramento River from the north, and the Feather and American Rivers, which are tributaries from the east. Numerous tributary creeks flow from the east and west. The average runoff from the basin is estimated to be 21.3 million acre-feet per year. The melting snowpack in the Sierra Nevada Mountains maintains streamflow during most of the summer.

The American River Watershed encompasses about 2,100 square miles and is a subbasin within the larger Sacramento River Basin (see Figure 4.12-2). There are three principal streams in the basin: North Fork, Middle Fork, and the South Fork American River. The North and Middle Forks merge near the City of Auburn. The South Fork joins the mainstream (North and Middle Forks) in Folsom Lake, and the River empties into the Sacramento River about 25 miles west of Folsom Dam. The American River has an average annual flow volume of about 2.7 million acre-feet per year.



Source: USCOE, 1987.

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FIGURE 4.12-1

SACRAMENTO BASIN

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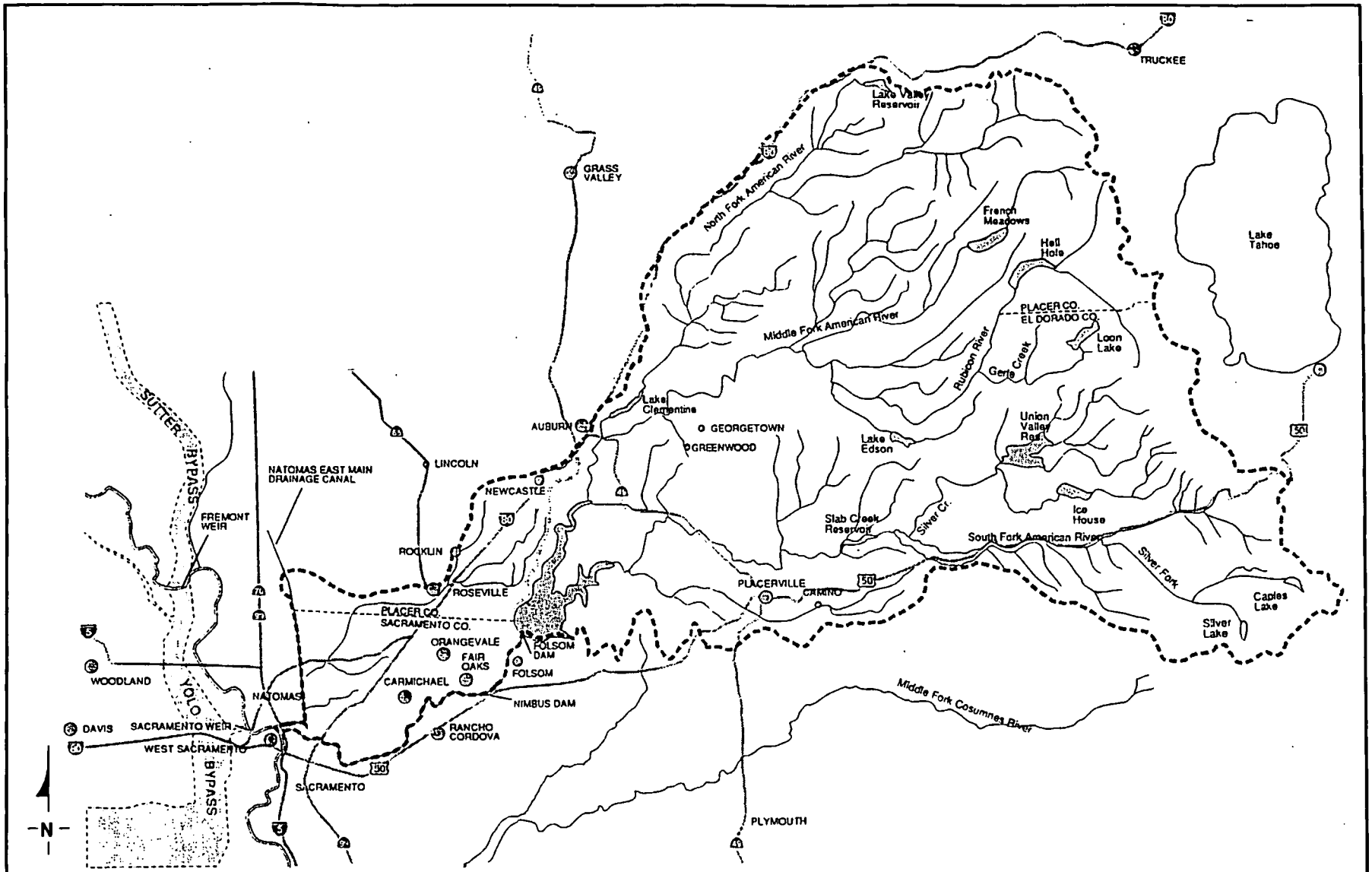

Source: USCOE, EIP Associates, 1989.

LEGEND

- American River Drainage Basin Boundary
- Lower River Folsom Reservoir Drainage Separation
- Major Highways
- County Boundaries

FIGURE 4.12-2

AMERICAN RIVER WATERSHED

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The Sacramento and American river system experiences variation in water level during different parts of the year and during different parts of the month. Two factors affecting the water level are the amount of runoff entering the system from the rivers' watersheds and the amount of water being released from dams upriver. The system is also subject to tidal action from the Sacramento-San Joaquin Delta.

Railyards Area

The Railyards Area once contained natural water features. The northern water body was known as Willow Lake, and the southern as Sutter Lake, Sutter Slough, or China Lake. These lakes and adjacent marshland covered the entire site. Both lakes were connected with the Sacramento River through a narrow channel. Over time, to accommodate development, the lakes and marshes were filled. No natural water features remain in the Railyards Area.

Richards Area

No natural water features exist in the Richards Area. The American River channel did flow through the area before it was diverted to its present location by the U. S. Army Corps of Engineers (USCOE) at the turn of the century.

Groundwater Resources

Railyards Area

Previous investigations of the Railyards Area have identified three water-bearing zones within less than 100 feet of the surface: the Silty Sand and Clay zone, the Sand zone, and the Gravel zone. Well logs have not indicated the presence of aquitards (zones which are sufficiently permeable to vertically transmit water to or from a confined aquifer) between the zones; therefore, the zones are probably hydrologically interconnected. A forth water-bearing zone, the Interbedded zone, underlies the Gravel separated by clay layer. Groundwater flow in these shallow zones is generally in a east-southeast direction.[1] These shallow zones are also hydraulically connected to the Sacramento River. Depth to groundwater is approximately 20 feet, but water levels have historically fluctuated in the area from less than five feet to greater than 15 feet on an annual basis.[2] As the surface water elevation of the Sacramento and American Rivers rises and falls, groundwater levels near the banks also fluctuate. When the Sacramento River is high, the river recharges the groundwater and results in an easterly gradient under the area. When the water stage levels are lower, the river is being recharged by groundwater, resulting in a westerly gradient.[3]

Richards Area

Groundwater was identified in the Richards Area at a depth of approximately 15 to 30 feet below grade.[4] Depths as shallow as six feet have been identified.[5] As with the Railyards Area, groundwater elevation will fluctuate. In the vicinity of the Sacramento and American Rivers, groundwater generally flows toward the river during periods of low flow, and away from the

river during periods of high flows. Towards the center of the site, groundwater generally flows in a southwesterly direction.[6] However, due to its proximity to the rivers, direction of groundwater flow in the Richards Area will vary.

Flooding Hazard

Major storm events can produce high flows throughout the Sacramento and American river systems. Flood control facilities along the rivers consist of a comprehensive system of dams, levees, overflow weirs (diversion structures in the river intended to ensure a maximum flow in the river), drainage pumping plants, and flood control bypass channels. Such facilities harness flood flows by regulating the amount of water passing through a particular reach of the river. The Sacramento River flood control system downstream of the American River was designed to hold a maximum flow of 110,000 cfs with a minimum of three feet of freeboard. The American River flood control system was designed to hold a maximum flow of 115,000 cubic feet per second (cfs) with a designed minimum of five feet of freeboard.

During major flood events, high flows can occur throughout the Sacramento and American river system. The relative timing of these flows can accentuate the flood risk, because high water levels in a primary stream can result in a "backwater" effect which reduces the effective slope and capacity of the tributary or incoming stream.

An example of this effect would be the lower reach of the American River. The flood water surface elevations in the American are "controlled" or affected by the Sacramento River water surface elevation, either at the mouth of the American or at the Sacramento Weir. Under most conditions, the water surface in the American River is controlled by the water surface elevation (WSEL) at its mouth; however, during maximum peak flows, the American River is controlled by the WSEL in the Sacramento River at I Street, at the confluence and at the Sacramento Weir. Under these conditions there is actually a "flow reversal" when a portion of the flow from the American moves upstream in the Sacramento River to the Sacramento Weir. Numerous other local flood control and drainage facilities are also affected by the high water levels in the main channels. Due to the relatively flat terrain of the Central Valley, this "backwater" effect is a significant controlling factor for most natural streams and flood control or drainage channels in the region. This effect was significantly demonstrated during the February 1986 flood event, which was characterized by the long duration of the storm that caused high water levels in the primary streams. Near the end of this storm period, an intense period of precipitation was experienced resulting in high runoff which could not be adequately handled due to the "backwater effect" of the primary streams.

100-Year Flood Plain

Railyards Area

The Railyards Area, for the most part, is not located within the 100-year flood plain as defined by the Federal Emergency Management Agency (FEMA) November 15, 1989 Flood Insurance Rate Map (FIRM) for the City of Sacramento (see Figure 4.12-3). Most of the area is classified

as Zone X, "Areas determined to be outside 500-year flood plain," due to site elevation. Three small sites within the Railyards Area are classified as A99. FEMA defines A99 zones as areas "To be protected from 100-year flood by federal flood protection system under construction; no base elevations determined". Therefore, by definition, flood elevations are not designated in the A99 Flood Hazard Zone, and the designation indicates anticipation that the area will be afforded 100-year flood protection after a relatively short period of time. In Sacramento's case, FEMA considers the A99 Zone designation to be a 'special use' of this designation since the reason for not showing base flood elevations in the A zone is special legislation, rather than a determination that the area is making adequate progress toward achieving a 100-year level of protection. Designated A99 zones on-site are: 1) an area between the Southern Pacific rail line and the eastern boundary of the site; 2) a small area north of the Southern Pacific rail lines west of Dos Rios Boulevard; and 3) a small section along the northern boundary (see Figure 4.12-3). The Railyards Area is considered to be subject to the 100-year flood by inundation from the American River.

Richards Boulevard Area Plan

The Richards Area is primarily classified as being located within an A99 Zone and is subject to inundation by a 100-year flood event from the American River (see Figure 4.12-3). Four areas within the Richards Area are classified as being located within Zone X. These areas are: 1) the southern boundary along the Southern Pacific rail line; 2) an area running along the eastern side of the Union Pacific rail line; 3) the area adjacent to the eastern boundary (between 24th and 28th streets); and 4) the American River levee and Sacramento levee along the northern and western boundaries. The area between the American River and the levee is designated floodway. FEMA defines floodway as "the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot at any point".

Flood Plain Regulations

Designated A99 zones in the City of Sacramento are not subject to FEMA building requirements for development in the 100-year flood plain designated A Zones. In order to assure proper floodplain management within the designated A99 zones, the City was required to develop a land use policy for those areas designated as A99 in compliance with the Special Legislation for the Sacramento area contained in the McKinney Homeless Assistance Act of 1988 (H.R. 524). The existing A99 Zone is an interim floodplain designation. In late 1988, FEMA was in the process of revising the 1986 FIRMs based on data collected by the USCOE following the record storm of February 1986. This new data indicated that the levees along the Sacramento River did not meet FEMA criteria for stability and that the flood control system along the American River and its tributaries provided less than the minimum 100-year level of protection required under the National Flood Insurance Program. Based on this new data, FEMA prepared new FIRMs delineating a 100-year floodplain that encompassed much of the City of Sacramento, with flooding in the affected areas ranging from one to 25 feet in depth.

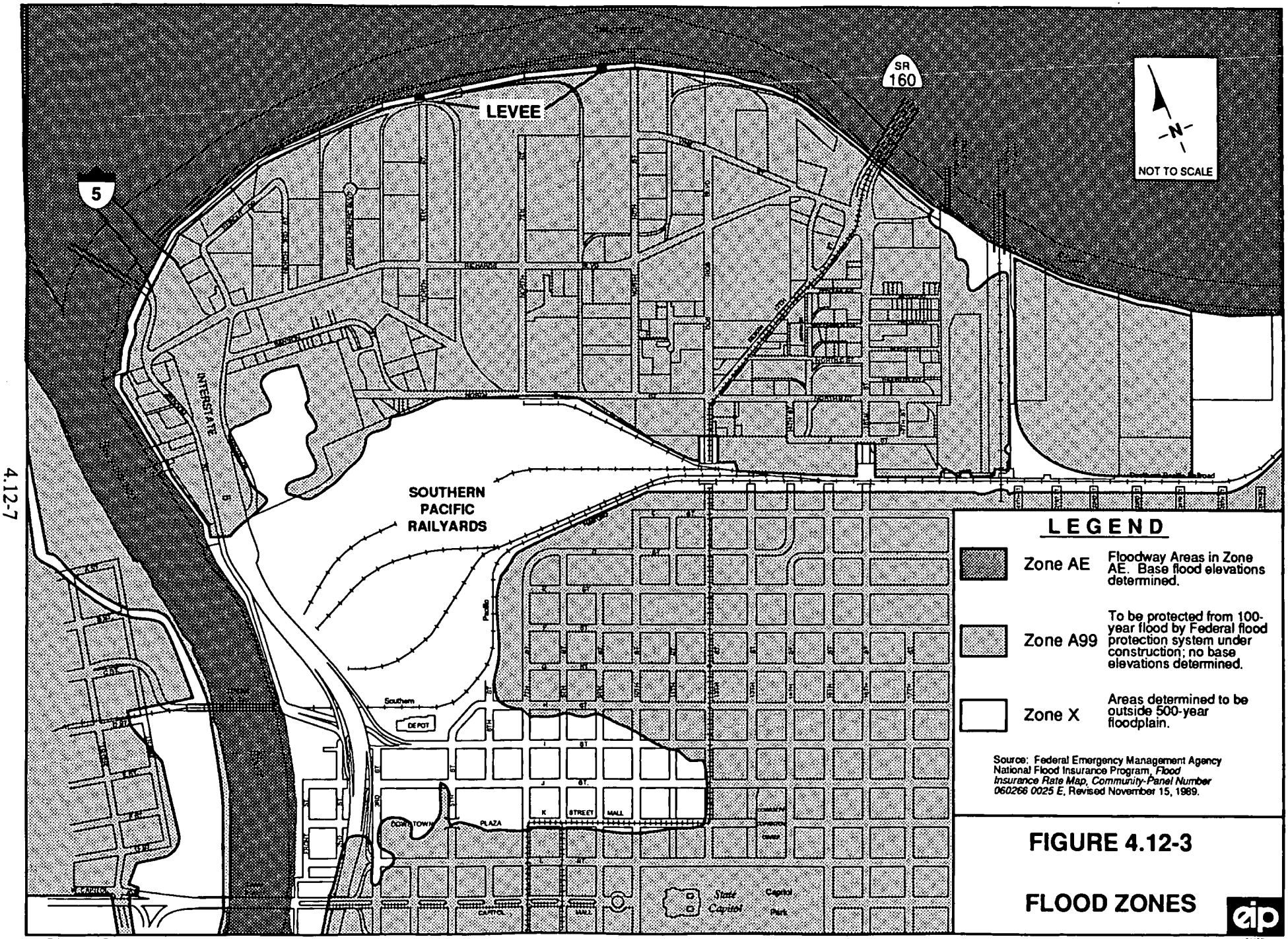

FIGURE 4.12-3

FLOOD ZONES

F-EX/Flood-Zones--5/27/92/15:00

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Because of the perception that promulgation of these new FIRMs would have a severe impact on the local economy and would undermine Sacramento's ability to mount an effective flood protection effort, the local community, through its representatives in Congress, sought legislative relief from the FEMA mapping process. In response, Congress enacted special legislation directing FEMA to regulate the Sacramento area based on the flood elevations shown on the then-effective 1986 FIRMs. This legislation was enacted in October 1988 for a period not to exceed four years.

FEMA's response to this legislation was to promulgate new FIRMs showing the boundaries of the new 100-year floodplain, but without indicating base flood elevations. The areas lying within the expanded floodplain were designated as a "special use" A99 Zone. This zone designation is normally reserved for flood-prone areas that meet the "adequate progress" requirements of Section 1307(e) of the National Flood Insurance Act. The "A" portion of this zone designation indicates that the area is within the 100-year floodplain. The "99" portion indicates that the area is making adequate progress toward the achievement of a 100-year level of protection, and may therefore be relieved from the need to elevate new structures above the water level that would be reached in the event of a 100-year storm (base flood elevation). This "99" designation thus removes the need to show base flood elevations, and none are shown in the A99 Zone.

As previously discussed, in Sacramento's case FEMA considers the A99 Zone designation to be a "special use" of this designation since the reason for not showing base flood elevations in the A zone is special legislation, rather than a determination that the area is making adequate progress toward achieving a 100-year level of protection. It is understood that this "special use" designation will end in October 1992, the expiration date of the special legislation. At that time, FEMA will evaluate Sacramento's progress in developing a comprehensive flood protection program for the area. If the area is deemed to be making sufficient progress in this regard, FEMA could convert the "special use" A99 designation into a "normal" A99.

Under applicable provisions of the Sacramento City Code, new development in a designated A99 Zone is permitted provided building permit applicants, by agreement with the City, assume the risk of all flood-related damage to any permitted new construction, and agree to notify subsequent purchasers of the flood risk.

A99 Zones

The following two sections from Ordinance 90-005 amending Articles XXVI and XXVII of Chapter 9 of the Sacramento City Code relating to new construction in areas of the 100-year floodplain refer to the notice and waiver requirements for those places within the Planning Area located within the A99 Zone.

§ **9.1103 Notice to Purchasers of New Construction.**

(a) In connection with the sale of any new construction located in the A99 zone, the seller, any real estate agent or broker representing the seller, and the primary escrow agent involved in the transaction shall:

(1) Provide the prospective purchaser with written notice of the flood danger in a form acceptable to the City Attorney; and

(2) Obtain the prospective purchaser's signed acknowledgement of receipt of the notice.

(b) The written notice required by this section shall be provided as follows:

(1) In the case of sales which must be preceded by the furnishing to prospective purchasers of a public report pursuant to Section 11018.1 of the California Business and Professions Code or a disclosure statement pursuant to Section 1102.2 of the California Civil Code, the seller and any real estate agent or broker representing the seller shall insure that the notice of the flood danger either accompanies or is included in the public report or the disclosure statement;

(2) In the case of sales to which paragraph (b)(1) does not apply, the seller and any real estate agency or broker representing the seller shall provide the notice of the flood danger to the prospective purchaser as soon as practicable before transfer of title; and

(3) In the event that escrow services are utilized in connection with any sales subject to this section, the primary escrow agent shall verify that the notice of the flood danger has been delivered as required under paragraphs (b)(1) and (b)(2). If for any reason the prospective purchaser has not received the notice, then the primary escrow agent shall provide the notice to the prospective purchaser through the escrow process prior to transfer of title.

(c) This section shall apply to all sales of new construction which occur on or after August 25, 1989, provided that at the time of the sale the affected structure is located in the A99 zone.

§ **9.1104 Contractual Assumption of the Risk of Flooding.**

(a) As of August 25, 1989, no building permit shall be issued for any new construction or substantial improvements located in the A99 zone unless the owners of the new construction or the persons contracting for the substantial improvements execute an agreement with the City, in a form acceptable to the City Attorney, whereby such persons:

(1) Are notified of and expressly assume the risk that the new construction or substantial improvements may be subject to flood-related property damage;

(2) Unconditionally waive any claim of liability on the part of the City, or its officers, agents or employees for any flood-related property damage premised on the issuance of a permit for the new construction or substantial improvements;

(3) Expressly agree, in connection with any transfer of any ownership interest, or a possessory interest of more than three years duration, in the new construction or the substantial improvements, to notify the transferee of the flood danger and obtain on behalf of the City the transferee's waiver of any claim of flood-related property damage premised on the issuance of a permit for the new construction or substantial improvements; and

(4) Agree to assume the defense of and indemnify the City and its officers, employees and agents from and against all claims for any flood-related property damage premised on the issuance of a permit for the new construction or substantial improvements, provided:

(i) In the case of new construction, the indemnification obligation shall become effective only in the event that the persons executing the agreement sell the new construction within three years after the execution date; and

(ii) In the case of substantial improvements, the indemnification obligation shall not apply if the substantial improvements add to or modify a residential structure occupied by the persons executing the agreement as of the execution date and for at least three years thereafter; and

(iii) The indemnifiers shall be released from this indemnification pledge if, at such time as the City seeks to enforce this pledge, the indemnifiers demonstrate that they have fully complied with the provisions of the agreement requiring that they give notice of the flood danger to third parties obtaining an interest in the new construction or substantial improvements.

A Zones (except A99)

FEMA requirements for residential development in a designated A Zone include raising the first floor to or above the base flood elevation (100-year). Requirements for nonresidential structures include the following:

1) Elevate the lowest floor (including the basement) to or above the base flood level; or

2) together with attendant utility and sanitary facilities, design so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

3) require that fully enclosed areas below the lowest floor that are subject to flooding be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters.

Regulatory Floodway

FEMA prohibits encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.[7]

Flood Protection

Prior to 1986, it was believed that the levee system around the Sacramento area afforded 100-year protection. Estimated peak flows of historic flood events on the Sacramento River at the I Street river gauging system, adjacent to the Railyards Area, range from 94,000 cfs in January 1970 to a maximum of 117,000 cfs in February 1986 (17,000 cfs over design capacity). Peak releases from Folsom Reservoir in February of 1986 were as high as 134,000 cfs, or 19,000 cfs over design capacity. Although the levees contained the record flows, in many cases, there occurred encroachment into the design freeboard and erosion of the levee embankment. As a result of the 1986 event, the USCOE re-evaluated the magnitude of the 100-year event, the condition of existing levees, and the level of protection provided by the existing flood control system. The USCOE determined that the magnitude of the 100-year flood event had been underestimated, and that the existing American River flood control system provides an average flood protection of only 63 years. A 63-year event has a 1.6 percent chance of occurring in any given year, in comparison to a 100-year event which has a one percent chance of occurring in any given year.[8]

The Sacramento Area Flood Control Agency (SAFCA) has determined that additional flood protection along the American River, including the implementation of levee improvements and additional upstream storage (the proposed Auburn expandable dam project), could be achieved as early as 1996. Interim 100-year protection could be achieved as early as 1992 if measures are taken to increase the storage capacity of Folsom Dam. A draft Operation Plan and draft Environmental Impact Statement (EIS) for the Folsom Dam and Reservoir Reoperation Investigation was issued by the USCOE, March 20, 1992. The Plan and draft EIS evaluate measures to afford Sacramento interim 100-year protection including increasing seasonal flood storage from 400,000 to 590,000 acre-feet. The document evaluates the effects of this reoperation, including the reallocation of storage space now used for water supply, hydro power, and recreation to flood control.

However, due to the political and environmental review process to which the proposed flood control project is subject, improvements to increase flood protection along the American River may not be possible by 1996. The Reclamation Board, with assistance from the State Department of Water Resources, has prepared an environmental document for the USCOE. The "American River Watershed Investigation" evaluated alternative approaches to flood protection, and a draft feasibility report and draft EIS were issued in April 1991. That feasibility report included an evaluation of six alternatives that would provide a range from 400-year to 100-year protection.[9]

The Final Feasibility Report was completed and submitted to the federal government in February, 1992. The recommended plan of improvement would provide a 200-year level of protection and includes a concrete gravity dam 425 feet high with a detention capacity of 545,000 acre-feet on the North Fork of the American River. The plan also includes the acquisition of approximately 6,030 acres of lands in the detention area and replacement of the State Highway 49 bridge and Ponderosa Way bridge in the Planning Area near Auburn.

Project features in the Natomas area would include construction of levee improvements along the Natomas East Main Drainage Canal (NEMDC), Pleasant Grove Creek Canal, Natomas Cross Canal, lower Arcade and Dry Creeks, and Sankey Road; replacement of Main Avenue bridge; a pump station in the NEMDC at Dry Creek; a 3,000 acre-foot detention basin in the northeast corner of Natomas; and, construction of a 3,000 cubic feet per second capacity channel and culvert along the NEMDC and under the Union Pacific Railroad. The recreation features of the plan include pedestrian, biking and equestrian trails along areas in Natomas where levees would be modified. The Plan includes environmental mitigation with major features of acquisition, planting and management of approximately 5,700 acres of land for fish and wildlife mitigation, data recovery and preservation of historic, pre-historic and paleontological sites.

Following Congressional authorization and funding, construction of the proposed project would be undertaken by the USCOE. Implementation of the proposed plan would include participation by non-federal interests in accordance with the general requirements of law for this type of project.

City of Sacramento Goals and Policies

The City's General Plan contains the following goals and policies related to flood control.

Flood Hazards

Goal A

Protect against flood related hazards wherever feasible.

Policy 1

Prohibit development of areas subject to unreasonable flooding unless measures can be implemented to eliminate or reduce the risk of flooding.

The Railyards Area is primarily located outside of the 100-year floodplain. However, portions of the area are not, and could be inundated by up to four feet of water. The Richards Area is located within the 100-year floodplain, and would be inundated by up to 15 feet of flood water. Development under all of the Alternatives would place structures and inhabitants in designated flood zones. The City of Sacramento has implemented City ordinances and zoning codes regulating residential and non-residential development in the 100-year floodplain. Furthermore, improvements are being implemented and proposed to improve the American River flood control system to afford the Planning Area with adequate flood protection.

Public Health and Safety

Goal A

Continue to work toward providing a levee system which protects the community from flood related hazards and make use of its open space areas where appropriate.

Policy 1

Support levee reconstruction with appropriate crown widths for recreational use to the extent feasible.

The levee system along the American River in the Richards Area is designated as open space, under the American River Parkway Plan, for all of the Alternatives. The levee system along the Sacramento River currently contains a trail system, which would be maintained. Modifications to incorporate an amphitheater, as proposed under Alternatives 2, 3, 4, 6 and 7, would be coordinated with the appropriate agencies, including the USCOE, the State Lands Commission, and SAFCA, to ensure levee integrity is maintained.

Surface Water Quality

Water quality objectives for all waters in the state are established under applicable provisions of Section 303 of the Federal Clean Water Act (CWA) and the State's Porter-Cologne Water Quality Act. Water quality objectives have been established for the Sacramento River (including the American River because it is a tributary) which are contained in the 1991 Sacramento River Basin Plan prepared by the Central Valley Regional Water Quality Control Board (CVRWQCB). Both the Sacramento and American Rivers are calcium bicarbonate waters affected by upstream development. Both are extensively regulated by federal, state, and local flood control and storage facilities which regulate stream flow, reducing high water flows and increasing summer and fall flows, affecting water quality. Table 4.12-1 describes a general range of values for common water quality parameters for both rivers.[10] A summary of the water quality objectives for the Sacramento and American Rivers in the Planning Area vicinity is contained in Appendix H. The following discussion describes water quality characteristics of both the Sacramento and American Rivers.

Sacramento River

The Sacramento River is classified as having numerous beneficial uses, including municipal water supply, agriculture, recreation and fisheries. The River system, as a whole, is the largest and most important freshwater habitat in the state, supporting many fish species. Water quality within the river is classified as "good" to "impaired" in the reach from Red Bluff to the Delta. Upstream water management and use can affect the quality of water in the river. Regulation of stream flow by the federal and state flood control and storage facilities reduces high water flows and increases summer and fall flows, substantially lessening water quality variations. Extensive irrigated agriculture upstream from the City of Sacramento tends to degrade river water quality. During the spring and fall, irrigation return flows are discharged to drainage canals that flow into the river; during the winter, local runoff also flows over agricultural lands, increasing the turbidity in the water and introducing herbicides and pesticides.[11]

The Sacramento Regional County Sanitation District (SRCSD) operates a main treatment plant, the Sacramento Regional Wastewater Treatment Plant (SRWTP), which discharges secondary

TABLE 4.12-1
AVERAGE WATER QUALITY OF THE SACRAMENTO AND AMERICAN RIVERS

Constituent[1]	Sacramento River at Sacramento		American River at Sacramento	
	Range	Average	Range	Average
pH (units)	6.8-8.3	7.5	7-1-7.8	7.5
Electrical conductance (µmhos/cm)	110-270	150	45-85	60
Temperature (°C)	5-24	---	0-26	---
Dissolved oxygen	6.5-13.5	---	6-13.5	---
Calcium, Ca	2-20	12	4-8	6
Manganese, Mg	2-12	7	0.3-2.6	1
Sodium, Na	2-30	12	1-5	2
Potassium, K	0-2	1.5	0.5-1	0.7
Bicarbonate, HCO_3	35-120	85	18-30	22
Sulfate, SO_4	4-18	10	0-8	4
Chloride, Cl	1-20	10	<1-4	2
Nitrate, NO_3	0-1	0.5	0-1	0.3
Silicon dioxide, SiO_2	5-23	20	1-16	10
Hardness as calcium carbonate, $CaCO_3$	25-100	70	12-30	20
Turbidity (TU)	8-100	13	1-50	4
Total dissolved solids	40-200	110	30-70	45

[1] All parameters in mg/l unless otherwise indicated.

Source: Metcalf and Eddy 1985

Note: Values are from various sources from 1970 to present and are intended to show the general ranges expected, not necessarily extremes, and to approximate average values where applicable under present levels of water supply regulation and use.

treated wastewater into the Sacramento River near the town of Freeport. In the winter and during summer storm periods, wastewater flows are also directed to the City Combined Wastewater Treatment Plant (located at Fruitridge Road and South Land Park Drive), Pioneer Reservoir or the Sacramento River.

The City of Sacramento operates two water diversion and treatment facilities along the Sacramento River, the Sacramento River Water Treatment Plant located directly north of the Railyards Area, and the Riverside Water Treatment Plant located in Freeport.

The City of Sacramento monitors water quality in the Sacramento River on a daily basis. Samples taken at the City water intake indicate that river water in the vicinity of the East Yolo water intake has very low concentrations of total dissolved solids and has dissolved concentrations of heavy metals below laboratory analytical detection limits. The river has historically been highly turbid and naturally carries high sediment loads. During peak regional storm events, the river's total sediment load can increase by several times its average levels.[12]

American River

The American River is classified as having beneficial uses similar to those of the Sacramento River, including municipal water supply, agriculture, recreation and fisheries. Water quality along the American River has been, in general, within acceptable limits to meet CVRWQCB objectives and beneficial uses. However, water quality violations have occurred at sites sampled between 1960 and 1980 (see Table 4.12-2).[13] Unlike the Sacramento River, water quality degradation attributed to irrigation return flows is limited. The lower American River (including the American River Parkway) is generally good to excellent for all beneficial uses, but dissolved oxygen and temperature do not always meet water quality objectives during periods of low flow. For example, the lower American experienced 89 violations of pH and dissolved oxygen between the years 1960 and 1980. Water temperatures during low flow periods can also become high enough to jeopardize juvenile fish.[14]

The City of Sacramento operates a water diversion and treatment facility on the American River.

Long-term water quality monitoring programs have been conducted in the upper American River. The U.S. Bureau of Reclamation (USBR) conducted a comprehensive sampling effort in 1980 through 1981, which compared water quality between the North and Middle Forks. The results identified the North Fork as having higher concentrations of dissolved minerals resulting in higher conductivities, hardness and pH. Dissolved oxygen levels were similar between the North and Middle Forks of the American.[15]

Urban Runoff Quality

A number of studies have been conducted as part of the Nationwide Urban Runoff Program (NURP) to characterize urban runoff quality. Heavy metals were observed to be the most prevalent priority pollutant constituents, and concentrations in urban runoff were found to exceed Environmental Protection Agency (EPA) ambient water quality criteria and drinking water

TABLE 4.12-2
VIOLATIONS OF WATER QUALITY GOALS AT AMERICAN RIVER (1960 TO 1980)

Station Name	Station No.	Parameter	No. of Violations	No. of Observations	Percent
North Fork American River upstream of Middle Fork	052557	pH	5	84	6
Middle Fork American River upstream of North Fork	052558	pH	6	98	6
South Fork American River (Kyburz)	A7455000	Arsenic Selenium	2 1	18 9	11 11
South Fork American River (Kyburz)	11439500	pH	1	--	--
American River at Folsom Bridge	052552	pH	11	98	11
American River at Nimbus Dam	11446400	pH	1	113	<1
Lower American River below Nimbus Dam	WB05A0718000	pH DO[1]	1	191	<1
American River below Nimbus Dam	A0718000	DO	2	192	1
American River at Nimbus Dam Fish Screen	052551	pH	13	112	12
American River at Fair Oaks	11446500	pH	1	43	2
American River Cordova Sewage Treatment Plant R2	WSB050079871R1	pH DO	1 1	125 127	<1 <1
American River Northeast Sewage Treatment Plant R1	WB050079871R1	pH DO	8 1	129 126	6 <1
American River at Sacramento	11447000	pH	2	--	--
American River at Sacramento	A0714000	DO	2	217	<1
American River Arden Sewage Treatment Plant R2	WB050079847R2	DO	1	125	<1
American River Arden Sewage Treatment Plant R1	WB050079847R1	pH DO	27 5	109 111	25 5
American River at 16th St.	052549	pH	10	--	--

[1] Dissolved oxygen.

Source: Shulters, M.V. (1982).

standards in many cases. Organic priority pollutants were also identified, but at a lower frequency and at lower concentrations than the heavy metals.

Constituents found in urban runoff vary during a storm event from event to event at a given site, and from site to site within a given area. Variances can be the result of differences in rainfall intensity and occurrence, geographic features, and the land use of a site, as well as vehicle traffic and percent of impervious surface. Furthermore, the EPA estimates that sediment runoff rates from construction sites without adequate erosion control measures can contribute more sediment to receiving waters than was previously deposited over several decades.

In the Sacramento area, there is a natural weather pattern of a long dry period from May to October. During this seasonal dry period, pollutants contributed by vehicle exhaust, vehicle and tire wear, crankcase drippings, spills, and atmospheric fallout accumulate within a watershed. Precipitation during the early portion of the wet season (November to April) displaces these pollutants into the storm water runoff, resulting in high pollutant concentrations in the initial wet weather runoff. This initial runoff with peak pollutant levels can be referred to as the "first flush" of a storm event or events. A study conducted by the CVRWQCB in Sacramento, California during the 1986 to 1987 rainy season revealed that, during the rainy season, the first flush of heavy metals and hydrocarbons occurred during the first five inches of seasonal rainfall.[16] Trace metals and hydrocarbon concentrations then remained largely static in subsequent storm events. However, the event mean concentration levels for copper, lead and zinc remained above EPA water quality criteria.

Concentrations of heavy metals present in dry weather runoff (runoff during dry season generated by landscape irrigation, street washing, etc.) are typically lower than concentrations measured in wet weather runoff (runoff generated during rainy season primarily by precipitation). Some sources of dry weather runoff constituent pollutants include commercial and domestic irrigation, general washoff, groundwater infiltration, and illegal discharges.

EPA Stormwater Discharge Permitting Regulations

The 1972 amendments to the Clean Water Act prohibit the discharge of pollutants to navigable waters from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. To date, Federal pollution control activities focused on major point sources, such as untreated sewage or industrial process wastewater. Storm water discharge, while legally required to be permitted under the 1972 amendments, was not addressed by the EPA until recently. The EPA, using the results of the NURP studies of commercial and residential storm water characteristics, developed a permitting strategy, which is described in the municipal storm water permitting regulations promulgated November 16, 1990.

The regulations address two sizes of municipalities, large (population 250,000 or above) and medium (population 100,000 to 250,000). The EPA plans to adopt regulations for small municipalities (populations less than 100,000) in 1992. Industries that have direct storm water discharges to navigable waters are required to obtain permits. Industries that have storm water

discharges to large or medium municipal storm water systems must notify the municipality and certify that non-storm water discharges are not present.

General Industrial Stormwater Permit

The State Water Resources Control Board (SWRCB) adopted a General Industrial Stormwater Permit in November of 1991. That permit covers specific industries including manufacturing, transportation and recycling facilities. The general permit requires industrial dischargers to 1) eliminate illicit discharges of storm water to storm water systems; 2) develop and implement a storm water pollution prevention plan; and 3) perform monitoring of discharges to storm water systems. The Permit requires that those dischargers wishing to be covered by the Permit submit a Notice of Intent by March 30, 1992. Industries are expected to be covered by either an individual or the General Permit by October 1, 1992. A separate general permit to cover construction activities over five acres is expected to be released in late 1992.

Sacramento County Stormwater Quality Control Program

The EPA and the RWQCBs encouraged several large municipalities to apply for permits prior to the promulgation of the Federal Regulations. In response, the Sacramento County Water Agency, City of Sacramento, City of Folsom, and the City of Galt, applied for and were granted a joint NPDES permit (No. CAD0082597) under Order No. 90-158 on June 22, 1990. The permittees listed under the joint permit have the authority to develop, administer, implement, and enforce storm water management programs within their own jurisdiction.

The purpose of the NPDES program is to establish a comprehensive storm water quality program to manage urban storm water, minimizing pollution of the environment to the maximum extent practicable (MEP). The NPDES program consists of 1) characterizing receiving water quality; 2) identifying harmful constituents 3) targeting potential sources of pollutants; and 4) implementing a Comprehensive Stormwater Management Program (CSWMP).

The goal of the NPDES permit is to evaluate the impacts of existing urban storm water runoff on receiving waters and reduce the pollutants in urban storm water runoff in the Sacramento County area to the MEP. Urban storm water runoff is defined in the permit as including storm water runoff, dry weather surface runoff, wash water related to street cleaning or maintenance, infiltration, and drainage related to storm events. The permit regulates the discharge of all wet and dry weather urban storm water runoff within the jurisdiction of the discharger (the discharge consists of all urban storm water runoff generated from urbanized watersheds within the boundaries of Sacramento County, excluding the City of Isleton). Agricultural runoff (defined as runoff from land zoned agricultural or used for agricultural purposes) is not considered part of urban storm water runoff. Any discharger currently operating with a NPDES permit[17] that already includes the regulation of urban storm water runoff within the County is not regulated by this permit. The permit is intended to implement the CVRWQCB's March 31, 1989 Water Quality Control Plan for the Sacramento River Basin and the Delta.

The permit provisions require the permittee to implement urban storm water management programs over the next five years. The first three years of the permit will be to formulate and implement the CSWMP. The remaining two years will be used to evaluate the effectiveness of the CSWMP in reducing the pollutants entering the receiving waters.

As part of the conditions of the permit, the implementation of Best Management Practices (BMPs) is required. BMPs could include but are not limited to:

1) Educational programs on the impacts of potentially harmful chemicals dumped into the storm water drainage systems and good housekeeping procedures to prevent accidental discharge of harmful contaminants;

2) Research, strengthen (if necessary), and enforce regulations giving local jurisdictions the legal authority to prevent the improper disposal of potentially harmful wastes and eliminate cross-connections, which allow sanitary sewage and/or commercial/industrial wastewater to enter storm sewers or drainage facilities; and

3) Public agency control measures, such as implementing intensified street sweeping programs in strategic locations (i.e., major parking lots, shopping malls) and/or at strategic time (i.e., following extended periods of dry weather).

Inland Water Quality Standards

The SWRCB has developed water quality objectives for priority pollutants. The objectives are contained in two documents entitled *California Inland Surface Waters Plan: Water Quality Control Plan for Inland Surface Waters of California*; and *California Enclosed Bays and Estuaries Plan: Water Quality Control Plan for Enclosed Bays and Estuaries of California*, both adopted April 11, 1991. The water quality objectives set limits or levels of water quality characteristics for inland surface waters[18] to ensure the reasonable protection of beneficial uses and the prevention of nuisance. The water quality objectives apply throughout a water body outside mixing zones,[19] except that no acute toxicity[20] shall occur within mixing zones. The water quality objectives were established to ensure that:

1. Inland surface water communities and populations, including vertebrate, invertebrate, and plant species, shall not be degraded as a result of the discharge of waste.

2. The natural taste and odor of fish, shellfish, or the inland surface water resources used for human consumption shall not be impaired.

3. Toxic pollutants shall not be discharged at levels that will accumulate in aquatic resources to levels that are harmful to human health.

4. The concentration of contaminants in waters that are existing or potential sources of drinking water shall not occur at levels that are harmful to human health.

5. The concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.

Numerical inland surface water quality objectives for the protection of freshwater aquatic life are identified in Table 4.12-3. Numerical inland surface water quality objectives for the protection of human health are identified in Table 4.12-4.

The CWA Section 303(c)(2)(B) requires each state to adopt water quality objectives for the Section 307(a) priority pollutants that the EPA has published water quality objectives for under Section 304(a). The 1991 *Water Quality Control Plan for Inland Surface Waters of California* did not address all of the Section 307(a) priority pollutants. On March 27, 1992, the SWRCB issued a draft Functional Equivalent Document for amendments of the 1991 *Water Quality Control Plan for Inland Surface Waters of California.* The purpose of the draft Functional Equivalent Document is to present alternatives and SWRCB staff recommendations for amending the Plan. The major amendment proposed is the addition of new water quality objectives for protection of aquatic life, and the protection of human health from consumption of contaminated drinking water and aquatic life to comply with Section 303(c)(2)(B). To provide for clarification, alternatives and recommendations are also presented for several minor changes to various Plan provisions.[21]

The draft Functional Equivalent Document and the draft amendments will be considered at a public hearing April 28, 1992. Following the hearing, the SWRCB will notice a public workshop to consider approving the Functional Equivalent Document and adopting the proposed amendments.[22]

Among the other provisions pertaining to the state's inland surface water objectives: a) all point and nonpoint discharges (including storm water runoff) must comply with the identified water quality objectives; and b) effluent limits are to be imposed, either through NPDES permits or waste discharge requirements (WDR), such that the water quality objectives shall not be exceeded in the receiving water outside a designated mixing zone. Allocation of a mixing zone provides limited dilution of wastewater discharge before certain water quality objectives must be met.[23]

In addition to the above criteria, the SWRCB recommended to the CVRWQCB that the following more stringent water quality criteria be adopted for the Sacramento River.[24]

Cadmium	0.16 micrograms/liter
Copper	2.6 micrograms/liter
Zinc	16.0 micrograms/liter

The above criteria are applicable as 30-day averages of the acid-soluble concentration (an analysis method that removes loosely bound forms from particulate matter; the method recovers less than would be found using a total-recoverable analysis) of an unfiltered sample. Discharge

TABLE 4.12-3
WATER QUALITY OBJECTIVES
FOR PROTECTION OF FRESHWATER AQUATIC LIFE

Constituent	Unit	4-Day Average	Daily Average	1-Hour Average	Instantaneous Maximum
Arsenic	µg/l	190	--	360	--
Cadmium	µg/l	b	--	b	--
Chlordane	ng/l	--	4.3	--	--
Chromium (VI)[a]	µg/l	11	--	16	--
Copper	µg/l	c	--	c	--
DDT	ng/l	--	1.0	--	--
Dieldrin	ng/l	--	1.9	--	--
Endosulfan	ng/l	--	56	--	220
Endrin	ng/l	--	2.3	--	180
Heptachlor	ng/l	--	3.8	--	--
Hexachlorocyclohexane-gamma	ng/l	--	80	--	--
Lead	µg/l	d	--	d	--
Mercury	µg/l	--	--	2.4	--
Nickel	µg/l	e	--	e	--
PCBs	ng/l	--	14	--	--
Pentachlorophenol	µg/l	h	--	h	--
Selenium	µg/l	5.0	--	20	--
Silver	µg/l	--	--	--	f
Toxaphene	ng/l	0.2	--	730	--
Tributyltin	ng/l	20[i]	40	--	60
Zinc	µg/l	g	--	g	--

mg/l = milligram(s) per liter; µg/l =microgram(s) per liter; ng/l = nanogram(s) per liter; "--" = Not applicable.
a = Dischargers may, at their option, meet this limitation as total chromium.
b-g = Objectives for these metals are expressed by the following formulas, where H = ln (hardness) in mg/l as $CaCO_3$.
b = 4-day average cadmium = $e^{0.7852H - 3.490}$; 1-hour average cadmium = $e^{1.128H - 3.828}$. For example where hardness is 50 mg/l, the 4-day average cadmium - 0.66 µg/l and the 1-hour average cadmium = 1.8 µg/l.
c = 4-day average copper = $e^{0.8545H - 1.465}$; 1-hour average copper = $e^{0.9422H - 1.464}$. For example where hardness is 50 mg/l, the 4-day average copper = 6.5 µg/l and the 1-hour average copper - 9.2 µg/l.
d = 4-day average lead = $e^{1.273H - 4.705}$; 1-hour average lead = $e^{1.273H - 1.460}$. For example where hardness is 50 mg/l, the 4-day average lead = 1.13 µg/l and the 1-hour average lead - 34 µg/l.
e = 4-day average nickel = $e^{0.846H + 1.1645}$; 1-hour average nickel = $e^{0.846H + 3.3612}$. For example where hardness is 50 mg/l, the 4-day average nickel = 88 µg/l and the 1-hour average nickel = 790 µg/l.
f = instantaneous maximum silver = $e^{1.72H - 6.52}$. For example where hardness is 50 mg/l, the instantaneous maximum silver - 1.2 µg/l.
g = 4-day average zinc = $e^{0.8473H + 0.7614}$; 1-hour average zinc = $e^{0.8473H + 0.8604}$. For example where hardness is 50 mg/l, the 4-day average zinc = 59 µg/l and the 1-hour average zinc = 65 µg/l.
h = the 4-day average objective for pentachlorophenol is $e^{1.005(pH) - 5.290}$. This is 13 µg/l at pH = 7.8. The 1-hour average objective for pentachlorophenol is $e^{1.005(pH) - 4.830}$. This is 20 µg/l at pH - 7.8.
i = six-month median.

Source: California Water Resources Control Board, *California Inland Surface Waters Plan Water Quality Control Plan for Inland Surface Waters of California*, 91-12WQ, April 1991.

TABLE 4.12-4
WATER QUALITY OBJECTIVES FOR INLAND SURFACE WATERS FOR PROTECTION OF HUMAN HEALTH

Constituent	Existing or Potential Sources of Drinking Water		Other Waters	
	Unit	30-Day Average	Unit	30-Day Average
Non-Carcinogens**				
Cadmium	µg/l	10	--	--
4-chloro-3-methylphenol	µg/l	3,000**	--	--
Chromium (VI)[a]	mg/l	0.05	--	--
Copper	µg/l	1,000.0**	--	--
1,2-dichlorobenzene	µg/l	2,700	mg/l	18
1,3-dichlorobenzene	µg/l	400	µg/l	2,600
2-4-dichlorophenol	µg/l	0.30**	--	--
Endosulfan	µg/l	0.9	µg/l	2.0
Endrin	µg/l	0.8	µg/l	0.8
Fluoranthene	µg/l	42	µg/l	42
Lead	µg/l	50.0	--	--
Mercury	ng/l	12	ng/l	12
Nickel	mg/l	0.6	mg/l	4.6
Phenol	µg/l	300**	--	--
Selenium	µg/l	10	--	--
Silver	mg/l	0.05	--	--
Toluene	µg/l	10,000	mg/l	300
Zinc	mg/l	5.0**	--	--
Carcinogens*				
Aldrin	pg/l	130	pg/l	140
Arsenic	µg/l	5.0	--	--
Benzene	µg/l	0.34	µg/l	21
Chlordane	ng/l	0.08	pg/l	81
Chloroform	µg/l	100	µg/l	480
DDT	ng/l	0.59	pg/l	600
1,4-dichlorobenzene	µg/l	9.9	µg/l	64
dichloromethane	µg/l	4.6	µg/l	1,600
Dieldrin	pg/l	140	pg/l	140
Halomethanes	µg/l	100	µg/l	480
Heptachlor	ng/l	0.16	ng/l	0.17
Heptachlor epoxide	ng/l	0.07	ng/l	0.07
Hexachlorobenzene	ng/l	0.66	pg/l	690
Hexachlorocyclohexane				
Alpha	ng/l	3.9	ng/l	13
Beta	ng/l	14	ng/l	46
Gamma	ng/l	19	ng/l	62
PAHs	ng/l	2.8	ng/l	31
PCBs	pg/l	70	pg/l	70
Pentachlorophenol	µg/l	0.28	µg/l	8.2
TCDD equivalents	pg/l	0.013	pg/l	0.014
Toxaphene	ng/l	0.67	pg/l	690
2,4,6-trichlorophenol	µg/l	0.34	µg/l	1.0

** = Taste and/or odor-based objectives.

* = Note: Certain dischargers may be subject to more stringent requirements pursuant to Chapter 6.6 of Division 20 of the California Health and Safety Code.

mg/l = milligram(s) per liter; µg/l - microgram(s) per liter; ng/l = nanogram(s) per liter; pg/l = picogram(s) per liter; "__" = not applicable.

a = Dischargers may, at their option, meet this limitation as total chromium.

Source: California Water Resources Control Board, *California Inland Surface Waters Plan Water Quality Control Plan for Inland Surface Waters of California*, 91-12WQ, April 1991.

to an agricultural drain may allow for a lower level of water quality to be set by the CVRWQCB. However, it may also be set at the above levels, which are applicable to the Sacramento River, since by the "tributary rule" attainment of the water quality objectives is only possible if the waters' tributary to the water body meet the same objectives (have the same quality). Although specific water quality objectives for agricultural drains have not been established, timetables are now in place for establishing the criteria for cadmium, copper and zinc listed above for agricultural drains.

As previously stated, the objectives contained in the plan apply to inland surface waters that receive storm water discharges. Within five years, the RWQCB shall determine what actions, including compliance schedules in Waste Discharge Requirements, are appropriate to ensure that storm water discharges are in compliance with the numerical objectives in the plan. All dischargers shall be given a maximum of 10 years to come into compliance with the numerical objectives in the plan.

Sacramento County has questioned the attainability of the new criteria for storm water discharges,[25,26] due to limited available dilution (the ability to dilute contaminated discharges with cleaner water in the receiving water body), restricted mixing zones, and the use of "total recoverable" as the constituent form to be measured. It was argued that the majority of most metals found in urban runoff are particle-bound, and therefore, biologically unavailable (unlikely to be taken up by organisms as part of the food chain or to be physically exposed to the constituent). Furthermore, the toxicity tests upon which the adopted criteria were based were performed on soluble forms, not "total recoverable" (which would include the particle-bound proportion of the constituent). Under these circumstances the use of total-recoverable was argued to be over-protective of aquatic life.

According to a study prepared by Larry Walker and Associates for the City and County of Sacramento, entitled *Urban Runoff Controls Necessary to Achieve Water Quality Objectives Proposed in the Inland Surface Waters Plan*, urban runoff in the Sacramento area (both wet and dry weather conditions) will not be able to comply with seven of the proposed aquatic life and human health objectives. Both wet and dry weather runoff are unable to attain the proposed aquatic life objectives for cadmium, chromium, copper, lead, zinc, and the proposed human health objectives for arsenic and lead. Table 4.12-5 represents the reductions in urban runoff metals concentrations necessary to meet the proposed objectives in the Sacramento area.

The State's response to these arguments was that until such time as standardized testing methods are available for acid-recoverable constituent forms, the criteria will be based upon total-recoverable constituent forms. Dischargers who feel the criteria are overly-restrictive can perform toxicity studies and request that the RWQCB adopt separate criteria for the water body in question.[27]

Groundwater Quality

Groundwater in the shallow aquifers underlying the Sacramento area is generally of good quality of a bicarbonate type. Table 4.12-6 represents typical analytical results of groundwater quality

TABLE 4.12-5

REQUIRED REDUCTIONS IN
URBAN RUNOFF METALS CONCENTRATIONS

Metal	Wet Weather (Percent)	Dry Weather (Percent)
Arsenic		
Aquatic Life	0	0
Human Health	61	63
Cadmium	77	33
Chromium	95	15
Copper	96	86
Lead		
Aquatic Life	99.5	86
Human Health	99.9	97.3
Nickel	0	0
Zinc	90	61

Source: Larry Walker and Associates

in the Sacramento area. The fresh groundwater is underlain by saline water at depths ranging from 800 feet in the east to 2,000 feet in the southwest. The most wide spread water quality concern in the area is excessive iron and manganese, which have tested in concentrations well above current drinking water standards. However, these concentrations are not a health hazard but can cause staining and taste problems.[28] Groundwater contamination has also been identified underlying the Planning Area. The nature, extent, and evaluation of impacts is discussed in Section 4.13 Hazardous Materials.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

For the purposes of this EIR, an impact was considered significant if one or more of the following conditions would result from implementation of the Alternatives:

- Interfere with groundwater recharge quantitatively or qualitatively;
- expose development to flood hazards by being located within the 100-year floodplain as defined by FEMA; or
- degrade surface water quality due to increases in sediment, erosion and contaminants generated by construction and implementation of the proposed project.

Method

Potential impacts to groundwater recharge were evaluated using geological data for a description of the underlying formations and overlying soil characteristics. Estimates of existing and potential impervious surfaces in the Planning Area were derived from aerial photographs, proposed land use types and typical impervious cover values for the proposed land uses. This information was used to evaluate impacts to groundwater recharge and to water quality, based on assumed increases in urban runoff.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

Groundwater Recharge

4.12-1 Implementation of the Alternatives could interfere with the recharge of the underlying groundwater aquifer.

TABLE 4.12-6

GROUNDWATER QUALITY IN THE SACRAMENTO GENERAL PLAN AREA[1]

Constituent	Location	
	North Area	South Area
pH	7.3	7.7
Electrical conductivity (μmhos/cm)	265	195
Temperature (°C)	21	22
Calcium, Ca	16	6
Magnesium, Mg	13	4
Sodium, Na	17	28
Potassium, K	1.8	3
Bicarbonate, HCO_3	90	56
Sulfate, SO_4	6	28
Chloride, Cl	22	8
Nitrate, NO_3	3	5
Hardness as calcium carbonate, $CaCO_3$	94	30
Total dissolved solids	220	215

[1] In mg/l unless otherwise noted

Source: Metcalf and Eddy, 1985.

A-1 through A-7

Alternative 1 would result in additional office, highway commercial/retail, heavy commercial/light industrial and hotel land uses in the Planning Area. Alternatives 2, 3, 4, 5, 6, and 7 would result in additional office, highway commercial/retail, heavy commercial/light industrial, residential, hotel and cultural/industrial land uses in the Planning Area. While both sites are underlain by alluvial deposits which can have moderate to rapid permeability, large portions of the areas are covered with impervious surfaces under existing conditions. Furthermore, groundwater recharge in the Planning Area appears to be tied more to levels in the Sacramento and American Rivers than to percolation through the soil profile. Therefore, this is considered to be a ***less-than-significant impact.***

Mitigation Measures

4.12-1 *None required.*

Flood Hazard

4.12-2 Implementation of any of the Alternatives would allow additional development in the FEMA A99 Zone, exposing future inhabitants to risks associated with inundation of a 100-year flood.

In February, 1990, the City Council certified an EIR on the Land Use Planning Policy within the 100-Year Flood Plain in the City and County of Sacramento (State Clearinghouse No. 89071707). That EIR assessed the potential environmental impacts associated with the City's land use policy for the A99 Zone. That policy is described earlier in this section.

The EIR analysis focused on the risk to life and property that could be the result of continued development in the A99 Zone. The EIR concluded that in the portion of the floodplain that contains the Richards Area, the impacts to loss of life and property damage would be significant. Mitigation measures were recommended and adopted that require flood proofing of structures, implementation of flood awareness programs, and pursuant of long term flood control solutions. The EIR on the Land Use Planning Policy in the 100-Year Flood Plain in the City and County of Sacramento, particularly pages 101 to 116, is hereby incorporated by reference.

A-1 through A-7

Alternative 1 would result in additional office, highway commercial/retail, heavy commercial/light industrial and hotel land uses but would not result in additional residential land use in the Planning Area. Alternatives 2, 3, 4, 5, 6, and 7 would result in additional office, highway commercial/ retail, heavy commercial/light industrial, residential, hotel and cultural/industrial land uses in the Planning Area.

The levee system surrounding the Planning Area currently provides for approximately 63-year protection. Until 100-year protection is achieved, a 100-year flood event could inundate the three small areas designated within A99 zones in the Railyards Area with up to four feet of water. The entire Richards Area could be subject to inundation during a 100-year event with 10 to 15 feet of water. Such an event would not only damage property, but would also pose a risk to people living and working in the affected areas. Therefore, this is considered to be a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.12-2 (a) and b) would reduce the above impact to a *less-than-significant level.*

4.12-2(a) *Development of the proposed Planning Area shall comply with City ordinances and zoning codes regulating residential and non-residential development in the A99 Zone (City of Sacramento Ordinance 90-005) 100-year flood plain. This mitigation measure would be required for all Alternatives.*

4.12-2(b) *If project development is not completed prior to removal of A99 designation and 100-year protection has not been achieved, development of the proposed Planning Area shall comply with all applicable FEMA regulations. This mitigation measure would be required for all Alternatives.*

Surface Water Quality

4.12-3 Increased siltation and sedimentation could result from erosion and storm water runoff during construction in the Planning Area.

A-1 through A-7

Alternative 1 would result in minor levels of construction of new development in the Planning Area. Alternatives 2, 3, 4, 5, 6, and 7 would result in significant levels of construction of new development in the Planning Area. Contaminants could be discharged in storm water runoff from all construction activities in both areas regardless of the Alternative including, but not limited to, sediments, and oil and grease. This is considered a ***significant impact.***

The Clean Water Act of 1972 and the Water Quality Act of 1987 call for the elimination of non-storm water discharges from storm water discharges, and specifically identify construction operations as a potentially significant source of contaminant loadings (normally sediment) to receiving waters.

Mitigation Measures

Implementation of Mitigation Measure 4.12-3 would reduce the above impact to a *less-than-significant level.*

4.12-3 *A comprehensive erosion control plan shall be prepared by a registered civil engineer or a registered professional hydrologist prior to submittal of the final map to protect water resources from impacts due to siltation and sedimentation generated by project construction in the Planning Area. This mitigation measure would be required for all Alternatives. The plan shall be prepared in coordination with the Central Valley Regional Water Quality Control Board, and the City of Sacramento to assure compliance with applicable NPDES permit requirements for construction activities. The plan shall include a combination of the following Best Management Practices (BMPs), or equally effective measures or any other measures required by local codes and ordinances:*

(a) If feasible, project construction periods should be limited to the dry months of the year (May through October).

(b) If project construction does occur during the rainy season (November through April), sediment traps, barriers, covers or other methods shall be used to reduce erosion.

(c) Slopes, both cut and fill, shall not be steeper than those recommended by the detailed geotechnical report for the Planning Area (see Mitigation Measure 4.11-1(a)).

(d) Sediment basins, sediment traps, or similar sediment control Best Management Practices (BMP's) shall be installed before extensive ground alteration operations begin.

(e) Temporary mulching, seeding, or other suitable stabilization measures shall be used to protect exposed areas during construction activities.

(f) Excavated materials shall not be deposited or stored where the material could be washed away by storm water runoff.

4.12-4 Implementation of any of the Alternatives would increase peak rates of runoff and alter the character of storm water runoff, thereby affecting the quality of receiving waters.

As discussed in Chapter 4.17, Storm Water and Drainage, under existing conditions, the percent of impervious surface for the Railyards Area is estimated to be between 60 and 65 percent. The existing Richards Area is estimated to be between 82 and 88 percent.

Redevelopment of the Planning Area could increase the impervious surface, increasing peak rates of runoff. Under the proposed Alternatives, estimated percentages of impervious surfaces range from 67 to 85 percent for the Railyards Area, and 82 to 85 percent for the Richards Area.

Besides changes in peak rates of runoff, receiving water quality adjacent to the Planning Area could be altered from quality under existing conditions depending on the proposed land uses.

A-1 Alternative 1 would result in an increase in the acreage of heavy commercial and light industrial land use. Types of land uses that fit this classification usually produce a higher level of contaminants (including oil and grease, and heavy metals) in storm water runoff. The actual contaminants that may be present in storm water runoff from the light industrial/heavy commercial site would depend on the type of land use present, i.e., runoff contaminants from a warehouse facility would probably differ substantially from runoff from a manufacturing facility. This is considered to be a ***significant impact.***

A-2 through A-7

Alternatives 2, 3, 4, 5, 6, and 7, would result in a decrease in the acreage of heavy commercial and light industrial land use and an increase in the acreage dedicated to residential, office, highway commercial, retail, hotel and cultural/institutional land uses. Typical urban contaminants associated with these types of developments not only include oil and grease and heavy metals, but fertilizers as well. This is considered to be a ***significant impact.***

Furthermore, development in the Planning Area, both existing and proposed, will need to comply with the state and local storm water runoff quality control programs and obtain appropriate permits required by these programs.

Mitigation Measures

Implementation of Mitigation Measures 4.12-4(a) and (b) would reduce the above impact to a *less-than-significant level.*

4.12-4(a) *Prior to development of any part of the Planning Area, a comprehensive runoff control plan shall be prepared by a registered civil engineer or registered professional hydrologist to protect water resources from impacts due to urban and landscape runoff generated by the project. This mitigation measure would be required for all Alternatives. The plan shall be prepared in coordination with the Central Valley Regional Water Quality Control Board, and the City of Sacramento to assure compliance with applicable NPDES permit requirements for new developments. The plan shall include a combination of the following Best Management Practice (BMP's), or equally effective measures:*

(i) Oil and grease separators shall be used to control roadway and parking lot contaminants.

(ii) Streets and parking lots shall be cleaned and swept on a regular basis.

(iii) Peak flow reduction and infiltration practices, such as grass swales, infiltration trenches and grass filter strips, and detention and retention basins, shall be incorporated.

(iv) Landscape areas including borders and medians shall use low water-using plants wherever feasible.

(v) Warm season grasses shall be required for playing fields and other lawn dependent uses.

(vi) Plants of similar water use shall be grouped to reduce overirrigation of low-water-using plants.

(vii) Mulch shall be used in all non-lawn landscaped areas to a minimum depth of two (2) inches. Mulch applied on top of the soil will improve the water-holding capacity and reduce runoff.

(viii) Existing trees and shrubs shall be preserved and protected where feasible, because established plants are often adapted to low-water-using conditions.

(ix) Efficient irrigation systems shall be installed to minimize runoff and evaporation and maximize the water that will reach the plant roots such as drip irrigation, soil moisture sensors, and automatic irrigation systems.

(x) Seasonal, climatical, and dosage fertilizer application restrictions shall be followed, as recommended by manufacturer.

(xi) Slow release fertilizers shall be used.

(xii) Where feasible, landscape areas shall be limited to 4:1 slopes to reduce runoff, unless such slopes form landscape berms which are required to mitigate aesthetic and noise impacts.

(xiii) The use of plastic or other impervious materials to control weed growth in landscaped areas shall not be permitted.

4.12-4(b) *Comply with joint City and County storm water NPDES permit requirements for the City's municipal storm water conveyance system. This mitigation measure would be required for all Alternatives.*

Impacts Due to Development in the Railyards Area Only

4.12-5 Construction of the proposed amphitheater in the Railyards Area would encroach on the existing Sacramento River levee system.

A-1

An amphitheater is not proposed as part of Alternative 1. Therefore, there would be no encroachment to the existing levee system. This is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 include the construction of an amphitheater into the levee along the Sacramento River.

Construction of the amphitheater in the levee can have two effects on the Sacramento River system. First, a breech in the levee may weaken the integrity of that stretch of levee, increasing the potential for a break during a flood event. The majority of the Railyards Area is located outside of the 100-year floodplain due to the elevation of the ground, and is not protected by the levee system. However, there are still portions of the area in the 100-year floodplain and surrounding areas (including the Richards Area) that are currently subject to inundation. This potential increased risk of levee failure would increase the flooding potential in the Railyards Area and adjacent floodplain areas, including the Richards Area. The structure itself would not be expected to obstruct flood flows or raise the water surface elevation in the river.

Second, construction into the levee may also generate erosion of the levee where the amphitheater structure connects with the earthen levee structure. Wave action caused by the protrusion of the structure into the river could undercut the toe of the levee at the upstream end of the amphitheater. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of the Mitigation Measure 4.12-5(a) and 4.12-5(b) would reduce the above impact to a *less-than-significant level.*

4.12-5(a) *Prior to issuance of permit to construct, a comprehensive levee stability study shall be prepared by a registered civil engineer to determine the stability of the stretch of levee affected by the proposed amphitheater. Study recommendations shall be implemented as part of the construction of the amphitheater to ensure levee stability in order to provide adequate flood control. The study shall be prepared in coordination with the USCOE, the State Lands Commission, and SAFCA to ensure that no regional flood control projects are interfered with, and*

to ensure adequate coverage of all potential issues of concern. This mitigation measure would be required for Alternatives 2 through 7.

4.12-5(b) *Implement Mitigation Measure 4.12-3 and 4.12-4. This mitigation measure would be required for Alternatives 2 through 7.*

4.12-6 Implementation of the proposed new railroad bridge across the Sacramento River could obstruct flood flows and raise the current water surface elevation.

A-1 and A-5

Implementation of the proposed new railroad bridge across the Sacramento River is not proposed as part of Alternative 1 or Alternative 5. Therefore, there would be no obstruction of flood flows or potential rise in water surface elevation. This is considered a ***less-than-significant impact.***

A-2 through A-4; A-6 and A-7

Implementation of Alternatives 2, 3, 4, 6 and 7 include the construction of a new railroad crossing over the Sacramento River. If not constructed to be outside of the 100-year water surface elevation, the structure could act as an obstruction to flow, and potentially raise water surface elevations. Pilings or other anchoring supports, if large enough, could also raise water surface elevations. This could generate higher flood elevations along the levee system causing encroachment into the levee freeboard. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.12-6(a) and 4.12-6(b) would reduce the impact to a *less-than-significant level.*

4.12-6(a) *A detailed hydrological study shall be prepared by a registered civil engineer or a registered professional hydrologist prior to submittal of final bridge crossing design plans to accurately determine water surface elevations. This information shall be incorporated into the bridge design to prevent encroachment into flood water surface elevations, and obstruction of flood flows. The study shall be coordinated with the USCOE, CALTRANS, and SAFCA. This mitigation measure would be required for Alternatives 2, 3, 4, 6, and 7.*

4.12-6(b) *Implement Mitigation Measure 4.13-6(b). This mitigation measure would be required for Alternatives 2, 3, 4, 6, and 7.*

Cumulative Impacts

Flood Hazard

4.12-7 Development in the Planning Area, together with cumulative development in the downtown area, will result in increased exposure to flood hazards.

A-1 through A-7

On a regional basis, cumulative growth in downtown Sacramento, including the Planning Area, would contribute to exposing more people and structures to hazards associated with being inundated by a 100-year flood event. This is considered to be a ***significant impact.***

Development within the downtown Sacramento area will increase the number of people and structures exposed to hazards associated with inundation during a flood event. Given the current level of flood protection (63 years), a 100-year flood event could inflict extensive property damage, and possible loss of life. SAFCA and the Federal government are currently working on solutions to achieve 100-year, or better, flood protection for the Sacramento area. Until that time, compliance with all applicable federal, state and local flood protection regulations will help reduce the flood risk.

Mitigation Measures

Implementation of Mitigation Measures 4.12-7(a) and 4.12-7(b) would reduce project-specific contributions to the above impacts to a *less-than-significant level.*

4.12-7(a) *Implement Mitigation Measures 4.12-2(a) and 4.12-2(b). This mitigation measure would be required for all Alternatives.*

4.12-7(b) *The City shall continue to implement the following under all Alternatives.*

(1) The procedures contained in the City's Multi-Hazard Emergency Plan and County's Multi-Functional Plan for flood events;

(2) the four-stage river warning system;

(3) public awareness programs to explain the risks associated with a flood event, in coordination with the State Office of Emergency Services; and

(4) the most up-to-date flood-fighting procedures at the first warning of the onset of a flood event.

Water Quality

Under existing conditions, the downtown Sacramento area is primarily developed and covered with impervious surface. Future cumulative development would not contribute detectable increases in storm water runoff over that of existing conditions. Therefore, effects to the quality of receiving waters, under cumulative development would also be negligible.

ENDNOTES

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2. Woodward-Clyde Consultants. 1989. *Draft Remedial Action Plan, Sacramento Station Site, Sacramento Yard, Sacramento, California*, October 21, 1989.

3. Ibid.

4. Harding Lawson Associates. 1990. *Preliminary Geotechnical Evaluation Richards Boulevard Redevelopment Area Sacramento, California*, October 17, 1990.

5. City of Sacramento. 1990. *Draft Environmental Impact Report, Richards Boulevard Redevelopment Plan*, The Redevelopment Agency of the City of Sacramento, March 14, 1990.

6. Ibid.

7. Federal Emergency Management Agency. 1988. *National Flood Insurance Program (Regulations for Floodplain Management and Flood Hazard Identification)*, revised as of October 1, 1988.

8. City of Sacramento Planning and Development Department, *Land Use Planning Policy Within the 100-Year Flood Plain in the City and County of Sacramento*, September 18, 1989.

9. U.S. Army Corps of Engineers. 1991. *Draft American River Watershed Investigation California, Feasibility Report*, April 1991.

10. City of Sacramento. 1987. *City of Sacramento General Plan Update, Environmental Impact Report*, March 1987.

11. City of Sacramento. 1990. *City of West Sacramento General Plan, Background Report*, May 3, 1990.

12. Ibid.

13. U.S. Army Corps of Engineers. 1991. *Draft American River Watershed Investigation California, Feasibility Report*, April 1991.

14. Ibid.

15. Ibid.

16. Larry Walker and Associates. 1990. *A Report for the City of Sacramento and the County of Sacramento, Urban Runoff Controls Necessary to Achieve Water Quality Objectives Proposed in the Inland Surface Water Plan*, February 1990.

17. California Regional Water Quality Control Board. 1990. Central Valley Region Order No. 90-158, NPDES No. CA0082597, *Waste Discharge Requirements for Sacramento County Water Agency, City of Sacramento, City of Folsom, City of Galt, Non-Point Source/Point Source Urban Stormwater Discharges, Sacramento County*, June 22, 1990.

18. All surface waters of the State which do not include the ocean, enclosed bays or estuaries.

19. A designated volume of a receiving water where wastewaters and receiving waters mix. Allocation of a mixing zone provides limited dilution of a wastewater discharge before certain water quality objectives must be met.

20. Less than ninety percent survival, fifty percent of the time, and less than seventy percent survival, ten percent of the time, of standard test organisms in undiluted effluent in a 96-hour static or continuous-flow test.

21. State Water Resources Control Board (SWRCB). 1992. *Draft Functional Equivalent Document, Amendments of the Water Quality Control Plan for Inland Surface Waters of California*, SWRCB, March 27, 1992.

22. Ibid.

23. California Water Resources Control Board. 1991. *California Inland Surface Waters Plan, Water Quality Control Plan for Inland Surface Waters of California*, April 11, 1991.

24. State of California Water Resources Control Board. 1990. *Development of Water Quality Control Plans for Inland Surface Waters of California and Enclosed Bays and Estuaries of California.*

25. Ibid.

26. Larry Walker Associates. 1990. *A Report for the City of Sacramento and County of Sacramento, Urban Runoff Controls Necessary to Achieve Water Quality Objectives Proposed in the Inland Surface Waters Plan.*

27. Regional Water Quality Control Board. 1990. *Development of Water Quality Control Plans for Inland Surface Waters of California and Enclosed Bays and Estuaries of California.*

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4.13 HAZARDOUS MATERIALS

4.13 HAZARDOUS MATERIALS

INTRODUCTION

This section addresses the anticipated effects of known or suspected hazardous materials contamination on redevelopment of the Planning Area. In the Railyards Area, remediation of both soil and groundwater is expected to proceed regardless of development, and is expected to take many years. The extent of contamination and any necessary remediation activities in the Richards Area is presently unknown.

The development of any of the Alternatives presents a wide range of environmental issues related to the compatibility of hazardous materials remediation and the implementation of development within the Planning Area. The primary concern is the potential increased risk to human health and the environment from exposure to existing soil and/or groundwater contamination due to construction, development phasing, and as well as during the life of the project.

In order to evaluate these issues, this chapter summarizes the existing conditions in the Planning Area (Setting Section), evaluates impacts associated with redevelopment, and proposes mitigation measures. Included in this summary are an overview of hazardous materials regulations, a description of the types of contaminants found or suspected based on historic land uses, a description of identified and suspected sites of contamination, and a description of remediation and monitoring activities, ongoing or planned, in the Planning Area. Other aspects of hazardous materials discussed include the risk of exposure due to the proximity of rail lines to proposed development, and the risk of exposure due to existing or proposed industrial uses. In addition to soils contamination, issues posed by groundwater contamination and remediation are fully addressed.

Definition of Hazardous Materials

The term "hazardous materials" refers to both hazardous materials and hazardous wastes. A material is defined as hazardous if it appears on a list of hazardous materials prepared by a federal, state or local regulatory agency, or if it has characteristics defined as hazardous by such an agency. The California Department of Toxic Substances Control (DTSC), formerly the Department of Health Services, defines hazardous materials as follows:

> A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either: 1) cause, or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible, illness; or 2) pose a substantial present or potential hazard to human health or the environment when properly treated, stored, transported or disposed of, or otherwise managed.

Table 4.13-1 represents general hazardous material categories and potential associated hazards.

Definition of Hazardous Waste

A hazardous waste is a "solid waste" that exhibits hazardous characteristics. The Federal Environmental Protection Agency (EPA) has defined the term "solid waste" to include the following" any gaseous, liquid, semi-liquid, or solid material that is discarded or has served its intended purpose, unless the material is excluded from regulation. Such materials are considered wastes whether they are discarded, reused, recycled, or reclaimed.[1]

The EPA classified a waste as hazardous if it 1) is listed on the EPAs list of hazardous waste; and 2) exhibits one or more of the following properties: ignitability (including oxidizers, compressed gases, and extremely flammable liquids and solids), corrosivity (including strong acids and bases,) reactivity (including materials that are explosive or generate toxic fumes when exposed to air or water), or toxicity (including materials listed by EPa as capable of inducing systemic damage in humans or animals).[2]

Risk of Exposure

Hazard vs. Risk

Worker and public health are potentially at risk whenever hazardous materials have been or will be used. It is necessary to differentiate between the "hazard" of these materials and the acceptability of the "risk" they pose to human health and the environment. A hazard is any situation that has the potential to cause damage to human health and the environment. The risk to human health and the environment is determined by the probability of exposure to the hazardous material and the severity of harm such exposure would pose; that is, the likelihood and means of exposure, in addition to the inherent toxicity of a material, determine the degree of risk to human health. For example, a high probability of exposure to a slightly toxic chemical would not necessarily pose an unacceptable health risk, whereas a low probability of exposure to a highly toxic chemical might.

When the risk of an activity is judged acceptable by society in relation to perceived benefits, the activity is judged to be safe. For example, ammonia is a common household chemical whose use has been judged safe in our society. Although it can be hazardous to health, irritating the eyes, respiratory tract and skin, and even causing bronchitis or pneumonia following severe exposures, the risk of such a severe exposure is believed to be low and its benefits as a cleaner and disinfectant are high. Therefore, the use of household ammonia is thought to be a safe activity.

TABLE 4.13-1

GENERAL HAZARDOUS MATERIAL CATEGORIES AND POTENTIAL ASSOCIATED HAZARDS

General Hazardous Materials Categories	Nature of Hazard
Compressed Gases	Pressurized gases, liquefied gases, cryogenic gases, dissolved gases stored under pressure can explode.
Severe Poisons	Substances that may cause death or injury at relatively low concentrations, or significant health effects from chronic exposure at relatively low concentrations.
Moderate Poisons	Substances that may cause premature death, injury or disease form chronic exposure, or harmful effects from acute exposure at higher concentrations.
Water Reactives	Materials that react violently with water to produce fire or toxic fumes other than strong acids or bases.
Oxidizers	Materials that release oxygen or add to the intensity of a fire.
Flammables	Liquids or solids that readily burn and/or are difficult to extinguish.
Corrosives	Materials that are strong acids or bases, will corrode skin or metal, and may react violently with water.
Radioactives	Materials that emit ionizing radiation.
Biohazards	Disease producing living organisms or spores.
Other Hazardous Materials	Includes carcinogens, halogenated solvents, explosives and others.

SOURCE: EIP Associates and Stanford University Department of Health and Safety.

Means of Exposure

Exposure to hazardous materials in the Planning Area could occur in the following manner:

1) Exposure to soil and/or groundwater contamination during construction;

2) Improper handling or use of hazardous materials during the course of business, particularly by untrained personnel;

3) Failure of storage containment systems;

4) Environmentally unsound treatment/disposal methods;

5) Transportation accidents;

6) Fire, explosion or other emergencies;

7) Exposure to existing soil and/or contaminants throughout the life of the project.

Health Effects of Exposure to Hazardous Materials

The following factors influence the health effects of exposure to hazardous materials: the dose to which the person is exposed, the frequency of exposure, the duration of exposure, the exposure pathway (route by which a chemical enters a person's body), and the individual's unique biological susceptibility.

The means of exposure as outlined above would determine the way in which hazardous materials are absorbed into the body and, therefore, the bodily organs or systems affected. The major ways in which toxic materials may enter and be absorbed by the body are through the mouth (ingestion), the skin (penetration) or the lungs (inhalation). How a hazardous material gets into the body and what damage it causes depends on the form or physical properties of the material, i.e. liquid, solid, gas, dust, fibers, fumes or mist. A chemical may be toxic by one route and not another.

Health effects from exposure to toxic materials may be acute or chronic. Acute effects may include reversible or irreversible damage to organs and systems in the body, including death. Chronic effects may also include systemic and organ damage, but chronic effects of particular concern are birth defects, genetic damage and cancer.

SETTING

Regulatory Compliance Overview for the Management of Hazardous Materials

Table 4.13-2 lists federal, state and local regulatory agencies that oversee hazardous materials management and the statutes and regulations that they administer. The following discussion

TABLE 4.13-2

SUMMARY OF HAZARDOUS MATERIALS REGULATORY AUTHORITY

Regulatory Agency	Jurisdiction	Authority
FEDERAL AGENCIES		
Dept. of Transportation	Federal	National Transportation Act - Code of Federal Regulations (CFR) 49
Environmental Protection Agency	Federal	Federal Water Pollution Control Act Clean Air Act Resource Conservation & Recovery Act (RCRA) Comprehensive Environmental Response, Compensation & Liability Act (CERCLA) Superfund Amendments & Reauthorization Act (SARA) Federal Insecticide, Fungicide & Rodenticide Act
Occupational Safety & Health Administration	Federal	Occupational Safety and Health Act & CFR 29
STATE AGENCIES		
Dept. of Toxic Substances Control	State	Hazardous Waste Control Law Hazardous Materials Release Response Plans/Inventory Law Acutely Hazardous Materials Law Sherman Food, Drug and Cosmetic Law Underground Storage Tanks Law California Code of Regulations (CCR) Titles 17, 19, and 22
Dept. of Industrial Relations (CAL-OSHA)	State	California Occupational Safety & Health Act, CCR Title 8
State Water Resources Control Board & Regional Water Quality Control Board	State	Porter-Cologne Water Quality Act
Health & Welfare Agency	State	Safe Drinking Water & Toxic Enforcement Act
Air Resources Board & Air Pollution Control District	State	Air Resources Act
Office of Emergency Services	State	Hazardous Materials Release Response Plans/Inventory Law
Dept. of Fish & Game	State	Fish & Game Code
Dept. of Food & Agriculture	State	Food & Agriculture Code
State Fire Marshal	State	Uniform Fire Code, CCR Title 19
COUNTY AGENCIES		
Sacramento Co. Environmental Mgmt Dept. Hazardous Materials Division	County	CCR Title 22

SOURCE: EIP Associates, 1991.

contains a summary review of regulatory controls pertaining to hazards, including federal, state and local laws and ordinances pertaining to hazardous materials management and cleanup.

Overview of Regulatory Structure

Federal

Many agencies regulate hazardous materials. These include federal agencies such as the EPA, the Occupational Safety and Health Administration (OSHA), the Nuclear Regulatory Commission (NRC), the Department of Transportation (DOT) and the National Institutes of Health (NIH). The following represent federal laws and guidelines governing hazardous materials.

- Federal Water Pollution Control Act
- Clean Air Act
- Occupational Safety and Health Act
- Federal Insecticide, Fungicide, and Rodenticide Act
- Comprehensive Environmental Response Compensation and Liability Act
- Guidelines for Carcinogens and Biohazards
- Superfund Amendments and Reauthorization Act Title III
- Resource Conservation and Recovery Act
- Safe Drinking Water Act
- Toxic Substances Control Act

At the federal level, the principal agency regulating the generation, transport and disposal of hazardous materials is the EPA, under the authority of the Resource Conservation and Recovery Act (RCRA). The EPA regulates hazardous waste sites under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Applicable federal regulations are contained primarily in Titles 29, 40, and 49 of the Code of Federal Regulations (CFR).

State

The California Environmental Protection Agency (Cal-EPA) and the Office of Emergency Services (OES) of the State of California establish rules governing the use of hazardous materials. The California Highway Patrol (CHP) and the California Department of Transportation (Caltrans) are the enforcement agencies for hazardous materials transportation regulations. Chemical suppliers are responsible for complying with all applicable packaging, labeling and shipping regulations.

Applicable state laws include the following:

- Public Safety/Fire Regulations/Building Codes
- Hazardous Waste Control Law
- Hazardous Substances Information and Training Act
- Hazardous Materials Release Response Plans and Inventory Act

- Air Toxics Hot Spots and Emissions Inventory Law
- Underground Storage of Hazardous Substances Act

Within Cal-EPA, the Department of Toxic Substance Control (DTSC), formerly the Department of Health Services, has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the state agency, for the generation, transport and disposal of hazardous materials under the authority of the Hazardous Waste Control Law (HWCL). State regulations applicable to hazardous materials are indexed in Title 26 of the California Code of Regulations (CCR).

Local

The City of Sacramento has a Right-to-Know Ordinance which gives it the authority to inventory hazardous materials used by businesses. The City is also in the process of collecting information regarding existing and proposed locations of hazardous material disposal, storage, handling and transportation facilities.

Sacramento County is responsible for enforcing the state regulations, both in the City and County, governing hazardous waste generators, hazardous waste storage, and underground storage tanks, including inspections and enforcement. The Sacramento County Hazardous Materials Division (HMD) regulates the use, storage, and disposal of hazardous materials in Sacramento County by issuing permits, monitoring regulatory compliance, investigating complaints, and other enforcement activities. HMD reviews technical aspects of hazardous waste site cleanups, and oversees remediation of certain contaminated sites resulting from leaking underground storage tanks. HMD is also responsible for providing technical assistance to public and private entities which seek to minimize the generation of hazardous waste.

Goals and policies have been developed by the City and County of Sacramento concerning the management of hazardous materials to protect human health and the environment.[3,4]

Hazardous Materials Handling Requirements

Federal

The RCRA established a federal hazardous waste "cradle-to-grave" regulatory program that is administered by EPA. Under the RCRA, EPA regulates the generation, transportation, treatment, storage and disposal of hazardous materials.

The RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle-to-grave" system of regulating hazardous materials. The HSWA specifically prohibits the use of certain techniques for the disposal of some hazardous materials.

Under the RCRA, individual states may implement their own hazardous waste management programs as long as they are consistent with, and at least as strict as, the RCRA. EPA must approve state programs intended to implement the RCRA requirements.

State

In California, approval of the state hazardous waste management program is still pending, so both state and federal hazardous materials laws apply. The state program was created by the enactment of the HWCL, which is administered by the DTSC. The DTSC regulations govern the generation, transportation and disposal of hazardous materials.

Regulations implementing the HWCL list 791 hazardous chemicals and 20 or 30 more common materials that may be hazardous; establish criteria for identifying, packaging and labeling hazardous materials; prescribe management of hazardous materials; establish permit requirements for hazardous materials treatment, storage, disposal and transportation; and identify hazardous materials that cannot be deposited in landfills.

Under both the RCRA and the HWCL, the generator of a hazardous material must complete a manifest that accompanies the waste from the point of generation to the ultimate treatment, storage or disposal location. The manifest describes the waste, its intended destination, and other regulatory information about the waste. Copies must be filed with the DTSC. Generators must also match copies of waste manifests with receipts from the treatment, storage or disposal facility to which it sends waste.

Hazardous Materials Worker Safety Requirements

Federal

The Federal Occupational Safety and Health Administration (Fed/OSHA) is the agency responsible for ensuring worker safety. Fed/OSHA sets federal standards for implementation of training in the work place, exposure limits, and safety procedures in the handling of hazardous substances (as well as other hazards). Fed/OSHA also establishes criteria by which each state can implement its own health and safety program.

State

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing work place safety regulations within the State. Cal/OSHA standards are more stringent than federal regulations.

Cal/OSHA regulations concerning the use of hazardous materials include requirements for safety training, availability of safety equipment, hazardous materials exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces the hazard communication program regulations, which include provisions for identifying and labeling hazardous materials, providing employees with Material Safety Data Sheets (MSDSs), describing the hazards of chemicals, and documenting employee training programs.

Both federal and state laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training must include safe methods for handling hazardous materials, an explanation of MSDSs, use of emergency response equipment, and building emergency response plans and procedures.

Hazardous Materials Management Planning

Federal

As of January 1991, Fed/OSHA requires a written Chemical Hygiene Plan for operations which use hazardous chemicals. Standards for Chemical Hygiene Plans emphasize safe handling and use of hazardous chemicals through procedures established by individual employers. The Chemical Hygiene Plans outline specific work practices and procedures (including employee training) that ensure employee protection from health hazards associated with hazardous chemicals.

State

State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and to prevent or minimize injury to human health or the environment in the event such materials are accidentally released. Federal laws, such as the Emergency Planning and Community-Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act, or SARA Title III) impose similar requirements.

The Hazardous Materials Release Response Plans and Inventory Law of 1985 (or the Business Plan Act) requires that a business that uses, handles, or stores hazardous materials prepare a plan, which must include:

1) details, including floor plans, of the facility;

2) an inventory of hazardous materials handled or stored;

3) an emergency response plan; and

4) a training program in safety procedures and emergency response for new employees, including annual refresher courses.

In addition, under the terms of State legislation passed in 1989, AB 3777-LaFollette, the responsible local agency is to be provided with a Risk Management and Prevention Plan (RMPP). A RMPP is the sum total of programs aimed at minimizing acutely hazardous material incident risks. This can include, but is not limited to:

1) systems safety review of design for new and existing equipment;

2) safety evaluation of standard operating procedures;

3) system review for reliability, both human and equipment/facility;

4) preventive maintenance procedures;

5) risk assessment for failure of specific pieces of equipment or operating alternatives;

6) emergency response planning; and

7) internal or external auditing procedures to ensure that safety programs and safety engineering controls are being executed as planned.

In general, this law requires that users of hazardous chemicals include in their RMPPs a hazards operations analysis (HAZOP) to be performed if specified quantities of approximately 30 acutely hazardous chemicals are used. In particular, the HAZOP must consider the off-site consequence of the release of any acutely hazardous material, as defined.

Hazardous Materials Transportation

Federal

The U.S. Department of Transportation (DOT) has the regulatory responsibility for the safe transportation of hazardous material between states and to foreign countries. DOT regulations govern all means of hazardous materials transportation, (except for those packages shipped by mail, which are covered by the U.S. Postal Service (USPS) regulations), including transportation by rail. DOT regulations are contained in the Code of Federal Regulations Title 49.

Under the RCRA, the EPA sets standards for transporters of hazardous materials. In turn, the federal government authorized the State of California to carry out EPA regulations concerning transportation of hazardous waste material originating in, or passing through, the state.

State

The State of California has also adopted regulations for the intrastate movement of hazardous materials. State regulations are indexed in the CCR Title 26.

The California Highway Patrol (CHP) has primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces hazardous materials labeling and packaging regulations. The goal of these regulations is to prevent leakage and spills of material in transit and to provide detailed information to clean-up crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance.

Common carriers conduct a large portion of their business in the delivery of hazardous materials. Common carriers are licensed by the CHP under conditions specified in CCR Title 26, Division 14.1 Transportation of Hazardous Material, Section 32000.5, License to Transport Hazardous Materials. This section requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time, and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards. If the supplier or distributor carries fewer than 1,000 pounds of material, a license is not required. Every package type used by a hazardous materials shipper must undergo tests that imitate some of the possible rigors of travel.

Transportation of Hazardous Materials on Rail Lines

In the State of California, the transportation of hazardous materials on rail lines is regulated by the Federal Railroad Administration and the California Public Utilities Commission. The following discussion is a summary of the applicable federal and state regulations.

Federal

Federal regulations governing the transportation of hazardous materials over rail lines is contained in the Code of Federal Regulations (CFR) 49 Parts 106 through 189.[5] Provisions in the regulations include requirements for packaging, train and tank specifications, and track standards. Track standards determine the speed a train can travel on a stretch of track.

State

The Railroad Safety Division of the California Public Utilities Commission (PUC), is certified to perform federal inspections to ensure compliance with the provisions of CFR 49, including track inspections. The PUC, in response to the increased transportation of hazardous materials by rail and increased incidents involving their transportation by rail, adopted General Order (GO) 161 in August 7, 1991. GO 161 was adopted to include rules to assure coordination between the state, local agencies, and the railroads, particularly in the area of emergency response. These rules were designed to address safety issues not addressed by the federal rules, and are not preempted by federal law. The key provisions of GO 161 will require each railroad that transports hazardous materials to:

1. Immediately notify by telephone the appropriate emergency response agency (ERA) about the release or threatened release of a hazardous material.
2. Provide the railroad's 24-hour emergency telephone number to ERAs along each rail line.
3. Have in place an emergency preparedness plan to respond to hazardous material spills.
4. Ensure that train crew members have the ability to communicate via radio transceivers with each other and with the train dispatcher.

Overview of Site Specific Hazardous Materials

The following discussion describes the predominant types of hazardous materials that have been identified, or which may occur in the Planning Area, including metals, volatile organic compounds, hydrocarbons, and semi-volatile organic compounds.[6] Included below is a general description of the hazardous materials, their behavior in the environment, and accepted remediation techniques (see Table 4.13-3). Much more is known about the Railyards Area, which has been the subject of some degree of investigation and characterization, at least at a reconnaissance level, over much of the site, as well as detailed investigation and characterization in some specific areas. Most of the Richards Area has undergone only a preliminary site assessment; therefore, detail about the type and extent of possible contamination in that area is not available at this time. Based on historic land use patterns, contamination in the Richards

Area is believed to be much more localized than that in the Railyards Area, although many of the same contaminants may be present.

Metals

Lead

Lead is known to cause a range of biological effects across a broad range of exposures. It is classified by EPA as a "Class B-2 Carcinogen", which is defined as having been shown to be carcinogenic in animal studies only. Clinical effects in humans (those that show up as identifiable symptoms) can occur in individuals with blood concentrations at 10 micrograms per deciliter or above. Symptoms include anemia; brain disorders, elevated blood pressure, retarded growth, reduced IQ scores, reduced gestation age, birth weight and mental development, miscarriages, and impaired hearing. Subclinical effects (those that are measured in terms of changes in body chemistry, but do not produce identifiable symptoms) can occur at levels so low that there is no known totally "safe" level for lead in the blood. Subclinical effects include changes in blood chemistry and vitamin D metabolism.

Lead is not mobile in soil under most conditions because it exists in or forms insoluble compounds, and does not typically migrate to groundwater. Lead can be transported from plant roots up to the plant's branches and leaves. The plant's leaves eventually fall to the ground, thus providing an avenue for lead to be transported from root level to the surface. Lead can also be taken up by plant roots (especially in the case of annuals), but it is not readily taken up by the plant stems. Lead can also migrate into skins of edible roots such as carrots and potatoes, but peeling the root skins removes the lead contaminated portion of the plant. Lead is not taken up by leafy vegetables, such as lettuce, therefore, lead found in such leafy vegetables can be attributed to dust containing lead in the atmosphere rather than uptake from soil.[7]

The immobility of lead means that it generally remains where it was originally deposited in the soil, except when exposed soil becomes windblown. Typically, concentrations of lead are highest at the surface and decrease with depth, unless fill has been placed on top of contaminated soil, or the fill itself was contaminated.

Other Heavy Metals

Copper, zinc, and antimony are considered mobile heavy metals (because they are soluble, especially in acidic environments), and are readily absorbed by plants. However, these metals do not pose a health problem because they are not carcinogenic and are only mildly toxic to humans. Mercury, on the other hand, can be highly toxic to humans. Although not very mobile

TABLE 4.13-3
SUMMARY OF KNOWN EXTENT AND TYPES OF CONTAMINATION IN THE PLANNING AREA

Hazardous Material	Known Primary Location within the Planning Area	Mobility and Probable Presence in Soil and/or Groundwater	Cleanup Approach Issues
Heavy Metals (Lead, mercury, copper, zinc, antimony)	Lead: throughout the Railyards Area. Other Metals: highly localized, but never found without lead in the Railyards Area. Could also be located in the Richards Area at sites of active or abandoned junkyards, wrecking yards, and similar uses.	Lead and Mercury: very low mobility. Found primarily in top four feet of soil. Other Metals: can be highly mobile. All metals: some indication of groundwater contamination.	Excavation and treatment or disposal. Partial removal[1] combined with impervious cover or clean fill cover. Some possibility of in-place fixation.
Volatile Organic Compounds (VOCs) (Solvents, strippers, degreasers) ■ Chlorinated solvents (TCE, PCE, TCA) ■ Nonchlorinated solvents (acetone, toluene, 2-butanone)	In the Railyards Area, including Central Shops, Northern Shops, Car Shop 9, Drum Storage Area, Pond and Ditch, API Separator Overflow Area; Lagoons, Paint/Solvent Tank; Former Waste Disposal Site, and possibly along the old industrial sewer line. In the Richards Area, including the Sacramento City landfill, Purity Oil Sales, Big Valley Express, WEMPCO, and the Office of State Printing.	High mobility. Found from depth of about five feet down to and into groundwater.	Removal and disposal (very expensive). Soil vapor extraction (much less expensive). Partial removal combined with impervious cover or clean fill cover. Groundwater extraction and/or treatment system.
Hydrocarbons (Diesel, fuel oil, lubricating oil, gasoline, and kerosene)	In the Railyards Area, including the Laundry Tracks, tank at Sacramento Station, Grit Blast area, cleaning building, Drum Storage Area, Tank 28, API Overflow area, Lagoons, Central Shops, former oil tank. Could also be in the Richards Area at sites of underground storage tanks.	Relatively low mobility. Found on or near surface or around old underground fuel tanks.	Removal and reuse as foundation, roadbed, or road surface. Soil vapor extraction. Partial removal[1] combined with impervious cover or clean fill cover. Bioremediation in place.
Semi-Volatile Organic Compounds ■ PAHs (combustion and fuel products) ■ Phthalates (plasticizers)	Near painting facility, Central Shops, Sheet Metal Shop, Painting Shed, Sand Blast Area, Parking Lot, Former Waste Disposal Site, Sacramento Station.	Relatively low mobility, except naphthalenes. Found in surface soils. Some in groundwater beneath Central Shops and Car Shop 9.	Excavation and disposal or incineration. Biodegradation in place. Partial removal[1] combined with impervious cover or clean fill cover. In-place fixation/stabilization (still experimental).
Leachate	Potentially underlying landfill area east of the Union Pacific Railroad tracks in the Richards Area. May be present in groundwater underlying landfills in both the Railyards and Richards Areas.	Can migrate through soil into groundwater.	Groundwater extraction and/or treatment system. Leachate extraction system.
Landfill Gases	Potentially underlying landfill area east of the Union Pacific Railroad tracks; possibly the WEMPCO property in the Richards Area. May also be present in landfills which accepted municipal waste in both the Railyards and Richards Areas.	Associated with decomposing organic matter. Can migrate into subsurface structures.	Landfill gas collection and removal systems.

[1] Provided groundwater is protected and direct human access is not possible.
SOURCE: EIP Associates, 1992

in soil, mercury can volatize in high temperatures, and soil microorganisms can convert it to highly toxic methylmercury gas.

Remediation

Despite differences between lead and other heavy metals, their implications for soil remediation are the same. Remediation may involve the excavation of soil to a depth at which a concentration is reached that is considered "safe" by regulatory authorities. In some cases, this may mean simply scraping the surface, while in others it may mean major excavation. Once lead contaminated soil has been excavated, it is either removed from the site to a hazardous waste facility, chemically "fixed" on-site, or reused in areas where no human exposure to soil is possible, depending on the lead concentrations. Lead contaminated soil can also be chemically fixed in place or "capped" with an impervious surface or sufficient clean fill so that no soil is exposed.

Metals in groundwater can be remediated by pumping the water to the surface and treating it. Unlike soil, lead and other metals do not occur together in groundwater, and different treatment methods may be required to remove different metals.

Volatile Organic Compounds

Volatile organic compound (VOCs), both chlorinated and nonchlorinated, comprise the solvents and degreasers used to clean machine parts. Solvents are also used for the degreasing of metals, as paint strippers, and to clean and dry parts of precision equipment.

Unlike metals, VOCs are highly mobile in the environment. They are rarely found in surface soil because they volatilize into the atmosphere. They can migrate throughout the soil column, from the surface down to the water table, and into the groundwater as well. Over time, VOCs are converted into other compounds by naturally occurring microorganisms in the soil and groundwater.

Chlorinated Solvents

Chlorinated solvents found in soil and groundwater include TCE (trichloroethylene), PCE (perchloroethylene), 1,1,1-TCA (1,1,1-trichloroethane), 1,2-DCE (1,2-dichloroethylene), 1,1-DCE (1,1-dichloroethylene), and vinyl chloride.[8]

TCE is commonly used for vapor degreasing of metals. When oxygen is absent (anaerobic conditions), as in deep soils and groundwaters, microorganisms convert TCE into 1,2-DCE and vinyl chloride, a confirmed human carcinogen. Like lead, TCE is classified by the EPA as a Group B-2 carcinogen, which means that it has only been shown to be carcinogenic in animal studies. TCE is an eye and skin irritant, and high exposure to TCE can cause ventricular fibrillation and cardiac failure. Lower exposures can damage the liver and other organs.

PCE is also used for vapor degreasing of metals and can be located in the soil. Under anaerobic conditions, PCE is slowly biodegraded to TCE and ultimately vinyl chloride. PCE has also been classified as a Group B-2 Carcinogen and is toxic to humans by inhalation, causing irritation,

hallucinations, coma and pulmonary changes. It is an eye and severe skin irritant and is moderately toxic by ingestion.

1,1,1-TCA is also commonly used for vapor degreasing of metals. High concentrations of 1,1,1-TCA can be found in the soil and in groundwater. 1,1,1-TCA is not classified as a human carcinogen. It is a skin and eye irritant and can cause cardiac arrest when inhaled in large quantities.

Vinyl chloride is predominately used to manufacture PVC and 1,1,1-TCA, and is also used as an adhesive for plastics, a refrigerant, and a solvent. It is produced when microorganisms biodegrade chlorinated solvents including TCE, PCE, 1,1,1-TCA, and 1,2-DCE. Vinyl chloride may also be present as a byproduct from the degradation of other chlorinated solvents, or an impurity in 1,1,1-TCA used for vapor degreasing. Vinyl chloride is a confirmed human carcinogen (Group A) and a potent skin and eye irritant. Exposure to high concentrations causes dizziness, headaches, nausea, and ultimately damage to the liver, central nervous system, and respiratory system. Exposure to low concentrations for long periods causes "vinyl chloride disease" and liver damage.

Both 1,2-DCE and 1,1-DCE can be generated as either impurities in the commercial solvents or products of degradation of the other solvents. 1,2-DCE is not known to be a carcinogen. It causes liver, kidney and lung damage and produces adverse central nervous system effects, especially when inhaled. 1,1-DCE is a suspected carcinogen and a poison by inhalation and ingestion.

Nonchlorinated Solvents

Nonchlorinated solvents include acetone and toluene, ethylbenzene, xylenes, and 2-butanone (also known as methylethylketone). Acetone and 2-butanone are solvents that are commonly used to strip paint, varnish and lacquer, and to clean and dry parts for precision equipment. Both of these ketones are skin irritants but are only mildly toxic, principally affecting the central nervous system at high doses.

Toluene, ethylbenzene and xylenes are components of petroleum fuels, and are common industrial solvents used to remove paints, gums, resins and lacquers. Toluene and ethylbenzene adversely affect the liver, kidney, nervous system, and lungs. Xylenes are eye irritants, cause hyperactivity, reduced weight and mortality, and affect the liver and kidneys. None of these solvents is classified as a human carcinogen.

Remediation

VOCs are highly mobile and may migrate through the soil column into the groundwater. Therefore, the movement of contaminated groundwater can contaminate clean soil. Implications for remediation are twofold. First, VOC contaminated soil needs to be remediated as soon as practicable to stop the spread of groundwater contamination, and second, the groundwater should be remediated at the same time to avoid recontamination of the clean soil by contaminated groundwater.

The remediation of soil containing VOCs can involve the excavation and removal of affected soil to a hazardous waste facility. An alternative to the excavation and removal of contaminated soil involves the extraction of the VOCs in vapor form ("soil vapor extraction"). Soil vapor extraction involves pumping air through the contaminated soil to strip out vapors. The extracted vapors are then treated to remove the VOCs and the purified air is vented to the atmosphere.

Groundwater remediation usually consists of the installation of a groundwater extraction system, which involves installing a series of wells strategically located to control the spread of the plume. The wells are pumped to bring the contaminated groundwater to the surface. Treatment involves air stripping, carbon absorption, ultraviolet oxidation, or treatment at a municipal wastewater treatment plant.

Semi-Volatile Organic Compounds

Most semi-volatile organic compounds (semi-VOCs) are not volatile under normal conditions and are adsorbed by soil. They are relatively immobile in the environment and stay close to the point where they are initially discharged. Some, such as phenols and naphthalenes, are volatile, not as strongly adsorbed, and somewhat soluble in water and, thus, are mobile. Other semi-VOCs include polynuclear aromatic hydrocarbons and phthalates, which are discussed below.

Polynuclear Aromatic Hydrocarbons

Polynuclear aromatic hydrocarbons (PAH) are products of combustion, formed when organic materials are burned, and are also present in hydrocarbon fuels. The source of PAHs found in the soil may include ashes and other residue from coal and oil burning and in locomotives that were washed and cleaned. Some PAHs are also present in petroleum products.

Lower-molecular weight PAHs include naphthalenes, and can be present in both the soil and groundwater. Some high-molecular weight PAHs are classified by the EPA as Group B-2 carcinogens.[9] Some are classified as Group D carcinogens, which means there are inadequate data to determine if they are carcinogens.[10] Many of the Group D PAHs are toxic by ingestion and are skin irritants. Naphthalene can also cause nausea, headache, diaphoresis, fever, anemia, liver damage, vomiting, convulsions and coma.

Phthalates

Phthalates are used in vacuum pumps, and are also plasticizers that are used in plastics, resins, stains, coatings and adhesives, and other products. These compounds are relatively immobile, though less so than PAHs.

Bis (2-ethylhexyl) phthalate is a phthalate which can be present in the soil and groundwater. This compound is a confirmed human carcinogen, a mild skin and eye irritant, and is toxic when swallowed. Butyl benzyl phthalate is classified by the EPA as a Group C carcinogen, which means that it is a possible human carcinogen. It is also a mild skin and eye irritant and is toxic when swallowed. Di-n-butyl phthalate is widely used in commercial products including paints and inks, and is not known to be toxic.

Remediation

Because phthalates and high-molecular weight PAHs are relatively immobile and primarily present near the surface, contaminated soil can be excavated and disposed of off-site, capped with an impervious surface, used as fill (provided groundwater is protected and no direct human access is possible), incinerated, chemically fixed or stabilized in place (still an experimental technology), or biodegraded in place. The low-molecular weight PAHs, which are predominately present in groundwater, can be remediated with the same methods used for VOCs.

Hydrocarbons

Hydrocarbons are primarily petroleum products, such as diesel, fuel oil and lubricating oils that have leaked from storage tanks, or spilled on the ground. The more mobile petroleum hydrocarbons, such as benzene, ethylbenzene, toluene, and xylenes, are commonly grouped with VOCs (discussed earlier). Hydrocarbons can be relatively immobile, and tend not to migrate great distances. However, hydrocarbons can be found throughout the soil column and in groundwater if leaked from an underground storage tank. Petroleum hydrocarbons generally are not toxic unless ingested in large quantities.

Remediation

Soil and groundwater that contain hydrocarbon contamination can be remediated using most of the methods previously described, including excavation and removal, excavation and aeration (until the hydrocarbons volatilize), excavation and reuse (as road surfacing material), or groundwater extraction and treatment.

Bioremediation is another method used to remediate contaminated soil. Bioremediation works by fostering the growth of microorganisms that consume fuel hydrocarbons in soil. Microorganism growth is encouraged by creating a favorable soil environment with respect to moisture content, oxygen, and nutrient availability. Because optimizing these factors is sometimes difficult, the effectiveness of this treatment method is unpredictable.

Site Cleanup Process

The Sacramento regional office of the DTSC oversees the clean-up of state-listed hazardous waste sites in the Sacramento area. DTSC is responsible for reviewing and approving all clean-up plans, for setting clean-up standards, and for evaluating health risks. In general, cleanup of a listed site includes the following steps (as is the case with the Railyards Area):

- Remedial Investigation ("RI"): data gathering in order to characterize the extent of contamination.
- Feasibility Study ("FS"): evaluation of clean-up options.
- Risk Assessment ("RA"): evaluation of human health and environmental risks.
- Remedial Action Plan ("RAP"): final clean-up strategy.

- Remedial Design and Construction: implementation of the RAP.

- Closure Report: documentation of successful remediation efforts and implementation of RAP.

Other agencies can act as lead agencies for purposes of overseeing the remediation process and/or play key roles. The Central Valley Regional Water Quality Control Board (CVRWQCB) reviews cleanup plans with regard to water quality issues, and assumes an active role in approving groundwater cleanup systems. The EPA (Region IX) reviews cleanup plans for compliance with federal law, where applicable. The Sacramento County HMD monitors the remediation of contamination from leaking underground storage tanks.

Overview of the Railyards Area

The following describes historic land uses associated with the Railyards Area, the type and extent of contamination associated with current or former activities in the Planning Area, and completed or ongoing remediation activities.

Site History

The Central Pacific Railroad (which later became the Southern Pacific Railyard, or Southern Pacific) was incorporated in Sacramento, California, in 1861. As part of the incorporation, the City of Sacramento and the State of California deeded lands north of downtown Sacramento to the Railroad.

Building the Southern Pacific Railyard (Railyards) began on the deeded land in 1863. The City ordered the railroad to keep their tracks, grounds and shops at the same elevation as the existing levees, beginning a long period of dredging and filling where the confluence of the Sacramento and American Rivers exists. Much of this work was done by one-horse cart in the early days and later by dredges, which pumped river sand into the area to be filled.

The Central Shops, the earliest buildings in the Railyards Area, include the current fabrication, erecting and machine shops, transfer tables and turntable. These structures were built in 1867, and were enlarged from time to time until 1906. Figure 4.13-1 identifies current and historic structures located within the Railyards Area.

In order to build additional facilities at the Railyards in the early 1900s, the railroad had to fill water-covered areas. The Sutter Lake or China Slough covered the southern part of the site from I to D streets and from 2nd to 6th streets in the 1850s. The northwest part of the lake was filled in the 1860s for the Central Shops, and the area along the extension of 6th Street upon

which an iron foundry was built in 1884 was filled in the 1870s. Sutter Lake was filled by 1910. The part of the Railyards Area north of the Central Shops was also a slough, and was filled by about 1913. Shop facilities, the Stores, the Frog and Spring Shops, and the Brass Foundry were added from 1915 to 1920. The present Amtrak depot at the southern edge of the site was built in 1925.

Industrial Operations

Many different industrial operations have occurred at the Railyards over its history. Primary operations at the site have been assembly and building of locomotives and railroad cars and repairing or refurbishing of the cars and locomotives. Activities associated with these operations included steel fabrication, brick production, boiler-making, copper and tinsmithing, blacksmithing, machine work, carpentry, metal plating, upholstering, washing, welding and cutting, paint removal and application and sand blasting. At one time, the Railyards also produced rails, steam and ferry parts and cable cars. Many of these activities are associated with lead and other heavy metal waste.

Chemical Use, Storage and Disposal

Many different industrial processes were associated with specific buildings on the site and some processes were performed in numerous structures over time.[11] Additional operations may have existed that were not recorded or did not occur in one location long enough to warrant mention by historians. These factors contribute to difficulties in obtaining accurate chemical use, storage, and disposal information.

Chemical Use

Many types of chemicals have been used in association with Railyards operations. Fuels, caustic solutions, paints, solvents, and metal alloys appear to constitute the majority of chemicals used at the site. Table 4.13-4 summarizes the chemicals known to have been used at the Railyards in recent years, the operations in which they were used, and the buildings that housed those operations. General chemical use patterns for the Planning Areas within the Railyards include solvents, oils and fuels, caustic cleaning solutions, paints, lacquers and thinners, and metal alloys.[12]

Chemical Storage

Over the history of the Railyards, numerous underground storage tanks (USTs) have been installed to store chemicals associated with operations. USTs can contain hazardous materials, which could leak and contribute to soil and groundwater contamination. Approximately 19 known USTs have been removed from service. Their locations are identified in Figure 4.13-2. Of the UST removals performed, 12 are identified as closed, three involved contaminated soils (no closure identified), three had no discussion of contamination (no closure identified), and one had no evidence of contamination (no closure identified). Additional tanks may be discovered during the course of subsequent site investigations. A summary description of the known USTs is contained in Appendix I.[13]

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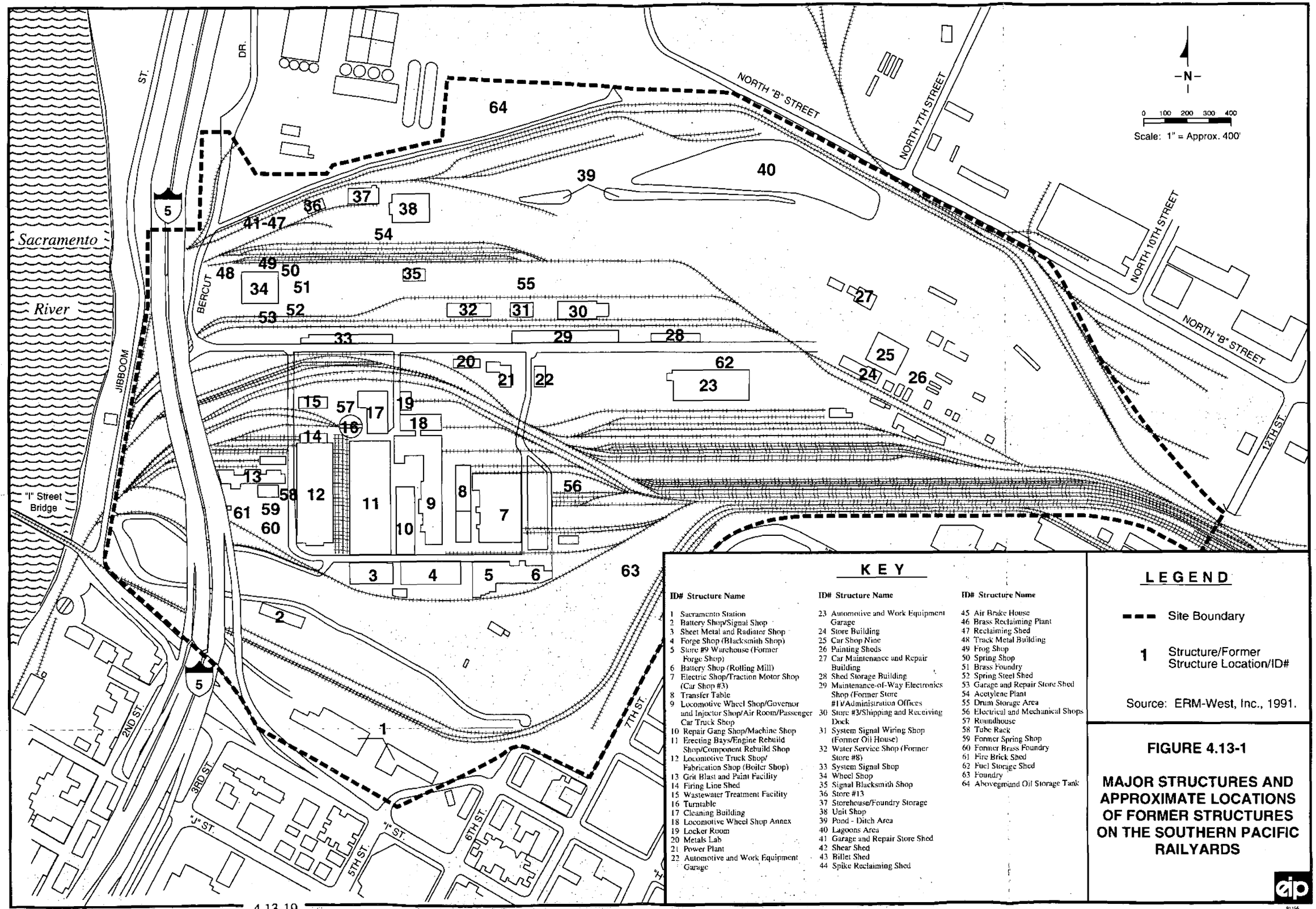

KEY

ID#	Structure Name
1	Sacramento Station
2	Battery Shop/Signal Shop
3	Sheet Metal and Radiator Shop
4	Forge Shop (Blacksmith Shop)
5	Store #9 Warehouse (Former Forge Shop)
6	Battery Shop (Rolling Mill)
7	Electric Shop/Traction Motor Shop (Car Shop #3)
8	Transfer Table
9	Locomotive Wheel Shop/Governor and Injector Shop/Air Room/Passenger Car Truck Shop
10	Repair Gang Shop/Machine Shop
11	Erecting Bays/Engine Rebuild Shop/Component Rebuild Shop
12	Locomotive Truck Shop/ Fabrication Shop (Boiler Shop)
13	Grit Blast and Paint Facility
14	Firing Line Shed
15	Wastewater Treatment Facility
16	Turntable
17	Cleaning Building
18	Locomotive Wheel Shop Annex
19	Locker Room
20	Metals Lab
21	Power Plant
22	Automotive and Work Equipment Garage
23	Automotive and Work Equipment Garage
24	Store Building
25	Car Shop Nine
26	Painting Sheds
27	Car Maintenance and Repair Building
28	Shed Storage Building
29	Maintenance-of-Way Electronics Shop (Former Store #11/Administration Offices
30	Store #3/Shipping and Receiving Dock
31	System Signal Wiring Shop (Former Oil House)
32	Water Service Shop (Former Store #8)
33	System Signal Shop
34	Wheel Shop
35	Signal Blacksmith Shop
36	Store #13
37	Storehouse/Foundry Storage
38	Unit Shop
39	Pond - Ditch Area
40	Lagoons Area
41	Garage and Repair Store Shed
42	Shear Shed
43	Billet Shed
44	Spike Reclaiming Shed
45	Air Brake House
46	Brass Reclaiming Plant
47	Reclaiming Shed
48	Track Metal Building
49	Frog Shop
50	Spring Shop
51	Brass Foundry
52	Spring Steel Shed
53	Garage and Repair Store Shed
54	Acetylene Plant
55	Drum Storage Area
56	Electrical and Mechanical Shops
57	Roundhouse
58	Tube Rack
59	Former Spring Shop
60	Former Brass Foundry
61	Fire Brick Shed
62	Fuel Storage Shed
63	Foundry
64	Aboveground Oil Storage Tank

LEGEND

- Site Boundary
- 1 Structure/Former Structure Location/ID#

Source: ERM-West, Inc., 1991.

FIGURE 4.13-1

MAJOR STRUCTURES AND APPROXIMATE LOCATIONS OF FORMER STRUCTURES ON THE SOUTHERN PACIFIC RAILYARDS

TABLE 4.13-4
CHEMICAL USAGE SUMMARY OF THE RAILYARDS AREA

Facility	Process	Capacity	Materials/Chemicals Used	Notes
Air Brake Shop	Dip tank	1,160 gallons	40% SP237E[1] +5% Sodium Gluco-heptonate	Caustic cleaner
	Dip tank	40 gallons	Chevron #350H thinner[2]	
	Pass through component cleaning system consisting of three tanks:	300 gallons	10% Quaker 625NW[3] and 5% Nordall emulsion-kerosene	
		300 gallons	15% Quaker 625NW[3] and 3% Nordall emulsion kerosene	
		300 gallons	Water with 0.2% sodium nitrate	
Traction Motor Shop	Precleaning of Traction Motors	N/A	40% SP312[4] and 60% water	Alkaline soap
	Traction Motor Cleaning:			
	Tank 1	2,300 gallons	2% Action 9000[5] and 98% water	Caustic cleaner
	Tank 2	1,640 gallons	100% water	
	Vapor degreaser	450 gallons	1, 1, 1-Trichloroethane	Use of 1, 1, 1-Trichloroethane was discontinued sometime between 1984 and 1988.
Governor and Injector Shop	Precleaner:			
	3 tanks	50 gallons each	100% SP 291NC[6]	Non-chlorinated solvent cleaner; prior to 1984, SP 291 contained chlorinated solvents.
	1 tank	5 gallons	20% Turco 2858[7] and 80% kerosene	Solvent cleaner
	Cleaner:			
	2 tanks	85 gallons each	Water and 7% Quaker 698LQ[8]	Alkaline cleaner
	1 tank	85 gallons	Water and 1 oz./gallon SP312[4]	
Erecting Shop	Steam cleaner (2 tanks):	5,500 gallons	Water with 3% SPP239[9]	Caustic cleaner
		12,433 gallons	Water with 3% SP239[9]	
Locomotive Laundry Track	Closed cleaning system, 1 tank:	5,500 gallons	3% SP239[9], 1% kerosene, and 96% water	Caustic cleaner
	Locomotive Wash Rack, 1 tank	2,500 gallons	2% SP239[9] and 98% water	
	Prewash and rinse:	N/A	40% SP312[4] and 60% water	Alkaline detergent
	Locomotive fluid removal:	N/A	Diesel fuel, engine and journal oil, cooling water treated with Nalco 2106[10]	
Engine Line	Magnetic particle testing, 1 bath:	20 gallons	Chev Base Oil C and 4 oz. Magnaglo Powder	

TABLE 4.13-4
CHEMICAL USAGE SUMMARY OF THE RAILYARDS AREA

Facility	Process	Capacity	Materials/Chemicals Used	Notes
Firing Line	Fuel tank flush	N/A	90% Diesel fuel and 10% water	Pumped to storage tank for recycling
Cleaning Building	Parts cleaning, 4 tanks:	4,500 gallons	15% Quaker 625NW[3] and 85% water	
		5,000 gallons	25% SP 237E[1] + 5% SG and 75% water	
		9,000 gallons	35% SP 237E[1] + 5% SG and 65% water	
		330 gallons	100% kerosene	Cleaning solvent
	Automatic System, 4 tanks:	1,950 gallons	40% SP 237E[1] + 5% SG and 60% water	
		1,800 gallons	50% SP 237E[1] + 5% SG and 50% water	
		9,850 gallons	40% SP 237E[1] + 5% SG and 60% water	
		1,800 gallons	0.3% sodium nitrate and 99.7% water	
	Mix tank:	2,000 gallons	0.3% sodium nitrate and 99.7% water	
	Steam cleaning	N/A	5% SP 237E[1] + 5% SG and 95% water	
	High-pressure washing	N/A	20% SP 236D[11] and 80 % water	
Paint Shop	Paint mixing:			
	3 tanks	110 gallons each	50% PRC484A and 50% PRC484B	Polyurethane two-part paint
	1 tank	110 gallons	100% PRC 66	Polyurethane primer
	1 tank	110 gallons	100% Clear top coat	Polyurethane top coat
Paint Shop	2-Butanone recovery, 1 still:	25 gallons	95% 2-Butanone and 5% spent paint	
Locomotive Wheel Shop	Magnetic particle testing, 1 bath	10 gallons	Chev Base Oil C + 2 oz. Magnaglo Powder	
	Wheel set washer, 1 tank:	4,000 gallons	4% SP 237E[1] + 5% SG, 1% kerosene, 1% TSP, 94% water	
Locomotive Wheel Shop Annex	Roller bearing cleaning:			
	1 tank	110 gallons	100% SP 236[11]	Water soluble solvent
	1 tank	110 gallons	100% kerosene	
	Small parts cleaning, 1 tank:	10 gallons	100% kerosene	
EMD Assembly Area	Magnetic particle testing, 1 bath:	10 gallons	Chev Base Oil C + 1 oz. Magnaglo Powder	
	Liner cleaning, 1 tank:	720 gallons	5% SP 237E[1] + 5% SG and 95% water	

Facility	Process	Capacity	Materials/Chemicals Used	Notes
Freight Car Wheel Shop	Automatic bearing washer:			
	Tank 1	110 gallons	7% Turco Sprayeze and 93% water	Alkaline detergent
	Tank 2	110 gallons	7% Turco Sprayeze and 93% water	
	Rinse	N/A	4:1 Turco 5809 to water	Petroleum based rust preventive
	Magnetic particle testing, 1 bath:	10 gallons	Chev Base Oil C + 2 oz. Magnaglo Powder	
	Rinse	N/A	4:1 Turco 5809 to water	Petroleum based rust preventive
	Magnetic particle testing, 1 bath:	10 gallons	Chev Base Oil C + 2 oz. Magnaglo Powder	

[1] SP 237 contains free caustic NaOH, surfactant, tetrasodium salt of EDTA, and butyl carbitol.
[2] Typical composition of Chevron #350 H contains 87% paraffins including naphthenes and 13% aromatics including benzene, toluene, and xylenes.
[3] Quaker 625NW contains water, borax, nitrite, NaOH, silicate, amino acid chelate, phosphate surfactant, glycol ether, and ethoxylated fatty alcohols.
[4] SP 312 is an aqueous solution of sodium silicate, nonionic surfactant, sodium xylene sulfonate, and tetrasodium salt of EDTA.
[5] Action 9000 is a caustic cleaner containing potassium hydroxide, soluble silicates, and complex phosphates.
[6] SP 291 contains an aromatic hydrocarbon, glycol-ether, methyl chloroform, an aliphatic hydrocarbon, fatty acid soap, monoethanolomine, and water.
[7] Turco 2858 is a solvent cleaner containing aromatic and aliphatic petroleum distillates and butyl ether of ethylene glycol.
[8] Quaker 698 LQ is a caustic cleaner containing NaOH, chelate, and water.
[9] SP 239 is a caustic cleaner containing NaOH.
[10] Nalco 2106 is a rust inhibitor consisting of a borate-nitrite-nitrate-meta silicate blend.
[11] SP 236 is a solvent cleaner composed of petroleum distillates.

SG = Sodium gluco-heptonate.

N/A = Not Applicable.

SOURCE: Brown and Caldwell, 1984; Woodward-Clyde Consultants, 1988; and ERM-West, 1991.

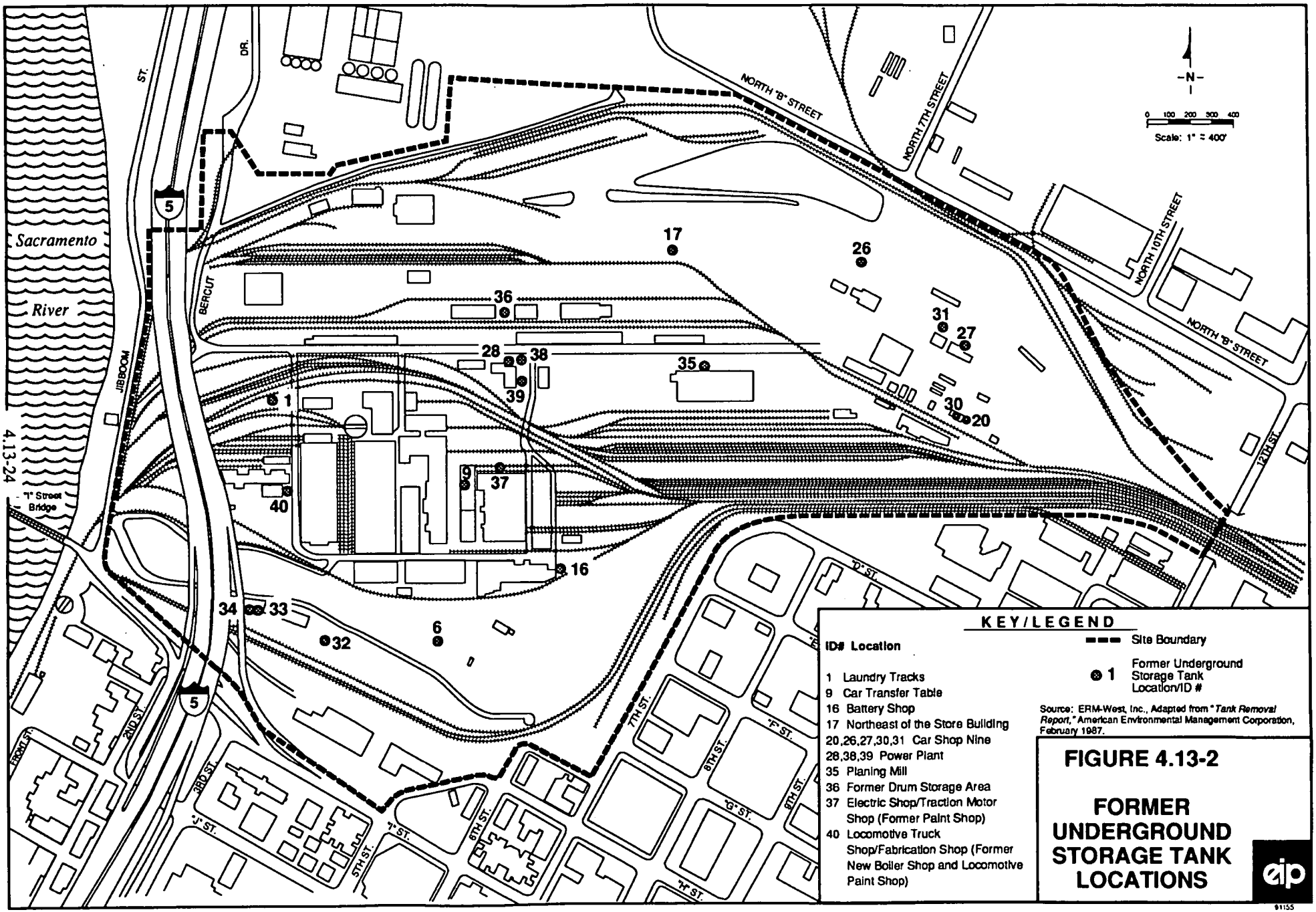

FIGURE 4.13-2

FORMER UNDERGROUND STORAGE TANK LOCATIONS

4.13-24

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Chemical Disposal

Chemical wastes currently generated at the Railyards are either recycled, treated in the industrial waste sewer system, or removed from the site for proper landfill disposal. Historically, some waste streams were placed into the industrial waste lagoon area, beginning around the time of World War II until around the early 1960s, when the lagoon began to be filled.[14] For approximately five years in the late 1970s, sludge and water were occasionally pumped from industrial wastewater sewers in the Central Shops area, and released onto the ground in the overflow area of the lagoon.[15]

Identified Contaminated and Potentially Contaminated Sites

Table 4.13-5 summarizes the investigation history of the Railyards Area.[16] Pursuant to these investigations, 12 areas have been identified as containing some elevated concentrations of chemicals or metals in the soil and/or groundwater (See Figures 4.13-3 through 4.13-11). The type and extent of contamination, as well as current status of remediation, is described below.[17],[18] Refer to Table 4.13-3 for a summary of the type of contamination, where the contamination is primarily located in the Railyards Area, and the applicable remediation methods.

Central Shops

History

The Central Shops area, covering approximately 31 acres, has been in continuous use since the 1860s for steam and diesel locomotive fabrication and repair, and is the most active area currently in use in the Railyards Area.

Contamination

Eighty-four soil samples were taken during the Phase I investigation from 29 borings ranging in depth from six to 34 feet. The principal chemicals of concern in this area are VOCs, semi-VOCs, and TPHs. Among the VOCs, chlorinated solvents were identified in the soil below five feet, and include TCE, PCE, 1,1-DCA, 1,1-DCE, 1,1,1-TCA, and vinyl chloride. Several nonchlorinated solvents, including acetone, toluene, 2-butanone, xylenes, and ethylbenzene were also identified in the soil at a few scattered sites. Semi-VOCs, principally phthalates and PAHs with some naphthalenes and phenols, were also detected at scattered locations including outside of the new painting facility, outside of the Cleaning Building, inside the Erecting Shop, between the Sheet Metal and Forge Shops, and at the Wheelset Washing Station. TPHs were detected along the laundry tracks and near the API Separator in the upper five feet of soil. Relatively low metal levels were detected in soil throughout the area except for elevated lead levels outside of the new painting facility and elevated copper levels at the former Forge Shop.

The Central Shops area has been determined to be the source of a large groundwater plume that extends in a southerly direction (the southern plume) beyond the site boundaries (see Figure 4.13-9). Both the upper sand aquifer and the lower gravel units contain VOCs, although concentrations are much lower in the deeper gravel units. The principal compounds found in the

TABLE 4.13-5
SUMMARY OF INVESTIGATIONS CONDUCTED ON THE RAILYARDS AREA

Consultant	Date	Purpose
Brown and Caldwell	September 1982	Hydrologic investigation of the Railyards including the installation of 17 wells.
	July to August 1984	Determination whether chemicals were present in soil and groundwater as a result of the Pond and Ditch operations.
Ecology and Environment, Inc.	February 1983	Characterization for the disposal of soils at the new painting facility.
Kennedy/Jenks/Chilton	October 1986 to February 1987	Preliminary characterization of extent and nature of chemical occurrence in soils at the Drum Storage Area, Battery Shop, and Sand Piles.
	November 1987 to May 1990	Remedial Investigation/Feasibility Study for soils and groundwater at the former Drum Storage Area.
	December 1987 to June 1990	Remedial Investigation/Feasibility Study for soils and groundwater at the former Battery Shop, followed by remedial activities and subsequent closure.
	December 1987 to June 1990	Remedial Investigation/Feasibility Study for soils and groundwater at the Sand Piles, followed by remedial activities and subsequent closure.
American Environmental Management Corporation	October to December 1987	Removal of underground storage tanks.
	March to November 1988	Additional investigation and clean-up work at eight sites identified during earlier tank removal work.
Woodward-Clyde Consultants	March 1985 to August 1990	Remedial Investigation/Feasibility Study for soils and groundwater at the Pond and Ditch area, culminating in RAP. (Remediation in progress)
	February 1989 to January 1991	Remedial Investigation/Feasibility Study for soils and groundwater at the Sacramento Station area, followed by remedial activities and subsequent closure.
	April to May 1989	Phase I Remedial Investigation/Feasibility Study for soils and groundwater at the overall site.
	May 1989	Characterization of soils at the former Forge Shop.
ERM-West, Inc.	July 1991	Overall Site Remedial Investigation/Feasibility Study Shell Work Plan for soil and groundwater contamination characterization. Central Shops Sampling and Analysis Plan.
	August 1991	Lagoon Study Area sampling and analysis plan for soil and groundwater contamination characterization. South Plume Sampling and Analysis Plan.
	September 1991	Initiate Remedial Investigation of Central Shops.
	November 1991	Final investigation report on soil and lead sampling in the residential and open space area.

SOURCE: ERM-West, 1991; EIP Associates, 1992.

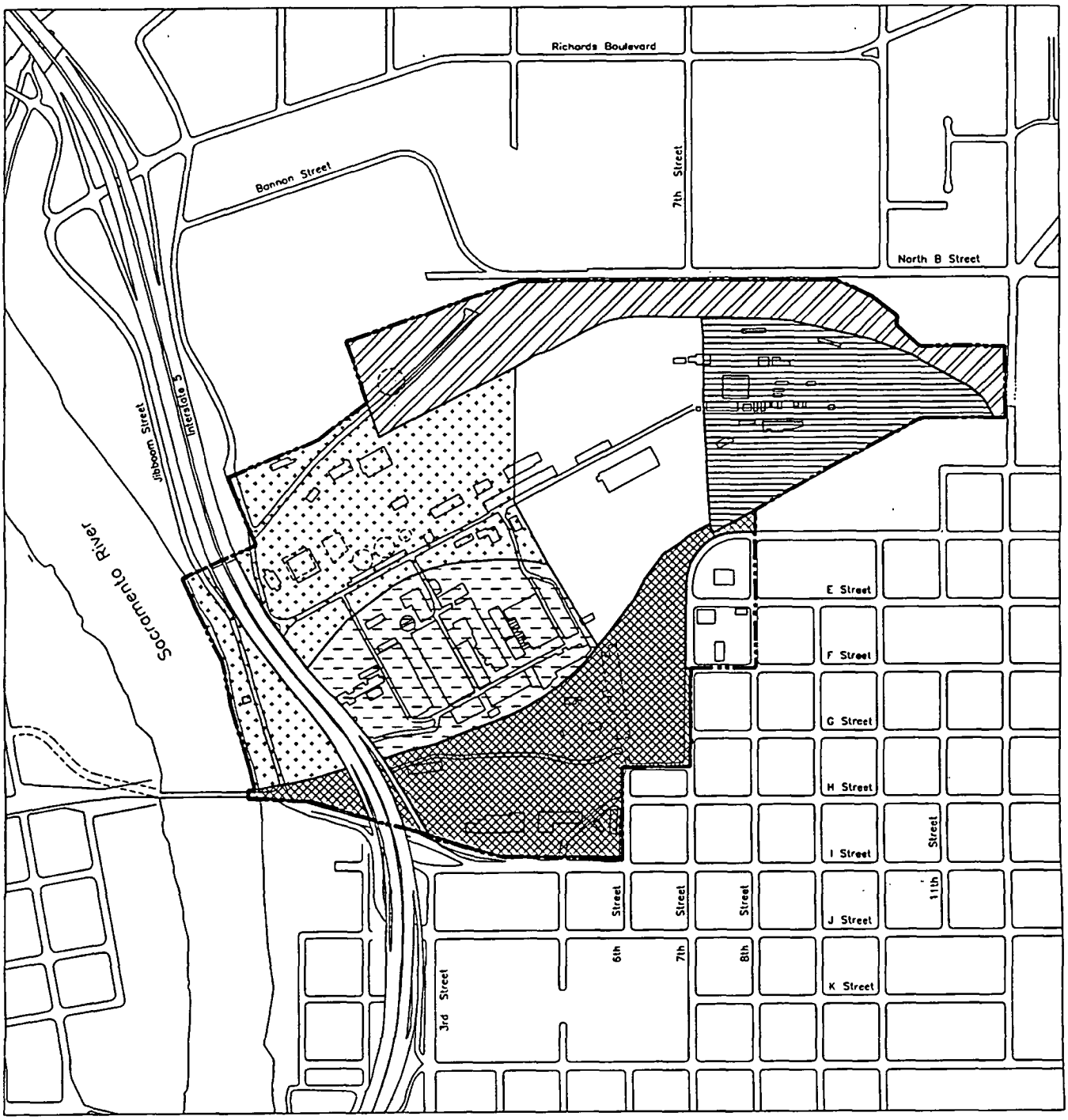


FIGURE 4.13-3
Railyards Hazardous Substance Remediation Areas

Source: ROMA Design Group, 1992.

FIGURE 4.13-4
Principal Areas of Lead Contamination in Soils

Lead : 174 to 1000 PPM

Lead : > 1000 PPM

Source: ROMA Design Group, 1992.

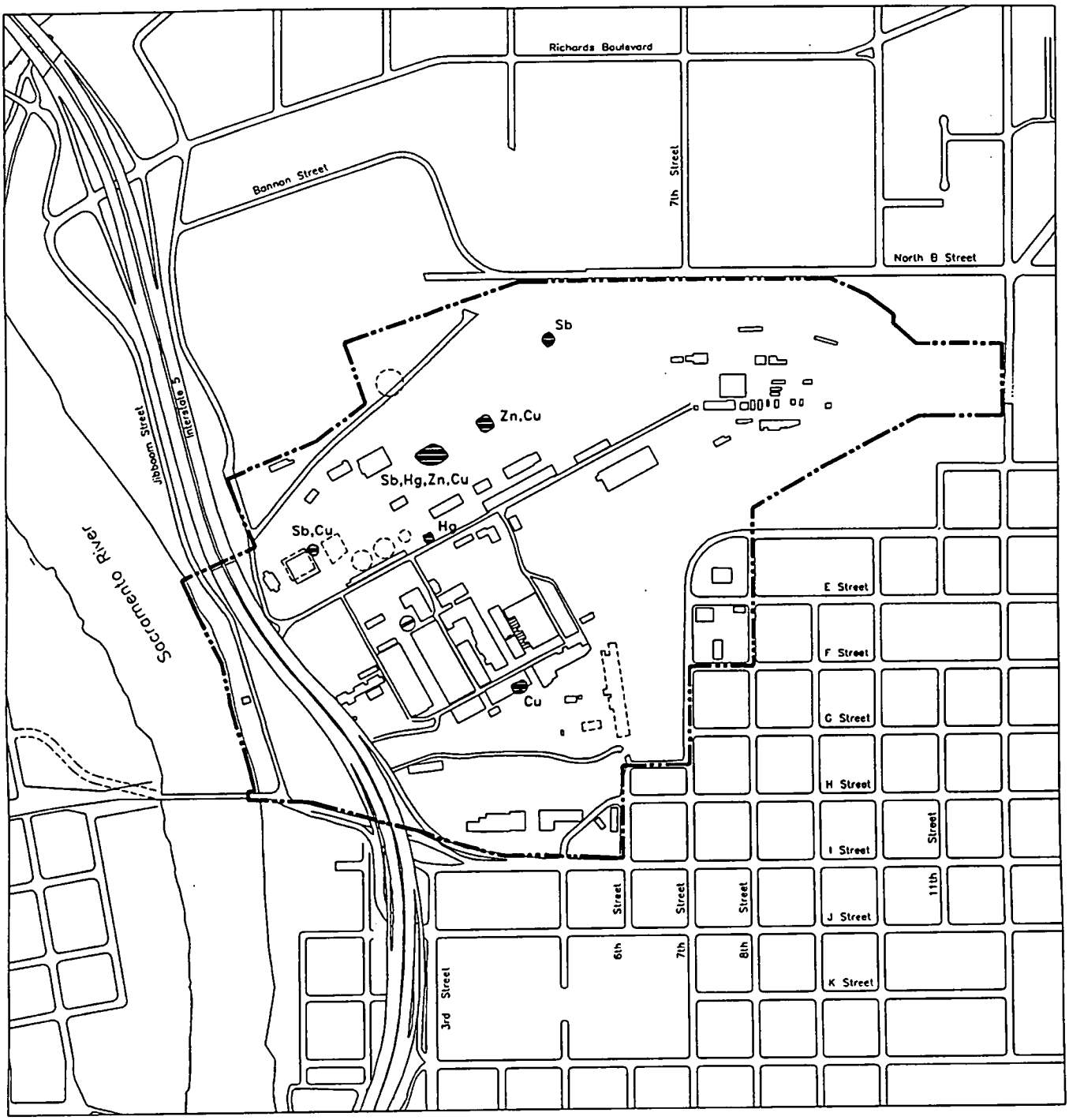


FIGURE 4.13-5
Principal Area of Heavy Metals Contamination in Soils

Metals other than Lead greater than total threshold limit concentration (TTLC) values

Cu = Copper
Hg = Mercury
Sb = Antimony
Zn = Zinc

Source: ROMA Design Group, 1992.

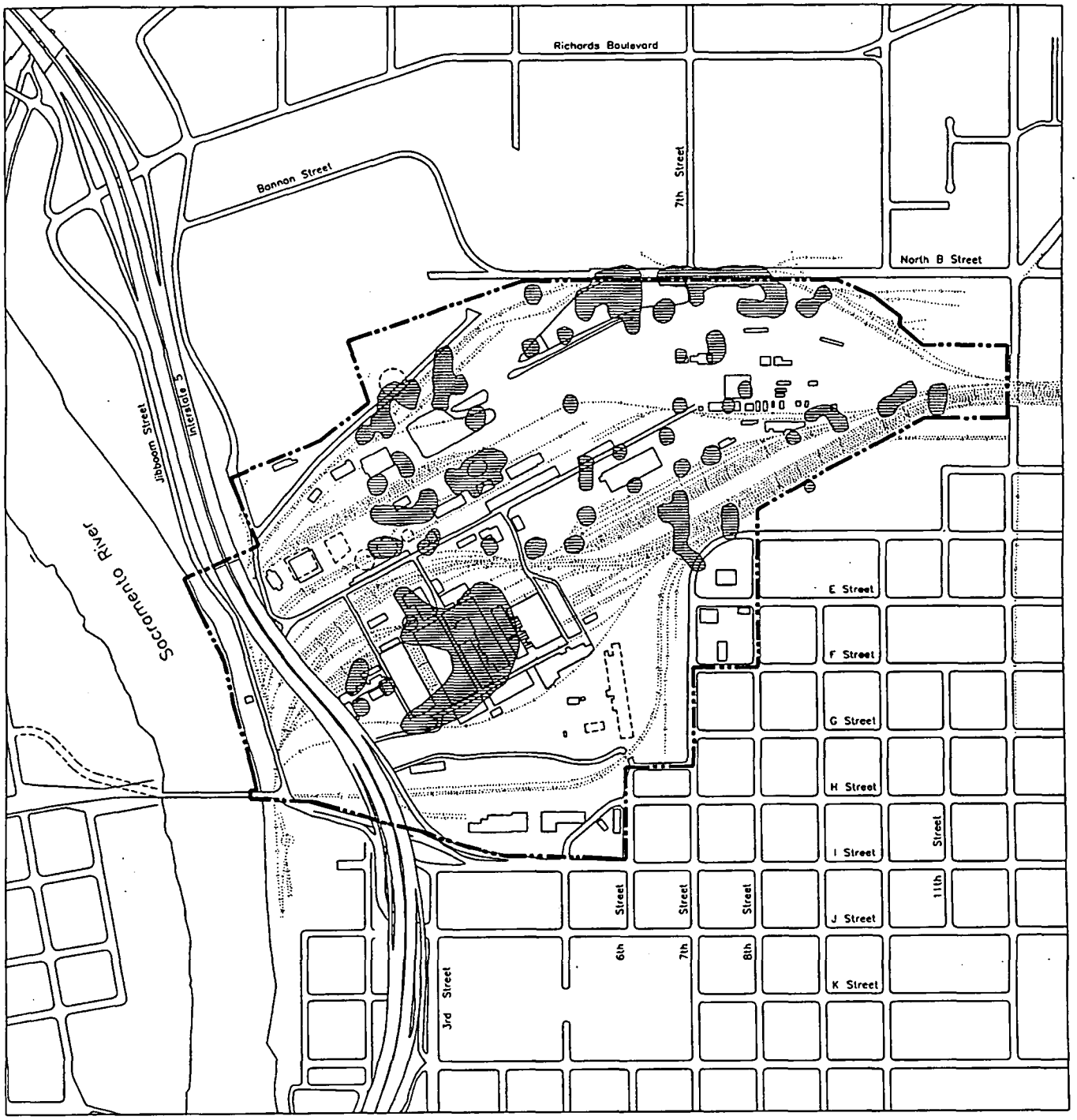


FIGURE 4.13-6
Principal Areas of Volatile Organic Compound Contamination in Soils

Concentration >0.1 PPM for the sum of individual volatic organic compounds or > or = 1 PPM by flame ionization detection or photoionization detection

Source: ROMA Design Group, 1992.

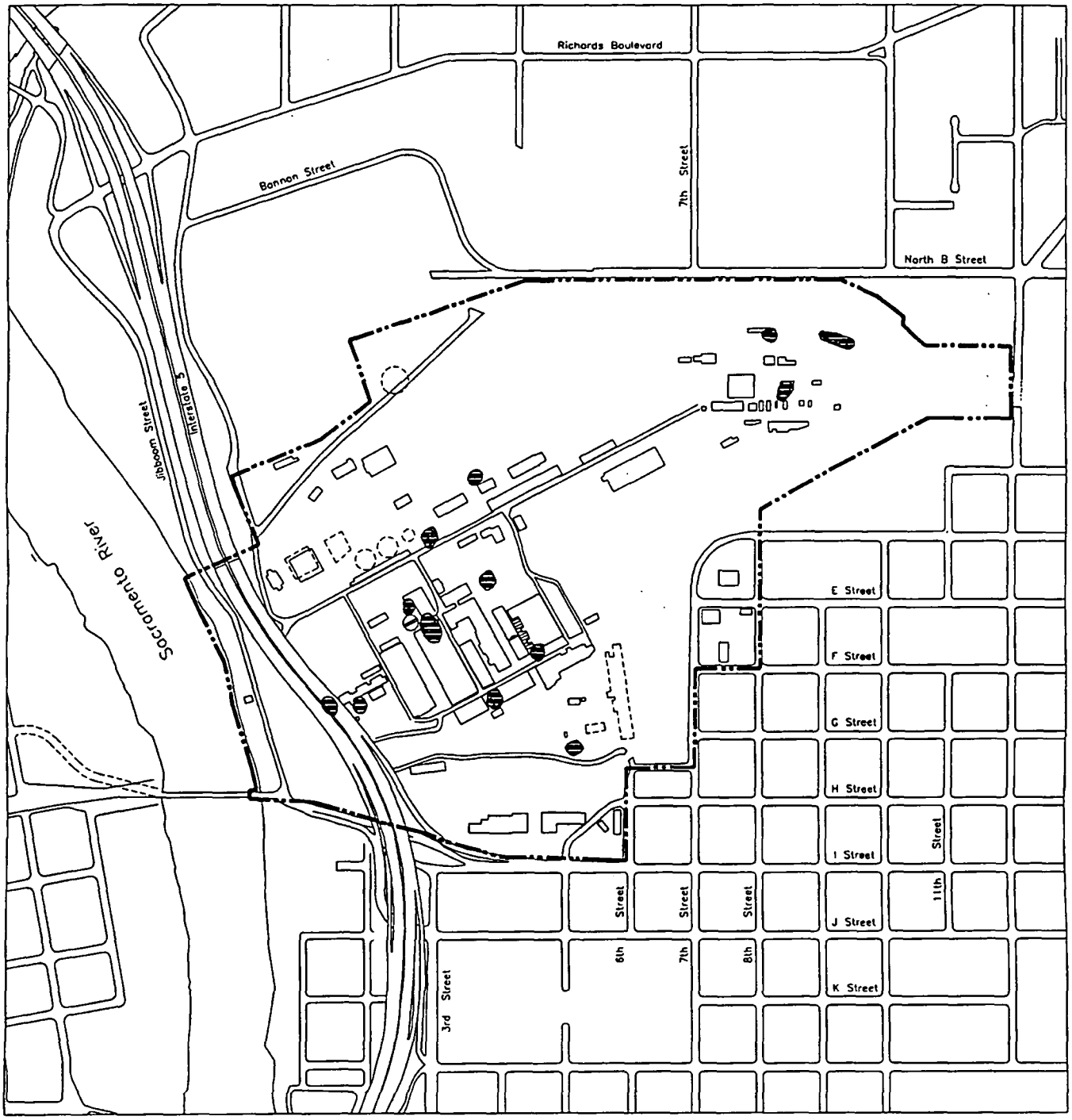


FIGURE 4.13-7
Principal Areas of Semivolatile Organic Compound Contamination in Soils

Concentration greater than 0.1 PPM

Source: ROMA Design Group, 1992.

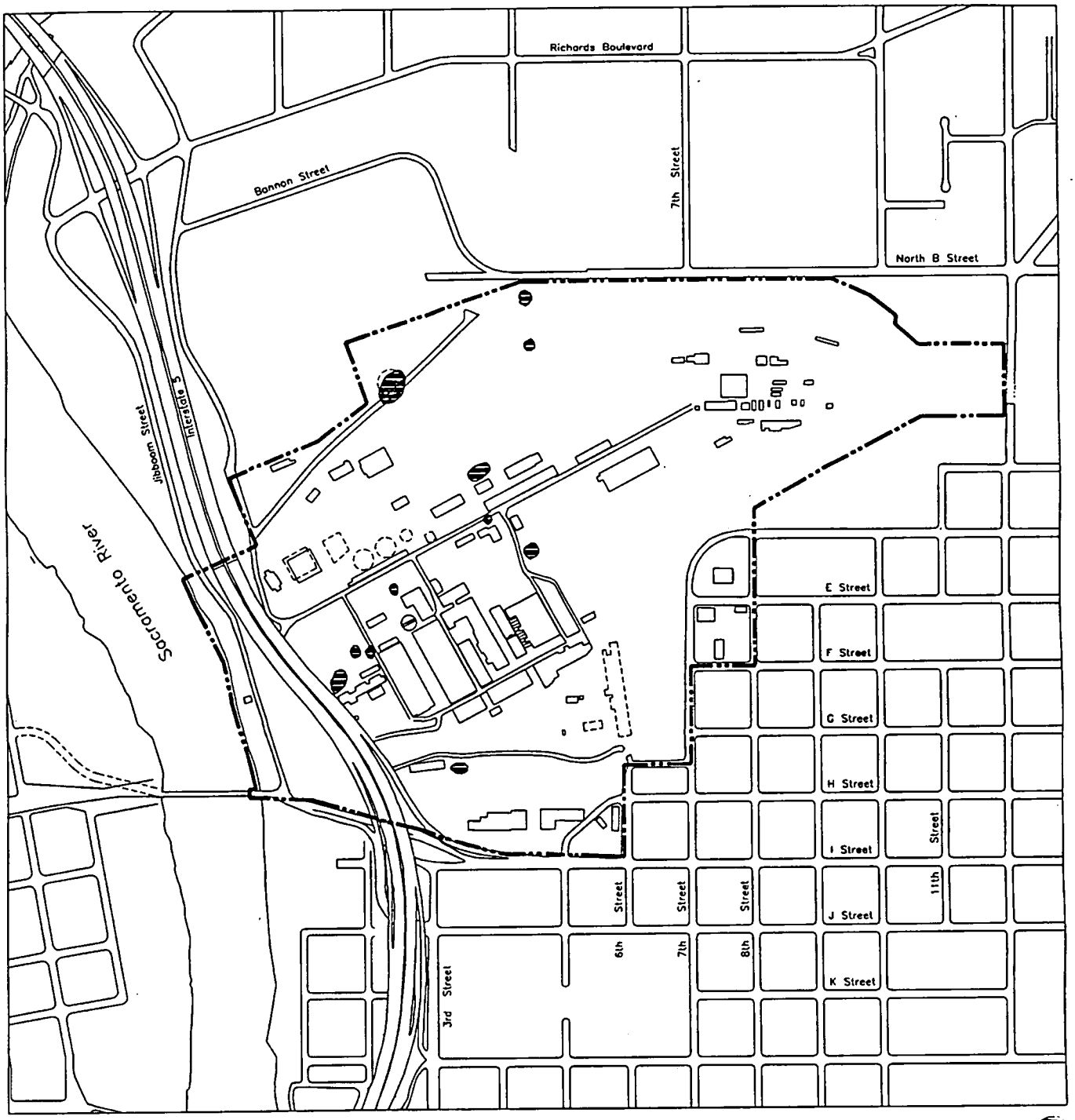


FIGURE 4.13-8
Principal Areas of Hydrocarbon Contamination in Soils

Concentration greater than 100 PPM

Source: ROMA Design Group, 1992.

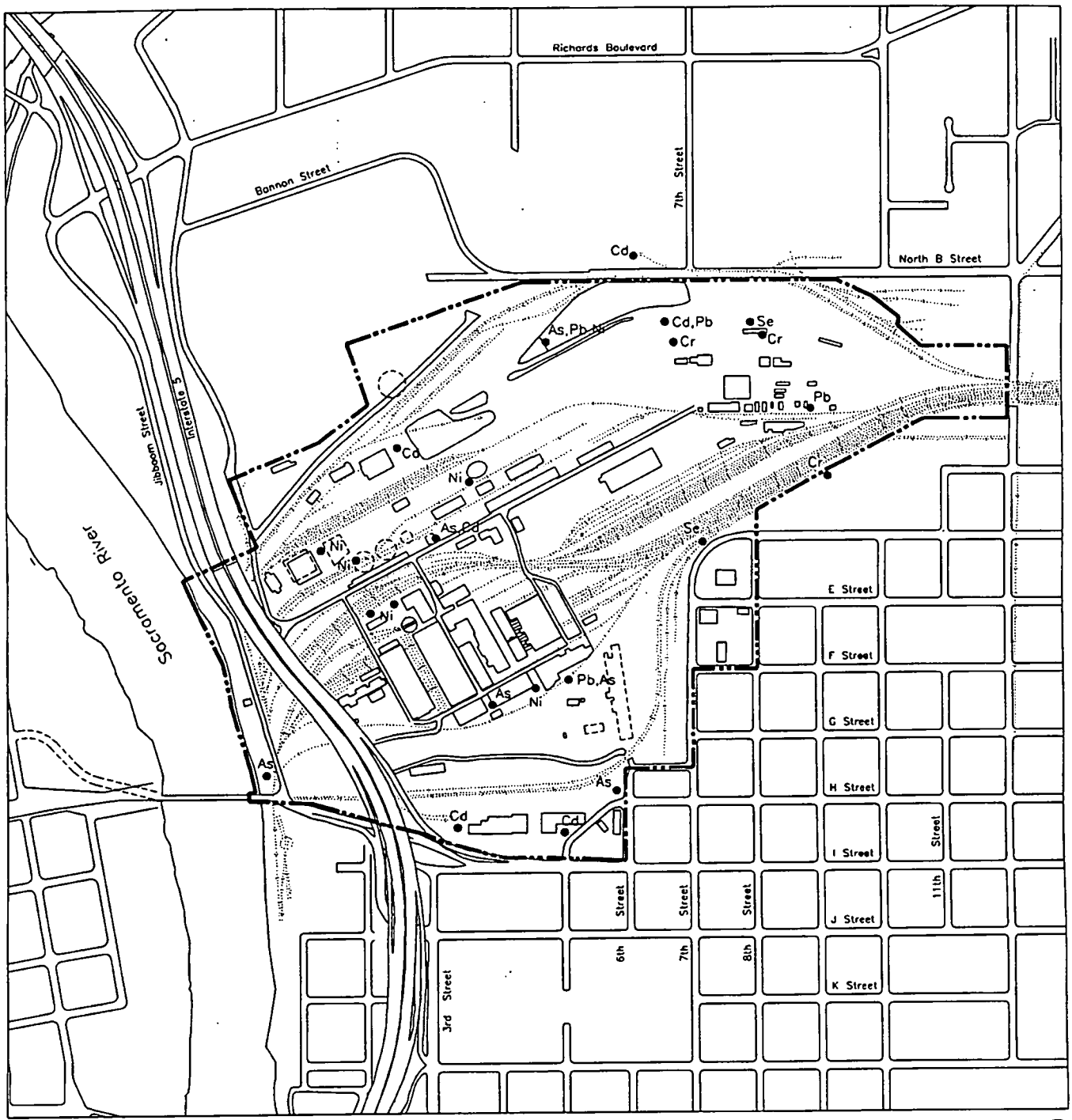


FIGURE 4.13-9
Principal Areas of Groundwater Contamination
(Metals)

Metals greater than maximum contaminant level (MCL)
EPA action level of 0.015 MG/L used for Lead

As = Arsenic
Cd = Cadmium
Cr = Chromium
Ni = Nickel
Pb = Lead
Se = Selenium

Source: ROMA Design Group, 1992.

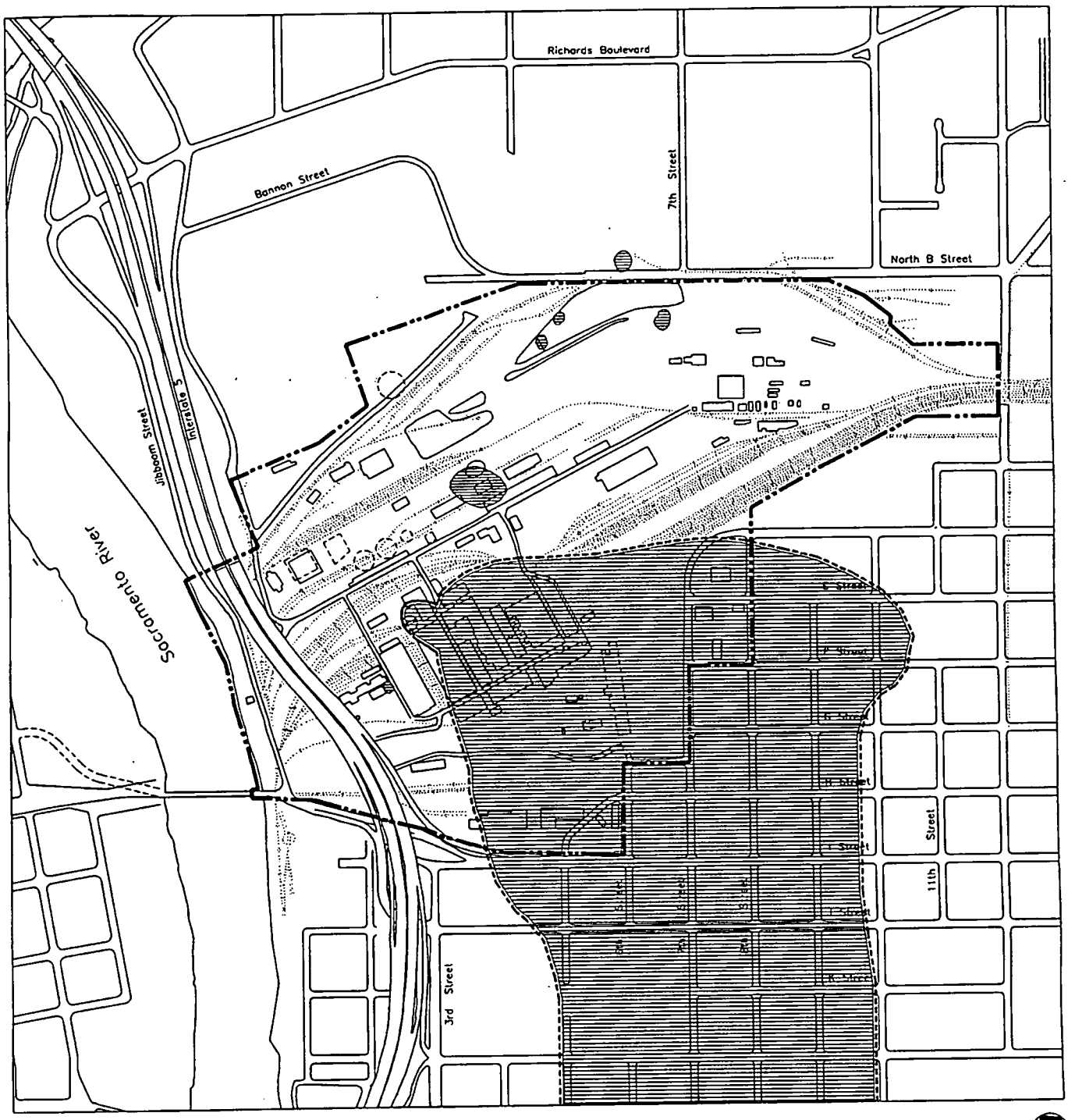


FIGURE 4.13-10

Principal Areas of Groundwater Contamination
(Volatile Organic Compounds)

Volatile organic compounds 0.1 MG/L

Extent of southern plume uncertain

Source: ROMA Design Group, 1992.

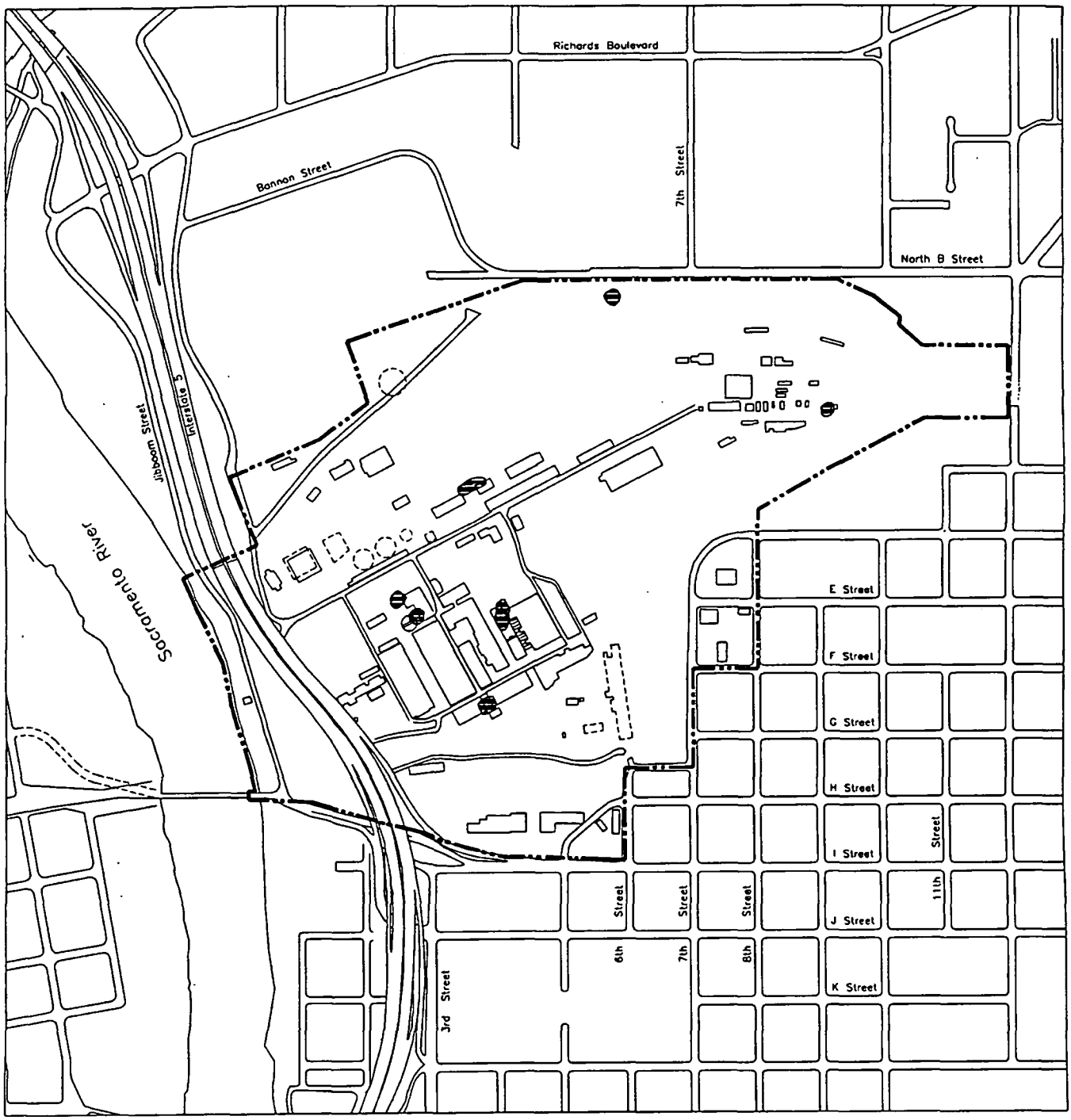


FIGURE 4.13-11
Principal Areas of Groundwater Contamination
(Semivolatile Organic Compounds)

Semivolatile organic compounds 0.1 MG/L

Source: ROMA Design Group, 1992.

southern groundwater plume include chlorinated solvents. Nonchlorinated solvents (naphthalenes and phenols) have been detected in a few scattered wells. PAHs and phthalates have not been detected in groundwaters. Nickel and arsenic concentrations in excess of drinking water standards have been detected in four wells.

Site Status

Removal and disposal of contaminated soil, capping and soil vapor extraction may be used to remediate soils. Groundwaters may be remediated by pumping the contaminated water to the surface and treating it. Other remediation methods may be incorporated depending on the results of further site characterization. Further investigation to characterize the extent of any contamination is in progress. Interim remediation, to control the source of the southern groundwater plume, is expected to be completed by 1993. A Final RAP is expected to be issued in May of 1995 with soil cleanup to be completed by 1997.

Former Battery Shop

History

The former Battery Shop was the eastern-most building at the southern edge of the Central Shops. Locomotive batteries were reconditioned at this 3,800-square-foot location for about 30 years. Acid was apparently drained, the batteries rinsed, the fluids poured into dry wells.

Contamination

Sixty-four soil samples from the surface and subsurface identified lead contamination concentrated in the upper two feet across most of the site and down to eight feet below the surface in the dry wells. Elevated concentrations of VOCs, arsenic and lead have been reported in groundwater underlying the Battery Shop Yard.

Site Status

A RAP was prepared and approved for the former Battery Shop, and the remediation of the contaminated soil was completed in the spring of 1990. Remediation activities consisted of excavation and transport of contaminated soil to an off-site landfill. Soils were remediated to a lead level of 950 mg/kg. RCRA closure was certified in June of 1990, and a deed restriction recorded limiting future land uses to commercial development. Contaminated groundwater beneath the site will be combined into the overall groundwater remediation program and cleaned up at a future date most likely by pumping the water to the surface and treating it.

Sacramento Station

History

The Sacramento Station site encompasses approximately 40 acres in the southern portion of the RAMP Area and includes the existing Amtrak terminal. The eastern portion of the site was an active industrial area from the 1880s to the 1950s, during which time a foundry was located

along 6th Street. A passenger station has been located on this site since 1879. The remainder of the site has been used for light maintenance activities associated with passenger trains and as track areas for both passenger and freight trains.[19]

Contamination

Fifty-seven soil samples collected in 1989 identified two areas of soil requiring remediation: (1) an area containing elevated levels of metals, principally lead, arsenic, and copper; and, (2) an area with subsurface hydrocarbons and metals.[20] The metals area is located between the Former Foundry and the Former Battery Shop, and the soil in this area was contaminated with metals to a shallow depth of about 1 1/2 feet. The metals area was remediated in late 1990.

The hydrocarbon area is southeast of the Maintenance-of-Way Building, and has a layer of soil stained with diesel contamination approximately 10 feet below the current ground surface.

Metals-contaminated soil was also encountered in one sample about six feet deep adjacent to the hydrocarbon area. This is referred to as the "additional metals area" and the principal contaminants are lead and zinc. The hydrocarbon area and the additional metals area have not been remediated.[21]

As discussed in the section on Central Shops contamination, a large groundwater plume underlies much of the Sacramento Station. This plume is apparently the result of using degreasers and solvents in the Central Shops area. Numerous wells have been installed, including many in the Sacramento Station area, and investigations are in progress to assess the vertical and horizontal extent of the chemicals in groundwaters beneath the Central Shops, Sacramento Station, and off-site areas southeast of the Railyards Area. The principal contaminants in the southern groundwater plume are chlorinated VOCs, including TCE, PCE, 1,1-DCA, 1,1-DCE, 1,1,1-TCA, and vinyl chloride. Several semi-VOCs, including naphthalenes, dibenzofuran and fluorene, have also been detected in one well,[22] while concentrations of lead, arsenic, and cadmium (exceeding drinking water standards) have been identified in several wells.[23,24]

Site Status

A "fast track" RI/FS was conducted between January and April 1989 to facilitate the anticipated sale of the Sacramento Station. The metals area was remediated in late 1990 by excavating about 5,000 tons of soil, disposing it in a Class I landfill, and backfilling the area with clean soil. The area was cleaned up to a lead level of 950 mg/kg. The RAP, signed in December of 1989, specified that the soils containing hydrocarbons would either be moved to an on-site land treatment facility for treatment by biodegradation, shipped to Utah to be recycled as asphalt road pavement, or remediated through soil vapor extraction. Contaminated groundwater will be incorporated into the overall groundwater remediation program. Remediation of this ground water will occur at a future date, most likely by pumping the contaminated water to the surface and treating it. Approval of the closure certification by DTSC is expected, pending full excavation of the identified hydrocarbons.

Former Locomotive Gritblast Piles ("Sand Piles")

History

Sandblasting waste, generated from locomotive paint removal operations, was stored between 1976 and 1987 in the southwestern portion of the facility, north of the Grit Blast and Painting Facility, between the railroad track spurs that serviced the facility. The piles were predominantly silica and black waste slag.

Contamination

Several phases of soil investigation were conducted at the Sand Piles from 1986 through 1988 to evaluate metals contamination in the gritblast waste and underlying soil. Concentrations of total and soluble copper, lead, and zinc exceeded the Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC) in an isolated 27-acre portion of the pile labeled as the "hot spot." Total copper exceeded the TTLC throughout the pile. Table 4.13-6, identifies the TTLC and STLC for these and other hazardous materials.

Site Status

The RAP for remediation of the gritblast piles was approved in 1989, and the gritblast material was removed that same year. The "hot spot" material was excavated and sent to a Class I disposal facility. The remaining material was separated into recyclable sand, construction rubble, and non-recyclable hazardous waste. The recyclable sand was used to produce asphalt and the remainder of the material was sent to Class I or III landfills. RCRA closure was certified for the site. No deed restriction was recorded.

Car Shop 9

History

Car Shop 9 was located in the east-central part of the Railyards Area, and was used as a facility for the building, repair and painting of railroad cars from about 1915 to 1980. The shops were dismantled in 1988. Limited characterization of this area was conducted during the 1989 Phase I Investigation.

Contamination

Thirty-one soil samples were taken during the Phase I investigation from 13 borings ranging in depth from six to 32 feet and analyzed for metals, VOCs, and semi-VOCs. Additional soil samples were collected from the one and four foot depths during the reconnaissance testing study and analyzed for lead and soil gas.[25] Lead is the most common chemical of concern in this area, although some elevated concentrations of select VOCs and semi-VOCs are also present. Concentrations of lead in excess of the TTLC have been detected in surface soils at the former car sandblast area, in the vicinity of the former painting sheds in the northeastern and southern

TABLE 4.13-6
TOTAL THRESHOLD LIMIT CONCENTRATIONS AND SOLUBLE THRESHOLD LIMIT CONCENTRATIONS FOR VARIOUS HAZARDOUS MATERIALS

Material[1]	Total Threshold Limit Concentration (TTLC) (mg/kg)	Soluble Threshold Limit Concentration (STLC) (mg/l)
Antimony	500	15
Arsenic	500	5
Asbestos	1	-
Barium	10,000	100
Beryllium	75	0.75
Cadmium	100	1
Chromium (VI)	500	5
Chromium (III)	2,500	560
Cobalt	8,000	80
Copper	2,500	25
Fluoride Salts	18,000	180
Lead	1,000	5
Mercury	20	0.2
Molybdenum	3,500	350
Nickel	2,000	20
Selenium	100	1
Silver	500	5
Thallium	700	7
Vanadium	2,400	24
Zinc	5,000	250

[1] and/or compounds

SOURCE: CCR Title 26, Section 22-66699

portion of the Car Shop 9 area, and in the southeastern portion of the area outside of known areas of industrial activity.[26] Elevated levels of zinc and chromium have been identified in some soil samples. Phthalates and PAHs have been detected at high concentrations at most of these locations in surface soil. Among the VOCs, acetone is primarily distributed in the soil below five feet. Isolated occurrences of other VOCs have been reported typically below five feet, including PCE, methylene chloride, 2-butanone, toluene and ethylbenzene. Many of the high solvent concentrations occur in the vicinity of a former waste solvent tank that apparently leaked. Petroleum hydrocarbons have only been detected at one site near the former paint/solvent tank.[27]

In groundwater, concentrations of selenium, chromium and lead exceed drinking water standards at several locations. Bis(2-ethylhexyl)phthalate (a semi-VOC) has been detected at low concentrations in most wells. Naphthalene has been detected in one well close to the former paint/solvent tank area. VOCs have not been detected in groundwaters.[28]

Site Status

Excavation and treatment or disposal, chemical fixation, or capping can be used to remediate metals contamination. Removal and disposal, or soil vapor extraction can be used to treat VOC and semi-VOCs contamination in the soil. Groundwater can be remediated by pumping the contaminated water to the surface and treating it. A final RAP is expected to be issued in March of 1997. Soil clean-up is expected to be completed by 1999.

Pond and Ditch/Former API Separator

History

The former Pond and Ditch Area is located in the northern part of the Railyards Area and covers an area of approximately 7,200 square feet. The area consisted of an API separator, which removed oil from industrial waters, two unlined ponds, which stored the API-treated wastes, and an unlined ditch, which carried wastewaters from the pond to the City of Sacramento sanitary sewer. The facility was used from the 1950s through 1984.

Contamination

This area has been under investigation since 1984. Chemicals found in the soil included VOCs, semi-VOCs, and metals. Metals were generally found close to the surface down to five feet, while VOCs exist down to and below the groundwater table (as deep as 25 to 30 feet below the surface).

Toluene was identified as the most common organic contaminant in the soil underlying the site. PCE, TCE, 1,1-DCA, xylene, and benzene were found in 17 to 31 percent of the borings. Several other VOCs were identified, and in general were more prevalent in the pond area. Some semi-VOCs, principally PAHs, were also detected. Lead exceeded the TTLC in about 6 percent of the soil samples and was most prevalent in the ditch area.[29]

Eighteen groundwater wells were installed in the area to characterize a 2,000-foot-long and 250- to 550-foot-wide contaminated plume centered beneath the pond and ditch in the shallow sand

aquifer. A somewhat smaller contaminated plume is also present in the underlying gravel unit. Groundwaters have been shown to contain organic compounds similar to those detected in the soil. The most widespread VOCs are 1,1-DCA, 1,1,1-TCA, and vinyl chloride. With the exception of nickel, metals have generally not migrated into the groundwater. Some samples identified concentrations of lead, cadmium, chromium, and arsenic, that exceeded drinking water standards.[30]

Site Status

The original RAP/CP was approved in June 1989, and subsequently modified and approved in August 1989. The Modified Final RAP/CP required excavation and disposal of the API Separator debris and contaminated soil at a licensed Class I landfill, and the extraction of contaminated groundwater using five wells with conveyance of contaminated waters to the Sacramento municipal waste treatment plant.[31] Demolition and removal of the API Separator debris has been completed, and all contaminated soil in the area has been excavated and removed of in accordance with the modified Final RAP/CP, and confirmation sampling has been completed. The ditch has been backfilled and closed. The other areas will be backfilled and closure is expected in 1992. A deed restriction is proposed for the Pond and Ditch/Former API Separator site. VOCs encountered at the bottom of the pond were removed by in-place mechanical aeration. Soil was remediated to a lead level of 950 mg/kg.[32] Groundwater extraction wells and an above ground conveyance system have been installed. Remediation is expected to begin when a final agreement is reached on the ultimate disposition of extracted groundwaters.

Industrial Wastewater Lagoons

History

The Lagoon Study Area consists of approximately 34 acres within the northern and eastern portion of the Railyards Area. The Lagoon Study Area includes the industrial wastewater lagoon, north berm, former bulk oil storage area, and the API separator overflow area. In the overflow area, sludge and water were occasionally pumped from sewer access holes in the Central Shops onto the ground. Unlike most of the Railyards Area, few industrial operations occurred in the Lagoon area. Known areas of concern include the former fuel oil storage tank, the former API separator overflow area, and the former wastewater lagoon. The lagoon was constructed during or just after World War II. The surface extent of liquids in the lagoon varied over time. The bunker crude oil tank was removed in the 1950s, but contamination remains.

Contamination

Four investigations were conducted in the area between 1983 and 1991. These investigations indicated locally elevated concentrations of VOCs, semi-VOCs, TPHs, and metals in the soil and groundwater underlying the site. In the vicinity of the former oil storage tank, high concentrations of PAHs (such as fluorene and chrysene) and TPHs were identified in the soil. Lower amounts of nonchlorinated VOCs, principally toluene, benzene, and xylene, were also identified. In the lagoon area, VOCs were detected in most soil samples, and included acetone, toluene, and PCE. Elevated levels of TPHs are known to be present in the overflow area.

Metals are typically below TTLCs in the lagoon; however, one sample contained elevated levels of antimony and lead. An isolated area of soil contamination was located between the former oil storage tank and the lagoon north of the former pond. The soil in this area was identified as containing lead levels in excess of the TTLC, as well as elevated VOCs.

Groundwater is poorly characterized at the present time. Contamination appears to be localized and is predominately the chlorinated VOCs 1,1-DCA, 1,2-DCE, and vinyl chloride. Concentrations of arsenic, lead, cadmium and nickel have been identified as locally exceeding drinking water standards.[33]

Site Status

The Lagoon Study Area investigation is being conducted to comply with requirements in the June 1988 Enforceable Agreement between SPTCo and DTSC. Soil remediation techniques could include excavation and treatment or disposal, soil vapor extraction, or bioremediation in place. Groundwater remediation could include extraction and treatment. Interim soil cleanup is expected to be completed in 1995. A final RAP should be issued in that same year.

Former Waste Disposal Site

History

This approximately 3-acre area in the northern part of the Railyards Area was used as a waste dump for an unknown period of time. Nine trenches, four to five feet deep, contained waste materials three to five feet thick, consisting of wood, brick, metal, charcoal, and ceramics. This site has not been completely characterized. Additional characterization is scheduled to begin in late 1992 as part of the investigation of the Northern Shops Planning Area.

Contamination

Sixteen soil samples were collected from nine trenches and analyzed during the Phase I investigation. Concentrations of lead in all the soil samples and zinc in most of the soil samples exceeded TTLCs. Antimony and mercury also exceed TTLCs in the southwest corner of this site. Toluene and PCE are the most widespread VOCs identified in area soils. No semi-VOCs were identified. Nothing is known about potential groundwater contamination beneath the site.

Site Status

Additional investigations will be necessary to determine appropriate remediation methods. Potential methods may include excavation and disposal of contaminated soil and soil vapor extraction.

Former Drum Storage Area

History

The former drum storage area is located north of the Central Shops area. This 250-by-150-foot area is unpaved and was used to store drums formerly containing solvents, oils, and other industrial fluids. Empty drums were steam cleaned and drained onto the unpaved surface.

Contamination

Five separate investigations have been conducted in the area resulting in the collection of numerous soil samples from 30 soil borings, and the installation of 13 groundwater monitoring wells. The area is well characterized, and the chemicals identified in the soil and groundwater include VOCs, and lower concentrations of semi-VOCs, TPHs, oil and grease, and metals. The highest VOC concentrations in soil are found in the upper five feet in the vicinity of the upper sand/clay contact zone, which apparently retarded the downward migration of contaminants. The principal VOCs found in the soil are 1,1-DCA, 1,2-DCE, PCE, TCE, 1,1,1-TCA, toluene, and acetone. PAHs were detected in one soil sample from a depth of six feet. Concentrations of TPHs are generally low throughout the area except in shallow soils in the southwestern corner of the area. Lead was found in several soil samples at concentrations above the associated TTLC.

VOCs are widespread in the groundwater, and include the same chemicals as those identified in area soils. Phthalates and TPHs have been detected in two wells each. Metal concentrations are less than drinking water standards, except in one well in which nickel concentrations are greater.

Site Status

This area has been under investigation as part of a Stipulated Judgment between SPTCo and DTSC since 1988. In early 1990 the top two feet of soil containing metals and VOCs were removed and disposed at a Class I landfill. The draft RAP indicates that cleanup will occur in two phases. First, sand and a portion of the clay layer will be treated by soil vapor extraction. If the clay layer is not successfully remediated, the clay will be excavated and aerated. Groundwater will be remediated by extracting it and disposing of it in the City sanitary sewer system. The final RAP is expected to be completed in mid-1992.

Parking Lot Area

History

Samples collected in the parking lot area, west of the Southern Pacific laboratory in the Northern Shops, suggest that this area may have been used for waste disposal at some point in the past.

Contamination

All surface soil samples from the area contain lead concentrations that exceed the TTLC. Levels of mercury in one sample were also found to exceed the TTLC. Toluene, 2-butanone, acetone

and PAHs were elevated in one soil sample. Concentrations of arsenic and cadmium in groundwater exceeded drinking water standards in one well. Additional investigation is needed to determine the nature and extent of contamination. Further site characterization is scheduled to begin in this area late in 1992.

Site Status

Soil remediation may include excavation and disposal of contaminated soil or biodegradation in place. Groundwater remediation may include pumping the contaminated water to the surface for treatment.

Former Spring Shop and Brass Foundry

History

These shops were originally located in the Central Shops area, but were moved to the northwest part of the Railyards Area in 1915.[34] Railroad car springs and brass parts were manufactured in these buildings.

Contamination

Soil borings collected during the Phase I investigation indicated elevated metal concentrations at depths ranging from two to five feet below the surface. In two of the samples collected, lead, copper and antimony exceeded their TTLCs, and zinc was just below its TTLC. Additional samples were collected from the one- and four-foot depths and analyzed for lead during the 1991 Reconnaissance Testing Program (see below). Lead in excess of the TTLC was present in 10 samples collected in the vicinity of the former Spring Shop and Brass Foundry. Nickel levels in excess of drinking water standards have been reported in two wells in the area. Further investigation of the Northern Shops Area (where this area is located) is scheduled to begin in late 1992.

Site Status

Additional investigation will determine the appropriate remediation process, which may include chemical fixation or landfill disposal of any contaminated soils, and the possible extraction and treatment of any contaminated groundwater.

Other Areas

History

Other portions of the Railyards Area may also be contaminated. These areas include the proposed 7th Street Corridor and portions of the proposed Intermodal Transit Station and the Residential and Open Space Study Area in the northern portion of the Railyards.

Contamination

In 1991, at the City's request, a reconnaissance study was conducted to investigate these other areas. Samples were collected on a 100-foot grid over a 92-acre area. Soil samples were collected from one- and four-foot depths and were analyzed for lead. Soil gas was screened for VOCs at four feet, and about 10 percent of the samples were analyzed for individual VOCs. This study indicates that lead levels range from 174 to 1,000 mg/kg over about 35 percent of the Planning Area, and that concentrations exceed the TTLC of 1,000 mg/kg in about 20 percent of the Planning Area. VOCs were detected in soil gas at several places along the Seventh Street Corridor and at a few scattered locations elsewhere. Further investigation is necessary to adequately characterize contamination in these other areas.

Site Status

As discussed above, additional investigations are required before remediation can be accurately determined. Soil contaminated with lead could possibly be placed in contained areas without treatment and capped fixed in place, or excavated and removed to a Class I landfill, or recycled. Soil contaminated with VOCs would probably be remediated by soil vapor extraction.

Closure Certification

To date, only the Sand Pile site and Battery Shop Yard have received final certification of "closure" by DTSC. Three other soil clean-up sites are nearing completion. The Sacramento Station and the Pond and Ditch/Former API Separator sites have approved final RAPs and closure plans. A final RAP and closure plan for the Former Drum Storage Area is pending. The status of site cleanup is presented in Table 4.13-7.

Following remediation the environmental regulatory agency (in this case DTSC) certifies that the site is "closed" for purposes of further cleanup of contamination that was identified during site investigation. Closure certification, under RCRA and CERCLA, means that DTSC issues a letter stating that the soil remediation has been completed to the agency's satisfaction. Following closure, DTSC

will issue a post-closure permit covering all four RCRA sites located in the Railyards Area. The post-closure permit will provide for periodic inspection, monitoring, and review of deed restrictions.

Closure certification does not necessarily mean that all of the contamination has been completely removed. If contaminants at levels above the naturally occurring "background levels" are left in place, DTSC may choose to restrict the land uses that may be developed on a site according to the health risk posed by the chemical constituents left in place. Thus, based on the levels of contamination present in the soil and the probability of human exposure to those contaminants, some sites may be deemed suitable only for commercial or industrial type uses and unsuitable for more sensitive uses, such as single-family residential or open space. For such sites, DTSC records a land use ("deed") restriction, which specifies the limitations on-site development.

TABLE 4.13-7
CURRENT STATUS OF RAILYARDS AREA SITE CLEAN-UP

Site	Remediation Status
Sand (Grit Blast) Piles	RCRA closure certified. No deed restriction recorded.
Battery Storage Yard	RCRA closure certified. Deed restriction recorded.
Pond and Ditch/Former API Separator	RCRA closure certification expected in 1992. Approved final RAP. Deed restriction proposed.
Sacramento Station	Awaiting closure certification. Approved final RAP. Deed restriction proposed.
Former Drum Storage Area	Awaiting RCRA closure certification. RAP and closure plan expected to be finalized in 1992. Deed restriction proposed.
Central Shops	Investigation in progress.
South Plume	Investigation in progress.
Lagoons	Investigation in progress.

SOURCE: DTSC; EIP Associates, 1992.

In the Railyards Area, cleanup to date has not been to background levels. Instead, DTSC has determined acceptable levels of chemicals that may be left in place. For more sensitive land uses where the possibility exists for human contact with soil (which DTSC believes would include single-family residential, educational and open space land uses), DTSC has set a lead cleanup level of 174 mg/kg, which is the level deemed acceptable for childhood exposure. For land uses where no to little possibility exists for human contact with soil (which DTSC believes would include commercial and industrial land uses), DTSC has set a lead cleanup level of 3,000 mg/kg, which is an acceptable level for the greatest expected adult exposure (construction workers). In industrial and commercial areas, Southern Pacific has voluntarily cleaned up to the more protective level of 950 mg/kg to avoid a "hazardous waste" designation of remaining soils and associated soil disposal problems for future construction on the site. A deed restriction has been recorded for the Battery Shop Yard, which was cleaned up to a lead in soil level of 950 mg/kg. Deed restrictions are planned for the Pond and Ditch/Former API Separator, portions of the Sacramento Station site and the Drum Storage Area.

Closure certification also does not mean that groundwater cleanup, if required, is complete. Since groundwater can take years to remediate, DTSC will continue to monitor groundwater cleanup

by means of periodic inspections and post-closure permits that require testing, reporting, and financial assurances that long-term clean-up will be completed.

The Railyards Area is listed as a state "superfund" site under the provisions of the state Hazardous Substances Clean-up Fund. Cleanup of the majority of the site is subject only to state law. However, four small areas of the site, including the Sand Piles Site, Battery Shop Yard, Pond and Ditch/Former API Separator, and the Drum Storage Area, are subject to federal law (under RCRA) in addition to state law because they were used for hazardous waste treatment, storage, or disposal after November 19, 1980.

Site Cleanup Priorities

DTSC has established cleanup priorities based on the apparent degree of environmental risk posed by different areas of the site. DTSC's priorities for cleanup of these areas is as follows:

1. Central Shops.
2. Off-Site Groundwater: groundwater plume emanating from the Central Shops area.
3. Industrial Wastewater Lagoons, including northern groundwater plume.
4. Parking Lot.
5. Northern Shops.
6. Former Disposal Site: old landfill located in the Northern Shops area.
7. Car Shop 9.

As a result of DTSC priorities and the pace of investigation and remediation, most of the investigation, and all of the remediation on the site is concentrated in a few areas, so large areas remain primarily unexplored. The proposed schedule for remediation of the remainder of the site is shown in Table 4.13-8. The schedules depicted in Table 4.13-8 call for investigation and remediation in the future, but the information from this effort will not be available before adoption of one of the Alternatives. Accordingly, at the City's request, Southern Pacific undertook additional reconnaissance level sampling (as previously discussed). This reconnaissance testing was designed to present a "snapshot" of toxics issues posed throughout the rest of the site.

Overview of the Richards Area

Like many older areas of the City where industrial activities have taken place, the presence of contamination is suspected in the Richards Area, but the nature and extent of this contamination is presently unknown. The RBAP proposes the development of residential and higher density

TABLE 4.13-8
PROPOSED SCHEDULE FOR REMEDIATION OF THE REMAINDER OF THE RAILYARDS AREA

Contaminated Site	Remediation Status	Expected Completion Date
Central Shops	Interim remediation to control source of the southern groundwater plume	Late 1992 to early 1993
Central Shops	Final RAP	May 1995
Central Shops	Soil clean-up	1996 or 1997
Lagoons	Soil clean-up (interim remediation)	First quarter of 1995
Lagoons	Final RAP	October 1995
7th Street Corridor	Final RAP	April 1996
Southern Plume	Final RAP	May 1996
Northern Shops	Final RAP	June 1996
Car Shop 9	Final RAP	March 1997
7th Street Corridor	Soil clean-up	1997
Northern Shops	Soil clean-up	1997-1998
Car Shop 9	Soil clean-up	1998-1999

SOURCE: DTSC; EIP Associates, 1992.

mixed use development adjacent to industrial, warehousing and office uses. For properties that are likely to remain commercial, warehousing, or industrial, the presence of hazardous materials is unknown because investigation and possible remediation are not typically required unless a problem is suspected, a potential buyer or lender requires an inspection, or, in some instances, when a land use change is anticipated. Nevertheless, for properties that will be redeveloped for residential and mixed uses, it is important to provide for adequate remediation prior to habitation.

The following discussion describes current and historic land uses in the Richards Area, the types of contamination typically associated with those uses, the known extent of contamination, and identified remediation activities, based on the Draft Preliminary Environmental Assessment Phase I Hazardous Substance site investigation report prepared by ERM-West, Inc. This report, which presents a broad overview of potential sites contaminated with hazardous materials, is based on the following sources of information:

- review of existing reports;
- review of historical aerial photographs;
- identification of potential problem sites through review of listings developed by regulatory agencies;

- review of appropriate agency files for additional site-specific information; and
- a windshield survey/drive-by of the Planning Area to further characterize existing land uses and identify potential sites by locating soil staining, possible hazardous materials storage, and other visible indicators of potential contamination.

Area History

Historically, the Richards Area was used for agricultural production, a use that continued in some locations until the 1970s. Once adequate levees along the rivers were constructed in the earlier part of the century and the threat of chronic flooding was eliminated, much of the Richards Area developed into a warehousing and agricultural produce distribution center due to the area's easy access to rails and major roadways. Industrial uses were later established in the warehousing and distribution district. Interspersed throughout the Richards Area are small residential pockets, including the Basler/Dreher neighborhood and Dos Rios public housing complex.

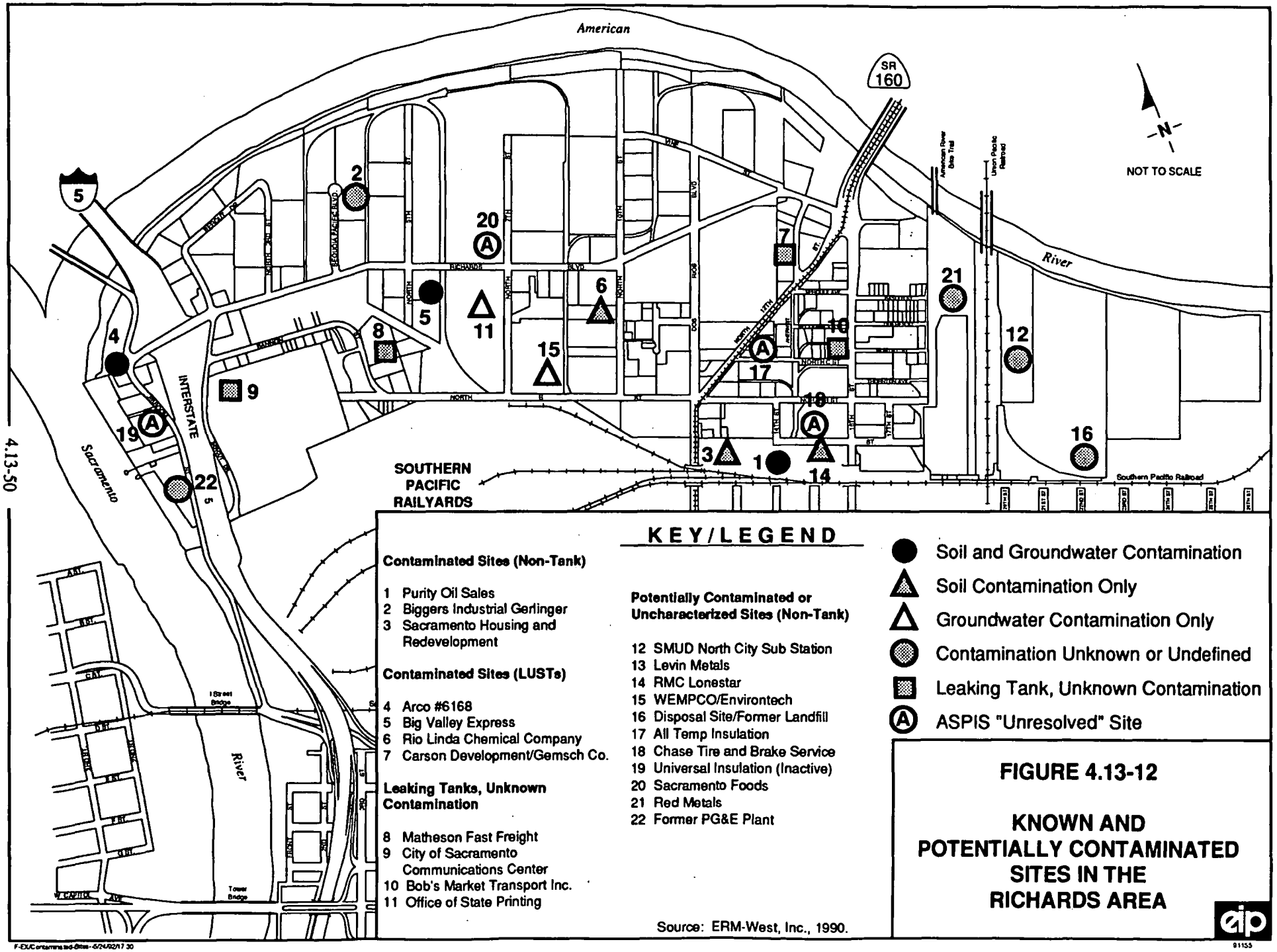
The central portion of the Richards Area retains many of the older warehousing and distribution uses, plus industrial uses such as food processing, the State printing plant, metal recycling and wrecking yards, junkyards, tank manufacture and recycling, metal production, and tire recapping. Newer, low-rise "back office" and commercial uses have developed north of Richards Boulevard along North 7th and North 10th Streets.

Highway commercial uses, including motels, restaurants, and automotive services, have developed near the I-5/Richards Boulevard Interchange. The area east of the Union Pacific Railroad tracks consists primarily of former or active municipal and private solid waste landfills. In addition, an almond shell processing plant, and sand and gravel mining operations are located in the eastern portion of the Planning Area.

Identified Contaminated and Potentially Contaminated Sites

As discussed above, the Richards Area has historically supported a variety of industrial uses. Other uses include wrecking yards, landfills, and automotive-related uses with underground tanks. Hazardous materials could be used and/or generated by such uses. For example, wrecking yards may contain old auto parts, which can generate heavy metals (including lead) and petroleum hydrocarbon contamination. Landfills are often associated with VOCs, semi-VOCs, landfill gas and leachate. Automotive-related uses often produce oil and grease, and underground petroleum hydrocarbon contamination. Industrial uses may be associated with a wide range of hazardous materials including those mentioned above.

The following discussion summarizes the information known about the 22 sites in the Richards Area that have been identified as contaminated, or that may be contaminated with elevated concentrations of chemicals in the soil and/or groundwater (see Figure 4.13-12), as identified in the ERM-West, Incorporated 1990 report, and updated for the purposes of this analysis. Some of these sites have undergone complete or partial remediation. In some cases, no remediation was required following the initial site investigation.[35]



Source: ERM-West, Inc., 1990.

FIGURE 4.13-12

KNOWN AND POTENTIALLY CONTAMINATED SITES IN THE RICHARDS AREA

Purity Oil Sales - A Street between 12th and 14th Streets

The Abandoned Sites Program Information System (ASPIS) database indicated that the Sacramento County Environmental Management Department (SCEMD) identified waste disposal on the site in 1984. Site screening was conducted in 1989 as part of a preacquisition site assessment pending sale of the property. The site assessment stated that Purity Oil used the site for oil processing from approximately 1960 to 1978. In August 1985, two large above-ground tanks and several drums of unknown content were removed from the property. During that time, a rectangular UST was removed from the property and the excavation pit has remained open. Oil and tar in the soil were observed down to 16 feet in the tank excavation.

Soil and groundwater was investigated in November 1989. Surface soil samples collected from the stockpiled soil and the excavation pit showed 2,200 to 70,000 ppm grease and oil. TPHs were detected at 220 to 6,700 ppm in the stockpiled soil. Soluble lead was found in one surface soil sample at 11 mg/l, which exceeds the STLC for hazardous waste. Subsurface soil samples were collected from 5 to 20 feet below the ground surface. Grease and oil were detected in subsurface soil samples at 35 to 110 ppm and toluene was found at 37 to 210 ppb. Groundwater samples showed up to 3.7 ppb vinyl chloride, 11 ppb dichloroethane, 1.5 ppb benzene and 61 ppm TPH. Groundwater is approximately 25 to 28 feet below the ground surface.

Biggers Industrial Gerlinger - 551 Sequoia Pacific Boulevard

The facility formerly operated as a plating shop, and is identified on both the ASPIS and Cortese lists. A complaint was filed with the DTSC in January 1988, alleging that drums were being emptied at the railroad tracks behind the facility. The DTSC inspected the facility shortly thereafter. In March 1988, the plant was cited for unauthorized disposal of hazardous waste (including waste motor oil, waste hot tank fluid, and sludge) and unauthorized discharge of waste containing chrome into the sanitary sewer, onto the ground, and possibly into the storm drain.

Soil samples collected near the storm drain showed elevated concentrations of chromium (950 ppm) and lead (617 ppm). In January 1989, the DTSC requested that Biggers submit a Preliminary Endangerment Assessment, which identifies the magnitude and extent of contamination to determine the threat to human health and the environment. The ASPIS database indicated that waste removal was completed in 1989; however, cleanup near the drain was not conducted.

Sacramento Housing and Redevelopment SHRA Temporary Housing Shelter - 12th and A Streets

This site is located just west of the Purity Oil site and just north of the Railyards Area. The CVRWQCB investigated the risk of placing temporary housing on this site, and determined that there would be no significant hazards as long as no grading or excavation took place.

Grease and oil have been identified in surface soil samples at the southern boundary of the property at 80 to 220 ppm. Subsurface soil samples taken at 15 to 25 feet below the ground surface showed grease and oil at 20 to 100 ppm and toluene at 60 to 200 ppb. No petroleum constituents were identified in the groundwater.

The Sacramento Housing and Redevelopment Agency has plans to remediate this site, but neither City nor CVRWQCB files contain an update as to its current status.

Arco #6168 - 222 Jibboom Street

The SCEMD Master List indicated that Arco has three permitted USTs. The CVRWQCB file for this site indicated that in April 1989 soil contamination (5,600 and 150 ppm TPH) was found in three soil borings installed near these USTs. The tanks were removed in July 1989 and additional soil sampling in the excavation pit detected TPHs at 76 and 83 ppm. Four groundwater monitoring wells were installed at the site in October 1989. Groundwater analyses detected 0.12 ppm TPH, 0.013 ppm of benzene, 0.0018 ppm of ethylbenzene, 0.0065 of toluene and 0.0082 ppm of xylenes. Increasing levels of these constituents have been identified and off-site sources are suspected. ARCO, as of February 1992, is awaiting permission to place wells on adjacent properties to determine if an off-site source is present.

Big Valley Express - 500 Richards Boulevard

In March 1988, the CVRWQCB conducted a routine inspection of the freight transportation facility, and discovered an illegal discharge to the American River, caused by material spillage during petroleum dispensing activities. The discharge had migrated to the storm drain. Big Valley Express was given the option of continuing fuel dispensing operations and developing a spill containment and tank testing program, or closing the tanks.

A SCEMD letter dated December 19, 1988, indicated soil and groundwater contamination had been identified, apparently due to leakage from the vent pipes of two 10,000-gallon USTs. In February 1989, three groundwater monitoring wells were installed, and soil contamination was discovered during removal of the two tanks was as high as 3,400 mg/kg gasoline, and 860 mg/kg diesel. Water samples taken detected TPH as high as 886 ppm. It was proposed that 250 cubic yards of soil bioremediated.

In October 1989, the CVRWQCB requested that additional wells be installed to further define the plume. Monitoring results showed gasoline at 4.7 mg/l, benzene (700 ug/l), ethylbenzene (160 ug/l), toluene (17 ug/l), and total xylenes at 410 ug/l. As of March 1990, additional wells were installed and sampled. Levels of the identified contaminants have decreased, but not below state action levels.

Rio Linda Chemical Company - 410 North 10th Street

The SCEMD tank file for this site indicated that one 1,000-gallon gasoline, one 1,000-gallon diesel, and one 20-gallon bulk oil USTs were removed from this site. Diesel fuel contamination was discovered upon removal. Soil analyses showed levels of TPH from 69.2 to 128.8 ppm. Benzene, toluene, and ethylbenzene were not detected. The soil was excavated, sampled and aerated. In January 1987, the fill showed that the City had approved the backfill of the excavation as long as a small bit of the affected soil was removed and aerated on the site.

Carson Development/Gemsch Co. - 520 North 12th Street

The CVRWQCB file reviewed identified an UST leak report filed in September 4, 1990. Subsurface monitoring conducted during removal of a 10,000-gallon gasoline UST indicated contamination; however, the file did not include information on contaminant concentration or extent. The report indicated cleanup via excavation and treatment was in progress.

Matheson Fast Freight - 401 Bannon Street

This site was identified as a leaking tank site on the state Cortese list and by the SCEMD and the CVRWQCB. The SCEMD file indicated that the facility has two permitted USTs. In December 1990, the CVRWQCB determined that there was no known groundwater contamination associated with the site; however, no further information was provided regarding the investigation itself.

City of Sacramento Communications Center - 111 Bercut Drive

The CVRWQCB file included an UST leak report filed May 12, 1987 which did not identify any groundwater contamination. During tank testing of a 4,000-gallon diesel tank, a leak in the product line was discovered. No further information was available in the file. This site is also indicated on the SCEMD Master List as having a permitted tank.

Bob's Market Transport Inc., Chant Associates/Petro-Speed - 324 North 16th Street

This site is listed on the state Cortese List as Petro-Speed, on the CVRWQCB list as Chant Associates, and on the SCEMD list as Bob's Market Transport. According to SCEMD files, the facility currently has three permitted 10,000-gallon USTs, one containing gasoline and two containing diesel. The tanks have been tested, and are monitored to identify any leaks.

The CVRWQCB file documented that a leak was discovered during removal of two USTs, one containing waste oil and the other containing unleaded gas. An UST leak report was filed February 22, 1988. The County approved the removal and transportation of the affected soil to a Class I landfill, with the backfilling of the excavated area. The CVRWQCB file did not identify the extent of the contamination.

Office of State Printing - 344 North 7th Street

The DTSC file for this site indicated that an inspection was performed on April 12, 1988. The inspection report cited improper storage of drums (labeled hydraulic oil, paper softener and 1,1,1-TCE) near a storm drain; and unlabeled drums containing oily waste, some leaking and/or damaged. An April 1988 letter from the State Printing Office stated that they intended to have these drums removed.

In June 1987, water from the storm drain outfall into the American River was found to have 9.2 ppb of vinyl chloride, 1.4 ppb of chloroform and 1.3 ppb of 1,1,1-TCE. Nearby water supply wells were found to have 3.8 ppb of vinyl chloride and 1.0 ppb of 1,1,1-TCE. The CVRWQCB issued an NPDES discharge permit for this site in 1987.

The SCEMD file for this site indicated that the State Printing Office maintains four USTs on the site. There are two 15,000-gallon #6 fuel oil tanks, one 2,000-gallon double-walled alcohol tank, and one 15,000-gallon naphtha tank. In January 1989, one of the fuel oil tanks failed precision testing due to a piping failure. A bid request was filed for repair of the piping in February 1989 and no further documentation was present in the SCEMD file. According to information obtained from a CVRWQCB memo dated January 29, 1987, the 15,000-gallon #6 oil tank was leaking at a rate of two gallons per hour. A letter from the SCEMD, dated October 25, 1988, stated that remedial actions were complete and that no further investigations are necessary.

SMUD North City Substation - 20th and North B Streets

The ASPIS database and DTSC file for the site indicated that the City of Sacramento used the site for waste disposal. Approximately 8,000 gallons of transformer oil was drained on the site in 1967. In 1984, SMUD collected 28 soil samples at zero to six-feet deep for PCB analyses and found PCB levels ranging from 0.8 to 1.0 ppm. SMUD then prepared a PCB Cleanup Plan for 10 of its substation-sites. The plan established a sampling and remediation methodology to be used at all their substations, and established a cleanup goal of 10 ppm of PCBs. Soil samples were taken at the North City site again in 1986 and these showed no PCB concentrations above 10 ppm, so no cleanup was performed.

The DTSC file indicated that the agency conducted a site inspection in February 1990, and questioned whether the soil samples previously taken were collected in locations where transformers were drained. The DTSC file identified the need for a risk assessment to determine a cleanup level.

Levin Metals - 130 North 12th Street

The DTSC file showed that Levin Metals buys, processes, and recycles approximately 7,500 tons of ferrous and non-ferrous metals on a monthly basis. The DTSC inspected the site in May 1981, finding oily waste seeping onto the ground from engines and other machinery stored prior to processing. Sampling of this residue revealed elevated levels of chromium, copper, nickel, lead, and zinc. PCBs were not detected above 10 ppm. Analyses did not include solvents or organic compounds. A 2,500 gallon UST was removed from the site in March of 1986. The ASPIS database indicated that DTSC ranks this site as a high priority, but little additional information is provided. To date, no remediation or further investigations have been conducted at this site.

RMC Lonestar - A Street between 14th and 16th Streets

The Lonestar facility is a former concrete mixing plant located adjacent to and east of the Purity Oil site. The SCEMD file for this site indicated that a 10,000-gallon diesel tank was removed in June 1989. No noticeable signs of contamination were identified.

Groundwater and surface and subsurface soil samples were collected in November 1989 as part of a previous investigation. Virtually all surface and subsurface soil samples had levels of grease and oil ranging from 16 to 680 ppm, and toluene from 14 to 200 ppb. Most subsurface samples

were taken from 15 to 20 feet below the ground surface. Of the five groundwater monitoring wells at the Lonestar site, only one, located at a fueling island showed diesel at 0.34 ppm.

WEMPCO/Environtech - 721 North B Street

This site is owned by the City of Sacramento, and is located across from the State Printing Office on 7th Street. The DTSC file identified facility manufactures pumps, mineral flotation steel tanks, and oil/water separator tanks for industrial uses.

The DTSC conducted a site inspection in January 1983. An inventory of hazardous chemicals conducted during this inspection included paints, solvents, oil, toluene, ethylene glycol, 1,1,1-trichloroethane, and methylene chloroform. Four 55-gallon drums of 1,1,1-trichloroethane and eight 55-gallon drums of paint sludge were identified as having been stored in excess of the 90-day hazardous waste storage limit without a permit or variance. WEMPCO requested a variance from hazardous waste storage requirements, reporting that the quantity of hazardous waste the facility generates is between 100 and 1,000 kg/month. A 1985 letter to the EPA indicated that the DTSC was referring the site for possible federal enforcement action.

Solvents are used extensively on the site. WEMPCO has monitored the groundwater for potential contaminants, and has notified the CVRWQCB that groundwater beneath the site may contain chemicals at above background levels. The CVRWQCB may require further investigation, and regulatory involvement is likely.

The WEMPCO site is also occupied by an abandoned city municipal garbage incinerator. A landfill was encountered while installing a well at a nearby site (Consolidated Products, 851 Richards Boulevard). This landfill was used for rubbish disposal before the incinerator was built, therefore it is possible that the landfill may contain incinerator ash and associated metals, although there is no documentation on the actual location of an incinerator ash disposal site. The ASPIS database reports that DTSC ranks this site as a high priority.

All Temp Insulation - North C Street between 12th and 16th Streets

The ASPIS database indicated that the facility generates hazardous waste, consisting of an aqueous solution containing metals. It is unclear whether disposal of this waste occurred of on the site. The DTSC designated site screening as a high priority for this site in July 1990. The DTSC did not have a file on this site. The RCRA database indicated that this facility is a licensed hazardous waste transporter.

Chase Tire and Brake Service - 100 North 16th Street

The ASPIS database indicated that this facility generates waste and rubber dust from recapping tires. The DTSC apparently has not conducted a site investigation, nor does the agency have a file on the site. The ASPIS database indicated that as of May 1981, the status of the site was "unresolved" and that further investigation is necessary to determine the presence of contamination.

Universal Insulation - 208 Jibboom Street

The ASPIS database indicated that Universal Insulation was an inactive site. The DTSC database reported that the status of the site is unresolved. No further information was available from the regulatory agencies consulted.

Sacramento Foods - 424 North 7th Street

The ASPIS database indicated that the site was operated by T.H. Richards Processing Company. A DTSC questionnaire completed by this company in 1981 indicated that the facility had discharged diluted sodium hydroxide to the City sewer for 30 years. The status of the site is unresolved and DTSC does not have a file on the site.

This facility is also occupied by the Sierra Fruit Company cannery facility. The Sierra Fruit Company is listed on the RCRA database as a hazardous waste generator. The DTSC file for this site indicated that a complaint was filed in April 1988, stating employees were instructed to remove asbestos pipe lagging, and that the material was scattered about the work area. In April of 1988, asbestos abatement and encapsulation procedures were conducted. All hazardous materials identified during a site audit were removed from the site under the appropriate manifest procedures.

Seven USTs were removed from the facility in April of 1990. Contaminated soil and groundwater was identified at this time. Constituents included TPH, benzene, toluene, xylene, and ethylbenzene. The extent of the contamination is monitored on a quarterly basis. Remediation is currently being conducted with soil vapor extraction and groundwater pumping.

Red Metals - Basler Road

Red Metals is a metal recycler located at the end of Basler Road. The facility stored hydraulic fluid and metal shavings in drums on the site. Sampling by the DTSC did not identify hazardous wastes, and no further investigations have occurred.

Former PG&E Plant - Jibboom Street south of Richards Boulevard

The former PG&E plant site is located adjacent to and north of the Jibboom Street Junkyard. Soil samples were collected at the site in 1981 as part of the Jibboom Junkyard investigation. Samples collected in the vicinity of three above-ground tanks showed arsenic and lead at 130 and 231 ppm, respectively. A February 1987 letter from PG&E, included in the DTSC file for this site, indicated that contaminants such as PAHs, lead, arsenic, mercury, and cyanide may be present. To date, the DTSC has not required further investigation at this site.

The CVRWQCB file indicated that a small underground tank was removed in August 1988. A small amount of residual bunker fuel spilled onto the soil in the excavation during the tank removal; however, no further action regarding this incident was required. The Department of Water Resources purchased the site in 1988. In December of 1989 two bunker oil storage tanks were removed along with contaminated soil and concrete. Asbestos fuel oil and heavy metals have been identified in the PG&E building itself.

Sacramento City Landfill - 23rd east to Business 80

The City landfill, excluding the current landfill area (28th Street east to Business 80), has been used as a City and public dump. The properties were originally under private and public ownership. However, the private properties were purchased by the City in 1949. Undocumented public dumping occurred throughout the site prior to this date. The site was closed to the public in 1959 and the City ceased active landfill activities in 1973. From 1949 to 1959, it is estimated that 2,900,000 tons of waste were burned or buried at this site.

The currently active portion of the landfill (28th Street east to Business 80) is lined and dewatered, and receives approximately 945 tons per day of municipal, garden and construction waste. Closure is expected in a year or two, but no specific date has been set.

The northeastern and east-central portions of the site were filled with residential and commercial garbage and street cleaning material. Refuse was burned daily until 1959. The western portion of the site was used for burial of municipal, street and public waste. The fill material is estimated to be approximately 21 feet in depth.

In June 1981, the DTSC inspected the landfill and found no evidence of hazardous waste. A CVRWQCB-designed groundwater monitoring program (occurring in January 1985) required the installation of six monitoring wells, which identified a significant increase in chloride ion concentration, indicating that compounds may be leaching into the groundwater. The CVRWQCB indicated that a mitigation and contingency plan, as well as a groundwater sampling plan would be required. Groundwater samples collected in February 1985 detected vinyl chloride (0 to 26 ppb), tetrahydrofuran (38 to 206 ppb), and benzene (0 to 26 ppb). In March 1985, water samples taken at the bank of the American River, adjacent to the landfill, showed 0.5 to 2.0 ppb trichloroethylene. Currently, groundwater beneath both the active and inactive portions of the landfill are monitored on a quarterly basis. Corrective action has begun for groundwater remediation. A pump-and-treat feasibility study is in progress to remediate the vinyl chloride identified in the groundwater. No further information is available as to the exact remediation process or timing.

Identified Previously Remediated Sites

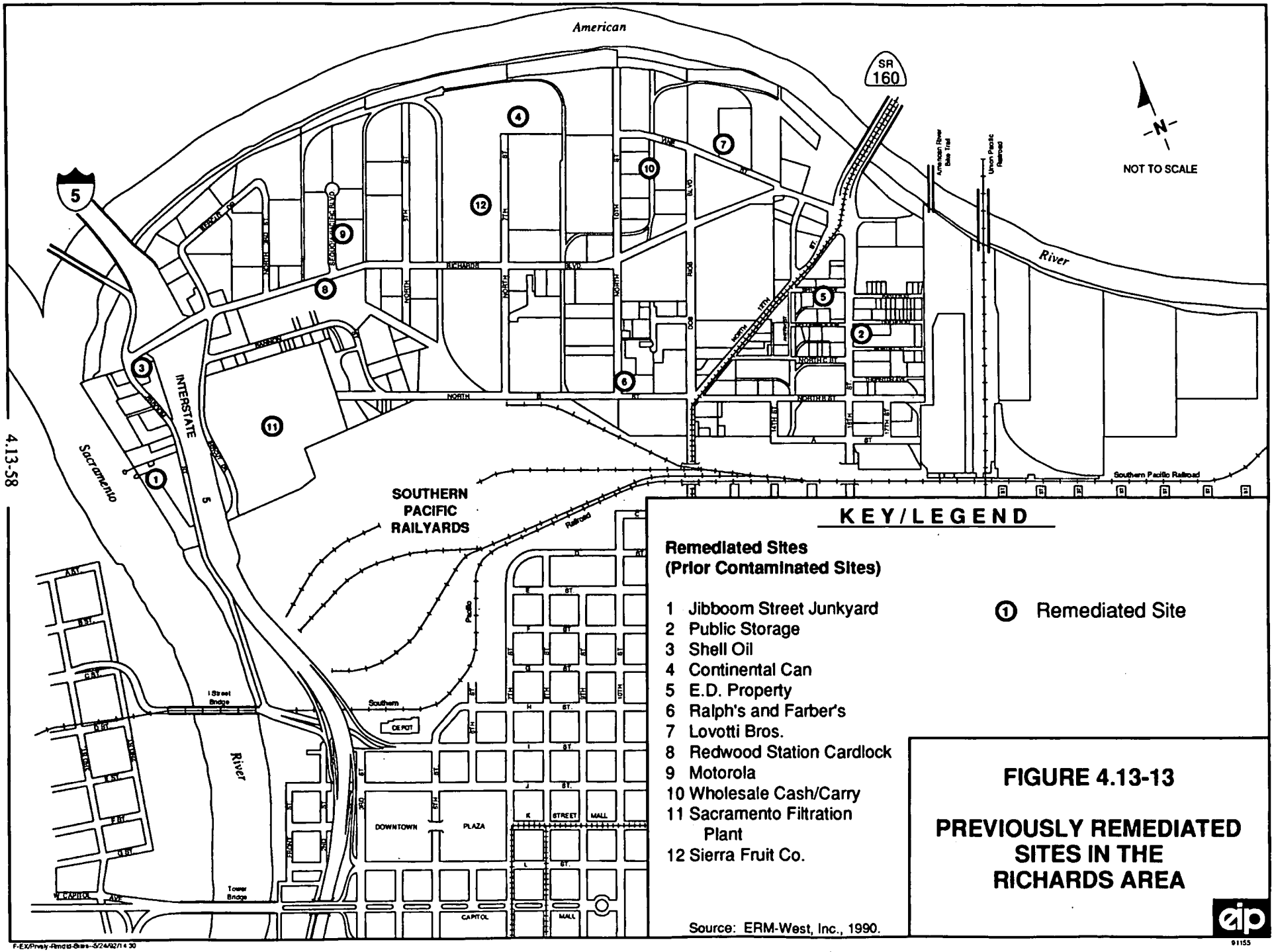
Twelve sites have been identified in the Planning Area as having been previously remediated for soil and or groundwater contamination (see Figure 4.13-13).[36] Detailed discussion of these sites is contained in Appendix I.

General Plan Goals and Policies

The following are relevant City of Sacramento General Plan goals and policies that apply to the Alternatives.

Goal A

Provide for the health and safety of the citizens of Sacramento and for the protection of the environment by reducing exposure to hazardous materials and waste.



KEY/LEGEND

Remediated Sites
(Prior Contaminated Sites)

1 Jibboom Street Junkyard
2 Public Storage
3 Shell Oil
4 Continental Can
5 E.D. Property
6 Ralph's and Farber's
7 Lovotti Bros.
8 Redwood Station Cardlock
9 Motorola
10 Wholesale Cash/Carry
11 Sacramento Filtration Plant
12 Sierra Fruit Co.

① Remediated Site

Source: ERM-West, Inc., 1990.

FIGURE 4.13-13

PREVIOUSLY REMEDIATED SITES IN THE RICHARDS AREA

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91155

Policy 1

Work with the County, State, and federal agencies and responsible parties to identify, contain and cleanup sites that contain hazardous materials.

The Planning Area is currently undergoing investigation and remediation to clean up identified contaminated sites. This process will continue, regardless of the Alternative, as development proceeds, until remediation is completed to acceptable levels established by enforcement agencies.

Policy 4

Coordinate with Sacramento County, the State and federal governments to ensure compatibility among plans, programs, regulations and safeguards.

The County Department of Environmental Management also includes the City of Sacramento in its jurisdiction. The HMD is responsible for the City's hazardous waste generator, hazardouswaste storage, and underground storage tank programs. The HMD performs inspections of underground tanks and businesses, and oversees hazardous materials remediation when state and federal agencies are not primarily involved. Occasionally at the request of the City, the HMD will review City land use applications to identify hazardous materials issues. Under any of the Alternatives, the County would be involved with implementing hazardous materials programs for the City.

IMPACTS AND MITIGATION MEASURES

Introduction

As was presented earlier in this chapter, the Railyards Area is known to be the site of extensive soil and groundwater contamination, and has been designated a State of California "superfund" site. The Richards Area is known to contain a number of contaminated sites and, based on a preliminary reconnaissance investigation, is believed to hold the potential for additional contaminated areas. The potential redevelopment of the Planning Area presents a range of concerns related to the intense reuse of contaminated sites. Such concerns include the appropriate staging of new development in relation to toxics remediation activities, the appropriateness of future land uses, and the types of measures necessary to protect the public health and safety today, during the redevelopment (construction) process, and throughout the life of the uses to be developed in the Planning Area.

The RSP includes a Hazardous Substances Element which addresses the need to remediate toxics contamination in order to protect the public health of current and future inhabitants, workers, visitors, surrounding areas, and the environment. This Element includes a history of the site and a discussion of known and potential contamination in the Railyards Area, and sets forth public objectives and implementing policies to ensure that hazardous materials problems are addressed prior to and in coordination with development. These objectives and policies have been incorporated into the EIR mitigation measures, where appropriate.

Standards of Significance

For the purposes of this EIR, an impact is considered significant if one or more of the following conditions would result from implementation of the Alternatives in the Planning Area:

A substantial risk of:

- unacceptable human exposure to hazardous materials;
- unacceptable environmental degradation; or
- explosion, fire or accidental release of hazardous materials

Due to any of the following:

- attracting people to the Planning Area;
- construction work in the Planning Area;
- use of hazardous materials in the Planning Area;
- storage of hazardous materials in the Planning Area; or
- transportation of hazardous materials through the Planning Area.

Method

Redevelopment of the Planning Area would increase the potential for unacceptable exposure of individuals and/or a number of people simultaneously to hazardous materials contamination or use. The land uses evaluated in this EIR for all the Alternatives result in a relatively substantial increase in the daytime and/or nighttime population of the Planning Area. Exposure of the projected population was assumed to occur for this analysis under the following circumstances: (1) due to the mixed-use nature of the land uses in most Alternatives, people would move freely throughout the area; (2) demolition and construction activities could involve exposure to hazardous materials; and (3) over time, site uses may change. Hence, increased levels of development activities in the Planning Area would require steps to ensure protection for future workers, residents, and visitors from unacceptable exposures to hazardous materials.

In terms of risk of a release of hazardous materials, it is accepted that some hazardous materials pose a safety hazard, rather than a toxic hazard. For instance, methane gas is not toxic, but it is dangerous due to the fact that it can explode if ignited in the presence of air. Some materials may be both explosive and toxic, and would pose both a safety and a toxic hazard. A discussion of hazard versus risk is included in the introduction to this chapter, as are discussions of means of exposure, and health effects of exposure.

The information used to evaluate the impacts of the Alternatives was obtained through a review of existing documentation and discussions with involved agency personnel. Files of the environmental regulatory agencies, such as the DTSC, the EPA, the CVRWQCB, and the SCEMD, were reviewed for the existence of site characterization studies prepared for the Planning Area. These studies were then reviewed. In addition, numerous investigations, some of them ongoing, have been conducted by the property owner to characterize the extent of hazardous materials contamination of soils and groundwater in the Railyards Area. The results of these investigations were reviewed as well. The majority of the Richards Area, by contrast, has not been investigated for hazardous waste contamination; therefore, little is known about the extent of contamination in the area.

In this impacts analysis, the differences between the two subareas in known and suspected types and degrees of contamination have been taken into account. Therefore, in many cases, the same mitigation measures are not warranted for both areas. Where the risk of exposure is thought to be specific to activities within the Railyards Area or the Richards Area, the impact is identified only for the particular subarea. Where the potential exists for the same type of impact in either subarea, a single impact is identified for both subareas. In some cases, different mitigation measures are recommended for each subarea due to specific knowledge about existing contamination, or due to the implications of property ownership. Hence, the same impact may have different mitigation measures for each subarea.

Impacts Due to Development in the Planning Area

Project Construction

4.13-1 Construction in the Planning Area could expose construction workers to contaminated soil.

Construction activities that move soil, such as grading, trenching and excavation, could expose construction workers to chemicals not only near the surface, but also deeper in the soil column. As previously discussed, contaminants in the Planning Area can be classified in four basic categories: metals, VOCs, hydrocarbons and semi-VOCs, each with its own characteristics in terms of where it is likely to be found in the soil column and its mobility in the environment. Exposure to substances that adsorb to the soil, like heavy metals and semi-volatile organic compounds, could occur through inhalation or ingestion of affected soils. Exposure to more mobile chemicals, such as VOCs, could result from inhalation of gases or skin contact. Exposure to hydrocarbons could result by any of the above mentioned exposure routes.

A-1 through A-7

Redevelopment of the Planning Area could expose construction workers to contaminated soil. All construction activities under all the proposed Alternatives would require some earth disturbance that could expose contaminated soils. As a general rule, contamination in each development phase area would be remediated to an acceptable construction worker exposure level prior to the start of construction (see Mitigation Measure 4.13-1(b)). Nevertheless, in some cases, coordinating initial site grading or excavation and remediation may be advantageous. In addition, previously unidentified pockets of

contamination could be discovered during construction. Therefore, exposure of construction workers to hazardous materials is possible. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-1(a) through 4.13-1(e) would reduce the above impacts to a *less-than-significant level.* Mitigation Measures 4.13-1(b) through 4.13-1(d) would apply to the Railyards Area only. Mitigation Measure 4.13-1(e) would apply to the Richards Area only.

4.13-1(a) *The entire Railyards Area, and each site within the Richards Area where hazardous materials contamination that requires remediation is identified, shall be cleaned up at the time of development or redevelopment, to levels, at a minimum, determined by DTSC (and other involved agencies as appropriate) to be adequately protective of construction workers. This measure would be required for all Alternatives.*

4.13-1(b) *Prior to the commencement of any construction in the Railyards Area, the City shall require the owner, or developer, to prepare a health and safety plan, in accordance with all applicable regulations, to determine construction worker health and safety requirements based on the levels of remediation already performed in the Planning Area. Depending on the anticipated levels and types of exposure, pursuant to the requirements of federal and state law, the health and safety plan may require the use of personal protective equipment and on-site continuous air quality monitoring during construction. The plan shall be kept on construction sites at all times. This measure would be required for all Alternatives.*

4.13-1(c) *The City shall require reconnaissance sampling in the Railyards Area, in areas where excavation is to occur, to confirm that chemicals do not exceed acceptable exposure levels for construction workers. This requirement may be waived in portions of the Railyards Area for which a final RAP has been approved.*

4.13-1(d) *The City and DTSC, through a Memorandum of Understanding, shall provide for site inspection in the Railyards Area during construction, develop a procedure for detecting previously undiscovered contamination during construction, and prepare contingency plans for investigating and remediating such contamination. This measure would be required for all Alternatives.*

4.13-1(e) *The City and DTSC shall, through Participation Agreements with individual land developers, provide for site inspection in the Richards Area during construction, develop a procedure for detecting previously undiscovered contamination during construction, and prepare contingency plans for investigating and remediating such contamination. This measure would be required for all Alternatives.*

4.13-2 Groundwater drawn to the surface from construction dewatering could result in increased short-term exposures to hazardous materials.

Some constituents, such as VOCs, are highly mobile in the environment and can migrate from the soil column to the groundwater, and visa versa. Not only will construction activities, such as grading, possibly expose construction workers to VOCs, but deep excavations requiring groundwater dewatering activities could bring contaminated groundwater to the surface. Contaminated groundwater has been identified in the Planning Area. Depth to groundwater in the Railyards Area is approximately 20 feet, but water levels have historically fluctuated from less than five feet to greater than 15 feet on an annual basis.[37] Depth to groundwater in the Richards Area has been identified at depths ranging from 15 to 30 feet.[38] Depths as shallow as six feet have been documented.[39] Subsurface excavation required for certain construction activities could expose construction workers to contaminated groundwater.

A-1 Alternative 1 does not propose the development of high-rise structures which may require below-grade construction resulting in the possible exposure to contaminated groundwater. This is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 propose the development of mid- and/or high-rise structures. Construction of such buildings may include excavation for foundations, deep basements, parking garages, elevator pits, or other below-grade construction that may encounter shallow contaminated groundwater. Such construction activities may result in the exposure of construction workers to contaminated groundwater. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-2(a) and 4.13-2(b) would reduce this impact to a *less-than-significant level.*

4.13-2(a) *Implement Mitigation Measures 4.13-1(a) through 4.13-1(e). This measure would apply to Alternatives 2 through 7.*

4.13-2(b) *The City shall require that extracted groundwater in the Planning Area be tested for the presence of hazardous materials, and that appropriate handling and disposal techniques be required accordingly. This measure would apply to Alternatives 2 through 7.*

4.13-3 Disposal of groundwater extracted during construction dewatering activities may result in off-site contamination.

Depending on the chemical composition of the groundwater, waste produced by dewatering may exceed human or environmental exposure standards, in which case special handling and disposal would be required. Often disposal would consist of sending the groundwater through City

sanitary sewers to the regional wastewater treatment plant. Although the sewer permit would require the contaminated groundwater to meet certain standards in order to protect the wastewater treatment plant, impacts on the sewer systems are possible, because it can be assumed that all sewers, even newly constructed lines, leak to some degree. Therefore, chemicals may leak out either as liquids or gases along the path of the sewer line, potentially exposing people to associated hazards off-site of the Planning Area.

A-1 Alternative 1 does not propose the development of high-rise structures which may include below-grade construction and dewatering activities that could expose contaminated groundwater. This is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 propose the development of mid- and/or high-rise structures. Construction of such buildings may include foundations, deep basements, elevator pits, parking garages, or other below-grade construction that may encounter shallow groundwater, which may be contaminated. Groundwater extracted during dewatering activities may be discharged into the City sewer system. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-3(a) through 4.13-3(c) would reduce this impact to a *less-than-significant level.*

4.13-3(a) *Implement Mitigation Measure 4.13-2(b). This measure would apply to Alternatives 2 through 7.*

4.13-3(b) *The City shall require extracted groundwater that is to be discharged to the sanitary sewer be authorized by the City in compliance with its obligations to meet standards established by the CVRWQCB, in order to reduce the risk of leakage of unacceptable levels of contaminants along the sewer lines, and to assure that the regional treatment plant can meet standards established under its NPDES permit, prior to discharge. This measure would apply to Alternatives 2 through 7.*

4.13-3(c) *If the City, or regional treatment plant determines that groundwater extracted during dewatering activities does not meet applicable standards for discharge into the city sewer system, contractors shall implement groundwater treatment systems that treat groundwater to standards established by the CVRWQCB, City, and regional treatment plant. This measure would apply to Alternatives 2 through 7.*

4.13-4 Dewatering for construction activities could interfere with groundwater remediation by moving plumes or lengthening the time required for remediation.

Dewatering for construction activities could interfere with groundwater remediation. Groundwater remediation techniques are dependent upon the ability of groundwater pumping to draw all contaminated waters into above-ground treatment systems. Pumping systems for dewatering could work at cross purposes with groundwater extraction systems for remediation by moving the contamination plume into previously uncontaminated, or less contaminated, areas. Such effects could spread the contamination and/or lengthen the overall time needed to complete groundwater remediation. As previously stated, groundwater contamination has already been identified underlying the Planning Area.

A-1 Alternative 1 does not propose the development of high-rise structures which may include below-grade construction which could require dewatering activities. This is considered a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 propose the development of mid- and/or high-rise structures. Construction of such buildings may include foundations, deep basements, elevator pits, parking garages, or other below-grade construction that may require dewatering activities. Dewatering activities could interfere with groundwater remediation. This is considered a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measures 4.13-4(a) and 4.13-4(b) would reduce this impact to a *less-than-significant level.* Mitigation Measure 4.13-4(a) applies to the Railyards Area only. Mitigation Measure 4.13-4(b) applies to the Richards Area only.

4.13-4(a) *In the Railyards Area, prior to obtaining a grading or building permit for construction that requires dewatering, the contractor shall coordinate with the engineer in charge of groundwater remediation activities for the Railyards Area to ensure that dewatering does not interfere with groundwater remediation. This measure would apply to Alternatives 2 through 7.*

4.13-4(b) *In the Richards Area, prior to obtaining a grading or building permit that requires dewatering, the contractor shall coordinate with the City and the CVRWQCB to ensure that dewatering does not interfere with any adjacent or on-site groundwater remediation. This measure would apply to Alternatives 2 through 7.*

4.13-5 Construction in the Planning Area would require the demolition and/or renovation of existing structures, possibly containing asbestos material, thereby exposing construction workers to associated hazards. Asbestos materials may also be present in the soils of the Planning Area.

The demolition of older buildings could expose construction workers and the public to carcinogenic asbestos fibers. Asbestos is present in a variety of forms in the existing structures. In some cases the asbestos is considered to be "friable," that is it can become loose and airborne

where it can be inhaled. Loose insulation, ceiling panels, and brittle plaster could be sources of friable asbestos. Non-friable asbestos is generally bound to other materials such that it does not become airborne under normal conditions. In most cases, asbestos in older structures is contained in linoleum, insulation, and similar building materials. These non-friable materials do not present an intrinsic health hazard by their mere presence, because the asbestos is encapsulated in another material. However, any activity that involves manipulation of these materials (i.e., cutting, grinding, or drilling) could release hazardous airborne asbestos fibers.

It is also possible that asbestos may exist in other areas of the Railyards Area, as well as in the soils underlying the Richards Area.

A-1 Development of the Planning Area under Alternative 1 would not explicitly call for the demolition or renovation of existing structures. In the Railyards Area, the Central Shops, Sacramento Station site, and other older buildings on the site would maintain their existing uses; no new use of those buildings is proposed. All development would occur on vacant land, so the potential for releasing airborne asbestos fibers is considered a ***less-than-significant impact.***

A-2 through A-7

Implementation of Alternatives 2 through 7 in the Railyards Area and the Richards Area would involve the demolition and/or renovation of existing structures, which may presently contain asbestos fibers. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-5(a) through 4.13-5(c) would reduce the above impacts to a *less-than-significant level.*

4.13-5(a) *Implement Mitigation Measures 4.13-1(a) through 4.13-1(e). This measure would apply to Alternatives 2 through 7.*

4.13-5(b) *If asbestos fibers are suspected or identified in soils or existing building materials, then additional sampling shall be performed prior to any construction activities to identify asbestos-containing materials that may be contained in building materials or obscured behind walls, above ceilings, and beneath floors. This measure would apply to Alternatives 2 through 7.*

4.13-5(c) *Demolition activities affecting asbestos-containing material shall be performed by a licensed asbestos abatement contractor with properly trained personnel in accordance with all applicable federal, state and local regulations. This measure would apply to Alternatives 2 through 7.*

Project Phasing

4.13-6 In the Railyards Area, implementation of any of the Alternatives would occur incrementally so that early stages of development would be completed prior to

remediation of the entire site, thereby potentially exposing inhabitants and users to hazardous materials.

A-1 through A-7

Due to its size and the complexity of the proposed redevelopment activities, the Railyards Area would be developed incrementally over many years. Based on the current remediation schedule, during at least the first 10 years of site development, development of some portions of the site will occur at the same time as remediation of other portions of the site. (For example, the 7th Street Corridor and the site of the Intermodal Transit Station are expected to be developed prior to cleanup of the entire site.) In order to protect occupants of earlier project phases and occupants of adjacent properties from unacceptable exposures to hazardous materials, remediation must be designed to prevent the spread of groundwater plumes, mobile chemicals in soil, or airborne contaminants. The concurrent development of some portions of the Railyards Area and remediation of other portions of the Railyards Area, could result in potential exposure of new residents and/or employees in the area to hazardous materials. Such exposures could occur from exposed soils and blown dust, uncontrolled runoff, or the free movement of people between portions of the Planning Area.

Remediation of the land within a given project phase needs to be coordinated with construction in that phase. For example, the development of a specific phase may include the construction of certain streets, sewer and drainage infrastructure, parks, and other public facilities required by that development, but outside the remediated area. In such cases, remediation must extend beyond the established cleanup boundaries to the unremediated infrastructure and facilities described above. If it is discovered that the source of contamination is outside the cleanup boundaries, that source will require remediation as well, so that the development area, which has already undergone clean up, is not contaminated again.

Major projects of this size involve substantial financial commitments. Financial events unrelated to the project, or possibly the project requirements themselves, may lead to financial problems for the original owner or subsequent owners or developers. When the project is partially developed, a substantial number of people will live, work, shop, and/or go to school on the site. At the same time, areas of the site may not be completely remediated, and major infrastructure and mitigation measures such as streets, transit, and parks will not yet be complete.

If the project stops, and no further remediation occurs, and the population on the site remains surrounded by unremediated and undeveloped property, that population may be exposed to potential long term health risks. The possibility of a failed or partially completed project and incomplete hazardous materials remediation could pose health risks for the public. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-6(a) through 4.13-6(f) would reduce the above impacts to a *less-than-significant level.* These measures would apply to the Railyards Area only.

4.13-6(a) *Southern Pacific shall perform an overall site risk assessment of the Railyards Area prior to development in order to identify areas that require early remediation or implementation of interim protective measures prior to final site remediation. This measure would be required for all Alternatives.*

4.13-6(b) *Unacceptable exposures to active remediation sites, and unremediated portions of the Railyards Area shall be prevented by one or more of the following measures, which would be required, as necessary, for all Alternatives:*

(1) Buffer zones between areas that are completely remediated and ready for development and those that are not completely remediated.

(2) Cleanup of accessible portions of the site to interim levels that are determined by DTSC to be adequately protective for short-term human exposure.

(3) Interim cover of accessible portions of the site in order to bury or otherwise encapsulate hazardous materials and to prevent human exposure.

(4) Limitations on access to active remediation sites, and unremediated areas of the site, that are not otherwise covered by means of fencing, posting of signs, and site security.

(5) Dust control for active cleanup sites and unremediated bare ground.

(6) Perimeter air monitoring for active remediation sites and during construction.

4.13-6(c) *In the Railyards Area, no building or occupancy permits shall be issued until the Planning Area, buffer zones, and appropriate related infrastructure areas are remediated. This measure would be required for all Alternatives.*

4.13-6(d) *The City shall enter into a development agreement and adopt applicable zoning to provide for a phasing plan linking approval of development in any given phase of the Railyards Area with remediation of the site itself, remediation of adjacent buffer areas, and remediation of linked infrastructure development areas. This measure would be required for all Alternatives.*

4.13-6(e) *The City shall develop a permitting process requiring linkages between remediation steps and development approvals which is designed to ensure that the*

site remediation in the Railyards Area precedes or is coordinated with site development of each phase of the project.

4.13-6(f) *The City shall enter into a development agreement and adopt applicable zoning which require a combination of phasing, financial assurances and entitlement linkages to ensure that required remediation in the Railyards Area can be completed regardless of financial problems of project owners or developers. This measure would be required for all Alternatives.*

4.13-7 Incremental development of the Railyards Area could interfere with cleanup efforts of existing contaminated sites.

A-1 through A-7

A plan of this size would be developed incrementally over many years. Similarly, the anticipated schedule of remediation activities would occur at least throughout the 1990s.

The timing of required remediation activities and the development of the Railyards Area may not coincide in all cases. DTSC's priorities, which are based on the apparent degree of environmental risk posed by the identified cleanup areas, may not coincide with proposed development schedules. For example, the 7th Street Corridor is scheduled to be developed in the first phase of the project, but is not at the top of DTSC's cleanup list. In order to accommodate both DTSC's concerns and development goals, Southern Pacific has expanded and combined the identified cleanup areas to encompass the entire site. In addition, Southern Pacific has proposed expediting cleanup of the 7th Street Corridor and the Lagoons (site of the Intermodal Transit Station) to allow timely development of those areas. To the extent that expedited cleanup interferes with the attainment of DTSC goals for priority remediation areas, this is considered a ***significant impact.***

The following mitigation measures are most meaningful when development is under way but the entire site is not yet remediated. Since it is possible that remediation could be completed within Phase I of the project, some of the following policies may not be entirely applicable after the year 2000.

Mitigation Measures

Implementation of Mitigation Measures 4.13-7(a) through 4.13-7(c) would reduce the above impacts to a *less-than-significant level.* These measures would apply to the Railyards Area only.

4.13-7(a) *Southern Pacific shall coordinate with the City, DTSC, and other involved agencies as appropriate to assure that the proposed development in the Railyards Area does not interfere with any adjacent, and/or on-site remediation activities, or unduly delay either project development or area remediation. This measure would be required for all Alternatives.*

4.13-7(b) *All contractors in the Railyards Area shall coordinate with the City, DTSC, and other involved agencies, as appropriate, to assure that construction activities shall*

not interfere with any adjacent and/or on-site remediation activities or unduly delay either project development or site remediation. This measure would be required for all Alternatives.

4.13-7(c) *The City shall cooperate with DTSC to ensure that DTSC remediation priorities for the Railyards Area are maintained. This measure would be required for all Alternatives.*

4.13-8 In the Richards Area, development adjacent to unremediated sites or sites that are currently undergoing remediation could expose inhabitants or users to hazardous materials.

A-1 through A-7

Only a small portion of the Richards Area has been characterized. Preliminary reconnaissance studies indicate that a range of contaminants may be present in the Richards Area. Investigation and remediation of sites would be triggered, in many cases, by specific development actions. Development of sites adjacent to sites that either have not been remediated, or are undergoing remediation, could expose inhabitants or users of remediated, developed sites to hazardous materials and the associated risks. Such exposures could occur from exposed soils, uncontrolled surface runoff, or the free movement of people between sites in the Richards Area.

To further protect adjacent developments, financial assurances may be necessary to provide that remediation activities be completed. Contamination initially discovered on a site slated for development may later be found to cross property lines, thereby requiring a greater remediation effort than called for by the proposed project. Contamination could be found on properties planned for major public improvements, such as new road rights of way or open space. Discovery of contamination could also make land assembly difficult for large development projects if some of the owners lack the means to deliver a clean site or responsible parties cannot be found. Also, remediation costs could simply be too great for a project to bear.

In cases such as these, hazardous materials remediation may create impediments to development if no alternative or supplemental funding mechanism is available. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-8(a) through 4.13-8(d) would reduce the above impacts to a *less-than-significant level.* These measures would apply to the Richards Area only.

4.13-8(a) *All contractors in the Richards Area shall coordinate with the City, DTSC, and other involved agencies, as appropriate, to assure that construction activities shall not interfere with any adjacent and/or on-site remediation activities or unduly delay either project development or site remediation. This measure would be required for all Alternatives.*

4.13-8(b) *All contractors in the Richards Area shall coordinate with the City, DTSC, and other involved agencies, as appropriate, to assure that accessible portions of the Richards Area containing hazardous materials contamination shall be covered, encapsulated, or otherwise rendered inaccessible to prevent unacceptable human exposure to hazardous materials. This measure would be required for all Alternatives.*

4.13-8(c) *Active remediation sites in the Richards Area shall employ measures to protect the surrounding population and environment. Such measures could include, as appropriate, buffer zones, fencing, posting, site security, dust control, and perimeter air monitoring. This measure would be required for all Alternatives.*

4.13-8(d) *To the extent that properties stand to benefit from infrastructure improvements, such as open space and development incentives allowing greater development densities, such properties shall be required to agree to inclusion in special assessment districts or special taxing districts, such as Mello-Roos districts, that are set up by the City to provide financing for all or portions of hazardous materials remediation efforts. Formation of such districts shall precede any new development under any of the Alternatives in the Richards Area, but the tax or assessment collecting functions of these districts can be delayed until such time as funds are needed. This measure would be required for all Alternatives.*

Long Term Exposure

4.13-9 Implementation of any of the Alternatives could result in exposure of inhabitants and users to contaminated soil and/or groundwater.

A-1 through A-7

DTSC is responsible for setting cleanup levels and standards that adequately protect the users of the site and the surrounding population. However, under DTSC's two-tier lead cleanup standards (currently applied in the Railyards Area), not all land uses require the same level of cleanup. Multifamily residential developments over podium parking (where most of a site is buried under impervious surfaces), for instance, would not expose residents to soils, and may not require cleanup levels as strict as those for low-density residential uses. Similarly, commercial development with landscaped areas may require more stringent cleanup levels due to potential exposure of soils in landscaping areas. Thus, different areas of the Planning Area may require different levels of cleanup.

In addition to concern for initial inhabitants and users, remediation measures must account for movement of people and activities across the site through its entire life. Mixed-use development implies the movement of individuals from one type of use to another. This may bring sensitive populations into areas that they would not ordinarily frequent. For example, commercial uses might normally be considered tolerant of higher levels of contamination. Yet, over the life of the project, a commercial use may include a park or a child care facility.

Currently, federal and state law provide for recordation of deed restrictions in order to restrict existing and future land uses on contaminated sites to uses compatible with the levels of hazardous materials left in place. The allowable land uses are those that have been determined by DTSC not to pose an unacceptable risk to human health or the environment. Although the remaining levels of contamination may be considered protective of populations associated with some types of land uses (such as industrial and commercial), they may not be acceptable for others (such as children), regardless of the primary land use designation. These deed restrictions are imposed and administered by DTSC. The wording of the current deed restrictions gives DTSC the authority and responsibility for enforcing the deed restrictions in the event of violation.

A site that has been remediated may be subject to additional remediation at a future time if any of the following conditions occur: (1) the clean-up standards themselves change; (2) the previous remediation is determined to have been inadequate; or (3) previously unidentified hazardous material contamination is identified.

Groundwater contamination poses several possible exposure issues over the life of the project. First, for buildings with deep basements or parking garages, ongoing dewatering may be required to keep substructures dry. The extracted groundwater may require special handling and disposal, depending on chemical concentrations. The most likely method of disposal is discharge to the regional wastewater treatment plant via the City sanitary sewer system. As discussed in Impact 4.13-3, such discharge could leak chemicals along the route of the sewer system depending on the chemical concentrations in the extracted groundwater. Second, buildings with basements that are located in areas with high levels of groundwater contamination may also require design features to protect from soils vapors. Third, ongoing groundwater extraction for remediation will require that extraction wells be strategically located. If treatment of extracted groundwater is required prior to disposal, it may be necessary to construct air stripping towers, which could increase exposure to hazardous materials through the air.

Redevelopment of the Richards Area will lead to changes in land use that will bring increased numbers of residents and users into an area that formerly was primarily industrial and heavy commercial. In addition, residential and mixed use development may in some instances be located relatively close to industrial or commercial uses. Although the likelihood of exposure to hazardous materials is unknown at this time, redevelopment of this area will require investigation of potential risks to public health and safety.

The potential exposure of inhabitants and users over the life of the project to contaminated soil and/or groundwater is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-9(a) through 4.13-9(g) would reduce the above impacts to a *less-than-significant level.* Mitigation Measures 4.13-9(c) through 4.13-9(e) would apply to the Railyards Area only. Mitigation Measure 4.13-9(f) and 4.13-9(g) would apply to the Richards Area only.

4.13-9(a) *Implement Mitigation Measures 4.13-1(a) through 4.13-1(e) and 4.13-2(b). This measure would be required for all Alternatives.*

4.13-9(b) *Prior to issuance of building permits in areas of known groundwater contamination, the City shall assess the need for building features designed to protect against the risk of exposure to soil vapors in enclosed underground spaces. Such features could include vapor barriers and adequate ventilation. This measure would be required for all Alternatives.*

4.13-9(c) *Southern Pacific shall perform a health risk assessment on any intended groundwater treatment system in the Railyards Area, such as air strippers, in accordance with Sacramento Metropolitan Air Quality Management District requirements to determine the air quality related health effects. Air strippers and other treatment systems that release hazardous materials to the air shall be located in areas that will not create a risk of unacceptable human exposures to hazardous materials. This measure would be required for all Alternatives.*

4.13-9(d) *Individual site plans for each project phase or subphase in the Railyards Area shall be coordinated with locations of groundwater extraction wells, air stripping towers, and other groundwater treatment facilities. This measure would be required for all Alternatives.*

4.13-9(e) *The City shall implement a permitting program, in coordination with DTSC and other appropriate agencies, that requires appropriate cleanup levels based on the anticipated land uses and exposure scenarios for each development area in the Railyards Area. This measure would be required for all Alternatives.*

4.13-9(f) *For the Richards Area, the City shall link development approvals to specific remediation steps for each of the Alternatives as follows:*

(1) For all sites proposed to remain industrial or commercial, the City shall require reconnaissance level testing of the area of soil to be disturbed before issuing any building or grading permit that would result in disturbance of more than 50 cubic yards of soil. A registered engineer or geologist shall certify that the testing is representative of the proposed excavation site conditions.

(2) For all sites that formerly were industrial or commercial and are proposed for residential, mixed use, open space, or similar development, prior to issuing any project approvals, the City shall require reconnaissance level soil and groundwater testing of the entire site.

(3) For major redevelopment sites where contamination is found, the Owner Participation Agreement shall set forth a linkage between development approvals and specific remediation steps.

(4) *For all sites where contamination is found, the City shall require completed soil remediation and/or site closure approved by the applicable state or federal regulatory agency prior to the issuance of grading, demolition, building, or occupancy permits, unless preliminary construction work, such as excavation for building foundations, will occur as part of the remediation process. In some cases, permits may be issued while groundwater remediation or soil vapor extraction is ongoing, if a site specific health risk assessment demonstrates that there will be no significant risk to construction workers, site users, or occupants. In lieu of completed remediation and/or site closure, the permit applicant may submit a statement from the appropriate regulatory agency or from a registered engineer or geologist certifying that no remediation would be required under applicable laws.*

4.13-9(g) *The City shall implement a regulatory system to ensure that the presence of any deed restrictions affecting a proposed development in the Planning Area are noted and the contents of such deed restrictions reviewed prior to any land use approvals. This measure would be required for all Alternatives.*

4.13-10 Throughout the life of the project, currently proposed land uses may be changed and new construction or demolition may occur, exposing construction workers, inhabitants and users to unacceptable levels of contaminated soil and/or groundwater in the Planning Area.

A-1 through A-7

Throughout the life of the project, uses in the Planning Area may change from those that were originally approved. Original cleanup levels may, or may not, be adequate for these new uses. In addition, over time, cleanup standards may change. Any reuse of a site that results in increased exposure to chemicals above currently acceptable levels should accordingly trigger a review of prior remediation levels in light of the most recent scientific information and applicable standards to determine if additional remediation is necessary. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-10(a) through 4.13-10(i) would reduce the above impacts to a less-than-significant level. Mitigation Measures 4.13-10(d), 4.13-10(e), 4.13-10(h) and 4.13-10(i) apply to the Railyards Area only.

4.13-10(a) *Redevelopment or change of use of any portion of the Planning Area shall require an assessment of the need for remediation prior to issuing development permits. This measure would be required for all Alternatives.*

4.13-10(b) *In the event that reuse of land in the Planning Area or a change in a proposed use would expose users of the site to unacceptable soil contaminant levels, remediation that reflects the most current applicable remediation standards shall be implemented. This measure would be required for all Alternatives.*

4.13-10(c) *Implement Mitigation Measures 4.13-1(a) through 4.13-1(e). This measure would be required for all Alternatives.*

4.13-10(d) *The City shall enter into a Memorandum of Understanding with DTSC, other affected agencies, such as the County Environmental Management Department, Hazardous Materials Division, and the developer, as appropriate. The Memorandum of Understanding shall set forth a process that allows the City, in processing development applications for the Railyards Area, to apply the appropriate DTSC remediation levels to each land use, inform DTSC of each decision, and monitor implementation of the remediation levels. This measure would be required for all Alternatives.*

4.13-10(e) *The City shall create a land use and development permitting process for the Railyards Area that requires consideration of toxic and hazardous materials issues in coordination with DTSC and other affected agencies. This measure would be required for all Alternatives. The permitting process shall include the following:*

(1) A means for keeping track of recorded DTSC deed restrictions.

(2) A means for tracking the levels of remediation undertaken at specific portions of the site, in case additional remediation is required to address changes in use, or reuse, that permit unacceptable exposure to contamination in soil.

(3) A system for ensuring that any street work, large-scale landscaping, or other activities likely to involve excavation be subject to review in order to alert contractors to the possible presence of hazardous materials.

(4) A system for categorization of individual structures and development projects to determine the applicable level of remediation.

(5) A system for discovering previously undetected contamination during construction and ensuring effective and efficient remediation of such contamination.

(6) A system for ongoing communication with DTSC and other applicable agencies.

4.13-10(f) *The City shall adequately staff the permitting department to include individuals with specific responsibility for tracking developments in the Planning Area and maintaining contact with DTSC and other agencies. This measure would be required for all Alternatives.*

4.13-10(g) *The City shall enter into a Memorandum of Understanding with DTSC and other agencies that would provide an administrative mechanism to keep applicable City permitting officials up to date on changes in standards for contaminants known*

to exist in the Planning Area. This measure would be required for all Alternatives.

4.13-10(h) *To ensure that all necessary hazardous materials remediation in the Railyards Area is accomplished, the City shall enter into a development agreement and adopt specific plans and zoning ordinances which will include the following provisions for each of the Alternatives:*

(1) A regulatory and permitting process that links development approvals to hazardous materials remediation.

(2) Adequate financial assurances to ensure that hazardous materials remediation is completed.

4.13-10(i) *The City shall require developer contributions to ensure adequate staffing of enhanced regulatory programs required to ensure that remediation of the Railyards Area is coordinated with site development. This measure would be required for all Alternatives.*

Hazardous Materials Transportation

4.13-11 Development under the Alternatives would include uses that could increase the amount of hazardous materials transported through the Planning Area, as well as bring new residents in proximity to existing hazardous materials transportation routes, such as Interstate 5 and the Southern Pacific rail lines.

Although it is not possible at this time to predict the exact types of hazardous materials that could be transported through the Planning Area, it can be expected that haulers could transport any material legally transportable on roads and rail lines. Trucking on highways and local streets is the most common method of transporting hazardous materials and waste in Sacramento County. It is estimated that 6.9 percent of all highway accidents involve trucks, and that accidents also occur on local streets where the trucks travel when delivering hazardous materials and collecting the waste. The California Highway Patrol estimates that approximately 25 percent of trucks in urban areas carry hazardous materials.[40] In 1990, Department of Transportation accident reports for California identified approximately 668 accidents involving hazardous materials. Approximately 59 incidents involving trains carrying hazardous materials occurred for the same period. As discussed in the Setting Section of this Chapter, CFR 49 and Title 26 regulate the transportation of hazardous materials by trucks and other vehicles. CFR 49, Parts 106 through 189, regulate the transport of Hazardous Materials on rail lines. Furthermore, the California PUC General Order 161 requires rules to assure coordination between federal, state, and local agencies and railroads in the area of emergency response during a hazardous materials incident during rail transport.

A-1 Alternative 1 includes infill development of new industrial uses and some public services that would use and transport hazardous materials through the Planning Area. The number of hazardous materials incidents along existing and proposed roadways could increase depending on the type of commercial and industrial uses and the number of persons

exposed would increase due to the proposed plans. This is considered a ***significant impact.***

A-2 through A-7

Alternatives 2 through 7 involve development in the Richards Area of industrial and commercial uses that may include the use of hazardous materials. These Alternatives would also bring new residents to the Planning Area. Proposed uses requiring the use of hazardous materials could generate hazardous waste, and could increase the transportation of such materials through the Planning Area, thereby increasing the risk of exposure to new residents to a transportation related hazardous materials incident. Furthermore, under Alternatives 2, 3, 4, 5, and 7, new residential uses are proposed to be developed adjacent to the existing main line, and the north/south UP line, which are used to transport hazardous and other materials. This is considered a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.13-11(a) would reduce the above impact to a *less-than-significant level.*

4.13-11(a) *Prior to issuance of any entitlement to construct in the Railyards Area and the Richards Area, a Hazardous Materials Transportation Program shall be prepared for incorporation into project design. This measure would be required for all Alternatives. The transportation program shall be in compliance with City policy and the Sacramento County Hazardous Waste Management Plan and shall include the following elements:*

(1) Identify firms and land uses requiring hazardous material shipping access.

(2) Identify sensitive facilities (residential, schools, hospitals, etc.) and environmentally sensitive areas.

(3) Identify and adopt appropriate transportation routes that would avoid sensitive land uses.

(4) Evaluate accident probability and severity.

(5) Identify emergency response services.

Exposure Due to Flood Event

4.13-12 Development in the Planning Area would increase the number of people exposed to the release of existing hazardous materials contamination during a flood event.

A-1 through A-7

As stated in Section 4.12, Hydrology and Water Quality, the levee system surrounding the Planning Area currently provides protection from a 63-year storm event. The majority of the Railyards Area is not located within a 100-year floodplain, and therefore the risk of flooding due to a 100-year event is localized. The entire Richards Area is located in a flood hazard zone. Until protection from a 100-year flood is achieved, a 100-year flood event could inundate areas designated within A99 zones in portions of the Railyards Area with up to four feet of water, and 10 to 15 feet of water in the entire Richards Area.

Floodwaters could transport contaminated soil in the Planning Area, wash contaminated soil into the surrounding area (depending on flood flow paths), and/or expose contaminants that formerly were below the surface after the flows recede by eroding the top layer of soil. Water soluble contaminants such as VOCs could be dissolved into floodwaters and volatized into the atmosphere. Even constituents such as lead could be uncovered if cleanup only required shallow remediation. However, the actual constituent levels in the floodwater itself are not likely to be very high because the levels remaining in the soil would be at or below DTSC action levels, and the floodwater would dilute what levels remain. Therefore, the health hazards associated with contact with the water itself would not be great. This is considered a ***less-than-significant impact.***

Mitigation Measures

4.13-12 *None required.*

Impacts Due to Development in the Richards Area Only

4.13-13 Location of industrial and commercial uses in the Richards Area adjacent to existing and proposed residential uses could expose residents to hazardous materials.

Permitted heavy commercial uses in the Richards Area under some Alternatives include warehousing and distribution, light manufacturing and assembly, automotive services, trade shops, home and business repair and research and development. Permitted industrial uses include food processing and small-scale processing and fabrication. Such uses may entail storage, use, handling and emissions of hazardous materials. Siting residential or mixed use development near heavy commercial or industrial uses could result in increased unacceptable exposure to hazardous materials. Greater numbers of people, or more sensitive populations (such as children) may be exposed to ongoing industrial or commercial operations. As summarized in the setting section of this chapter, many federal and state regulations govern storage, use, handling and emissions of hazardous materials. Anyone handling hazardous materials within the Richards Area would be required to comply with all applicable regulations.

A-1 Alternative 1 involves the retention of existing heavy commercial/light industrial uses, as well as the development of new heavy commercial/light industrial uses, adjacent to existing residential development. This is considered a ***significant impact.***

A-2, A-3, A-4 and A-7

Alternative 2, Alternative 3, Alternative 4, and Alternative 7 involve the development of heavy commercial/light industrial uses adjacent to the Basler/Dreher and 12th Street/16th Street triangle (mixed uses designation) residential neighborhoods. This is considered a ***significant impact.***

A-5 and A-6

Alternatives 5 and 6 involve the development of heavy commercial/light industrial uses adjacent to a mixed-use designation area between the commercial/industrial area, and 12th Street. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-13(a) through 4.13-13(e) would reduce the above impact to a *less-than-significant level.* These measures would apply to the Richards Area only.

4.13-13(a) *The City shall adopt development standards in the Richards Area for each of the Alternatives. Such development standards shall require all new proposed heavy commercial and industrial land uses, including:*

- *warehousing and distribution*
- *light manufacturing and assembly businesses*
- *automotive services and repair*
- *research and development*
- *food processing*
- *small-scale processing and fabrication*

which abut residential and mixed use areas, schools, and open space areas, to meet the following standards:

(1) New industrial activities shall be sited such that all heavy fabrication and processing activities are located away from adjoining residential uses. All new commercial and industrial uses shall install a six-foot-high solid wall of masonry, brick or similar material along all property lines which abut another property to protect more sensitive uses. Chain link fences shall not be allowed.

(2) Proposed heavy commercial and industrial land uses shall submit the following information with their permit application:

- *A description of proposed activities, processes and hours of operation that would be conducted on the site; and*
- *A disclosure of the amount and types of chemicals and compounds that would typically be used onsite.*

(3) Setbacks shall be required as necessary to provide separation and buffering for residential and other nonconforming uses from heavy commercial and industrial uses, to be determined on a project-by-project basis, considering the size of the parcel, the adjoining land uses, the characteristics of the proposed uses and activities for the site, and any specific findings of hazardous materials studies conducted for the proposed use.

4.13-13(b) *As part of the information required to apply for a development permit in the Richards Area, the City shall require, as appropriate, studies, such as air toxics evaluations, to determine if the proposed use will create an unreasonable risk to adjoining properties. Such studies shall suggest measures that would mitigate the unacceptable effects of hazardous material on adjoining properties. This measure would be required for all Alternatives.*

4.13-13(c) *The City shall require businesses in the Richards Area that use solvents and/or other toxic or hazardous materials to present Hazardous Substance Management Plans for the review and approval of the City Fire Chief, prior to final building inspection. This measure would be required for all Alternatives. The plans shall demonstrate that adequate safety precautions have been taken for the storage and handling of hazardous materials and/or wastes, including:*

- *Proper on-site management;*
- *Proper transportation;*
- *Properly designed and outfitted disposal facilities;*
- *Source reduction and recovery;*
- *Measures to prevent hazardous wastes from entering sanitary sewers;*
- *Programs to reduce spills of hazardous substances during transport.*

4.13-13(d) *The City shall require that all buildings or structures containing hazardous materials in the Richards Area be labeled at all doorways with easy-to-read signs that provide emergency response teams with information on the hazardous contents of the building or structure, and proper containment procedures. Labeling should be based on existing systems (such as the national Fire Protection Association 704 System) and approved by the City Fire Department. This measure would be required for all Alternatives.*

4.13-13(e) *Outdoor storage of materials in the Richards Area shall be minimized. Materials which emit odors, fumes, or otherwise cause a nuisance or hazard to neighboring properties shall not be stored outdoors. Any outdoor storage shall be done in compliance with all applicable federal, state, and local regulations. This measure would be required for all Alternatives.*

Landfill Gas

4.13-14 Development on, or adjacent to, the private and municipal landfills in the Richards Area could expose inhabitants and users to risks associated with landfill gas.

Most of the area east of the Union Pacific railroad tracks was at one time or currently is used for landfills. These landfills began operation before the adoption of most or all modern landfill environmental controls, including regulations requiring the separation of hazardous from nonhazardous wastes. Although the landfills primarily received public, municipal, and street cleaning wastes, almost anything could have been disposed in them, including hazardous wastes. Landfills often contain organic matter that decomposes into landfill gas. Methane, the primary component of landfill gas, is a combustible gas that can explode when ignited in the presence of air when concentrations exceed approximately 5 percent total concentration. Methane gas migrates though the soil column into the atmosphere and can accumulate in enclosed structures. Over time, methane production in a landfill will decrease, thus reducing the associated hazard. The California Waste Management Board regulates post-closure land uses for solid waste landfills to mitigate the potential impacts from methane gas under the, *Emergency Regulations, Closure and Post-closure Maintenance Plan, Adoption Procedures and Uniform Standards for Closure and Post-closure of Solid Waste Landfills*, contained in Title 14, Chapter 3, Subarticle 7.8. Other gases associated with landfills, such as vinyl chloride, are carcinogenic or otherwise toxic.

A-1 Under Alternative 1, no development is proposed east of the Union Pacific Railroad track that could expose people to hazards associated with landfill gas. This is considered a ***less-than-significant impact.***

A-2 and A-3

Alternatives 2 and 3 propose open space on the former landfill sites, as well as industrial and residential uses just west of the Union Pacific Railroad tracks that could involve construction of maintenance and service structures on top of areas subject to the hazards associated with landfill gas. This is considered a ***significant impact.***

A-4 Alternative 4 proposes industrial uses east of the Union Pacific Railroad track on top of potential landfill areas. Industrial, commercial and residential uses are proposed just west of the Union Pacific Railroad tracks. Structures built in these areas, could be subject to hazards associated with landfill gas. This is considered a ***significant impact.***

A-5, A-6, and A-7

Alternatives 5, 6, and 7 propose industrial uses west of the Union Pacific Railroad tracks as well as to the east. Structures built on these areas could be subject to hazards associated with landfill gas. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.13-14(a) and 4.13-14(b) would reduce the above impacts to a *less-than-significant level.* This measure would apply to the Richards Area only.

4.13-14(a) *Implement applicable provisions under California Code of Regulations Title 14, Chapter 3, Subarticle 7.8, and any subsequent landfill regulations adopted by the California Waste Management Board, or other responsible agencies. This measure would be required for Alternatives 2 through 7.*

4.13-14(b) *The City shall require that all buildings constructed on or near landfills shall have adequate venting to prevent the buildup of landfill gases. This measure would be required for Alternatives 2 through 7.*

Cumulative Impacts

4.13-15 Cumulative development in the region, including development of the Planning Area, would increase the number of people exposed to risks associated with hazardous materials.

A-1 through A-7

Growth in the Sacramento Area, including the Alternatives, would increase industrial and commercial operations which could increase the use, storage, handling and transportation of hazardous materials. Planned development in the region would also increase the number of people living in proximity to such uses who could be exposed to risks associated with hazardous materials handling.

Even though the project could reduce industrial use in the Planning Area over that found under existing conditions, it will bring more people in contact with existing and proposed industrial operations than currently exists. Furthermore, on a cumulative level, increased handling of hazardous materials and therefore increased potential for a hazardous materials incident, is to be expected in an area experiencing industrial and commercial growth. It is also to be expected that population growth in an area will increase the number of people exposed to associated health risks of such incidents.

Even with waste minimization and the implementation of all applicable federal, state and local regulations, this is considered a ***significant and unavoidable impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.13-15 would reduce the above impact, but it will remain ***significant and unavoidable.***

4.13-15 *The City of Sacramento, Sacramento County and other involved jurisdictions in the region shall coordinate with the EPA, the DTSC, the CVRWQCB, the SMAQMD and other applicable agencies to develop policies to enforce regulations*

which ensure that risks associated with hazardous materials are reduced to the maximum extent possible, in compliance with all applicable federal, state, and local regulations. This measure would be required for all Alternatives.

ENDNOTES

1. American Chemical Society. 1986. U.S. Code of Federal Regulations 40 CFR 261, RCRA and Laboratories.

2. American Chemical Society. 1986. RCRA and Laboratories.

3. City of Sacramento. Revised October 30, 1987. *1986 to 2006 General Plan for Sacramento, Health and Safety Element*, released January 16, 1987.

4. County of Sacramento. 1988. *Sacramento County Hazardous Water Management Plan*, March 30, 1988.

5. Bill Schoonover, Hazardous Materials Division, Federal Railroad Administration, personal communication, February 5, 1992.

6. Information has been summarized from the Revised Draft-In-Progress Hazardous Substances Element for the Railyards Area.

7. Donald W. Rains, Professor of Agronomy and Plant Sciences, University of California, Davis, personal communication, March 24, 1992.

8. Other chlorinated solvents that have been detected on the Railyards site, generally at lower concentrations, include 1,1-dichloroethane, and trichlorofluoromethane.

9. Chrysene, benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene.

10. Anthracene, phenanthrene, pyrene, fluorene, fluoranthene, benzo(g,h,i)perylene, and benzonaphthalene.

11. ERM-West, Inc. 1991. *Overall Site Remedial Investigation/Feasibility Study Shell Work Plan Sacramento Railyard Sacramento, California*, July 1, 1991.

12. Ibid.

13. Ibid.

14. Ibid.

15. ERM-West, Inc. 1991. *Lagoon Study Area Sampling and Analysis Plan, Sacramento Rail Yard, Sacramento, California*, prepared for Southern Pacific Transportation Company, August 30, 1991.

16. ERM West, Inc. 1991. *Overall Site Remedial Investigation/Feasibility Study, Shell Workplan, Sacramento Rail Yard, Sacramento, California*, prepared for the Southern Pacific Transportation Company, July 1, 1991.

17. Woodward Clyde Consultants. 1990. *Southern Pacific Railyards Master Plan Existing Conditions Volume 2, Hazardous Materials*, September 1990.

18. ERM-West, Inc. 1991. *Lagoon Study Area, Sampling and Analysis Plan, Sacramento Rail Yard, Sacramento, California*, prepared for Southern Pacific Transportation Company, August 30, 1991.

19. Woodward-Clyde Consultants. 1989. *Draft Remedial Action Plan, Sacramento Station Site, Sacramento Yard, Sacramento, California*, prepared for the Southern pacific Transportation Company, October 1989.

20. Woodward-Clyde Consultants. 1989. *Draft Remedial Action Plan, Sacramento Station Site, Sacramento Yard, Sacramento, California.* October 1989.

21. Woodward-Clyde Consultants. 1991. *Closure Certification Report, Sacramento Station Metals Area, Sacramento Yard, Sacramento California.* January 1991.

22. ERM-West. 1991. *South Plume Sampling and Analysis Plan, Sacramento Rail Yard, Sacramento, California.* August 1, 1991.

23. ERM-West. 1991. *South Plume Sampling and Analysis Plan, Sacramento Rail Yard, Sacramento, California.* August 1, 1991.

24. Woodward-Clyde Consultants. 1991. *Ground Water Quality Monitoring Report for April 1991, Sacramento Yard, Sacramento, California.* July 1991.

25. ERM-West. 1991. *Final Investigation Report, Soil Gas and Lead Sampling Program, Residential and Open Space Study Area, Sacramento Yard, Sacramento, California.* November 1991.

26. ERM-West. 1991. *Final Investigation Report, Soil Gas and Lead Sampling Program, Residential and Open Space Study Area, Sacramento Yard, Sacramento, California.* November 1991.

27. Ibid.

28. Woodward Clyde Consultants. 1991. *Ground Water Quality Monitoring Report for April 1991, Sacramento Yard, Sacramento, California.* July 1991.

29. ERM-West. 1991. *Health Risk Assessment for Sacramento Yard, Pond/API Separator Area, Sacramento, California.* March 1991.

30. Woodward-Clyde Consultants. 1990. *Final Remedial Action Plan and Closure Plan, Pond and Ditch Site, Sacramento Yard, Sacramento, California, Modified Plan.* August 1990.

31. Woodward-Clyde Consultants. 1990. *Final Remedial Action Plan and Closure Plan,*

Pond and Ditch Site, Sacramento Yard, Sacramento, California, Modified Plan. August 1990.

32. ERM-West. 1991. *Health Risk Assessment for Sacramento Yard, Pond/API Separator Area, Sacramento, California.* March 1991.

33. ERM-West. 1991. *Lagoon Study Area Sampling and Analysis Plan, Sacramento Rail Yard, Sacramento, California.* August 30, 1991.

34. ERM-West, Inc. 1991. *Overall Site Remedial Investigation/Feasibility Study, Shell Workplan, Sacramento Rail Yard, Sacramento, California.* Prepared for the Southern Pacific Transportation Company, prepared by ERM-West, Inc. July 1, 1991.

35. ERM-West, Inc., 1990. *Preliminary Environmental Assessment, Phase I Hazardous Substance Site Investigation of Richards Boulevard Redevelopment Area*, November 12, 1990.

36. Ibid.

37. Woodward-Clyde Consultants, *Draft Remedial Action Plan, Sacramento Station Siteplan area, Sacramento Yard, Sacramento, California,* October 21, 1989.

38. Harding Lawson Associates. 1990. *Preliminary Geotechnical Evaluation Richards Boulevard Redevelopment Area Sacramento, California,* October 17, 1990.

39. Sacramento Housing and Redevelopment Agency. 1990. *Draft Environmental Impact Report, Richards Boulevard Redevelopment Plan,* March 14, 1990.

40. Sacramento County. 1989. *Sacramento County Hazardous Waste Management Plan,* Sacramento County Environmental Management Department and the Planning and Community Development Department, January 24, 1989.

4.14 BIOTIC RESOURCES

4.14 BIOTIC RESOURCES

INTRODUCTION

This chapter describes the plant and animal species within the Planning Area, discusses relevant policies, and examines potential impacts on plant, wildlife, and wetland habitats and on rare, threatened, or endangered species that could result from implementation of the Alternatives.

SETTING

Descriptions of biological resources within the Planning Area are based upon a literature review, use of the Department of Fish and Game's Wildlife Habitat Relations system (WHR), a record search of the California Natural Diversity Database (CNDDB), data from the Sacramento Audubon Breeding Bird Atlas Project,[1] communications with knowledgeable individuals, and field surveys.

Comprehensive field surveys within the Railyards Area were conducted by EIP Associates in 1990 on March 9,[2] August 27,[3] and November 9.[4] On April 18 and 19, 1990, field surveys for the presence of the Valley elderberry longhorn beetle (VELB) within the Railyards Area were conducted for EIP Associates by ECOS Incorporated.[5] A field reconnaissance within the Richards Area was conducted by EIP Associates on August 20, 1991.[6]

Habitats

The Planning Area consists primarily of extensively disturbed and modified vegetation. However, the Planning Area is immediately south of the American River Parkway, a 29-mile long stretch of riparian habitat, and east of the Sacramento River, one of the nation's largest rivers. As a consequence of this location, vegetation within the Planning Area provides greater habitat values than it would otherwise. Many species of wildlife that nest or den in vegetation along the rivers can use the Planning Area as significant foraging habitat.

Habitats on site are classified into three general types according to the multiagency "A Guide to Wildlife Habitats of California":[7] urban, Valley-foothill riparian, and riverine. Within each type, the vegetation and associated wildlife are described in the following section. Figure 4.14-1 shows the distribution of habitat types within the Planning Area. Because the majority of the site is urban, only the riparian and riverine habitats are indicated as distinct areas on Figure 4.14-1. Table 4.14-1 contains a complete list of all plant species observed during field surveys. Table 4.14-2 contains a complete list of all animal species observed during field surveys.

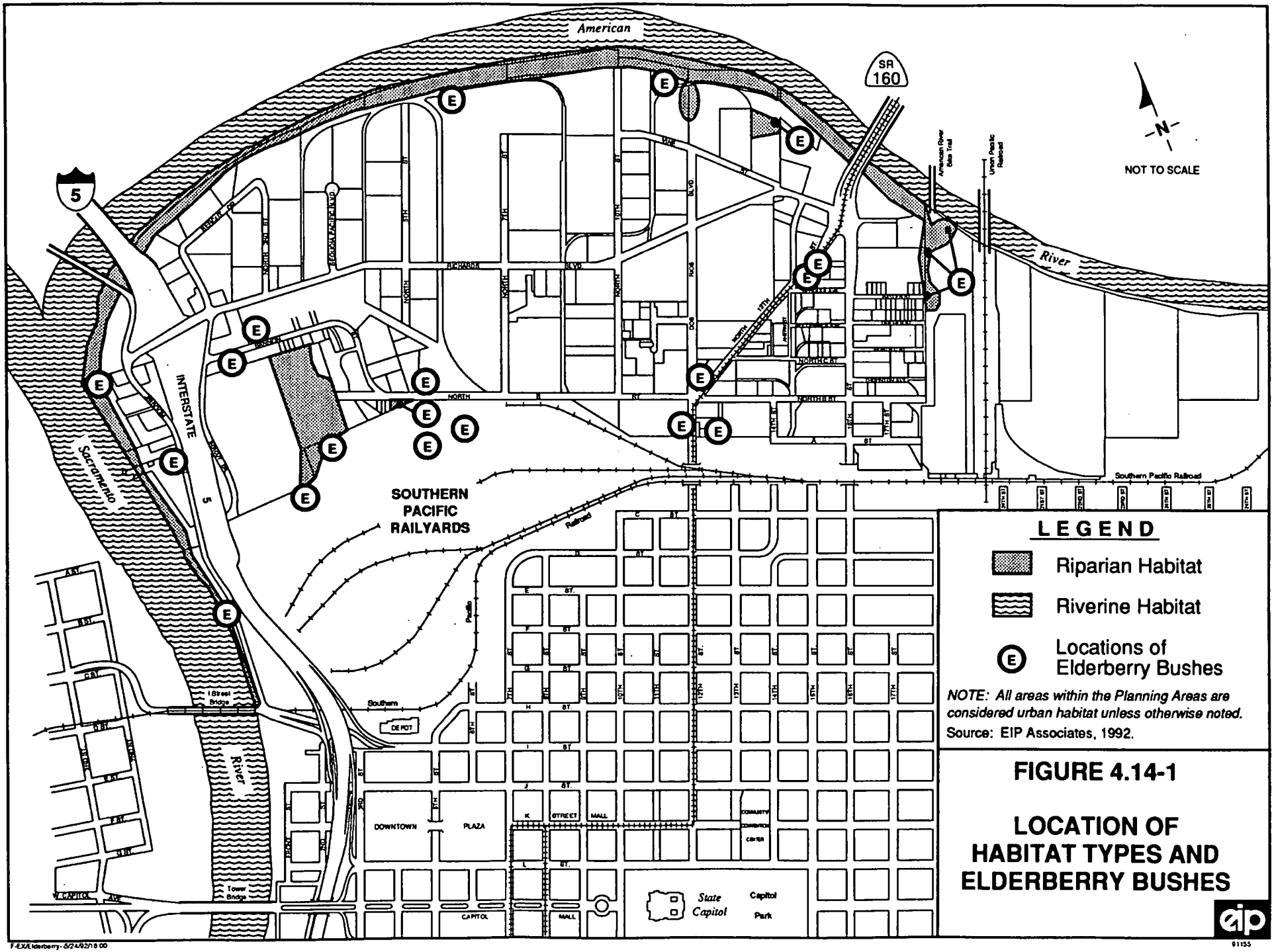

FIGURE 4.14-1

LOCATION OF HABITAT TYPES AND ELDERBERRY BUSHES

TABLE 4.14-1

PLANT SPECIES OBSERVED DURING FIELD SURVEYS
WITHIN THE PLANNING AREA

Common Name	Scientific Name
box elder	*Acer negundo* ssp. *californicum*
tree-of-heaven	*Ailanthus altissima*
white alder	*Alnus rhombifolia*
mugwort	*Artemesia douglasiana*
reed grass	*Arundo donax*
slender wild oat	*Avena barbata*
coyote bush	*Baccharis pilularis*
barberry	*Berberis* sp.
black mustard	*Brassica nigra*
ripgut grass	*Bromus diandrus*
foxtail chess	*Bromus rubens*
hoary-cress	*Cardaria draba*
sedge	*Carex* sp.
yellow star thistle	*Centaurea solstitialis*
button bush	*Cephalanthus occidentalis*
orange	*Citrus* sp.
poison-hemlock	*Conium maculatum*
cotoneaster	*Cotoneaster* sp.
bermuda grass	*Cynodon dactylon*
umbrella sedge	*Cyperus eragrostis*
creeping wild-rye	*Elymus triticoides*
willow herb	*Epilobium paniculatum*
horse tail	*Equisetum* sp.
filaree	*Erodium botrys*
filaree	*Erodium cicutarium*

TABLE 4.14-1

PLANT SPECIES OBSERVED DURING FIELD SURVEYS
WITHIN THE PLANNING AREA

Common Name	Scientific Name
gum tree	*Eucalyptus* sp.
common fig	*Ficus carica*
Oregon ash	*Fraxinus latifolia*
English ivy	*Hedera helix*
sunflower	*Helianthus annuus*
tarweed	*Holocarpha* sp.
foxtail	*Hordeum jubatum*
black walnut	*Juglans hindsii*
prickly lettuce	*Lactuca serriola*
tule pea	*Lathyrus jepsonii* ssp. *californica*
English ryegrass	*Lolium perenne*
lupine	*Lupinus* sp.
ice plant	*Mesembryanthemum* sp.
oleander	*Nerium oleander*
oak mistletoe	*Phoradendron villosum*
Fremont cottonwood	*Populus fremontii*
almond	*Prunus amygdalus*
plum	*Prunus* sp.
valley oak	*Quercus lobata*
wild radish	*Raphanus sativus*
Himalaya-berry	*Rubus procerus*
curly dock	*Rumex crispus*
bank willow	*Salix hindsiana*
willow	*Salix* sp.
Russian thistle	*Salsola kali* var. *tenuifolia*

TABLE 4.14-1

PLANT SPECIES OBSERVED DURING FIELD SURVEYS WITHIN THE PLANNING AREA

Common Name	Scientific Name
elderberry	*Sambucus caerulea/mexicana*
common groundsel	*Senecio vulgaris*
redwood	*Sequoia sempervirens*
milk thistle	*Silybum marianum*
common sowthistle	*Sonchus oleraceus*
Johnson grass	*Sorghum halpense*
chickweed	*Stellaria longipes*
vinegar weed	*Trichostema lanceolatum*
California bay	*Umbellularia californica*
mullein	*Verbascum thapsus*
California wild grape	*Vitis californica*
fan palm	*Washingtonia filifera*

SOURCE: EIP Associates, 1992.

TABLE 4.14-2

ANIMAL SPECIES OBSERVED DURING FIELD SURVEYS
WITHIN THE PLANNING AREAS

Common Name	Scientific Name
BIRDS	
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
black phoebe	*Sayornis migricans*
dark-eyed junco	*Junco hyemalis*
golden-crowned sparrow	*Zonotrichia atricapilla*
house finch	*Carpodacus mexicanus*
house sparrow	*Passer domesticus*
killdeer	*Charadrius vociferus*
mourning dove	*Zenaida macroura*
northern flicker	*Colaptes auratus*
Northern mockingbird	*Mimus polyglottos*
Nuttall's woodpecker	*Picoides nuttallii*
plain titmouse	*Parus inornatus*
purple martin	*Progne subis*
red-tailed hawk	*Buteo jamaicensis*
rock dove	*Columba livia*
ruby-crowned kinglet	*Regulus calendula*
scrub jay	*Aphelocoma coerulescens*
white-crowned sparrow	*Zonotrichia leucophrys*
yellow-billed magpie	*Pica nuttalli*
yellow-rumped warbler	*Dendroica coronata*
MAMMALS	
black-tailed jack rabbit	*Lepus californicus*
California ground squirrel	*Spermophilus beecheyi*
SOURCE: EIP Associates, 1992.	

Urban

Urban habitat exists within developed areas where pre-development vegetation has been removed and new species of plants introduced, intentionally (ornamental species) or inadvertently (weeds). Urban vegetation accounts for most of the habitat acreage present within the Planning Area.

Within the Planning Area, urban habitat consists of discontinuous patches of landscape vegetation and ruderal vegetation. Landscape vegetation consists of numerous species introduced and maintained by humans. Within the Planning Area, widely planted species include London plane tree (*Platanus acerifolia*), almond (*Prunus amygdalus*), oleander (*Nerium oleander*), roses (*Rosa* spp.), English ivy (*Hedera helix*), and lawn grasses (family Gramineae). Ruderal vegetation consists of weedy species capable of maintaining populations within developed areas. It exists on vacant land and other areas receiving little maintenance. Many of these species are annuals or rhizomatous perennials and many are wind- or bird-dispersed. Widespread species within the Planning Area include Bermuda grass (*Cynodon dactylon*), wild oats (*Avena* sp.), Johnson grass (*Sorghum halepense*), ripgut brome (*Bromus diandrus*), tree of heaven (*Ailanthus altissima*), Himalaya berry (*Rubus procerus*), elderberry (*Sambucus mexicana/caerulea*), Russian thistle (*Salsola pestifera*), yellow starthistle (*Centaurea solstitialis*), and filaree (*Erodium botrys, E. cicutarium*).

Urban habitat within the Planning Area contains elements of the Valley-foothill riparian habitat originally present on site. Some cottonwood (*Populus fremontii*), Valley oak (*Quercus lobata*), and California walnut (*Juglans hindsii*) trees have been retained and incorporated into landscape vegetation. Isolated individuals of these species and of box elder (*Acer negundo*) and willows (*Salix spp.*) also exist within some patches of ruderal vegetation.

Urban vegetation provides highly variable wildlife habitat. Where vegetation occurs as very small discontinuous patches, urban vegetation may provide habitat for only a few non-native species such as starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), rock dove (*Columba livia*), and eastern gray squirrel (*Scirius carolinensis*). However, larger expanses of urban vegetation typically provide habitat for a variety of native species including Virginia possum (*Didelphis virginiana*), western grey squirrel (*Sciurus griseus*), American robin (*Turdus migratorius*), mourning dove (*Zenaida macroura*), scrub jay (*Aphelocoma coerulescens*), and northern mockingbird (*Mimus polyglottos*). Large areas of ruderal vegetation can support populations of black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), house mouse (*Mus musculus*), deer mouse (*Peromyscus maniculatus*), harvest mouse (*Reithrodontomys megalotis*), western fence lizard (*Sceloporus occidentalis*), and western toad (*Bufo boreas*). In these areas, many other species also forage on seeds and invertebrates including white-crowned sparrow (*Zonotrichia leucophrys*), golden-crowned sparrow (*Zonotrichia atricapilla*), yellow-billed magpie (*Pica nuttalli*), cliff swallow (*Hirundo pyrrhonota*), and big brown bat (*Eptesicus fuscus*). American kestrel (*Falco sparverius*), black-shouldered kite (*Elanus caeruleus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), and possibly Swainson's hawk (*Buteo swainsoni*) use open patches of ruderal vegetation to forage for small mammals.

Within urban vegetation throughout the Planning Area, elderberry bushes provide known and potential habitat for Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*), a federally listed threatened species. There are clumps of elderberry bushes throughout both the Richards and the Railyards Areas. Elderberry is bird-dispersed, and capable of establishing within any ruderal vegetation, such as alongside roads or in vacant lots. Evidence of VELB use of elderberry bushes has been found within the Planning Area, surrounding urban areas, and the American River Parkway.[8]

Valley-Foothill Riparian

Valley-foothill riparian habitat is found regionally in valleys bordered by sloping alluvial fans, terraces, and lower foothills. It generally occurs where there are deep alluvial soils and a high water table, such as on floodplains or on flat to gently sloping areas adjacent to low-velocity streams.

For many species of wildlife, Valley-foothill riparian habitats provide food, water and cover, as well as migration and dispersal corridors. At least 50 species of amphibians and reptiles occur in lowland riparian systems. Many are permanent residents, while others are transient or seasonal users. As many as 147 species of birds and 35 species of mammals are known to use California's Central Valley riparian systems.

Within the Planning Area, riparian habitat exists in several small patches. This habitat type exists along the Sacramento and American Rivers immediately adjacent to the Planning Area. It is represented by three plant communities: herb-scrub, willow-cottonwood woodland and riparian forest. To an extent, these plant communities reflect the successional stage, or maturity, that the Valley-Foothill riparian habitat has reached at different locations within the Planning Area. This is closely tied to the frequency and intensity of flooding and/or human disturbance of these areas. In addition, there may be areas within the riparian areas on site that are potentially jurisdictional under the U.S. Army Corps of Engineers (COE) definition of wetland.

A riparian herb-scrub community exists where disturbance associated with levee, canal, and agricultural maintenance prevents woodland and forest vegetation from developing. It may be dominated by Himalaya Berry (*Rubus procerus*) which forms dense thickets, or by Johnson grass (*Sorghum halpense*), smartweed (*Polygonum* spp.), curly dock (*Rumex crispus*), wild mustards (*Brassica* spp.), yellow star thistle (*Centaurea solstitialis*), and rip-gut brome (*Bromus diandrus*).

Riparian herb-scrub provides cover and foraging habitat for a variety of wildlife species including black-tailed jackrabbit (*Lepus californicus*), ring-neck pheasant (*Phasianus colchicus*), mourning dove (*Zenaida macroura*), white-crowned sparrow (*Zonotrichia leucophrys*), golden-crowned sparrow (*Zonotrichia atricapilla*), dark-eyed junco (*Junco hyemalis*), savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), deer mouse (*Peromyscus maniculatus*), and house mouse (*Mus musculus*).

A willow-cottonwood community exists where there is periodic flooding and in riparian areas disturbed by human activities. Its composition varies from young Fremont cottonwoods (*Populus*

fremontii) and dense thickets of willows (*Salix* spp.) to a partial cover of cottonwoods with a relatively high cover of Himalaya berry and ruderal herbs.

Willow-cottonwood woodlands provide cover and foraging for numerous animal species including Bewick's wren (*Thyromanes bewickii*), plain titmouse (*Parus inornatus*), rufous-sided towhee (*Pipilo erythrophthalmus*), brown towhee (*Pipilo fuscus*), dark-eyed junco, raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), gray fox (*Urocyon cinereoargenteus*), Pacific treefrog (*Hyla regilla*), and gopher snake (*Pituophis melanoleucus*).

Riparian forest exists on alluvial terraces that have been relatively free from human disturbance. Riparian forest has tree canopy of Valley oak (*Quercus lobata*), Northern California black walnut (*Juglans hindsii*), and cottonwood; a mixed mid-canopy of sandbar and black willow (*Salix hindsiana, S. goodingii*), Oregon ash (*Fraxinus latifolia*), and box elder (*Acer negundo*); and an understory of California rose (*Rosa californica*), elderberry (*Sambucus caerulea/mexicana),* and poison oak (*Toxicodendron diversilobum*). The lower and mid-canopy layers are overgrown by California grape (*Vitus californica*) and Himalaya berry. This community is particularly valuable habitat for many bird species. Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis*), black-shouldered kite (*Elanus caeruleus*), and other raptors often nest in the large trees. Woodpeckers excavate nest holes in live and dead oaks that can subsequently be used by other hole nesting species, such as American kestrel (*Falco sparverius*), white-breasted nuthatch (*Sitta carolinensis*), and western bluebird (*Sialia mexicana*). Oak acorns are important in the diets of many wildlife species such as acorn woodpecker (*Melanerpes formicivorus*), northern flicker (*Colaptes auratus*), scrub jay (*Aphelocoma coerulescens*), and western grey squirrel (*Sciurus griseus*). Oak foliage and bark attract insects that are prey of ash-throated flycatcher (*Myiarchus cinerascens*), bushtit (*Psaltriparus minimus*), Bewick's wren, plain titmouse, and a variety of warblers (family Emberizidae) and vireos (family Virieonidae). Trees on the borders of this habitat provide hunting perches for raptors, which forage in open meadows or agricultural fields adjacent to the riparian forest.

Valley-foothill riparian habitats may fall within the regulatory jurisdiction of the U. S. Army Corps of Engineers (COE). Under Section 404 of the Clean Water Act, the COE has authority to regulate activity that may discharge fill or dredge material into wetlands or other waters of the United States. Any impacts on Valley-foothill riparian habitats may require a permit from COE prior to the start of any work in those areas. Sections 1601 through 1603 of the California Fish and Game Code require that a streambed alteration agreement be obtained from DFG prior to any construction or other activity that may affect the bed, channel, or bank of a river, stream, lake, or riparian (streamside) corridor.

Riverine

Riverine habitats consist of running water originating from some elevated source such as ponds, lakes, springs, or seepage areas. Water flows downward at a rate relative to slope or gradient and the volume of surface runoff or discharge. Riverine habitats are used for reproduction, food, water and cover by many mammals, birds, reptiles, amphibians and invertebrates. Adjacent to

the Planning Area, riverine habitats exist in the Sacramento and the American Rivers (distinct from riparian habitat, occurring on the riverbanks).

Both locally resident and migratory fish species use the Sacramento and American Rivers. Fish residing within the Sacramento and American Rivers include channel catfish (*Ictalurus punctatus*), white catfish (*Ictalurus catus*), hard head (*Mylopharodon conocephalus*), large-mouth bass (*Micropterus salmoides*), red-eared sunfish (*Lepomis microlophus*), Sacramento sucker (*Catostomus occidentalis*), Sacramento squawfish (*Ptychocheilus grandis*), tule perch (*Hysterocarpus traski*), and western sucker (*Catostomus occidentalis*). The Sacramento split-tail (*Pogonichthy macrolepidotus*) spawns in the Sacramento area but lives in the Delta. Anadromous fish species use the Sacramento and American Rivers as migration corridors between the ocean and spawning areas upstream. These species include steelhead trout (*Onocorhynchus mykiss*), chinook salmon (*Onocorhynchus tshawytscha*), striped bass (*Morone saxatilis*), sturgeon (*Acipenser*), and American shad (*Alosa sapidissima*). Although striped bass is an anadromous species, young striped bass are present in the Sacramento area year-round.

The open water zones of the Sacramento and American Rivers provide cover and foraging for bird species. Many species of waterfowl, such as American coot (*Fulica americana*), use the open water zone for resting and escape. Gulls (*Larus* species) forage on open water, and species of insectivorous birds, such as black phoebe (*Sayornis nigricans*) and violet-green swallow (*Tachycineta thalassina*), hawk their prey over the water.

Near shore waters, riverbanks and adjacent riparian vegetation provide several specialized habitats. Steep banks provide nesting habitat for northern rough-winged swallow (*Stelgidopteeryx serripennis*). In the near shore waters, mallard (*Anas platyrhynchos*) and wood duck (*Aix sponsa*) feed upon plants. Green-backed heron (*Butorides striatus*) and belted kingfisher (*Ceryle alcyon*) forage for fish. Fish feed upon "insect drop" from riparian vegetation overhanging the water, and rocky substrates provide habitats for crayfish, sunfish and bass.

Riverine habitat and adjacent Valley-Foothill riparian habitat also serve as migration and dispersal corridors for amphibians, reptiles and mammals. For example, Gilbert's skink (*Eumeces gilberti*) and ring-neck snake (*Diadophis punctatus*) are foothill species that extend their ranges down into the Central Valley along the American River.

Both the American and the Sacramento Rivers are "Navigable Waters of the U. S.," as defined in the Federal Register (33 CFR part 329). Any development within either of these rivers must comply with Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344). Section 10 requires that a permit be obtained from the U. S. Corps of Engineers (COE) to obstruct or alter a Navigable Waters of the U. S. Section 404 requires that a "404 Permit" be obtained from the COE to discharge dredged or fill material into a Waters of the U. S. ("Navigable Waters" are a subset of Waters of the U. S.).

Additionally, the California State Lands Commission has exclusive jurisdiction over the beds of navigable rivers, sloughs, and lakes. The commission has the authority to grant Land Use

Leases, which are required for any proposal to use navigable waterways for any purpose other than dredging (such as bridge piers).

Any construction within the Sacramento or American Rivers will also require a Streambed Alteration Agreement from the California Department of Fish and Game, under Section 1601-1603 of the Fish and Game Code.

Both a 404 Permit and a Streambed Alteration Agreement require specific measures to avoid impacts on fish and wildlife during and following construction. Monitoring the implementation and resulting level of success of these measures will also be required.

To construct a bridge across either river, a bridge crossing permit from the Coast Guard will be required, and possibly a dredging permit from the California Department of Fish and Game and a Land Use Lease from the State Lands Commission.

Special-Status Species

For the purposes of this EIR, the special-status plants and animals include plants on the California Native Plant Society's List 1B, California Department of Fish and Game Species of Special Concern, State or federal candidate species, species listed by the State and/or federal government as rare, threatened, or endangered, and species "fully protected" by the State from taking or possession. Besides referring to injury or death of an animal, the term "take" includes the disruption of nests, burrows, or dens during the breeding season. California Department of Fish and Game Species of Special Concern are species not listed as threatened or endangered by the State, but whose breeding populations in the state have declined severely. In the near future, some of these species could be added to state or federal lists of threatened or endangered species.

Special-status species known to occur within or near the Planning Area are described below, as well as species occurring within the Sacramento region in habitats similar to those within the Planning Area. For each species, legal status, habitat requirements, and potential habitat are noted. Special-status plants are listed in Table 4.14-3 and described below. Special status animals are listed in Table 4.14-4 and described below.

Special-Status Plants

California Hibiscus (*Hibiscus californicus*) is a category 2 candidate for federal listing as threatened or endangered and is on List 1B of the CNPS Inventory. This species flowers from July to September and seed capsules remain on the plant into late fall. It occurs in riparian and freshwater marsh habitat from Butte County to San Joaquin County. The nearest known occurrence of California hibiscus is in a drainage ditch at the intersection of Interstate 80 and West El Camino Avenue in Natomas. Potential habitat for this species may exist along the Sacramento and American Rivers adjacent to the Planning Area.

Delta Tule Pea (*Lathyrus jepsonii* ssp. *jepsonii*) is a category 2 candidate for federal listing as threatened or endangered and is on List 1B of the CNPS Inventory. Delta tule pea is a perennial twining vine occurring in riparian and freshwater marsh habitats. Its known range extends from

TABLE 4.14-3

SPECIAL STATUS PLANT SPECIES

Common Name	Scientific Name	Status			Flowering
		State	Federal	CNPS[1]	
California Hibiscus	*Hibiscus californicus*	--	C2	1B	July-September
Delta Tule Pea	*Lathyrus jepsonii* ssp. *jepsonii*	--	C2	1B	May-June
Northern California Black Walnut	*Juglans hindsii*	--	C2	1B	April-May
Valley Oak	*Quercus lobata*	--	--	4	March-April
Sanford's sagittaria	*Sagittaria Sanfordii*	--	C2	3	May-June

[1] California Native Plant Society.

[2] Status designations as follows:

State Rare (CR), State Threatened (CT), Endangered (CE): California Endangered Species Act of 1971.

Federal Endangered (FE), Threatened (FT), Candidate (C1 - Taxa for which US Fish and Wildlife Service has information to support listing; C2 - Taxa for which the Service requires further study before listing; C3c - Taxa for which occurrence is too widespread and/or not threatened to support listing): Federal Endangered Species Act of 1973.

California Native Plant Society, J.P. Smith, Jr. and K. Berg, eds., 1988, Inventory of Rare and Endangered Vascular Plants of California, Sacramento, CA: List 1B - Plants rare and endangered in California and elsewhere; List 4 - "Watch List", plants of limited distribution, which warrant regular monitoring.

TABLE 4.14-4

SPECIAL STATUS ANIMAL SPECIES

Common Name	Scientific Name	Status
Birds		
American peregrine falcon	*Falco peregrinus anatum*	CE, CFP/FE
Bank swallow	*Riparia riparia*	CT
Black-shouldered kite	*Elanus caeruleus*	CFP
Burrowing Owl	*Athene cunicularia*	CSC
Cooper's hawk	*Accipiter cooperii*	CSC
Long-eared owl	*Asio otus*	CSC
Northern harrier	*Circus cyaneus*	CSC
Purple martin	*Progne subis*	CSC
Sharp-shinned hawk	*Accipiter striatus*	CSC
Short-eared owl	*Asio flammeus*	CSC
Swainson's hawk	*Buteo swainsoni*	CT/2
Tri-colored blackbird	*Agelaius tricolor*	CSC/2
Yellow-billed cuckoo	*Coccyzus americanus*	CE
Mammals		
Ringtail	*Bassaricus astutus*	CFP
Reptiles		
Giant garter snake	*Thamnophis gigas*	CT/1
Fish		
Sacramento split-tail	*Pogonichthys macro lepidotus*	--/2
Winter run Chinook salmon	*Oncorhynchus tshawytscha*	CE/FT
Insects		
Sacramento anthicid beetle	*Anthicus sacramento*	--/2
Sacramento tiger beetle	*Cicindela hirticollis abrupta*	--/2
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	--/FE

[1] Status designations as follows:

CE Listed as endangered in the State of California
CT Listed as threatened in the State of California
CSC California Department of Fish and Game "species of special concern"
CFP A California Department of Fish and Game "fully protected" species, as described in Section 4700 of Chapter 8; Section 5050 of Chapter 2, Division 6, Chapter 1, Section 5515. (NOTE: There are other fully protected species not included on the Special Animal List)
FE Listed by the federal government as Endangered
FT Listed by the federal government as Threatened
1 Category 1 Candidate for federal listing as threatened (taxa which have been officially proposed for federal listing).
2 Category 2 Candidate for federal listing (taxa which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.)
W Watch list. Location information for these taxa is not computerized. The NDDB is currently collecting distribution information but maintains manual files only.

Fresno County to Solano County. Within the Planning Area, no CNDDB records exist for this species. However, a closely related sub-species, *Lathyrus jepsonii* ssp. *californica*, does grow within the Valley-foothill riparian habitat along the American River adjacent to the Planning Area. Although Delta tule pea has not been observed locally, recently discovered occurrences outside its typical habitat (brackish marsh) suggest the possibility that it could occur in wetland habitat along the American River. Therefore, the Valley-foothill riparian vegetation along the American River may contain suitable habitat.

Northern California Black Walnut (*Juglans hindsii*) is on CNPS List 1B and is a category 2 candidate for federal listing as threatened or endangered. Northern California black walnut is accorded this status primarily because natural stands of the tree are rare. Individual Northern California black walnut trees are fairly common in the Central Valley, where they were widely planted during settlement and continue to be planted as a shade tree in both urban and rural areas. Within the Planning Area, Northern California black walnut trees are a component of Valley-Foothill Riparian and are present within urban habitat, particularly within the Richards Area.

Valley Oak (*Quercus lobata*) is on CNPS List 4. Valley oak trees provide many species of wildlife with an important source of nesting and foraging habitat. Within the Richards Area, Valley oaks are present within the Valley-foothill riparian habitats and several oaks have been retained in the landscape vegetation of urban habitats within the Richards Area.

The County of Sacramento has an ordinance (Sacramento County Code Sections 19.12.010 - .270) prohibiting the removal of any native oak greater than 4 inches in diameter at 48 inches above grade without a permit. This ordinance also prohibits all trenching, grading, or placement of fill beneath such oaks without a permit. This ordinance applies to most valley oak trees within the Richards Area and many of the valley oak trees within riparian habitat along the Sacramento and American Rivers adjacent to the Planning Area.

The City of Sacramento does not currently have a tree preservation ordinance plan, but does have a heritage tree ordinance. The City considers trees 32 inches or greater in diameter as heritage trees, regardless of species. Heritage trees are required to be avoided or replanted.

Sanford's Sagittaria (*Sagittaria sanfordii*) is a category 2 candidate for federal listing as threatened or endangered. It is a tuberous, perennial herb of fresh emergent wetlands and occurs from Butte County to Fresno County. There is a historical collection of the species from the vicinity of Sacramento and potential habitat for this species exists along the American River adjacent to the Richards Area.

Special-Status Animals

American Peregrine Falcon (*Falco peregrinus anatum*), a state- and federally-listed endangered species, may forage within the region during the winter. Peregrine falcons typically forage on waterfowl and other birds in and around open water and wetland habitats. This species has not been observed within the Planning Area, but potential habitat for this species exists along the Sacramento and American Rivers and the adjacent portions of the Planning Area.

Bank Swallow (*Riparia riparia*) is a state-listed threatened species. Bank swallows breed between May and July. They dig burrows in steep sandy riverbanks or roadcuts and nest in colonies. Bank swallows forage for insects over open water. Bank stabilization and flood control activities have greatly decreased the habitat available to this species, and it is estimated that the range of bank swallows has decreased by 50 percent since 1900. Over 50 percent of California's existing bank swallow population is along a 210-mile strip of the Sacramento River.

In 1986, a colony of bank swallows was reported nesting near the Richards Area on the south side of the American River near the Business 80 bridge.[9] The U.S. Fish and Wildlife Service surveyed this area in 1987 and 1988 and found rough-winged swallows using the bank. Bank swallows were apparently not using this area.

Black-Shouldered Kite (*Elanus caeruleus*) is a "fully protected" raptor in California. Black-shouldered kites feed on rodents, small reptiles, and large insects in fresh emergent wetlands, annual grasslands, pastures, and ruderal vegetation. They breed between February and October. Unlike other raptors, kites often roost, and occasionally nest, communally; therefore, disturbance of a relatively small roost or nesting area could affect a large number of birds. This species has been observed foraging within the Railyards Area.[10]

Burrowing Owl (*Athene cunicularia*) is a California Department of Fish and Game Species of Special Concern and a "fully-protected" raptor. It is also federally protected under the Migratory Bird Treaty Act (Federal Law 16 USC 703-711). According to this law, burrowing owls may not be possessed or taken in any manner without a special permit. Burrowing owls forage in open habitats for insects, mice, and small birds. They breed between March and August and frequently nest in ground squirrel burrows in berms along paved roads, dirt roads, and channels, and in ruderal vegetation or annual grassland. This species has been observed in Natomas, but not within the Planning Area. Evidence of burrows being used by burrowing owls has not been observed within the Planning Area. However, specific burrowing owl surveys have not been conducted throughout the Planning Area, where suitable habitat does exist in the ruderal vegetation.

Cooper's Hawk (*Accipiter cooperii*) is a State Species of Special Concern. Cooper's hawks breed between March and August. Usually they nest and forage in woodlands or riparian vegetation near water. This species has not been observed within the Planning Area. However, suitable habitat for this species exists along the American and Sacramento Rivers adjacent to the Planning Area.

Long-eared Owl (*Asio otus*), a State Species of Special Concern, may forage within the region during winter. Long-eared owls forage in open habitats for small mammals and birds. They roost in dense thickets within riparian vegetation. This species has not been observed within the Planning Area, but suitable habitat exists within patches of riparian habitat within the Richards Area and along the Sacramento and American Rivers adjacent to the Planning Area.

Northern Harrier (*Circus cyaneus*) is a State Species of Special Concern. Northern harriers breed between April and September and nest on the ground in shrubby vegetation. They hunt in annual grasslands, pastures, fresh emergent wetlands, and some croplands. This species has not been

observed within the Planning Area. Suitable foraging habitat for this species may exist in some of the ruderal vegetation in both Planning Areas.

Purple Martin (*Progne subis*) is a state Species of Special Concern. It is a breeding resident that winters in South America. Purple martins are cavity nesters that have been observed to nest in artificial structures such as nest boxes or the undersides of bridges. Loss of riparian habitat, removal of snags, and competition with starlings for nest cavities has resulted in a decline in numbers of breeding purple martins. There is a colony of martins that is known to use the underside of the I Street on-ramp to Interstate 5, adjacent to the proposed Planning Area. This area has possibly been used by purple martins during the breeding season since 1974.[11]

Sharp-Shinned Hawk (*Accipiter striatus*), a State Species of Special Concern, may forage within the region during the winter. Within the Sacramento region, Sharp-shinned hawks forage in open habitats and roost in woodlands. This species has not been observed within the Planning Area. However, potential foraging habitat for this species exists throughout the ruderal vegetation of the Planning Area, and potential roosting sites exist in the riparian habitat within the Richards Area and adjacent to Planning Area along the Sacramento and American Rivers.

Short-Eared Owl (*Asio flammeus*) is a State Species of Special Concern. Short-eared owls primarily forage for small mammals in open habitats. They breed between March and July and nest on the ground. This species has not been observed within the Planning Area. However, potential habitat for this species exists throughout the Planning Area in ruderal vegetation.

Swainson's Hawk (*Buteo swainsoni*) is listed as threatened by the State of California and is a category 2 candidate for federal listing as threatened or endangered. It is a migratory raptor nesting in or near valley floor riparian habitats during spring and summer months. Suitable nesting habitat for Swainson's hawks exists in all Valley-foothill riparian habitat along the Sacramento and American Rivers adjacent to the Planning Area and in the patches of riparian habitat within the Richards Area. Swainson's hawks feed primarily upon small mammals, birds, and insects. Annual grasslands, some croplands, and other open habitats up to 18 miles away are used for foraging, and are critical requirements for Swainson's hawk nesting habitat. In 1990, 31 Swainson's hawk nests were within 18 miles of the Planning Area.[12] Although no Swainson's hawks have been observed within the Planning Area, they are within the foraging range of numerous Swainson's hawk nests. However, it is highly unlikely that the discontinuous patches of ruderal vegetation within the Planning Area represents significant foraging habitat for this species.

The California Department of Fish and Game considers as significant all impacts to foraging habitat within a 10-mile radius of active nesting territories. The Planning Area lies within 10 miles of several known active nesting territories.[13]

Tricolored Blackbird (*Agelaius tricolor*) is a State Species of Special Concern and a category 2 candidate for federal listing as threatened or endangered. This bird breeds between April and July and prefers to nest in marshes with a heavy growth of cattails or bulrushes. It forages on the ground in grasslands, croplands, and wetlands. Tricolored blackbirds have been observed in

Natomas but not within the Planning Area. Suitable habitat for this species does not exist within the Planning Area.

Yellow-Billed Cuckoo (*Coccyzus americanus*) is a State-listed endangered species. Yellow-billed cuckoo breeds in June and July. It typically nests in dense stands of willow and cottonwood greater than 25 acres in size and at least 300 feet wide. Nearly half of the remaining yellow-billed cuckoos in California live along the Sacramento River north of Sacramento.

Within the surrounding area, yellow-billed cuckoos have not been observed since 1965, the last date cuckoos were observed nearby in Yolo County. Yellow-billed cuckoos have not been observed within the Planning Area nor along the banks of the Sacramento and American Rivers immediately adjacent to the Planning Area. No suitable nesting habitat for yellow-billed cuckoos presently exists within the Planning Area, nor along the Sacramento and American Rivers immediately adjacent to the Planning Area.

Ringtail (*Bassariscus astutus*) is "fully protected" in California from unregulated take or possession. Closely related to raccoons, ringtails feed on mice, woodrats, eggs, carrion, reptiles, invertebrates and soft fruits. This species lives in riparian habitats throughout the Sacramento Valley and has been observed within the Richards Area.[14]

Giant Garter Snake (*Thamnophis gigas*) is listed as threatened by the State of California and is a category 1 candidate for federal listing as threatened. It is among the largest and most aquatic of garter snakes. The species range extends from Butte County to Fresno County. Its habitat includes low-gradient streams, drainage canals, irrigation ditches, and fresh emergent wetland, and the snake is known to use flooded rice fields adjacent to suitable canal and ditch habitat. This species has been observed in Natomas but not within the Planning Area and no suitable habitat for this species exists within the Planning Area.

Sacramento Split-tail (*Pogonichthys macrolepidotus*) is a category 2 candidate for federal listing as threatened or endangered. Though this fish lives primarily within the Delta, Sacramento split-tail spawns in the Sacramento River in early spring (March-April).

Winter Run Chinook Salmon (*Oncorhynchus tshawytscha*) is a state listed endangered species and a federally listed threatened species. This fish passes through the Sacramento area in March to May on its way to spawn in the upper Sacramento River in May to June. The young live in the river until leaving for the ocean in November to March. (Most of the winter run salmon are thought to have originally spawned upstream of the Shasta Dam).

Sacramento Anthicid Beetle (*Anthicus sacramento*) is a category 2 candidate for federal listing as threatened or endangered. This species uses valley-foothill riparian habitat, and potential habitat for this species may exist along the American River adjacent to the Richards Area.

Sacramento Tiger Beetle (*Cicindela hirticollis abrupta*) is a category 2 candidate for federal listing as threatened or endangered. The larvae live in burrows in sand, and the adults inhabit sandy areas around water. Potential habitat exists along the banks of the American River adjacent to the Richards Area.

Valley Elderberry Longhorn Beetle (VELB; *Desmocerus californicus dimorphus)* is a Federally listed threatened species dependent on elderberry shrubs (*Sambucus mexicana/caerulea*) for every stage of its two-year life cycle. VELB adults lay their eggs on elderberry bushes (*Sambucus* spp.). The larvae bore into and feed upon the stems. Emergence of newly formed adults coincides with flowering of the elderberry. After emergence, adults feed upon the elderberry flowers, reproduce, and die.

Within the Planning Area, elderberry is a widespread species and VELB may use many of these elderberry bushes. Within the Railyards Area, one elderberry bush exhibited signs of VELB use, (holes left by the emerging new adults), during the 1990 survey.[15] In 1990, a survey of elderberry bushes just east of the Richards Area found VELB emergence holes in most elderberry bushes.[16] Also, VELB use elderberry bushes in Discovery Park across the American River from the Richards Area. Hence, all elderberry bushes within the Planning Area are potential VELB habitat.

Prior to destruction or removal of VELB habitat, a formal mitigation plan must be submitted to and approved by the United States Fish and Wildlife Service (USFWS). In addition to the guidelines within this preliminary plan, a formal mitigation plan would also include a project description, a specified mitigation site, and a map showing the planned location of transplants and replacement plantings at the mitigation site. Formal plans may be submitted through processes governed by either Section 10 or Section 7 of the Endangered Species Act. Under Section 10, project proponents may apply to the USFWS for an incidental take permit. This application takes approximately two years and, in addition to a mitigation plan, it requires a habitat conservation plan and compliance with NEPA. Under Section 7, if a federal agency is involved in the project it must consult with the USFWS to ensure that its actions do not jeopardize the continued existence of VELB. During this consultation, the USFWS will issue a biological opinion on the project. If the mitigation plan contains sufficient measures to mitigate the project's impacts, this biological opinion may conclude that "no jeopardy" to VELB would result from the project.

City Policies and Ordinances

The City of Sacramento has recognized the Sacramento and American Rivers as significant natural resources. It is Goal C of the City's General Plan to conserve and protect the planned open space areas along the Sacramento and American Rivers. The Sacramento River Parkway Master Plan contains a policy to protect and conserve important wildlife habitats and areas of unique ecological significance. The American River Parkway Plan contains a policy to preserve, protect, interpret, and improve the natural resources of the parkway. All of the Alternatives would retain open space adjacent to the rivers.

The City of Sacramento has a Heritage Tree Ordinance (Article 4, Chapter 45, Sacramento City Code) protecting trees with a circumference greater than 100 inches. This ordinance prohibits construction within the dripline of these trees.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

For the purposes of this EIR, an adverse impact on a biological resource will be considered significant if it causes any of the following:

1) An Alternative diminishes a population of a rare or endangered plant or animal, or substantially diminishes or degrades its habitat. According to CEQA standards, a plant or animal is considered endangered if "its survival or reproduction in the wild are in immediate jeopardy," and considered rare if "... the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens." In addition to species that are officially listed by the State or federal government, or are candidates for federal listing, a plant or animal species is considered to be rare or endangered if there are data that indicate that this species meets the criteria for State listing (CEQA Section 15380). Category 2 candidates would generally be regarded as rare, but not category 3 species. Plants that are on list 1 or 2 of the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California are generally considered to meet these criteria by the California Department of Fish and Game, whereas List 3 and 4 species do not generally meet these criteria.

2) An Alternative substantially interferes with the movement of any resident or migratory fish or wildlife species (CEQA Appendices).

3) An Alternative substantially diminishes or degrades habitat for fish, wildlife, or plants (CEQA Guidelines, section 15065A).

4) An Alternative is unsupportive of the general direction City or County natural resource protection policies or ordinances.

Methods

Biological resources were defined through field surveys, communications with knowledgeable individuals and a literature review. This process is described in detail in the setting of this section. Impacts on these resources were identified through examination of the Alternatives, assuming full buildout. The significance of these impacts was determined using the criteria described above. For significant impacts, mitigation measures were designed to reduce the impacts to less-than-significant levels wherever possible. For impacts that could not be reduced to less-than-significant levels, mitigation measures were designed to offset the impacts as much as possible.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.14-1 Elimination of potential VELB habitat and taking of VELB larvae could occur during construction within the Planning Area.

A-1 Under Alternative 1, development within the Planning Area could remove elderberry bushes, the critical habitat of VELB, and could also take VELB larvae living within the stems of the elderberry bushes. Although fewer elderberry bushes would be removed under this alternative, this is considered to be a ***significant impact.***

A-2 through A-7

Under Alternatives 2 through 7, development within the Planning Area could remove elderberry bushes, the critical habitat of VELB, and could also take VELB larvae living within the stems of the elderberry bushes. This is considered to be a ***significant impact.***

Mitigation Measures

For Alternatives 1 through 7, implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.14-1(a) *Elderberry bushes will be avoided wherever possible. Contractors will be briefed on the requirements necessary to avoid damaging the plant and the possible delays and penalties for not complying with these provisions. Shrubs on or near construction sites will be flagged and fenced. Fenced areas will be signed as follows: "This area is habitat of the Valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Federal Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment. This measure is required for Alternatives 1 through 7.*

4.14-1(b) *Where elderberry bushes cannot be avoided, impacts to VELB habitat will be minimized through transplanting and replacement planting as specified by a formal mitigation plan or habitat conservation plan approved by the United States Fish and Wildlife Service. A preliminary plan for mitigating potential impacts on VELB follows. This measure is required for Alternatives 1 through 7.*

PRELIMINARY VELB MITIGATION PLAN

Mitigation Site

The mitigation site should be as close as possible to the Planning Area to reduce habitat fragmentation. At the mitigation site, existing riparian vegetation should not be removed in the

planting of transplants and replacement plants. Furthermore, to avoid creating pure stands of elderberries, plantings of other riparian species (such as valley oak (*Quercus lobata*), box elder (*Acer negundo*), or willow (*Salix spp.*)) must be intermixed with elderberry plantings. A ratio of 1 to 1 is recommended. Mitigation plantings need to be protected for the indefinite future, either by obtaining a conservation easement for the mitigation site or purchasing the property and deeding it to a government entity that will preserve the habitat. The USFWS must approve the mitigation site prior to mitigation.

Transplantation

Where elderberry shrubs cannot be avoided, it is preferable that they be transplanted to an approved mitigation site. The USFWS requires that all plants with evidence of beetle use be transplanted to an approved mitigation site. At the Service's discretion, shrubs may be exempted from this requirement if they are difficult to remove due to access problems or are unlikely to survive transplantation.

The following guidelines will be followed to minimize the mortality of transplanted shrubs:

- Transplanting will take place when the plants are dormant, approximately November through the first two weeks in February.
- Prior to removing the shrubs to be transplanted, holes of suitable size (about 3 to 4 feet deep and 6 feet wide) will be excavated at the mitigation site to receive the plantings. The transplant holes will be spaced a minimum of 25 feet apart.
- Stones greater than 3 inches across will be removed from the excavated soil prior to using it for backfill.
- Shrubs will be cut back to 3 to 6 feet from the ground or to 50 percent of their height (whichever is greater) by removing branches and stems above this height.
- Cut branches and stems will be placed in a pile next to where the elderberry is transplanted.
- Plants will be dug up using a Vermeer Tree Spade, back hoe, front end loader, or other suitable equipment, taking as much of the root ball as possible. Shrubs will be replanted immediately at the mitigation site.
- Plants will be moved only by the root ball.
- The root ball will be wrapped in burlap and secured with wire. Additionally, the root ball will be kept moist and shaded at all times.
- Burlap and wire will be removed and the transplant placed in the center of the excavated hole with the root ball level. The hole should be back filled with soil and compacted sufficiently so that settlement does not occur.

- A circular water retention basin will be constructed from the excavated earth six to 10 feet in diameter and 12 inches high. It must be level.
- The soil will be saturated after the shrub is transplanted and the watering basin constructed.
- No fertilizers, supplements, pesticides, or paint on the tips of stems will be used.

Replacement

To mitigate damage to VELB habitat, the USFWS requires replacement plantings. For each elderberry stem greater than an inch in diameter destroyed or transplanted, two to four additional replacement plantings must be made at the mitigation site. The plantings may be rooted cuttings or seedlings. Together with the transplanted elderberry, these replacements create ratios of three to five stems planted at the mitigation site for each stem removed from the affected site. The 3 to 1 ratio is required by the USFWS for impacts on VELB habitat where beetles are present in less than 50 percent of the bushes. The 5 to 1 ratio is required by the USFWS for impacts on good quality habitat with beetle emergence holes present in the majority of the elderberry clumps. Currently, the elderberry bushes in the Planning Area do not represent such high quality habitat and beetle emergence holes are present in only one clump. However, as development in the Planning Area may be phased over several decades, the quality of habitat may be higher in the future when it is actually affected.

The following guidelines will be followed to minimize mortality of the replacement plantings:

- Replacement stock will be obtained from sources as close to the mitigation site as possible.
- Replacement planting will be conducted from December through the first two weeks of February.
- Seedlings or rooted cuttings will be planted in groups of four or less, each plant 18 inches to two feet apart. Groups will be separated by at least 25 feet.
- Holes for each plant will be augured two feet deep.
- Stones greater than three inches across will be removed from the excavated soil prior to using it for backfill.
- Prior to planting, broken, circling, or matted roots will be removed from replacement plants.
- Immediately after plants have been placed in holes and holes have been backfilled with soil, soil will be soaked with water.

- Watering basins four to five feet in diameter and eight inches high will be created around each group of plants.

- A water-penetrable weed control mat that is not ultraviolet light degradable will be laid over each group of four seedlings and held down with erosion control staples.

Irrigation

Initially, the root system of the planted elderberries will not be able to tap a large enough volume of soil to provide the plants with adequate water throughout the growing season. Irrigation will allow the plants to survive until their root systems are large enough to sustain them.

An irrigation system will be installed at the mitigation site to water both the transplanted mature plants and the replacement plants. The system will be installed in conjunction with the plantings so that water can be supplied to the plants as soon as water stress occurs in the spring following planting. A system with a stream type bubbler head (a "spider head") within each watering basin is recommended.

Recommended irrigation schedules are shown in Table 4.14-5. Water application will be monitored and adjusted as necessary. The rate (gallons per hour) and duration of irrigation must be adjusted to allow deep percolation of water throughout the root zone of all plants within the watering basin. The frequency of irrigation must be adjusted to ensure that plants are not damaged by water stress between waterings.

Irrigation will be continued for three growing seasons. Irrigation will be cut back over the three years and the effects monitored to ensure successful establishment of the plants.

Monitoring

All plantings at the mitigation site will be maintained and monitored for a period of 10 years. Damages to the irrigation system will be repaired and weeds will be removed as necessary. Plants that die or appear stunted or otherwise unhealthy will be replaced on an annual basis.

The survival and growth of the plantings will be monitored each April. For each plant, survival, height, number of stems, and stem diameters will be recorded. These data will be summarized in an annual report to the USFWS which will also include the previous year's irrigation schedule and a site map showing the plants and their status.

A minimum of 80 percent of the original transplants and replacement plantings must be alive and vigorous after 10 years. Maximum acceptable mortality without replacement is 5 percent of the original plantings after the first year, 10 percent after the second year, and 15 percent thereafter.

TABLE 4.14-5
RECOMMENDED IRRIGATION APPLICATION RATES

	April		May		June		July		August		September	
	# of Apps.	Amount	# of Apps.	Amount	# of Apps.	Amount	# of Apps.	Amount	# of Apps.	Amount	# of Apps.	Amount
First Growing Season												
Mature Transplants	2	30 gals.	2	30 gals.	3	30 gals.	4	30 gals.	4	30 gals.	3	30 gals.
Individual Seedlings	2	4 gals.	3	4 gals.	4	4 gals.	4	4 gals.	4	4 gals.	3	4 gals.
Second Growing Season												
Mature Transplants	1	30 gals.	1	30 gals.	2	30 gals.	3	30 gals.	3	30 gals.	3	30 gals.
Individual Seedlings	2	4 gals.	2	4 gals.	3	4 gals.	4	4 gals.	4	4 gals.	3	4 gals.
Third Growing Season												
Mature Transplants	1	30 gals.	1	30 gals.	1	30 gals.	2	30 gals.	2	30 gals.	2	30 gals.
Individual Seedlings	1	6 gals.	1	6 gals.	2	6 gals.	2	6 gals.	2	6 gals.	2	4 gals.

Apps. = Applications
Gals. = Gallons

Source: EIP Associates, 1991.

4.14-2 Valley oak trees (*Quercus lobata*) could be removed or damaged during construction within the Planning Area.

A-1 Under Alternative 1 development within urban habitat could remove native oak trees greater than six inches in diameter at 48 inches above grade. Although this impact is substantially smaller than the removal of native oak trees from within riparian habitat (as could occur under Alternatives 2 through 6), this is still considered a ***significant impact.***

A-2 through A-7

Under Alternatives 2 through 7, development within urban and riparian habitat could remove native oak trees greater than six inches in diameter at 48 inches above grade. This is considered a ***significant impact.***

Mitigation Measures

For Alternatives 1 through 7, implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.14-2(a) *All native oaks greater than six inches in diameter at 48 inches above grade that are approved for removal or are critically damaged during construction shall be replaced by a greater number of the same species. At a minimum, one tree shall be planted for each inch in the diameter of the removed tree at 48 inches above grade. The exact size and number of replacement trees shall be determined by the reviewing City body. A qualified biologist shall monitor trees during construction and the following spring, develop a revegetation plan, and monitor the growth and survival of the newly planted trees. All revegetation plans shall require monitoring the newly transplanted trees for at least five years and the replacement of all transplanted trees that die during that period. This measure applies to Alternatives 1 through 7.*

4.14-2(b) *Prior to project grading, highly visible temporary construction fencing shall be installed one foot outside the driplines of trees to be preserved on the property, and fencing shall not be removed until construction is completed. Vehicular parking and stockpiling of materials within the dripline of these trees to be preserved shall be prohibited. Any limbing or removal of trees near trees that are to be retained shall be conducted by an arborist certified by the International Society of Arborists. No trenching shall be allowed within the driplines of trees to be preserved. No fill shall be placed or cutting allowed within the driplines of these trees. No paving or irrigated landscaping shall be allowed within the driplines of these trees. This measure applies to Alternatives 1 through 7.*

4.14-3 Construction of the Interstate 5 improvements and other construction activity associated with the project could result in the loss of a breeding colony of purple martins.

A-1 and A-5

Under Alternatives 1 and 5, construction of the I-5 improvements would not take place. Because the actual nest site would not be removed under these alternatives, the impact would be considerably smaller than under Alternatives 2,3,4,6, and 7. Nonetheless, construction and increased human activity near the breeding colony could result in abandonment. This is considered to be a ***significant impact.***

A-2,through 4, 6 and 7

Under Alternatives 2, 3, 4, 6, and 7, construction of the Interstate 5 improvements could take an active breeding colony of purple martins. This is considered a ***significant impact.***

Mitigation Measures

For Alternatives 1 and 5, implementation of the following mitigation measure would reduce the above impacts to a *less-than-significant level.*

4.14-3(a) *No construction shall be conducted within 500 feet of the edge of the purple martin colony (as demarcated by the nest hole closest to the construction activity) during the breeding season from April 15 to August 1. In addition, no equipment shall be parked or stored beneath the I Street on-ramp or the Interstate 5 overpass at the I Street on-ramp during the breeding season (April 15 to August 1). This measure is required for Alternatives 1 through 7.*

For Alternatives 2, 3, 4, 6 and 7, implementation of the following mitigation measures would reduce the impacts to a *less-than-significant impact.*

4.14-3(b) *All construction on the I Street on-ramp and the Interstate 5 overpass near the I Street on-ramp shall be conducted between August 1 and April 14 (outside the breeding season). This measure is required for Alternatives 2, 3, 4, 6 and 7.*

4.14-3(c) *Reconstruction of the I Street on-ramp and the Interstate 5 overpass shall include material on the underside that would be suitable for use as nesting sites by purple martins, in order to replace the nest holes lost during the construction. The suitability of a given material to provide nest sites shall be determined by a qualified biologist. This measure would be required for Alternatives 2 through 4, 6 and 7.*

4.14-4 During the breeding season (February 15 to September 15), removal of trees or disturbance from construction activity could take an active raptor nest.

A-1 Under Alternative 1 removal of trees or disturbance from construction activity in or near riparian habitat during the breeding season (February 15 to September 15) could take an active raptor nest. Because little or no riparian habitat would be eliminated under this

alternative, this impact would be considerably smaller than under Alternatives 2 through 7. Nonetheless, this is still considered a ***significant impact.***

A-2 through A-7

Under Alternatives 2 through 7, removal of trees or disturbance from construction activity in or near riparian habitat during the breeding season (February 15 to September 15) could take an active raptor nest. This is considered a ***significant impact.***

Mitigation Measures

For Alternatives 1 through 7, implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.14-4(a) *To avoid taking active raptor nests, necessary tree removals within riparian habitat shall be conducted between September 15 and February 15. This measure would be required for Alternatives 1 through 7.*

4.14-4(b) *Prior to any construction within 500 feet of riparian habitat, a raptor nest survey shall be conducted of all riparian habitat within 500 feet of the construction site. A copy of this pre-construction survey shall be submitted to DFG and the City of Sacramento. If an active raptor nest is identified on-site, specific mitigation measures shall be developed in consultation with DFG. A 500-foot buffer shall be maintained between the nest and construction activity until DFG approves of mitigation measures. This measure is required for Alternatives 1 through 7.*

4.14-5 Marginally suitable potential foraging habitat for Swainson's hawks would be eliminated by development within the Planning Area.

The Swainson's hawk forages in open grassland or in various croplands (alfalfa, row crops, and others), and the Planning Area is within the foraging territories of at least 31 pairs of nesting Swainson's hawks. However, this species has not been observed foraging within the Planning Area, and it is very unlikely that it uses the highly disturbed ruderal habitats that occur as discontinuous patches in the Planning Area. Even if it forages in these areas occasionally, this habitat does not constitute an important acreage of foraging territory, so development of the Planning Area under Alternatives 1 through 7 would result in a ***less-than-significant impact*** on Swainson's hawk foraging habitat.

Mitigation Measures

4.14-5 *None required.*

4.14-6 Wetlands within the Planning Area could be filled due to development within the Planning Area.

Areas that may meet U.S. Army Corps of Engineers jurisdictional criteria for wetlands occur within the Valley-foothill riparian habitats of the Planning Area. The location of the riparian areas that may contain potential wetlands are indicated in Figure 4.14-1. Additionally, important habitat values occur in areas of wetland vegetation that might not meet the Corps definition of jurisdictional wetland, but would be regarded as wetland or critical adjacent habitat by CDFG or other biologists. Accordingly, in this analysis, the significance of potential direct impact on wetlands is not limited by Corps jurisdictional status. Important wetland habitat could exist in any area of riparian habitat within the Planning Area.

A-1 Under Alternative 1, wetlands within the Planning Area could be filled. Although considerably less wetlands would likely be filled under this alternative than under Alternatives 2 through 7, fill of any wetlands is considered a ***significant impact.***

A-2 through 4,6 and 7

Under Alternatives 2, 3, 4, 6 and 7, wetlands within the Planning Area could be filled. Wetlands along the Sacramento River could also be filled to construct the amphitheater and the rail bridge. This is considered a ***significant impact.***

A-5 Under Alternative 5, wetlands within the Planning Area could be filled. Although less wetlands would likely be filled under this alternative than under Alternatives 2, 3, 4, and 6, fill of any wetlands is considered a ***significant impact.***

Mitigation Measures

For Alternatives 1 through 7, implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.14-6(a) *Before project-specific site designs are finalized, a wetland delineation shall be conducted to precisely delineate and map wetlands on or near proposed development areas. To the extent possible, wetlands shall be preserved. This measure is required of Alternatives 1 through 7.*

4.14-6(b) *Where avoidance is not possible, compensation for wetland fills shall be specified in wetland mitigation plans to be submitted with project maps and descriptions and, if necessary, to the U.S. Army Corps of Engineers for permit applications. This measure is required for Alternatives 1 through 7. Essential elements of these plans will include but not necessarily be limited to the following provisions:*

a. All wetland acreage to be affected shall be replaced by the creation of an equal or greater acreage of new wetlands.

b. Replacement shall be "in kind."

c. *New wetland habitat shall be constructed adjacent to existing habitat of the same type.*

d. *Revegetation shall employ species native to California and typical of the project region. To the extent practical, planting stock shall be derived from wetland areas to be filled or by propagation from other plants on site.*

e. *Created and preserved wetlands shall be protected from developed areas by a buffer zone. Typically, the width of the buffer zone is determined on a case-by-case basis. The minimum width is 50 feet, and can be as wide as 200 feet, depending on adjacent land uses and the type and quality of the wetland habitat.*

f. *Created wetlands shall be monitored for a period of five years following the completion of planting, and appropriate remedial measures shall be implemented if success criteria stipulated in the wetland mitigation plan are not met.*

4.14-7 Northern California black walnut trees could be removed or damaged during construction within the Planning Area.

A-1 through A-7

Under Alternatives 1 through 7, Northern California black walnut trees could be removed or damaged during construction within the Planning Area. Although Northern California black walnut is on CNPS List 1B and is a category 2 candidate for federal listing as threatened or endangered, the species survival and reproduction within the Sacramento area are not in immediate jeopardy. Within the Planning Area, it is abundant in Valley-Foothill Riparian habitat and frequently occurs on vacant land. Because only a small portion of the local population and its habitat would be affected by development within the Planning Area, this is considered to be a ***less-than-significant impact.***

Mitigation Measures

4.14-7 *None required.*

Impacts Due to Development in the Richards Area Only

4.14-8 Riparian habitat quality could be adversely affected by disturbance resulting from the increased access provided by a vehicular parkway along the river, and the human and domestic pet population of developed areas within the Richards Area.

As shown in Figure 4.14-1, riparian habitat is found along the entire American River. In addition, a small area immediately east of the water treatment plant contains riparian habitat which may have originally been adjacent to the historic river course (see Figure 4.1-2 in section 4.1, Land Use). Trampling of vegetation, mortality caused by cats and dogs, and disruption of breeding (particularly for ground-nesting birds) would substantially degrade the habitat for numerous species.

A-1 Alternative 1 would not create substantially higher levels of disturbance from the activities of people and domestic pets because neither access to the river nor the population within the Richards Area would increase substantially. This is considered a ***less-than-significant impact.***

A-2 and A-3

Under Alternatives 2 and 3, higher levels of disturbance from the activities of people and domestic pets would result from increased access to the river and an increased population within the Richards Area. These alternatives would result in higher levels of disturbance than Alternatives 1, 4, 5, 6, and 7, because they proposed more residential units in areas adjacent to the river. This increase in disturbance could have an adverse effect on the value of Valley-Foothill riparian vegetation as habitat for plants and wildlife. This is considered a ***significant and unavoidable impact.***

A-4 Under Alternative 4, higher levels of disturbance from the activities of people and domestic pets would result from increased access to the river and an increased population within the Richards Area. Because of the number of proposed residential units in areas adjacent to the river, this alternative would result in higher levels of disturbance than Alternatives 1, 6, and 7, and lower levels of disturbance than Alternatives 2, 3, and 5. This increase in disturbance could have an adverse effect upon the value of Valley-Foothill riparian vegetation as habitat for plants and wildlife. This is considered a ***significant and unavoidable impact.***

A-5 Under Alternative 5, higher levels of disturbance from the activities of people and domestic pets would result from increased access to the river and an increased population within the Richards Area. Because of the number of proposed residential units in areas adjacent to the river, this alternative would result in higher levels of disturbance than Alternatives 1, 4, 6, and 7, and lower levels of disturbance than Alternatives 2 and 3. This increase in disturbance could have an adverse effect upon the value of Valley-Foothill riparian vegetation as habitat for plants and wildlife. This is considered a ***significant and unavoidable impact.***

A-6 Under Alternative 6, higher levels of disturbance from the activities of people and domestic pets would result from increased access to the river and an increased population within the Richards Area. Because of the number of proposed residential units in areas adjacent to the river, this alternative would result in higher levels of disturbance than Alternatives 1 and 7, and lower levels of disturbance than Alternatives 2, 3, 4, and 5. This increase in disturbance could have an adverse effect upon the value of Valley-

Foothill riparian vegetation as habitat for plants and wildlife. This is considered a ***significant and unavoidable impact.***

A-7 Under Alternative 7, higher levels of disturbance from the activities of people and domestic pets would result from increased access to the river and an increased population within the Richards Area. This alternative would result in lower levels of disturbance than Alternatives 2, 3, 4, 5, and 6 because it has fewer proposed residential units in areas adjacent to the river. This increase in disturbance could have an adverse effect upon the value of Valley-Foothill riparian vegetation as habitat for plants and wildlife. This is considered a ***significant and unavoidable impact.***

Mitigation Measures

No mitigation measures are necessary for Alternative 1. For Alternatives 2 through 7, the following mitigation measure would reduce the above impacts, *but not to a less-than-significant level.*

4.14-8 *Landscape the area between the American River Parkway and the base of the levee with native species present in the riparian habitat along the American River. Plantings within this area shall be designed by a qualified biologist, and will include but not be limited to: Quercus lobata, Juglans hindsii, Acer negundo, Salix hindsiana, Cephalanthus occidentalis, and Rosa californica. This measure is required of Alternatives 1 through 7.*

Impacts Due To Development in the Railyards Area Only

4.14-9 Riparian habitat could be fragmented by bridge or amphitheater development within the Southern Pacific Railyards Plan Area.

Under all Alternatives except the No Project Alternative, an amphitheater would be constructed along the Sacramento River. This amphitheater would isolate a small stretch of riparian habitat along the east bank of the Sacramento River. Under all Alternatives except the No Project Alternative and Alternative 5, a new rail bridge would be constructed across the Sacramento River. This bridge could bisect the corridor of riparian habitat along both sides of the Sacramento River, which may substantially interfere with wildlife movement through this area.

As noted in the setting section, permits that may be required for the bridge include: Corps permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act; a DFG Streambed Alteration Agreement pursuant to Sections 1601-1603 of the fish and Game Code; and a Land Use Lease from the State Lands Commission.

Permits that may be required for the amphitheater may include: a Corps Section 404 permit and a DFG Streambed Alteration Agreement.

A-1 Under Alternative 1 riparian habitat would not be fragmented. This is considered a ***less-than-significant impact.***

A-2 through 4, 6 and 7

Under Alternatives 2, 3, 4, 6 and 7, the corridor of riparian habitat along the Sacramento River would be bisected by the proposed bridge, which may substantially interfere with wildlife movement through this area. This is considered a ***significant impact.***

A-5 Under Alternative 5, the corridor of riparian habitat along the Sacramento River would not be bisected by a new bridge. A small stretch of riparian habitat would still be isolated by the construction of the amphitheater. This may substantially interfere with wildlife movement through the area. This is considered a ***significant impact.***

Mitigation Measures

For Alternatives 2, 3, 4, 5, 6, and 7 implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.14-9(a) *The proposed bridge shall be designed to allow for a continuous corridor of riparian vegetation between the water's edge and the bridge, so that wildlife can pass along the riverbank without crossing fences or pavement. The riparian corridor shall be 50 feet wide or left at its existing width, whichever is less. This measure is required for Alternatives 2 through 7.*

4.14-9(b) *All of the necessary permits shall be acquired, and associated mitigation measures developed and implemented, prior to construction of the bridge or amphitheater. This measure is required for Alternatives 2 through 7.*

4.14-9(c) *To the extent possible, a corridor of riparian habitat shall be maintained or created to connect riparian habitat on either side of the amphitheater. This measure is required for Alternatives 2 through 7.*

One way of creating a corridor would be to have a raised walkway to the amphitheater, beneath which riparian habitat could be recreated (under the supervision of a biologist experienced in the revegetation of native habitats) and protected form public access.

4.14-10 Some riverine habitat could be eliminated by development within the Railyards Area.

Under all Alternatives except Alternative 1, the construction of an amphitheater along the Sacramento River would eliminate riverine habitat. Under all Alternatives except the No Project Alternative and Alternative 5, the construction of a new rail bridge across the Sacramento River could eliminate small areas of riverine habitat. Neither of these structures nor the construction activities involved in producing them will affect anadromous fish species.[17] However, as noted in the Setting section, and Impact 4.14-9, bridge and amphitheater construction may require permits from agencies including the Corps, DFG, and the State Lands Commission.

A-1 Under Alternative 1, no aquatic habitat would be eliminated by development within the Planning Area. This is considered a ***less-than-significant impact.***

A-2 through 4, 6 and 7

Under Alternatives 2, 3, 4, 6 and 7, development would eliminate some aquatic habitat to construct an amphitheater and a new rail bridge. Due to the small area affected relative to the total habitat available locally, no species would have its habitat substantially diminished or degraded. This is considered a ***less-than-significant impact.***

A-5 Under Alternative 5, development would eliminate some aquatic habitat to construct an amphitheater. Due to the small area affected relative to the total habitat available locally, no species would have its habitat substantially diminished or degraded. This is considered a ***less-than-significant impact.***

Mitigation Measures

4.6-10 *None required*

Cumulative Impacts

4.14-11 Development within the Planning Area will contribute to the continued loss of areas of open ruderal vegetation used as foraging habitat by wildlife.

A-1 through A-7

As mentioned in the Setting section, the Planning Area consists of graveled and paved land. There are, however, open areas of ruderal vegetation within the urban mosaic, especially just north of the railyards and in the eastern part of Richards Area adjacent to the river. Because of the location of the Planning Area, many species of wildlife that nest or den along the Sacramento River or in the American River Parkway may use the Planning Area as foraging habitat. Under all alternatives (1-7), loss of even this marginal foraging habitat, in the context of the ongoing regional urbanization of land along these rivers, is a ***significant impact.***

Mitigation Measures

For Alternatives 1 through 7, implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.14-11(a) *Parks and open space shall be developed in consultation with a landscape specialist/biologist familiar with the use of species native to the Sacramento Valley region to enhance wildlife habitat values. They shall emphasize unmanicured open spaces with native grass and forb species that will support and include native rodents as a prey base for raptors and other predators. Any open areas around the detention basin shall be vegetated with native species and left*

unmanicured to provide additional foraging habitat. This measure is required for Alternatives 1 through 7.

Proposed project plans include 85-140 acres of parkland and open space. If these areas (especially the proposed parkway along the river) are landscaped with native species, including portions that are unmanicured native grassland, the increase in the habitat value of open space will offset the loss of existing open areas containing ruderal vegetation.

4.14-11(b) *Landscaping around all parts of project development shall emphasize native California species typical of the Sacramento Valley region. This measure is required for Alternatives 1 through 7.*

4.14-12 Project development could contribute to the continued loss of riparian habitat.

A-1 through A-7

The Planning Area lies within the historic range of the Sacramento Valley riparian forests. Since the 1850s, the riparian forests along the Sacramento River and its tributaries have been reduced from approximately to 775,000 acres to less than 12,000.[18] Historical descriptions of the Sacramento riparian forests in the 1800s characterized the riparian forests as non-uniform in width, ranging from 300 yards to five miles. According to these historical accounts, the forests formed continuous stands flanking the Sacramento in some areas; however, large dense clumps of tree stands were more common.[19] As a result of settlement the Sacramento Valley, the riparian woodlands were cleared for farming, lumber, flood control and riparian development.

Currently along the Sacramento River, continuous stands of riparian forests do exist, but continued development and modifications along the river have greatly diminished this resource. The forested zones along the river, sloughs, and streams have been reduced to remnants of the once extensive riparian woodlands. Generally, the remaining fragments form a belt less than 100 yards wide, and are largely confined to bank slopes.[20] The remaining stands generally provide high value habitat for numerous riparian wildlife species. Continued loss of riparian habitat is considered a ***significant impact.***

Mitigation Measures

For Alternatives 1 through 7, implementation of the following mitigation measures would reduce the impacts to a *less-than-significant level.*

4.14-12(a) *To the extent possible, combine avoidance and restorative strategies to ensure no net loss of riparian habitat within the Planning Area. This measure is required for Alternatives 1 through 7.*

4.14-12(b) *Where 4.14-12(a) is not fully effective, the developer shall use acquisition and planting techniques to ensure restoration of productivity equivalent riparian habitat elsewhere in the same river reach. This measure is required for Alternatives 1 through 7.*

4.14-12(c) *Where 4.14-12(a) and (b) are not fully effective, the developer shall extend strategy 4.14-12(b) to the full Planning Area. Replacement through acquisition or restoration of riparian habitat outside the Planning Area is not recommended, because it does not respond to the loss of local habitat productivity. Strong emphasis should be placed on exhausting possibilities under strategy 4.14-11(a), before strategies 4.14-12(b) and (c) are considered. This measure is required for Alternatives 1 through 7.*

4.14-12(d) *Experts from the California Department of Fish and Game and the U.S. Fish and Wildlife Service shall be consulted with respect to equivalent riparian habitat productivity. This measure is required for Alternatives 1 through 7.*

ENDNOTES

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11. EIP Associates conversation with Dan Airola. March 23, 1992.

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14. Belluomini, L. and G.R. Trappe. 1984. *Ringtail distribution and abundance in the Central Valley of California*, pages 906-914 in R.E. Warner and K.M. Hendrix, editors, California Riparian Systems, University of California Press, Berkeley.

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19. Kenneth Thompson, Department of Geography, University of California, Davis. 1977. *Riparian Forests of the Sacramento Valley*, University of California, Davis, Symposium, May 14, 1977.

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4.15 WATER SUPPLY

4.15 WATER SUPPLY

INTRODUCTION

This section examines the water facilities that would be required to meet the domestic and fire water demand resulting from development of any of the Alternatives. Water service within the city limits of Sacramento is supplied by the Department of Utilities, Division of Water. The City of Sacramento has an ample supply of water to meet its current water demands and the water demands generated by the Alternatives evaluated in this EIR. The City receives the majority of its water from the Sacramento and American Rivers.

SETTING

Water Availability

The City of Sacramento has water rights to 326,800 acre-feet of water per year (AFY) from the Sacramento and American Rivers. Of this, the Sacramento Municipal Utility District (SMUD) has rights to 15,000 AFY. Therefore, the City's available surface water supply is 311,800 AFY. The 1990 total surface water demand city-wide was 100,000 acre-feet (32 percent of available water rights). This equates to an average daily flow of approximately 89 million gallons per day (mgd).

In addition to surface water, the City has groundwater sources. A Groundwater Management Plan Study is currently being prepared for the City. This study will evaluate alternative methods of jointly managing groundwater and surface water resources, and will consider ways to reduce surface water demand in dry years.

The City's current annual water rights are estimated to be adequate to meet increased demands in the time frame covered in the 1988 Sacramento General Plan Update, which extends to 2006. The City will continue to have rights to meet the current demand, but could lose the portion of Sacramento River water rights that is not used. In 1988, the State extended to the City its water rights for another 10 years to preclude this possibility. The original deadline for the requirement of full use of the Sacramento River water rights was 1960. This deadline has been extended five times.

Water Supply Capacity

Water Treatment Plant Capacity

The City operates three water diversion and treatment facilities: the Sacramento River, E.A. Fairbairn and Riverside Water Treatment Plants. The Sacramento River Water Treatment Plant has a capacity of 135 mgd. The E.A. Fairbairn Water Treatment Plant has a capacity of 91 mgd. Together with the Riverside Water Treatment Plant's 15 mgd capacity, the City's water treatment capacity is 241 mgd.

The Sacramento River Water Treatment Plant is located within the Richards Area, south of Bannon Street and east of Interstate 5. A recently completed plant expansion is intended to supply future development in the Natomas area. However, since all three treatment plants jointly serve the interconnected distribution system, one plant is not dedicated to serve a specific area. Also, since development in the Natomas area has slowed due to restrictions on development in floodplains and recent business cycles, the plant capacity targeted for the Natomas area may not be needed as early as was anticipated.

In August of 1991, the City and County of Sacramento created the 'City-County Office of Water Planning' (CCOWP). The stated objective of this new agency is:

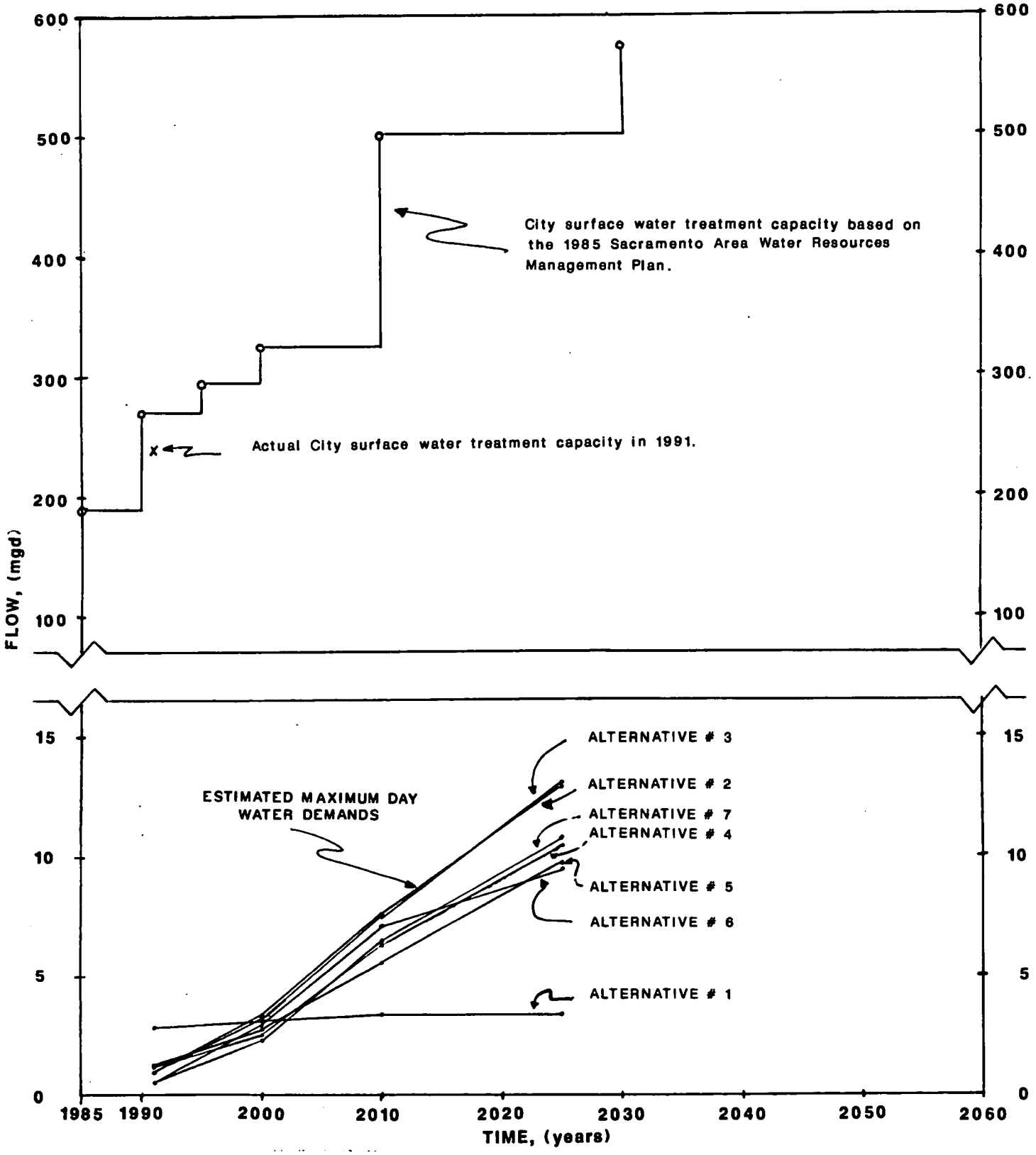
> To form an areawide plan for providing a safe and reliable water supply in a manner which protects the environment. The plan shall include the sound and efficient management of surface water, groundwater and reclaimed water resources and water conservation. The institutional arrangement necessary to insure successful implementation of the plan shall also be identified.

A comprehensive work plan is currently being developed which will meet the long term water supply needs within both the City and County of Sacramento in accordance with the objectives stated above. At the same time, the City of Sacramento is continuing to consider alternative projects to expand surface water diversion and treatment capacity to meet the short-term needs (10 years +/-) within its currently authorized Place of Use.

The City has stated in the Water Resources Management Plan that it will serve the water demand associated with planned growth within the city limits. The Management Plan calls for a total water treatment plant capacity of 575 mgd by 2030. The Management Plan was prepared for the City of Sacramento and the County of Sacramento in 1985. Projected total treatment plant capacity is shown on Figure 4.15-1, along with projected maximum cumulative water demands for each Alternative.

Water Storage Capacity

Water storage is required to meet water demand for periods when peak hour demands exceed maximum day demand rates. These high demand periods usually occur for four to six hours during hot summer days and potentially for longer periods during a large fire.



Source: Nolte and Associates, 1992.

FIGURE 4.15-1

PROJECTED CITY WATER TREATMENT PLANT CAPACITY AND PROJECT MAXIMUM DAY WATER DEMANDS

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The City of Sacramento has seven storage reservoirs, each with a capacity of three million gallons, and one underground reservoir with a capacity of 15 million gallons. Therefore, total water storage capacity is 36 million gallons. This capacity is more than one-third of the City's average daily water demand of 89 million gallons in 1990.

The City's current storage capacity is approximately one-sixth of the 1990 maximum day demand, which was 229 million gallons. The Sacramento Area Water Resources Management Plan recommends that three million gallons of storage be provided for every 20 million gallons of maximum daily demand. Although the Management Plan has not been officially adopted by the City, it recommends a course of action for provision of water to the City and the County through the year 2030.

Depending on the Alternative selected, the Planning Area would require between 1.5 and 2.0 million gallons of storage to meet the recommended storage capacity in the Management Plan and the City's current ratio of water demand to storage capacity.

Water Supply Demands

Existing Demands

The water demand estimate for existing development is based on existing land uses and flow rates per land use as described in Table 4.15-1. Water demand factors were assumed to be 110 percent of the sanitary sewage generation rates presented in the City of Sacramento's Design and Procedures Manual. Water demand factors were compared for accuracy to the factors defined in the Vacaville Water Master Plan (Nolte and Associates 1990) and from the Existing Facilities Report for the City of Brentwood (Nolte, 1991). Table 4.15-3A presents an estimate of the existing water demands for the Planning Area, as well as estimated average day and maximum day demands for Alternative 1, the No Project Alternative, through buildout. The existing maximum day demand of 2.80 mgd is approximately 1 percent of the City's current treatment capacity.

Future Demands

The future water demand estimates are based on alternative future land uses and estimated flow rates, in accordance with Table 4.15-1.

The estimated maximum day demand by phase and at buildout is summarized in Table 4.15-2 for the different Alternatives. The maximum day flow for the highest water use Alternative is 13.02 mgd at buildout for Alternative 3. This represents 6 percent of the City's existing treatment capacity of 241 mgd, or 2 percent of the projected City treatment capacity in the year 2030. Tables 4.15-3A through 4.15-3G enumerate the assumptions for flow demands for each Alternative.

TABLE 4.15-1

FUTURE WATER FLOW DEMAND RATES PER LAND USE UNITS

Land Use	Demand (gpd)	Units
Office	100	1,000 s.f.
Highway Commercial and Retail	100	1,000 s.f.
Heavy Commercial and Light Industrial	150	1,000 s.f.
Residential	390	Dwelling Units
Hotel	150	Room
Cultural and Institutional	260	1,000 s.f.

Note: s.f. = square feet

SOURCE: Nolte and Associates

TABLE 4.15-2

MAXIMUM DAY WATER DEMANDS SUMMARY

Year	Combined Railyards Area and Richards Area Maximum Day Water Demands (mgd)							Projected Treatment Capacity (mgd)
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	
1985								190
1990								270
1991	2.79	1.17	1.17	1.21	1.21	0.77	0.39	
1995								295
2000	3.15	3.56	3.39	1.88	2.70	3.16	2.16	325
2010	3.38	7.60	7.53	5.41	5.61	6.98	5.99	500
Build out	3.39	12.79	12.96	10.26	9.72	9.46	10.24	
2030								575

SOURCE: Nolte and Associates

Existing Water System

Trunk Distribution System

The trunk water distribution system for the City of Sacramento contains five major steel transmission mains in the Planning Area, originating at the Sacramento River treatment plant (see Figure 4.15-2). Three of these transmission mains are located along Jibboom Street and distribute water south. The two remaining transmission mains are located along North B Street and transport water in an easterly direction.

Local Distribution System

The City's primary distribution system is comprised of 12-inch, 10-inch and 8-inch asbestos cement and cast iron pipes, which are considered to be in good condition. The Railyards Area currently has a private water system consisting of approximately 9,500 feet of 12-inch and 10-inch water mains. These water mains, as well as the local water distribution system for the Richards Area, are shown on Figure 4.15-2. The existing Railyards' distribution mains do not coincide with the proposed street alignments within the Railyards Area.

Future Water System

Trunk Distribution System

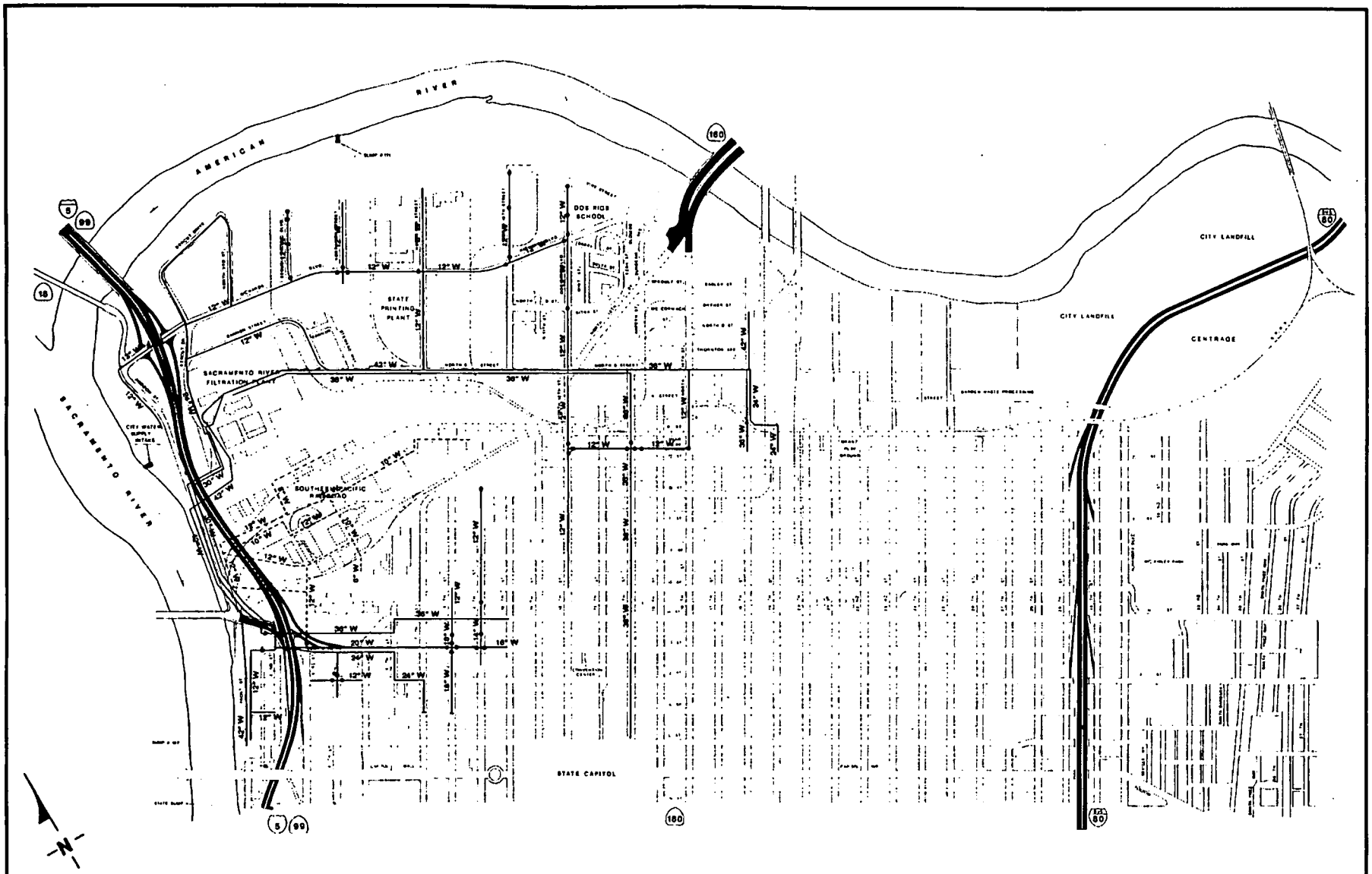
No improvements to the City's trunk distribution system are anticipated to be required in order to serve the new development in the Planning Area. There is, however, the possibility that lowering or relocating the trunk lines in Jibboom Street between the Interstate 5 Freeway and the Sacramento River will be required to accommodate future roadway alignments and grades.

Local Distribution System

Because of the age of the existing Railyards water mains and the location of the mains relative to the proposed street alignments, new water distribution mains will be required to adequately serve domestic and fire flow requirements for the proposed developments within the Railyards Area. The City will not allow the existing private water mains to become part of the City's water system.

The proposed water distribution system for the Railyards Area and the new streets in the Richards Area consists of a network of 12-inch diameter water mains along each new street alignment. A distribution main will be installed along each side of the street where a central median or light rail track is present.

Existing streets in the Richards Area are generally served by existing water mains. To serve the proposed development, these existing mains may need to be augmented by installation of additional piping systems in the Richards Area. The planned water distribution system is proposed to be connected to a major City transmission main in North B Street and to another in I Street. This redundancy will increase reliability of water service and water pressure within the project



Source: Nolte and Associates, 1992.

LEGEND

- 12" W — WATER MAIN, 12" AND LARGER
- 8" W — PRIVATE WATERLINE
- GATE VALVE

SCALE IN FEET

FIGURE 4.15-2

EXISTING WATER FACILITIES

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during critical water demand periods. Figure 4.15-3 shows the water distribution system master plan for the Planning Area.

Implementation Strategy for Water Facilities

Phasing of Water Facility Construction

Water facilities are anticipated to be constructed in conjunction with the development of the Planning Area. Major water mains and water facilities within arterial roadways will be constructed by joint efforts. These improvements are of areawide benefit and will be financed accordingly. Water system facilities serving individual development units are considered to be the developer's responsibility and will be installed at the developer's cost when street improvements are constructed.

Phase 1 Water Facilities

During Phase 1 development, water distribution systems will be installed in all new streets. The size of existing water mains in the Richards Area will be confirmed for adequacy. The analysis will be based on the specific type of construction and land use for the properties served by the individual distribution mains. A connection will be made to the existing city water transmission mains near the intersection of North B and North 7th streets. This connection will increase water system reliability and water pressure within the project during peak water demand periods and help meet fire flow requirements. The three existing water trunk mains along Jibboom Street will have to be protected to prevent damage from the realignment of the rail line across Jibboom Street.

Phase 2 Water Facilities

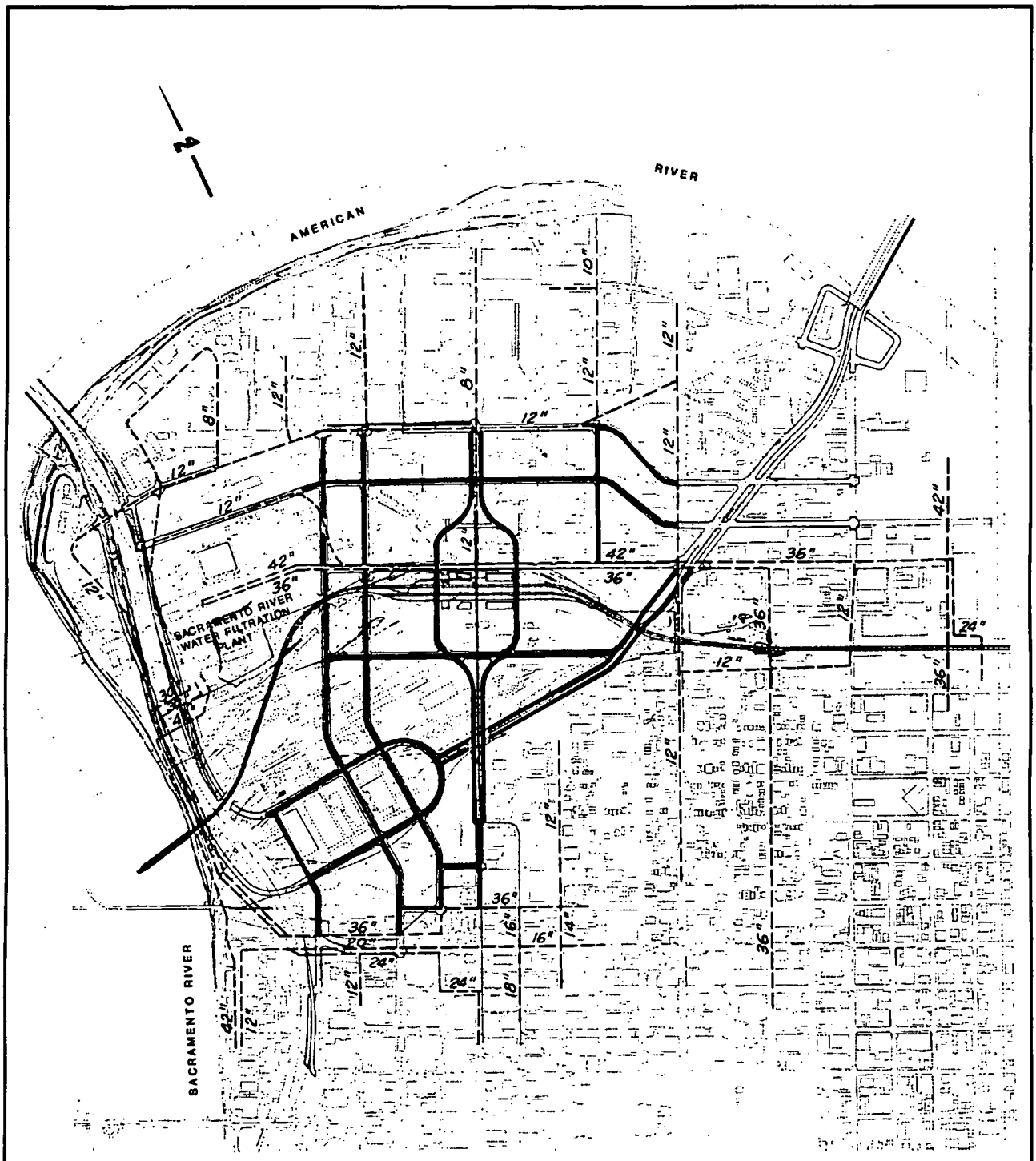
During Phase 2 development, water distribution systems will be installed in all new streets. The size of existing water mains in the Richards Area will be confirmed for adequacy. The analysis will be based on the specific type of construction and land use for the properties served by the individual distribution mains. For Alternatives 2 through 7, a water storage facility will be constructed. Also for Alternatives 2 through 7, the three existing water trunk mains along Jibboom Street will have to be relocated to avoid conflict with the two freeway ramps to be located on the west and east side of the freeway.

Phase 3 Water Facilities

During Phase 3 of development, the remainder of the water distribution system will be constructed along all new road alignments.

General Plan Goals and Policies

The following Sacramento General Plan Update (1986) Goals and Policies apply to development within the Planning Area.



Source: Nolte and Associates, 1992.

LEGEND

Existing

Proposed

FIGURE 4.15-3

WATER MASTER PLAN

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Public Facilities and Services Element

Goal A

Provide and maintain a high quality of public facilities and services to all areas of the City.

Under Alternative 1 through 7, there would be increased demand for water resulting in the need for additional water supply infrastructure to provide for required capacity. Development in the Planning Area would be coordinated with the City to contribute towards its share of expanding the water treatment facility to accommodate increases in flow through the system.

Goal B

Time all new public facilities and services as closely as possible to approved urban expansion.

New water supply system infrastructure would be coordinated with phased development under all of the Alternatives.

Goal C

Provide infrastructure for identified infill areas.

Under Alternative 1, which proposes the infill of development in the Planning Area, necessary infrastructure would be put in place to serve new development.

Goal D

Achieve economy and efficiency in the provision of services and facilities.

Development in the Planning Area would coordinate with the City to contribute towards its share of expanding the treatment facility and any other improvements to the City water infrastructure, to accommodate increases in flow through the system.

GOALS AND POLICIES FOR WATER

Goal A

Provide and improve water supply facilities to meet the future growth of the City and assure a continued supply of safe potable water.

Development under Alternatives 1 through 7 would increase the demand for domestic water supply treatment and storage capacity, as well as increase the need for an additional or upgraded water distribution system. Such infrastructure will be provided in the Planning Area to accommodate development.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The amount of water that can be supplied to the City is dependent on the capacity of the City's three surface water treatment plants. Current and planned capacity of the treatment plants far exceeds the phased buildout of the Planning Area; however, the cumulative use of treated water of this and other planned developments in the City will require additional treatment plant capacity. An impact that requires the capacity of a water treatment plant to be increased is considered a significant impact. Since each additional development uses up available treatment plant capacity, each development has an impact on the City's ability to supply water.

The City's Department of Utilities, Division of Water has a policy of serving all planned developments within the City boundary that are part of the City's General Plan, thereby allowing the City to plan future treatment facilities in advance of the required demand. Eventually, the City's water rights to the Sacramento and American Rivers may be the limiting factor of future development; however, treatment capacity is currently the deciding factor in determining a level of significant impact on the City's Water system.

Methods

The water demands for the Alternatives were calculated using land use data provided by ROMA Design Group and EIP Associates. The land use quantities were multiplied by a water demand factor corresponding to the land use. Demand factors are listed in Table 4.15-1. The water demands for the Alternatives and cumulative development were estimated and evaluated in terms of their increase relative to the City's average daily supply and maximum day water treatment plant capacity. Estimated water demands for the various Alternatives are summarized in Table 4.15-2 and described in Tables 4.15-3A through 4.15-3G. Cumulative demand is summarized in Table 4.15-4. Estimated water demands for the Alternatives taken with cumulative development are presented in Tables 4.15-5A through 4.15-5G.

Water demand factors were assumed to be 110 percent of the sanitary sewage generation rates presented in the City of Sacramento's Design and Procedures Manual. Water demand factors were compared to the factors defined in the Vacaville Water Master Plan (Nolte and Associates, 1990) and the Existing Facilities Report for the City of Brentwood (Nolte and Associates, 1991).

The maximum day water demands are assumed to be twice the average day water demand. Water treatment capacity must be able to meet the maximum day demand. Peak water demand is assumed to be twice the maximum day demand. Peak water demands are met by a combination of flow from the City's water treatment plants and flow from storage facilities.

TABLE 4.15-3A

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 1

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.09	1.30	1.39	0.18	2.61	2.79
Phase 1 (2000)	0.08	0.10	0.18	0.16	0.20	0.36
Phase 2 (2010)	0.08	0.04	0.12	0.16	0.08	0.24
Phase 3 (Buildout)	0.00	0.01	0.01	0.00	0.02	0.02
New Development Total	**0.16**	**0.15**	**0.31**	**0.32**	**0.30**	**0.62**
Total Demand	**0.25**	**1.45**	**1.80**	**0.5**	**2.91**	**3.41**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte and Associates

TABLE 4.15-3B

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 2

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.59	0.59	0.00	1.17	1.17
Phase 1 (2000)	0.75	0.45	1.19	1.50	0.89	2.39
Phase 2 (2010)	0.92	1.11	2.02	1.83	2.21	4.04
Phase 3 (Buildout)	0.43	2.16	2.59	0.87	4.32	5.19
New Development Total	**2.10**	**3.72**	**5.80**	**4.20**	**7.42**	**11.62**
Total Demand	**2.10**	**4.31**	**6.39**	**4.20**	**8.59**	**12.79**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-3C

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 3

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.59	0.59	0.00	1.17	1.17
Phase 1 (2000)	0.56	0.55	1.11	1.12	1.11	2.22
Phase 2 (2010)	0.95	1.12	2.07	1.90	2.25	4.14
Phase 3 (Buildout)	0.59	2.13	2.71	1.18	4.25	5.43
New Development Total	**2.10**	**3.80**	**5.89**	**4.20**	**7.61**	**11.79**
Total Demand	**2.10**	**4.39**	**6.48**	**4.20**	**8.78**	**12.96**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-3D

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 4

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.68	0.68	0.00	1.21	1.21
Phase 1 (2000)	0.24	0.09	0.33	0.48	0.18	0.67
Phase 2 (2010)	0.98	0.79	1.77	1.95	1.58	3.53
Phase 3 (Buildout)	1.07	1.35	2.42	2.14	2.71	4.85
New Development Total	**2.29**	**2.23**	**4.52**	**4.57**	**4.47**	**9.05**
Total Demand	**2.29**	**2.91**	**5.20**	**4.57**	**5.68**	**10.26**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-3E

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 5

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.61	0.61	0.00	1.21	1.21
Phase 1 (2000)	0.35	0.39	0.75	0.70	0.79	1.49
Phase 2 (2010)	0.48	0.97	1.46	0.97	1.94	2.91
Phase 3 (Buildout)	0.63	1.43	2.05	1.25	2.85	4.11
New Development Total	**1.46**	**2.79**	**4.26**	**2.92**	**5.58**	**8.51**
Total Demand	**1.46**	**3.40**	**4.87**	**2.92**	**6.79**	**9.72**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-3F

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 6

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.38	0.38	0.00	0.77	0.77
Phase 1 (2000)	0.35	0.39	0.75	0.70	0.79	1.49
Phase 2 (2010)	0.48	0.97	1.46	0.97	1.94	2.91
Phase 3 (Buildout)	0.63	1.43	2.05	1.25	2.85	4.11
New Development Total	**1.46**	**2.79**	**4.26**	**2.92**	**5.58**	**8.51**
Total Demand	**1.46**	**3.17**	**4.64**	**2.92**	**6.35**	**9.28**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-3G

ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 7

Phase	Capacity Demands[1,2]					
	Average Day Demand			Maximum Day Demand[3]		
	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.20	0.20	0.00	0.39	0.39
Phase 1 (2000)	0.49	0.40	0.88	0.97	0.80	1.77
Phase 2 (2010)	1.10	0.82	1.91	2.19	1.63	3.83
Phase 3 (Buildout)	0.70	1.42	2.12	1.41	2.84	4.25
New Development Total	**2.29**	**2.64**	**4.91**	**4.57**	**5.27**	**9.85**
Total Demand	**2.29**	**2.84**	**5.11**	**4.57**	**5.66**	**10.24**

1 Total demands are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand + 0.5 mgd.
3 Maximum Day = 2.0 X Average Day.
4 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-4
PLANNING AREA AND CUMULATIVE CITY DEVELOPMENT
PROJECTED CITY WATER TREATMENT PLANT CAPACITY
AND MAXIMUM DAY CUMULATIVE WATER DEMANDS SUMMARY

Year	Planning Area and Cumulative City Development Maximum Day Cumulative Water Demands Summary (mgd)							Projected Treatment Capacity (mgd)
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	
1985								190
1990								270
1991	2.79	1.17	1.17	1.21	1.21	0.77	0.39	
1995								295
2000	6.34	6.76	6.55	5.10	5.94	5.02	5.24	325
2010	10.57	14.63	14.46	12.34	12.62	10.97	12.51	500
Buildout	10.59	19.82	19.89	17.19	16.73	15.08	16.76	
2030								575

Source: Nolte Engineering, Inc., 1991

Impacts and Mitigation Measures

Impacts Due To Development in the Planning Area

4.15-1 Implementation of most of the Alternatives would result in an increased demand on domestic water supply, treatment and storage capacity.

Table 4.15-2 summarizes water demand by alternative and phase. Tables 4.15-3A through 3G show water demand for each alternative.

A-1 Alternative 1, the No Project Alternative, will result in an estimated maximum day water demand of approximately 3.41 million gallons per day (mgd) at full buildout. This is considered a ***less-than-significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 0.50 mgd and Richards Area developments are estimated to produce maximum day water demands of 2.91 mgd. This results in an increased demand of 0.62 mgd over estimated existing demands.

A-2 Alternative 2 will result in an estimated maximum day water demand of approximately 12.79 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 4.20 mgd, and Richards Area developments are estimated to produce maximum day water demands of 8.59 mgd. This results in an increased demand of 11.62 mgd, which is 2 percent of the projected (2030) City water treatment capacity at buildout of this Alternative. Approximately 2.0 million gallons of storage will be required.

A-3 Alternative 3 will result in an estimated maximum day water demands of approximately 12.96 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 4.20 mgd, and Richards Area developments are estimated to produce maximum day water demands of 8.78 mgd. This results in an increase demand of 11.79 mgd, which is 2 percent of the projected (2030) City water treatment capacity at buildout of this Alternative. Approximately 2.0 million gallons of storage will be required.

A-4 Alternative 4 will result in an estimated maximum day water demand of approximately 10.26 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 4.57 mgd, and Richards Area developments are estimated to produce maximum day water demands of 5.68 mgd. This results in an increased demand of 9.05 mgd, which is 1 percent of the projected (2030) City water treatment

capacity at buildout of this Alternative. Approximately 1.5 million gallons of storage will be required.

A-5 Alternative 5 will result in an estimated maximum day water demand of approximately 9.72 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 2.92 mgd, and Richards Area developments are estimated to produce maximum day water demands of 6.79 mgd. This results in an increased demand of 8.51 mgd, which is 1 percent of the projected (2030) City water treatment capacity at buildout of this Alternative. Approximately 1.0 million gallons of storage will be required.

A-6 Alternative 6 will result in an estimated maximum day water demand of approximately 9.28 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 2.92 mgd and Richards Area developments are estimated to produce maximum day water demands of 6.35 mgd. This results in an increased demand of 8.51 mgd, which is 1 percent of the projected (2030) City water treatment capacity at buildout of this Alternative. Approximately 1.0 million gallons of storage will be required.

A-7 Alternative 7 will result in an estimated maximum day water demand of approximately 10.24 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Railyards Area developments are estimated to produce maximum day water demands of 4.57 mgd, and Richards Area developments are estimated to produce maximum day water demands of 5.66 mgd. This results in an increased demand of 9.85 mgd, which is 1 percent of the projected (2030) City water treatment capacity at buildout of this Alternative. Approximately 1.5 million gallons of storage will be required.

Implementation of Mitigation Measures 4.15-1(a) through (c) would reduce the above impact to a *less-than-significant level.*

Mitigation Measures

4.15-1(a) *Increase water treatment plant capacity. This mitigation measure would be required for Alternatives 2 through 7.*

Treated water production will have to be increased to meet the domestic water requirements of the selected Alternative. The amount of the increase will be dependent on the Alternative selected and cumulative increased demands of other projects served by the City.

Existing and proposed City water treatment capacity greatly exceeds existing and future buildout of all the Alternatives. Therefore, construction of a particular phase of an Alternative may not require immediate expansion of treatment facilities. However, the development will, along with other developments in the City, use a portion of the available treatment capacity, which will eventually require expansion of treatment facilities to assure that City water demands are met. The demand rate for treated water required at each phase of each Alternative is compared with the projected treatment capacity of the City plants in Figure 4.15-3.

Reimbursement of the City's costs for additional water treatment capacity is considered to be the developer's obligation. At the time a development project is approved, the developer will pay for the portion of treatment plant expansion related to the project's water demand, which will be a portion of the total water demand of the selected Alternative.

4.15-1(b) *Increase storage capacity. Storage capacity will have to be provided to meet the water demands that are in excess of the water treatment plants' capacities. The approximate water storage capacity required for each Alternative is listed in the Impacts section above. This mitigation would be required for Alternatives 2 through 7.*

Storage in connection with the WTP capacity allows the water system to meet fire demand plus maximum day demand, or peak domestic demand. Reimbursement of the City's costs for additional water storage capacity is considered to be the developer's obligation. The City will construct water storage facilities and the developer will pay a proportional part of the facilities.

4.15-1(c) *Implement the following water conservation measures:*

1) *To reduce the impact on the City's total water supply, treatment and distribution system, proposed buildings shall include low flow fixtures to conserve water;*

2) *Water meters shall be installed at all new buildings to help provide an incentive for saving water;*

3) *Landscaping will feature drought resistant plants and water conservative irrigation methods in order to mitigate water demand during the summer months (June through September) when there is a high demand for water for landscaping.*

This measure would be required for Alternatives 2 through 7.

4.15-1(d) *Implement Mitigation Measure 4.12-4(a); items (iv) through (ix). This measure would be required for Alternatives.*

Mitigation Measure 4.12-4(a) is found in Section 4.12, Hydrology and Water Quality. Items 4.12-4(a) iv through ix address measures that would reduce the amount of water required for landscaping.

4.15-2 Implementation of any of the Alternatives would require new or upgraded water distribution systems to serve new and redeveloped areas.

A-1 through A-7

Alternatives 1 through 7 will require new or upgraded water distribution systems to meet water supply demands for domestic and fire flow requirements. In addition, the City of Sacramento will have to maintain additional water mains. This is considered a ***significant impact.***

The City's Water Division has stated in their response to the Notice of Preparation for this project that the existing water system on the Railyards Area will not be taken over as public water mains. In addition, most of the existing on-site mains do not correspond with proposed street alignments. Therefore, a new distribution system will be constructed to serve the Railyards Area.

In the Richards Area, an existing public water distribution system serves existing land uses. Where the future land use increases the domestic water or fire flow demand to a level greater than the existing system capacity, a new system or additions to the existing distribution system will be required to meet the new demands.

Mitigation Measure

Implementation of the following mitigation measure would reduce this impact to a *less-than-significant level.*

4.15-2 *Construct water distribution system. A water distribution system will be installed in each new street. The water distribution system will be made up of a network of 12-inch diameter water mains. Water mains will be located on both sides of streets with raised center medians or light rail tracks. The water distribution system will be connected to two of the City's major transmission mains. One transmission main is located along North B Street and the other is located in I Street. This mitigation is required for all Alternatives.*

New local water distribution system piping will be installed concurrent with construction of the roadways that are proposed to serve the Planning Area. New water mains are considered to be a developer responsibility and will be installed at the developer's cost at the time the roadways are constructed.

Proposed water mains will be sized to meet domestic and fire flow requirements. Water main size shall be verified at both the preliminary design and final design stage of project development.

4.15-3 Implementation of most of the Alternatives would result in the construction of transportation facilities whose construction may require relocation and/or protection of new and existing water facilities.

A-1 Alternative 1, the No Project Alternative would not result in any new roadways or transportation facilities. Therefore, this is a ***less-than-significant impact.***

A-2 through A-7

Under Alternatives 2 through 7, new and existing water distribution mains crossing railroad tracks could be damaged by construction and/or operation of the rail facilities. In addition, Alternatives 2, 3, 4, 5, 6 and 7 will result in a potential conflict between proposed freeway on-ramps and off-ramps and three existing City water transmission mains in Jibboom Street between the Interstate 5 Freeway and the Sacramento River. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.15-3(a) and 4.15-3(b) would reduce the above to *less-than-significant levels.*

4.15-3(a) *Protect existing and proposed water distribution mains. All water distribution mains crossing a railroad track will be protected by the installation of a casing pipe. This mitigation measure would be required for Alternatives 2 through 7.*

4.15-3(b) *Relocate and protect existing transmission mains in Jibboom Street, as necessary. In Phase 1, the three existing water transmission mains along Jibboom Street will have to be protected to prevent damage from the realignment of the rail line across Jibboom Street. This mitigation measure would be required for Alternatives 2 through 7.*

In Phase 2, the three existing water transmission mains in Jibboom Street will have to be relocated in the event of a grade conflict, to provide for and prevent damage from the realignment of the rail line and regrading for the two freeway ramps.

4.15-4 Implementation of any of the Alternatives would increase flow in the City's existing water system transmission mains.

A-1 through A-7

Alternatives 1 through 7 will result in additional flow in the City's water transmission main to allow the system to meet increased water supply demands for domestic and fire flow requirements. In their response to the Notice of Preparation for this project, the City's Water Division has stated that this is a ***less-than-significant impact.***

Mitigation Measures

4.15-4 *None required.*

Implementation of Mitigation Measure 4.15-3 would, however, help to reduce impacts to the transmission mains.

Cumulative Impacts

A summary of cumulative water demand by Alternative is shown in Table 4.15-4. The cumulative water demand analysis for each Alternative is shown in Tables 4.15-5A through G.

4.15-5 Implementation of most of the Alternatives, taken with cumulative development in the City, would result in an increased demand on domestic water supply, treatment, and storage capacity.

A-1 Alternative 1 and cumulative development will result in estimated maximum day water demand of approximately 10.59 mgd at full buildout. This is considered a ***less-than-significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 3.41 mgd. Cumulative development is estimated to produce an increase in maximum day water demand of 7.18 mgd. This results in a total estimated increased demand of 7.80 mgd over estimated existing demands.

A-2 Alternative 2 and cumulative development will result in an estimated maximum day water demand of approximately 19.82 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 12.79 mgd. Cumulative development is estimated to produce an increase in maximum day water demand of 7.03 mgd. This results in a total estimated increased demand of 18.65 mgd, which is 3.3 percent of the projected (2030) City water treatment capacity at buildout of this Alternative and cumulative development. Approximately 3.5 million gallons of storage will be required.

A-3 Alternative 3, and cumulative development will result in estimated maximum day water demands of approximately 19.89 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 12.96 mgd. Cumulative development is estimated to produce an increase in maximum day water demands of 6.93 mgd. This results in a total estimated increased demand of 18.72 mgd, which is 3.3 percent of the projected (2030)

City water treatment capacity at buildout of this Alternative and cumulative development. Approximately 3.0 million gallons of storage will be required.

A-4 Alternative 4 and cumulative development will result in an estimated maximum day water demand of approximately 17.19 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 10.26 mgd. Cumulative development is estimated to produce an increase in maximum day water demand of 6.93 mgd. This results in a total estimated increased demand of 15.98 mgd, which is 2.8 percent of the projected (2030) City water treatment capacity at buildout of this Alternative and cumulative development. Approximately 3.0 million gallons of storage will be required.

A-5 Alternative 5 and cumulative development will result in an estimated maximum day water demand of approximately 16.73 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 9.72 mgd. Cumulative development is estimated to produce an increase in maximum day water demand of 7.01 mgd. This results in a total estimated increased demand of 15.52 mgd, which is 2.7 percent of the projected (2030) City water treatment capacity at buildout of this Alternative and cumulative development. Approximately 2.5 million gallons of storage will be required.

A-6 Alternative 6 and cumulative development will result in an estimated maximum day water demand of approximately 14.31 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 8.51 mgd. Cumulative developments are estimated to produce an increase in maximum day water demand of 5.80 mgd. This results in a total estimated increased demand of 13.1 mgd, which is 2.3 percent of the projected (2030) City water treatment capacity at buildout of this Alternative and cumulative development. Approximately 2.5 million gallons of storage will be required.

A-7 Alternative 7 and cumulative development will result in an estimated maximum day water demand of approximately 16.76 mgd at full buildout. This is considered a ***significant impact.***

Under this Alternative, Planning Area development is estimated to produce maximum day water demands of 10.24 mgd. Cumulative developments are estimated to produce an increase in maximum day water demand of 6.52 mgd. This results in a total estimated increased demand of 15.51 mgd, which is 2.7 percent of the projected (2030) City water treatment capacity at buildout of this Alternative and cumulative development. Approximately 3.0 million gallons of storage will be required.

TABLE 4.15-5A
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 1 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	1.39	0.00	1.39	2.79	0.00	2.79
Phase 1 (2000)	0.18	1.60	1.78	0.36	3.19	3.55
Phase 2 (2010)	0.12	1.99	2.11	0.24	3.99	4.23
Phase 3 (Buildout)	0.01	0.00	0.01	0.02	0.00	0.02
New Development Total	**0.31**	**3.59**	**3.90**	**0.62**	**7.18**	**7.80**
Total Demand	**1.70**	**3.59**	**5.29**	**3.41**	**7.18**	**10.59**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.

2 Total demands are expressed in million gallons per day (mgd).

3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.

4 Maximum Day = 2.0 X Average Day.

5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-5B
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 2 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	0.59	0.00	0.59	1.17	0.00	1.17
Phase 1 (2000)	1.19	1.60	2.79	2.39	3.20	5.59
Phase 2 (2010)	2.02	1.92	3.94	4.04	3.83	7.87
Phase 3 (Buildout)	2.59	0.00	2.59	5.19	0.00	5.19
New Development Total	**5.80**	**3.52**	**9.32**	**11.62**	**7.03**	**18.65**
Total Demand	**6.39**	**3.52**	**9.91**	**12.79**	**7.03**	**19.82**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Total demands are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.
4 Maximum Day = 2.0 X Average Day.
5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-5C
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 3 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	0.59	0.00	0.59	1.17	0.00	1.17
Phase 1 (2000)	1.11	1.58	2.69	2.22	3.16	5.38
Phase 2 (2010)	2.07	1.88	3.95	4.14	3.77	7.91
Phase 3 (Buildout)	2.71	0.00	2.71	5.43	0.00	5.43
New Development Total	**5.89**	**3.46**	**9.35**	**11.79**	**6.93**	**18.72**
Total Demand	**6.48**	**3.46**	**9.94**	**12.96**	**6.93**	**19.89**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.

2 Total demands are expressed in million gallons per day (mgd).

3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.

4 Maximum Day = 2.0 X Average Day.

5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-5D
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 4 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	0.68	0.00	0.68	1.21	0.00	1.21
Phase 1 (2000)	0.33	1.61	1.94	0.67	3.22	3.89
Phase 2 (2010)	1.77	1.85	3.62	3.53	3.71	7.24
Phase 3 (Buildout)	2.42	0.00	2.42	4.85	0.00	4.85
New Development Total	**4.52**	**3.46**	**7.98**	**9.05**	**6.93**	**15.98**
Total Demand	**5.20**	**3.46**	**8.66**	**10.26**	**6.93**	**17.19**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Total demands are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.
4 Maximum Day = 2.0 X Average Day.
5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-5E
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 5 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	0.61	0.00	0.61	1.21	0.00	1.21
Phase 1 (2000)	0.75	1.62	2.37	1.49	3.24	4.73
Phase 2 (2010)	1.46	1.88	3.34	2.91	3.77	6.68
Phase 3 (Buildout)	2.05	0.00	2.05	4.11	0.00	4.11
New Development Total	**4.26**	**3.50**	**7.76**	**8.51**	**7.01**	**15.52**
Total Demand	**4.87**	**3.50**	**8.37**	**9.72**	**7.01**	**16.73**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.

2 Total demands are expressed in million gallons per day (mgd).

3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.

4 Maximum Day = 2.0 X Average Day.

5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-5F
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 6 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	0.38	0.00	0.38	0.77	0.00	0.77
Phase 1 (2000)	0.75	1.38	2.13	1.49	2.76	4.25
Phase 2 (2010)	1.46	1.52	2.98	2.91	3.04	5.95
Phase 3 (Buildout)	2.05	0.00	2.05	4.11	0.00	4.11
New Development Total	**4.26**	**2.90**	**7.16**	**8.51**	**5.80**	**14.31**
Total Demand	**4.64**	**2.90**	**7.16**	**8.51**	**5.80**	**14.31**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Total demands are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.
4 Maximum Day = 2.0 X Average Day.
5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

TABLE 4.15-5G
ESTIMATED WATER SUPPLY CAPACITY DEMANDS
ALTERNATIVE 7 WITH CUMULATIVE CITY[1]

Phase	Capacity Demands[2,3]					
	Average Day Demand			Maximum Day Demand[4]		
	Planning Area	Cumulative City	Total	Planning Area	Cumulative City	Total
Existing[5]	0.20	0.00	0.20	0.39	0.00	0.39
Phase 1 (2000)	0.88	1.54	2.42	1.77	3.08	4.85
Phase 2 (2010)	1.91	1.72	3.63	3.83	3.44	7.27
Phase 3 (Buildout)	2.12	0.00	2.12	4.25	0.00	4.25
New Development Total	**4.91**	**3.26**	**8.17**	**9.85**	**6.52**	**16.37**
Total Demand	**5.11**	**3.26**	**8.37**	**10.24**	**6.52**	**16.76**

1 This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.

2 Total demands are expressed in million gallons per day (mgd).

3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit Company 1990 Average Day Demand = 0.5 mgd.

4 Maximum Day = 2.0 X Average Day.

5 Existing demands are based on land use estimates by ROMA Design Group multiplied by capacity demand rates.

Note: Numbers may not add due to rounding.

SOURCE: Nolte Engineering, Inc., 1991

Mitigation Measure

Implementation of the following mitigation measure would reduce the above to *less-than significant levels.*

4.15-5 *Implement Mitigation Measures 4.15-1(a) through (d). This measure will be required for Alternatives 2 through 7.*

While not required, it is recommended that Mitigation Measure 4.15-6 be implemented for all impacts associated with Alternative 1.

4.15-6 Implementation of any of the Alternatives taken with cumulative development may require new or upgraded water distribution systems to serve new and redeveloped areas.

A-1 through A-7

Cumulative development, taken with Alternatives 1 through 7, may require new or upgraded water distribution systems to meet water supply demands for domestic and fire flow requirements. In addition, the City of Sacramento will have to maintain additional water mains. This is considered a ***significant impact.***

Please see the discussion under Impact 4.15-2 for impacts relative to the Planning Area.

In much of the cumulative development area, existing public water distribution systems serve existing land uses. Where the future land uses increase the domestic water or fire flow demand to a level greater than the existing system capacity, a new system or additions to the existing distribution system will be required to meet the new demands.

Mitigation Measures

Implementation of Mitigation Measure 4.15-1(c) would help to reduce the impact to existing water distribution systems in the cumulative development areas and to the existing and new water distribution systems in the Planning Area. Implementation of Mitigation Measures 4.15-6(a) through (c) would reduce the above to a *less-than-significant impact* . These measures would be required for all Alternatives.

4.15-6(a) *Implement Mitigation Measure 4.15-2.*

4.15-6(b) *Evaluate existing water distribution system capacity.*

4.15-6(c) *Implement system improvements required to meet domestic and fire flow requirements.*

4.15-7 Implementation of any of the Alternatives, taken with cumulative development in the City, would result in the construction of transportation facilities whose construction may require relocation and/or protection of new and existing water facilities.

A-1 through A-7

When cumulative development is added to Alternatives 1 through 7, new and existing water distribution mains crossing railroad tracks could potentially be damaged by construction and/or operation of the rail facilities. Cumulative development taken with Alternatives 2 through 7 would result in a potential conflict between proposed freeway on-ramps and off-ramps and three existing City water transmission mains in Jibboom Street between the Interstate 5 Freeway and the Sacramento River. This is considered a ***significant impact.***

Water distribution facilities in cumulative development areas could conflict with new roadway and railway grades and alignments, thereby potentially requiring relocation and protection.

Mitigation Measures

Implementation of Mitigation Measures 4.15-7(a) and (b) would reduce the above to *less-than-significant levels* in the cumulative development areas. This measure would be required of all Alternatives.

4.15-7(a) *Implement Mitigation Measures 4.15-3(a) and (b).*

4.15-7(b) *Evaluate alternative roadway and railway grades and alignments to avoid existing transmission mains.*

4.15-8 Implementation of any of the Alternatives, taken with cumulative development, would increase flow in the City's existing water system transmission mains.

A-1 through A-7

Cumulative development, taken with Alternatives 1 through 7, will result in additional flow in the City's water transmission main to allow the system to meet increased water supply demands for domestic and fire flow requirements. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.15-8 would reduce the above to a *less-than-significant level.* This measure would be required of all Alternatives.

Mitigation Measures

4.15-8 *Implement Mitigation Measures 4.15-1(b and c), 4.15-2, 4.15-6(b), and 4.15-6(c).*

4.16 WASTEWATER CONVEYANCE AND TREATMENT

4.16 WASTEWATER CONVEYANCE AND TREATMENT

INTRODUCTION

This section addresses the City's wastewater conveyance and treatment facilities as they relate to the development of the Alternative plans. The ability of these facilities to serve the Alternatives is evaluated.

SETTING

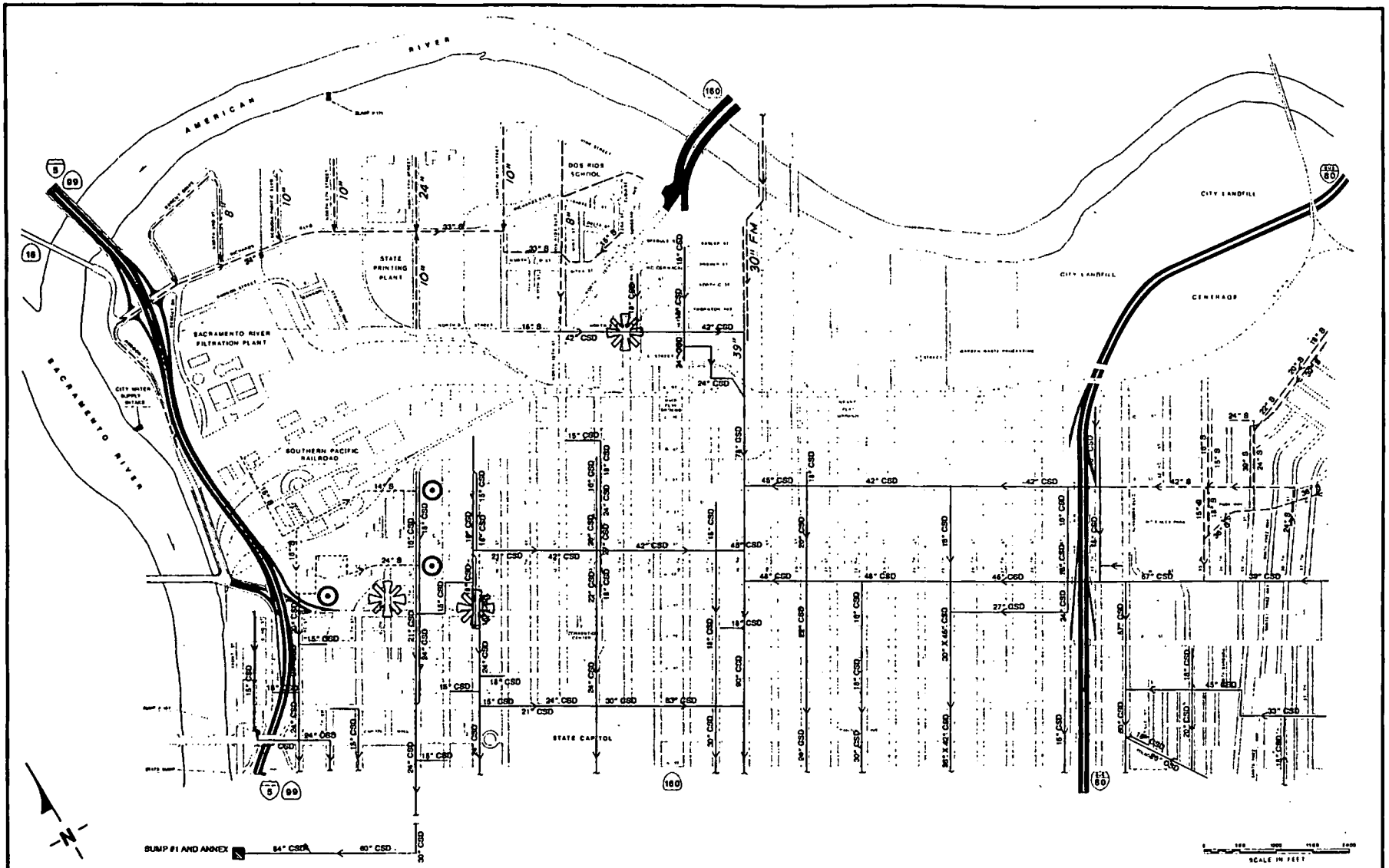
Introduction

Several older portions of the City, including the Central City core area and the Railyards Area, are served by a combined sanitary/storm sewer collection system. The greater part of the Richards Area is served by separated sanitary and drainage systems. The sanitary sewer from the Richards Area, however, flows into the Central City core area and into the Combined Sewer System. Existing combined and separate sewer systems are shown in Figure 4.16-1. The wastewater flows originating in the Planning Area, as well as the Central City core area, are normally collected and transported to the Sacramento Regional Wastewater Treatment Plant (SRWTP). During winter and summer storm events, when combined sewer flows are high, sewer flows can be directed to the SRWTP, City Combined Wastewater Treatment Plant (CWTP), Pioneer Reservoir, or the Sacramento River, according to the Combined Wastewater Control System (CWCS) *Interim Plan of Operations* which is discussed below.

The City's Division of Flood Control and Sewers has mapped locations in the combined sewer collection system that have historically overflowed during periods of intense rainfall. The existing collection system does have sufficient capacity for the current sanitary sewer flows. However, the City has indicated that, until the overflow situation is corrected, any increase in flows cannot be accommodated by the existing system. In response to a Cease and Desist Order issued by the State Regional Water Quality Control Board in June, 1990 (as discussed further herein), the City has adopted a position that additional sanitary sewage flows can be discharged to the combined sewer system if (where capacity exits) a corresponding existing storm water flow can be removed from the combined sewer system.

Wastewater Treatment Plant Capacity

The Sacramento County Regional Sanitation District (SCRSD) operates interceptors and treats wastewater and storm water generated in the City and elsewhere in the district. The SCRSD's main treatment plant, the Sacramento Regional Wastewater Treatment Plant, is located south of the City of Sacramento near the town of Freeport. The plant provides secondary treatment and



Source: Nolte and Associates, 1992.

LEGEND

- 16" CSD — Combined Sanitary Sewer and Storm Drain Main, 15" and Larger
- 15" S — Sanitary Sewer Main, 15" and Larger
- 14" S — Private Combined Sewer Main 14" and Larger
- Complaint Area
- SP Railyards Connections to Combined Sewer System

FIGURE 4.16-1

EXISTING SEPARATE AND COMBINED SEWER FACILITIES

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ultimately discharges treated wastewater into the Sacramento River. Construction is expected to be completed between June 1992 and January 1993 to expand the SRWTP's capacity to accommodate 181 mgd during dry weather, 332 mgd during peak hour 2-year storm and 490 mgd during peak hour 100-year storm flows. A master plan to enable the SRWTP to accommodate additional dry weather and wet weather flows is currently being prepared. The current policy of the SCRSD is to provide treatment capacity as required.

The average dry weather flow (ADWF) received at the SRWTP in 1990 was 130 mgd. Dry weather flow occurs during months with less than approximately 1 or 2 inches of rain. The SRWTP received an average flow of approximately 161 mgd from July to September, 1990 which is the canning season. The average wet weather flow (AWWF) in the drought year of 1990 was 162 mgd. During a year with normal rainfall, typical wet weather flows average approximately 200 mgd. Maximum peak wet weather flows in February, 1986, which experienced a flood record throughout the SCRSD's service area, were 394 mgd.

Sanitary Sewage Flow Generation Rates

Average and Peak Sanitary Sewage Flows

ADWF estimates for sanitary sewage generation are based on projected land uses for the various Alternatives. Sanitary sewage flow generation rates were determined using the City of Sacramento Design and Procedures manual (September 1, 1990). The manual presents equivalent single family dwelling unit factors for a number of land uses. A single family dwelling unit is assumed to include four persons per unit, 100 gallons per person per day, and four lots per acre. Table 4.16-1 presents sanitary sewage flow generation rates for the land uses of the Alternatives.

City of Sacramento Design and Procedures Manual (plate 9-2) presents sanitary sewer diurnal peaking factors. Peak flows (PF) for the Planning Area are calculated as 2.3 times the ADWF.

Peak Wet Weather Flow

During dry weather, wastewater flows are more consistent and regular than during storm periods when there are rapid increases for short periods. The primary factor contributing to a significant increase in wastewater flows during wet weather is the City's combined storm/sewer system. Inflow and infiltration of surface water runoff into collection facilities (such as manholes and catch basins) is transported in addition to the sanitary flows.

City of Sacramento Design and procedures Manual (Section 9.2) addresses inflow and infiltration (I&I) by requiring that an average infiltration value of 500 gpd per inch diameter per mile be added to the peak flow value to determine the design flow.

In areas with combined sewers, the City of Sacramento Storm Water Management Model (SWMM) has shown that storm water run off can contribute as much as 0.6 CFS/acre (0.388 mgd) to combined sewage flows during storm events.

TABLE 4.16-1

SANITARY SEWAGE FLOW GENERATION RATES PER LAND USE UNITS

Land Use	Flow (gpd)	Units
Office	80	1,000 s.f.
Highway Commercial and Retail	80	1,000 s.f.
Heavy Commercial and Light Industrial	130	1,000 s.f.
Residential	350	Dwelling Unit
Hotel	120	Room
Cultural and Institutional	240	1,000 s.f.

* Note: s.f. = square feet

SOURCE: City of Sacramento Design and Procedures Manual, September, 1990

Existing Wastewater Collection System

Existing Wastewater Flows

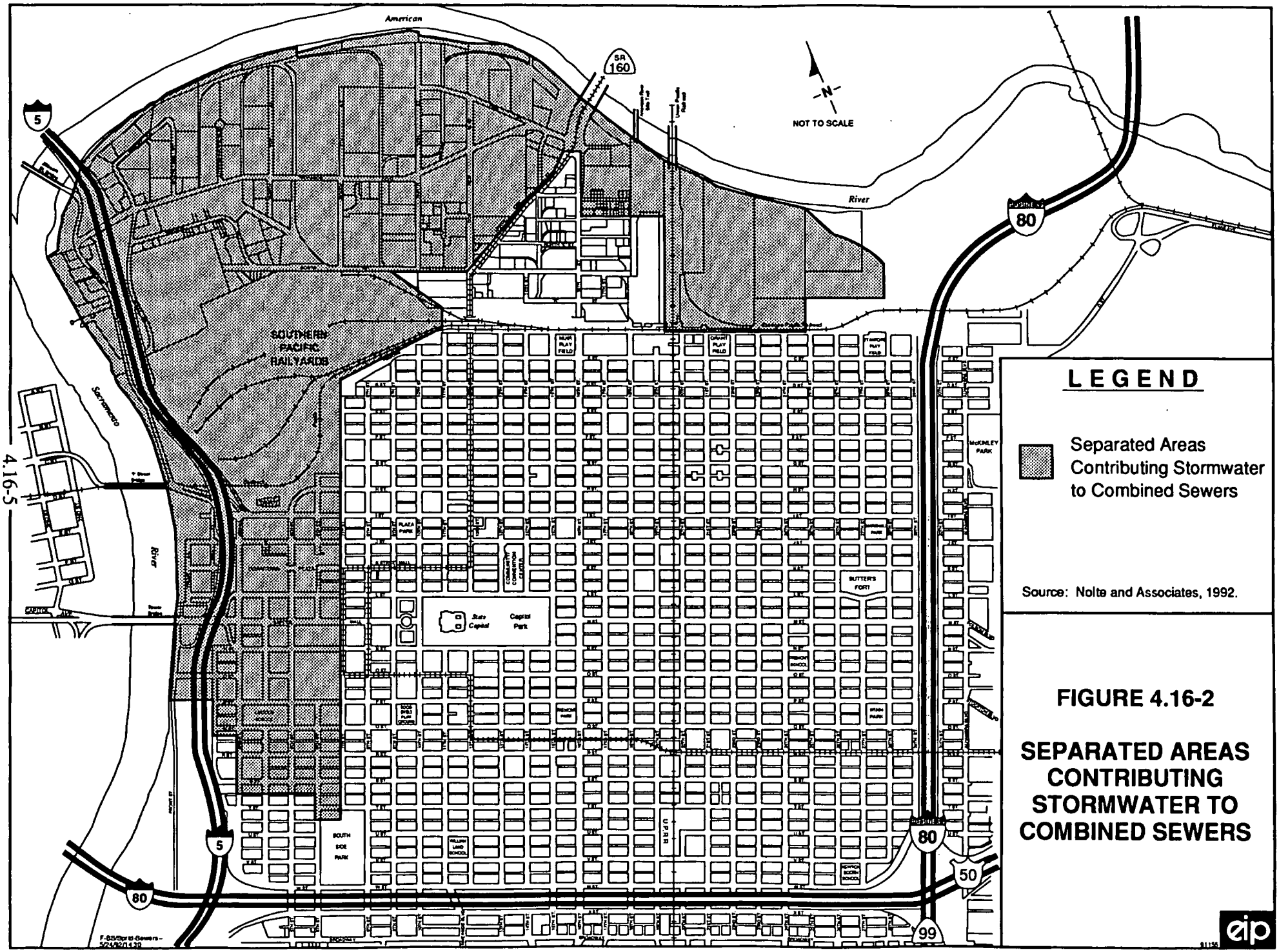
Estimated wastewater flows for existing conditions are shown in Table 4.16-3a.

Existing Collection System Description

The Railyards Area is served by a private, on-site, combined sewer system that discharges to the City's Combined Sewer System at two locations in 7th Street and one location in 3rd Street (see Figure 4.16-1).

In the Richards Area, both combined and separated storm and sanitary sewer systems exist (see Figure 4.16-2). The area west of North 12th Street and north of North B Street is served by an existing separated system. The balance of the Richards Area is served by a combined storm/sanitary sewer system. This system connects to the City's combined sewer trunk main at North B and 18th streets.

The existing separated sanitary sewer system in the Richards Area and the existing private combined sewer system in the Railyards Area generate flows that normally pass through the


American
River
SR 160
NOT TO SCALE
N
5
80
50
99
SOUTHERN PACIFIC RAILYARDS
Sacramento
River
State Capitol
Capitol Park
SOUTH SIDE PARK
McKINLEY PARK
SUTTER'S FORT
CAPITOL AVE.
LEGEND
Separated Areas Contributing Stormwater to Combined Sewers
Source: Nolte and Associates, 1992.
FIGURE 4.16-2
SEPARATED AREAS CONTRIBUTING STORMWATER TO COMBINED SEWERS
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City's Combined Sewer System to the City's Sump 2 pumping facility. This sump is capable of pumping combined wastewater water flows to the Sacramento Regional Wastewater Treatment Plant (SRWTP), the City of Sacramento Combined Wastewater Treatment Plant (CWTP) and the City's Pioneer Reservoir.

The Combined Sewer System operates in accordance with the Interim Plan of Operations for National Pollutant Discharge Elimination System (NPDES) Permit No. CA0079111, approved by the Regional Water Quality Control Board. Sacramento currently has a combined storm water and sewer system in the older parts of the City. The area served by the combined system encompasses approximately 7,000 acres in the downtown area and in the City's southern section. Both storm water and municipal wastewater are treated at the Sacramento Regional Wastewater Treatment Plant (SRWTP).

In the downtown area of Sacramento, the Combined Wastewater Collection System conveys domestic and industrial wastewater and storm runoff to Sump 2, where it continues to the Regional Plant under normal conditions. Treatment of sewage from the City is presently provided by the Sacramento Regional County Sanitation District (District). The District's SRWTP is located south of the City just east of Freeport Boulevard. The plant has an existing treatment capacity of approximately 150 million gallons per day (mgd) of dry-weather flow and 300 mgd of wet-weather flow. The District and the City have contracted for 60 mgd of the SRWTP's 300 mgd wet-weather capacity for wastewater from the portion of the City served by the combined wastewater system. The District is currently in the process of a phased increase in treatment capacity. By late 1991, the SRWTP is expected to handle 185 mgd of dry-weather flow, while the wet-weather capacity will be expanded to 400 mgd. By the year 2000, it is anticipated that plant capacity will be expanded to handle a 220 mgd dry-weather flow. The plant could ultimately be expanded to adequately handle dry weather and wet weather flows of 300 mgd and 600 mgd, respectively (Scotti 1988, Anastas 1988). The District is responsible for the operation of all regional interceptors and the SRWTP, except for the Combined Wastewater Treatment Plan (CWTP) operated by the City. Dry weather flow to the main combined sewer pumping station, Sump 2, normally does not exceed 60 mgd. Wet-weather flows exceeding this rate (60 mgd) are sent to the CWTP, located at 35th Avenue and South Land Park Drive. This treatment plant has the capacity to treat 130 mgd wet-weather flow.

The CWTP is the refurbished City Main Plant. At the CWTP, up to 130 mgd of combined sewage receives primary treatment, with disinfection, prior to discharge into the Sacramento River through the CWTP outfall. Under the current NPDES Plan of Operation, wet weather flows at Sump 2 exceeding 190 mgd are discharged directly into the Sacramento River. Wet weather combined system wastewater flowing to Sump 1 is diverted to Pioneer Reservoir, which has a storage capacity of 28mg (23 mg for reservoir and 5 mg for interceptor). Flow surpassing the 28 mg reservoir storage capacity is sent directly to the Sacramento River, with some settling and removal of solids as this water flows through the reservoir.

Sump 2 is operated so that it pumps a maximum of 60 mgd of sanitary sewage and storm water to the SRWTP. Sanitary flow at Sump 2 is projected to vary from a non-seasonal (dry weather non-canning season) average of approximately 34 mgd to a peak seasonal (dry weather canning

season) average of approximately 61 mgd. During summer operation, flows in excess of 60 mgd are pumped to the Pioneer reservoir, located in the northwest quadrant of Interstate 5 and Business 80 at the Sacramento River, for storage and later returned to Sump 2. During winter operation, if wastewater flows are greater than 60 mgd, the additional flow is pumped to the CWTP located at Fruitridge Road and South Land Park Drive. This plant provides primary treatment only and has a design capacity of 150 mgd.

According to the *Interim Plan of Operations*, if wastewater flows to the CWTP exceed 150 mgd (total inflow to Sump 2 exceeds 210 mgd), the additional flows are discharged to the Sacramento River.

Existing Collection System Capacity Problems

The City's Division of Flood Control and Sewers has mapped locations in the combined sewer collection system area that have historically overflowed during periods of intense rainfall. These locations are shown on Figure 4.16-1. The existing collection system does, however, have sufficient capacity for the current sanitary sewer flows. The City has indicated that, until the overflow situation is corrected, any increase in flows cannot be accommodated by the existing system.

Cease and Desist Order

On June 22, 1990, the California Regional Water Quality Control Board, with support from the Department of Health Services, issued a Cease and Desist Order to stop Combined Sewer System overflow and flooding in the Sacramento Area. The Cease and Desist order also states that additional sanitary flows (whether new or increases in existing flows), storm drainage flows or urban runoff flows will increase the violations or likelihood of violations. Storm drainage demands account for most of the combined sewer system capacity deficiencies. It is believed that removing all or part of the storm drainage flows from the combined system would create ample capacity to carry sanitary flows.

The City has adopted a position that, where capacity exists, additional sanitary sewage flows can be discharged to the combined sewer system if a corresponding existing storm water flow can be removed from the combined system. Storm water can be removed completely from the combined sewer system (discharged to a water body or a separated storm drain system) or can be stored for later discharge to the combined sewer system as capacity becomes available.

Future Wastewater System

Future Wastewater System Capacity Demands

Estimated sanitary sewer flows for the Alternatives are summarized in Table 4.16-2 and shown in Tables 4.16-3a through 4.16-3g. The estimated flows assume separation of sanitary sewers and storm drains in the Planning Area.

TABLE 4.16-2
SUMMARY
CITY WASTEWATER FLOW PROJECTIONS and PEAK SEWAGE FLOW

Year	Planning Area Peak Sewage Flow Summary (mgd)							County Wastewater Flow Projections (mgd)			
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	ADWF	ADMMF	2-yr Storm	100-yr Storm
1990								131	151	287	446
1991	2.81	1.20	1.21	1.40	1.24	0.58	0.45				
1995								163	223	340	516
2000	3.15	3.61	3.46	2.04	2.73	2.95	2.20	186	254	377	566
2005								212	289	420	623
2010	3.38	7.67	7.63	5.56	5.61	6.67	6.00	242	330	469	690
Buildout	3.38	12.98	13.15	10.39	9.76	8.95	10.19				

Notes: ADWF - Average Daily Wastewater Flow
ADMMF - Average Day Maximum Month Flow
2-yr Storm - Peak Hourly 2-Year Storm Flow
100-yr Storm - Peak Hourly 100-Year Storm

SOURCE: Nolte and Associates, 1992

TABLE 4.16-3A
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 1

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[6,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.08	1.11	1.19	0.18	2.56	2.74	0.01	0.0[6]	0.07	0.19	2.62	2.81
Phase 1 (2000)	0.07	0.08	0.15	0.15	0.19	0.34	0.00[6]	0.00[6]	0.00[6]	0.15	0.19	0.34
Phase 2 (2010)	0.07	0.03	0.10	0.15	0.08	0.23	0.00[6]	0.00[6]	0.00[6]	0.15	0.08	0.23
Phase 3 (Buildout)	0.00	0.00[6]	0.00[6]	0.00	0.00[5]	0.00[5]	0.00[5]	0.00[5]	0.00[5]	0.00	0.00	0.00
New Development Flow	**0.14**	**0.11**	**0.25**	**0.30**	**0.27**	**0.57**	**0.00**	**0.00**	**0.00**	**0.30**	**0.27**	**0.57**
Total Flows[1]	**0.21**	**1.24**	**1.44**	**0.48**	**2.84**	**3.32**	**0.01**	**0.0[6]**	**0.07**	**0.49**	**2.89**	**3.38**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

* Note: Numbers may not add perfectly due to rounding.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-3B
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 2

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[6,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.49	0.49	0.00	1.13	1.13	0.01	0.06	0.07	0.01	1.19	1.20
Phase 1 (2000)	0.65	0.38	1.03	1.50	0.88	2.38	0.02	0.01	0.03	1.52	0.89	2.41
Phase 2 (2010)	0.78	0.97	1.75	1.80	2.23	4.03	0.02	0.01	0.03	1.82	2.24	4.06
Phase 3 (Buildout)	0.38	1.93	2.31	0.89	4.43	5.31	0.00[5]	0.00[5]	0.00[5]	0.89	4.43	5.31
New Development Flow	**1.81**	**3.28**	**5.09**	**4.19**	**7.54**	**11.72**	**0.04**	**0.02**	**0.06**	**4.23**	**7.56**	**11.78**
Total Flows[1]	**1.82**	**3.77**	**5.58**	**4.18**	**8.67**	**12.85**	**0.05**	**0.08**	**0.13**	**4.24**	**8.75**	**12.98**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

SOURCE: Nolte and Associates, 1992

TABLE 4.16-3C
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 3

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[6,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.49	0.49	0.00	1.13	1.13	0.01	0.07	0.08	0.07	1.20	1.21
Phase 1 (2000)	0.48	0.48	0.96	1.10	1.10	2.20	0.02	0.03	0.05	1.12	1.13	2.25
Phase 2 (2010)	0.81	0.98	1.79	1.86	2.26	4.12	0.02	0.03	0.05	1.88	2.29	4.17
Phase 3 (Buildout)	0.52	1.88	2.40	1.19	4.33	5.52	0.00[5]	0.00[5]	0.00[5]	1.19	4.33	5.52
Buildout Total Units	**1.81**	**3.34**	**5.15**	**4.15**	**7.69**	**11.84**	**0.04**	**0.06**	**0.10**	**4.19**	**7.75**	**11.94**
Total Flows[1]	**1.81**	**3.83**	**5.64**	**4.15**	**8.83**	**12.98**	**0.05**	**0.13**	**0.18**	**4.26**	**8.95**	**13.15**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

SOURCE: Nolte and Associates, 1992

TABLE 4.16-3D
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 4

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[6,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.58	0.58	0.00	1.33	1.33	0.01	0.06	0.07	0.01	1.34	1.40
Phase 1 (2000)	0.19	0.07	0.27	0.44	0.17	0.61	0.02	0.01	0.03	0.46	0.18	0.64
Phase 2 (2010)	0.83	0.69	1.52	1.91	1.58	3.49	0.02	0.01	0.03	1.93	1.59	3.52
Phase 3 (Buildout)	0.92	1.17	2.10	2.13	2.70	4.83	0.00[5]	0.00[5]	0.00[5]	2.13	2.70	4.83
Buildout Total Units	**1.94**	**1.93**	**3.89**	**4.48**	**4.45**	**8.93**	**0.04**	**0.02**	**0.06**	**4.52**	**4.47**	**8.99**
Total Flows[1]	**1.94**	**2.51**	**4.47**	**4.48**	**5.78**	**10.26**	**0.05**	**0.08**	**0.13**	**4.53**	**5.81**	**10.39**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-3E
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 5

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[6,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.51	0.51	0.00	1.17	1.17	0.01	0.06	0.07	0.01	1.23	1.24
Phase 1 (2000)	0.29	0.34	0.63	0.67	0.79	1.46	0.02	0.01	0.03	0.69	0.80	1.49
Phase 2 (2010)	0.39	0.85	1.24	0.90	1.95	2.85	0.02	0.01	0.03	0.92	1.96	2.88
Phase 3 (Buildout)	0.50	1.26	1.76	1.15	2.96	4.11	0.00[5]	0.00[5]	0.00[5]	1.15	2.96	4.18
Bulldout Total Units	**1.18**	**2.45**	**3.63**	**2.72**	**5.70**	**8.42**	**0.04**	**0.02**	**0.06**	**2.76**	**5.72**	**8.55**
Total Flows[1]	**1.18**	**2.96**	**4.14**	**2.72**	**6.87**	**9.59**	**0.05**	**0.08**	**0.13**	**2.77**	**6.95**	**9.79**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

SOURCE: Nolte and Associates, 199.2

TABLE 4.16-3F
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 6

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[5,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.32	0.32	0.00	0.51	0.51	0.01	0.06	0.07	0.01	0.57	0.58
Phase 1 (2000)	0.48	0.54	1.02	1.10	1.24	2.34	0.02	0.01	0.03	1.12	1.25	2.37
Phase 2 (2010)	0.71	0.90	1.60	1.63	2.07	3.69	0.02	0.01	0.03	1.65	2.08	3.72
Phase 3 (Buildout)	0.54	0.45	0.99	1.24	1.04	2.28	0.00[5]	0.00[5]	0.00[5]	1.24	1.04	2.28
Buildout Total Units	**1.73**	**1.89**	**3.61**	**3.97**	**4.35**	**8.31**	**0.04**	**0.02**	**0.06**	**4.01**	**4.37**	**8.37**
Total Flows[1]	**1.73**	**2.21**	**3.93**	**3.97**	**4.86**	**8.82**	**0.05**	**0.08**	**0.13**	**4.02**	**4.94**	**8.95**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-3G
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 7

	Sewage Flows[1,2]						Sewage Flows[1,2]					
	Average Dry Weather Flows			Peak Flows[3]			Inflow and Infiltration			Peak Wet Weather Flows[6,7]		
	SP	RB	Total	SP	RB	Total	SP	RB	Total	SP	RB	Total
Existing[4]	0.00	0.17	0.17	0.00	0.38	0.38	0.01	0.06	0.07	0.01	0.44	0.45
Phase 1 (2000)	0.41	0.34	0.75	0.94	0.78	1.72	0.02	0.01	0.03	0.96	0.79	1.75
Phase 2 (2010)	0.94	0.70	1.64	2.16	1.61	3.77	0.02	0.01	0.03	2.18	1.62	3.80
Phase 3 (Buildout)	0.60	1.22	1.82	1.38	2.81	4.19	0.00[5]	0.00[5]	0.00[5]	1.38	2.81	4.19
Buildout Total Units	**1.95**	**2.26**	**4.21**	**4.48**	**5.20**	**9.68**	**0.04**	**0.02**	**0.06**	**4.52**	**5.22**	**9.74**
Total Flows[1]	**1.95**	**2.43**	**4.38**	**4.48**	**5.58**	**10.06**	**0.05**	**0.08**	**0.13**	**4.53**	**5.66**	**10.19**

1 Flows are expressed in million gallons per day (mgd).
2 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
3 PF = 2.3 x ADWF.
4 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
5 Flow is less than 0.005 mgd.
6 PWWF = Peak Flow Plus I & I.
7 Does not include runoff to existing combined sewers which is estimated to be approximately 52 mgd. in the Railyards Area and approximately 43 mgd. in the ROMP Area.

SOURCE: Nolte and Associates, 1992.

In addition to sanitary waste, the City has required that first flush storm water be detained at the site for later discharge to the sanitary sewer system in order to aid in meeting anticipated NPDES requirements for urban storm water discharges.

The sanitary sewer is also proposed to transport contaminated groundwater extracted from the Railyards Area. Sanitary sewer sizes and capacities of pumping facilities required to accommodate these flows have been estimated and are shown on the sanitary sewer master plan, Figure 4.16-3.

Trunk Sewer System

Initially, three alternative methods of diverting the sanitary wastewater to the SCRSD's interceptor located north of the American River were evaluated. The City of Sacramento, after review of these Alternatives, expressed a preference for the Alternative summarized below. This Alternative is depicted on Figures 4.16-3 and 4.16-4.

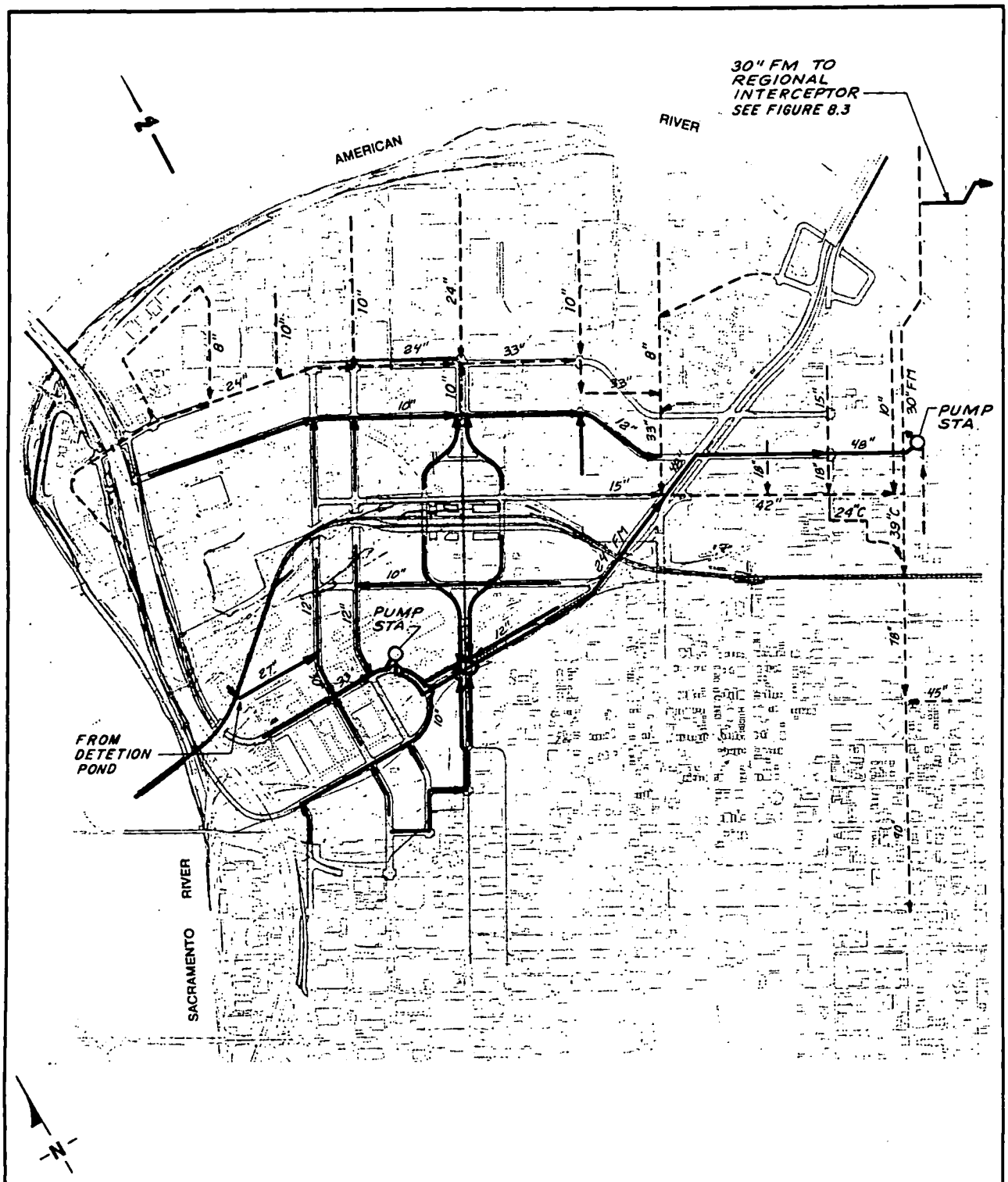
The sanitary waste from the Railyards Area would be pumped to 12th and A Streets where it would merge with sanitary waste from the Richards Area separated system. The merged sanitary waste would flow by gravity through a proposed sewer main along A Street to a proposed pump station at 18th and A Streets. This pumping facility would pump the sanitary waste through an existing 30-inch force main, then through a proposed 30-inch force main to the existing 78-inch diameter Regional Sanitation District's Natomas Interceptor.

This configuration assists the City in complying with the cease and desist order, both by avoiding discharge of the Railyards Area's sanitary sewage into the City's combined sewer system and by diverting the Richards Area's existing separated sewage out of the combined sewer system. Routing the sanitary sewage to 18th and A Streets would also facilitate connection to the proposed Natomas/City interceptor which is expected to use the Union Pacific right-of-way.

An agreement between the City and the Regional Sanitation District has been negotiated to permit this connection. The agreement provides for an interim transfer for the Phase 1 development only and calls for other Alternatives to be evaluated in conjunction with the City's combined sewer system study and the County's sewerage study update. The County Sanitation District would provide interim service for Phase 1 under the conditions listed below.

A. This service would be provided for the Phase 1 development only with the following flow limits:

	Average Flow (MGD)	Peak Flow (MGD)
Railyards Area, Phase 1	0.618	1.422
Richards Area, Phase 1	0.576	1.330
Subtotal Sanitary Flow	1.194	2.752
Extracted Groundwater	1.440	1.440
TOTAL FLOW	2.634	4.192



Source: Nolte and Associates, 1992.

LEGEND

Existing

Proposed

FIGURE 4.16-3

SANITARY SEWERS MASTER PLAN

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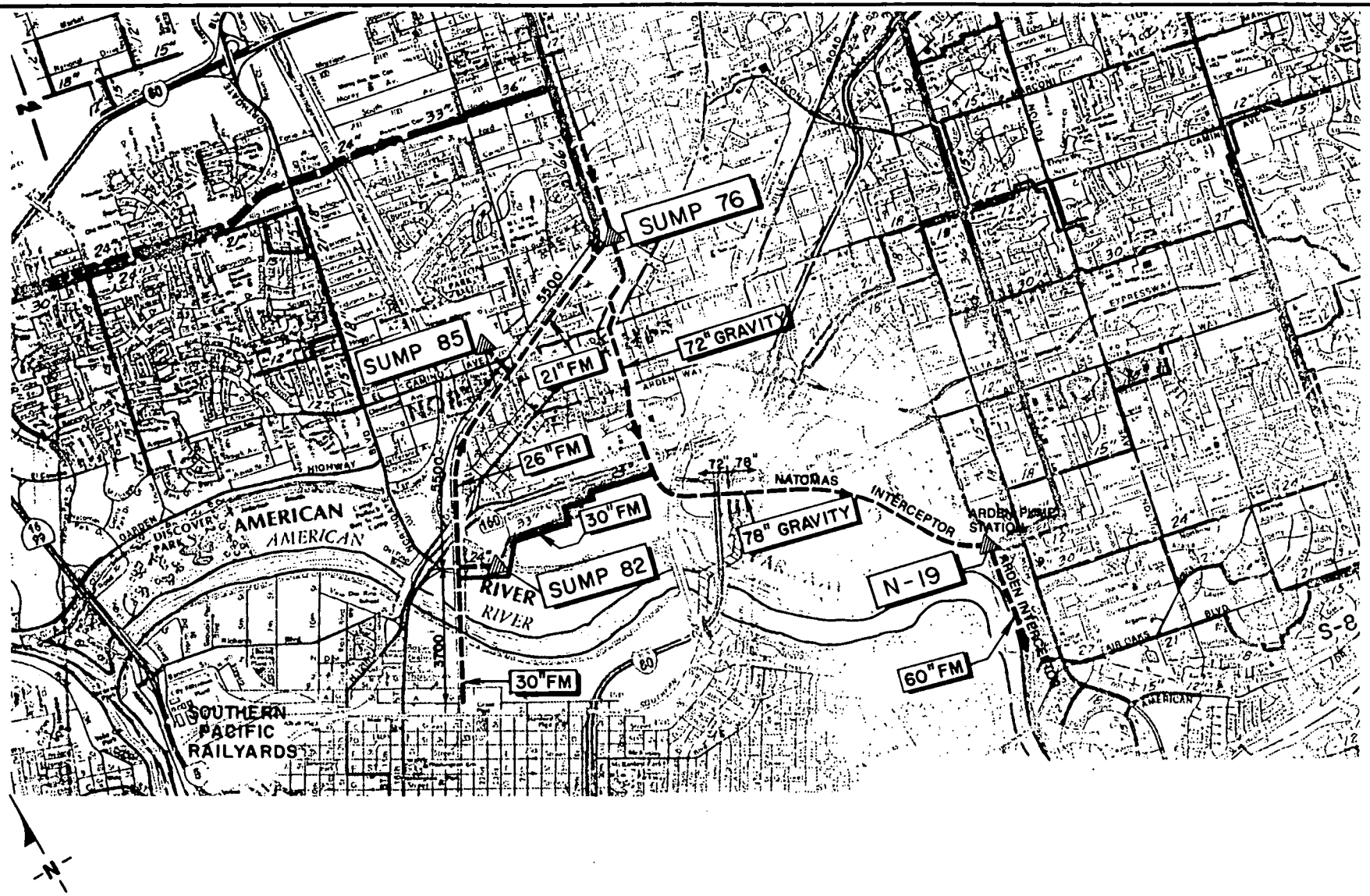

Source: Nolte and Associates, 1992.

LEGEND

———	Proposed Sewer	FM	Force Main
- - - -	Existing Sewer		

FIGURE 4.16-4

CONCEPTUAL SANITARY SEWER TRUNK FACILITIES

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B. Extracted groundwater discharge would be accepted provided that the discharge is mutually acceptable to the District and the Central Valley Regional Water Quality Control Board. The District has the authority to have the discharge discontinued during any high peak wet weather flow period and other emergencies. A Sewer Use Permit would be required as well as the payment of connection fees and monthly service charges.

C. First flush storm water would not be accepted through the Natomas Interceptor. The County believes bleed-off from the proposed detention basin should be to the City's combined wastewater control system.

D. The City must reimburse the District for the cost of operating pumping station N-19. Reimbursement is to be based proportionally to the flows pumped.

Local Collection System

The proposed sanitary sewer collection system in the Planning Area would consist of 8-inch to 30-inch sanitary sewer piping. Sanitary sewage from the Railyards Area would be collected at a pumping station centrally located within the site. The pump station would discharge to the force main as described above. The Richards Area would continue to use the area's existing separated sanitary sewer system. The combined sanitary/storm sewer system in the Richards Area east of 12th Street is proposed to be separated. The existing system would remain in use for conveying sanitary sewage flows, and a new storm drain system would be constructed to convey storm water flows (see Section 4.19). The sanitary sewer system master plan is shown on Figure 4.16-3.

Implementation Strategy for Sanitary Sewers

Phasing of Sanitary Sewer Facility Construction

Construction of sanitary sewer facilities is anticipated to be undertaken in concert with development of the Planning Area. Trunk facilities and facilities that are within arterial roadways would be constructed by joint efforts. These items are of area wide benefit and would be financed accordingly.

Local sanitary sewer system facilities serving the smaller development unit areas are considered a developer's responsibility and would be installed at developer cost when local street improvements are constructed.

Phase 1 Sanitary Sewer Facilities

The backbone sanitary sewer system, consisting of the pumping station in the Railyards Area, the force main to 12th and A streets, the gravity sewer to 18th and A Streets, the pumping station at 18th and A streets, and the section of force main to the Regional Sanitation District interceptor, would be constructed to serve Phase 1 and (potentially) subsequent development.

As noted above, the connection to the district interceptor provides only interim service. Figure 4.16-5 shows the proposed Phase 1 improvements.

Phase 2 Sanitary Sewer Facilities

During Phase 2 of the development, capacities of the two sanitary sewer pumping stations would be increased and the trunk sanitary sewer, which conveys detained storm drainage to the combined sewer system, would be constructed. Figure 4.16-6 illustrates the proposed Phase 2 improvements.

Phase 2 sanitary sewer improvements are expected to include participation in a trunk sewer facilities expansion by either the SCRSD or the City. As discussed under Mitigation Measures 4.16-4(c) and 4.16-1(a) respectively, the City and the County are currently evaluating the needs of their systems to provide sanitary sewer service.

Phase 3 Sanitary Sewer Facilities .

During Phase 3 of the development, capacities of the two pumping stations would be further increased. Figure 4.16-7 illustrates the proposed Phase 3 improvements.

Phase 3 improvement may also include expansion of regional conveyance facilities.

General Plan Goals and Policies

The following City of Sacramento general plan goals and policies address provision of wastewater treatment.

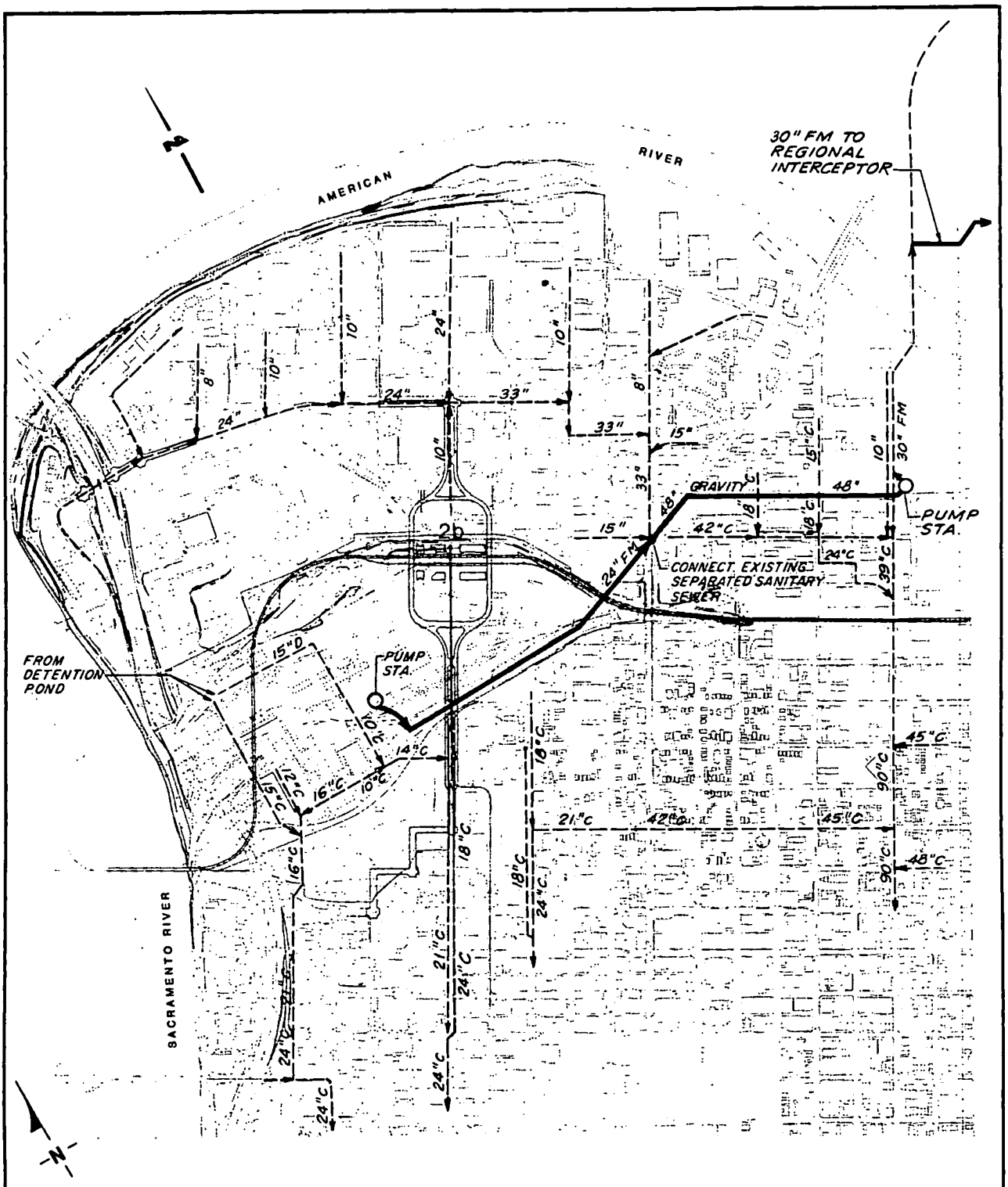
Public Facilities and Services Element

Goal A

Provide and maintain a high quality of public facilities and services to all areas of the City.

Goal B

Time all new public facilities and services as closely as possible to approved urban expansion.



Source: Nolte and Associates, 1992.

LEGEND

Existing
"C" Indicates Combined
"D" Indicates Drainage

Proposed

FIGURE 4.16-5

SANITARY SEWERS PHASE ONE (1991-2000)

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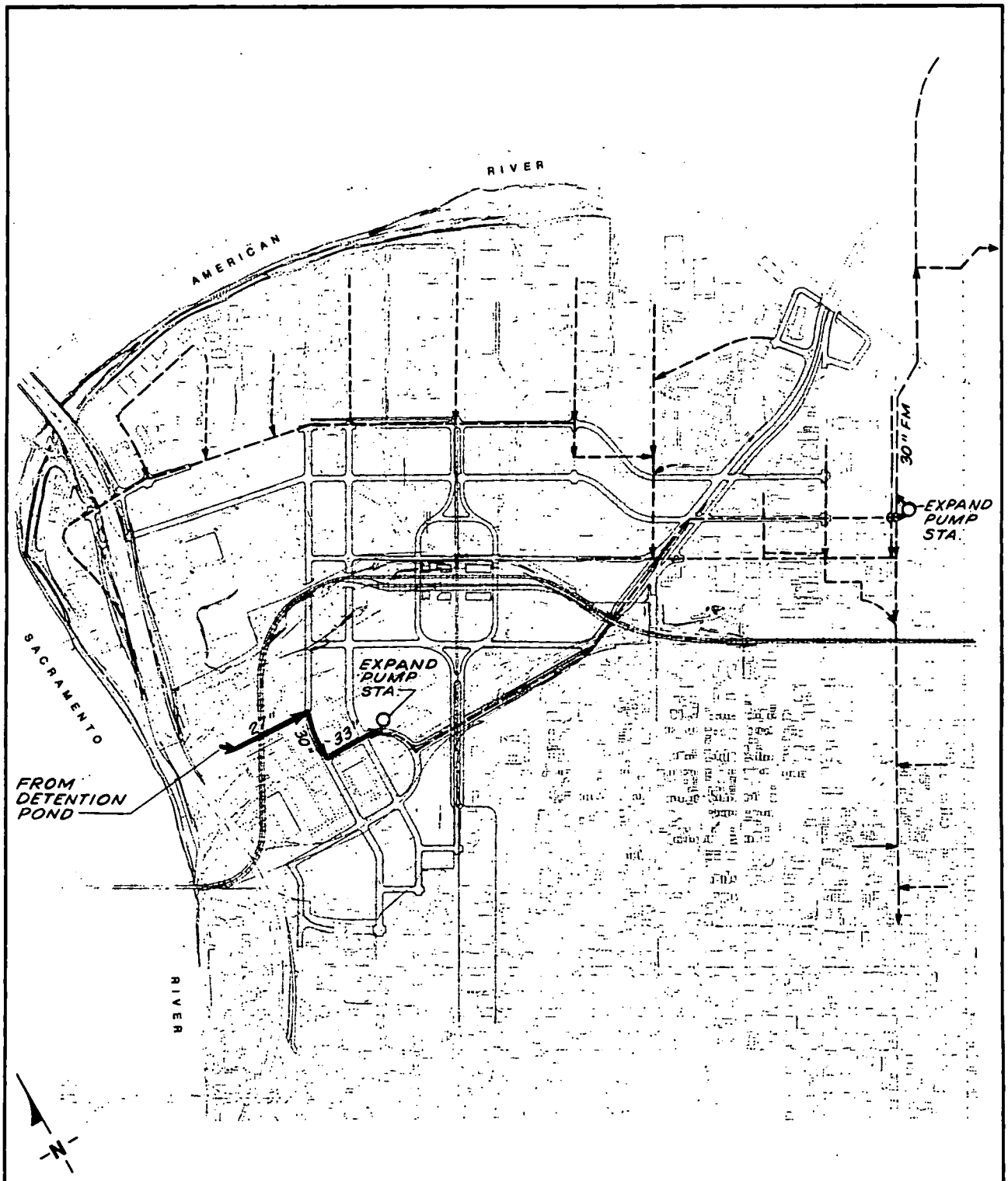

Source: Nolte and Associates, 1992.

LEGEND

Existing
(Or Previous Phase)

Proposed

FIGURE 4.16-6

SANITARY SEWERS
PHASE TWO (2001-2010)

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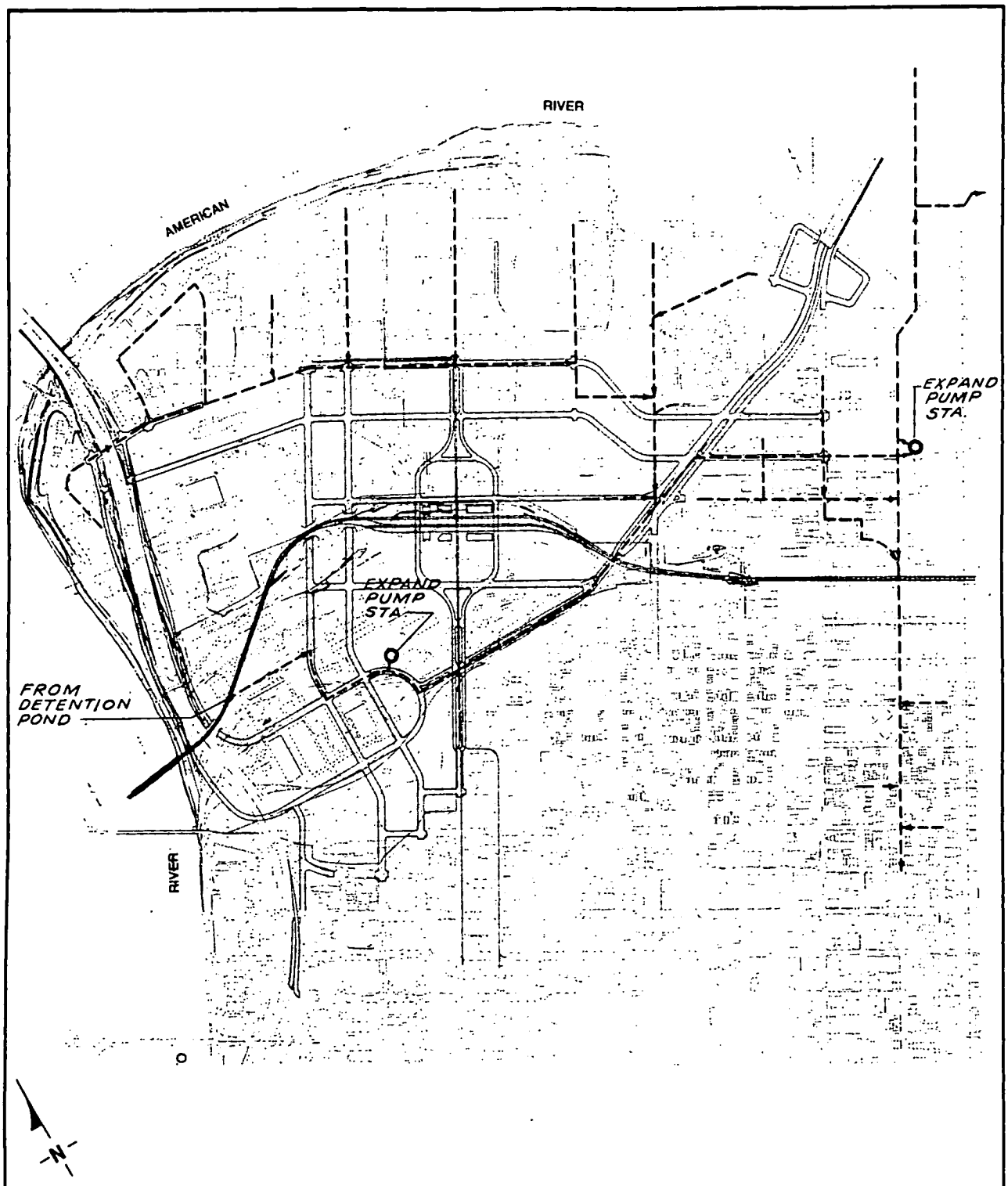

Source: Nolte and Associates, 1992.

LEGEND

Existing
(Or Previous Phase)

Proposed

FIGURE 4.16-7

SANITARY SEWERS
PHASE THREE (2011-2025)

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Goal C

Provide infrastructure for identified infill areas.

Goal D

Achieve economy and efficiency in the provision of services and facilities.

Under Alternatives 1 through 7, which propose the infill of development in the Planning Area, necessary infrastructure would be put in place to serve new development. Under Alternative 1 through 7, increases in wastewater flows would result in the need for additional sanitary sewer systems. Development in the Planning Area would be coordinated with the City and would contribute its fair share toward expanding the SRWTP, and other City infrastructure, in order to accommodate increases in flow through the system. The new wastewater system infrastructure would be coordinated with phased development under all of the Alternatives.

Goal E

Design public facilities in such a manner as to ensure safety and attractiveness.

Infrastructure design will be evaluated by the City for safety and attractiveness, prior to its construction.

Goals and Policies for Sanitary Sewers

Goal A

Provide adequate sewer service for all urbanized or developing neighborhoods.

Policy 1

Provide and upgrade sewer facilities where needed to newly developing areas in the City.

Policy 2

Develop plans for extension of sewer lines to existing developed areas where sewer service is lacking.

Policy 3

Work with property owners to develop financing arrangements in order to provide sewer services.

Under Alternative 1 through 7, increases in wastewater flows would result in the need for additional sanitary sewer systems. Development in the Planning Area would be coordinated with the City to contribute its fair share toward expanding the SRWTP, and other City infrastructure, in order to accommodate increases in flow through the system.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Impacts are considered significant if any of the following occur:

- Increased flow to the Combined Wastewater Control System (CWCS);
- Transfer of flow from one interceptor system to another interceptor system;
- Changes to the characteristics of the wastewater flow;
- Substantially increased flow of wastewater to the SRWTP;
- Creation of a need for extension of sewers to serve new development; or
- Increased flows to existing sewer systems beyond their capacity.

Method

Wastewater generation estimates for the Alternatives were calculated using the flow generation factors presented in the *City of Sacramento Design and Procedures Manual* (September 1, 1990). Alternative estimates were compared to the flows presented in the Sacramento Regional Wastewater Treatment Plant 1991 Annual Report.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.16-1 Implementation of any of the Alternatives would increase the amount of sewage treated by the Sacramento Regional Wastewater Treatment Plant.

Table 4.16-2 shows a summary of wastewater flow projections for all Alternatives.

A-1 Alternative 1 is estimated to generate an additional 0.57 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 2.81 mgd to 3.38 mgd. This impact is considered ***less-than-significant***.

The existing flow in the Planning Area represents approximately 1.5 percent of the existing SRWTP plant capacity of 181 mgd. At buildout, the estimated total sewage flow would represent 1.0 percent of the projected (2010) Average Daily Maximum Month Flow (ADMMF) SRWTP plant capacity of 330 mgd. Table 4.16-3a presents the estimated sanitary sewer flow for this Alternative.

A-2 Alternative 2 is estimated to generate an additional 11.78 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 1.20 mgd to 12.98 mgd. This is considered a ***significant impact.***

At buildout, the estimated total sewage flow would represent 3.9 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-3b presents the estimate sanitary sewer flow for this Alternative.

A-3 Alternative 3 is estimated to generate an additional 11.94 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 1.21 mgd to 13.15 mgd. This is considered a ***significant impact.***

At buildout, the estimated total sewage flow would represent 4.0 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-3c presents the estimated sanitary sewer flow for this Alternative.

A-4 Alternative 4 is estimated to generate an additional 8.99 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 1.40 mgd to 10.47 mgd. This is considered a ***significant impact.***

At buildout, the estimated total sewage flow would represent 3.1 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-3d presents the estimated sanitary sewer flow for this Alternative.

A-5 Alternative 5 is estimated to generate an additional 8.82 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 1.24 mgd to 9.76 mgd. This is considered a ***significant impact.***

At buildout, the estimated total sewage flow would represent 2.9 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-3e presents the estimated sanitary sewer flow for this Alternative.

A-6 Alternative 6 is estimated to generate an additional 8.37 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 0.58 mgd to 8.95 mgd. This is considered a ***significant impact.***

At buildout, the estimated total sewage flow would represent 2.8 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-3f presents the estimated sanitary sewer flow for this Alternative.

A-7 Alternative 7 is estimated to generate an additional 9.74 mgd of peak sewage flow at buildout. This would increase the estimated existing flow from 0.45 mgd to 10.49 mgd. This is considered a ***significant impact.***

At buildout, the estimated total sewage flow would represent 3.2 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-3g presents the estimated sanitary sewer flow for this Alternative.

The Sacramento County Regional Sanitation District (SCRSD) is currently developing a master plan for its wastewater treatment plant. This master plan has developed a projected service population through the year 2010. Based on this population projection, SCRSD has estimated treatment plant capacity requirements to serve the projected population. Figure 4.16-7 shows a plot of ADWF, ADMMF, peak hourly 2-year storm flow (2-year PHWWF) and peak hourly 100-year storm flow (100-year PHWWF) for each of the study years. Figure 4.16-8 also plots the estimated peak flow of the project Alternatives against the project's time period.

Mitigation Measures

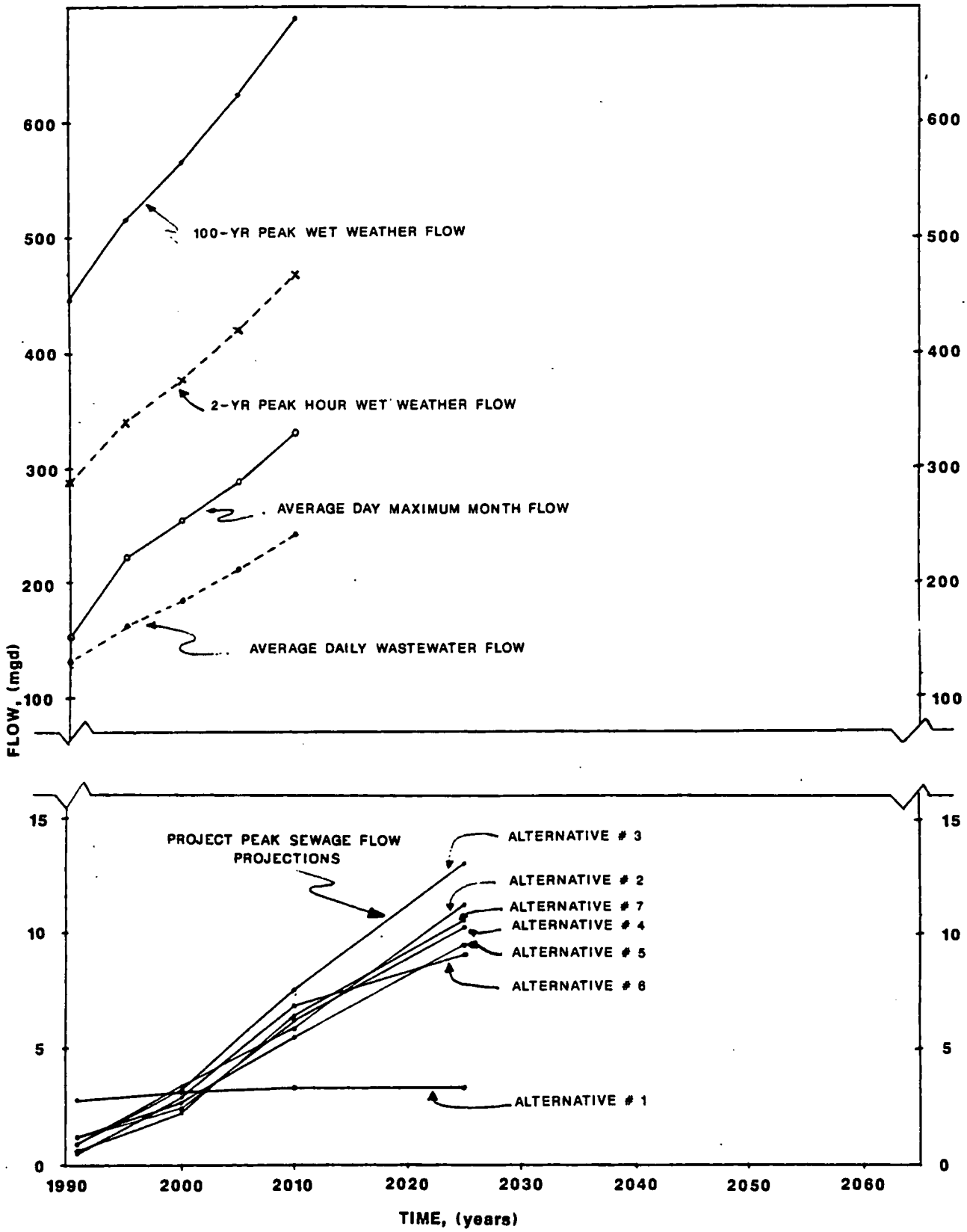
Implementation of Mitigation Measures 4.16-1(a) and (b) would reduce the above impacts to a *less-than-significant level.*

4.16-1(a) *Increase Sacramento Regional Wastewater Treatment Plant capacity. This mitigation measure would be required for Alternatives 2 through 7.*

The Planning Area would participate in increasing the SRWTP capacity by providing input to the district's planning efforts, and by contributing its pro rata share of the cost of treatment capacity required to serve the project. It should also be noted that the SCRSD SRWTP Master Plan states that the population projection will not dictate a specific calendar time frame for implementation of any portion of the SRWTP Master Plan. Future treatment facilities would be constructed in incremental stages over the planning period. Therefore, if the growth rate is slower than projected, the construction of the next increment of treatment capacity could be delayed until it is required. Conversely, if the growth rate is faster than projected, the next increment of treatment capacity could be constructed earlier than anticipated. Using this approach, planning and facility construction is not tied to the long range growth projection, but instead is designed to respond to the actually experienced growth rate (and associated flows).

4.16-1(b) *Use water conserving plumbing fixtures in new and renovated buildings. This mitigation measure would be required for Alternatives 2 through 7. This measure is recommended for Alternative 1.*

Use of water conserving plumbing fixtures would reduce flows to the SRWTP by reducing the water which is used for activities such as toilet flushing, showering and dishwashing. This mitigation measure would also reduce the demand on the domestic water supply and water system. The SCRSD Master Plan estimates that an approximate 23 percent reduction in indoor water use is possible with conservation measures such as water conserving appliances, low flow shower heads and low water use toilets.



Source: Nolte and Associates, 1992.

FIGURE 4.16-8

CITY WASTEWATER FLOW PROJECTIONS AND PROJECT PEAK SEWAGE FLOW PROJECTIONS

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4.16-2 Implementation of any of the Alternatives would potentially increase the flow of sanitary sewage to the Combined Wastewater Control System (CWCS).

A-1 Alternative 1 is estimated to generate an additional 0.57 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 3.33 mgd. This is considered to be a ***significant impact.***

The RWQCB has issued a cease and desist order to the City. The RWQCB has stated that an increase in existing flows or any new flows to the CWCS would increase the occurrence or the likelihood of occurrence of violations of the NPDES permit conditions. Violations (overflows and street flooding) generally occur as the result of wet weather. The City has calculated that the CWCS has capacity in the Planning Area to serve the Alternative 1 estimated sanitary sewage flows. However, until the CWCS violations are prevented, the City will not allow additional flows to the CWCS without offset.

A-2 Alternative 2 is estimated to generate an additional 8.45 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 11.21 mgd. This is considered to be a ***significant impact.***

A-3 Alternative 3 is estimated to generate an additional 10.28 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 13.04 mgd. This is considered to be a ***significant impact.***

A-4 Alternative 4 is estimated to generate an additional 7.50 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 10.26 mgd. This is considered to be a ***significant impact.***

A-5 Alternative 5 is estimated to generate an additional 6.76 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 9.52 mgd. This is considered to be a ***significant impact.***

A-6 Alternative 6 is estimated to generate an additional 6.32 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 9.08 mgd. This is considered to be a ***significant impact.***

A-7 Alternative 7 is estimated to generate an additional 7.80 mgd of peak sewage flow at buildout. This would increase the estimated existing flow of 2.76 mgd to 10.56 mgd. This is considered to be a ***significant impact.***

As discussed under Alternative 1, the RWQCB has issued a cease and desist order to the City regarding CWCS NPDES permit violations. Until all such violations are prevented, the City will not allow additional flows to the CWCS. Based on calculations provided by the City, the CWCS would have sufficient capacity in the Planning Area to serve Alternatives 2 through 7 estimated peak sewage flows during dry weather periods. The

CWCS would not, however, have capacity to serve Alternatives 2 through 7 during wet weather.

Mitigation Measures

Implementation of Mitigation Measures 4.16-2(a) through (d) would reduce the above impacts to a *less-than-significant level.*

4.16-2(a) *Detain existing storm drainage flows to the combined sewer system to offset the estimated sanitary sewage flow increase. This mitigation measure would be required for Alternative 1 and Phase 1 of Alternatives 2 through 7.*

This mitigation measure would detain storm drainage that presently enters the combined sewer system from the existing Planning Area. A sufficient flow would be detained to offset the estimated increase in sanitary sewage flow resulting from proposed development. Detained storm water would be released back into the combined sewer system as capacity is available.

4.16-2(b) *Transfer sanitary sewage flow to the regional interceptor on an interim basis for Phase 1. This mitigation measure would be required for Alternatives 2 through 7.*

4.16-2(c) *Develop a plan to provide sanitary sewer service for Phase 2 and Phase 3 by participation in the SCRSD Sewerage Expansion Study and by participation in the City Combined Sewer System Improvement Plan study. Implement the most practical plan to provide permanent sanitary sewer service to the Planning Area.*

For discussion of the SCRSD study see Impact 4.16-3. The City is currently conducting a CWCS improvement study regarding economical implementation of a combined sewer overflow strategy. The improvement plan is expected to be presented to the City Council and the RWQCB by July 1, 1992. Approval and implementation of the plan is expected to lead to the withdrawal of the RWQCB cease and desist order prohibiting increases in flows to the CWCS.

4.16-2(d) *Separate Combined Sewers in the Railyards Area and Eastern Richards Area.*

See discussion under Mitigation Measure 4.16-3(c).

4.16-3 Implementation of most of the Alternatives would produce impacts on the Natomas Interceptor resulting from the proposed sanitary sewage flow transfer.

A-1 Alternative 1 would not discharge any waste water to the Natomas interceptor, therefore, this is considered a ***less-than-significant impact.***

A-2 through A-7

Permanent diversion of sewage flow to the Natomas Interceptor could limit options available to the SCRSD relative to the handling of North Natomas flows. Diversion of sewage flow to the Regional Interceptor could affect SCRSD's "Mode 2 Operation" in which flows from north of the American River are transferred through the City's combined wastewater control system during an emergency or a planned scheduled shut-down of the Arden Pump Station (N-19).

Significant diversion of sewage flow to the Regional Interceptor could increase operational costs to the SCRSD as the result of pumping a larger volume of flow. Significant changes in the Plan of Operations of the Combined Wastewater Control System could require Regional Board approval. These are considered to be ***significant impacts.***

Mitigation Measures

The implementation of Mitigation Measures 4.16-3(a) through 4.16-3(f) would reduce the above impacts to a *less-than-significant level.*

4.16-3(a) *Divert only Phase 1 sewage flow on an interim basis to the Natomas Interceptor system. This mitigation measure would be required for Alternatives 2 through 7.*

4.16-3(b) *Participate in the SCRSD sewerage expansion study to arrive at a permanent method of providing sanitary sewer service to the Planning Area. This mitigation measure would be required for Alternative 2 through 7.*

4.16-3(c) *Implement the SCRSD Sewerage Expansion Plan as it pertains to the Planning Area. This mitigation measure would be required for Alternative 2 through 7.*

The SCRSD is currently conducting a study to develop Alternatives for regional interceptor routes to serve developing areas of Sacramento County. The final report for this study is expected to be complete in April 1992. Included in the scope of work is a requirement to consider the Planning Area in the demographic and land use projections for the study. Continued or expanded diversion of Planning Area flow to the regional interceptor system after Phase 1 would only occur with the approval of the SCRSD.

4.16-3(d) *Provide for SCRSD "Mode 2 Operation" of the interface between regional interceptor and the city combined sewer system in the facilities design facilities to divert Planning Area flows to the regional interceptor. This mitigation measure would be required of Alternatives 2 through 7.*

Mode 2 Operation would be provided by the inclusion of piping, valving and controls to allow the flows from north of the American River to be transferred through the combined wastewater control system (CWCS) during an emergency or a planned scheduled shutdown of the Arden

Pump Station (N-19). During this period, Planning Area flows would also be conveyed through the CWCS, as are the existing flows from the combined and separated sewer systems in the Richards Area. The scheduled Mode 2 Operation would occur during dry weather periods when the CWCS has sufficient capacity to convey the flows.

4.16-3(e) *Reimburse SCRSD for the increased operational costs incurred as a result of the diversion of the Planning Area flows to the regional interceptor. This mitigation measure would be required for Alternatives 2 through 7.*

4.16-3(f) *Obtain RWQCB approval (if required) of the change in the "Plan of Operations" of the CWCS and regional interceptor. This mitigation measure would be required for Alternatives 2 through 7.*

4.16-4 Implementation of any of the Alternatives could affect local sanitary sewers.

A-1 through A-7

Implementation of Alternatives 1 through 7 would add new flows to the existing separated and combined sewer system in the Planning Area. See Impact 4.16-3 for discussion of increased flows for each Alternative. Implementation of the Alternatives would also require extension or construction of separated sewers to serve the Planning Area that are not now sewered or whose existing sewer system will be abandoned due to new roadway alignments. All Alternatives would require some degree of sewer extension or construction. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of Mitigations Measures 4.16-4(a) and (b) would will reduce the above impacts to a *less-than-significant level.*

4.16-4(a) *Confirm adequacy of existing sanitary sewer system in the Planning Area to serve new land uses. If the capacity of the existing sewer is not sufficient to serve new land uses, construct additional sanitary sewers to provide the required capacity. This mitigation measure would be required for Alternatives 1 through 7.*

4.16-4(b) *Construct a new sanitary sewer system to serve locations in the Planning Area that are not presently served by sanitary sewer facilities, or where existing sanitary sewer facilities would require abandonment due to new development. This mitigation measure would be required for Alternatives 1 through 7.*

A-1 Alternative 1 would result in an increase in the acreage of heavy commercial and light industrial land use. This is considered to be a ***significant impact.***

4.16-5 Implementation of any of the Alternatives could change the characteristics of sewage flows treated by the SRWTP.

The change in the land use in the Planning Area could alter the characteristics of sanitary sewage uflows. Such characteristics could include biological oxygen demand (BOD), total suspended solids (TSS), and trace metals.

A-2 through A-7

Alternatives 2 through 7 would result in a decrease in the acreage of heavy commercial and light industrial land use, and an increase in the acreage of land use dedicated to residential, office, highway commercial, retail, hotel and cultural/institutional land uses. Conversion of industrial land uses (such as the existing cannery) to residential and commercial land uses would potentially reduce the BOD and trace metal loads to the SRWTP. This could be considered beneficial.

As discussed in Mitigation Measure 4.16-1(a), the SRWTP master plan has developed a schedule by which the various treatment processes must be upgraded to meet projected plant loadings for the various wastewater characteristics. Changes in land uses in the Planning Area may require a revision to the master plan implementation schedule. This is considered to be a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.16-5(a) and (b) would reduce the above impacts to a *less-than-significant level.*

4.16-5(a) *Advise SCRSD of Planning Area development in a timely manner to allow SCRSD lead time to adjust its treatment processes should such adjustment be required. This mitigation measure would be required for Alternatives 1 through 7.*

4.16-5(b) *Implement industrial pretreatment programs to treat industrial wastewater to a level where it can be accepted by the SRWTP. This mitigation measure would be required for Alternative 1. On a case by case basis, this mitigation may be required for specific developments proposing to locate in the Planning Area in Alternatives 2 through 7.*

Cumulative Impacts

4.16-6 Implementation of any of the Alternatives, taken with cumulative development in the City, would increase the amount of sewage treated by the Sacramento County Regional Wastewater Treatment Plant.

Table 4.16-4 shows a summary of cumulative waste water flows for each Alternative.

A-1 Alternative 1, taken with cumulative development, is estimated to generate an additional 9.60 mgd of peak sewage flow at buildout. This is considered a ***significant impact.***

At buildout, the estimated total peak sewage flow of 12.36 mgd would represent 3.7 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-5a presents the estimated sanitary sewer flow for this Alternative with cumulative development.

A-2 Alternative 2, taken with cumulative development, is estimated to generate an additional 19.21 mgd of peak sewage flow at buildout. This is considered a ***significant impact.***

At buildout, the estimated total peak sewage flow of 21.97 mgd would represent 6.7 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd.

Table 4.16-5b presents the estimated sanitary sewer flow for this Alternative with cumulative development.

A-3 Alternative 3, taken with cumulative development, is estimated to generate an additional 19.07 mgd of peak sewage flow at buildout. This is considered a ***significant impact.***

At buildout, the estimated total peak sewage flow of 21.83 mgd would represent 6.6 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-5c presents the estimated sanitary sewer flow for this Alternative with cumulative development.

A-4 Alternative 4, taken with cumulative development, is estimated to generate an additional 16.28 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

At buildout, the estimated total peak sewage flow of 19.04 mgd would represent 5.8 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-5d presents the estimated sanitary sewer flow for this Alternative with cumulative development.

A-5 Alternative 5, taken with cumulative development, is estimated to generate an additional 15.64 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

At buildout, the estimated total peak sewage flow of 18.40 mgd would represent 5.6 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-5e presents the estimated sanitary sewer flow for this Alternative with cumulative development.

TABLE 4.16-4
CUMULATIVE WASTEWATER FLOW PROJECTIONS AND PEAK SEWAGE FLOW

Year	PLANNING AREA AND CUMULATIVE CITY DEVELOPMENT Peak Cumulative Sewage Flow Summary (mgd)							City Wastewater Flow Projections (mgd)			
	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	ADWF	ADMMF	2-yr Storm	100-yr Storm
1990								131	151	287	446
1991	2.76	0.92	0.92	1.13	1.17	0.51	0.60				
1995								163	223	340	516
2000	7.42	7.62	7.43	6.79	6.99	6.76	6.55	186	254	377	566
2005								212	289	420	623
2010	12.36	16.52	16.29	14.95	14.35	14.56	14.79	242	330	469	690
Buildout	12.36	21.97	21.83	19.04	18.40	16.86	18.95				

Notes:
ADWF - Average Daily Wastewater Flow
ADMMF - Average Day Maximum Month Flow
2-yr Storm - Peak Hourly 2-Year Storm Flow
100-yr Storm - Peak Hourly 100-Year Storm

SOURCE: Nolte and Associates, 1992.

A-6 Alternative 6, taken with cumulative development, is estimated to generate an additional 14.10 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

At buildout, the estimated total peak sewage flow of 16.86 mgd would represent 5.1 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-5f presents the estimated sanitary sewer flow for this Alternative with cumulative development.

A-7 Alternative 7, taken with cumulative development, is estimated to generate an additional 16.19 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

At buildout, the estimated total peak sewage flow of 18.95 mgd would represent 5.7 percent of the projected (2010) ADMMF SRWTP plant capacity of 330 mgd. Table 4.16-5g presents the estimated sanitary sewer flow for this Alternative.

Mitigation Measures

Implementation of Mitigation Measures 4.16-6(a) and (b) would reduce the above impacts to a *less-than-significant* level.

4.16-6(a) *Increase Sacramento Regional Wastewater Treatment Plant capacity. This mitigation measure would be required for Alternatives 1 through 7.*

See discussion under Mitigation Measure 4.16-1, above.

4.16-6(b) *Use water conserving plumbing fixtures in new and renovated buildings. This mitigation measure would be required for Alternatives 1 through 7.*

See discussion under Mitigation Measure 4.16-2, above.

4.16-7 Implementation of any of the Alternatives, taken with cumulative development in the City, would potentially increase the flow of sanitary sewage to the Combined Wastewater Control System (CWCS).

A-1 Alternative 1 and cumulative development are estimated to generate an additional 9.60 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

A-2 Alternative 2 and cumulative development are estimated to generate an additional 19.21 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

A-3 Alternative 3 and cumulative development are estimated to generate an additional 19.07 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

TABLE 4.16-5A
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 1 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	1.19	0.00	1.19	2.74	0.00	2.74
Phase 1 (2000)	0.15	1.39	1.54	0.34	3.20	3.54
Phase 2 (2010)	0.10	1.74	1.83	0.23	3.99	4.22
Phase 3 (Buildout)	0.00	0.00[6]	0.00[6]	0.00	0.00[6]	0.00[6]
New Development Flows	**0.16**	**3.13**	**3.37**	**0.57**	**4.31**	**7.76**
Total Flows[2]	**1.44**	**3.13**	**4.56**	**3.32**	**4.31**	**10.50**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-5B
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 2 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	0.40	0.00	0.40	1.13	0.00	1.13
Phase 1 (2000)	1.03	1.40	2.43	2.38	3.21	5.59
Phase 2 (2010)	1.75	1.67	3.43	4.03	3.85	7.88
Phase 3 (Buildout)	2.31	0.00	2.31	5.31	0.00	5.31
New Development Flows	**5.09**	**3.07**	**8.17**	**11.72**	**7.06**	**18.78**
Total Flows	**5.49**	**3.07**	**8.57**	**12.85**	**7.06**	**19.91**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-5C
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 3 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	0.49	0.00	0.49	1.13	0.00	1.13
Phase 1 (2000)	0.96	1.38	2.34	2.20	3.17	5.37
Phase 2 (2010)	1.79	1.65	3.44	4.12	3.79	7.91
Phase 3 (Buildout)	2.40	0.00	2.40	5.52	0.00	5.52
New Development Flows	**5.15**	**3.03**	**8.18**	**11.84**	**6.96**	**18.80**
Total Flows	**5.64**	**3.03**	**8.67**	**12.98**	**6.96**	**19.93**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-5D
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 4 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	0.58	0.00	0.58	1.33	0.00	1.33
Phase 1 (2000)	0.27	1.40	1.67	0.61	3.23	3.84
Phase 2 (2010)	1.52	1.62	3.14	3.49	3.74	7.22
Phase 3 (Buildout)	2.10	0.00	2.10	4.83	0.00	4.83
New Development Flows	**3.89**	**3.02**	**6.91**	**8.93**	**6.97**	**15.89**
Total Flows	**4.47**	**3.02**	**7.49**	**10.26**	**6.97**	**17.22**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-5E
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 5 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	0.51	0.00	0.51	1.17	0.00	1.17
Phase 1 (2000)	0.63	1.41	2.04	1.46	3.24	4.70
Phase 2 (2010)	1.24	1.65	2.89	2.85	3.79	6.65
Phase 3 (Buildout)	1.76	0.00	1.76	4.11	0.00	4.11
New Development Flows	**3.63**	**3.06**	**6.69**	**8.42**	**7.03**	**15.46**
Total Flows	**4.14**	**3.06**	**7.20**	**9.59**	**7.03**	**16.63**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992.

TABLE 4.16-5F
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 6 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	0.32	0.00	0.32	0.51	0.00	0.51
Phase 1 (2000)	1.02	1.22	2.23	2.34	2.80	5.13
Phase 2 (2010)	1.60	1.36	2.96	3.69	3.12	6.81
Phase 3 (Buildout)	0.99	0.00	0.99	2.28	0.00	2.28
New Development Flows	**3.61**	**2.58**	**6.18**	**8.31**	**5.92**	**14.22**
Total Flows	**3.93**	**2.58**	**6.50**	**8.82**	**5.92**	**14.73**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992

TABLE 4.16-5G
ESTIMATED SANITARY SEWAGE FLOWS
ALTERNATIVE 7 WITH CUMULATIVE[1] CITY

	Average Dry Weather Flows[2,3]			Peak Flows[2,3,4]		
	Planning Area	City	Total	Planning Area	City	Total
Existing[5]	0.17	0.00	0.17	0.38	0.00	0.38
Phase 1 (2000)	0.75	1.35	2.10	1.72	3.09	4.82
Phase 2 (2010)	1.64	1.52	3.16	3.77	3.49	7.26
Phase 3 (Buildout)	1.82	0.00	1.82	4.19	0.00	4.19
New Development Flows	**4.21**	**2.87**	**7.08**	**9.68**	**6.58**	**16.27**
Total Flows	**4.38**	**2.87**	**7.25**	**10.06**	**6.58**	**16.65**

1 This uses 6,700 housing units as a worst-case assumption based on the Central City Housing Stragegy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2 Flows are expressed in million gallons per day (mgd).
3 Flows do not reflect high seasonal demands, such as the canning season. Sierra Fruit company 1990 ADWF = 0.5 mgd (based on water use).
4 PF = 2.3 x ADWF.
5 Existing flows are based on land use estimates by ROMA Group multiplied by flow generation rates.
6 Flow is less than 0.005 mgd.
7 PWWF = Peak flow plus I&I.
8 Does not include runoff to combined sewers.

SOURCE: Nolte and Associates, 1992.

A-4 Alternative 4 and cumulative development are estimated to generate an additional 16.28 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

A-5 Alternative 5 and cumulative development are estimated to generate an additional 15.64 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

A-6 Alternative 6 and cumulative development are estimated to generate an additional 14.10 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

A-7 Alternative 7 and cumulative development are estimated to generate an additional 16.19 mgd of peak sewage flow at buildout. This is considered to be a ***significant impact.***

As discussed under Alternative 1, the CWCS is under a cease and desist order. Until the CWCS NPDES permit violations are prevented, the City will not allow additional flows to the CWCS. Based on calculations provided by the City, the CWCS would have sufficient capacity in the Planning Area to serve Alternatives 2 through 7 estimated sewage flows during dry weather periods. Capacity availability for cumulative development would be evaluated on a site-by-site basis depending on the location of the cumulative development in the Central City. The CWCS would not, however, have capacity to serve Alternatives 2 through 7 and cumulative development during wet weather.

Mitigation Measures

Implementation of Mitigation Measures 4.16-7(a) and (b) would reduce the above impacts to a *less-than-significant* level.

4.16-7(a) *Decrease existing storm drainage flows to the combined sewer system to offset the estimated sanitary sewage flow increase. This mitigation measure would be required for Alternatives 1 through 7.*

In the Planning Area, this mitigation measure would involve detaining storm drainage that presently enters the combined sewer system from the existing Planning Area. A sufficient flow would be detained to offset the estimated increase in sanitary sewage flow resulting from proposed development. Detained storm water would be released back into the combined sewer system as capacity is available.

In the Central City area, this mitigation measure would require compliance with cumulative development mitigation measures designed to offset project-specific impacts resulting from increased flow to the CWCS. The City is presently developing policies and standards for assessing the potential impacts of cumulative development on the existing CWCS.

4.16-7(b) *Implement Mitigation Measures 4.16-3(a) through (d). This mitigation measure would be required for Alternatives 2 through 7.*

4.16-8 New flows would be added to local sanitary sewers.

A-1 through A-7

Development associated with any of the Alternatives, taken with cumulative development in the City, would add new flows to existing separated and combined sewer system in the Planning Area. See Impact 4.16-7 for discussion of increased flows for each Alternative.

Implementation of the Alternatives would require extension or construction of separated sewers to serve locations in the Planning Area that are not now sewered or whose existing sewer system would be abandoned due to new roadway alignments. All Alternatives would require some degree of sewer extension or construction. Impacts on local sanitary sewers are considered ***significant.***

Mitigation Measures

Implementation of Mitigations Measures 4.16-8(a) and (b) would reduce the above impacts to a *less-than-significant level.*

4.16-8(a) *Confirm adequacy of existing sanitary sewer system in the development areas to serve new land uses. If the capacity of the existing sewer is not sufficient to serve new land uses, construct additional sanitary sewer to provide the required capacity. This mitigation measure would be required for Alternatives 1 through 7.*

4.16-8(b) *Construct a new sanitary sewer system to serve the Planning Area that is not presently served by sanitary sewer facilities or where existing sanitary sewer facilities would require abandonment due to new development. Implement Mitigation Measure 4.16-4(b). This mitigation measure would be required for Alternatives 1 through 7.*

4.16-9 Implementation of any of the Alternatives, taken with cumulative development in the City, could change the characteristics of sewage flows treated by the SRWTP.

A-1 through A-7

See discussion of this impact under Impact 4.16-5.

Mitigation Measures

Implementation of Mitigation Measure 4.16-9 would reduce the above impacts to a *less-than-significant level.*

4.16-9 *Implement Mitigation Measure 4.16-5(a) and (b). This mitigation measure would be required for Alternatives 1 through 7.*

ENDNOTES

1. HDR Engineering, *et. al., City of Sacramento Combined Wastewater Control System Phase 2 Detailed Technical Report,* July 1, 1991.

2. HDR Engineering, *et. al., City of Sacramento Combined Wastewater Control System, Technical Overview Report, October 1, 1990.*

3. Carrollo, John Engineers, *Sacramento Regional Wastewater Treatment Plant Master Plan Report, Task 300, Technical Memorandum No. 5, Projected Wastewater Flows and Characteristics,* August 1991.

4. *City of Sacramento, General Plan Update,* January 19, 1988.

5. *Sacramento Regional County Sanitation District,* 1990 Annual Report.

4.17 STORMWATER AND DRAINAGE

4.17 STORM WATER AND DRAINAGE

INTRODUCTION

This chapter provides an overview of the potential impacts of the redevelopment of the Planning Area and cumulative downtown development on the city storm drainage system, including issues associated with the existing combined storm/sewer system. The information provided in this section draws heavily on information developed by Nolte and Associates for the preparation of the infrastructure elements of the Facilities Element.

SETTING

Local Drainage Systems

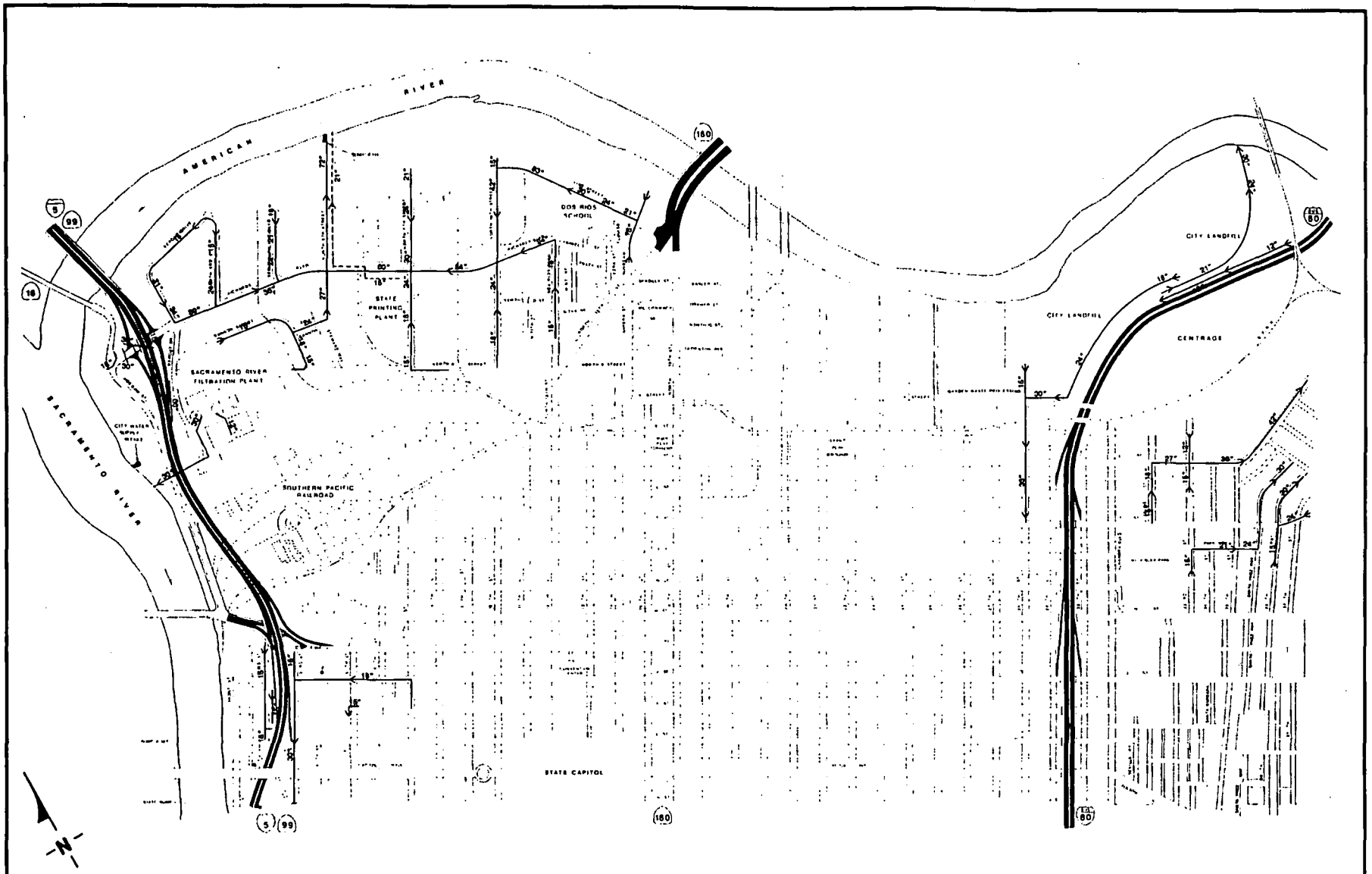
Portions of the City of Sacramento, including the Railyards Area and a portion of the Richards Area, are served by the City's combined storm/sanitary sewer system. The combined sewer service area of the city is bounded by the Sacramento River on the west, 65th Street on the east, the American River on the north and Sutterville Road on the south. Most of the Richards Area is serviced by separate drainage and sanitary sewer systems (see Figure 4.17-1).

Existing Storm Drainage Facilities

No separate storm drain facilities exist on the Railyards site. The Railyards on-site combined storm/sanitary/industrial sewer systems discharge into the existing city combined storm/sewer system at two locations in 7th Street and at one location in 3rd Street.

In the Richards Area, both combined and separated storm/sanitary sewer systems exist. The area west of North 12th Street and north of North B Street is served by an existing separated system. Storm water from this area flows to Sump 111 (located at the north end of North 5th Street) and is discharged to the American River. Figure 4.17-1 shows the separated storm drainage facilities in the Planning Area. The balance of the Richards Area is served by a combined storm/sanitary sewer system. This system connects to the City's sewer trunk main at North B and 18th Street.

Storm water from the combined sewer areas flows to the Regional County Sanitation District wastewater treatment plant located near the town of Freeport. When combined flows in the City interceptor reach 60 million gallons per day (mgd), wastewater flow in excess of 60 mgd is diverted to and is treated at the City Combined Wastewater Treatment Plant located at the corner of South Land Park Drive and 35th Avenue. Both treatment facilities discharge treated wastewater into the Sacramento River.



Source: Nolte and Associates, 1992.

LEGEND

SEPARATED STORMDRAIN, 12" AND LARGER

STATE FORCE MAIN

FIGURE 4.17-1
EXISTING SEPARATED STORM DRAIN FACILITIES

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Several areas within the combined system have been identified as having a history of overflowing during periods of intense rainfall (see Figure 4.17-1). With the exception of these periodic overflows, the existing combined system has sufficient capacity to handle existing sanitary wastewater flows. However, the City, in response to a cease and desist order issued by the California Regional Water Quality Control Board in June of 1990, has indicated that, until the overflow situation is corrected, any significant increase in flows cannot be accommodated by the existing combined system.

Future Storm Drainage Facilities

Potential Future Separation of the Combined Sewer System

The City is currently considering its future storm drainage needs. Several alternative master plans for sewer and storm drain facilities have been prepared. One study investigated the infrastructure needed to separate the combined storm/sanitary sewer system in the Richards Area, Railyards Area and the North Central Core area of the City, and to re-direct both the existing and newly separated storm waters to an outfall on the Sacramento River, downstream of the water treatment plant intakes. The preferred outfall location is a site along the western Railyards Area boundary, south of D street and north of G street, at least 800 feet south of the water treatment plant intake. Another study is investigating alternatives to re-operate or modify the combined sewer system to increase its capacity, yet still convey combined wastewater. This study was released July 1, 1991, and is discussed below.

Alternatives to Separation of the Combined Sewer System

The City of Sacramento is developing a plan to improve its combined sewer system in order to control street flooding and overflows (CSOs). A study regarding the plan was begun in July 1990 in response to the Regional Water Quality Control Board's cease and desist order. The study is being pursued in three phases.

Phase 1 was completed in October 1990 and included several reports: an *Interim Plan of Operations*, a *Technical Overview Report of the Combined Sewer System*, and a *Sampling Program* for the Sacramento River and combined sewer system. These reports were approved by the Regional Board.

The Phase 2 Detailed Technical Report, completed in July 1991, presented the results of an affordability analysis of the least costly project designed to control flooding for the 10-year, 6-hour storm, and to limit CSOs to one event per year (referred to as the "10/1 Criteria").

To develop projects to meet the 10/1 Criteria, various flood and CSO control methods were initially considered. The various alternatives included increased conveyance capacity, separated sewers, storage, deep tunnels and treatment. After initial consideration, the remaining specific alternatives were combined and sized to meet the 10/1 Criteria for both flooding and CSO control. Cost estimates for the resultant comprehensive project plans were then prepared. The study indicated that the lowest-cost alternative satisfying the 10/1 Criteria is a tunnel storage and

conveyance system. An affordability analysis was conducted and concluded that the resulting service fees would exceed EPA's threshold of hardship for all the financing options considered.

The Phase 3 work (scheduled for completion in July 1992) will expand the analysis of alternative improvement plans to meet flooding and CSO control criteria less costly than the 10/1 criteria. Phase 3 is expected to result in a final improvement plan that is both cost-effective and affordable.

Storm Drainage System Objectives

The storm drainage systems serving the Planning Area are planned to accommodate several objectives. These are:

1. Implement separation of combined sewer flows in the Planning Area.

2. Assist in separation of combined sewer flows from upstream tributary areas from the Richards Boulevard area east of 12th Street and (potentially) the North Core area of the city (north of H Street).

3. Relocate the Richards Boulevard area drainage discharge from the American River to a point on the Sacramento River downstream from the intake of the City water filtration plant.

4. Enable the capture of first flush storm drainage pollutants for treatment.

5. Avoid deep excavation in areas suspected of having toxic contamination of soils and groundwater.

Separation of the North Core area's combined sewer system (as identified in objective 2) has been assumed in the analysis of drainage alternatives for the Planning Area. If Phase 3 of the City's combined sewer system improvement study concludes that separation of the North Core Area is not the most cost effective alternative to solve flooding in the combined sewer service area, the drainage facilities required for the North Core separation can be deleted from the drainage plan. The alignments of the facilities that are discussed below should not change significantly. The size of the drainage facilities would be reduced proportionately to the acreage of the North Core area that is not separated.

Trunk Storm Drain Facilities

Several trunk storm drain alternative alignments were investigated to provide drainage facilities for the Planning Area. After reviewing these alternatives, the City expressed a preference for the alignment described below.

The preferred configuration would require the construction of a pump station east of the Railyards site and a force main to convey North Core, Centrage and newly separated Richards Area drainage. The discharge force main alignment would parallel the railroad tracks to the

Intermodal Transit Station, and would then parallel the tracks and the North B Street alignment and connect to the gravity trunk storm drain from the Richards Area. Railyards Area drainage would be conveyed separately in a smaller diameter gravity/force main system.

Western Richards Area drainage would be conveyed separately in a gravity system north and west of the Southern Pacific Railroad track alignment.

The trunk storm drain collection system would convey storm flows to a portion of the Railyards Area just south of the City's water treatment plant. At this location, a storm water pump station would be constructed to discharge the storm drainage to the Sacramento River. To aid in meeting storm water quality regulations, a diversion structure and pump station could be provided upstream of the storm water pump station at the Sacramento River. The diversion facility would route the first flush and low flows to the CSS, or through the project's sanitary sewer system and ultimately to the SRWTP for treatment. Allowable discharge rates to the CSS would determine the storage required to detain the first flush. Assuming storage of a first flush of 0.5 inches over the North Core and Planning area, the first flush storage volume would be approximately 60 acre ft. Precipitation depths and runoff (storage) volumes are presented in Table 4.17-1 and Table 4.17-2, respectively.

The trunk storm drain system to serve the Planning Area and the North Core area consists of the components listed below and shown in Figure 4.17-2.

1. A large pumping station outfall into the Sacramento River. This will have a capacity of approximately 645 cubic feet per second (cfs).

2. A detention pond storing approximately 60 acre-feet adjacent to the pumping station.

3. A 144-inch diameter pipeline from the pumping station to a point at North B Street and 6th Street extended.

4. A 96-inch diameter pipeline from North B and 6th Streets to Richards Boulevard and 6th Street extended, to intercept drainage from the Richards Boulevard area now flowing north to Sump 111 on the American River.

5. A pumping station near 12th and A Streets with a capacity of approximately 370 cfs, and a dual 42-inch diameter force main from this location to the 144 inch pipeline at North B and 6th Streets. This serves the area east of 12th Street, including the North Core area.

6. 60-inch, 54-inch and 48-inch trunk drains on A Street and 16th Street discharging to the 12th and A pumping station.

TABLE 4.17-1

PRECIPITATION DATA

Frequency	Duration - Precipitation Depth (Inches)		
	1-Hour	6-Hour	24-Hour
2-Year	0.45	1.06	1.90
10-Year	0.77	1.65	2.98
100-Year	1.21	2.50	4.25

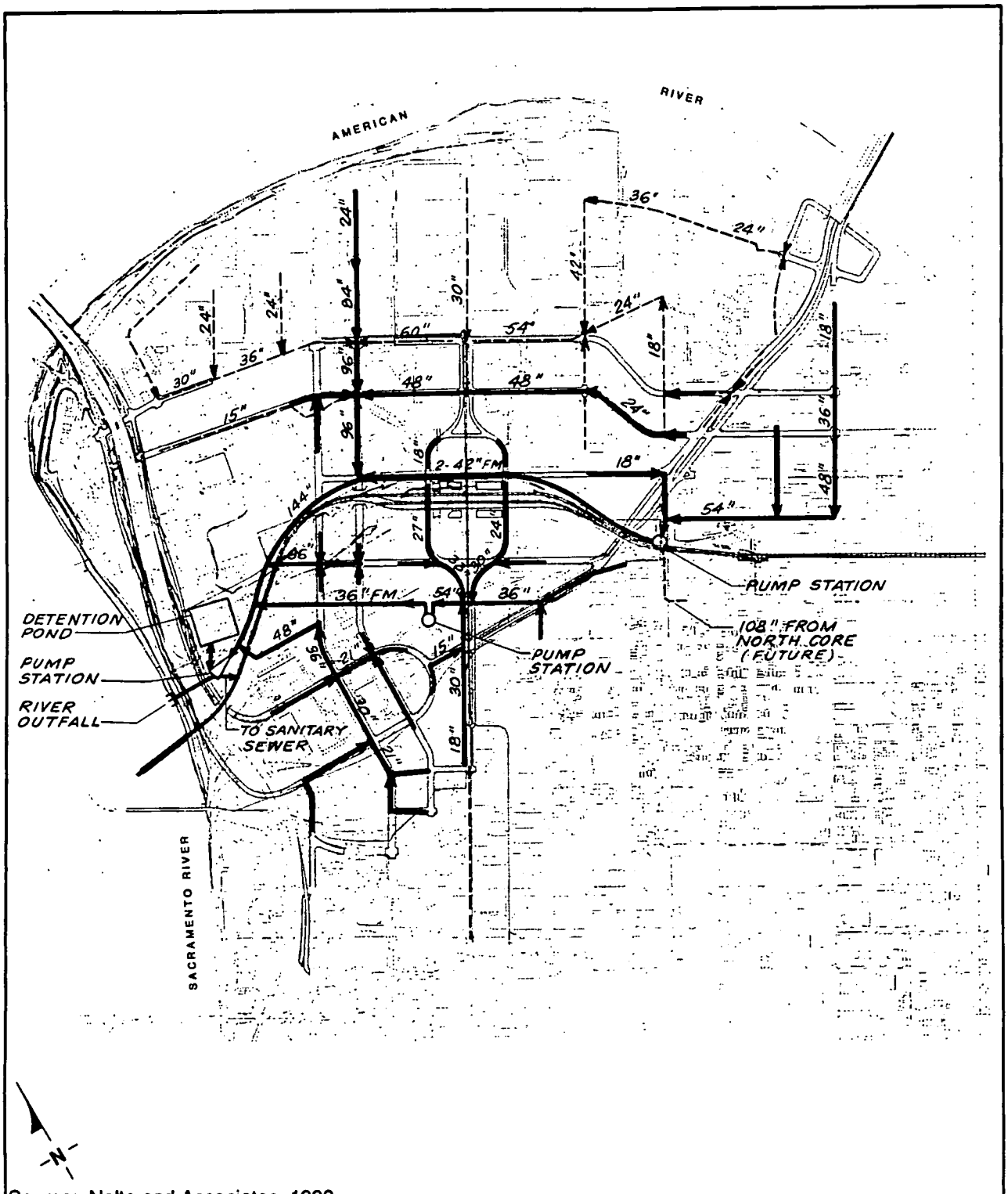
SOURCE: *Draft City-County of Sacramento Hydrology Manual*, October 1991

TABLE 4.17-2

RUNOFF VOLUMES

Site	Area (acres)	Runoff Volume (Ave. C = 0.90)		
		First Flush (acre-feet)	10-yr, 24-hr (acre-feet)	100-yr, 24-hr (acre-feet)
Railyards Area Phase 1	107	4.0	23.9	34.1
Railyards Area Phase 2	100	3.8	22.4	31.9
Railyards Area Phase 3	71	2.7	15.9	22.6
Richards Blvd.	633	23.8	141.5	201.8
North Core	575	21.6	128.5	183.3

SOURCE: Nolte and Associates, 1992



Source: Nolte and Associates, 1992.

LEGEND

Existing

Proposed

FIGURE 4.17-2

STORM DRAINAGE MASTER PLAN

91155

7. A 48-inch diameter trunk drain on Bannon Street extended discharging to the 96-inch pipeline at 6th and Bannon Streets.

8. A pumping station centrally located within the Richards Area, and a 36-inch diameter force main running west along C Street extended to the 144-inch diameter trunk line. This serves the northeasterly portion of the Railyards Area. The remaining portion is able to drain by gravity to the riverside pumping station.

The City is currently studying alternatives for dealing with combined sewers throughout the older sections of the city. There is a possibility that the outcome of these studies could result in some change in the drainage concept described above.

Local Storm Drainage System

The existing local drainage system in the Richards Area would be augmented by storm drainage facilities in the new project roadways. The Richards Boulevard drainage system is anticipated to be entirely gravity flow.

The local drainage facilities for the Railyards Area would be provided by a new gravity collection system. This drainage system drains the Railyards Area Phase 1 and the eastern portion of Railyards Area Phase 2 to a storm water pump station near the center of the Phase 1 area. The pump station discharges through a force main in the "C" Street right of way. The force main outfalls into the 144-inch diameter trunk storm drain.

The remaining portions of Phase 2 and Phase 3 storm flows are separately drained to small local storm drain systems. These systems discharge to the 144-inch diameter trunk storm drain.

The local storm drainage system master plan is shown on Figure 4.17-2.

These on-site storm drainage facilities were developed in an effort to minimize disturbance to contaminated soils and impacts on contaminated groundwater that would have occurred with the construction of large-diameter storm drains in deep trenches.

In each of these alignments, long term first flush flows would be directed to the detention basin for later discharge to the sanitary sewer system. By directing first flush flows to the detention basin, the impact of the first flush flows on the sanitary sewer system is reduced to a manageable level.

Low flows (dry weather flows such as those produced by car washing, pavement washdown, etc.) for both long term and Railyards Area Phase 1 storm drainage would be discharged to the Railyards Area on-site sanitary sewer system. Low flows, by definition, are dry weather flows and would not adversely affect the sanitary sewer system. The Railyards Area on-site sanitary sewer system has been sized to handle these flows.

Implementation Strategy for Storm Drainage Facilities

Phasing of Sanitary Sewer Facility Construction

Construction of storm drainage facilities is anticipated to be undertaken in concert with development of the Planning Area. Trunk facilities and facilities that are within arterial roadways will be constructed by joint efforts. These items are of areawide benefit and will be financed accordingly.

Local storm drainage system facilities serving the smaller development unit areas are considered to be a developer responsibility, and will be installed at developer cost when local street improvements are constructed.

Phase 1 Storm Drainage Facilities

Trunk facilities for Phase 1 construction, which are shown in Figure 4.17-3, will include the pumping station within the Railyards Area and the 36-inch force main west along C Street to the detention pond. Phase 1 storm drainage from the Railyards Area site will be stored in a detention pond and pumped at a controlled rate to the City combined sewer system after the storm peak has passed, using portions of existing sewers in the Railyards Area to reach City sewers. This storage is estimated to accommodate flows from a 100-year, 24-hour storm. An emergency overflow to the Sacramento River will be used in the event of a larger storm event.

Phase 2 Storm Drainage Facilities

Trunk facilities for Phase 2 construction, which are shown in Figure 4.17-4, will include the riverside pumping station and the remaining portion of the detention pond. The remaining trunk storm drains and force mains described on page 4.17-4 will be constructed.

Phase 3 Storm Drainage Facilities

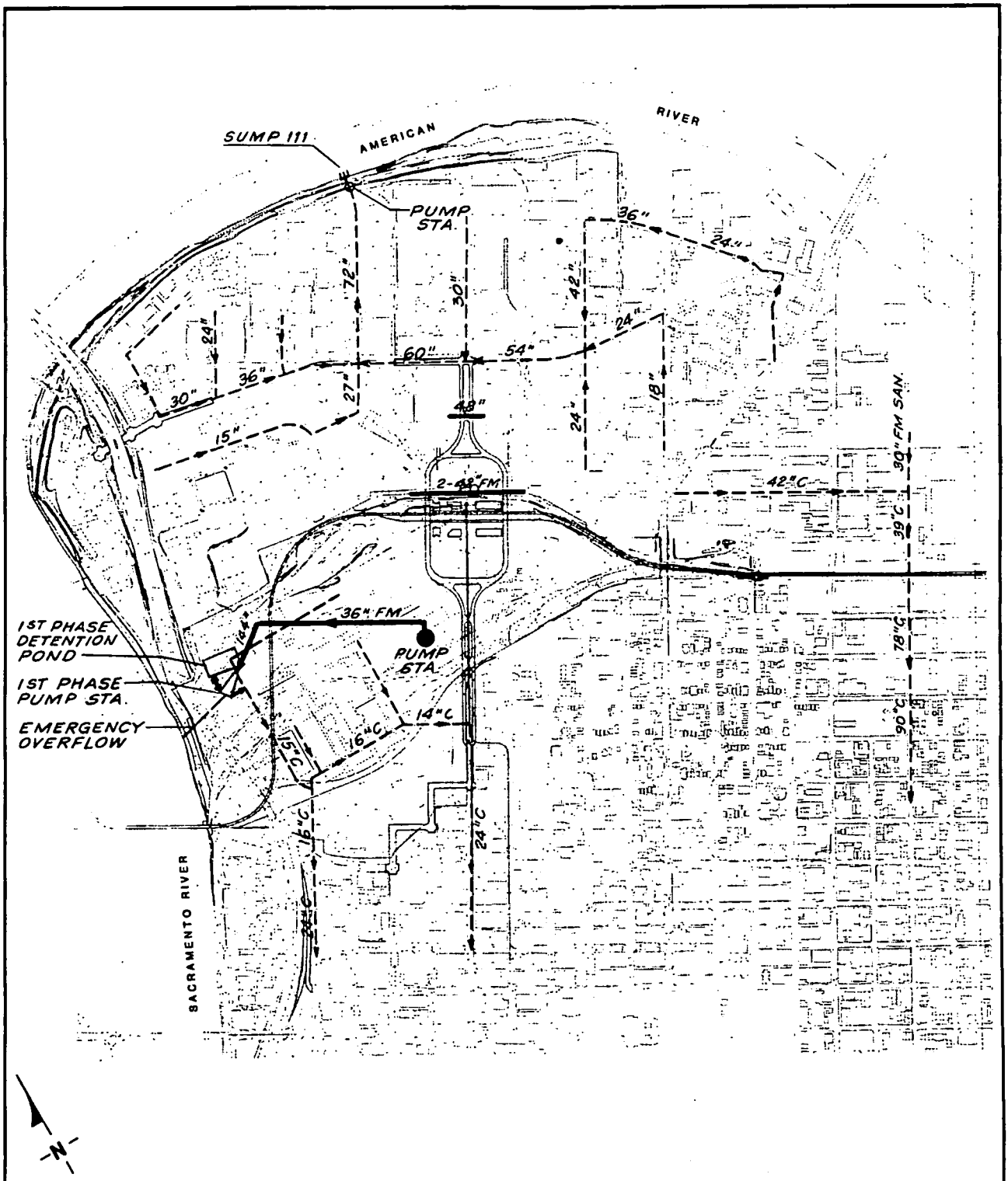
During Phase 3, no further areawide facilities are anticipated to be constructed. Local storm drainage facilities serving the Phase 3 area will be constructed by developers during the construction of local streets.

General Plan Goals and Policies

The following General Plan goals and policies direct the development of storm water drainage facilities in the City of Sacramento.

Public Facilities and Services Element

Goal A	Provide and maintain a high quality of public facilities and services to all areas of the City.
Goal B	Time all new public facilities and services as closely as possible to approved urban expansion.



Source: Nolte and Associates, 1992.

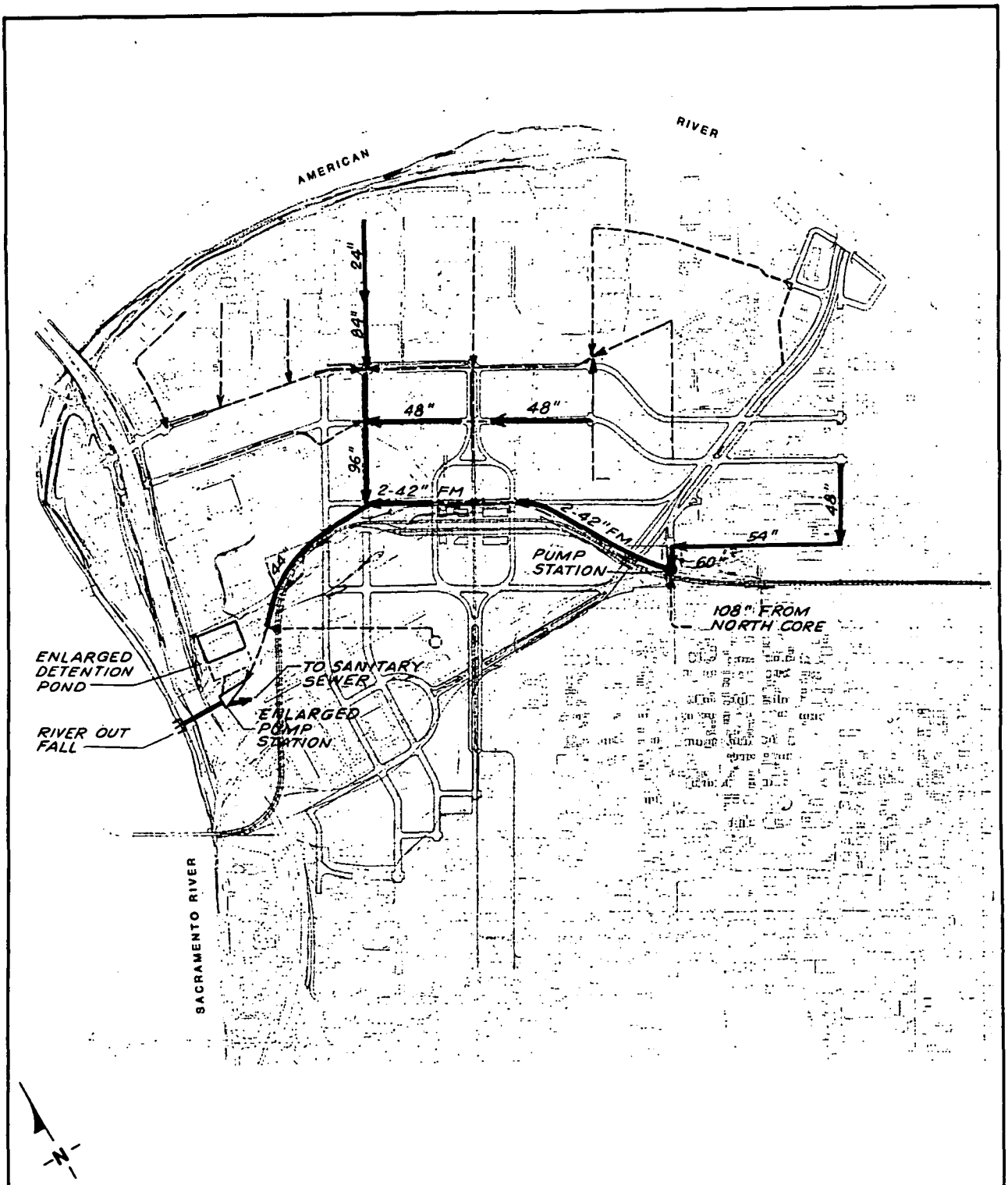
LEGEND

- Existing
  "C" Indicates Combined
- Proposed

FIGURE 4.17-3

STORM DRAINAGE PHASE ONE (1991-2000)

91155



Source: Nolte and Associates, 1992.

LEGEND

Existing (Or Previous Phase)

Proposed

FIGURE 4.17-4

STORM DRAINAGE PHASE TWO (2001-2010)

91155

Goal C Provide infrastructure for identified infill areas.

Goal D Achieve economy and efficiency in the provision of services and facilities.

Under Alternatives 1 through 7, increases in impervious surfaces would increase storm water runoff, resulting in the need for additional storm water drainage facilities. New storm water drainage infrastructure would be coordinated with phased development under all of the Alternatives. Development in the Planning Area would be coordinated with the City to contribute towards its share of expanding any improvements to the City storm water drainage infrastructure.

Goal E Design public facilities in such a manner as to ensure safety and attractiveness.

Infrastructure design would be reviewed by the City prior to construction to ensure safety and attractiveness.

Goals and Policies for Drainage

Goal A Provide adequate drainage facilities and services to accommodate desired growth levels.

Policy 1 Ensure that all drainage facilities are adequately sized and constructed to accommodate the projected increase in storm water runoff from urbanization.

All proposed storm water drainage facilities will be designed and sized to accommodate increase storm water runoff generated Alternatives 1 through 7.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Impacts are considered significant if they:

- Result in a need for new systems, or substantial alterations to storm water drainage facilities; or
- result in substantial changes in absorption rates, drainage patterns, or the rate and amount of surface runoff.

Method

Estimates of existing and potential impervious surfaces in the Planning Area were derived from aerial photographs, proposed land use types and typical impervious cover values for the proposed land uses. Estimates of the existing percentages of impervious surface for the Central City area were taken from the City's Storm Water Management Model (SWMM) input data developed by R.E. Young Engineers for study of the combined sewer system.

TABLE 4.17-3

ESTIMATED IMPERVIOUS COVER PERCENTAGES FOR VARIOUS LAND USES

Land Use	Range (Percent)	Typical Value for Average Conditions-Percent
Natural or Agriculture	0. - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential:		
8 -10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Commercial, Downtown Business or Industrial	80 - 100	90

SOURCE: Nolte and Associates, 1992

Typical ranges for percent impervious surface for proposed land uses are presented in Table 4.17-3.

Typical values are based on average conditions, which may not apply to a particular Planning Area. The percentage of impervious surface may vary greatly, even on comparable sized lots, due to differences in building size, improvements, and so on. Landscape practices should also be considered, as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs.

Storm flows used to determine pipe sizes for the storm drain master plan were taken from the Conceptual Master Plan for Combined Sewer Storm Drain Separation in the Richards Boulevard and North Core Area (Nolte May 1990) and Calculations for Storm Drain Alternatives Investigations (Nolte 1990 and 1991).

Impacts Due to Development in the Planning Area

4.17-1 Implementation of any of the Alternatives could increase the percentage of impervious surfaces in the Planning Area.

All Alternatives could potentially increase the percentage of impervious surfaces in the Planning Area. The change in percent imperviousness with each Alternative would vary depending on the existing percent imperviousness of the existing land use compared to the percent imperviousness of the proposed land use. The percent imperviousness of the proposed land use will vary with actual building coverage, hardscape and landscape type for the individual developments.

The existing Richards Area is estimated to be between 82 percent and 88 percent impervious surface. The existing Railyards Area is estimated to be between 60 percent and 65 percent impervious surface. Overall, the Planning Area is estimated to be between 78 percent and 81 percent imperious surface.

An increase in the percentage of impervious surfaces normally results in higher peak flows and a greater volume of storm water runoff. Higher peak flows and greater storm water volumes could cause or increase flooding in the Combined Wastewater Control System (CWCS) and the Richards Boulevard separated storm drain system.

A-1 Alternative 1 could increase the percentage of impervious surfaces in the Railyards Area to approximately 85 percent and the Richards Area to approximately 85 percent. This is considered a ***significant impact.***

A-2 Alternative 2 could increase the percentage of impervious surfaces in the Railyards Area to approximately 70 percent and the Richards Area to approximately 82 percent. This is considered a ***significant impact.***

A-3 Alternative 3 could increase the percentage of impervious surfaces in the Railyards Area to approximately 69 percent and the Richards Area to approximately 82 percent. This is considered a ***significant impact.***

A-4 Alternative 4 could increase the percentage of impervious surfaces in the Railyards Area to approximately 68 percent and the Richards Area to approximately 83 percent. This is considered a ***significant impact.***

A-5 Alternative 5 could increase the percentage of impervious surfaces in the Railyards Area to approximately 67 percent and the Richards Area to approximately 83 percent. This is considered a ***significant impact.***

A-6 Alternative 6 could increase the percentage of impervious surfaces in the Railyards Area to approximately 69 percent and the Richards Area to approximately 83 percent. This is considered a ***significant impact.***

A-7 Alternative 7 could increase the percentage of impervious surfaces in the Railyards Area to approximately 68 percent and the Richards Area to approximately 83 percent. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.17-1(a) through 4.17-1(c) would reduce the above impacts to a *less-than-significant level.*

4.17-1(a) *Construct a storm drainage system to accommodate increased storm water runoff resulting from development in the Planning Area. This mitigation measure would be required for all Alternatives.*

For Alternative 1, the Storm Drainage System in the Richards Area would remain substantially in its existing configuration. The existing separated system (which has approximately a 5-year design capacity) would be augmented or reconfigured as land uses change or evolve to serve new purposes.

The storm drainage system in the Railyards Area would be left as is, separated and/or reconfigured to serve the revised or reconfigured land uses of the Southern Pacific site. Subject to the results of the combined sewer system improvement study, the existing combined sewer system in the eastern Richards Area (east of North 12th Street Extension) would be separated or would remain a combined system.

Relocation of the Sump 111 outfall to the Sacramento River would be implemented at some future time at the discretion of the City's Flood Control and Sewers Division.

For Alternatives 2 through 7, the storm drainage system would be sized to convey a 10-year, 24-hour rainfall event without street flooding. The existing separated drainage system in the Richards Area would be augmented by paralleling existing storm drainage mains, or by relieving existing mains by providing additional storm drains in new streets. Drainage facilities would be designed in compliance with City of Sacramento standards.

Storm water collection systems will be constructed to provide drainage for development in the Planning Area.

The storm drainage systems would consist of a network of inlets, pipes and pump stations to serve the Planning Area. Depending on the result of the City's combined sewer system improvement study, the storm drainage system may also include provisions to serve the North Core area.

Figure 4.17-2 shows the Master Drainage Plan for the Planning Area for Alternatives 2 through 7. Figures 4.17-3 and 4.17-4 show the trunk facilities required for Phase 1 and Phase 2. There are no trunk storm drainage facilities anticipated for Phase 3.

4.17-1(b) *Construct a detention basin to capture first flush flows. The volume of the detention basin will be based on the acreage of the area served by the facility, i.e., inclusion/exclusion of the North Core area. This mitigation measure would be required for all Alternatives.*

A storm water detention basin would be constructed to capture first flush storm flows. Detained storm water would be released into the City's combined sewer system as capacity becomes available.

Detention of first flush storm water flows for later release into the combined sewer system would provide for treatment of the fraction of storm flows that are normally associated with the highest concentration contaminates in urban and industrial storm water runoff.

Figure 4.17-3 shows the proposed location of the detention basin.

4.17-1(c) *Separate combined sewers in Railyards Area and eastern Richards Area. This mitigation measure would be required for Alternatives 2 through 7.*

Separate storm drainage and sanitary sewer facilities would be constructed in the Railyards Area and eastern (east of North 12th Street) Richards Area.

Implementation of this mitigation measure would be provided in the Railyards Area by the abandonment and/or removal of the existing Railyards wastewater system, and the construction of new separated storm drainage and sanitary sewer systems as development progresses.

Implementation of the mitigation measure in the eastern Richards Area would be provided by the construction of a storm drainage system as redevelopment progresses. The existing sanitary sewer facilities in the eastern Richards Area would remain in use as the separated sanitary sewer system.

This mitigation measure reduces two impacts to the combined sewer system. First, it reduces the amount of storm water flowing to the combined sewer system during peak wet weather flow periods; and secondly, it reduces the impact of the Planning Area on the conveyance and treatment capacity of the CWCS and SRWTP by removing the substantial storm water flow from this existing combined sewer system area.

Cumulative Impacts

4.17-2 Implementation of any of the Alternatives could increase the percentage of impervious surfaces in the downtown Sacramento area.

An increase in the percentage of impervious surfaces normally results in higher peak flows and a greater volume of storm water runoff. Higher peak flows and greater storm water volumes could cause or increase flooding in the Combined Wastewater Control System (CWCS) and the Richards Boulevard separated storm drain system.

A-1 Alternative 1, combined with cumulative development, could increase the percentage of impervious surfaces in the Planning Area and Central City area to 78 percent. This is considered a ***significant impact.***

A-2 through A-5

Alternatives 2 through 5, combined with cumulative development, could increase the percentage of impervious surfaces in the Planning Area and Central City area to 75 percent. This is considered a ***significant impact.***

A-6 and A-7

Alternatives 6 and 7, combined with cumulative development, could increase the percentage of impervious surfaces in the Planning Area and Central City area to 76 percent. This is considered a ***significant impact.***

All Alternatives could increase the percentage of impervious surfaces in the Planning Area and the City. The change in percent imperviousness with each Alternative would vary depending on the existing percent imperviousness of the existing land use compared to the percent imperviousness of the proposed land use. The percent imperviousness of the proposed land use will vary with actual building coverage, hardscape and landscape type for the individual developments.

Discussion under Impact 4.17-1 describes the estimated existing and proposed percent imperviousness for the Planning Area.

The existing percent of impervious surface for the Central City is estimated at approximately 69 percent. Cumulative development in the Central City is expected to increase the percent of impervious surface to approximately 75 percent. Table 4.17-3 presents typical ranges for percent impervious surface for existing and proposed land uses.

Mitigation Measures

Implementation of Mitigation Measure 4.17-2 would reduce the above impacts to a *less-than-significant level.*

4.17-2 *Implement Mitigation Measures 4.17-1(a) through (c). This mitigation measure would be required for all Alternatives.*

Discussions under Mitigation Measures 4.17-1(a) through (c) describe the anticipated implementation of these mitigation measures relative to the Planning Area. The extent to which Mitigation Measures 4.17-1(a) through (c) can be implemented will depend on the size, type and location of the cumulative development in the City. The conclusions of the City's Combined Sewer System Improvement Study and the SRCSD Sewerage Expansion Study will govern the extent to which these mitigation measures will have to be implemented by development proposed in the area served by the City's combined sewer system.

REFERENCES

1. HDR Engineering, et al. 1991. *City of Sacramento Combined Wastewater Control System Phase 2 Detailed Technical Report*, July 1, 1991.

2. HDR Engineering, et al. 1991. *City of Sacramento Combined Wastewater Control System, Technical Overview Report*, October 1, 1990.

3. EIP Associates. 1991. *EIR for Land Use Planning Policy Within the 100-Year Flood Plain in the City and County of Sacramento, State Clearing House No. 89071707*, September 18, 1989 (Draft), January 25, 1991 (Final).

4. Nolte and Associates. 1990. *Conceptual Master Plan Sewer/Storm Drain Separation, Southern Pacific/Richards Boulevard/North Core Study Area*, May 29, 1990.

5. Robert E. Young Engineers. 1988. *Study of Combined Sewer System*, November 1988.

4.18 SOLID WASTE

4.18 SOLID WASTE

INTRODUCTION

The solid waste section of this EIR describes the overall framework for the collection, disposal and recycling of solid waste in the City of Sacramento and Sacramento County. Future solid waste generated by the Alternatives is projected based on existing waste generation estimates and anticipated recycling potential.

SETTING

Solid Waste Disposal

Solid waste within the City of Sacramento is generally deposited in landfills, recycled or composted. There are three landfills that serve areas within the City of Sacramento: the City of Sacramento Landfill, the Sacramento County Landfill, and the Yolo County Landfill. Under current operating practices, the City Landfill will close sometime in 1992. Efforts are underway to extend landfill capacity at this site by implementing a balefill operation, which would provide landfill capacity savings through compaction of solid waste into "bales" for more efficient space utilization. The operation of a balefill will extend the life of the City Landfill into 1994.

The Sacramento County Landfill receives approximately 846,000 tons of solid waste per year.[1] This landfill is located on Keifer Boulevard, and is expected to have adequate capacity to serve the projected population of the county until the year 2015 or 2018, pending additional permit approvals now in progress.[2] The Yolo County Landfill currently receives approximately 250,000 tons of solid waste per year, and is anticipated to have adequate capacity through the year 2030.[3] Some commercial solid waste collectors haul solid waste from the City of Sacramento to the Yolo County Landfill. However, it is not known what will be done with solid waste currently deposited at the Sacramento County Landfill when this facility reaches its capacity. The County of Sacramento is attempting to add an additional 400 acres to the landfill site, which would provide adequate capacity to serve the projected county waste stream through approximately the year 2050.[4]

Solid Waste Collection

Solid waste within the City of Sacramento is collected by the City of Sacramento and various private contractors. City policy prohibits the collection of putricible or "wet" solid wastes by collection agencies other than the City. Nonputricible or "dry" waste can be collected by any permitted refuse hauler. If a commercial customer segregates their wet waste from dry refuse,

they may subscribe to the City service for disposal of the wet waste and a private collector for dry waste disposal.[5]

The City of Sacramento offers a variety of collection services, including collection of greenwaste (tree prunings, lawn clippings, leaves, etc.) for composting. The City also is in the process of implementing a comprehensive recycling program for curbside recycling throughout the City.

Upon closure of the City Landfill, it is anticipated that solid waste collected by the City of Sacramento will be transported to the Sacramento County Landfill located on Keifer Boulevard. Small amounts of solid waste generated by the City are transported to the L & D Landfill, a privately operated Class III landfill (general, non-hazardous solid waste) located in the south City area, and to the Sacramento County Landfill.[6]

The City currently generates approximately 841,000 tons per year of solid waste. Of this, the City Landfill is permitted to accommodate 219,000 tons (600 tons per day), and the remainder is transported to the Yolo County Landfill, the Sacramento County Landfill, or the L & D Landfill in the south area.[7]

Recycling and Composting Programs

The City of Sacramento has been implementing a comprehensive recycling program which will provide curbside recycling service to all single-family homes during 1992.[8] This program provides separate containers for refuse, recyclable metals and plastics, and paper. Containers with recyclable materials are collected on the same day as other refuse. Recyclables are collected by special vehicles.

Recyclable material and yard wastes are currently collected by the City and recycled at a commercially operated recycling sorting facility. The City anticipates constructing its own recycling sorting facility by 1995. The City anticipates the operation of an expanded composting facility by 1994, with a capacity of approximately 87,000 to 90,000 tons per year. Present composting capacity is approximately 8,000 tons per year.[9]

The City provides a special collection of greenwaste, such as prunings, leaves and lawn clippings, once per week. This material is composted and recycled for a variety of uses. In addition, the City encourages the use of some soil removed from large excavation projects as landfill cover, and the use of composted materials as replacement soil where possible. This policy both provides a market for the composted material, and eliminates the unnecessary use of landfill for compostable materials.

It is estimated that 35 percent of the total solid waste stream generated by the City is recycled. This includes materials classified as "inerts" such as asphalt, cement, soil, and rock. Commercial recycling by private recycling companies amounts to an estimated eighteen percent of the solid waste stream within the City. The majority of this recycling is performed by private recycling contractors and builders.

Sacramento City General Plan

The Sacramento City General Plan contains broad policies regarding the provision of services as well as policies targeted at specific aspects of public service provision.

Goals and Policies for Solid Waste

Goal A

Provide adequate solid waste disposal facilities and services for collection, storage and reuse of refuse.

Development under Alternatives 1 through 7 would result in the increased generation of solid waste. Development within the Planning Area would be required to implement waste minimization programs to ease effects on the County Landfill. Agency coordination will be necessary to ensure that adequate solid waste disposal services and facilities are provided to serve the Planning Area, as well as other growth in the Sacramento area.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Solid waste generated by new development can affect existing operations by decreasing the useful life of existing landfills, or not conforming to local recycling and source reduction goals required by AB 939 (Chapter 1095, California Statutes of 1989). AB 939 requires that California counties achieve a 25 percent solid waste reduction by 1994, and that 50 percent of all solid waste be diverted from landfills to recycling or waste reduction facilities by the year 2000.

In addition, the City of Sacramento Solid Waste Division considers a project to have a significant impact when it is estimated to produce more than 500 tons of solid waste annually.

Method

The City of Sacramento uses solid waste generation factors from the National Solid Waste Management Association Technical Bulletin 85-6 to estimate solid waste generated by different types of residential and commercial development. Using the estimates provided in this bulletin yields an existing solid waste generation of 15,000 pounds per day from the Railyards Area and 168,310 pounds per day from the Richards Area, for a total Planning Area generation of 183,310 pounds per day or 33,454 tons per year.

Total net solid waste generated by the Alternatives was determined as the net increase in solid waste generation allowing for existing uses to be removed or relocated. For the Railyards Area, it was assumed that existing heavy commercial uses would be eliminated during the first phase of development. For the Richards Area, it was assumed that existing uses would remain until

sometime during the second phase of development, during the construction of improvements up to the year 2010.

Table 4.18-1 summarizes solid waste generation rates by land use employed by the City of Sacramento. Table 4.18-2 summarizes the solid waste generation by phase of development and project Alternative in the number of pounds per day. Table 4.18-3 summarizes the amount of solid waste generated in tons per year. Solid waste generation estimates include existing uses that would remain. Thus, the No Project Alternative reflects anticipated increases in solid waste generation for existing land uses and land uses anticipated to be built under existing land use and zoning conditions in the Planning Area.

Cumulative solid waste generated by development downtown without development in the Planning Area was estimated using the Technical Bulletin 85-6 data as used for the Alternatives analysis. Cumulative development solid waste generation is summarized by Alternative in Table 4.18-4.

TABLE 4.18-1

SOLID WASTE GENERATED BY LAND USE

Land Use Type	Pounds per Day	Unit of Measure
Apartment	2.5	Person/Day
Department Store	75.0	$1,000 sales
Eating/Drinking Places	200.0	100 sq. ft./Day
Office	1.0	100 sq. ft./Day
Printing	18.0	Employee/Day
Shopping Malls	2.5	100 sq. ft./Day
Warehouse	1.0	100 sq. ft./Day

SOURCE: National Solid Waste Management Association, Technical Bulletin 85-6, 1985.

TABLE 4.18-2
NET SOLID WASTE GENERATION
(In Pounds Per Day)

Alternative	Year 2000		Year 2010		Buildout	
	Railyards	Richards	Railyards	Richards	Railyards	Richards
1	27,500	184,545	40,000	185,970	40,000	187,470
2	29,733	192,650	70,542	107,105	81,657	131,605
3	29,290	191,406	73,840	106,040	91,601	155,956
4	25,295	183,495	77,045	111,864	125,413	164,052
5	24,806	185,900	65,956	94,446	128,806	129,156
6	29,290	210,150	86,360	117,142	152,848	177,392
7	27,932	193,313	80,980	221,512	125,413	292,802

SOURCE: EIP Associates, 1991.

TABLE 4.18-3
NET SOLID WASTE GENERATION
(In Tons Per Year)

Alternative	Year 2000		Year 2010		Buildout	
	Railyards	Richards	Railyards	Richards	Railyards	Richards
1	5,019	33,679	12,319	67,619	19,619	101,832
2	5,426	35,159	18,300	54,705	33,203	78,723
3	5,346	34,932	18,821	54,284	35,539	82,746
4	4,616	33,488	18,677	53,903	41,565	83,842
5	4,527	33,927	16,564	51,163	40,071	74,734
6	5,346	38,352	21,106	59,731	49,001	92,105
7	5,098	35,280	19,876	75,705	42,764	129,142

SOURCE: EIP Associates, 1991.

TABLE 4.18-4
CUMULATIVE[1] DEVELOPMENT SOLID WASTE GENERATION AT BUILDOUT
(Central City)

Alternative	Pounds per Day		Tons per Year	
	Without Planning Area Development[2]	With Planning Area Development[2]	Without Planning Area Development[2]	With Planning Area Development[2]
1	143,289	581,304	26,150	106,088
2	136,089	536,119	24,836	97,841
3	130,589	531,166	23,833	96,938
4	130,999	528,698	23,907	96,488
5	132,339	503,447	24,152	91,879
6	74,329	517,272	13,565	94,402
7	110,199	633,935	20,111	115,693

[1] This uses 6,700 housing units as a worst-case assumption, based on Central City Housing Strategy. See Section 4.9, Housing, for a discussion of the likely range of cumulative housing units.

[2] Section 4.1, Land Use, describes the differences in expected Central City cumulative development with and without the Alternatives.

SOURCE: EIP Associates, 1991.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.18-1 Implementation of any of the Alternatives would result in additional solid waste in excess of 500 tons annually and could shorten the useful life of the Sacramento County Landfill by as much as one or two years over the life of the landfill.

A-1 Development anticipated under the No Project Alternative would generate approximately 38,698 tons of solid waste annually by the year 2000. Development anticipated by the year 2010 would generate a total of 79,938 tons per year, and solid waste generation by buildout would represent a total of 121,451 tons per year. This would be approximately a 4.8 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 16

percent of this increase, while the Richards Area would account for 84 percent. This is considered a ***significant impact.***

A-2 Development anticipated under Alternative 2 would generate approximately 40,585 tons of solid waste annually by the year 2000. Development anticipated by the year 2010 would generate a total of 73,005 tons per year, and solid waste generation by buildout would represent a total of 111,926 tons per year. This would be an approximate 4.5 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 30 percent of this increase, while the Richards Area would account for 70 percent. This is considered a ***significant impact.***

A-3 Development anticipated under Alternative 3 would generate approximately 40,277 tons of solid waste annually. Development anticipated by the year 2010 would generate a total of 73,105 tons per year, and solid waste generation by buildout would represent a total of 18,284 tons per year. This would be approximately a 5.3 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 30 percent of this increase, while the Richards Area would account for 70 percent. This is considered a ***significant impact.***

A-4 Development anticipated under Alternative 4 would generate approximately 38,104 tons of solid waste annually. Development anticipated by the year 2010 would generate a total of 72,580 tons per year, and solid waste generation by buildout would represent a total of 125,407 tons per year. This would be approximately a 5.9 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 33 percent of this increase, while the Richards Area would account for 67 percent. This is considered a ***significant impact.***

A-5 Development anticipated under Alternative 5 would generate approximately 38,454 tons of solid waste annually. Development anticipated by the year 2010 would generate a total of 67,727 tons per year, and solid waste generation by buildout would represent a total of 114,805 tons per year. This would be approximately a 5.5 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 35 percent of this increase, while the Richards Area would account for 65 percent. This is considered a ***significant impact.***

A-6 Development anticipated under Alternative 6 would generate approximately 43,698 tons of solid waste annually. Development anticipated by the year 2010 would generate a total of 80,837 tons per year, and solid waste generation by buildout would represent a total of 141,106 tons per year. This would be approximately a 7.1 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 35 percent of this increase, while the Richards Area would account for 65 percent. This is considered a ***significant impact.***

A-7 Development anticipated under Alternative 7 would generate approximately 40,377 tons of solid waste annually by the year 2000. Development anticipated by the year 2010 would generate a total of 95,582 tons per year, and solid waste generation by buildout would represent a total of 171,906 tons per year. This would be approximately a 8.8 percent increase in solid waste generation over the existing City solid waste generation. Of these increases, the Railyards Area would account for approximately 25 percent of this increase, while the Richards Area would account for 75 percent. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.18-1(a) and (b) will reduce the above impacts to a *less-than-significant level* as determined by the effects on the useful life of existing landfills.

4.18-1(a) *The City of Sacramento shall require all new development within the Planning Area to participate fully in a comprehensive solid waste management program designed so that, on average, at least 50 percent of the solid waste generated within the Planning Area is diverted from landfilling to either recycling, re-use, or other disposal means such as cogeneration. All recycling and source reduction programs shall comply fully with the City of Sacramento Recycling and Solid Waste Reduction Ordinance. This mitigation measure would be required for all Alternatives at all phases.*

4.18-1(b) *The City of Sacramento and the County of Sacramento shall coordinate with interested agencies to provide for suitable long-term disposal of solid waste generated within the greater Sacramento area after the current Sacramento County Landfill reaches capacity (expected by 2015). Such coordination shall consist of detailed analyses of Alternative disposal sites, Alternative disposal methods, and increasing recycling/re-use among the various land uses within the greater Sacramento region. This mitigation measure would be required for all Alternatives after the year 2000.*

Table 4.18-5 summarizes daily solid waste generation by Alternative for 50 percent solid waste reduction efforts within the Planning Area. Achievement of a 50 percent reduction, as required under AB 939, would lessen the effects, but not to a less-than-significant level.

Cumulative Impact

4.18-2 Cumulative development when combined with development in the Planning Area would result in solid waste in excess of 500 tons annually and could shorten the useful life of the Sacramento County Landfill by as much as one year over the life of the landfill.

A-1 through A-7

Planning Area and cumulative downtown development combined would generate the annual solid waste amounts summarized in Table 4.18-4. All Alternatives would generate over 500 tons annually, and could shorten the life of available landfill sites. When added to expected waste generation in the Planning Area, the effect on landfills would be substantially worse. This is considered to be a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.18-2 would reduce the above impact to a *less-than-significant level.*

4.18-2 *Implement Mitigation Measures 4.18-1(a) and (b). This mitigation measure would be required for all alternatives at all phases.*

TABLE 4.18-5

SOLID WASTE GENERATION BY ALTERNATIVE
WITH 50 PERCENT RECYCLING/DIVERSION
(In Tons Per Year)

Alternative	Solid Waste Generated Year 2000		Solid Waste Generated Year 2010		Solid Waste Generated Buildout	
	Railyards	Richards	Railyards	Richards	Railyards	Richards
1	2,509	16,362	3,650	16,492	3,650	16,629
2	2,713	17,102	6,437	9,296	7,451	11,531
3	2,673	16,988	6,738	9,198	8,359	13,753
4	2,308	16,266	7,030	9,730	11,444	14,492
5	2,264	16,486	6,018	8,141	11,754	11,308
6	2,673	18,698	7,880	10,211	13,947	15,709
7	2,549	17,162	7,389	19,735	11,444	26,241

SOURCE: EIP Associates, 1992.

ENDNOTES

1. Keith A. Johnson, Senior Engineer, City of Sacramento Department of Public Works, written communication, April 19, 1991.

2. John Abernathy, Solid Waste Division, Sacramento County Public Works, personal communication November 14, 1991.

3. Keith A. Johnson, Senior Engineer, City of Sacramento Department of Public Works, written communication, April 19, 1991.

4. John Abernathy, Solid Waste Division, Sacramento County Public Works, personal communication November 14, 1991.

5. Keith A. Johnson, Senior Engineer, City of Sacramento Department of Public Works, written communication, April 19, 1991.

6. Gary Van Dorst, Solid Waste Recycling Coordinator, City of Sacramento, personal communication, November 14, 1991.

7. Ibid.

8. Ibid.

9. Ibid.

4.19 POLICE SERVICES

4.19 POLICE PROTECTION SERVICES

INTRODUCTION

This chapter examines the potential increased demand for police protection services that could result from redevelopment of the Planning Area and cumulative development in the downtown area. The information in this chapter is largely drawn from the *Southern Pacific Railyards Existing Conditions Report*, and from communication with the City of Sacramento Police Department.

SETTING

Police protection services within the City of Sacramento are provided by the City of Sacramento Police Department. The Police Department maintains two stations. The central station is located adjacent to the Planning Area at 6th and I streets, with a secondary station at 29th Avenue and Franklin Boulevard, serving the south City area. In addition, the Police Department parks unmarked vehicles within the Planning Area in a parking lot to the north of H Street at 5th Street, and parks marked vehicles in a lot to the south of H Street. Parking for employee vehicles is leased by the Sacramento Police Officer Association and the Widows and Orphans Foundation near the existing Amtrak station within the Railyards Area.[1]

The Police Department has four geographic sectors in the City, which are divided into individual patrol districts. Each patrol district is assigned a squad car, which is assigned to at least one officer.[2] In addition, the Police Department maintains crime suppression and traffic enforcement units, which may be available to respond to first priority calls involving serious crime or a life in danger. The Police Department has an authorized strength of 614 sworn officers for the City. In addition, the Police Department has 309 non-sworn staff for support and administrative functions.[3]

The Police Department target staff ratio is 2.0 officers per 1,000 residents.[4] As of September 1991, this level was actually 1.6 officers per 1,000 population.[5]

The Police Department provides a comprehensive range of protection services, including patrol, suppression, traffic enforcement and investigation.[6] In addition, the Police Department operates several specialized programs for special operations such as Special Weapons Assault Team (SWAT), Explosive Ordinance Disposal (EOD or bomb disposal), and the Special Crime Prevention/Suppression program. The Police Department increases community awareness for crime and drug abuse prevention through the Partners in Preparation, Neighborhood Watch, and Business Alert programs.[7]

In addition to these programs, the Police Department takes an active role in crime prevention for new construction through the Crime Prevention Through Environmental Design program. This program requires new development to coordinate with the Community Resources division of the Police Department to facilitate public safety through environmental design of new residential and commercial developments.[8]

The Police Department is planning to establish a new substation in the North Area north of the American River. Additionally, the Police Department anticipates the eventual construction of a new central station near the current City Hall complex.[9]

Sacramento City General Plan

The City's General Plan contains several goals and policies addressing public services generally, and police services specifically.

Public Facilities and Services Element

Goal A:	Provide and maintain a high quality of public facilities and services to all areas of the City.
Goal B:	Time all new public facilities and services as closely as possible to approved urban expansion.
Goal E:	Design public facilities in such a manner as to ensure safety and attractiveness.

Police Services

Goal A:	Provide the highest level of police service to protect City residents and businesses.
Policy 1:	Continue Police Department participation in the review of subdivision proposals and in assisting the Public Works Department with traffic matters.
Policy 2:	Maintain communication with residents and businesses in order to learn about developing crime problems and to educate people on crime prevention measures and programs.

Development under all of the Alternatives supports these goals and policies. Existing Police Department programs, such as design review and public liaison, would address General Plan policies. Provision of adequate staff and equipment by development under the Alternatives are representative of General Plan goals and policies.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

In accordance with the CEQA Guidelines and commonly-accepted professional standards, the proposed plans would result in a significant impact if they would:

1) Require additional staff and equipment in order to maintain acceptable levels of service; or

2) Result in a substantial need for new, altered or expanded police protection services.

Method

The Police Department currently uses a ratio of sworn officer positions to resident population as a means of anticipating the level of police services provided. However, non-residential uses also contribute to the demand for police services. For the purposes of this EIR, the existing staff levels were compared to the total estimated number of employees and residents within the City. This ratio of sworn officers to total employees plus residents was then applied to the projected population by Alternative. Table 4.19-1 summarizes the total residential plus employment population for each Alternative.

TABLE 4.19-1

TOTAL POPULATION[1] OF ALTERNATIVES BY PHASE

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	24,305	25,688	25,888
Alternative 2	25,661	54,203	75,244
Alternative 3	25,913	55,701	79,692
Alternative 4	22,537	52,282	89,279
Alternative 5	23,284	49,387	87,496
Alternative 6	30,711	76,178	123,868
Alternative 7	25,049	60,511	103,762

[1] Total population = residents plus employees in the Planning Area.

SOURCE: EIP Associates, 1991.

As most of the Alternatives combine large amounts of residential development and non-residential development, the analysis assumes that an appropriate level of service could be maintained with the existing ratio of police officers to total employees and residents within the Central City area. According to SACOG estimates, there were approximately 82,554 employees in the Central City area in 1990. The 1990 Census lists 30,294 residents for this area. This gives an approximate ratio of 2.72 employees per resident. The Police Department's basic staff

goal is an average 2.0 police officers per 1,000 residents. Using this goal per resident would amount to a total of 0.537 police officers per 1,000 residents and employees within the Central City area. The existing level of service is an average 1.6 officers per 1,000 residents. Using this ratio would amount to 0.429 officers per 1,000 residents and employees within the Central City.

The City of Sacramento Police Department does not recognize the ratio of police officers to residents as having a clear relationship to public security. The Police Department is more concerned that a project be designed with adequate lighting and that areas which promote crime be eliminated. Areas that are screened from view from the roadways in the vicinity are of concern. Overall, it is the intent of the City of Sacramento Police Department to provide police protection as needed. If an area is particularly prone to criminal activity, the ratio of police officers to citizens may be higher than in areas where criminal activity is less common. The primary goal of the Police Department is to ensure that a project is designed to include features that will discourage criminal activity.[10]

Table 4.19-1 summarizes the projected total employee and residential population for the Alternatives, while Table 4.19-2 shows the number of sworn officer positions necessary to maintain the Police Department's target staff ratio. Table 4.19-3 summarizes the number of positions necessary to maintain existing staff levels. Although the department's goal is 2.0 officers per 1,000 residents, current policy would require staffing at a minimum of the current ratio at time of project construction.

The total population listed in Table 4.19-1 includes existing population and development that would remain within the Richards Area, and so overstates the additional need for police officers. This total need for officers is offset by the number of officers currently assigned to the Planning Area. Based on the Police Department current staff ratio of 1.6 officers per 1,000 residents, the Richards Area generates an existing demand for approximately one officer position.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.19-1 Development under any of the Alternatives would result in the need for additional police protection services and additional sworn officers, equipment, and support personnel.

A-1 Development anticipated under the No Project Alternative would increase the demand for police protection services through buildout. An additional 10.4 officers would be required by 2000, 11.0 by 2010 and 11.1 by buildout. This is considered a ***significant impact.***

TABLE 4.19-2
ADDITIONAL SWORN OFFICERS REQUIRED
TARGET STAFF LEVELS[1]
By Phase

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	13.0	13.8	13.9
Alternative 2	13.8	29.3	40.4
Alternative 3	13.9	29.9	42.8
Alternative 4	12.1	28.1	47.9
Alternative 5	12.5	26.5	47.0
Alternative 6	16.5	40.9	66.5
Alternative 7	13.4	32.5	55.7

[1] 0.537 officers per 1,000 total population;
Total population = residents plus employees in the Planning Area.

SOURCE: EIP Associates, 1991.

TABLE 4.19-3
ADDITIONAL SWORN OFFICERS REQUIRED
EXISTING LEVELS[1]
By Phase

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	10.4	11.0	11.1
Alternative 2	11.0	23.3	32.3
Alternative 3	11.1	23.9	34.2
Alternative 4	9.7	22.5	38.3
Alternative 5	10.0	21.2	37.6
Alternative 6	13.2	32.7	53.2
Alternative 7	10.8	26.0	44.6

[1] 0.429 officers per 1,000 total population
Total population = residents plus employees in the Planning Area.

SOURCE: EIP Associates, 1991.

A-2 Development anticipated under Alternative 2 would generate increased demand for police protection services of 11.0 officers by the year 2000, 23.3 officers by 2010 and 32.3 officers by buildout. This is considered a ***significant impact.***

The additional number of police officers demanded by development within the Planning Area is summarized in Tables 4.19-2 and 4.19-3.

A-3 Development anticipated under Alternative 3 would generate a demand for an additional 11.1 to 13.9 sworn officers and related equipment and support staff by the year 2000. Development anticipated by the year 2010 would generate a demand for 23.9 to 29.9 sworn officers and related equipment and support staff. Development by buildout would generate a demand for 34.2 to 42.8 sworn officers and related equipment and support staff. Staffing additional patrols would require at least 10 full-time officer positions and an additional patrol vehicle by the year 2000. This is considered a ***significant impact.***

A-4 Development anticipated under Alternative 4 would generate a demand for an additional 9.7 to 12.1 officer positions by the year 2000. Development anticipated by the year 2010 would generate a demand for 22.5 to 28.1 officer positions. Development at buildout would generate a demand for 38.3 to 47.9 officer positions. This is considered a ***significant impact.***

A-5 Development anticipated under Alternative 5 would generate a demand for an additional 10.0 to 12.5 officer positions by the year 2000. Development anticipated by the year 2010 would generate a demand for 21.2 to 26.5 officer positions. Development by buildout would generate a demand for 37.6 to 47.0 officer positions. This is considered a ***significant impact.***

A-6 Development anticipated under Alternative 6 would generate a demand for an additional 13.2 to 16.5 officer positions by the year 2000. Development anticipated by the year 2010 would generate a demand for 32.7 to 40.9 officer positions. Development by buildout would generate a demand for 53.2 to 66.5 officer positions. This is considered a ***significant impact.***

A-7 Development anticipated under Alternative 7 would generate a demand for an additional 10.8 to 13.4 officer positions by the year 2000. Development anticipated by the year 2010 would generate a demand for 26.0 to 32.5 officer positions. Development by buildout would generate a demand for 44.6 to 55.7 officer positions. This is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measures 4.19-1(a) and 4.19-1(b) would serve to reduce the above impacts to a *less-than-significant level.*

4.19-1(a) *Development within the Planning Area shall ensure that adequate police protection services are available at the time of development. All necessary sworn*

officer positions and non-sworn support staff shall be made available to the Planning Area in accordance with Police Department standards. This mitigation measure would be required for all Alternatives.

4.19-1(b) *Development within the Planning Area shall be coordinated on a project-specific basis with the Sacramento City Police Department Community Resources Division at the design phase of project approval. This will ensure that appropriate design measures are implemented to improve public safety and reduce crime. This mitigation measure would be required for all Alternatives.*

Cumulative Impacts

4.19-2 Development under any of the Alternatives, combined with cumulative development, would result in the need for additional police protection services and additional sworn officers, equipment, and support personnel.

A-1 through A-7

Table 4.15-4 summarizes the projected total employee and residential population for the Alternatives, while Table 4.15-5 shows the number of sworn officer positions necessary to maintain the Police Department's target ratio. Table 4.15-6 summarizes the number of positions necessary to maintain existing levels. This is considered a ***significant impact.***

The total population listed in Table 4.15-4 includes existing population and development that would remain within the Richards Area, and so overstates the additional need for police officers. This total need for officers is offset by the number of officers currently assigned to the Planning Area. Based on the Police Department current staffing ratio of 1.6 officers per 1,000 residents, the Richards Area generates a demand for approximately one officer position.

Implementation of Mitigation Measure 4.19-2 would reduce this impact to a *less-than-significant level.*

Mitigation Measure

4.19-2 *Implement Mitigation Measures 4.19-1(a) and (b). This mitigation measure would be required for all alternatives.*

TABLE 4.19-4
TOTAL CUMULATIVE[1] POPULATION

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	46,073	75,144	75,344
Alternative 2	47,689	100,778	121,819
Alternative 3	47,021	100,077	124,067
Alternative 4	44,957	96,821	133,969
Alternative 5	46,044	95,454	133,563
Alternative 6	43,818	98,049	145,739
Alternative 7	44,549	96,730	139,982

[1] This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.9, Housing, for a discussion of the likely range of cumulative housing units.

SOURCE: EIP Associates, 1991.

TABLE 4.19-5
CUMULATIVE DEMAND
SWORN OFFICERS REQUIRED[1]

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	24.7	40.3	40.5
Alternative 2	25.6	54.1	65.4
Alternative 3	25.2	53.7	66.6
Alternative 4	24.1	52.0	71.9
Alternative 5	24.7	51.2	71.7
Alternative 6	23.5	52.6	78.2
Alternative 7	23.9	51.9	75.2

[1] 0.537 officers per 1,000 total population

SOURCE: EIP Associates, 1991.

TABLE 4.19-6

CUMULATIVE DEMAND
SWORN OFFICERS NEEDED
TO MEET EXISTING LEVELS[1]

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	19.8	32.3	32.4
Alternative 2	20.5	43.3	52.3
Alternative 3	20.2	43.0	53.3
Alternative 4	19.3	41.6	57.5
Alternative 5	19.8	41.0	57.4
Alternative 6	18.8	42.1	62.6
Alternative 7	19.1	41.5	60.1

[1] 0.429 officers per 1,000 total population

SOURCE: EIP Associates, 1991.

ENDNOTES

1. Officer Jim Barclay, City of Sacramento Police Department, Community Resources, personal communication, November 7, 1991.

2. Linda Pierce Associates. February 1990. *Existing Conditions Report.*

3. Officer Jim Barclay, City of Sacramento Police Department, Community Resources, personal communication, November 7, 1991.

4. Linda Pierce Associates. February 1990. *Existing Conditions Report.*

5. Officer Jim Barclay, City of Sacramento Police Department, Community Resources, personal communication, November 7, 1991.

6. Linda Pierce Associates. February 1990. *Existing Conditions Report.*

7. Officer Jim Barclay, City of Sacramento Police Department, Community Resources, personal communication, November 7, 1991.

8. Officer Jim Barclay, City of Sacramento Police Department, Community Resources, personal communication, November 7, 1991.

9. Officer Jim Barclay, City of Sacramento Police Department, Community Resources, personal communication, November 7, 1991.

10. Hilary Perry, Assistant Planner, City of Sacramento, written communication to Joe Broadhead, Associate Planner, December 20, 1991.

4.20 FIRE PROTECTION SERVICES

4.20 FIRE PROTECTION SERVICES

INTRODUCTION

This chapter examines the potential increased demand for fire protection services that could result from redevelopment of the Planning Area and cumulative downtown development. The information in this chapter is largely drawn from the *Southern Pacific Railyards Existing Conditions Report*, and from communication with the City of Sacramento Fire Department.

SETTING

Fire protection services to the City of Sacramento are provided through the City of Sacramento Fire Department. The Fire Department is staffed by 446 fire fighters and 25 civilian employees. Approximately 90 to 95 percent of the fire fighters are certified Emergency Medical Technicians.[1] The Fire Department offers a pay incentive program to encourage fire fighters to maintain their emergency medical certifications. The department provides services throughout its 142 square mile service area via 21 fire stations and a total of 87 pieces of major equipment, consisting primarily of fire trucks and engines.[2]

The Fire Department maintains two stations within the downtown area, Station Number 1 at 7th and Q streets, and Station Number 2 at 13th and I streets.[3] Station Number 2 is a two company station, with a truck, engine, and battalion chief. The Fire Department also maintains Station Number 14 within the Richards Area at 1341 North C Street.[4] These stations maintain a response time to the Planning Area of approximately 3.5 minutes.[5] Average Fire Department-wide response time is 4.2 minutes.[6] The Fire Department goal is to maintain response times of 3 to 4 minutes throughout its service area.[7]

Table 4.20-1 summarizes existing staff and equipment available in each of the two stations that provide service to the Planning Area and Station 14, located in the downtown area.

The Fire Department currently maintains full staff levels at the Fire Department's target of 1.4 fire fighters per 1,000 resident population.[8] The Fire Department also maintains equipment to fight fires or initiate rescues in multi-story buildings. The Fire Department currently operates a 150-foot aerial ladder, and buildings over 150 feet in height are required to construct emergency helicopter pads to facilitate access to high-rise buildings for emergency equipment and personnel.[9] Buildings over 75 feet must also conform to the State of California High-rise Code regarding fire prevention, detection and suppression with measures such as sprinkler systems. The Fire Department encourages the use of sprinkler systems in all residential and commercial structures.[10]

TABLE 4.20-1

EXISTING FIRE STATION STAFF AND EQUIPMENT

Station Number	Staff	Equipment
Number 1	12 Fire Fighters (1 company station)	1 Engine
Number 2	24 Fire Fighters 1 Battalion Chief (2 company station)	1 Truck 1 Engine
Number 14	12 Fire Fighters (1 company station)	1 Engine 1 Hose Wagon

SOURCE: Chief Dennis Smith, Sacramento Fire Department, personal communication, November 7, 1991.

The Fire Department plans to relocate Station Number 14 from its present location on North C Street to the intersection of North 10th Street and Richards Boulevard.[11] The Fire Department requires all new stations to be suitable for future expansion to two company stations, with fire houses of 6,500 to 8,000 square feet, two engine bays, and approximately one acre lots. New stations are generally required during the first phase of a new development, typically at approximately 40 percent of first phase construction.[12]

Sacramento City General Plan

The Sacramento City General Plan contains broad policies regarding the provision of services as well as policies targeted at fire protection services.

Goals and Policies for Fire Service

Goal A: Provide adequate fire service for all areas of the City.

Policy 1: Continue to support all efforts directed at providing the best fire protection services for the least cost.

Policy 2: Ensure that adequate water supplies are available for fire-fighting equipment in newly developing areas.

Policy 3: Work with the various fire protection districts bordering the City in establishing centralized communications and fire-fighter training facilities.

Policy 4: Promote greater coordination of land use development proposals with the Fire Department in order to insure adequate on-site fire protection provisions.

Policy 5: Promote greater use of fire sprinkler systems for both commercial and residential use.

Development under Alternatives 1 through 7 would increase the demand for fire protection services. Existing Fire Department programs, such as design review and public liaison, would effectively address General Plan policies. Provision of adequate staff and equipment by development under the Alternatives would support General Plan goals and policies.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

In accordance with the CEQA Guidelines and commonly-accepted professional standards, an Alternative would result in a significant impact if it would:

- Require additional staff and equipment in order to maintain acceptable levels of service; or
- Result in a substantial need for new, altered or expanded fire protection services.

Method

The Fire Department maintains several standards for providing service to its service area. These include the target staff ratio of 1.4 fire fighters per 1,000 residents, an average response time of 3 to 4 minutes or better, and a minimum station size of one company consisting of a 1,500- to 2,000-gallon pumper truck and 12 fire fighters (3 shifts of 4 fire fighters) on a one acre lot with an 8,000-square-foot station. The Fire Department does not include office space in its target staff ratio. All stations are constructed to house two full companies. One company is equivalent to 12 fire fighters and equipment.

As most of the Alternatives combine large amounts of both residential development and non-residential development, the analysis in this EIR assumes that an appropriate level of service could be maintained with the existing ratio of fire fighters to total employees and residents within the Central City area. According to SACOG estimates, there were approximately 82,554 employees in the Central City area in 1990. The 1990 Census lists 30,294 residents for this area. This gives an approximate ratio of 2.72 employees per resident. Applying the goal of 1.4 fire fighters per 1,000 residents to the resident and employee population results in a ratio of 0.376 fire fighters per 1,000 residents and employees within the Central City area.

Table 4.20-2 summarizes the projected total employee and residential population for the Alternatives, while Table 4.20-3 shows the number of fire fighter positions necessary to maintain the Department's target staff ratio.

TABLE 4.20-2

TOTAL POPULATION OF ALTERNATIVES
(By Phase)

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	24,305	25,688	25,888
Alternative 2	25,661	54,203	75,244
Alternative 3	25,913	55,701	79,692
Alternative 4	22,537	52,282	89,279
Alternative 5	23,284	49,387	87,496
Alternative 6	30,711	76,178	123,868
Alternative 7	25,049	60,511	103,762

SOURCE: EIP Associates, 1991.

TABLE 4.20-3

NUMBER OF FIRE FIGHTERS REQUIRED[1]
(By Phase)

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	9.1	9.7	9.7
Alternative 2	9.6	20.4	28.3
Alternative 3	9.7	20.9	30.0
Alternative 4	9.0	19.6	33.6
Alternative 5	8.8	18.6	32.9
Alternative 6	11.5	28.6	46.6
Alternative 7	9.4	22.7	39.0

[1] 0.376 fire fighters per 1,000 total population

SOURCE: EIP Associates, 1991.

The Fire Department minimum station staff is one company, or 12 full-time fire fighter positions and related equipment. The total population listed in Table 4.20-3 includes existing population and development that would remain within the Richards Area, and so overstates the additional need for fire fighting personnel beyond the existing level of 12 fire fighters. The Fire Department has an existing station within the Richards Area, which is a one company station.

Using the Fire Department's development threshold of 40 percent to trigger new station construction, an additional station would be necessary when development density reaches a demand for a total of 5 fire fighter positions (40 percent of 12 fire fighters is 4.8 fire fighter positions). Thus, when development density within the Planning Area reaches the level of 16.8 or more fire fighters, it will be necessary to add an additional fire station to the area to provide adequate fire protection.

Company requirements by Alternative and phase are presented in Table 4.20-4.

TABLE 4.20-4

ADDITIONAL REQUIRED FIRE COMPANIES[1]
(By Phase)

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	0	0	1
Alternative 2	0	1	2
Alternative 3	0	1	2
Alternative 4	0	1	2
Alternative 5	0	1	2
Alternative 6	0	1	3
Alternative 7	0	1	3

[1] 1 company = 12 fire fighters

SOURCE: EIP Associates, 1991.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.20-1 Development of any of the Alternatives would increase demand for fire protection services through construction of high-occupancy buildings and increased surface street networks, which could add to the response time within the Planning Area.

A-1 Development anticipated in Phase 1 of Alternative 1 would not substantially alter the existing demand for fire protection services from the Planning Area. However, development anticipated during Phase 2 until buildout would require additional firefighters within the Planning Area. This is considered to be a ***less-than-significant impact.***

A-2 through A-5

Development anticipated under Alternative 2, 3, 4 and 5 would generate increased demand for fire protection services. This demand would be for one new company by the year 2010 and for two new companies by buildout This is considered to be a ***significant impact.***

A-6 and A-7

Development anticipated under Alternatives 6 and 7 would generate a need for one additional company by the year 2010 and for a total of three new companies by buildout. This is considered to be a ***significant impact.***

Mitigation Measure

Implementation of Mitigation Measure 4.20-1 would serve to reduce the above impacts to a *less-than-significant level.*

4.20-1 *Construct and staff new fire station(s) within the Planning Area in accordance with Sacramento Fire Department policies and procedures regarding new station construction and siting. This mitigation measure would be required for Alternatives 2 through 7 prior to the completion of Phase 2.*

Siting, acquisition, construction and staffing of at least one new fire station within the Planning Area will be required during the early stages of plan construction. Development within the Planning Area shall coordinate closely with the Sacramento Fire Department to permit appropriate timing and location of the station. Such stations shall initially consist at the minimum of a one company station staffed by four fire fighters on each shift (12 total) equipped with a fire engine meeting Fire Department standards. Additional companies will be added as necessary in accordance with Fire Department procedures.

Cumulative Impacts

Impacts Due to Development in the Planning Area

4.20-2 Development within the Planning Area, combined with cumulative development within the Central City area, would result in the need for additional fire company services.

A-1 through A-7

Cumulative development under all seven of the Alternatives would generate substantial demand for new fire prevention and suppression services due to increases in population and increased commercial and residential structures. This is considered to be a ***significant impact.***

Cumulative population figures are given in Table 4.20-5. The increased resident and employee population would generate demand for fire fighting staff and companies as indicated in Table 4.20-6 and 4.20-7.

Mitigation Measure

Implementation of the following mitigation measure would be required during all phases of development under all Alternatives to reduce the effects of this impact to a *less-than-significant level.*

4.20-2 *Implement Mitigation Measure 4.20-1. This mitigation measure would be required for all Alternatives.*

TABLE 4.20-5
CUMULATIVE[1] RESIDENTIAL AND EMPLOYMENT POPULATION

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	46,073	75,144	75,344
Alternative 2	47,689	100,778	121,819
Alternative 3	47,021	100,077	124,067
Alternative 4	44,957	96,821	133,969
Alternative 5	46,044	95,454	133,563
Alternative 6	43,818	98,049	145,739
Alternative 7	44,549	96,730	139,982

[1] This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. Section 4.9, Housing, for a discussion of the likely range of cumulative housing units.

SOURCE: EIP Associates, 1991.

TABLE 4.20-6

NUMBER OF FIRE FIGHTERS REQUIRED
FOR CUMULATIVE CENTRAL CITY DEVELOPMENT[1]

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	17.3	28.2	28.3
Alternative 2	17.9	37.9	45.8
Alternative 3	17.7	37.6	46.6
Alternative 4	16.9	36.4	50.3
Alternative 5	17.3	35.9	50.2
Alternative 6	16.5	36.8	54.8
Alternative 7	16.7	36.4	52.6

[1] 0.376 fire fighters per 1,000 total population

SOURCE: EIP Associates, 1991.

TABLE 4.20-7

CUMULATIVE ADDITIONAL REQUIRED FIRE COMPANIES[1]

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	1	2	2
Alternative 2	1	2	3
Alternative 3	1	2	3
Alternative 4	1	2	3
Alternative 5	1	2	3
Alternative 6	1	2	4
Alternative 7	1	2	4

[1] 1 company = 12 fire fighters

SOURCE: EIP Associates, 1991.

ENDNOTES

1. Chief Dennis Smith, Sacramento Fire Department, personal communication, November 7, 1991.

2. *Existing Conditions Report*, Linda Pierce Associates, February 1990.

3. Ibid.

4. Chief Dennis Smith, Sacramento Fire Department, personal communication, November 7, 1991.

5. *Existing Conditions Report*, Linda Pierce Associates, February 1990.

6. Chief Dennis Smith, Sacramento Fire Department, personal communication, November 7, 1991.

7. Ibid.

8. Ibid.

9. *Existing Conditions Report*, Linda Pierce Associates, February 1990.

10. Ibid.

11. Chief Dennis Smith, Sacramento Fire Department, personal communication, November 7, 1991.

12. Ibid.

4.21 SCHOOLS AND CHILDCARE

4.21 SCHOOLS AND CHILD CARE

INTRODUCTION

This section examines the increased demand for schools and child care that would result from residential and office development in the Planning Area.

SETTING

School Services

Public school services are provided to the Planning Area through three separate school districts: Sacramento City Unified School District, Grant Joint Union High School District, and North Sacramento Elementary School District. District boundaries are shown in Figure 4.21-1.

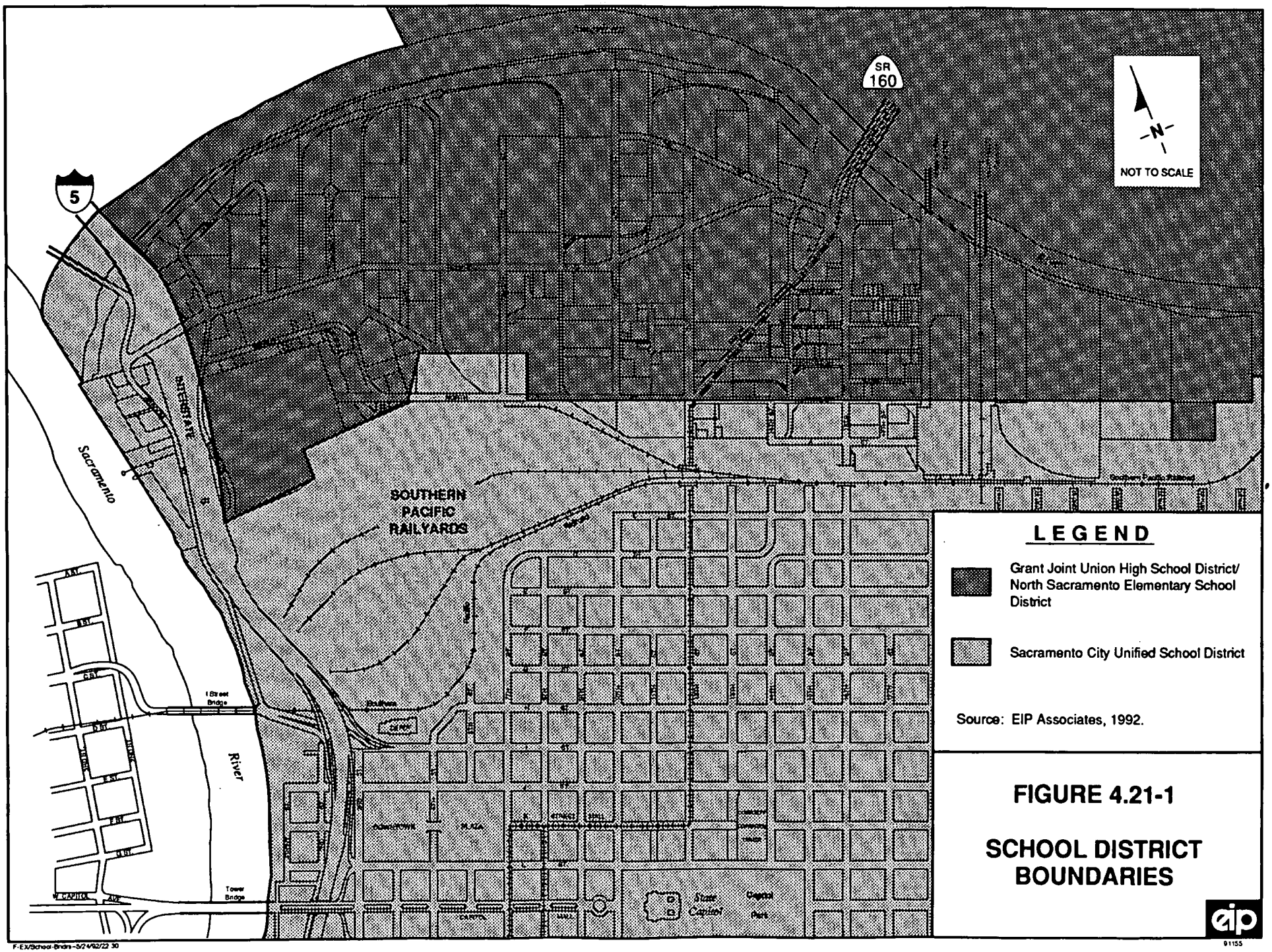
School services are also provided through various private schools in the Sacramento area. These schools are usually on a fee basis, and many have religious affiliations. Private schooling is an option for families, often based on their ability to pay private school tuition fees.

Sacramento City Unified School District

The Sacramento City Unified School District serves the Railyards Area. The District operates four schools that provide service to the Railyards Area and vicinity: Washington Elementary (grades K through 4), Theodore Judah (grades 5 and 6), Sutter Middle School (grades 7 and 8), and Sacramento High (grades 9 through 12). Table 4.21-1 summarizes school capacity and current enrollments for these schools.

The SCUSD is forming a Mello-Roos Community Facilities District to finance facility improvements and expansions. The District does not anticipate constructing any new schools in the Planning Area at this time. However, the newly formulated Mello-Roos District would provide financing to permit facility expansions anticipated within the area. The goal of the school district is to encourage additional properties to annex to the Mello-Roos District as they are planned for development.

To finance new facility construction, the Mello-Roos District would permit the sale of a maximum of $75 million in bonds. The sale of bonds would occur in four stages, resulting in the ability to make incremental facility improvements in a manner consistent with the timing of development projects in the area. Participation in the Mello-Roos District requires that property owners pay an additional tax at the time a building permit is issued. In turn, the assessed value of the participating properties permits the sale of bonds with lower interest and administrative fees than otherwise possible.


SR 160
5
NOT TO SCALE
INTERSTATE
Sacramento
River
SOUTHERN PACIFIC RAILYARDS
I Street Bridge
Tower Bridge
W. CAPITOL AVE.
State Capitol
Capitol Park
LEGEND
Grant Joint Union High School District/ North Sacramento Elementary School District
Sacramento City Unified School District
Source: EIP Associates, 1992.
FIGURE 4.21-1
SCHOOL DISTRICT BOUNDARIES
eip
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91155

TABLE 4.21-1

SCHOOL CAPACITY AND ENROLLMENT
BY SCHOOL AND GRADE LEVEL

School	Capacity	Enrollment	Remaining Capacity
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT[1]			
Washington Elementary (K-4)	439	415	24
Theodore Judah (5-6)	610	538	72
Sutter Middle (7-8)[2]	857	590	267
Sacramento High (9-12)	1,956	2,101	(145)
NORTH SACRAMENTO SCHOOL DISTRICT[3]			
Dos Rios Elementary (K-6)	272	272	0
GRANT JOINT UNION HIGH SCHOOL DISTRICT[4]			
Rio Tierra (7-9)[5]	800	800	0
Grant High (9-12)	1,578	1,476	102

1 Ray Rodriguez, Administrator, Sacramento City Unified School District, written communication, October 1, 1991.

2 According to the SCUSD, Sutter Middle School will undergo programmatic changes that could alter these figures substantially.

3 Steve Little, Assistant Superintendent, North Sacramento School District, personal communication, October 2, 1991.

4 Matt Washburn, Facilities Planning, Grant Joint Union High School District, personal communication, October 2, 1991.

5 Rio Terra attendance is currently comprised of approximately 600 students in grades 7-8 and 200 students in grade 9. Total capacity of school (using portable classrooms) is 800. Permanent capacity is 725.

Grant Joint Union School District

The Grant Joint Union High School District provides high school and junior high school services to the northern part of the City of Sacramento, in addition to the Natomas and Del Paso areas. The District currently provides services to a total of six elementary school districts, including Del Paso Heights, Elverta Joint, Natomas Union, Rio Linda Union, Robla, and the North Sacramento Elementary School District. Of the "feeder" districts to Grant, only the North Sacramento Elementary School District contains a portion of the Richards Area.

The Grant Joint Union High School District has been involved in on-going political controversy regarding the administrative structure of providing educational services within the district area. These issues are unresolved this time. However, it is likely that some form of political and/or administrative changes could occur that would alter the existing system of educational service in the District. This could take the form of consolidating several districts, transferring high school facilities to some elementary districts, or other political and administrative changes. It is unclear what direct effect such changes would have on provision of public school services to the Planning Area. Any changes would have to be placed on a ballot in affected areas by the Sacramento County Board of Education.

North Sacramento Elementary School District

The North Sacramento Elementary School District provides school services for children in grades K through 6. The Richards Area is served by the Dos Rios campus. The school is over 40 years old, with an original design capacity of 210 to 220 students. With the use of two portable classrooms, the school currently houses an estimated 272 students. Enrollment trends since 1986 have shown increases annually from one percent in 1990 to 21 percent in 1991. Average enrollment increases are approximately eight percent annually since the 1986-87 school year. The school experienced slight enrollment declines of three to five percent during the period of the 1983-84 year through the 1985-86 year.

Child Care Services

Child care services can be provided by a variety of sources. Child care services can be provided by either a licensed care provider or an unlicensed provider. Unlicensed providers would include friends, neighbors, and relatives. Licensed care providers are licensed by the State of California Department of Social Services Community Care Licensing Division. Licenses are granted for two general types of child care facilities in age group classifications. These include:

1. Child Care Home, which includes size classifications of small (up to six children) and large (over seven children). There are no requirements for child development education for caregivers.

2. Child Care Center, which is of no distinct size, but requires college credit in child development and education for teachers and caregivers.

The age groups are the same for both child care homes and child care centers. These are:

1. Infant/Toddler (0 to 2 years);

2. Pre-School (2 through 6 years);

3. School-Age (6 through 12 years).

Licensing approval varies for each of the three age groups and for each of the child care facility categories. Trends during the 1980's and early 1990's have been for care services to be offered by franchise or chain operations on a profit basis. Centers and homes may have a combination of age groupings; however, each of the age groups requires a separate license.

As of July 2, 1991, the Department of Social Services reported a total of 214 licensed facilities for both categories within the City of Sacramento. These combined facilities had a total capacity of 11,137 spaces. Table 4.21-2 summarizes the breakdown of care facilities in the City of Sacramento by facility category. Table 4.21-3 summarizes the licensed centers for the 95814 zip code, which includes the City of Sacramento Central City area and the Planning Area.

City of Sacramento General Plan

The Sacramento City General Plan contains a number of policies designed to facilitate the provision of services to persons within the City. Goals and policies most directly relevant to the provision of schools and childcare in the Planning Area are shown below.

Goal A

Continue to assist school districts in providing quality education facilities that will accommodate projected student enrollment growth.

Policy 1

Assist school districts with school financing plans and methods to provide permanent schools in existing and newly developing areas in the City.

Policy 2

Involve school districts in the early stages of the land use planning process for the future growth of the City.

Policy 5

Continue to assist in reserving school sites based on each district's criteria, and upon the City's additional locational criteria as follows:

TABLE 4.21-2
LICENSED CHILD CARE FACILITIES IN THE CITY OF SACRAMENTO

Facility Type by Age Category	Total Capacity
Infant/Toddler (0 - 2 years)	508
Pre-School (2 - 6 years)	2,421
School-Age (6 - 12 years)	8,208
Total Capacity, All Licensed Child Care Facilities	11,137

SOURCE: State of California Department of Social Services Community Care Licensing Division, Licensing Information System Report, July 2, 1991; EIP Associates, 1991.

TABLE 4.21-3
LICENSED CARE FACILITIES IN CENTRAL CITY AREA[1]

Care Provider	Total Capacity
Child's Play	20
Lil' People's School	100
Lil' People's School #6	56
Rainbow Day Care	60
Tots on Tenth - YMCA	60
Dot Tot Center	60
Grace Day Home	126
Washington Children's Center	94
Total Capacity, 95814 Area:	576

[1] Central City area in this case is approximated by the 95814 U.S. Postal Zip Code area.

SOURCE: State of California Department of Social Services Community Care Licensing Division, Licensing Information System Report, July 2, 1991; EIP Associates, 1991.

- Locate elementary schools on-sites that are safely and conveniently accessible, and free from heavy traffic, excessive noise and incompatible land uses.
- Locate schools beyond the elementary level adjacent to major streets. Streets that serve as existing or planned transit corridors should be considered priority locations.
- Locate all school sites centrally with respect to their planned attendance areas.

Alternative 1 would not result in increased school enrollments. Alternatives 2 through 7 would provide flexibility for constructive interaction between development and existing school districts. The siting of new school facilities would be supportive of the city-wide locational criteria. Expansion of existing schools could serve to improve existing facilities to serve both existing and projected students.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

In accordance with the CEQA Guidelines and commonly-accepted professional standards, an Alternative would result in a significant impact if it would: (1) require additional staff and equipment in order to maintain acceptable levels of service; or (2) result in a substantial need for new, altered, or expanded school facilities beyond those identified in the Alternative.

For the schools analysis, a significant impact would result if anticipated students would exceed existing and planned school facility capacities, or if the necessary school size would exceed the general enrollment maximum of 800 elementary students (used by the Sacramento City Unified School District as a guideline).

For the child care analysis, a significant impact would occur if the anticipated demand for child care services would occur without specific provision for adequate child care facilities to meet the demand.

Tables 4.21-4 and 4.21-5 summarize the State Department of Education guidelines for public school site size.

Method

The following is a summary of the methodology used in the analysis to estimate the effects of development among the Alternatives on the schools and child care systems currently existing in the City of Sacramento near the Central City area. The Schools and Child Care Appendix (Appendix J) of this document contains a full description of the methodology employed, and shows the step-by-step analysis for each of the Alternatives across each of the analysis years through buildout.

TABLE 4.21-4
SITE REQUIREMENTS FOR ELEMENTARY GRADES 1, 2, AND 3

Enrollment (# pupils)	Up to 75	76 to 150	151 to 300	301 to 450	451 to 600
P.E. Area	0.5	0.7	1.3	1.9	2.4
Buildings and Grounds	0.4	0.6	1.1	1.6	2.1
Parking and Roads	0.2	0.3	0.3	0.4	0.4
Total Acreage	1.1	1.6	2.7	3.9	4.9

SOURCE: *School Site Analysis and Development*, California State Department of Education, Table 2, 1987.

TABLE 4.21-5
SITE REQUIREMENTS FOR ELEMENTARY GRADES 4, 5, AND 6

Enrollment (# pupils)	Up to 75	76 to 150	151 to 300	301 to 450	451 to 600
P.E. Area	1.2	2.4	4.4	6.0	7.4
Buildings and Grounds	0.4	0.6	1.1	1.6	2.1
Parking and Roads	0.2	0.3	0.3	0.4	0.4
Total Acreage	1.8	3.3	5.8	8.0	9.9

SOURCE: *School Site Analysis and Development*, California State Department of Education, Table 2, 1987.

Schools

Estimates of projected school demand are derived from existing data regarding ages of persons living in the existing Central City of Sacramento. This data was obtained from the 1990 Census information, and provides a tabulation of the number of persons per dwelling unit by various age groups.

The Central City area of the City of Sacramento is the area between American and Sacramento rivers and the freeways; more specifically, Census Tracts 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 19, 20 and 21. These tracts define the demographic characteristics of the area west of Alhambra Boulevard, north of Broadway, east of the Sacramento River, and south of the Planning Area. This area is shown in Figure 4.21-2. The Planning Area falls entirely within Census Tract 54.

The 1990 Census reports 13 age categories for persons ages 0 though 18 years. These 53 categories were identified with the typical ages of grade school children based on the assumption that a child enters kindergarten at approximately five years of age and progresses one grade level each year.

Table 4.21-6 summarizes these age categories by school grade group and the number of children in each group as a factor of the total number of dwelling units. These generation factors were then distributed across the planning sub-areas and assigned to school districts on the basis of existing school district boundaries and approximate locations of future residential development under each of the Alternatives.

Each school district develops its own student demand rates based on the number of children per household within its boundary. For example, the SCUSD has suggested that the following factors be used:

K-6 students	=	.258/household
7-8 students	=	.057/household
9-12 students	=	.096/household
Total Students	=	.411/household

These are district-wide factors which average areas containing households with a relatively high number of children per household, such as neighborhoods that are primarily single-family homes with those areas where households have very low numbers of children per household, such as downtown with its preponderance of multi-family units. If district-wide factors were used in this analysis, the number of school children associated with the Alternatives would be approximately 66 percent higher than the numbers found in this EIR.

Lower factors were used for this analysis in order to reflect the urban nature of the Alternatives. It should be noted that, for the most part, the impact statements and mitigation measures identified in this section would be appropriate even if the SCUSD factors were used. This is

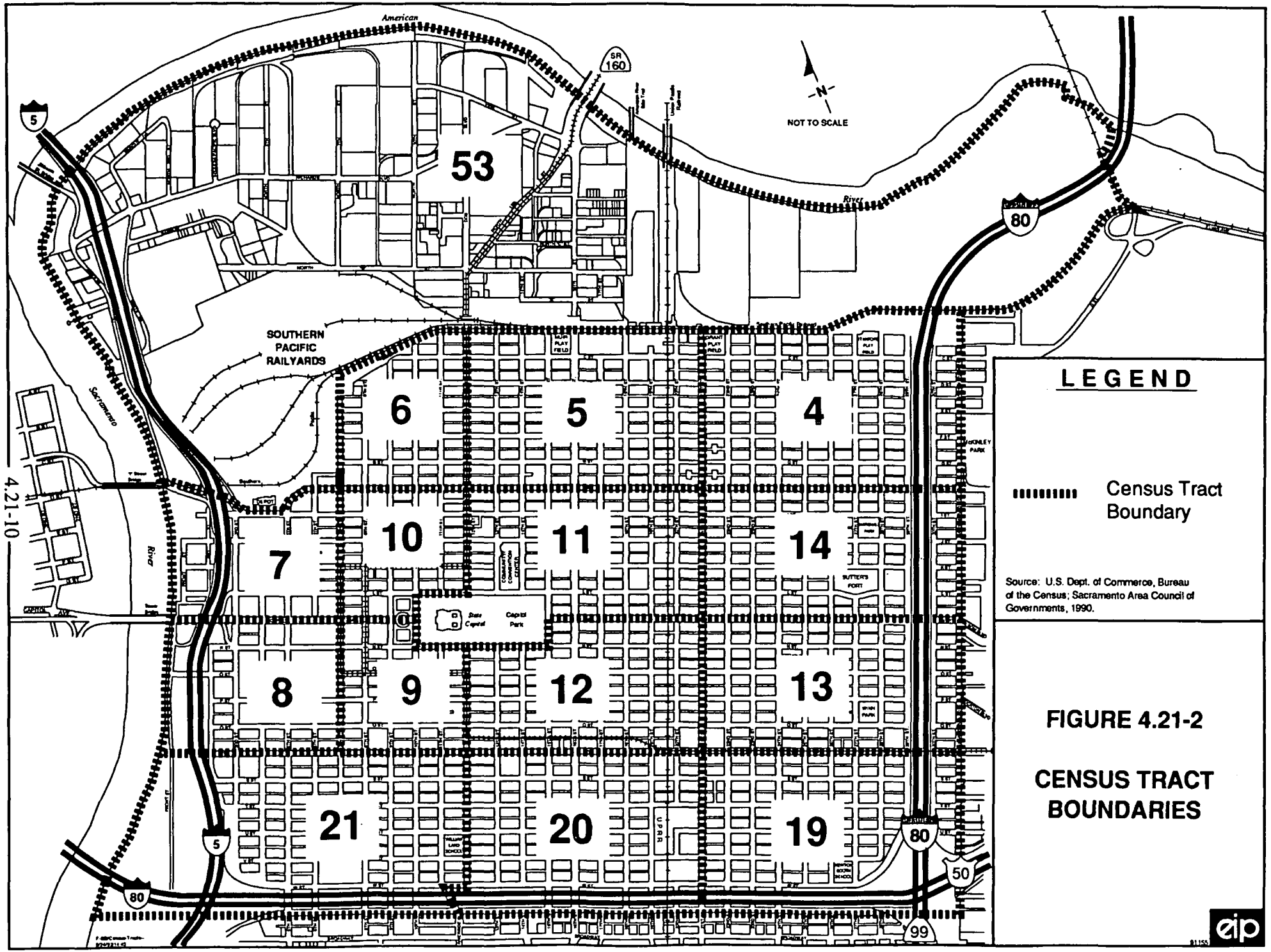
American
SR 160
NOT TO SCALE
53
River
80
SOUTHERN PACIFIC RAILYARDS
6
5
4
Sacramento
7
10
11
14
State Capitol
Capitol Park
SUTTER'S FORT
8
9
12
13
21
20
19
5
80
50
99
LEGEND
Census Tract Boundary
Source: U.S. Dept. of Commerce, Bureau of the Census; Sacramento Area Council of Governments, 1990.
FIGURE 4.21-2
CENSUS TRACT BOUNDARIES
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TABLE 4.21-6

SCHOOL CHILDREN GENERATION RATES
BY SCHOOL GRADE GROUP

Child School Group	Ages of Group	Number of Children Per Dwelling Unit
Infant/Toddler/Pre-School	0 through 4	0.08785
Kindergarten through Grade 4	Ages 5 through 9	0.06602
Grades 5 and 6	Ages 10 and 11	0.02109
Junior High School Grades 7 and 8	Ages 12 and 13	0.02012
High School Grades 9 through 12	Ages 14, 15, 16, 17, and 1/3 of persons age 18	0.05106
Total All Pre-School and School Children	Ages 0 through 17, and 1/3 of persons age 18	0.2468

SOURCE: 1990 Census, Release STF-1A; EIP Associates, 1991.

appropriate given that this EIR is intended to characterize the effects of the population increase in the Planning Area.

Tables 4.21-7 through 4.21-13 summarize the student increases anticipated under the Alternative development scenarios for the City of Sacramento School District, North Sacramento School District, and the Grant Joint Union High School District.

Child Care

Child care demand estimates were derived using the number of children in two age groups: infant/toddler/pre-school and elementary grades K through 4. For purposes of the analysis, it is assumed that 80 percent of all children under the age of 12 who are residents of the Planning Area would require some form of child care services outside of the home.

For employees of the Planning Area, the analysis used a formula provided by Child Action, Inc., a child care referral agency in Sacramento, to estimate market demand for child care services within Sacramento. This formula divides the child care market into two age groups: 0 through 4, and 5 through 13. Based on SACOG estimates of total household size and estimates of population age prepared by the Department of Finance for the Sacramento region, the Child Action formula assumes that there are 1.14 employees per household in the Sacramento region (based on 1980 Census data). Each household is assumed to have a total of 2.56 persons, and 8.3 percent of the total population is assumed to be between 0 and 4 years of age, while 13.7 percent is assumed to be between the ages of 5 and 13. Taking the number of employees generated by the Alternative and dividing by 1.14 generates the number of households associated with the employment opportunities, then multiplying the number of households by the average household size for the Sacramento region of 2.56 generates the total population. Child Action estimates that 46 percent of the households with children of pre-school age have the primary caregiver working, and that 66 percent of the school-age households have the primary caregiver working. Of those households with the primary caregiver working, Child Action assumes that 50 percent will demand market child care, as opposed to non-market child care (such as care given by a relative or non-licensed caregiver). According to surveys of employees of both Sacramento County and the City of Sacramento, approximately 40 percent of all employees prefer child care located near their place of employment. Tables 4.21-21 through 4.21-23 reflect that only 40 percent of the total employee-generated childcare demand would occur in the downtown area.

Tables 4.21-14 through 4.21-20 show the incremental acreage requirements by phase for each of the Alternatives. These incremental acreage requirements follow the State guidelines for new school facility construction, and illustrate the school site needs resulting from increased residential development within the Planning Area. These acreages are additive for each district and phase. Some schools would be able to accommodate limited enrollment increases through increased facility density on existing sites with adequate total site acreage. Other schools would be unable to do so. The Facility Element calls for the provision of new school sites during the final phase of development.

TABLE 4.21-7
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 1

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	0	0	0	0	0	0	N/A	N/A	N/A
Primary Grades 5 and 6	0	0	0	0	0	0	N/A	N/A	N/A
Junior High Grades 7 and 8	0	0	0	N/A	N/A	N/A	0	0	0
High School Grades 9 through 12	0	0	0	N/A	N/A	N/A	0	0	0

SOURCE: EIP Associates, 1991.

TABLE 4.21-8
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 2

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	96	187	250	37	165	500	N/A	N/A	N/A
Primary Grades 5 and 6	31	60	74	12	53	160	N/A	N/A	N/A
Junior High Grades 7 and 8	29	57	70	N/A	N/A	N/A	11	50	152
High School Grades 9 through 12	74	145	178	N/A	N/A	N/A	29	128	387

SOURCE: EIP Associates, 1991.

TABLE 4.21-9
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 3

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	63	151	230	57	185	500	N/A	N/A	N/A
Primary Grades 5 and 6	20	48	74	18	59	160	N/A	N/A	N/A
Junior High Grades 7 and 8	19	46	70	N/A	N/A	N/A	17	56	152
High School Grades 9 through 12	49	117	178	N/A	N/A	N/A	44	143	387

SOURCE: EIP Associates, 1991.

TABLE 4.21-10
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 4

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	0	83	202	0	88	238	N/A	N/A	N/A
Primary Grades 5 and 6	0	26	65	0	28	76	N/A	N/A	N/A
Junior High Grades 7 and 8	0	27	62	N/A	N/A	N/A	0	27	72
High School Grades 9 through 12	0	64	156	N/A	N/A	N/A	0	68	184

SOURCE: EIP Associates, 1991.

TABLE 4.21-11
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 5

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	37	148	354	66	180	386	N/A	N/A	N/A
Primary Grades 5 and 6	12	47	113	21	58	123	N/A	N/A	N/A
Junior High Grades 7 and 8	11	45	108	N/A	N/A	N/A	11	45	108
High School Grades 9 through 12	29	114	274	N/A	N/A	N/A	29	114	274

SOURCE: EIP Associates, 1991.

TABLE 4.21-12
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 6

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	20	91	91	100	208	208	N/A	N/A	N/A
Primary Grades 5 and 6	6	29	29	32	67	67	N/A	N/A	N/A
Junior High Grades 7 and 8	6	28	28	N/A	N/A	N/A	6	28	28
High School Grades 9 through 12	15	70	70	N/A	N/A	N/A	15	70	70

SOURCE: EIP Associates, 1991.

TABLE 4.21-13
TOTAL NUMBER OF NEW STUDENTS
ALTERNATIVE 7

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out	Year 2000	Year 2010	Build-out
Primary Grades K through 4	26	93	233	75	235	424	N/A	N/A	N/A
Primary Grades 5 and 6	8	30	75	24	75	135	N/A	N/A	N/A
Junior High Grades 7 and 8	8	28	71	N/A	N/A	N/A	8	28	71
High School Grades 9 through 12	20	72	180	N/A	N/A	N/A	20	72	180

Note: Number of net new students by phase.

SOURCE: EIP Associates, 1991.

TABLE 4.21-14
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 1

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	0	0	0	0	0	0	N/A	N/A	N/A
Primary Grades 5 and 6	0	0	0	0	0	0	N/A	N/A	N/A
Junior High Grades 7 and 8	0	0	0	N/A	N/A	N/A	0	0	0
High School Grades 9 through 12	0	0	0	N/A	N/A	N/A	0	0	0

SOURCE: EIP Associates, 1991.

TABLE 4.21-15
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 2

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	1.44	1.37	0.94	0.55	1.92	5.02	N/A	N/A	N/A
Primary Grades 5 and 6	0.86	0.82	0.56	0.18	0.61	1.60	N/A	N/A	N/A
Junior High Grades 7 and 8	0.53	0.50	0.34	N/A	N/A	N/A	0.20	0.70	1.84
High School Grades 9 through 12	1.33	1.27	0.87	N/A	N/A	N/A	0.51	1.78	4.66

SOURCE: EIP Associates, 1991.

TABLE 4.21-16
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 3

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	0.94	1.32	1.19	0.85	1.92	4.72	N/A	N/A	N/A
Primary Grades 5 and 6	0.56	0.79	0.71	0.27	0.61	1.51	N/A	N/A	N/A
Junior High Grades 7 and 8	0.34	0.48	0.43	N/A	N/A	N/A	0.31	0.70	1.73
High School Grades 9 through 12	0.87	1.23	1.10	N/A	N/A	N/A	0.79	1.79	4.38

SOURCE: EIP Associates, 1991.

TABLE 4.21-17
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 4

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	0.00	1.24	1.79	0.00	1.32	2.25	N/A	N/A	N/A
Primary Grades 5 and 6	0.00	0.74	1.07	0.00	0.42	0.72	N/A	N/A	N/A
Junior High Grades 7 and 8	0.00	0.45	0.66	N/A	N/A	N/A	0.00	0.48	0.82
High School Grades 9 through 12	0.00	1.15	1.66	N/A	N/A	N/A	0.00	1.22	2.09

SOURCE: EIP Associates, 1991.

TABLE 4.21-18
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 5

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	0.55	1.67	3.09	0.99	1.71	3.09	N/A	N/A	N/A
Primary Grades 5 and 6	0.33	0.99	1.84	0.32	0.55	0.99	N/A	N/A	N/A
Junior High Grades 7 and 8	0.20	0.61	1.13	N/A	N/A	N/A	0.20	0.61	1.13
High School Grades 9 through 12	0.51	1.55	2.87	N/A	N/A	N/A	0.51	1.55	2.87

SOURCE: EIP Associates, 1991.

TABLE 4.21-19
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 6

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	0.30	1.06	0	1.50	1.63	0	N/A	N/A	N/A
Primary Grades 5 and 6	0.18	0.63	0	0.48	0.52	0	N/A	N/A	N/A
Junior High Grades 7 and 8	0.11	0.39	0	N/A	N/A	N/A	0.11	0.39	0
High School Grades 9 through 12	0.28	0.99	0	N/A	N/A	N/A	0.28	0.99	0

SOURCE: EIP Associates, 1991.

TABLE 4.21-20
SCHOOL FACILITY ACREAGES PER PHASE OF DEVELOPMENT
ALTERNATIVE 7

	Sacramento City Unified School Dist.			North Sacramento School Dist.			Grant Joint Union High School Dist.		
Grade Level	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025	Year 2000	Year 2010	Year 2025
Primary Grades K through 4	0.40	0.99	2.11	1.12	2.40	2.83	N/A	N/A	N/A
Primary Grades 5 and 6	0.24	0.59	1.26	0.36	0.77	0.91	N/A	N/A	N/A
Junior High Grades 7 and 8	0.14	0.36	0.77	N/A	N/A	N/A	0.14	0.36	0.77
High School Grades 9 through 12	0.37	0.92	1.96	N/A	N/A	N/A	0.37	0.92	1.96

SOURCE:EIP Associates, 1991.

Table 4.21-21 summarizes the net increases in numbers of children needing child care services by age group under each of the Alternatives for each of the project phases through buildout as a result of both residential and employment components of the Alternatives. Table 4.21-22 summarizes this information for residential development, while Table 4.21-23 provides information regarding employment demand for child care services.

Child care center guidelines require a minimum of 35 square feet of activity area per child, plus approximately 15 square feet per child for support areas. Infants require an additional 15 square feet to accommodate cribs. These guidelines also recommend an additional 75 square feet of outdoor play area for each child. Indoor and outdoor space requirement estimates for the Alternatives are summarized in Tables 4.21-24 and 4.21-25.

TABLE 4.21-21

TOTAL NUMBER OF CHILD CARE SPACES DEMANDED
BY BOTH RESIDENTS AND EMPLOYEES

Planning Horizon:	Year 2000		Year 2010		Buildout	
Age Group:	Pre-school	School Age	Pre-school	School Age	Pre-school	School Age
Alternative 1						
Railyard Area	17	24	34	49	58	49
Richards Area	18	25	23	32	48	34
Alternative 2						
Railyards Area	241	282	562	680	842	761
Richards Area	143	172	437	498	928	1,000
Alternative 3						
Railyards Area	221	278	562	705	882	855
Richards Area	159	180	452	505	914	1,011
Alternative 4						
Railyards Area	163	234	545	728	896	1,182
Richards Area	62	89	273	335	555	847
Alternative 5						
Railyards Area	180	243	457	641	684	1,238
Richards Area	80	80	265	264	528	555
Alternative 6						
Railyards Area	221	278	621	824	857	1,435
Richards Area	131	154	562	722	679	1,271
Alternative 7						
Railyards Area	207	267	611	777	896	1,182
Richards Area	151	192	442	562	757	1,243

SOURCE: EIP Associates, 1991.

TABLE 4.21-22

TOTAL NUMBER OF CHILD CARE SPACES DEMANDED
BY NEW RESIDENTS ONLY

Planning Horizon:	Year 2000		Year 2010		Buildout	
Age Group:	Pre-school	School Age	Pre-school	School Age	Pre-school	School Age
Alternative 1						
Railyard Area	0	0	0	0	0	0
Richards Area	0	0	0	0	0	0
Alternative 2						
Railyard Area	92	69	186	140	253	190
Richards Area	49	37	189	142	545	410
Alternative 3						
Railyard Area	57	43	148	111	232	174
Richards Area	70	53	210	158	545	410
Alternative 4						
Railyard Area	0	0	79	60	197	148
Richards Area	0	0	83	62	276	207
Alternative 5						
Railyard Area	21	16	21	16	21	16
Richards Area	49	37	171	128	390	293
Alternative 6						
Railyard Area	57	43	98	74	98	74
Richards Area	49	37	124	93	124	93
Alternative 7						
Railyard Area	44	33	145	109	197	148
Richards Area	35	26	105	79	254	191

SOURCE: EIP Associates, 1991.

TABLE 4.21-23

TOTAL NUMBER OF CHILD CARE SPACES DEMANDED
BY NEW EMPLOYEES ONLY

Planning Horizon:	Year 2000		Year 2010		Buildout	
Age Group:	Pre-school	School Age	Pre-school	School Age	Pre-school	School Age
Alternative 1						
Railyard Area	17	24	34	49	58	49
Richards Area	18	25	23	32	48	34
Alternative 2						
Railyard Area	149	213	376	540	589	571
Richards Area	94	135	248	356	383	590
Alternative 3						
Railyard Area	164	236	414	594	650	681
Richards Area	88	127	242	348	369	602
Alternative 4						
Railyard Area	163	234	465	668	699	1,034
Richards Area	62	89	190	273	279	639
Alternative 5						
Railyard Area	158	227	436	625	663	1,222
Richards Area	30	44	95	136	138	262
Alternative 6						
Railyard Area	164	236	523	750	758	1,361
Richards Area	82	117	439	630	556	1,178
Alternative 7						
Railyard Area	163	234	465	668	699	1,034
Richards Area	115	166	337	484	503	1,052

SOURCE: EIP Associates, 1991.

TABLE 4.21-24

TOTAL CHILD CARE FACILITY SPACE REQUIRED
INDOOR SPACE MINIMUM
(Square Feet)

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	49,188	52,040	52,452
Alternative 2	57,414	124,332	183,958
Alternative 3	57,393	126,753	192,361
Alternative 4	45,541	112,183	201,602
Alternative 5	49,782	107,348	194,372
Alternative 6	66,477	163,762	262,117
Alternative 7	53,775	132,531	229,460

SOURCE: EIP Associates, 1991.

TABLE 4.21-25

TOTAL CHILD CARE FACILITY SPACE REQUIRED
OUTDOOR SPACE MINIMUM
(Square Feet)

Alternative	Year 2000	Year 2010	Buildout
Alternative 1	73,781	78,060	78,678
Alternative 2	86,121	186,498	275,937
Alternative 3	86,090	190,129	288,542
Alternative 4	68,312	168,274	302,402
Alternative 5	74,674	161,021	291,558
Alternative 6	99,716	245,643	393,175
Alternative 7	80,663	198,797	344,190

SOURCE: EIP Associates, 1991.

Impacts and Mitigation Measures

Schools

Impacts Due to Development in the Planning Area

4.21-1 Implementation of most of the Alternatives would increase the number of schoolchildren in the Sacramento Unified School District and the North Sacramento School District in the elementary school grades (Kindergarten through grade 6).

A-1 Alternative 1 would not result in increases in students at local elementary schools since no new residential construction would be constructed. This is considered a ***less-than-significant impact.***

Although some schools that serve the existing residential uses within the Richards Area are near or over capacity, the No Project Alternative would not result in increased residential demand for school facilities. Existing school facility deficiencies would continue without independent intervention by the districts.

A-2 through A-7

Alternatives 2 through 7 would result in substantial increases in enrollments in grades K through 6. This is considered a ***significant impact.***

At present time, there are no school facilities in the Railyards Area, and there is one elementary school, the Dos Rios School, within the Richards Area. The Dos Rios Elementary School was constructed in 1942 on a 33-acre site to accommodate students from the adjoining Dos Rios housing development. The Dos Rios Elementary School has a capacity of 272 students; current enrollment at the school is 272 students, so there is no excess capacity.

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.21-1(a) *Development in the Planning Area shall be coordinated with the Sacramento City Unified School District, the North Sacramento Elementary School District, and the Grant Joint Union High School District with the express purpose of securing adequate school capacity to provide for students expected to be generated by development within the Planning Areas, and to provide for the continuing provision of school services to existing students within the Planning Area. This measure would be required for Alternatives 2 through 7. This coordination effort shall take place during the design and planning phase of all residential maps or construction plans and shall be coordinated by the City of Sacramento Planning Department. School capacity may be provided by one or a combination of the following:*

- *Identify and secure one or more school sites;*
- *Improve and expand existing school sites in or near the Planning Area; or*
- *Develop alternative types of school facilities within the Railyards and/or Richards Area.*

Depending on the Alternative, the increased number of school children may not require a typical large school facility. As discussed above, large existing schools near the Planning Area may not be able to expand to accommodate increased enrollment. Therefore, the City and School Districts may consider alternative approaches to schooling in the Planning Area, such as small facilities in residential areas and/or office buildings and varying mixes of grade levels. The Planning Area, particularly the Cultural Shops complex, could be developed with facilities and programs to support school-related needs, such as playing fields, libraries, child care, museums, and telecommunication centers. School administrators have indicated their support of the exploration of such alternative approaches for the provision of school facilities.

4.21-1(b) *Development within the Planning Area shall provide for its fair share of all facility improvements necessary to provide adequate capacity for increases in the number of students generated by development within the Area. This contribution shall be determined on a project-specific basis with any mitigation fees to be paid in accordance with State and City policies. This measure is required for Alternatives 2 through 7.*

4.21-2 Implementation of most of the Alternatives would increase the number of schoolchildren demanding public school facilities in the middle school grades 7 and 8 at the Sacramento City Unified School District and the Grant Joint Union High School District.

A-1 Alternative 1 would not result in increases in students at local junior high schools as a result of new residential construction. This is considered a ***less-than-significant impact.***

The No Project Alternative would not result in increased residential demand for school facilities. Existing school facility deficiencies would continue without independent intervention by the districts.

A-2 through A-7

Alternatives 2 through 7 would result in increases in enrollments at local schools in the grades 7 and 8. This is considered a ***significant impact.***

Tables 4.21-8 through 4.21-13 summarize the total number of new students at each of the districts for each Alternative. These increases are anticipated to exceed the available capacity for grades 7 and 8 using existing facilities.

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant level.*

4.21-2 *Implement Mitigation Measures 4.21-1(a) and 4.21-1(b). This measure is required for Alternatives 2 through 7.*

4.21-3 Implementation of most of the Alternatives would increase demand for public school facilities in the grades 9 through 12 at the Sacramento City Unified School District.

A-1 Alternative 1 would not result in increases in students at local high schools as a result of new residential construction. This is considered a ***less-than-significant impact.***

The No Project Alternative would not result in increased residential demand for school facilities. Existing school facility deficiencies would continue without independent intervention by the districts.

A-2 through A-7

Alternatives 2 through 7 would result in increases in enrollments at City of Sacramento School District in the grades 9 through 12 at the Sacramento City Unified School District. This is considered a ***significant impact.***

Tables 4.21-8 through 4.21-13 summarize the total number of new students at each of the districts for each Alternative. Increases within the Sacramento City Unified School District are anticipated to further aggravate existing overcrowding conditions during all phases of development.

Mitigation Measures

Implementation of the following mitigation measures would reduce the above impacts to a *less-than-significant level.*

4.21-3(a) *Implement Mitigation Measures 4.21-1(a) and 4.21-1(b). This mitigation measure is required for Alternatives 2 through 7.*

4.21-3(b) *The Sacramento City Unified School District and the Grant Joint Union High School District shall jointly investigate the feasibility of student transfers and/or other methods of providing for adequate facility space for students at high schools that are over capacity. If it is determined that an economical and efficient method of transferring students may be achieved, then the districts shall seek to implement necessary administrative procedures to ensure that the quality of education for the existing students is not degraded as a result of overcrowding conditions. If it is determined that a feasible solution does not exist, then*

development within the Planning Areas shall contribute its fair share to the provision of adequate facility needs. This mitigation measure is required for Alternatives 2 through 7.

Impacts Due to Development in the Richards Area Only

4.21-4 Implementation of most of the Alternatives would increase the number of schoolchildren demanding public school facilities in the high school grades 9 through 12 at the Grant Joint Union High School District.

A-1 Alternative 1 would not result in increases in students at the Grant Joint Union High School District as a result of new residential construction. This is considered a ***less-than-significant impact.***

Alternative 1 would not result in increased residential demand for school facilities. Existing school facility deficiencies would continue without independent intervention by the districts.

A-2 through A-5 and A-7

Alternatives 2 through 5 and 7 would result in increases in enrollments at Grant Joint Union High School District in the grades 9 through 12. This is considered a ***significant impact.***

Tables 4.21-8 through 4.21-11 and 4.21-13 summarize the total number of new students at each of the districts for Alternatives 2 through 5 and 7. Increases within the Grant Joint Union High School District are anticipated to exceed currently available capacity after the first phase of development.

A-6 Alternative 6 would result in increases in enrollments at the Grant Joint Union High School District in the grades 9 through 12. This is considered a ***less-than-significant impact.***

Table 4.21-12 summarizes the total number of new students at each of the districts for the Alternative. Increases within the Grant Joint Union High School District are not anticipated to exceed currently available capacity through buildout as a result of development under this Alternative.

Mitigation Measures

Implementation of the following mitigation measure would be required for development under Alternatives 2 through 5 and 7 during the initial phase of construction. While not required for Alternative 6, it is recommended.

4.21-4 *Implement Mitigation Measures 4.21-1(a), 4.21-1(b), and 4.21-3(b). This measure would be required for Alternatives 2 through 5, and 7.*

4.21-5 Development of the Richards Area could result in increased enrollments at Dos Rios Elementary school and expansion of the school to enrollments in excess of 800 students.

A-1 Alternative 1, the No Project Alternative, would not result in increases in students at the Dos Rios Elementary School as a result of new residential construction. This is considered a ***less-than-significant impact.***

A-2 and A-3

Alternatives 2 and 3 could result in increases in enrollments at Dos Rios Elementary in excess of 800 students. This would require expansion of the Dos Rios campus to accommodate over 800 students, which is generally over the enrollment guidelines used by local school districts to determine maximum school capacity. This is considered a ***significant impact.***

A-4 through A-7

Alternatives 4 through Alternative 7 could result in increases in enrollments at the Dos Rios Elementary School, but not in excess of 800 students. This would require expansion of the Dos Rios Elementary School. This is considered a ***less-than-significant impact.***

Mitigation Measures

Implementation of the following mitigation measure would be required for development under Alternatives 2 and 3 prior to initiation of the third phase of project development in order to reduce impacts to a *less-than-significant level.* This measure is recommended, but not required, for Alternatives 4 through 7.

4.21-5 *Implement Mitigation Measures 4.21-1(a) and 4.21-1(b). This measure would be required for Alternatives 2 and 3.*

Child Care

Impacts Due to Development in the Planning Area

4.21-6 Implementation of the Alternatives would increase the number of children requiring day care (both infant/toddler/pre-school age and school age) facilities.

A-1 Alternative 1 would not result in increased demand for child care services as a result of new residential construction.

Total market demand for child care spaces is summarized in Table 4.21-21. Under the No Project Alternative, new employment-generating uses would create a demand for a total of 935 new child care spaces by the year 2000, and a maximum of nearly 1,000

spaces around the year 2010. This would require the minimum space summarized in Table 4.21-24 and outdoor space shown in Table 4.21-25. This is considered a ***significant impact.***

A-2 Alternative 2 would result in increased demand for child care services for both pre-school and school-age children. This is considered a ***significant impact.***

Total market demand for child care spaces is summarized in Table 4.21-21. Under this Alternative, there would be demand for a total of 1,151 new child care spaces by the year 2000, and a maximum of nearly 3,700 spaces by buildout. This would require the minimum space summarized in Table 4.21-24 and outdoor space shown in Table 4.21-25.

A-3 Alternative 3 would result in increased demand for child care services for both pre-school and school-age children. This is considered a ***significant impact.***

Total market demand for child care spaces is summarized in Table 4.21-21. Under this Alternative, there would be a demand for a total of 1,113 new child care spaces by the year 2000, and a maximum of nearly 3,353 spaces by buildout. This would require the minimum space summarized in Table 4.21-24 and outdoor space shown in Table 4.21-25.

A-4 Alternative 4 would result in increased demand for child care services for both pre-school and school-age children. This is considered a ***significant impact.***

Total market demand for child care spaces is summarized in Table 4.21-21. Under this Alternative, there would be a demand for a total of 988 new child care spaces by the year 2000, and a maximum of approximately 3,990 spaces by buildout. This would require minimum space as summarized in Table 4.21-24 and outdoor space as in Table 4.21-25.

A-5 Alternative 5 would result in increased demand for child care services for both pre-school and school-age children. This is considered a ***significant impact.***

Total market demand for child care space is summarized in Table 4.21-21. Under this Alternative, there would be a demand for a total of 996 new child care spaces by the year 2000, and a maximum of approximately 3,900 spaces by buildout. This would require the minimum space summarized in Table 4.21-24 and outdoor space shown in Table 4.21-25.

A-6 Alternative 6 would result in increased demand for child care services for both pre-school and school-age children. This is considered a ***significant impact.***

Total market demand for child care space is summarized in Table 4.21-21. Under this Alternative, there would be a demand from new employment-generating uses for a total of new child care spaces by the year 2000, and a maximum of approximately 3,900 spaces by buildout. This would require the minimum space summarized in Table 4.21-24 and outdoor space shown in Table 4.21-25.

A-7 Alternative 7 would result in increased demand for child care services for both pre-school and school-age children. This is considered a ***significant impact.***

Total market demand for child care space is summarized in Table 4.21-21. Under this Alternative, there would be a demand from new employment-generating uses for a total of new child care spaces by the year 2000, and a maximum of approximately 3,900 spaces by buildout. This would require minimum space as summarized in Table 4.21-24 and outdoor space as in Table 4.21-25.

Mitigation Measures

Implementation of the following mitigation measures would be required for all Alternatives during the initial phases of development.

4.21-6 *New development within the Planning Area shall demonstrate that adequate provision for facility space for child care services is included in the application for use permit approval. The City of Sacramento shall not approve the occupancy of any office, commercial or residential use that is unable to demonstrate the availability of child care services. In the absence of the immediate availability of child care services, approval may be granted to projects that submit a plan of action that would ensure the provision of child care services within a reasonable period and that is approved by the City of Sacramento Child Care Coordinator. Recognizing that market child care services require an established customer base to justify location of new facilities, the City of Sacramento, through the Child Care Coordinator, shall actively encourage and support the expansion of child care services by licensed care providers within the Planning Areas. This measure would be required for all Alternatives.*

Cumulative Impacts

4.21-7 Cumulative development within the downtown area would result in enrollment increases at the Sacramento Unified School District and the North Sacramento Elementary School District.

Enrollment levels for cumulative development are shown in Tables 4.21-26 through 4.21-29 by Alternative and phase for each affected school district.

A-1 Cumulative development under Alternative 1 would result in increases in students at all grade levels within the district as a result of new residential construction within the service areas of schools presently serving the Planning Area. This is considered a ***significant impact.***

As existing schools that serve the residential uses within the Richards Area are near or over capacity, the No Project Alternative would result in enrollments exceeding capacities at all districts. Existing school facility deficiencies would be further aggravated by increased enrollments without independent intervention by the districts. Identification and construction of additional school facilities will be necessary for all of the affected school districts to relieve existing and anticipated deficiencies.

A-2 through A-7

Alternatives 2 through 7 would result in substantial increases in enrollments in all grades. This is considered a ***significant impact.***

Increased enrollments resulting from cumulative development, including Alternatives A-2 through A-7 would result in the need for additional school facilities within the downtown and Planning Area. The need for new school facilities may result in locational demands for school facilities in areas outside of the service area of facilities to be constructed under each Alternative.

Mitigation Measures

Implementation of the following mitigation measures would be required for development anticipated under any of the Alternatives during the first phase of construction, or, in the case of Alternative 1, the No Project Alternative, effective immediately.

4.21-7(a) *Implement Mitigation Measures 4.21-1(a), 4.21-1 (b), and 4.21-3(b). This measure would be required for all Alternatives.*

4.21-7(b) *The City of Sacramento Planning Department shall coordinate with the Sacramento City Unified School District, the North Sacramento School District, and the Grant Joint Union High School District to facilitate the identification of facility needs arising from new or infill residential development within the Downtown and South Natomas areas. Residential developments shall not be approved for occupancy until adequate school capacity is shown to be either available or planned to be made available within three years of project construction. This measure would be required for all Alternatives.*

4.21-8 Cumulative development within the Central City would result in substantial increases in the demand for child care facilities within the Central City area.

A-1 through A-7

Alternatives 1 through 7 and cumulative development would result in increases in the number of child care spaces demanded as summarized in Table 4.21-30. This is considered a ***significant impact.***

Development within the Central City would result in substantial demands for child care services, particularly for working households with infant or school-age children. This increase would result in the need to develop additional facility space dedicated to child care services as summarized in Tables 4.21-31 and 4.21-32.

Mitigation Measure

Implementation of the following mitigation measure would be required for all projects within the Central City area and should be initiated during the initial phase of project development to reduce cumulative effects within the Central City to a *less-than-significant* level.

4.21-8 *Implement Mitigation Measure 4.21-6 on a city-wide basis. This measure would be required for all Alternatives.*

TABLE 4.21-26
YEAR 2000 CUMULATIVE TOTAL ENROLLMENT
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT
(Alternative plus Cumulative Downtown)

Alternative	Primary Grades K through 4	Primary Grades 5 and 6	Junior High 7 and 8	High School 9 through 12
Alternative 1	488	156	149	78
Alternative 2	584	187	178	452
Alternative 3	551	176	168	427
Alternative 4	488	156	149	378
Alternative 5	525	168	160	407
Alternative 6	508	162	155	393
Alternative 7	514	164	157	398

SOURCE: City of Sacramento Planning Department; EIP Associates, 1991.

TABLE 4.21-27
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT
YEAR 2010 CUMULATIVE TOTAL ENROLLMENT
(Alternative plus Cumulative Downtown)

Alternative	Primary Grades K through 4	Primary Grades 5 and 6	Junior High 7 and 8	High School 9 through 12
Alternative 1	548	175	167	424
Alternative 2	735	235	224	569
Alternative 3	699	223	213	541
Alternative 4	630	201	192	487
Alternative 5	696	222	212	538
Alternative 6	639	204	195	494
Alternative 7	641	205	195	496

SOURCE: City of Sacramento Planning Department; EIP Associates, 1991.

TABLE 4.21-28
SACRAMENTO CITY UNIFIED SCHOOL DISTRICT
CUMULATIVE[1] TOTAL ENROLLMENT THROUGH BUILDOUT
(Alternative plus Cumulative Downtown)

Alternative	Primary Grades K through 4	Primary Grades 5 and 6	Junior High 7 and 8	High School 9 through 12
Alternative 1	1036	331	316	802
Alternative 2	1319	422	402	1021
Alternative 3	1250	399	381	968
Alternative 4	1118	357	341	865
Alternative 5	1221	390	372	945
Alternative 6	1147	366	350	887
Alternative 7	1155	369	352	894

[1] This uses 6,700 housing units as a worst-case assumption, based on the Central City Housing Strategy. See Section 4.7, Population, Employment, and Housing for a discussion of the likely range of cumulative housing units.

SOURCE: City of Sacramento Planning Department; EIP Associates, 1991.

TABLE 4.21-29

CUMULATIVE DEVELOPMENT PROJECTIONS
GRANT HIGH SCHOOL AND NORTH SACRAMENTO AREAS
(Enrollments in Students)

School	2000 Enrollment Projected	2010 Enrollment Projected
Grant High	2,767	4,437
Rio Tierra[1]	800	800
Total Grant Joint Union High School District Grades 7 and 8	5,765	7,369
Total Grant Joint Union High School District Grades 9-12	8,659	13,742
Dos Rios Elementary[2]	273	273

[1] The Rio Tierra School is capped at its present enrollment of 800 students, and will not be expanded to accommodate additional students.

[2] The Dos Rios Elementary School service area is estimated to reach buildout by 1996 with a total of 273 students. Current enrollment is 259 students.

Source: Grant Joint Union High School: Matt Washburn, Advanced Planning, personal communication December 3, 1991.

North Sacramento Elementary School District: Steve Little, Facilities Administration, personal communication December 5, 1991.

TABLE 4.21-30

NUMBER OF CHILD CARE SPACES DEMANDED
CENTRAL CITY CUMULATIVE DEVELOPMENT

Planning Horizon:	Year 2000		Year 2010	
Age Group:	Pre-School	School Age	Pre-School	School Age
Alternative 1	896	1,114	931	966
Alternative 2	968	1,177	1,532	1,686
Alternative 3	949	1,159	1,515	1,674
Alternative 4	838	1,087	1,327	1,537
Alternative 5	898	1,125	1,332	1,523
Alternative 6	882	1,077	1,682	2,020
Alternative 7	878	1,090	1,282	1,413

SOURCE: EIP Associates, 1991.

TABLE 4.21-31

CUMULATIVE CHILD CARE FACILITY SPACE REQUIRED
INDOOR SPACE MINIMUM
(Square Feet)

Alternative	Year 2000	Year 2010
Alternative 1	100,488	94,846
Alternative 2	107,283	160,871
Alternative 3	105,365	159,442
Alternative 4	96,219	143,216
Alternative 5	101,161	142,744
Alternative 6	97,950	185,603
Alternative 7	98,431	134,741

SOURCE: EIP Associates, 1991.

TABLE 4.21-32

CUMULATIVE CHILD CARE FACILITY SPACE REQUIRED
OUTDOOR SPACE MINIMUM
(Square Feet)

Alternative	Year 2000	Year 2010
Alternative 1	150,733	142,268
Alternative 2	160,924	241,307
Alternative 3	158,048	239,163
Alternative 4	144,328	214,824
Alternative 5	151,742	214,117
Alternative 6	146,925	278,405
Alternative 7	147,646	202,111

SOURCE: EIP Associates, 1991.

4.22 ELECTRICITY AND GAS SERVICE

4.22 ELECTRICITY AND GAS SERVICE

INTRODUCTION

The energy section of this EIR describes the existing distribution systems for electricity and natural gas in the Planning Area. This section estimates energy consumption for the Alternatives and describes service delivery effects of this projected demands.

SETTING

Electrical Service

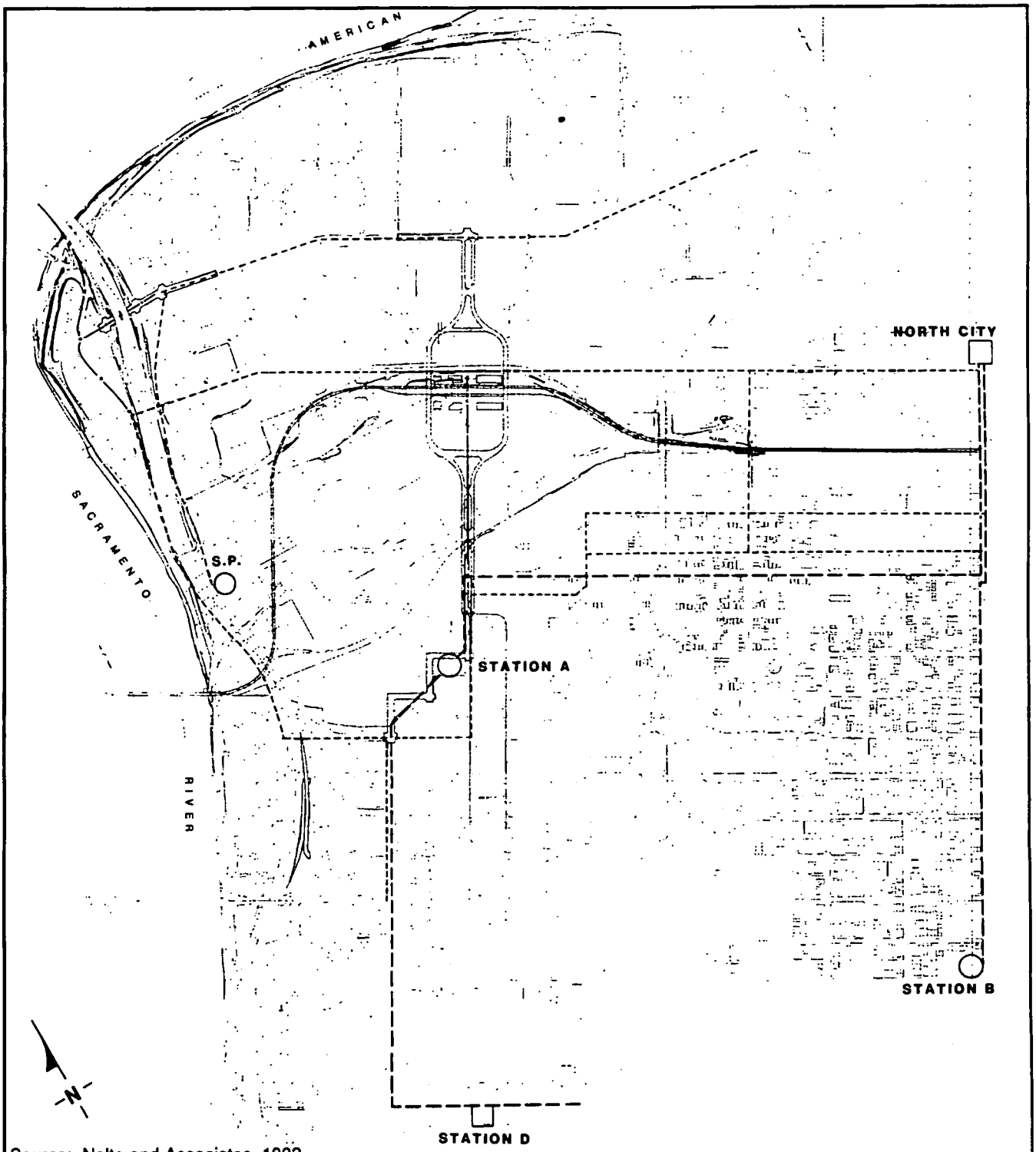
Electrical service is supplied to the Planning Area by the Sacramento Municipal Utility District (SMUD), which is responsible for the generation, transmission and distribution of electric power to its 900 square mile service area. This includes most of Sacramento County and a small portion of Placer County. SMUD is governed by a board of five directors who make policy decisions and appoint the general manager, who is the chief executive officer.

Capacity

SMUD has generating capacity of 659 megawatts (MW) in hydroelectric plants, 187 MW in thermal plants, and 2 MW in photovoltaic plants. SMUD has purchased power sources totaling 1310 MW from PG&E, Western Systems, So. Cal Edison and others. These sources can provide a total of 2158 MW of power capacity. SMUD has recently (August, 1991) requested and received proposals for up to five cogeneration plants which, if implemented, have the potential to add several hundred MW of additional capacity to the SMUD system.

Distribution

Power is transmitted to the downtown Sacramento area by overhead 115 kilovolt (KV) transmission lines along R Street east of 19th Street and along the 19th-20th corridor south of R Street. These connect to SMUD Station B at 19th and O streets. An underground 115 KV loop extends from Station B north to the SMUD North City substation near 20th and North B streets, and also west on R Street to 5th Street, north on 5th Street and 7th Street to E Street, and east on E Street to 19th Street. Station A at 7th and H streets and Station D at 7th and R streets are on this loop. The Station D and the North City substations drop the 115 KV to 21 KV to serve 21 KV feeder lines. The Station A and Station B substations feed 12 KV networks in the downtown Sacramento area. Locations of existing 115 KV and 21 KV facilities and substations are shown on Figure 4.22-1.



Source: Nolte and Associates, 1992.

LEGEND

- Existing OH/UG 21kV Feeder
- Existing UG 115kV Feeder
- Proposed UG 21kV Feeder
- Existing Substation 115kV-12kV
- Existing Substation 115kV-21kV

FIGURE 4.22-1

ELECTRICAL DISTRIBUTION PHASE ONE (1991-2000)

SMUD has programmed additional 21 KV feeders to be constructed in the next two years to serve existing and previously planned loads in the vicinity of 7th Street between F and I streets, west on I Street to the I-5 Freeway, and north along the freeway to the proposed California Resource Center on Jibboom Street. These are shown on Figure 4.22-1 as existing facilities for the purpose of this EIR.

Existing Demand

The Railyards Area is presently served by one 21 KV primary service located along the westerly edge of the Railyards. This serves a substation and a distribution system which is privately owned by Southern Pacific. Demand in 1990 was approximately 2.4 MW.

The Richards Area is presently served by two major 21 KV feeder circuits extending from the SMUD North City substation near 20th and North B streets. One feeder lies along Richards Boulevard and the other along North B Street (Figure 4.22-1). Demand in 1990 on these circuits was approximately 30 MW.

Future Demand and Consumption

Peak power demand in megawatts under full buildout of the various Alternatives has been estimated by SMUD engineering staff, based upon conventional development conforming to Title 24 energy conservation requirements. This data is shown in Table 4.22-1 for the Railyards Area, the Richards Area, and for both areas combined. To place this data in perspective, this table also shows the percentage increase over No Project levels, and the total SMUD power capacity represented by peak demand. SMUD has established a goal of a 25 percent savings in energy demand beyond Title 24 for new construction which, if fully implemented, would significantly reduce peak power demands.

Power consumption or use on an annual basis has also been estimated by SMUD staff, based upon conventional development conforming to Title 24 energy conservation requirements. This data is shown on Table 4.22-2 for the Railyards Area and the Richards Area. To place this data in perspective, this table also shows the percentage increase over No Project levels, and the percentage of the total electrical energy use forecast by SMUD for the year 2010. Again, the SMUD goal of 25 percent earnings in energy consumption beyond Title 24 for new construction would, if fully implemented, significantly reduce those annual consumption amounts.

Implementation Strategy for Electrical Facilities

Phase 1 Electrical Service

Existing electrical distribution facilities are largely adequate to serve Phase 1 development in both the Planning Areas[1]. A relatively small section of 21 KV feeder is planned along Jibboom Street on the west side of the I-5 Freeway to connect the feeder at the California Resource Center to facilities in Richards Boulevard and to the north of the American River (Figure 4.22-1).

TABLE 4.22-1
SUMMARY
ESTIMATED PEAK POWER DEMAND

Description	Estimated Existing	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Railyards Area-MW[1]	2.4	18.7	53.1	60.0	83.0	88.9	102.2	83.0
Percent over No Project	--	--	184.0	220.9	343.9	375.4	446.5	343.9
Percent of SMUD Capacity	--	0.9	2.5	2.8	3.8	4.1	4.7	3.8
Richards Area-MW[1,2]	30.0	91.7	128.5	129.1	110.0	102.1	143.3	128.7
Percent over No Project	--	--	40.1	40.8	20.0	11.3	56.3	40.3
Percent of SMUD Capacity	--	4.2	6.0	6.0	5.1	4.7	6.6	6.0
Both Areas-MW	32.4	110.4	181.6	189.1	193.0	191.0	245.5	211.7
Percent over No Project	--	--	64.5	71.3	74.8	73.0	122.4	91.8
Percent of SMUD Capacity	--	5.1	8.4	8.8	8.9	8.9	11.4	9.8

NOTE: SMUD CAPACITY MW: 2158 FROM HYDRO, THERMAL, PHOTOVOLTAIC & PURCHASED POWER SOURCES

[1] August 8, 1991, estimates by SMUD
[2] Peak demand includes both new development and existing development which is expected to remain.

SOURCE: Nolte and Associates

TABLE 4.22-2
SUMMARY
ANNUAL ELECTRICAL ENERGY CONSUMPTION

Description	Estimated Existing	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Railyards Area-GWH/Yr[1]	N/A	54	217	233	296	279	334	296
Percent over No Project	--	--	302	331	448	417	519	448
Percent of 2010 Total Use	--	0.4	1.6	1.7	2.1	2.0	2.4	2.1
Richards Area-GWH/YR[1]	N/A	290	424	427	359	345	409	398
Percent over No Project	--	--	46	47	24	19	41	37
Percent of 2010 Total Use	--	2.1	3.0	3.1	2.6	2.5	2.9	2.9
Both Areas-GWH/YR	N/A	344	641	660	655	624	743	694
Percent over No Project	--	--	86	92	90	81	116	102
Percent of 2010 Total Use	--	2.5	84.6	4.7	4.7	4.5	5.3	5.0

NOTES:

1. Year 2010 total electrical energy use = 13,907 GWH, from june 1991 forecast of demand for electricity - SMUD submittal to California Energy Commission.
2. Consumption factors by SMUD
3. 1 million KWF = 1 Gigawatt-Hours (GWH)

[1] Source: 8/8/91 estimates by SMUD
[2] Peak demand includes both new development and existing development which is expected to remain.

Source: Nolte and Associates

Phase 2 Electrical Service

Phase 2 development will require construction of an underground and overhead 115 KV feeder extending from the substation near 19th and North B streets, west along North B Street to 5th Street, then north and west as necessary to follow the alignment of the proposed light rail line north of Richards Boulevard to the American River, and across the American River to the existing transmission line near West El Camino Avenue. (The light rail alignment has not yet been selected.) Additional 21 KV underground facilities will be needed along 5th Street from H Street to Bannon Street, along Bannon Street/North C Street to 16th Street, and on B Street from 7th Street to 10th Street and south on 10th Street to the C-D Alley (Figure 4.22-2).

Additional substations for distribution will be required. Sites being considered by SMUD are near 7th and North B Street and near 8th and H streets.

Phase 3 Electrical Service

Phase 3 development will require constructing a small amount of 21 KV underground feeder along North Crescent Road from 5th Street west to the proposed freeway ramp, and north to connect to existing facilities (Figure 4.22-3).

District Heating and Cooling

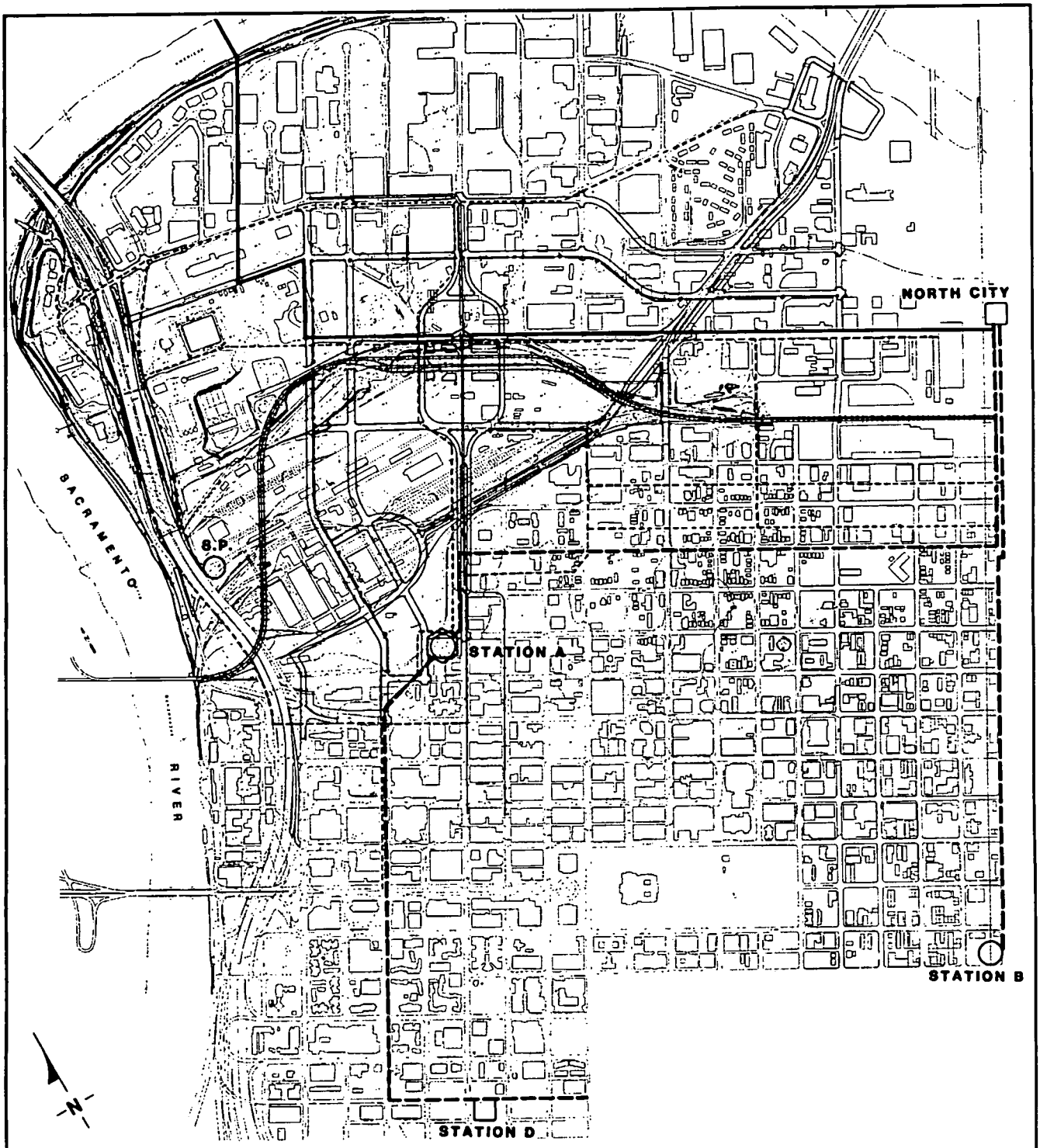
District heating and cooling (DHC) refers to the heating and cooling of multiple buildings from a central plant or group of plants. The buildings served are connected to a central plant through a distribution pipeline network, eliminating the need for individual building heating and cooling production equipment. District heating and cooling is most applicable for high density, mixed-use occupancy developments, such as that being proposed for the Planning Area. The primary advantages of DHC are energy efficiency, environmental protection, and cost savings to building owners. A preliminary evaluation of DHC for the Railyards Area estimates that (under Alternatives 4 and 7):

1. About 27 MW of the predicted 83 MW total peak electrical demand is a result of cooling equipment. District heating and cooling could significantly reduce the 27 MW impact by incorporating technologies such as thermal energy storage and heat based cooling.

2. Over 8 million kilowatt-hours can be saved annually through use of district heating and cooling.

3. Over 600,000 therms of natural gas can be saved annually through use of district heating and cooling.

4. DHC would result in significant environmental improvements through reduced use of CFC refrigerants and a reduction in boiler emissions (NO_x and CO_2) from in-building heating equipment.



Source: Nolte and Associates, 1992.

LEGEND

- Existing OH/UG 21kV Feeder
- Existing UG 115kV Feeder
- Existing OH/UG 115kV Feeder
- Proposed UG 21kV Feeder
- Existing Substation 115kV-12kV
- Existing Substation 115kV-21kV
- Potential Alternative Site For New 115kV-21kV Substation

FIGURE 4.22-2

ELECTRICAL DISTRIBUTION PHASE TWO (2001-2010)

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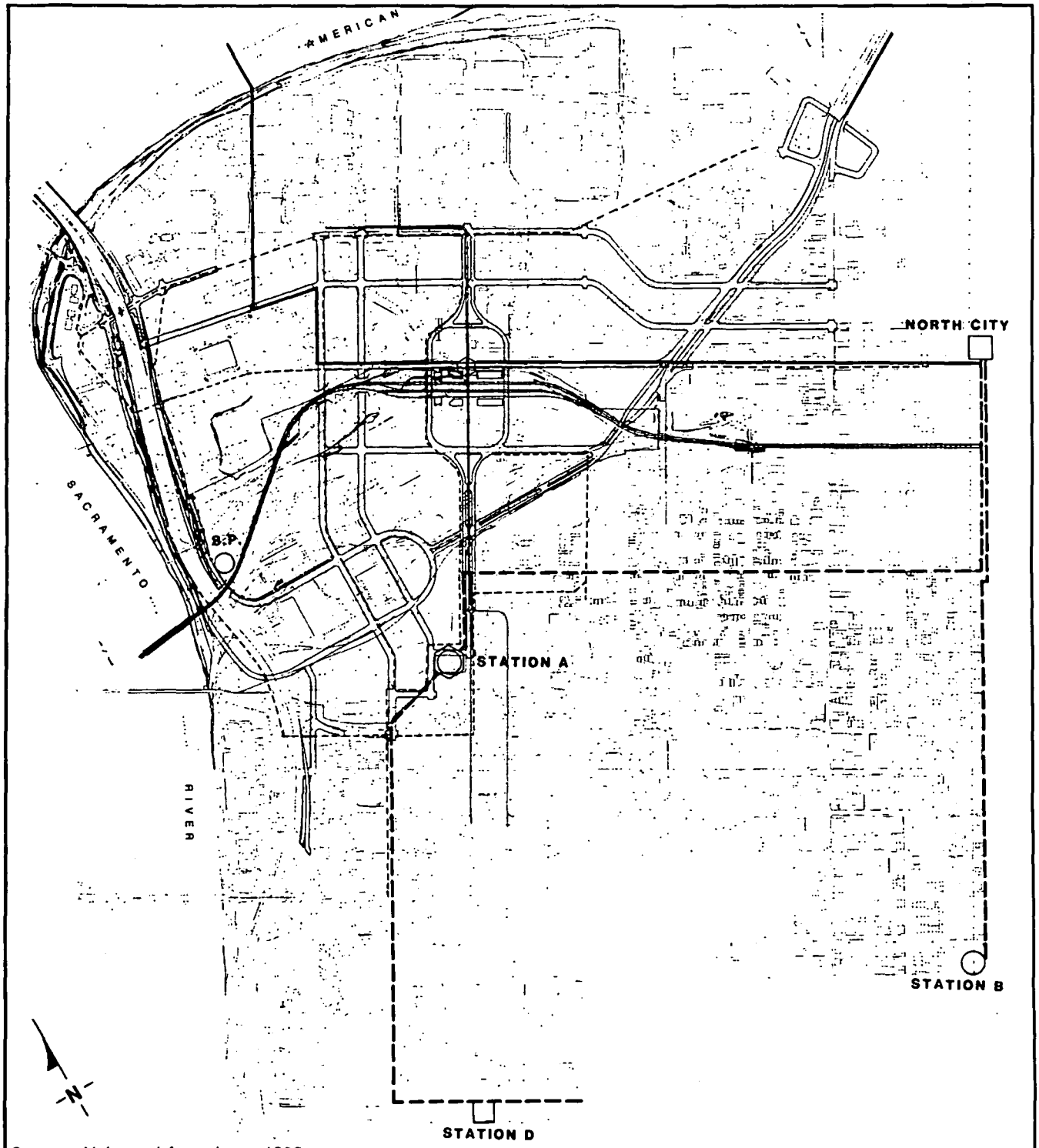

Source: Nolte and Associates, 1992.

LEGEND

- Existing OH/UG 21kV Feeder
- Existing UG 115kV Feeder
- Existing OH/UG 115kV Feeder
- Proposed UG 21kV Feeder
- Existing Substation 115kV-12kV
- Existing Substation 115kV-21kV
- Potential Alternative Site For New 115kV-21kV Substation

FIGURE 4.22-3

ELECTRICAL DISTRIBUTION PHASE THREE (2011-2025)

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5. The cost to construct buildings would be significantly reduced because they would not have to accommodate heating and cooling production equipment.

Greater savings are possible, depending on how DHC is combined with other technologies, such as cogeneration. No comparable estimate has been made for the Richards Area, due to the difficulty of predicting how transition from existing development to one of the Alternatives will occur.

Three potential sites for locating the central heating and cooling plants have been identified, and include: 1) an area south of the City water filtration plan, 2) an area near 7th and North B streets, and 3) in the vicinity of the County Courthouse complex. The DHC plants could be located in stand-alone buildings, incorporated into parking garage structures, incorporated into the proposed Intermodal Transit Station, or even be integrated into new commercial buildings. Heating and cooling would then be distributed to buildings from the central plants through insulated underground pipelines in street rights-of-way. The pipes could be installed at the same time as other underground utilities or phased with future building construction.

There are numerous options available for ownership of DHC facilities, including SMUD ownership; SMUD, in partnership with another entity; or a third party District Heating and Cooling Utility.

Gas Service

General

Gas service is supplied to the Planning Area by the Pacific Gas and Electric Company (PG&E), an investor-owned public utility, which is responsible for the transmission and distribution of gas to much of northern and central California. Gas is derived from sources in Canada (approximately 52 percent), California (approximately 10 percent), and the balance from sources in Texas, New Mexico and Colorado.

Distribution

Distribution in the Sacramento County area is the responsibility of the Sacramento Division of PG&E. Gas distribution pipelines in the central city core area adjoining the Railyards Area are a combination of low pressure (1 psi) and medium pressure (30 psi) pipelines. Low pressure pipelines are being phased out and replaced by medium pressure pipelines. Gas distribution pipelines in the Richards Area are all medium pressure. In general, gas distribution pipelines are located in public street rights of way.

Sacramento Division staff have indicated that PG&E will install distribution facilities, as needed, according to California Public Utilities Commission rules, and that PG&E has adequate supplies of gas available to meet the needs of any of the Alternatives[2].

Existing Demand

Approximately 4,121,000 million cubic feet (mcf) of gas were provided by the Sacramento Division during the 1990 calendar year. One cubic foot is equivalent to 1,000 British Thermal Units (BTU), and 100 cubic feet are equivalent to one therm. Data on existing consumption in the Planning Area are not currently available.

Future Gas Demand and Consumption

Estimates of future consumption were not available from PG&E. However, estimated gas consumption factors have been prepared by SMUD engineering staff in connection with their evaluation of district heating and cooling. Table 4.22-3 shows estimated peak demand by Alternative for heating in therms, assuming facilities meet Title 24 requirements. Table 4.22-4 shows estimated annual gas consumption. To place this data in perspective, these tables also show the percentage over No Project levels. These were estimated by applying the SMUD demand and consumption factors to the various Alternatives.

General Plan Goals & Policies

The following policies, although general in nature, are applicable to energy demand and facilities for development in the Planning Area.

Public Facilities and Services Element

Goal A

Provide and maintain a high quality of public facilities and services to all areas of the City.

Goal B

Time all new public facilities and services as closely as possible to approved urban expansion.

Goal C

Provide infrastructure for identified infill areas.

Under Alternative 1 through 7, increases in the demand for gas and electric power would result in the need for additional infrastructure to provide for the demand. Development in the Planning Area would be coordinated with SMUD and PG&E to ensure the timely construction of the infrastructure necessary to accommodate increased demand.

TABLE 4.22-3
SUMMARY OF ESTIMATED PEAK GAS DEMAND[1]

Description	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Railyards Area-Therms	213	2,947	3,168	4,022	3,743	4,531	4,022
Percent over No Project		1,284	1,387	1,788	1,657	2,027	1,788
Richards Area-Therms	2,027	5,273	5,298	4,215	4,207	5,527	4,910
Percent over No Project		160	161	108	108	173	142
Both Areas-Therms	2,240	8,220	8,466	8,237	7,950	10,058	8,932
Percent over No Project		267	278	268	255	349	299

NOTES:

1. Peak demand factors taken from SMUD estimates of heating loads prepared for analysis of district heating and cooling.
2. 100,000 BTU = 1 Therm.
3. Equipment efficiency = 75 percent.

[1] Peak demand includes both new development and existing development which is expected to remain.

Source: Nolte and Associates

TABLE 4.22-4
SUMMARY OF ESTIMATED ANNUAL GAS CONSUMPTION[1]

Description	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7
Railyards Area-KiloTherms	235	1,732	1,830	2,248	1,962	2,432	2,248
Percent over No Project		637	679	857	735	935	857
Richards Area-KiloTherms	1,492	3,300	3,315	2,550	2,615	2,974	2,900
Percent over No Project		121	122	71	75	99	94
Both Areas-KiloTherms	1,727	5,032	5,145	4,798	4,577	5,406	5,148
Percent over No Project		191	198	178	165	213	198

NOTES:

1. Consumption factors taken from SMUD estimates of heating loads prepared for analysis of district heating and cooling.
2. 100,000 BTU = 1 Therm.
3. Equipment efficiency = 75 percent.

[1] Peak demand includes both new development and existing development which is expected to remain.

Source: Nolte and Associates

IMPACTS AND MITIGATION MEASURES

Standards of Significance

Electricity

In the context of electrical service, a significant impact is defined as a capacity demand that cannot be met by existing or presently programmed supply, transmission and distribution facilities, and that requires the construction of substantial additional facilities.

Gas Service

In the context of gas service, a significant impact is defined as capacity demand that cannot be met by existing or presently programmed supply, transmission and distribution facilities, and that requires the construction of significant amounts of additional facilities.

Method

Electrical

Capacity demand is determined by estimating anticipated peak demand during peak load periods, which generally occur during hot summer days. Facilities generally must be sized to serve expected peak demand. Thus, conservation measures that level peak demand can reduce capacities and costs needed to accommodate planned growth. Estimates of peak demand have been prepared by SMUD engineering staff, based upon per square foot or per living unit demand factors for the various Alternatives. (Peak demand factors are given in Appendix K.)

Electrical consumption is determined by estimating the amount of electrical power that would flow through a meter throughout a given time period.. Estimates of consumption have been prepared by SMUD staff.

Gas Service

Capacity demand is determined by estimating anticipated peak demand during peak load periods, which generally occur during cold winter days. Estimates of peak demand were not available at this time from PG&E.

Gas consumption is determined by estimating the amount of gas that would flow through a meter throughout a given time period.

Impacts and Mitigation Measures

Impacts Due to Development in the Planning Area

4.22-1 Implementation of most of the Alternatives would increase peak power demands and would require new power transmission and primary distribution facilities in addition to those existing and presently proposed. Annual electrical energy consumption would also increase.

Table 4.22-1 summarizes the peak power demands in megawatts for Alternatives 1 through 7 for the Railyards Area, the Richards Area, and for both areas combined. This table also indicates for each the percent increase over the percent increase over implementation of Alternative 1, and the percent of total supply capacity of SMUD represented by each power demand. Peak power demands shown in this table are based upon implementation of Title 24 energy conservation measures, but do not take into account additional energy conservation measures that may be recommended. Table 4.22-2 summarizes the annual electrical energy consumption on the same basis.

A-1 Alternative 1 is not expected to require significant additional facilities for the Richards Area, since it is estimated that there would be adequate unused capacity in facilities serving that area to provide the estimated peak demand, partly due to certain high demand industries leaving the area. The Railyards Area may require some additional, but not substantial, facilities. Therefore, this is considered to be a ***less-than-significant impact.***

A-2 through A-7

Alternatives 2 through 7 is not expected to require significant additional facilities in the Richards Area, since it is estimated that there would be adequate unused capacity in facilities serving that area to provide the estimated peak demand, partly due to certain high demand industries leaving the area. The increase in annual energy consumption in this area is relatively small, compared with the No Project Alternative, for the time span of the Alternatives.

Alternatives 2 through 7 in the Railyards Area would require significant additional facilities to meet peak power demands and would have significantly larger increases in annual electrical energy consumption.

Facilities to be constructed would include: 1) New underground and overhead 115 KV transmission line along North B Street from existing 115 KV facilities near 19th Street, west to the point where the proposed light rail line turns north between North 3rd Street and Sequoia Blvd, then north along the proposed light rail alignment across the American River to existing 115 KV transmission facilities at West El Camino Avenue; 2) New 21 KV primary distribution facilities at several locations; 3) New substations at one of two Alternative locations (at Intermodal Transit Station, or adjacent to existing Station A at 6th and H streets). Implementation of any of Alternatives 2 through 7 for the Railyards

Area would require construction of these facilities. Due to the need for construction of facilities in the Railyards Area, this is considered to be a ***significant impact.***

Construction of overhead power transmission lines and substations may have significant visual and other land use, impacts which shall be addressed in a supplemental environmental document when locations and needs are more definitely established.

Mitigation Measures

Implementation of Mitigation Measure 4.22-1(a) will reduce the above impact to a *less-than-significant level* by making a substantial effort toward energy conservation, considerably greater than that required by Title 24. Mitigation Measure 4.22-1(b) will provide environmental review of transmission line and substation construction at the time that locations and needs are more definitely established.

4.22-1(a) *Use energy efficiency/load management measures for residential construction and for commercial/industrial construction by taking the following steps for Alternatives 2 through 7:*

1. *Participate in energy efficiency programs offered by the Sacramento Municipal Utility District and Pacific Gas and Electric. (See Appendix L for SMUD energy efficiency/load management measures.)*

2. *Contact SMUD during the initial development planning and project programming, and work with SMUD through design, construction and occupancy of projects for the purpose of maximizing energy efficiency measures in the design of the buildings.*

3. *Maximize improvement over and above California Building Standards (Title 24).*

4. *Work with SMUD to evaluate the appropriateness of providing central heating and cooling to the Railyards Area in lieu of conventional in-building heating, ventilation and air conditioning systems, and facilitate the design and construction of central heating and cooling plants.*

5. *Encourage builders to make new buildings more energy efficient than currently required.*

6. *Cooperate with electrical and gas infrastructure providers to develop the most efficient energy infrastructure.*

4.22-1(b) *Prepare supplemental environmental documents for overhead transmission lines and substations at the time that specific locations and needs are established. This mitigation measure would be required for Alternatives 2 through 7.*

4.22-2 Implementation of any of the Alternatives would likely require constructing new gas distribution facilities in addition to those existing and presently proposed, beyond those that would normally be constructed with other underground utilities in new streets planned in both the Railyards and Richards Areas.

A-1 through A-7

Table 4.22-4 summarizes demand for gas under each Alternative. Because of the need for distribution facilities associated with this demand, this is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.22-2 would reduce the above impact to a *less-than-significant level* by making a substantial effort toward energy conservation, considerably greater than that required by Title 24.

4.22-2 *Implement Mitigation Measure 4.22-1. This mitigation measure would be required for all Alternatives.*

Cumulative Impacts

4.22-3 Implementation of any of the Alternatives, taken with cumulative development in the City, would increase both peak demand and overall annual electrical energy consumption.

A-1 through A-7

Table 4.22-5 summarizes the cumulative peak power demand when cumulative development assumptions for the Central City are added to those of each Alternative, and the same demand factors are applied. Table 4.22-6 summarizes in a similar way the cumulative annual electrical energy consumption.

Since electrical transmission and distribution facilities sized to serve the peak demands of the Planning Area are relatively localized in that area, cumulative peak demands of other city areas have less impact on these facilities. Cumulative peak demands are of greater importance in relation to the overall generating capacity of SMUD. However, cumulative annual electrical energy consumption is of importance in the context of energy conservation. Therefore, this is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.22-3 will reduce Impact 4.22-3 to a *less-than-significant level* by making a significant effort toward energy conservation, considerably greater than that required by Title 24.

TABLE 4.22-5
ESTIMATED CUMULATIVE[1] PEAK POWER DEMAND[2]

Land Use	Demand Factor W/SF	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6		Alternative 7	
		Sq Ft (000s)[3]	Giga Watts[4]	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts
Planning Area	--	--	110.4	--	181.6	--	189.1	--	193.0	--	191.0	--	245.5	--	211.7
Cumulative Assumptions Added															
Office	7.0	8,587	60.1	7,867	55.1	7,317	51.2	7,358	51.5	7,740	54.2	1,691	11.8	5,278	36.9
Retail	8.0	1,175	9.4	1,175	9.4	1,175	9.4	1,175	9.4	1,175	9.4	1,175	9.4	1,175	9.4
Residential Units[5]	3.0	6,700	20.1	6,700	20.1	6,700	20.1	6,700	20.1	6,700	20.1	6,700	20.1	6,700	20.1
Cumulative Total	--	--	200.0	--	266.2	--	269.8	--	274.0	--	274.7	--	286.8	--	278.1

NOTES:

1. This uses 6,700 housing units as a worst-case assumption, based on Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2. Peak power demand factors from SMUD.
3. Unless otherwise noted.
4. 1 million KW = 1 Gigawatt (GW).
5. Residential units at 3KW/unit; hotel rooms at 3 KW/room.

Source: Nolte and Associates

TABLE 4.22-6
ESTIMATED CUMULATIVE[1] ANNUAL ELECTRICAL ENERGY CONSUMPTION[2]

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6		Alternative 7	
Land Use	Demand Factor W/SF	Sq Ft (000s)[3]	Giga Watts[4]	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts	Sq Ft (000s)	Giga Watts
Planning Area	--	--	344.0	--	641.0	--	660.0	--	655.0	--	624.0	--	743.0	--	694.0
Cumulative Assumptions Added															
Office	21.1	8,587	181.2	7,867	166.0	7,317	154.4	7,358	155.3	7,740	163.3	1,691	35.7	5,278	111.4
Retail	14.0	1,175	16.5	1,175	16.5	1,175	16.5	1,175	16.5	1,175	16.5	1,175	16.5	1,175	16.5
Residential Units[5]	23.5	6,700	157.45	6,700	157.45	6,700	157.45	6,700	157.45	6,700	157.45	6,700	157.45	6,700	157.45
Cumulative Total	--	--	699.15	--	980.95	--	988.35	--	984.25	--	961.25	--	952.65	--	979.35

NOTES:

1. This uses 6,700 housing units as a worst-case assumption, based on Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2. Peak power demand factors from SMUD.
3. Unless otherwise noted.
4. 1 million KW = 1 Gigawatt (GW).
5. Residential units at 23.5KW/unit; hotel rooms at 3 KW/room.

Source: Nolte and Associates

4.22-3 *Implement Mitigation Measure 4.22-1. This mitigation measure would be required for all Alternatives.*

4.22-4 Implementation of any of the Alternatives, taken with cumulative development in the City, would increase both peak demand and overall annual gas consumption.

A-1 through A-7

Table 4.22-7 summarizes the cumulative peak gas demand when cumulative development assumptions added to those of each Alternative, and the same demand factors are applied. Table 4.22-8 summarizes in a similar way the cumulative annual gas consumption.

Since gas transmission and distribution facilities sized to serve the peak demands of the Planning Area are relatively localized in those areas, cumulative peak demands of other city areas have less impact on these facilities. Cumulative peak demands are of greater importance in relation to the overall source capacity of PG&E, and to energy conservation. Therefore, this is considered a ***significant impact.***

Mitigation Measures

Implementation of Mitigation Measure 4.22-4 will reduce the above impacts to a *less-than-significant level.*

4.22-4 *Implement Mitigation Measure 4.22-1. This mitigation measure would be required for all Alternatives.*

TABLE 4.22-7
ESTIMATED CUMULATIVE[1] PEAK GAS DEMAND[2]

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6		Alternative 7	
Land Use	Peak Factor BTU/SF	Sq Ft (000s)[3]	Thrms[4]	Sq Ft (000s)	Thrms	Sq Ft (000s)	Thrms	Sq Ft (000s)	Thrms	Sq Ft (000s)	Thrms	Sq Ft (000s)	Thrms	Sq Ft (000s)	Thrms
Planning Area	--	--	2,241	--	8,220	--	8,467	--	8,237	--	7,950	--	10,058	--	8,931
Cumulative Assumptions Added															
Office	21.1	8,587	2,404	7,867	2,203	7,317	2,049	7,358	2,060	7,740	2,167	1,691	473	5,278	1,478
Retail	23	1,175	360	1,175	360	1,175	360	1,175	360	1,175	360	1,175	360	1,175	360
Residential Units[5]	23	6,700	2,760	6,700	2,760	6,700	211.5	6,700	211.5	6,700	211.5	6,700	211.5	6,700	211.5
Cumulative Total	--	--	7,766	--	13,543	--	13,636	--	13,418	--	13,238	--	13,652	--	13,529

NOTES:

1. This uses 6,700 housing units as a worst-case assumption, based on Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2. Peak power demand factors from SMUD.
3. Unless otherwise noted.
4. 100,000BTU = 1 Therm.
5. Residential units at 23BTU/unit.

Source: Nolte and Associates

TABLE 4.22-8
ESTIMATED CUMULATIVE[1] ANNUAL GAS CONSUMPTION[2]

		Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6		Alternative 7	
Land Use	Consumption Factor BTU/SF	Sq Ft (000s)[3]	Thrms (000s)[4]	Sq Ft (000s)	Thrms (000s)	Sq Ft (000s)	Thrms (000s)	Sq Ft (000s)	Thrms (000s)	Sq Ft (000s)	Thrms (000s)	Sq Ft (000s)	Thrms (000s)	Sq Ft (000s)	Thrms (000s)
Planning Area	--	--	1,727	--	5,032	--	5,145	--	4,797	--	4,577	--	5,406	--	5,148
Cumulative Assumptions Added															
Office	11,000	8,587	1,259	7,867	1,154	7,317	1,073	7,358	1,079	7,740	1,135	1,691	248	5,278	774
Retail	11,000	1,175	172	1,175	172	1,175	172	1,175	172	1,175	172	1,175	172	1,175	172
Residential Units[5]	16,500	6,700	1,470	6,700	1,470	6,700	1,470	6,700	1,470	6,700	1,470	6,700	1,470	6,700	1,470
Cumulative Total	--	--	4,628	--	7,828	--	7,860	--	7,518	--	7,354	--	7,296	--	7,564

NOTES:

1. This uses 6,700 housing units as a worst-case assumption, based on Central City Housing Strategy. See Section 4.7, Population, Employment and Housing, for a discussion of the likely range of cumulative housing units.
2. Peak power demand factors from SMUD.
3. Unless otherwise noted.
4. 100,000BTU = 1 Therm.
5. Residential units at 16,500BTU.

Source: Nolte and Associates

ENDNOTES

1. SMUD staff, personal communication, October 1991

2. Diane Holland, PG&E Staff, personal communication, October 1991

5. OTHER STATUTORY CONSIDERATIONS

5.1 GROWTH INDUCEMENT

5.1 GROWTH INDUCEMENT

This section provides a summary of the implications of the Alternatives for the Railyards Area and the Richards Area for growth in the City of Sacramento and throughout the SACOG region. Some growth-inducing effects are described in the Land Use Section of this EIR in terms of implications for the City and regional growth, as well as implications for nearby areas. Those more detailed discussions are summarized and referenced here.

If approved and fully implemented, the RSP and RBAP would result in the largest, most intense, downtown redevelopment project in the State. It would be the locational choice for a wide variety of users, including corporations which might locate their headquarters in the high-rise buildings around the existing Amtrak depot; large floor plate office users, such as the State, which might locate around the Intermodal Transit Station and in the Richards Area; urban dwellers in the new multi-family housing areas; and a wide variety of commercial users supporting office and residential development. The development in the Planning Area would also indirectly foster economic growth elsewhere in downtown and throughout the region by creating additional demand for goods and services.

A number of complex issues must be considered when assessing the growth-inducing effects of large-scale development plans, such as the Alternatives. These include the following:

- **Increased Regional Capture**: The extent to which development in the Planning Area would result in growth of business activity and employment, or housing and population, that otherwise would not occur in the City (or the region);

- **Redistributional Effect**: The extent to which the type, form, and amenities included in the Planning Area would result in a redistribution of projected growth in the region;

- **Elimination of Obstacles to Growth**: The extent to which infrastructure capacity provided in the Plan alternatives would allow additional development in surrounding areas; and

- **The "Multiplier" Effect**: "Multiplier" is an economic term to describe inter-relationships among various sectors of the economy. The multiplier effect provides a quantitative description of the direct employment effect of a project, plus the indirect and induced employment growth. The multiplier effect acknowledges that Planning Area employment and population growth is not the complete picture of growth caused by the project.

Growth inducement issues are addressed for the alternatives at full buildout. The discussion is organized according to the four main issues described above, and focuses on a comparison of the alternative impacts for each issue.

Increased Regional Capture

Except for the No Project Alternative, development of the RSP and RBAP Alternatives would accommodate growth of business activity, employment, housing, and population in the Planning Area. Whether or not that growth would represent a net addition to economic activity in the City or region (including Sacramento, Yolo, South Sutter, South Placer, and Western El Dorado Counties) depends on location options for businesses and for housing development. Economic analyses prepared for the RSP and RBAP suggest that Planning Area development would not contribute to increases in economic activity in the region; that is, the Planning Area would provide a location for business expansion and/or residential development that otherwise would occur elsewhere in the City of Sacramento or in the region. Shifts in economic activity from one location to another (such as corporate relocations from elsewhere in the region to downtown) may have distributional implications (e.g., economic gain for City of Sacramento, loss for suburban communities) but do not affect the overall level of activity in the region. The Cumulative Development Scenario, included as Appendix D to this document, provides additional information related to regional capture rates.

Redistributional Effect

Growth of business activity and employment would occur in the City regardless of the RSP and RBAP Alternative selected. An alternative would result in a net employment gain for the City (compared to another alternative) if it would accommodate business activity and employment that would otherwise occur outside the city. Since some businesses likely to locate in the Planning Area would have other options elsewhere in the City, some of the employment growth associated with Planning Area development would not represent a net addition to citywide economic activity.

As can be seen from Table 5.1-1, the intense redevelopment of the Planning Area would result in a redistribution of development from elsewhere in the region (see also Appendix D). Each geographic submarket would be affected, with substantial reductions in the Highway 50 corridor, Natomas/Northgate area, and West Sacramento. Those submarkets would continue to be expected to grow dramatically; however, the overall effect of the RSP and RBAP would be to establish downtown Sacramento, along with the Highway 50 corridor, as the dominant force in the capture of the regional office market.

TABLE 5.1-1
PROJECTED MARKET SHARE OF OFFICE SPACE 1990-2010
SACRAMENTO REGION AND SUBMARKETS

Submarket	Existing Market Share		Projected Market Share			
			W/O RSP/RBAP		WITH RSP/RBAP	
	Sq. Ft.[1]	Percent	Sq. Ft.[1]	Percent	Sq. Ft.[1]	Percent
Sacramento Region	30,043	100%	54,137	100%	54,137	100%
Total Downtown	7,395	25%	9,587	18%	16,187	30%
Highway 50	5,965	20%	16,125	30%	14,500	27%
Natomas/ Northgate	2,745	9%	7,500	14%	5,875	11%
Pointe West	2,073	7%	1,000	2%	1,000	2%
Roseville/ Rocklin	942	3%	4,750	9%	4,025	7%
West Sacramento	289	1%	5,875	11%	3,750	7%
Other	10,634	35%	9,300	17%	8,800	16%

[1] In thousands of square feet.

SOURCE: Economic and Planning Systems, Inc., *Cumulative Development Scenario: Southern Pacific Railyards/Richards Boulevard Projects*, November, 1991

ELIMINATION OF GROWTH OBSTACLES

The elimination of physical obstacles to growth is considered to be a growth-inducing effect. A number of physical constraints to growth currently exist in the downtown Sacramento area. In summary, the primary growth obstacles present in downtown today include:

- A cease and desist order affecting the ability of new downtown development to rely on the existing downtown combined sewer/storm drainage system; and

- The limited capacity of a number of key downtown intersections and freeway ramps.

These obstacles require solutions to allow for development of the projected cumulative development in downtown. Those solutions are provided by the Facilities Element improvements, which include area circulation system and sewer/storm drainage system improvements. These improvements allow full redevelopment of the Planning Area as well as the cumulative development of the existing downtown area.

Multiplier Effects

The "multiplier effect" is a term used by economists to measure the effect of economic activity in a region. Employment multipliers presented in this analysis are measures of the direct employment generated in the Planning Area, and the additional employment generated by the expenditure of income generated in the Planning Area.

Multiplier effects account for economic relationships between businesses, business and households, and households and retail sales and household services. Economic activity in the Planning Area is thus related to economic activity elsewhere in the Central City and the region.

Table 5.1-2 summarizes total direct and secondary employment generated by the Alternatives. Table 5.1-3 summarizes just the secondary (indirect and induced) employment generated by the Alternatives.

Conversely, some economic activity in the Planning Area would be supported by the multiplier effect of businesses located outside of the Planning Area. For example, downtown offices or hotels could be customers of businesses likely to locate in the Planning Area. Thus, not all Planning Area commercial other employment-generating development would generate economic activity through multiplier effects. Some would accommodate multiplier activity generated from other locations.

TABLE 5.1-2
TOTAL INCREASE IN REGIONAL EMPLOYMENT
DUE TO EMPLOYMENT GROWTH IN THE PLANNING AREA[1]

Alternative	1990-2000 Addition	2000-2010 Addition	2010-Buildout Addition	1990-Buildout Addition
Alt. 1	26,791	5,864	558	33,213
Alt. 2	74,837	115,463	53,698	243,998
Alt. 3	78,895	122,505	70,063	271,463
Alt. 4	70,800	129,605	155,467	355,872
Alt. 5	69,077	119,325	175,511	362,912
Alt. 6	122,255	220,876	251,444	594,575
Alt. 7	87,378	159,197	201,389	447,965

[1] Total employment includes direct, indirect, and induced employment.

SOURCE: EIP Associates, 1992; Association of Bay Area Governments, Center for Analysis and Information Services, *1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Area*, September 1991.

TABLE 5.1-3
TOTAL INCREASE IN INDIRECT AND INDUCED EMPLOYMENT
DUE TO EMPLOYMENT GROWTH IN THE PLANNING AREA

Alternative	1990-2000 Addition	2000-2010 Addition	2010-Buildout Addition	1990-Buildout Addition
Alt. 1	21,654	4,727	357	26,738
Alt. 2	60,762	94,018	43,212	197,992
Alt. 3	64,233	99,781	56,577	220,591
Alt. 4	57,533	105,776	126,435	289,744
Alt. 5	56,389	97,744	143,049	297,182
Alt. 6	99,593	180,219	204,639	484,451
Alt. 7	71,192	129,851	163,811	364,854

[1]Excludes direct employment growth in the Planning Area.

SOURCE: EIP Associates, 1992; Association of Bay Area Governments, Center for Analysis and Information Services, *1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Area*, September 1991.

5.2 CUMULATIVE IMPACTS

5.2 SUMMARY OF CUMULATIVE IMPACTS

The Alternatives, in conjunction with cumulative development in the Central City and the region, would contribute to cumulative environmental impacts in the vicinity of the Planning Area. Cumulative development in the region, including over 54 million square feet of office space, is assessed as part of the transportation, air quality, and noise analyses. Cumulative development in the downtown Sacramento area is described in Chapter 4.1, Land Use. Table 4.1-5, page 4.1-39, describes the cumulative development scenario associated with each alternative.

Cumulative impacts are assessed as part of the evaluation of each individual environmental issue area (see Chapter 4.1 through 4.21). This chapter provides a brief summary of the significant cumulative impacts identified elsewhere in this EIR.

Land Use

- Implementation of the Alternatives could result in a change in the Central City's share of office space in the region (Impact 4.1-12).

Parks and Open Space

- Development of the Planning Area, in conjunction with cumulative development, would contribute to an intensification of residential and office uses within the Central City area which would increase demand for parks and recreational facilities (Impact 4.2-6).

Urban Design and Visual Quality

- Implementation of most of the Alternatives, in conjunction with cumulative development, would contribute to an intensification of residential and office uses within the Central City area (Impact 4.3-12).

Radio, Radar, and Microwave Transmissions

- Development in the Planning Area in conjunction with cumulative development in the downtown area would increase the likelihood of buildings that could block radar and communication signals (Impact 4.4-4).

Cultural Resources

- Implementation of the Alternatives, in conjunction with the cumulative development, could result in continued loss of historic structures throughout the Sacramento Region (Impact 4.6-11).

Population, Employment and Housing

- Implementation of the Alternatives would contribute to a significant lack of affordable housing (Impact 4.7-7).

Transportation

- Development in the Planning Area, under all of the Alternatives in conjunction with other cumulative development, would significantly increase traffic flows at local intersections, regional highways, and freeway ramps (see Section 4.8).

- Under Alternatives 1 and 7, cumulative increases in trains on the Southern Pacific main line, in conjunction with increased roadway traffic in West Sacramento, could cause conflicts at the at-grade crossing on 3rd Street (see Section 4.8).

Air Quality

- Development of the Planning Area, in conjunction with cumulative development, would contribute to continued carbon monoxide problems in downtown Sacramento. This would be true of all of the Alternatives in the Year 2000, of Alternative 6 in Year 2010 and all of the Alternatives at buildout (Impacts 4.9-1, 4.9-2, and 4.9-3).

- Traffic generated by the Alternatives, in conjunction with cumulative traffic flows, would increase regional emissions and cause a decrease in regional air quality (Impact 4.9-4).

Noise

- Cumulative change in rail traffic and operations could result in noise above normally acceptable levels at existing sensitive receptors (Impact 4.10-6).

Geology, Soils and Seismicity

- On a regional basis, cumulative development in Downtown Sacramento, including the Planning Area, would increase the number of people working and living within structures who would be exposed to hazards associated with seismic activity (Impact 4.11-7).

Hydrology and Water Quality

- Development in the Planning Area, together with cumulative development in the downtown area, will result in increased exposure to flood hazards (Impact 4.12-7).

Hazardous Materials

- On a regional basis, cumulative development in Downtown Sacramento, including development of the Planning Area, would increase the number of people exposed to risks associated with hazardous materials (Impact 4.13-15).

Biotic Resources

- Development within the Planning Area will contribute to the continued loss of areas of open ruderal vegetation used as foraging habitat by wildlife (Impact 4.14-11).

- Project development could contribute to the continued loss of riparian habitat (Impact 4.14-12).

Water Supply

- Implementation of most of the Alternatives, taken with cumulative development in the City, would result in an increased demand on domestic water supply, treatment, and storage capacity (Impact 4.15-5).

- Implementation of any of the Alternatives taken with cumulative development may require new or upgraded water distribution systems to serve new and redeveloped areas (Impact 4.15-6).

- Implementation of any of the Alternatives, taken with cumulative development in the City, would result in the construction of transportation facilities whose construction may require relocation and/or protection of new and existing water facilities (Impact 4.15-7).

- Implementation of any of the Alternatives, taken with cumulative development, would increase flow in the City's existing water system transmission mains (Impact 4.15-8).

Wastewater Conveyance and Treatment

- Implementation of any of the Alternatives, taken with cumulative development in the City, would increase the amount of sewage treated by the Sacramento County Regional Wastewater Treatment Plant (Impact 4.16-6).

- Implementation of any of the Alternatives, taken with cumulative development in the City, would potentially increase the flow of sanitary sewage to the Combined Wastewater Control System (CWCS) (Impact 4.16-7).

- New flows will be added to local sanitary sewers (Impact 4.16-8).

- Implementation of any of the Alternatives, taken with cumulative development in the City, could change the characteristics of sewage flows treated by the SRWTP (Impact 4.16-9).

Stormwater and Drainage

- Implementation of any of the Alternatives could increase the percentage of impervious surfaces in the downtown Sacramento area (Impact 4.17-2).

Solid Waste

- Cumulative development when combined with development in the Planning Area would result in the generation of solid waste in excess of 500 tons annually and could shorten the useful life of the Sacramento County Landfill by as much as one year over the life of the landfill (Impact 4.18-2).

Police Services

- Development under any of the Alternatives, combined with cumulative development, would result in the need for additional police protection services and the addition of sworn officers, equipment, and support personnel (Impact 4.19-2).

Fire Services

- Development within the Planning Area, combined with cumulative development within the Central City area, will result in the need for additional fire company services (Impact 4.20-2).

Schools and Childcare

- Cumulative development within the downtown area would result in enrollment increases at the Sacramento Unified School District and the North Sacramento School District (Impact 4.21-7).

- Cumulative development within the Central City would result in substantial increases in the demand for child care facilities within the Central City area (Impact 4.21-8).

Electricity and Gas Service

- Implementation of any of the Alternatives, taken with cumulative development in the City, will increase both peak demand and overall annual electrical energy consumption (Impact 4.22-3).

- Implementation of any of the Alternatives, taken with cumulative development in the City, will increase both peak demand and overall annual gas consumption (Impact 4.22-4).

5.3 SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL EFFECTS

5.3 SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL EFFECTS

This chapter identifies significant impacts that could not be eliminated or reduced to a less-than-significant level by mitigation measures that could be implemented. The final determination of significance of impacts and of the feasibility of mitigation measures will be made by the City Council as part of their certification action.

The following significant and unavoidable impacts would result from implementation of the Alternatives indicated. As noted in the specific chapters, some of these impacts can be reduced in magnitude, but not to less-than-significant levels.

4.1 Land Use

- Implementation of Alternatives 5 and 6 could be incompatible with land uses that border on the Alkali Flat and Midtown neighborhoods (Impact 4.1-4).

4.3 Urban Design and Visual Quality

- Implementation of Alternatives 2 through 7 could have a significant and unavoidable effect on the visual relationship between the Planning Area and sensitive receptors in the surrounding community (Impact 4.3-1).

- Implementation of Alternatives 3, 4, 6 and 7 could have a significant and unavoidable effect on the relationship between the Planning Area and key observation points in the surrounding community (Impact 4.3-2).

- Implementation of Alternatives 2 through 7, in conjunction with cumulative development, would contribute to significant and unavoidable intensification of residential and office uses within the Central City area (Impact 4.3-12).

4.6 Cultural Resources

- Implementation of Alternatives 2 through 7 would result in significant and unavoidable effects due to the loss of historic structures in the Railyards Area (Impact 4.6-2).

- Alternative 1 could result in extensive delays in the adaptive reuse of the historic Central Shops structures that could result in their continued deterioration and ultimate demise (Impact 4.6-9)

4.7 Population, Employment and Housing

- Implementation of Alternatives 1 through 7 would generate a net deficit of affordable housing (Impact 4.7-6).
- Implementation of Alternatives 1 through 7 would contribute to a significant cumulative lack of affordable housing (Impact 4.7-7).

4.8 Transportation

- Implementation of Alternatives 2, 3, 6 and 7 would result in significant and unavoidable levels of service at some intersections (Impacts 4.8-1 and 2).
- Implementation of Alternatives 1 through 7 would result in significant and unavoidable impacts on regional highways (Impacts 4.8-4, 5 and 6).
- Implementation of Alternatives 1 through 7 would result in significant and unavoidable impacts on freeway ramps (Impacts 4.8-7 and 8).

4.9 Air Quality

- For Year 2000, implementation of Alternatives 1 through 7 would contribute to significant and unavoidable carbon monoxide problems in downtown Sacramento (Impact 4.9-1).
- Implementation of Alternatives 1 through 7 would result in significant and unavoidable increases in regional emissions and deterioration in regional quality (Impact 4.9-4).

4.13 Hazardous Materials

- On a regional basis, cumulative development in Downtown Sacramento, including development of the Planning Area, would increase the number of people exposed to risks associated with hazardous materials and result in a significant and unavoidable impact for Alternatives 1 through 7 (Impact 4.13-15).

4.14 Biotic Resources

- Implementation of Alternatives 2 through 7 would result in significant and unavoidable adverse effects on riparian habitat, due to increased access along the American River (Impact 4.14-8).

5.4 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

5.4 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

CEQA Section 21100 indicates that the discussion of the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity should include any cumulative and long-term effects of the proposed project which adversely affect the environment, and that special attention should be given to impacts that narrow the range of future beneficial uses of the environment.

The Planning Area consists of urbanized lands which are used for a variety of light industrial, commercial and transportation uses with some residential. Development under all of the Alternatives would result in reuse of these lands for a variety of commercial, light industrial and residential uses at varying densities. None of the Alternatives would result in the conversion of land to urban uses. All of the Alternatives would alter the existing urban uses in the Planning Area.

Construction of office and residential related uses would limit the availability of land within the Central City area for industrial and manufacturing uses. The Planning Area, being adjacent to substantial transportation features such as Interstate 5, Interstate 80, U.S. Highway 50, the Southern Pacific rail line, and the Sacramento River would represent a potentially valuable site for industrial use. However, the availability of land with similar access to truck, rail transportation, and air transportation, coupled with the decline of heavy water cargo transportation north of the West Sacramento deep water channel result in numerous substitutes to the Planning Area for new heavy industrial use (such as Mather Field, Sacramento Executive, McClellan, Aerojet, etc.)

All Alternatives would include treatment or removal and disposal of hazardous materials that may be present in the Planning Area from previous industrial and commercial uses, in compliance with applicable local and state regulations. This would enhance the long-term environmental safety of the Planning Areas, and would serve to broaden the potential range of future uses for the Planning Area over existing possibilities.

Development of the Alternatives would contribute economic benefits to the region. The large-scale economic advantages are dependent upon the eventual uses accommodated within the Planning Areas. Firms serving the local economy would have a lesser degree of large-scale economic benefits than an equivalent level of employment activity that export goods or services outside of the Sacramento area.

Construction of the Alternatives, along with the corresponding increase in Planning Area residents, employees and visitors, would produce long-term effects by contributing to cumulative population increases, traffic impacts, air pollution emissions, employee-generated housing demand, and increases in the demand for public services such as water and sewer system, gas and electric services, transit, schools, and childcare.

In addition, project-related growth would necessitate the provision of water, energy and other public services to meet the new and increased needs of Planning Area employees and residents. This commitment to make public services available to the Planning Area would be a long-term, irreversible commitment of resources and services. Sections 4.15 through 4.22 analyze this commitment in detail.

5.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

5.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Section 15126 of CEQA states that significant irreversible environmental changes associated with a proposed project may include the following:

- Uses of non-renewable resources during the initial and continued phases of the project which may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely;

- Primary impacts and, particularly, secondary impacts (such as a highway improvement that provides access to a previously inaccessible area) that commit future generations to similar uses; and

- Irreversible damage which may result from environmental accidents associated with the project.

CEQA also states that irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Irreversible Effects

The Planning Area consists of urbanized lands which are currently used for a variety of light industrial, commercial and transportation uses with some residential. None of the Alternatives would result in the conversion of non-urban land to urban uses. However, all of the Alternatives would alter the existing urban uses in the Planning Area.

Development of the Alternatives would irretrievably commit building materials and energy in the construction and maintenance of the proposed facilities under all Alternatives.

Project-related growth would generate an increased commitment to the local use of fuels and building materials to meet increased transportation needs proposed under the Alternatives. Section 4.8, Transportation and Circulation provides a detailed discussion of specific irreversible environmental effects related to transportation issues. The increased transportation needs would generate indirect irreversible effects on the local and regional air quality. Project-related vehicular emissions would cause increases in carbon monoxide, ROC and NO_x levels such that the City and County abilities to meet State emissions requirements would be reduced. These issues are discussed in greater detail in Section 4.9.

In addition, growth related to the proposed Alternatives would necessitate the provision of water, energy, and other public services to meet the increased needs within the Planning Areas and related off-site populations. This commitment to make public services available to the Planning Areas and their related off-site populations would be a long-term, irreversible commitment of these service resources. Sections 4.15 through 4.22 provide a detailed analysis of these commitments.

The Planning Areas are believed to contain potentially sensitive archaeological, historic and cultural features. Development under the Alternatives would disturb subsurface features, and some existing historic structures would be altered and/or removed. A more specific discussion of the historical and archaeological resources within the Planning Areas is contained within Section 4.6.

6. ALTERNATIVES AND SPECIAL CONSIDERATIONS

6.0 INTRODUCTION

6.0 INTRODUCTION TO ADDITIONAL ALTERNATIVES AND SPECIAL CONSIDERATIONS

In accordance with Section 15126 of the CEQA Guidelines, a Draft EIR must describe a range of reasonable alternatives to the proposed Specific Plan (or to its location) that could feasibly attain the objectives of the project. The comparative merits of these alternatives must be described and evaluated. The CEQA Guidelines require that the No Project alternative and its impacts be evaluated and that an environmentally superior alternative be designated. If the alternative with the least environmental impacts is the No Project alternative, then one of the other remaining alternatives must be designated as the Environmentally Superior Alternative.

The main body of this EIR contains an evaluation of the environmental impacts associated with seven Alternatives (See Chapter 4). In this chapter, three additional Alternatives are evaluated; the additional Alternatives represent variations on Alternatives 1 and 4. Further, three "Special Considerations" are discussed. These special considerations relate to infrastructure or specific uses that are not tied to a particular Alternative. Finally, in Section 6.4, a discussion of the Environmentally Superior Alternative is presented.

Additional Alternatives

In Chapter 3, Description of the Alternatives, a range of seven Alternative plans for the Planning Area are presented; those seven Alternatives are evaluated in Chapter 4 of this EIR. This chapter evaluates a further set of Alternatives. In Sections 6.1 and 6.2 of this Chapter, three additional Alternatives are presented and evaluated. These include:

- Alternative 1A
- Alternative 4A
- Alternative 4B

These Alternatives are evaluated in less detail than are the seven Alternatives evaluated in Chapter 4, as is allowed under CEQA (see Section 15126(d)) of the CEQA Guidelines.

Special Considerations

The Special Consideration discussion focuses on elements of infrastructure or specific land uses which are relatively independent of any particular land use Alternative, but which could be varied under any particular plan. The Special Considerations presented include:

- Effects of Failure to Build a New Rail Bridge over the Sacramento River;
- Alternative Circulation Concepts in the Richards Area; and
- Alternative Locations for the Intermodal Transit Station.

Different Location Analysis

One of the requirements of CEQA is the assessment of the comparative environmental impacts of alternative locations for the "project". The situations where alternative locations must be evaluated are governed by the "rule of reason" and have been addressed by the courts.

The most recent case law that provides direction on the inclusion or exclusion of different site alternatives is the December 31, 1990 Supreme Court Decision in Citizens of Goleta Valley v. Board of Supervisors 52 Cal. 3d 553 (1990) (Goleta II). In Goleta II, the Supreme Court suggested that rationale for analysis of alternative sites was tied, in part, to the availability of another site to accommodate the project and to the consistency of the project with the local General Plan. In doing so, the Supreme Court reaffirmed the value of the General Plan as the primary local land use planning tool.

Further, the Court concluded that CEQA does not require an EIR to consider infeasible project alternatives or infeasible alternative sites. The opinion stated:

> In determining the nature and scope of alternatives to be examined in an EIR, the legislature has decreed that local agencies shall be guided by the doctrine of "feasibility".

The court went on to elaborate on the concept of "feasibility" by stating:

> A feasible alternative is one which can be "accomplished in a successful manner within a reasonable period of time, taking into account economic, legal, social and technological factors" (Public Resources Code Sec. 21061.1; Guidelines Sec. 15364).

This EIR addresses different locations of the Alternatives in a number of ways. First, the EIR assesses the implications of dispersement of the non-residential and residential land uses to other parts of the region in Alternative 1, the No Project Alternative. Table 4.1-5, in the Land Use Section, describes the anticipated locations of office development throughout the region under the No Project Alternative where substantial redevelopment does not occur in the Planning Area (also see Figure 4.1-4).

Secondly, the EIR evaluates the environmental implications of some specific features of the Alternatives, including the Intermodal Transit Station, and a potential convention center. Alternative locations for these features are discussed and evaluated in Section 6.3.3 and 6.3.4, respectively. Environmental issues associated with different locations for schools within the Planning Area are discussed in Section 4.21.

The City of Sacramento, as lead agency for this EIR, has determined that a different site alternative for the entire land use and infrastructure program of the Alternatives is not necessary for inclusion in this EIR. The reasons for this determination relate both to the City's objectives for the Planning Area, as well as the interrelated elements of urbanization and infrastructure development included in the Alternatives. In this case, the City and the Sacramento Housing and Redevelopment Agency have established priorities, through General Plan policy and redevelopment plan policy, to encourage intense redevelopment activities throughout the Planning Area. Further, the Planning Area, especially the Railyards Area, is the only underutilized large downtown property that can accommodate the magnitude of mixed-use development anticipated in the Alternatives. In addition, the Planning Area is the only site in the region that can accommodate Intermodal Transit Station which is a central component of the Alternatives. There are no other sites in the region where dense urban development, heavy rail, light rail, bus, and major freeway links are in close proximity to dense urban development. Based on the above factors, the City as lead agency has determined that analysis of the environmental impacts associated with implementation of the complete Alternative land use and infrastructure programs at a different location is not reasonable or necessary.

6.1 ALTERNATIVE 1A

6.1 - ALTERNATIVE 1A

Description

In the Richards Area, most areas are zoned for light industrial and heavy commercial uses. The exceptions are the Dos Rios and Basler-Dreher residential neighborhoods and the highway commercial areas on either side of Interstate 5. Figure 4.1-2 in Section 4.1, Land Use, depicts the existing zoning. In addition, special permits have been granted to allow approximately 850,000 square feet of office space in the M-2/PC zone.

Alternative 1A is a variation on Alternative 1, the No Project Alternative. Alternative 1A measures impacts that would occur if special permits for office construction were granted at a rate similar to that of recent experience in the Richards Area. As shown in Table 6.1-1, it is assumed that these special permits would result in approximately 1.27 million square feet of new office space. In addition, 130,000 square feet of new highway commercial/retail space is assumed, along with an additional 1 million square feet of heavy commercial/light industrial and 250 new hotel rooms. Under this alternative, no new residential units would be constructed in the Planning Area.

Under both Alternative 1 and 1A, it is assumed that there would be 600,000 square feet of heavy commercial/light industrial development in the Railyards Area.

Table 6.1-2 summarizes land uses under both Alternative 1 and 1A.

Relationship to Alternative 1

The main difference between Alternatives 1 and 1A is the assumption that special permits would allow for more office space under the latter. Under Alternative 1, 500,000 square feet of office would be built in conjunction with warehouse and industrial development. In addition, 500,000 square feet of office development would be constructed under special permits. All of the 1.27 million square feet of office space assumed under Alternative 1A would be constructed under special permit. Alternative 1A would result in 270,000 more square feet of office space than Alternative 1, and 10,000 fewer square feet of highway commercial/retail. All other uses would be identical.

Environmental Impacts

Generally, environmental impacts associated with Alternative 1A will be the same, although sometimes slightly more severe, than those of Alternative 1. Impacts associated with Alternative 1A are described briefly by topic, below.

Impacts are described for the buildout condition, but not Year 2000 or Year 2010.

TABLE 6.1-1
PROJECT CHARACTERISTICS - ALTERNATIVE 1A
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain--SP	Existing to Remain--RB	New SP	New RB	Total New SP&RB	Total SP&RB
Office						
2000			--	500	500	
2010			--	435	435	
Buildout			--	335	335	
Total Office	--	850	--	1,270	1,270	2,120
Highway Commercial/Retail						
2000			--	50	50	
2010			--	70	70	
Buildout			--	10	10	
Total Highway Commercial/Retail	--	260	--	130	130	390
Heavy Commercial/ Light Industrial						
2000			500	--	500	
2010			500	--	500	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	600	6,000	1,000	--	1,000	7,600
Residential (Units)						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Residential Units	--	272	--	--	--	272
Hotel (Rooms)						
2000			--	--	--	
2010			--	250	250	
Buildout			--	--	--	
Total Hotel Rooms	--	1,250	--	250	250	1,500
Cultural/Institutional						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Cultural/Institutional	--	--	--	--	--	--

SOURCE: ROMA Design Group, July 23, 1991.

TABLE 6.1-2
SUMMARY COMPARISON OF NEW LAND USES IN THE RICHARDS AREA[1]
ALTERNATIVES 1 AND 1A
(In thousands of square feet unless otherwise noted)

Land Use	Alternative 1	Alternative 1A
Office	1,000	1,270
HWC/Retail	140	130
Heavy Commercial/ Light Industrial	1,000	1,000
Residential	0	0
Hotel (Rooms)	250	250

[1] Railyards Area Land uses are identical for both alternatives.

Land Use

For the most part, development under Alternative 1A would be consistent with existing development and zoning in the Planning Area. The use of special permits could result in some conflicts between new office space existing industrial operations. Like Alternative 1, Alternative 1A would fail to promote City General Plan goals and policies that encourage balanced mixed use development, residential land use and expansion of the downtown area. Similarly, Alternative 1A would not facilitate the overall goals of the Richards Boulevard Redevelopment Plan and Implementation Strategy adopted July 7, 1990, which are to improve land use, consolidate social services facilities, and remove or replace substandard housing. Alternative 1A would be supportive of other plan documents, such as the American River Parkway Plan.

Parks and Open Space

Alternative 1A would not create any significant Parks or Open Space impacts.

Urban Design and Visual Quality

Alternative 1A would not be expected to adversely affect sensitive visual receptors in the surrounding area and would not conflict with any relevant goals or policies contained in the City of Sacramento General Plan Update.

Individual office projects may add to glare, but this impact could be rendered insignificant with implementation of Mitigation Measure 4.3-4, which requires use of particular materials to minimize glares. Shadows cast by office buildings would not be considered a potentially adverse affect as there would be no parks or other sensitive areas in the vicinity.

Microwave, Radar and Radio Transmission

Buildings constructed under Alternative 1A are not expected to exceed 100 feet in height. Therefore, impacts would not be expected for microwave, radar or radio transmission.

Wind

Buildings constructed under Alternative 1A are not expected to exceed 100 feet in height. Therefore, impacts would not be expected for wind.

Cultural Resources

Development in undisturbed areas and excavation in disturbed areas may lead to the damage or destruction of cultural resources. However, neither of these activities would be widespread under Alternative 1A. Should any resources be uncovered during development, work should cease until a qualified archeologist has examined the resource and determined an appropriate course of action, in accordance with Mitigation Measure 4.6-1.

Under Alternative 1A, all development would take place north and west of the Southern Pacific Railyards Central Shops area, so these historic resources would not be lost or damaged. However, development outside of the Central Shops area could result in the loss of a historic structure, which would be a significant and unavoidable impact. This impact could be reduced, but not to a less-than-significant level, with implementation of Mitigation Measure 4.6-2, which requires the recordation, designation, restoration and/or preservation of structures and/or artifacts in the Railyards Area (see page 4.6-24).

Since Seventh Street would not be widened under Alternative 1A, there would not be an impact on historic structures in the Alkali Flats area. Nor would Alternative 1A alter the character of adjacent historic neighborhoods or interfere with the historic rail alignment. The use of special permits and other development under Alternative 1A could result in the loss of structures eligible for the National Register of Historic Places or the Sacramento Register. This impact could be reduced to a less-than-significant level with Mitigation Measure 4.6-32 (See page 4.6-32).

Development under Alternative 1A could affect several masonry structures in the Richards Area that have been identified as eligible for the National Register of Historic Places or the Sacramento Register. Implementation of Mitigation Measures 4.6-12 and 4.6-13 would exempt these structures from new zoning provisions, would create incentives for historic restoration or would require documentation in the event of demolition, which would reduce any impacts to historic structures to a less-than-significant level.

Population Employment and Housing

Alternative 1A would result in a net reduction in population, from 1,646 to 1,014, in the Planning Area. This is considered a less-than-significant impact.

Alternative 1A would create approximately 7,800 ongoing jobs and approximately 2,000 construction jobs over the life of the Plans. These are not considered significant impacts.

Alternative 1A does not result in the removal of existing housing or the construction of new housing. Because Alternative 1A does not assume preservation of existing homes, existing units could decline in areas where substantial renovation is needed. Alternative 1A would contribute to a regional housing deficit as employment-driven demand for housing would increase with no change in supply.

Because it would not encourage development of new housing, Alternative 1A would not be supportive of the housing policies of the City's General Plan. Because it would increase employment levels without providing any new housing, this alternative would create a net deficit in affordable housing. This would be considered a significant and unavoidable impact.

With the creation of approximately 7,800 new jobs and no new housing, Alternative 1A would adversely effect the City's jobs/housing balance.

Transportation

Alternative 1A would generate approximately 82,250 daily vehicle trips as opposed to 79,000 resulting from Alternative 1. This difference is not great enough to create substantially more severe impacts. Therefore, Alternative 1A would be expected to have the same impacts as Alterative 1.

Unacceptable levels of service would be expected at one intersection at the PM peak hour for the Year 2000, and at three intersections in the AM peak hour for the Year 2010. Mitigation measures for these intersections are found in Section 4.8, Transportation. Significant and unavoidable impacts on freeway ramps and regional highway segments would occur due to the infeasibility of widening SR 160 and Interstate 5. In order to reduce traffic and parking impacts, a Transportation Management Plan would be required for Alternative 1A.

Air Quality

Because of the increased number of trips generated by Alternative 1A, air quality impacts would be slightly more severe than under Alternative 1. For Year 2000, carbon monoxide emissions would be significant, but could be reduced to a less-than-significant level with implementation of Mitigation Measure 4.9-1. Significant and unavoidable degradation of regional air quality would also result. Construction-related impacts would be expected to be significant, but could be reduced to a less-than-significant level with implementation of Mitigation Measure 4.9-5.

Noise

Under Alternative 1A, 250 hotel units would be developed near I-5 and Richards Boulevard. The placement of such sensitive noise uses near a freeway would be a significant impact. In addition, the LRT and the railroad extension could affect existing sensitive receptors. Mitigation Measures 4.10-1 and 4.10-3 would reduce these impact to a less-than-significant impact. Mitigation of construction-related noise would be required, as well.

Geology, Soils and Seismicity

Alternative 1A would involve development that could be exposed to seismic activity and associated hazards, soils with expansive characteristics, and groundwater. Impacts associated with this exposure would be mitigated to a less-than-significant level with implementation of measures found in Section 4.11, Geology and Soils.

Hydrology and Water Quality

The Planning Area is located in the FEMA A99 zone, so any development under Alternative 1A would expose future employees to flood risks. This impact can be mitigated to a less-than-significant level with implementation of Mitigation Measure 4.12-2.

Construction associated with Alternative 1A would be expected to induce water quality degradation due to increased contaminated stormwater runoff, as well as increasing the volume of runoff due to additional impervious surface. These impacts would be reduced to less-than-significant levels with implementation of Mitigation Measures 4.12-3 and 4.12-4.

Hazardous Materials

As discussed in section 4.13, Hazardous Materials, contaminated soils are suspected to exist throughout the Planning Areas. Consequently, any construction that requires grading and/or excavation could expose workers to contaminated soil. Only a small portion of the Richards Area has been characterized, but preliminary reconnaissance studies indicate that a range of contaminants may be present. Development of sites adjacent to areas that contain hazardous materials could expose inhabitants or users to risk of contamination. In addition, people could be exposed to low levels of contamination from sites that have been remediated to a "background" level. All of these impacts can be reduced to less-than-significant levels with implementation of Mitigation Measure 4.13-1, 4.13-6 through 4.13-11 and 4.13-13.

Employees and existing residents would also be at risk from hazardous materials transported through the Richards Area, or by hazardous materials used by adjacent commercial and/or industrial operations.

Biotic Resources

Elderberry bushes, which provide critical habitat for the federally-listed Valley elderberry longhorn beetle, grow throughout the Planning Area. As with Alternative 1, development under Alternative 1A could result in the loss of Elderberry bushes, which would be a significant impact. Other significant biological impacts associated with Alternative 1A are the loss of oak trees, the disturbance of active raptor nests, and the filling of wetlands. These impacts would be reduced to less-than-significant levels with implementation of Mitigation Measures 4.14-1 through 4.14-4 and 4.14-6. Riparian habitat would be unaffected by Alternative 1A.

Water Supply

Alternative 1A would not be expected to have a significant effect on water supply, treatment or storage. However, a significant impact on distribution facilities would occur under Alternative 1A. This impact could be reduced to a less-than-significant level with implementation of Mitigation Measure 4.15-2.

Wastewater Conveyance and Treatment

Alternative 1A impacts would be similar to, although slightly more sever, than impacts expected under Alternative 1. Alternative 1A would not be expected to have a significant impact on the City's sewage treatment capacity. However, significant effects would be expected on the sanitary sewer system, including excessive demand on the Natomas Interceptor, discharge of contaminated groundwater, increased flows to the Combined Wastewater Control System, local sewers, the character of sewage, and cumulative increases in the amount of sewage generated. These impacts can be reduced to less-than-significant levels with implementation of Mitigation Measures 4.16-3 through 4.16-8.

Stormwater and Drainage

Impacts associated with Alternative 1A would be similar to, but slightly more severe, than those found under Alternative 1. Increases in impervious surface, which results in increased stormwater runoff, would be significant, but could be reduced to less-than-significant levels with implementation of Mitigation Measures 4.17-1 and 4.17-2.

Solid Waste

Under Alternative 1A, approximately 63,364 tons per year would be generated by buildout. This is approximately 50 percent higher than the waste generated under Alternative 1. While any increase of more that 500 tons per year is considered significant, this impact can be reduced to a less-than-significant level with implementation of Mitigation Measure 4.20-1.

Police Services

At buildout Alternative 1A would generate the need for approximately 11 police officers to meet existing ratios. This is a significant impact, which can be reduced with implementation of Mitigation Measure 4.19-1, calling for increased staffing and the inclusion of the City Police Department in development planning processes.

Fire Services

Alternative 1A would generate a need for increased fire protection services slightly greater than Alternative 1. This is a significant impact, which can be reduced with implementation of Mitigation Measure 4.20-1, which calls for construction and staffing new fire stations within the Planning Area.

Schools and Child Care

There would be a net reduction in Planning Area population under Alternative 1A; therefore, there would be no increase school enrollment. The increase in employment would generate increased demand for child care, which could be mitigated with implementation of Mitigation Measure 4.21-6, which requires provision of child care facilities.

Electricity and Gas Service

Alternative 1A would not result in a need for substantial new electrical distribution facilities. However, the need for gas distribution and cumulative increases in electrical and gas demand would be significant. These impacts would be reduced to less-than-significant levels with implementation of Mitigation Measure 4.22-1.

6.2 ALTERNATIVES 4A AND 4B

6.2 ALTERNATIVES 4A AND 4B

Introduction

Alternative 4, described in Chapter 3, includes intensive development of office and residential uses in the Richards Area. This level of development assumes implementation of circulation and public transportation improvements in the Planning Area, a high absorption rate for office space in the Richards Area, and the creation of a strong market for residential development in the Richards Area. Alternatives 4A and 4B represent partial buildout land use patterns included in Alternative 4. Land use designations under Alternatives 4A and 4B would be identical to designations for Alternative 4 (see Figure 3-7).

Alternative 4A

Alternative 4A presumes that transit service would not be extended north of the Intermodal Transit Station, which would result in a very limited amount of office development in the area south of Richards Blvd. and no office or residential development north of Richards Blvd. This Alternative would result in continued development of heavy commercial and industrial uses throughout the Richards Area, with only a limited amount of new office development in the immediate vicinity of the Intermodal Transit Station. Development in the Railyards Area would be identical to that described for Alternative 4. Therefore, Alternative 4A would include the environmental consequences of proceeding with only the Railyards Area Plan.

As shown in Table 6.2-1, under Alternative 4A, approximately 3.5 million square of office space would be constructed in the Richards Area by buildout, with 850,000 square feet in Phase 1, 1.1 million square feet in Phase 2 and 1.55 million in Phase 3. Overall, Alternative 4A results in almost 60% less office space than Alternative 4.

Highway commercial/retail use also would be reduced under Alternative 4A, with 100,000 square feet in Phase 1, 115,000 square feet in Phase 2 and 25,000 square feet in Phase 3, for a total of 240,000 square feet. Alternative 4 assumes 540,000 square feet of highway commercial/retail.

Under Alternative 4A, only 500 units of housing would be built: 250 housing units would be built in Phase 1 and 250 in Phase 2, in comparison to almost 4,000 units in Alternative 4. The low number of residential units is assumed to result from decreased housing trust fund and tax increment revenues due to a lesser amount of office development which is necessary to subsidize residential development.

The number of hotel rooms, 500, would be the same under both Alternative 4 and 4A.

TABLE 6.2-1

PROJECT CHARACTERISTICS - ALTERNATIVE 4A
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain--SP	Existing to Remain--B	New SP	New B	Total New SP&B	Total SP&B
Office						
2000			2,342	850	3,192	
2010			3,967	1,100	5,067	
2025			3,339	1,550	4,889	
Total Office	--	850	9,648	3,500	13,148	13,998
Highway Commercial/Retail						
2000			75	100	175	
2010			192	115	307	
Buildout			250	25	275	
Total Highway Commercial/Retail	--	50	517	240	757	807
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	2,000	--	--	0	2,000
Residential (Units)						
2000			630	250	880	
2010			1,440	250	1,690	
Buildout			730		730	
Total Residential Units	--	272	2,800	500	3,300	3,572
Hotel (Rooms)						
2000			--	250	250	--
2010			500	250	750	
Buildout			140		140	
Total Hotel Rooms	--	1,250	640	500	1,140	2,390
Cultural/Institutional						
2000			--	--	--	
2010			170	--	170	
Buildout			150	--	150	
Total Cultural/Institutional	--	--	320	--	320	320

SOURCE: ROMA Design Group, July 23, 1991.

Alternative 4B

Alternative 4B represents a level of development that is between that described for Alternatives 4 and 4A. Alternative 4B assumes a level of development that would occur with implementation of the transit improvements in the Richards Area, but also assumes the failure of the development of a residential market in the area north of Richards Blvd.

As shown in Table 6.2-2, Alternative 4B would include approximately 5 million square-feet of office space in the Richards Area (as compared to 3.5 million square-feet under Alternative 4A and 6 million square-feet under Alternative 4). Under Alternative 4B, a total of 1,000 residential units would be constructed in the Richards Area, double that included in Alternative 4A. Alternative 4B, as well as Alternatives 4 and 4A, would result in an increase of 500 hotel rooms.

Table 6.2-3 summarizes the land uses under Alternatives 4, 4A and 4B.

Environmental Impacts of Alternative 4A

Significant environmental impacts associated with Alternative 4A would generally be the same as those of Alternative 4; however, in certain cases impacts would be less severe than those associated with Alternative 4. Impacts associated with Alternative 4A are summarized below. Differences between the Alternatives 4 and 4A are described briefly by topic.

Because development of the Railyards Area is identical for Alternatives 4 and 4A, only impacts on the Richards Area are described. This discussion focuses primarily on significant impacts.

Land Use

Alternative 4A would introduce a limited amount of new office space into the immediate vicinity of the Intermodal Transit Station, resulting in a change of character in that portion of the Richards Area. This would be a significant impact. Since Alternative 4A would not result in the expansion of residential uses in the Richards Area, proximity of housing units to industrial and heavy commercial development, and related incompatibilities would not be likely to occur. This would be a less-than-significant impact.

The construction of a new rail bridge would occur with Alternative 4A and could cause displacement of businesses in West Sacramento; this impact is the same as that associated with Alternative 2, 3, 4, 6 and 7.

Like Alternatives 2 through 7, Alternative 4A would increase the downtown Sacramento share of cumulative regional office development, although to a lesser degree than Alternative 4.

Parks and Open Space

Alternative 4A would increase demand for parkland in the Planning Area by approximately 28 acres. This impact is considered beneficial in the Railyards Area as about 28 acres of parkland

TABLE 6.2-2

PROJECT CHARACTERISTICS - ALTERNATIVE 4B
(In thousands of square feet unless otherwise noted)

Land Use	Existing to Remain--SP	Existing to Remain--B	New SP	New B	Total New SP&B	Total SP&B
Office						
2000			2,342	850	3,192	
2010			3,967	1,700	5,667	
Buildout			3,339	2,450	5,7689	
Total Office	--	850	9,648	5,000	14,648	15,498
Highway Commercial/Retail						
2000			75	100	175	
2010			192	115	307	
Buildout			250	25	275	
Total Highway Commercial/Retail	--	50	517	240	757	807
Heavy Commercial/ Light Industrial						
2000			--	--	--	
2010			--	--	--	
Buildout			--	--	--	
Total Heavy Commercial/ Light Industrial	--	2,000	--	--	0	2,000
Residential (Units)						
2000			630	250	880	
2010			1,440	500	1,940	
Buildout			730	250	980	
Total Residential Units	--	272	2,800	1,000	3,800	4,072
Hotel (Rooms)						
2000			--	250	250	--
2010			500	250	750	
Buildout			140		140	
Total Hotel Rooms	--	1,250	640	500	1,140	2,390
Cultural/Institutional						
2000			--	--	--	
2010			170	--	170	
Buildout			150	--	150	
Total Cultural/Institutional	--	--	320	--	320	320

SOURCE: ROMA Design Group

TABLE 6.2-3
SUMMARY COMPARISON OF ALTERNATIVES 4, 4A AND 4B
NEW LAND USES IN THE RICHARDS AREA[1]
(In thousands of square feet unless otherwise noted)

Land Use	Alternative 4	Alternative 4A	Alternative 4B
Office	6,000	3,500	5,000
Highway/ Commercial/Retail	540	240	240
Heavy Commercial/ Light Industrial	0	0	0
Residential (Units)	3,860	500	1,000
Hotel (Rooms)	500	500	500

[1] Railyards Area Land uses are identical for these Alternatives.

more than offsets a requirement of 23.5 acres. In the Richards Area the requirement of about 5 acres of parks would be reduced to a less-significant-level by implementing of Mitigation Measure 4.2-1, which requires the provision of 5 acres of parkland per 1,000 residents in the Planning Area.

Urban Design and Visual Quality

Although office development would be substantially less intense in the Richards Area under Alternative 4A than under Alternatives 2 through 7, it is likely that large office towers would be built in the Railyards Area and in the vicinity through the Intermodal Transit Station located in the Richards Area. These buildings could intrude visually on the City's designated view corridors and affect sensitive receptors. Although this impact would be considered significant and unavoidable, it could be partially mitigated by implementing Mitigation Measure 4.3-1, which requires the application of design standards and guidelines.

The development of large office buildings, particularly those constructed of highly reflective materials, could result in glare seen from nearby residential areas and other surrounding sensitive receptors. This impact would be reduced to a less-than-significant level by implementing Mitigation Measure 4.3-4.

Microwave, Radar and Radio Transmission

Alternative 4A would likely result in the construction of buildings taller than 180 feet. These buildings could interfere with the City and County emergency communication system and communication links used by flood control agencies. These impacts would be reduced to a less-than-significant level by implementing Mitigation Measures 4.4-2 and 4.4-3.

Wind

Structures more than 100 feet tall would be allowed with Alternative 4A and may adversely affect the microclimate in the immediate vicinity. Implementation of Mitigation Measure 4.5-1, which requires examination of buildings 100 to 150 feet tall for wind effects and wind tunnel studies for buildings over 150 feet, would reduce this impact to a less-than-significant level.

Cultural Resources

Any activity in an undisturbed area and/or excavation in a disturbed area could uncover, damage and/or destroy cultural resources, especially near the confluence of the Sacramento and American rivers. With substantial development activity in the Railyards area, and to a much lesser degree in the Richards Area, Alternative 4A could have an adverse effect on cultural resources. This effect could be reduced to a less-than-significant impact by implementing Mitigation Measure 4.6-1, which includes requirements for archaeological studies prior to construction, and specific steps to protect suspected or discovered resources.

Alternative 4A could result in the loss of several historic structures in the Richards Area, primarily because it could result in a much lower level of economic vitality, which could lead to abandonment and neglect of the structures. Implementation of Mitigation Measures 4.6-12 and 4.6-13 would reduced these impacts to a less-than-significant level.

Population Employment and Housing

Alternative 4A could be expected to increase the resident population of the Planning Area from 1,646 to 5,965 at buildout. This is not considered a significant impact.

Alternative 4A could be expected to generate approximately 15,300 new permanent jobs in the Planning Area, as well as 1,022 person years of construction employment. These are less-than significant impacts.

Development in the Richards Area could result in the loss of existing residential units and the displacement of residents. This impact is considered less-than-significant since it is offset by the provision of relocation funds.

Alternative 4A would result in a far greater demand for affordable housing than provided in the Planning Area. Mitigation Measure 4.7-6 would reduce this impact, but not to a less-than-significant level.

Transportation

The number of trips generated under Alternative 4A would be approximately one-third fewer than the number of trips anticipated under Alternative 4. Nonetheless, significant impacts would occur. Most intersections could be improved to bring service levels to an acceptable level with mitigation measures identified in Section 4.8. However, due to the infeasibility of widening SR

160 and I-5, there would be significant and unavoidable impacts on regional highway segments and freeway ramps. As with Alternative 4, a Transportation Management Program would be required to reduce traffic and parking impacts.

Air Quality

Construction activity and increases in traffic resulting from development in the Planning Area would contribute to air quality degradation in the Sacramento region. For year 2000, traffic related to the development of Alternative 4A would result in carbon monoxide levels that exceed state standards at several intersections. This impact could be reduced to a less-than-significant level by implementing Mitigation Measure 4.11-1. Year 2010 carbon monoxide standards would not be exceeded under Alternative 4A. The degradation of regional air quality would be considered a significant and unavoidable impact under Alternative 4A, but its severity could be reduced with by implementing Mitigation Measure 4.11-3. Construction-generated dust and particulate matter could be reduced to a less-than-significant level by implementing Mitigation Measure 4.11-4.

Noise

Noise effects of this Alternative would be similar to those of Alternative 4.

Geology, Soils and Seismicity

Alternative 4A would involve development that could be exposed to seismic activity and associated hazards, soils with expansive characteristics, and groundwater. Impacts associated with this exposure would be mitigated to a less-than-significant level by implementing measures found in Section 4.11, Geology and Soils.

Hydrology and Water Quality

The Richards Area lies within the FEMA A99 flood zone. As a result, development in the Area could expose residents and workers to risks associated with a 100-year flood. This impact would be reduced to a less-than-significant level by implementing Mitigation Measure 4.12-2, which requires compliance with City ordinances and FEMA regulations addressing flood hazards.

Impervious surface area would increase as a result of development under Alternative 4A, resulting in additional erosion and degradation of water quality. These impacts can be reduced to less-than-significant levels by implementing Mitigation Measures 4.12-3, which requires a comprehensive erosion control plan, and 4.12-4, which requires a comprehensive runoff control plan, compliance with NPDES permit requirements, and a new stormwater collection system and pumping station for discharging storm water into the Sacramento River.

Hazardous Materials

The impacts related to hazardous materials in the Railyards Area would be the same under this Alternative as under Alternative 4. In the Richards Area, the lack of residential development would reduce the potential for hazardous material impacts due to exposure of residents, since major new residential uses would not be built. However, there would continue to be concerns about cleanup for non-residential uses and the potential effects of methane from old landfills in the area.

Biotic Resources

Elderberry bushes, which provide critical habitat for the federally-listed VELB, grow throughout the Planning Area. Development under Alternative 4A could result in the loss of Elderberry bushes, which would be a significant impact. Other significant biological impacts associated with Alternative 4A are the loss of oak trees, the disturbance of active raptor nests, and the filling of wetlands. These impacts could be reduced to less-than-significant levels by implementing Mitigation Measures 4.14-1, 4.14-2, 4.14-3 and 4.14-5.

Other potentially significant biological effects include the loss of valley oak, disturbance or destruction of trees containing active raptors' nests, the filling of wetlands, and disturbance to riparian habitat. All of these impacts, except disturbance to riparian habitat, could be mitigated to less-than-significant levels by implementing Mitigation Measures 4.14-2 through 4.14-6. The affects on riparian habitat are considered significant and unavoidable for Alternative 4A.

Water Supply

Alternative 4A would generate a substantial demand for treated water at buildout. In addition, new or upgraded water distribution systems would be required. These are considered significant impacts, which could be mitigated to a less-than-significant levels by implementing Mitigation Measure 4.15-1, which requires increased water treatment plant capacity, increased storage capacity and water conservation measures; and 4.15-2, which requires construction of an adequate water distribution system.

Wastewater Conveyance and Treatment

Increased development would result in the need for additional sewage treatment, which could be mitigated to a less-than-significant level by implementing Mitigation Measure 4.17-1. Both the Combined Wastewater Control System and local sanitary sewers would be affected by development of Alternative 4A development. These impacts could be reduced to less-than-significant levels by implementing Mitigation Measures 4.17-4 and 4.17-5. Sewage flow may be diverted to the Natomas Interceptor, which could cause impacts that could be mitigated by implementing Mitigation Measure 4.17-2, requiring participation in a sewerage expansion study. Finally, the change in land use that would occur under Alternative 4A would cause alterations in the characteristics of sewage treated by the SRWTP. This impact could be reduced to a less-than-significant impact by implementing Mitigation Measure 4.17-6.

Stormwater and Drainage

Impacts associated with Alternative 4A would be similar to, but less severe than those found under Alternative 4. Increases in impervious surface, which result in increased stormwater runoff, would be significant but could be reduced to less-than-significant levels by implementing Mitigation Measures 4.17-1 and 4.17-2.

Solid Waste

Under Alternative 4A, approximately 62,600 tons of solid waste would be generated annually at buildout. While any increase of more than 500 tons per year is considered significant, this impact could be reduced to a less than significant level by implementing Mitigation Measure 4.18-1.

Police Services

Alternative 4A would generate the need additional police officers. This is a significant impact which could be reduced by implementing Mitigation Measure 4.20-1, calling for increased staffing and the inclusion of the City Police Department in the development planning processes.

Fire Services

Alternative 4A would generate the need for increased fire protection services. This is a significant impact, which could be reduced by implementing Mitigation Measure 4.20-1, calling for construction and staffing new fire stations within the Planning Area.

Schools and Childcare

Although Alternative 4A has fewer housing units and less intensive office development than Alternative 4, demand for schools and child care would exceed existing capacity. By implementing Mitigation Measure identified in section 4.21, these impacts would be reduced to a less-than significant level.

Electricity and Gas Service

Alternative 4A would not result in a need for substantial new electrical distribution facilities. However, the need for gas distribution and cumulative increases in electrical and gas demand would be significant. These impacts would be reduced to less-than-significant levels by implementing Mitigation Measure 4.24-1.

Environmental Impacts of Alternative 4B

Generally, the impacts of Alternative 4B would be very similar to those of Alternative 4A, described in the pages above. As is described on page 6.1-9, the primary difference in the level of development between Alternatives 4A and 4B is the addition of about 1.5 million square feet

of office space and about 500 additional housing units. As with Alternative 4A, the assumption is that the Railyards Area would be fully built out as proposed in Alternative 4.

A number of impacts associated with this Alternative would be essentially the same as those of Alternative 4A, including impacts on urban design, microwave transmission, wind, cultural resources, geology, hydrology/water quality, and biotic resources. The impacts that are tied to residential population, such as parks and open space, population, jobs/housing, and the full range of public services would be marginally different from Alternative 4A, consistent with the addition of 500 housing units. Transportation impacts would be somewhat larger than Alternative 4A, but would not be different in terms of the level of significance described for Alternative 4.

6.3 SPECIAL CONSIDERATIONS

6.3.1 SPECIAL CONSIDERATIONS: RICHARDS AREA CIRCULATION VARIATIONS

Introduction

The Facility Element describes many physical changes to the circulation network in the Richards Area. The improvements described have been evaluated in Chapters 4.1 through 4.21 of this EIR. There are other possible approaches to solving circulation problems in the Richards Area, however, that may be necessary to adopt at some time in the future. Reasons for their adoption could be financial, legal, or regulatory. The discussion that follows presents an analysis of a range of potential variations to the proposed circulation system in the Richards Area.

Failure to Construct a Richards Boulevard Couplet

The Facility Element calls for the construction of a one-way couplet along the current alignment of Richards Boulevard. Policy 3.3 of the Facility Element states:

> Improve east-west vehicular access within the Planning Area by the creation of roadway couplets along the Richards Boulevard and B/North B corridors.

The construction of a couplet along the Richards Boulevard corridor is part of a long-term plan for improvement of circulation and access to Interstate 5 and State Route 160 in the Richards Boulevard area. It is considered the critical east-west arterial street in the RBAP.

Description of the Couplet

The proposed north leg of the Richards Boulevard couplet would follow along the existing Richards Boulevard alignment between Interstate 5 and 10th Street. To the east of 10th Street, the roadway would curve to the south and connect to the existing alignment of McCormack Street between 12th Street and 16th Street. Short-term improvements planned for the existing segment of Richards Boulevard involve widening from the two-lane section to a five-lane section to provide additional capacity for two-way street operation. This would be consistent with the long-term plan to convert Richards Boulevard to a one-way street with three travel lanes, two parking lanes, and light rail tracks. The segment of the Richards Boulevard couplet between 3rd Street and 7th Street would include exclusive right-of-way for a double-track light rail configuration on the north side of the street along the planned Downtown-Natomas-Airport extension alignment.

The proposed south leg of the Richards Boulevard couplet would follow the Bannon Street configuration between Interstate 5 and the proposed 5th Street extension. To the east of 5th Street, the south leg would continue along a linear alignment to North 10th Street where it would curve to the south along a parallel configuration to the north leg of the couplet. It would connect to the existing alignment of North C Street between 12th Street and 16th Street. The south leg of the couplet would operate with one-way travel in the eastbound direction and include three travel lanes and two parking lanes.

Relationship to the Alternatives

The proposed Richards Boulevard couplet would be required for full implementation of Alternatives 2, 3, 4, 5, 6, and 7. Alternative 1 would use the existing Richards Boulevard alignment.

Environmental Implications

The primary impact of failing to construct the Richards Boulevard couplet along the proposed alignment would be increased congestion along the corridor. Additional widening of Richards Boulevard, beyond the planned 5-lane section, would be required to serve future traffic. In addition, heavy opposing left turn movements at the major intersections would limit capacity and ultimately require the restriction of left turn movements. Additional parallel collector facilities would have to be constructed to provide increased east-west circulation capacity.

Another major impact would be the capacity constraints provided by the two-way operation of light rail in an exclusive right-of-way along the north side of Richards Boulevard. The operation of light rail is more compatible with a one-way traffic pattern along Richards Boulevard. Also, the new right-of-way required for widening Richards Boulevard as a two-way street would have to be in addition to that needed to accommodate light rail along the north side of Richards Boulevard.

Finally, the failure to construct the Richards Boulevard couplet would result in increased pressure on the existing intersection of State Route 160/Richards Boulevard. This would require the construction of a grade-separated interchange in the vicinity to serve the ultimate demand for connections between State Route 160 and Richards Boulevard. This interchange would be costly to construct due to its proximity to the American River, would affect local land uses, would inhibit future access to the waterfront on both sides of State Route 160, and would provide a physical barrier between existing land uses and future waterfront uses.

Failure to Construct an At-grade Connection to State Route 160

The Facility Element calls for the construction of a one-way couplet along the current alignment of Richards Boulevard that would have an at-grade connection with State Route 160. Policy 2.2 of the Facility Element states:

Provide ramp and lane improvements to State Route 160 that will improve access to the Central City and the Richards Boulevard Planning Area.

The construction of an at-grade connection on Richards Boulevard at State Route 160 is part of a long-term plan for improvement of circulation and access to State Route 160 in the Richards Boulevard area. It is considered one of two critical interchanges in the Richards Area.

Description

The proposed north leg of the Richards Boulevard couplet would connect to the existing alignment of McCormack Street between Gateway Boulevard (currently 12th Street) and 16th Street. The proposed south leg of the Richards Boulevard couplet would connect to the existing alignment of North C Street between Gateway Boulevard (currently 12th Street) and 16th Street. At 16th Street, this would result in two new intersections at the junctions of one-way streets. This includes the intersections of Richards Boulevard North/16th Street and Richards Boulevard South/16th Street. At the planned Gateway Boulevard (currently 12th Street), left turn movements onto both legs of the Richards Boulevard couplet would be prohibited. This would result in two new intersections (Richards Boulevard North/Gateway and Richards Boulevard South/Gateway) with no conflicting movements along any of the approaches. These four new intersections would have accommodate high traffic demands due to their configuration.

Relationship to the Alternatives

The proposed at-grade connection of the Richards Boulevard couplet with State Route 160 would be required for full implementation of Alternatives 2, 3, 4, 5, 6, and 7. Each of the Alternatives includes the development of an at-grade connection of the Richards Boulevard couplet with State Route 160. Alternative 1 would use the existing Richards Boulevard connection to State Route 160.

Environmental Implications

The primary impact of failing to construct an at-grade connection of the Richards Boulevard couplet with State Route 160 is that a grade-separated interchange would be required to serve future traffic demands. As previously discussed, this intersection would likely be located at the existing junction of Richards Boulevard and State Route 160. This interchange would be costly to construct due to its proximity to the American River, would impact local land uses, would inhibit future access to the waterfront on both sides of State Route 160, and would provide a physical barrier between existing land uses and future waterfront uses.

The implementation of a two-way Richards Boulevard would require eight through-lanes, a wide median to accommodate two-lane turn pockets, and a light rail corridor. This would involve a total right-of-way of 210 feet, which compares to 130 feet and 90 feet for North Richards Boulevard and South Richards Boulevard, respectively. The right-of-way would accommodate a 15-foot sidewalk/landscaping area, parking on both sides of the street, eight through-lanes, a

28-foot median, and a 39-foot light rail section. Additional right-of-way would be required at the intersection of Richards Boulevard/Seventh Street, where the light rail configuration would require a full preemption of all approaches when light rail vehicles cross over from Seventh Street to Richards Boulevard. The construction of a boulevard configuration also increases the importance of providing parallel collectors along Richards Boulevard as no driveways could be allowed on either side of the street.

Failure to Construct a Split Diamond Interchange at I-5/Richards Boulevard

The Facility Element calls for the construction of a split diamond interchange at the intersection of Interstate 5 and Richards Boulevard in conjunction with the proposed Richards Boulevard couplet. Policy 2.1 of the Facility Element states:

> Provide freeway and ramp improvements on I-5 which will relieve existing congestion points and improve access to Downtown Sacramento and the Planning Area.

The construction of a split diamond interchange configuration at the I-5/Richards Boulevard interchange is a long-term plan for improvement of circulation and access to Interstate 5 in the Richards Boulevard area. It is considered one of two critical interchange junctions in the Richards Area.

Description

The proposed north leg of the Richards Boulevard couplet would connect to the existing northbound on-ramp and southbound off-ramp at the existing interchange intersections. The proposed south leg of the Richards Boulevard couplet would connect to Interstate 5 via an extension of Bannon Street to the west. This would require tunneling through the existing fill under Interstate 5. New ramp connections for the northbound off-ramp and southbound on-ramp would be made to the south of the existing intersections. One-way frontage roads would be constructed on both sides of Interstate 5 to connect the intersections at the foot of the existing and new ramp junctions. All four existing ramps would be widened to provide two-lane ramp facilities to accommodate future travel demands.

Relationship to the Alternatives

The proposed split diamond interchange at I-5 and the Richards Boulevard couplet would be required for full implementation of Alternatives 2, 3, 4, 5, 6, and 7. Each of the Alternatives includes the development of a split diamond interchange. Alternative 1 would use the existing I-5/Richards Boulevard interchange.

Environmental Implications

The primary impact of failing to construct a split diamond interchange is that an Alternative configuration would have to be constructed to accommodate future travel demands. Alternative

configurations include a spread diamond interchange, a partial cloverleaf interchange, and an urban interchange.

The spread diamond interchange would involve the creation of a greater separation between the intersections at the junctions of the northbound and southbound ramps. The additional separation would be required to provide adequate intersection operations by alleviating queues that would occur under the tight diamond configuration. The spread diamond interchange would result in land use impacts as it would require a significant acquisition of right-of-way. It would also require the realignment and widening of the four ramps. The realignment of the northbound on-ramp and the southbound off-ramp would be costly as it would require modification of the I-5 Bridge over the American River.

The partial cloverleaf interchange would involve the development of new loop ramps in opposite quadrants (i.e, either the northeast and southwest quadrants or the northwest and southeast quadrants). It would require the realignment of existing ramps in the two designated quadrants to allow for construction of the loop ramps. The addition of these loop ramps would eliminate left turn movements at the ramp junction intersections and improve operating conditions. The partial cloverleaf interchange would have land use impacts as it would require a significant amount of additional right-of-way. The construction of a loop ramp in either the northwest or northeast quadrant would require realignment of the southbound off-ramp or the northbound on-ramp, respectively, that would be costly as it would require modification of the I-5 Bridge over the American River.

The urban interchange would involve the reconstruction of all four ramps into a configuration that would have a "single-point" intersection located at the center of the existing interchange. This would require widening of Richards Boulevard under the overpass. The partial cloverleaf interchange would have land use impacts as it would require a significant amount of additional right-of-way. The realignment of the northbound on-ramp and the southbound off-ramp would be costly as it would require modification of the I-5 Bridge over the American River.

Construction of a One-way Couplet along the 15th/16th Street Corridor

The Facility Element does not call for the construction of a one-way couplet along the 15th/16th Street corridor. It does call for the construction of one-way couplets along the Richards Boulevard and the B/North B corridors. Policy 3.3 of the Facility Element states:

> Improve east-west vehicular access within the Planning Area by the creation of roadway couplets along the Richards Boulevard and B/North B corridors.

Description

The 15th/16th Street one-way couplet would replace the existing State Route 160 alignment along 12th Street and 16th Street. This would allow for a one-way couplet pair separated by only one

block. This would allow for a shift of traffic away from 12th Street, where conflicts presently existing between light rail vehicles and heavy traffic movements.

The development of a 15th/16th Street one-way couplet would require tunneling through the existing fill under the Southern Pacific Railroad mainline tracks between B Street and C Street. It would require the construction of a new link along the 15th Street corridor between the State Route 160 Bridge at the American River and the Southern Pacific Railroad mainline tracks. Given the future construction of Gateway Boulevard as a two-lane facility, the construction of a one-way couplet would require a flyover ramp from southbound State Ramp 160 at the American River Bridge to 15th Street. It would also require a reconfiguration of a portion of 15th Street immediately south of the Southern Pacific Railroad mainline tracks from two-way to one-way operation.

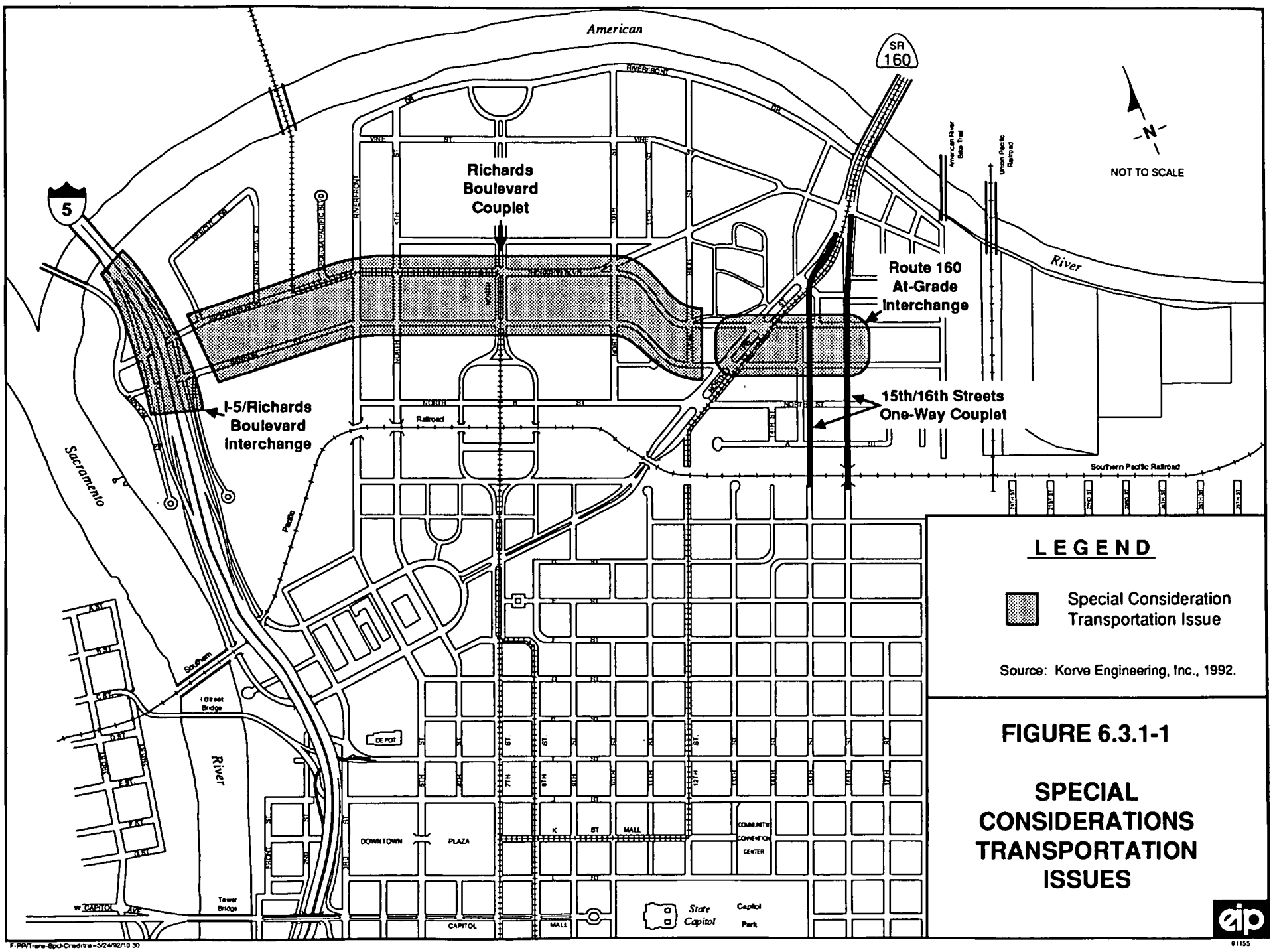
Relationship to the Alternatives

The 15th/16th Street one-way couplet would not be required for the implementation of any of the project Alternatives. It would provide a more direct alignment of State Route 160 through the downtown area and alleviate current conflicts along 12th Street between K Street and C Street.

Environmental Implications

Circulation Network Impacts

The 15th/16th Street one-way couplet would provide improved capacity along the State Route 160 corridor. It would provide a more direct connection on State Route 160 through the Central City area. It would be a costly improvement as it would require the construction of a tunnel under the Southern Pacific Railroad mainline tracks, a flyover from southbound State Route 160 at the American River Bridge to 15th Street, and the acquisition of a significant amount of right-of-way between the State Route 160 Bridge at the American River and the Southern Pacific Railroad mainline tracks. This right-of-way requirements would include the acquisition of several structures along the alignment. The construction of a 15th/16th Street couplet would provide an additional barrier between the proposed Social Services campus and 16th Street. The proximity of the 15th/16th Street one-way couplet would also require the widening of the Richards Boulevard couplet at the junction intersections. This would be required to provide adequate queuing space between intersections along the two legs of the Richards Boulevard couplet.


American
SR 160
Richards Boulevard Couplet
Route 160 At-Grade Interchange
15th/16th Streets One-Way Couplet
I-5/Richards Boulevard Interchange
River
Sacramento
Southern Pacific Railroad
NOT TO SCALE
LEGEND
Special Consideration Transportation Issue
Source: Korve Engineering, Inc., 1992.
FIGURE 6.3.1-1
SPECIAL CONSIDERATIONS TRANSPORTATION ISSUES

6.3.1-7

CHAPTER 6.3.2
SPECIAL CONSIDERATIONS:
FAILURE TO BUILD A NEW SACRAMENTO RIVER RAIL BRIDGE

Introduction

The Facility Element calls for the construction of a new heavy rail bridge across the Sacramento River for the Southern Pacific main line tracks. Policy 1.2 of the Facility Element states:

> Relocate the Southern Pacific main line tracks to the northern boundaries of the Railyards Planning Area, and locate the intermodal transportation center at Seventh Street and North B Streets.

The construction of the new rail bridge is part of the long term plan for realignment of the Southern Pacific main line to the northern part of the Railyards Area, and is considered a critical element in providing connection between the main portion of the Railyards Area and the Sacramento River.

Description

The new rail bridge would cross the Sacramento River to connect the Southern Pacific main line tracks, as they pass out of the Railyards Area on the east side of the River, with the main line along "C" Street in West Sacramento. The rail bridge would be located about 500 feet north of the existing "I" Street Bridge and would ultimately accommodate up to three rail lines serving commuter, intercity, and freight rail traffic. The new rail bridge would be a "lift" style bridge that is raised to allow tall boats to pass, similar in construction to the Tower Bridge, which is about one-half mile to the south. The existing "I" Street Bridge (a swing style bridge that turns 90 degrees to allow boats to pass) would remain and be used for automobile, pedestrian, and bicycle traffic.

The Phasing Strategy in the Facility Element states that the construction of the new rail bridge would be part of the Phase 2 infrastructure improvements. The Financing Strategy estimates that the costs for the new rail bridge, including all necessary roadway and freeway ramp modifications associated with construction of a "lift" style bridge, as well as right-of-way in West Sacramento, would be approximately $61 million. The Financing Strategy suggests that the new rail bridge would be funded through a combination of federal and state funding sources.

Relationship to the Alternatives

The new rail bridge would be required for full implementation of Alternatives 2, 3, 4, 6, and 7. Each of these Alternatives include realignment of the main line to the northern alignment at the Railyards, construction of the Intermodal Transit Station at the 7th/North "B" Street location, and increased access from the Railyards to the Sacramento River.

Alternatives 1 and 5 would use the existing "I" Street Bridge alignment. Although the "I" Street Bridge is over 80 years old, it is considered to be structurally sound and with currently planned improvements, could serve the main line for the indefinite future.

Environmental Implications

Interim Main Line Rail Alignment

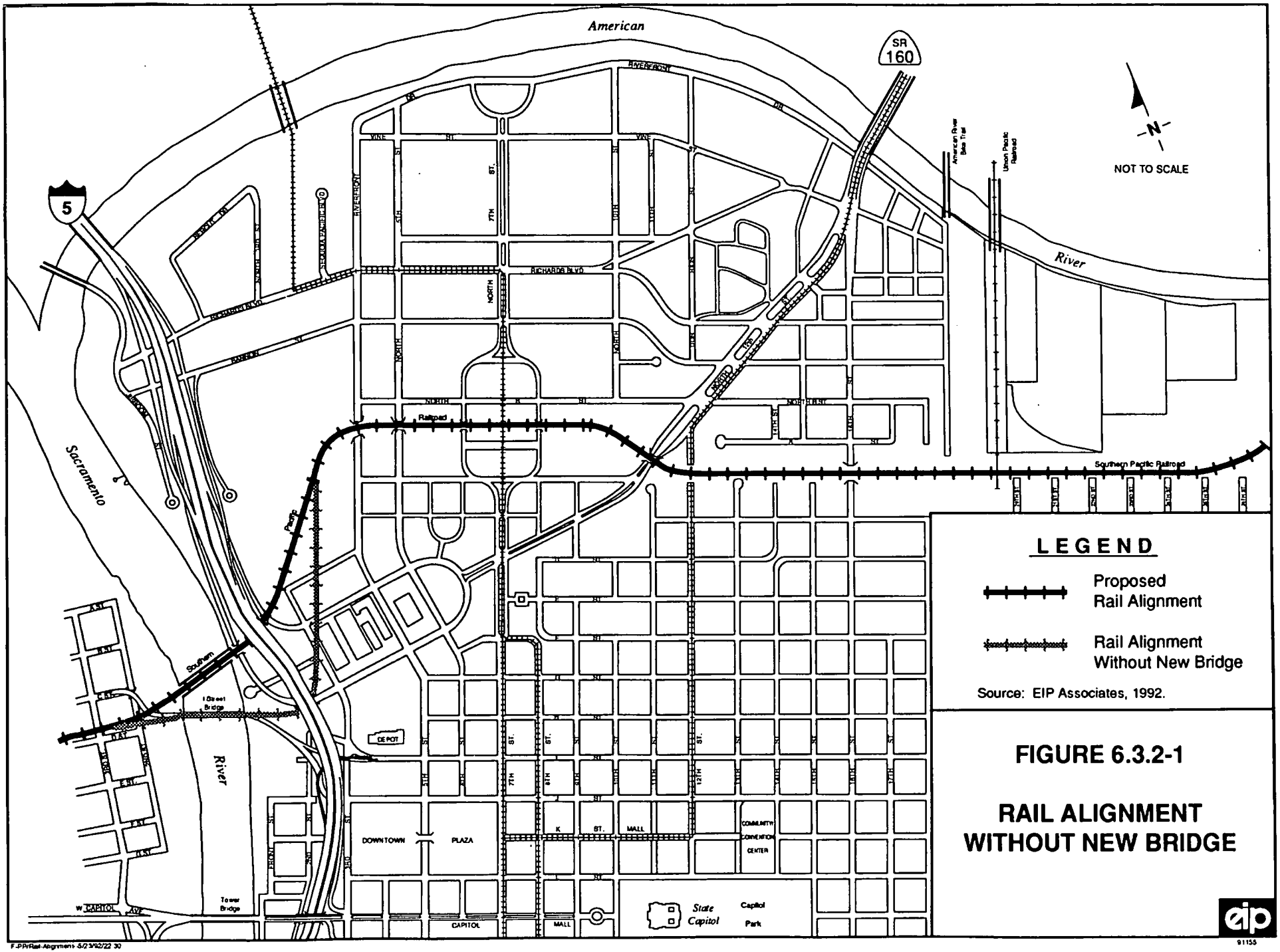
Chapter 4 of this EIR evaluates the environmental impacts of construction of a new rail bridge across the Sacramento River at the location identified in the RSP. Prior to Phase 3 implementation, but after realignment of the main line and construction of the Intermodal Transit Station at 7th/North "B" Streets, the main line would follow an interim alignment that would continue to use the "I" Street Bridge. In this stage, the main line rail alignment would turn south about 1,000 feet west of the Intermodal Transit Station, parallel to Interstate 5, and then turn west meeting the existing alignment at the eastern abutment to the "I" Street Bridge (see Figure 6.4.2-1).

Bridge Approval Process

A thorough regulatory permitting process would be required prior to approval of and construction of the bridge, including permitting or review by the City of Sacramento, the U.S. Army Corps of Engineers, the State Reclamation Board, the State Lands Commission, the U.S. Fish and Wildlife Services, the California Department of Fish and Game, and the Interstate Commerce Commission. Similarly, the proposed reliance on federal or state funding sources will require aggressive and successful pursuit of transportation subsidies or grant monies. Failure of any of these regulatory or financial aspects of the project could result in long-term use of the "I" Street Bridge with Alternatives 2, 3, 4, 6, and 7. The planning and environmental implications of such a scenario are discussed below.

Circulation Network Impacts

The assumed circulation network is identical for Alternatives 2, 3, 4, 6 and 7. The primary effect of the continued use of the Interim Alignment would be the inability to extend 3rd Street to the north of the South Crescent Drive. North Crescent Drive would be required to pass under the rail line and would begin to cut below grade farther to the east than with the new rail bridge. Traffic traveling north on 3rd Street toward I-5 northbound would be required to divert on South Crescent Drive to 5th Street to reach North Crescent Drive and the I-5 northbound on-ramps.



6.3.2-3

FIGURE 6.3.2-1

RAIL ALIGNMENT WITHOUT NEW BRIDGE

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This could lead to some increased congestion at the intersections of 5th/South Crescent Drive and 5th/North Crescent Drive.

The RSP calls for the use of the lower deck of the "I" Street Bridge for pedestrian and bicycle access to West Sacramento once the rail deck of the bridge has been replaced with the new rail bridge to the north. The bicycle access would be a new Class II bike lane that would connect to the "H" Street extension and to the Jedediah Smith Bike Trail along the east bank of the Sacramento River. Failure to construct the new rail bridge would eliminate the possibility of these pedestrian and bicycle connections across the Sacramento River. Continued use of the Interim Alignment for the main line rail would also eliminate the pedestrian and bicycle connections between the core of the Railyards Area with the Jedediah Smith Trail along the River, with its connections north to Discovery Park and the American River, and south to Old Sacramento and beyond to Miller Park. Pedestrian and bicycle connections to the river trail system would be available through the internal street system in the Planning Area and the downtown street system.

Rail Operations Impacts

The new Sacramento River rail bridge would provide three rail lines to serve freight, inter-city and commuter rail. The future level of operations on the main line is projected to be approximately 60 trains per day. In the event that the rail bridge is not constructed, the two rail "I" Street Bridge would be required to accommodate all rail uses. While the "I" Street Bridge may be able to accommodate the daily demand from rail operations, the limited capacity of the "I" Street Bridge may require the use of layover tracks to the west (likely west of the Yolo Bypass) and to the east (likely east of Roseville) to ensure avoidance of operational conflicts.

Impacts on Land Uses

The most obvious impact of permanent use of the Interim Alignment would be the loss of land at the western end of the Railyards Area for urban uses. The presence of the rail would sever the Sacramento River and land on either side of I-5 from the main body of the Railyards Area. A discussion of the specific land use impacts for each relevant Alternative is provided below.

Alternative 2

Under Alternative 2, permanent use of the Interim Alignment for the main line rail line would result in the loss of a portion of the Open Space area at the northwest corner of the Railyards Area, the loss of the neighborhood commercial uses located at 3rd Street and North Crescent Drive, as well as the public and cultural facilities planned to be located between the Central Shops and the Sacramento River. There would also be the potential for significant noise impacts on those residential units built to the west of 5th Street, and on the public activities planned for the historic Central Shops buildings.

Alternative 3

The land use impacts of the permanent use of the Interim Alignment would be essentially the same for Alternative 3 as are described above for Alternative 2. One critical difference relates to potential impacts on the historic Central Shops buildings which would be removed in favor of open space under Alternative 3.

Like Alternative 2, there would be the potential for significant noise impacts on those residential units built to the west of 5th Street. Under Alternative 3, there would also be significant noise impacts on the open space areas within the Crescent Drive loop.

Alternatives 4 and 7

Under Alternatives 4 and 7, the land use impacts of the permanent use of the Interim Alignment would be similar to those of Alternatives 2 and 3, with the exception that there would be a loss of mid-rise office space near the corner of 3rd and North Crescent Drive.

Alternative 6

Under Alternative 6, the land use impacts of the permanent use of the Interim Alignment would be similar to those of Alternatives 4 and 7, with the exception that there would be a loss of high-rise office space near the corner of 3rd and North Crescent Drive, rather than mid-rise office, as described above.

Other Environmental Impacts

Historic Buildings

Permanent use of the Interim Alignment, resulting in a loss of connections to the Sacramento River and a number of planned new cultural facilities, could endanger the planned preservation and renovation of the historic Central Shops buildings. The lack of supportive cultural facilities, as well as pedestrian activity connecting to the River, could undermine the economic viability of the planned $20.8 million rehabilitation project. Increased vibration due to proximity of the main line could hinder seismic upgrade and stabilization of the buildings.

Avoidance of Potential Impacts to the Sacramento River

A number of potential impacts to the Sacramento River and its associated habitats are described in Chapter 4 of the EIR. Such impacts, including potential biological impacts to the riparian and riverine habitats, hydrological, and geological impacts, would be avoided if the new rail bridge were not constructed.

Avoidance of Impacts in West Sacramento

On the west bank of the Sacramento River, the new main line would be routed from the western bridge abutment to the existing main line where it would merge between 3rd Street and 4th Street. The new alignment would require the demolition of the Capitol Plating industrial building, the West Sacramento Police Department parking lot, and the historic Bridge View Market. In the event that the new rail bridge is not constructed, these impacts would not occur. Please see also impact 4.1-4 in Chapter 4.1, Land Use.

6.3.3 SPECIAL CONSIDERATIONS: ALTERNATIVE INTERMODAL TRANSIT STATION LOCATIONS

Introduction

During the development of the RSP, eight potential locations for the Intermodal Transit Station were considered. The locations were analyzed by consultants and City staff for their operations efficiency, land use implications, environmental considerations, and cost. The results of the studies were presented at public workshops and were evaluated by a number of local land use and transportation planning agencies. The following locations are shown on Figures 6.3.3-1 through 6.3.3-4 and discussed below:

1. Existing Southern Pacific Depot (Figure 6.3.3-1)

2. Between 12th and 16th Streets (Figure 6.3.3-1)

3. Along Alkali Edge (Figure 6.3.3-2)

4. North of the Central Shops (Figure 6.3.3-3)

5. Along Interstate 5 (Figure 6.3.3-3)

6. Northwest Corner of the Railyards (Figure 6.3.3-4)

7. South of the Central Shops (Figure 6.3.3-2; fully analyzed in Alternatives)

8. 7th and North B Streets (Figure 6.3.3-4; fully analyzed in Alternatives 2-4, 6 and 7)

A source for describing and evaluating the above options is *Screening of Planned Alternatives, Draft, September 1990* (the screening document) prepared as part of the RSP planning process by Roma Design Group.

For many impacts, particularly those related to population, employment and land coverage, the location of the Intermodal Transit Station has little or no effect on the type or severity of impacts. The station site would affect land use decisions and the roadway network, so these are the focus of the discussion in this section.

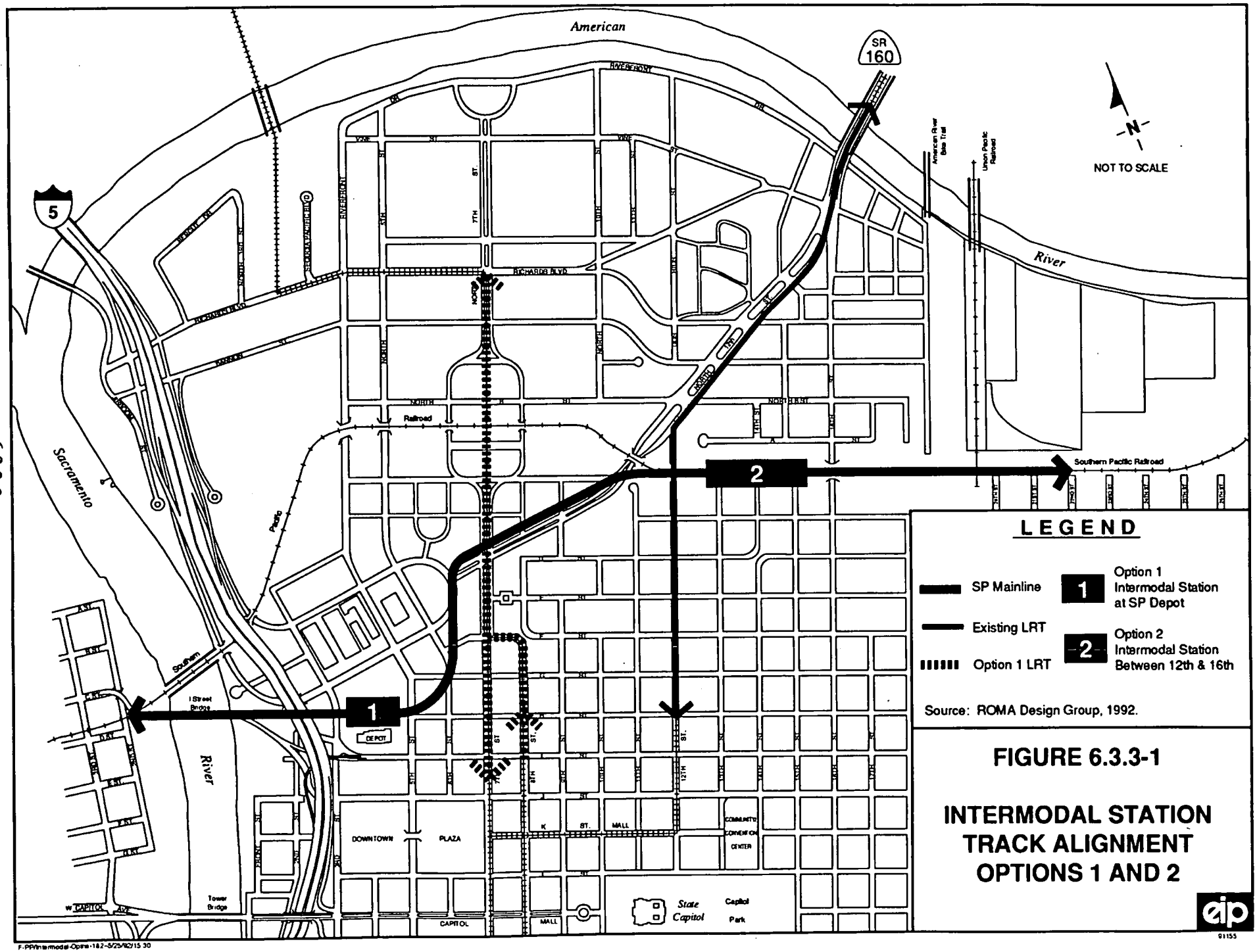

FIGURE 6.3.3-1

INTERMODAL STATION TRACK ALIGNMENT OPTIONS 1 AND 2

6.3.3-2

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1. Existing Souther Pacific Depot

An Intermodal Transit Station at the existing Depot would retain the structure's historic significance. In addition, the site is closer to the Central Business District than the proposed 7th and North B location. According to the Screening document, this option was eliminated for the following reasons:

> Inability of the existing alignment to accommodate the required 1,150-foot platform lengths at the existing depot.
>
> Difficulty in creating an appropriate interface between North Natomas LRT route and the Southern Pacific Depot, given: the desire to create a direct north-south linkage between the downtown and the area to the north; and the undercrossings that would be necessary below the existing rail alignment.
>
> The existing rail alignment will require under or over crossings for all north-south roadways, LRT routes and pedestrian ways, significantly affecting the objective for active pedestrian-oriented streets.
>
> Construction of an Intermodal Transit Station at the Southern Pacific Depot will significantly limit future options for the construction of a new rail bridge across the Sacramento River; this intermodal location and rail alignment limits the future options of a river crossing to I Street, presenting significant constraints related to the construction of a new bridge while maintaining river navigation and through-movement of rail traffic.

The existing rail bridge has two tracks and, with ongoing maintenance, is considered structurally sound. However, if a new bridge does become necessary or desirable in the future, whether to increase the number of tracks or because of the age of the existing bridge, the present location would preclude a detour over a temporary bridge. Consequently, rail traffic would have to cease until the existing bridge was replaced.

One of the problems associated with below grade track crossings is the potential exposure of contaminated soils and groundwater.

If the Depot site were used for the Intermodal Transit Station, the track alignment would be retained in its current location. Consequently, any increases in the number of trains would create noise impacts on residences in the Alkali Edge.

Retaining the current track alignment would affect future land uses in both the Railyards and Richards Areas. For example, noise contours would affect the location of residential units and the alignment of the LRT could affect the placement of office development, especially in the Richards Area.

2. Richards Gateway Area

This site is outside of the Planning Area, to the immediate east along the current Southern Pacific track alignment. A number of rail alignments would be possible under this option, but it was eliminated for the from planning consideration for the following reasons:

> The eccentric location related to existing downtown employment (e.g., 18 blocks from 7th and Capitol Mall) would make it relatively inaccessible for pedestrians and transit; in addition, it would be visually isolated from the rest of downtown.
>
> The surrounding pattern of land uses would make it difficult to create a significant new employment center around the station.
>
> Such a location could cause traffic impacts on the adjacent Alkali Flat neighborhood and further congestion along the 12th/16th Street corridor.
>
> While it could interface with the existing LRT line along 12th Street, it would have no relationship with the proposed LRT route to North Natomas.

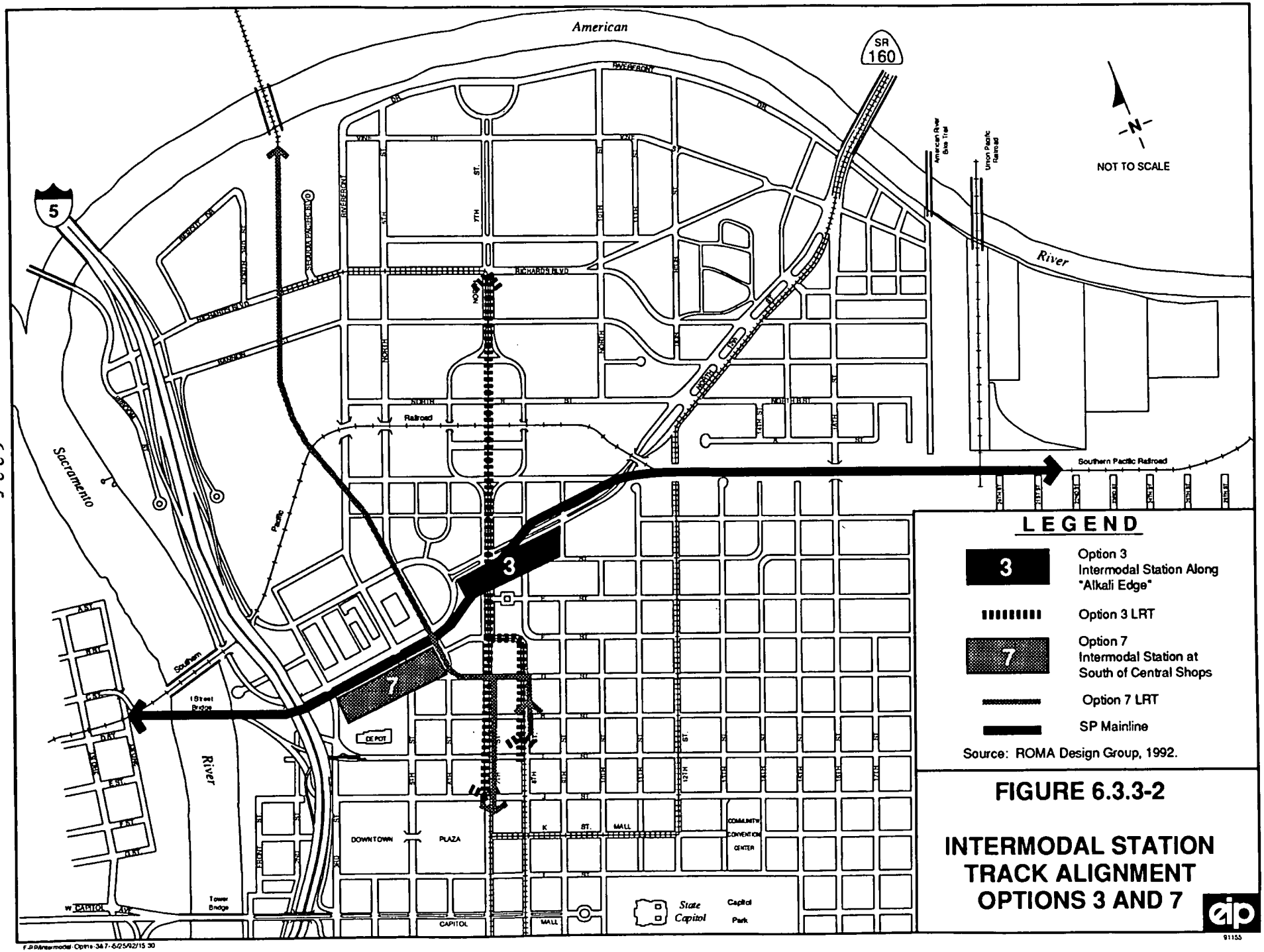
With the Intermodal Transit Station outside of the Planning Area, the tracks could be realigned anywhere on the Railyards Area site or retained in their current location. As discussed above and throughout the EIR, the track alignment affects land use, particularly the location of residential development, and traffic. Unless the tracks are moved north, any extension of 3rd, Fifth, Sixth and Seventh Streets would need to go under or over the tracks.

3. Alkali Edge

Located within approximately nine blocks of the Central Business District, this site is along the northern edge of the Alkali Flat neighborhood, on the existing track alignment between 7th and 10th Streets. From a planning perspective, the advantages of this site are its proximity to downtown and the possibility of elevating the tracks so that LRT, pedestrian and vehicle traffic could pass underneath. The disadvantages include:

> Potential impacts on the adjacent Alkali Flat neighborhood from land use compatibility, visual, noise and traffic circulation standpoint.
>
> Given the adjacency to Alkali Flat, this option would make it very difficult to create a higher-intensity concentration of employment oriented uses around the Intermodal Transit Station.
>
> In addition, the location of the Intermodal Transit Station in the northeast quadrant of the property would reduce the potential for on-site residential development; this portion of the property provides the greatest opportunities for residential uses, given adjacent land uses, noise contours, and the lower levels of soil contamination.

Because the tracks could be elevated, the traffic and soil and groundwater contamination concerns associated with most of the other site options would be avoided. However, as indicated by the Screening document, locating the Intermodal Transit Station adjacent to the Alkali Flat neighborhood would have noise and planning impacts on existing and future residents.



6.3.3-5

FIGURE 6.3.3-2

INTERMODAL STATION TRACK ALIGNMENT OPTIONS 3 AND 7

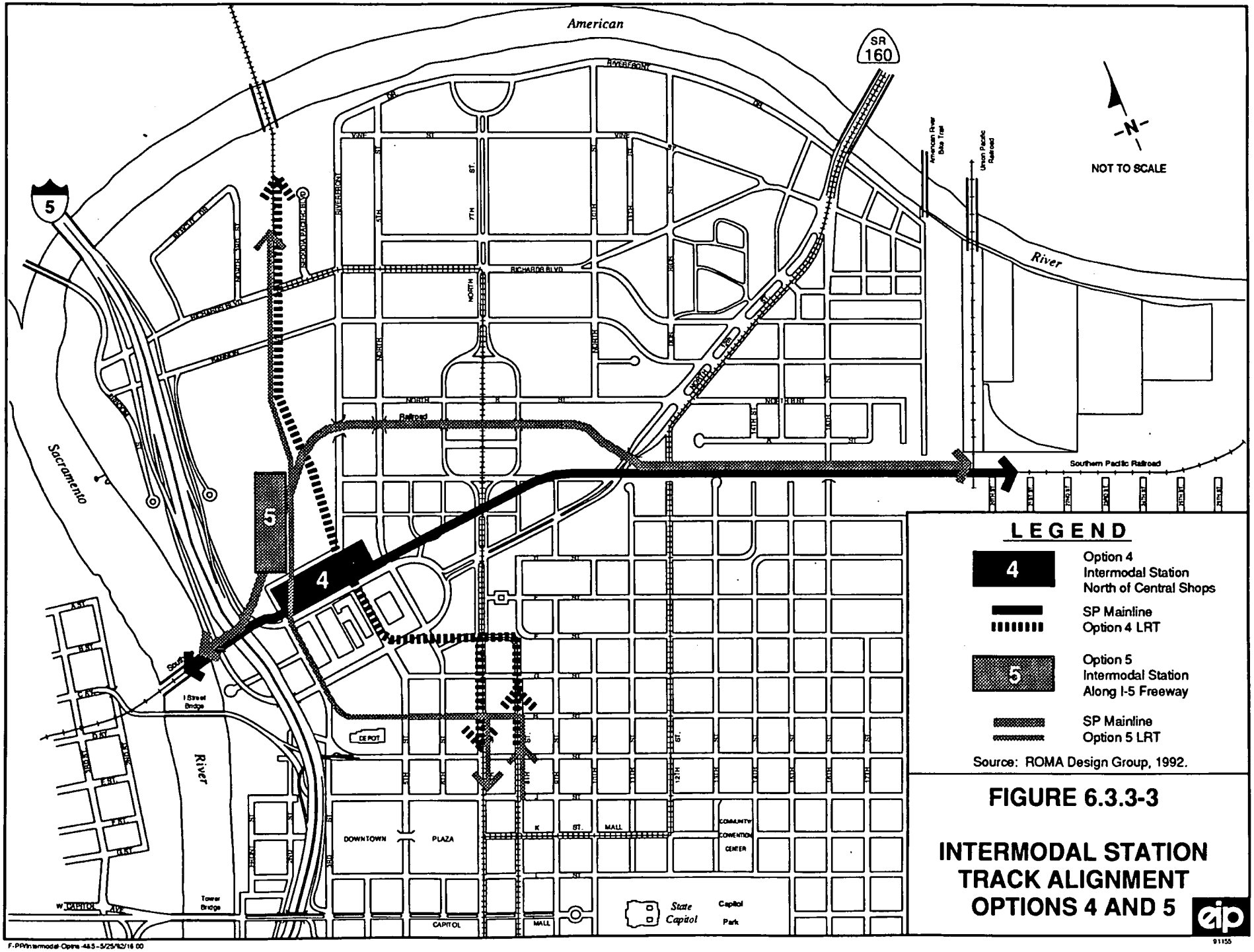


FIGURE 6.3.3-3

INTERMODAL STATION TRACK ALIGNMENT OPTIONS 4 AND 5

6.3.3-6

4. North of Central Shops

Placement of the Intermodal Transit Station to the north of the Central Shops would require moving the tracks toward the center of the Railyards, which would provide a straighter alignment and the most direct route through the site. However, a number of disadvantages arise, including:

The location of the Intermodal Transit Station behind the Central Shops is relatively remote from the existing downtown.

The immediate adjacency to the historic Shops makes it difficult to create a concentration of employment-oriented uses around the new station.

The alignment of the main line through the center of the property creates a significant barrier, and severely limits the potential for residential development on the site.

The elevation of the tracks and Intermodal Transit Station would need to be generally at existing grade (to allow for sufficient clearance below the I-5 freeway), requiring roads, the LRT and pedestrian ways to pass under or over the tracks, significantly affecting the preservation and reuse of the Central Shops complex and the desire to create a pedestrian-oriented environment at street level.

This Intermodal Transit Station location would require a new rail bridge across the Sacramento River; the interim use of the I Street Bridge would be precluded.

Also, this option may preclude the preservation and restoration of the Central Shops, which would be a significant cultural resources impact.

5. Along Interstate 5

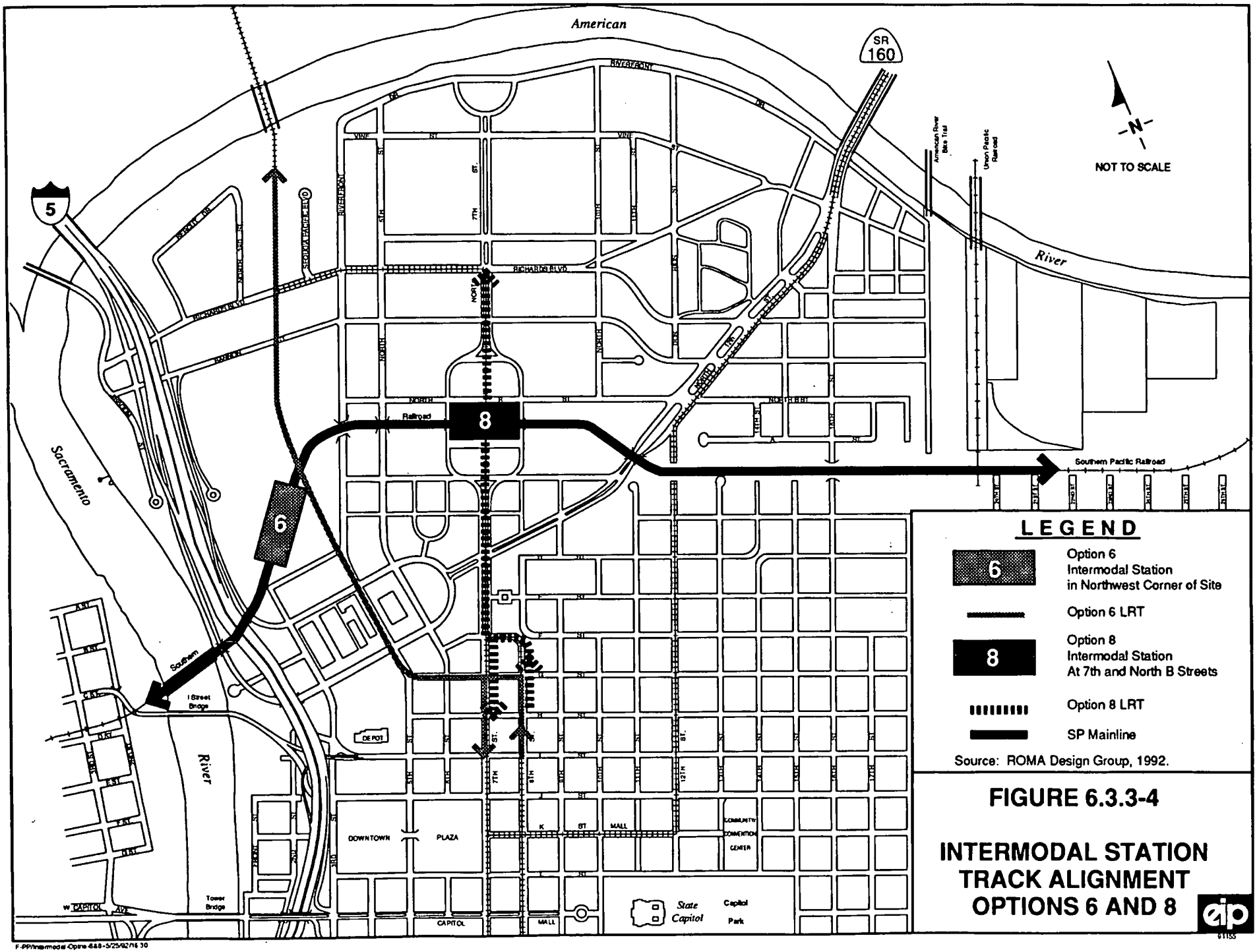
This site would provide a north-south alignment between the Sacramento River and Interstate 5. The location would concentrate major transportation functions in one site, thereby focusing noise impacts and similar constraints in one area. The disadvantages associated with this option are:

The opportunity to create direct pedestrian linkages between the property and the Sacramento River beneath the I-5 freeway are severely constrained by locating the Intermodal Transit Station and alignment parallel to the freeway. The elevation of the rail would need to remain substantially at existing grade, requiring pedestrians and vehicles to cross over the tracks.

The location of the station at this western-most position on the property would make it difficult to create an appropriate interface with the North Natomas LRT route; it would also conflict with potential ramp improvements between I-5 and the property.

The location of the station would limit future options for an alternative to the existing I Street Bridge river crossing.

As with Alternatives 2-4, 6 and 7, this site would require relocating the track to the northern edge of the Railyards Area. As a result, downtown streets could be extended to the Richards Area at grade. Residential land use decisions would be unaffected, but it would be difficult to concentrate office uses around the Intermodal Transit Station.



6.3.3-8

FIGURE 6.3.3-4

INTERMODAL STATION TRACK ALIGNMENT OPTIONS 6 AND 8

F:\PP\Intermodal Opns 6&8-5/25/92/16:30

6. Northwest Corner of Railyards

This site would require moving the tracks to the alignment assumed for Alternatives 2-4, 6 and 7. However, the station would be located just south of the water treatment plant, in order to isolate station related impacts to the greatest extent possible. A number of disadvantages were identified for this option, including:

> Its isolated location and adjacency to the I-5 freeway and Water Filtration Plant make it difficult to create a concentration of employment-oriented uses around the station.
>
> The elevation of the station would need to be substantially at existing grade, requiring all roads and the LRT route to be depressed below grade, thereby affecting the quality of the pedestrian environment at street level and creating a major barrier to the north.
>
> The station location would require a new rail bridge; the interim use of the I Street Bridge would be precluded.

In addition, the alignment of the LRT could affect the preservation of the historic shops area and the placement of housing.

7. South of Shops (Alternative 5)

This site is assumed under Alternative 5 is described in the Description of the Alternatives, and is fully analyzed in Alternative 5. The land use and environmental effects of locating the Intermodal Transit Station south of the historic shops area are discussed throughout the EIR. According to the Screening document, the site was rejected from consideration for the RSP for the following reasons.

> The elevation of the Intermodal Transit Station and the main line tracks would have to remain substantially at existing grade to maintain the 24-foot clearance required beneath the I-5 freeway. As a result, all pedestrian ways, the LRT route and vehicular streets would need to be depressed approximately 18 fee below present grade to pass below the tracks. The ramp approaches required for these underpasses would significantly impact the desire to create an active pedestrian-oriented environment at street level, and would result in a major barrier through the center of the site. In addition, these roadway depressions would significantly impair the movement of disabled people through the property.
>
> The elevation of the Intermodal Transit Station slightly above existing grade (+36-foot elevation) also creates a less desirable flow for passengers circulating between the downtown and the rail platforms. As illustrated in the station design study for this alternative (Figures 14 through 17), a passenger approaching the station from I Street would pass through the historic Southern Pacific Depot at existing grade (+30 feet), and then would need to descend 18 feet below the tracks and the ascend 26 feet to reach the platforms. As discussed below, the recommended concept at 7th and North B Streets would require only one change in elevation for passengers (e.g., from existing grade up 25 feet to the rail platforms).
>
> The need for undercrossings beneath the Intermodal Transit Station and main line also impacts the desire to preserve the historic core of the Central Shops as a unique resource. Ramp approaches

on 3rd, 5th and 6th Streets would cut through the Shops complex, significantly affecting the pedestrian environment around, and the linkages between, the Shops buildings.

The alignment of the main line through the center of the Southern Pacific property reduces the potential for residential development on the site because of noise impacts (Figure 18). Both the recommended concept and Scheme Two avoid residential development in areas above 65 dB. As illustrated in Scheme Two, it is estimated that approximately 1,500 units could be achieved in this alternative, or 600 less than the number of units projected for the recommended concept. In addition, maintaining the existing rail alignment along the northern edge of the Alkali Flat neighborhood would preclude the opportunity to link the new and existing residential neighborhoods and to remove the negative effects of the rail along the edge of Alkali Flat.

Although this location of the Intermodal Transit Station is the closest to the existing center of employment in the downtown (e.g., nine blocks from 7th and Capitol Mall), it was concluded that pedestrians will be reluctant to walk this full distance and, given the convenient LRT and bus connections, would likely shift mode. In addition, it became apparent in the analysis that the majority of transit riders would already be on LRT and bus (e.g., 47 percent) rather than on commuter or intercity trains (2 percent). For this reason, the advantage of the Intermodal Transit Station being 9 blocks away from the core as opposed to the 12 blocks from 7th and North B was not felt to be overriding.

The location of the Intermodal Transit Station south of the Central Shops limits future options related to the construction of a rail crossing over the Sacramento River because of the need to maintain the I Street Bridge and river navigation throughout the construction.

8. North "B" and 7th Streets (Alternatives 2-4, 6, 7)

This site is assumed for Alternatives 2-4, 6 and 7 is described in Chapter 3, Description of the Alternatives, and is fully analyzed in those Alternatives. The effects of locating the Intermodal Transit Station on North Bannon are discussed throughout the EIR. The Screening document gives the following reasons for using this site as the basis of the RSP.

This location allows the Intermodal Transit Station to be elevated to a height (approximately +52-foot elevation) that will permit pedestrian ways, the LRT route and vehicular streets to pass under substantially existing grade, thus maintaining the potential for an active pedestrian-oriented environment at street level.

Because of these elevations, the station design (Figures 20 through 23) will allow for the efficient and convenient movement of pedestrians between all modes.

The location of the Intermodal Transit Station astride 7th Street offers the opportunity to create a strong visual landmark that will be visible from the downtown. The creation of a transit- oriented boulevard along 7th Street with the LRT running in the median will reinforce this image and strengthen the linkage between the Intermodal Transit Station and the downtown.

The location allows for the creation of a significant employment-oriented district around the Intermodal Transit Station. As illustrated in the recommended concept (Figure 19), it is estimated that up to 8.0 million square feet of new office development and 780 dwelling units could be developed within two blocks of the Intermodal Transit Station (including the Richards Boulevard area to the north). The type of use projected would be large floorplate support office for major users and employers (e.g., financial institutions, the State of California, data processing centers,

etc.) that would be ideally served by transit and that could successfully institute incentive programs to promote ridership.

The Intermodal Transit Station at 7th and North B Streets would be a positive catalyst for the redevelopment of the Richards Boulevard area, creating strong support for employment-oriented uses to the north of the station. In addition, the station can become a strong activity center that reinforces the linkages between Richards Boulevard, the Southern Pacific Railyards, and the downtown.

The northern alignment of the rail through the property is most advantageous for the Alkali Flat neighborhood, removing a significant barrier and noise source. In addition, its relocation offers opportunities for the light industrial uses that currently exist along the rail line to transition to more compatible and supportive uses, including good opportunities for land use and pedestrian linkages between Alkali Flat and the Southern Pacific development.

The northern alignment of the rail maximizes opportunities for on-site residential by concentrating the highest noise levels on the site with areas of greatest soil contamination (Figures 24 and 25).

The northern alignment provides for a future rail crossing over the Sacramento River as well as the interim use of the I Street Bridge.

There are several constraints related to this alternative which will need to be overcome. First the realignment of the rail to the north of the site and its elevation to a +52-foot elevation is a major action that will require a significant commitment of funds early in the development of the project. The phasing and financing program will need to be carefully developed to assure sufficient revenues (both from on and off-site sources) to realize this option. It should be pointed out, however, that similar commitments of funds would be required for any of the eight options considered.

An additional constraint that would need to be addressed in any of the options is the visual effect of the main line as it passes through the property. The elevation of the rail along the northern edge of the Railyards Area will be carefully treated; landscaped embankments and attractively designed bridge structures that permit visual as well as pedestrian movement will be critical.

6.3.4 SPECIAL CONSIDERATIONS: CONSTRUCTION OF A CONVENTION CENTER

Introduction

During the planning process for the Railyards Area and the Richards Area, the possibility of including in the future land use plans the relocation and construction of a major convention center was discussed. A number of the alternatives evaluated in this EIR include the potential for the construction of such a convention center; however, neither the RASP or the RBAP specifically call for or allow for the construction of such a facility.

This section of the EIR describes the potential locations and relative environmental effects of locating a convention center in the Planning Area.

Description

For the purposes of analysis, in this EIR the convention center is assumed to involve construction a "state-of-the-art" facility of approximately 800,000 to 1 million square feet of meeting and exhibition space. This facility would require approximately 20 acres of land, excluding that needed for parking. Surface parking in the proximity to the convention center could require as much another 30 acres of land. Parking could be providing in a number of forms, including structure parking, surface parking, or below-grade parking. To the extent that structure or below-grade parking was provided, the land requirements could decrease.

A number of locations in the Planning Area could accommodate the construction of major convention center. Within the Railyards Area, the convention center could be constructed on land immediately south of the City water treatment plant (see site #1 on Figure 6.3.6-1). This could only be accomplished where the main rail line was kept in a southerly alignment, its existing alignment, or an alignment immediately south of the Central Shops, as depicted in Alternative 5. Under an alternative in which the rail alignment is changed to the north boundary of the Railyards Area, as is described for Alternatives 2, 3, 4, 6 and 7, the most likely site for a convention center would be within the Central Shops area (see site #2 on Figure 6.3.6-1). This location would require demolition of all the central shops buildings, and construction of the convention center within the Crescent Boulevard loop. In order to provide parking for this location or for the location to the north, structured parking under Interstate-5 would be adequate. Either of these locations within the Railyards Area would provide the necessary proximity to heavy and light rail lines, as well as proximity to Old Sacramento, Downtown Plaza, and the State Capital.

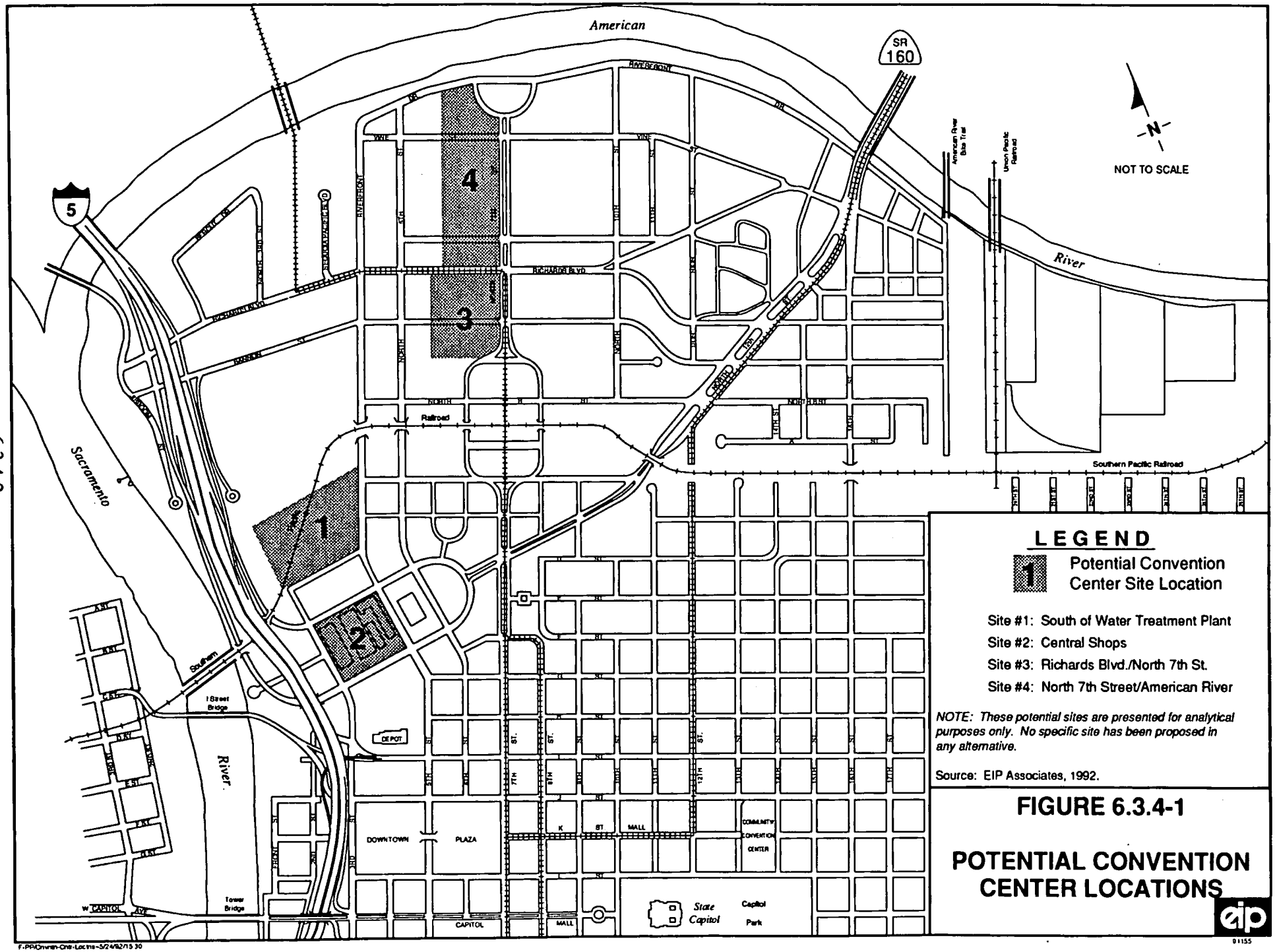


FIGURE 6.3.4-1

POTENTIAL CONVENTION CENTER LOCATIONS

6.3.4-2

Within the Richards Area, a number of locations for the convention center could be considered. Locations along the 7th Street corridor would most likely be able to provide the necessary land for a convention center, as well as the desired proximity to the light rail, circulation access, as well as the potential amenity of the American River. One potential location would be on the site of the State printing plant, at the southwest corner of Richards Boulevard and 7th Street (see site #3 on Figure 6.3.6-1). This location would provide adequate land for the construction of the convention center facility; however, land for the associated parking would have to be provided elsewhere. This location would have the advantage of proximity to both the light rail line along 7th Street and Richards Boulevard, as well as proximity to the Intermodal Transit Station at 7th and North B Street. Another potential location, would be at the northern terminus of 7th Street, where it meets the American River and River Front Drive (see site #4 on Figure 6.3.6-1). The full convention center facility, as well as associated surface parking, could be provided on the 50-acre cannery site at that location. This site would have the advantages of proximity to the light rail line, similar to other potential locations, as well as proximity to the American River Parkway and Riverfront Drive identified in the circulation plan. Further, the provision of service parking in the Richard's Area may be more cost effective than the provision of structured parking farther to the south in the Railyards Area.

Relationship To The Alternatives

A convention center, as described above, could be accommodated at one of the above described locations in a number of the alternatives. Alternative 1, the No Project Alternative, would appear least able to accommodate a convention center, due to the lack of other compatible urban development. Under Alternatives 2, 3, and 4, the most likely locations for the convention center would be at the south east corner of 7th and Richards Boulevard, or on the Central Shops complex location. Under Alternatives 2, 3, and 4 the location at the northern terminus of 7th Street in the Richards Area would not be compatible with the desire for that area to be a major residential neighborhood.

Under Alternative 5, the potential locations for the convention center would be on land immediately south of the city water treatment plant within the Railyards Area, at the Central Shops complex in the Railyards Area, or at the southwest corner of Richards Boulevard and 7th Street in the Richards Area. Under this alternative the Railyards Area convention center locations would be far preferable to the Richards location, due to the presence of the Intermodal Transit Station at the northern end of the Railyards Area.

Under Alternative 6, the convention center could be located at either the northern terminus of 7th Street at the American River, at the southwest corner of Richards Boulevard and 7th Street, or on the Central Shops complex location. This would be the one alternative where the location at the northern terminus of 7th Street would be compatible with other future planned development in the vicinity. Under Alternative 7, the potential locations of the convention center would be the same as those as under Alternatives 6. The location at the northern terminus of 7th Street could cause the mixed use designation in Alternative 7 to generate a greater balance of non-residential uses than without the convention center.

Environmental Implications

The environmental implications of construction of a "state-of-the-art" convention center in the Planning Area are dependant upon the ultimate location of the convention center, the ultimate specific design in the circulation system associated with the convention center, and the displaced potential uses that would otherwise be located at that site.

Traffic and Circulation

A convention center of the size contemplated in this chapter would have the potential for substantial traffic generation and significant effects on the roadway network immediately around the facility. The specific location of a convention center, in relation to the availability of alternative modes of transportation, including light and heavy rail, would be a major determinant in the types of roadway impacts that are generated by the facility. The greater roadway impacts of a convention center would most likely occur during the AM peak hours. It is during this time that most conventions are initiated and when most employees would arrive at the facility. Traffic to-and-from a convention center throughout the day is spread out, minimizing the potential effects on the PM peak hour traffic flow.

The trip generation character of a convention center likely would be less than those of high-density office. To the extent that a convention center would replace office uses in certain locations, particularly the southwest corner of Richards Boulevard and 7th Street, a convention center would decrease overall traffic impacts from those alternatives. To the extent that the convention center would replace residential uses, particularly north of Richards Boulevard, the convention center would generate increased peak hour, peak direction traffic. The actual relationship between a convention center traffic and residential traffic is highly dependant upon the density of the residential development.

The location of a convention center in the Railyards Area, either at the Central Shops complex location or the south of the water treatment plant location, would likely generate fewer traffic impacts than those locations in the Richards Area. This is due to both the proximity of the Railyards Area to light rail and heavy rail, and the proximity of the Railyards Area to other visitor-serving uses, such as Old Sacramento, Downtown Plaza, the State Capital, and other uses in the existing CBD.

Cultural Resources

In the event that a convention center was located at the Central Shops complex location, all of the existing historic Central Shops buildings would be demolished. Location of a convention center at the other potential sites would not have significant effects on historic or other cultural resources in the Planning Area.

Biological Resources

The location of a convention center within the Railyards Area, or at the 7th and Richards Boulevard location, would have no impacts on biological resources beyond those described for other uses within the Alternatives. Location of a convention center at the northern terminus of 7th Street could increase the level of human activity along the south shore of the American River and within the American River Parkway. This increased level of activity, beyond that associated with residential or office uses in the other alternatives, could generate more impacts on a natural environment of the American River Parkway, and potential incompatibility with the American River Parkway Plan, than was described for the Alternatives. It is not likely, however, that the impact of a convention center would be substantially greater than other intense urban uses at that location.

6.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

6.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Introduction and Background

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. CEQA Section 15126(d)(2) states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives. The following discussion compares the No Project Alternative to the other alternatives, and Alternatives 2 through 7 to each other, to determine which of the alternatives would be the environmentally superior alternative.

With the exception of the No Project Alternative, the Alternatives included in this EIR would result in many similar environmental impacts, despite being divergent in terms of the mix of land uses contained in the Planning Area. In some cases, one Alternative has a particular set of impacts that do not occur for all alternatives. Thus, while the impacts may differ between alternatives, the number of impacts are somewhat constant. As such, the identification of an environmentally "superior" alternative is not simply a matter of comparing the number of significant impacts. Designating a superior alternative depends in large part on what environmental effects one considers most important. For example, one alternative may have greater impacts on biological resources, while another may have greater impacts on historic resources. To suggest that one of these alternatives is environmentally superior assumes a particular set of values. This EIR does not presume to make such a suggestion; rather the determination of which impacts are more important is left to the reader and to the decision makers.

Finally, it should be noted that environmental considerations are one portion of the factors that must be considered by the public and the decision makers in deliberations on the Plan documents and the Alternatives. Other factors of importance include urban design, economics, social factors, fiscal considerations.

Alternative 1: No Project

Of the Alternatives evaluated in this EIR, the No Project Alternative would allow for the least amount of new development within the Planning Area. Although this limited level of development would generate the fewest new impacts within the Planning Area, in all likelihood the development would occur elsewhere in the region and impacts would occur in other locations. Development scattered through the region, or concentrated at locations less centrally located, would generate traffic and air quality impacts greater than those of the Alternatives since trip lengths would be longer and the availability of transit would be much less, increasing the percentage of single-occupant vehicle trips.

Further, there are a number of impacts within the vicinity of the Planning Area that would be exacerbated by the lack of new infrastructure that would be provided in Alternatives 2 through 7. These impacts include:

- Traffic circulation on the local downtown street system that would not be expanded with access through the Planning Area;
- Impacts on the downtown freeway ramps without the expanded capacity of freeway ramps to be included in the infrastructure to support Alternatives 2 through 7;
- Impacts on the combined storm drainage/sewer system which would not be improved within the Planning Area;
- Impacts on the historic Central Shops complex which could be vacated under the No Project Alternative without potential for adaptive reuse; and
- Potentially increased impacts associated with hazardous materials since (1) the economic incentive for remediation would be removed, and (2) the cleanup levels may be lower than they would be with the future development activities of Alternatives 2 through 7.

From these perspectives, the No Project Alternative would be environmentally inferior to the other Alternatives.

Alternatives 2 through 7

Alternatives 2 through 7 call for varying levels of intense urban redevelopment of the Planning Area. The Alternatives vary in terms of the relative amounts of office, commercial, residential, and other uses. The Alternatives have a similar assumed infrastructure system, with the exception of Alternative 5, which is designed around an Intermodal Transit Station located at the "South of Shops" location and which would continue to use the existing "I" Street Bridge for rail operations.

All of the Alternatives would have unavoidable significant impacts on the regional freeway system (Interstate 5 and SR 160). Impacts on the local roadway system are minimized by Alternatives 4 and 5 since they would have significant impacts at only 4 of 33 study intersections and no unavoidable significant impacts. At the opposite end of the spectrum, Alternative 6 would have significant impacts at 16 intersections in the AM and PM peak hours and 14 of these would be significant and unavoidable. The majority of related impacts, such as air quality and noise, are generated to a large degree by cumulative development and traffic operations, and are similar in magnitude among the Alternatives.

Impacts on infrastructure, in particular on the sewer and storm drainage systems, would be similar in all of the Alternatives since the greatest effect of the Alternatives is to replace the existing systems with new separated sewer and storm drain systems.

The impacts associated with hazardous materials could vary between the Alternatives. To the extent that some Alternatives call for greater amounts of housing located on known or potentially contaminated soils, the potential for long-term exposure of residents could be higher for Alternatives with more housing. However, to the extent that regulators require the more extensive remediation of residential properties, the potential for long-term exposure could be decreased as compared to alternatives with fewer housing units.

In terms of historic resources, distinct differences exist between the Alternatives. Alternatives 4, 6 and 7 would directly preserve the most historic buildings in the Railyards Area through adaptive reuse of the Central Shops. Alternative 5 call for the preservation of all of the same structures, but the presence of the SP main line in this Alternative would separate the Central Shops from the downtown area, limiting the potential reuse of these structures. Alternatives 2 and 3 would allow for the removal of all or some of the Central Shop Structures. Alternative 1 could jeopardize the future of the historic structures by limiting the economic future of the Railyards Area.

Only Alternative 5 calls for the continued use of the "I" Street Bridge; all other Alternatives call for the construction of a new rail bridge across the Sacramento River. The new rail bridge would create impacts on the riparian and riverine habitats due to construction of, and placement of footings for, the new bridge.

Impacts on the school systems would be lower with those Alternatives that have smaller amounts of new housing development, especially Alternative 6. However, Alternative 6 is identified in the EIR as being less supportive of the overall set of goals and policies of the local plans because by providing for extensive office development with little housing, it is not as balanced in its overall mix of land uses as other Alternatives.

Conclusion

As can be seen from the discussion above, each Alternative possesses a unique set of environmental strengths and weaknesses. The determination of which set of environmental characteristics are most important is most appropriately left to the reader and to the decision makers. Once again, it should be noted that environmental considerations are one set of the factors that must be considered by the public and decision makers and must be considered along with urban design, economics, social factors, and social considerations.

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