

DEPARTMENT OF
PUBLIC WORKS

OFFICE OF THE DIRECTOR

CITY OF SACRAMENTO
CALIFORNIA

CITY HALL
ROOM 207
915 I STREET
SACRAMENTO, CA
95814-2673

916-449-5283

MELVIN H. JOHNSON
DIRECTOR
LESLIE M. FRINK
DEPUTY DIRECTOR
REGINALD YOUNG
DEPUTY DIRECTOR

February 9, 1988

Joint Transportation and Community Development and Budget and Finance Committee
Sacramento, California

Honorable Members in Session:

SUBJECT: RESOLUTION AUTHORIZING NEGOTIATION AND EXECUTION OF AN
AGREEMENT WITH A SPECIAL TAX CONSULTANT/BENEFIT ENGINEER AND
WITH A REAL ESTATE APPRAISAL FIRM AND APPROPRIATING FUNDS IN
CONNECTION WITH THE FORMATION OF THE NORTH NATOMAS MELLO ROOS
COMMUNITY FACILITIES DISTRICT

SUMMARY

This report recommends that the City Manager be authorized to negotiate and execute an agreement with a Special Tax Consultant/Benefit Engineer and with a real estate appraisal firm for services connected with forming the North Natomas Mello Roos Community Facilities District. It also recommends that funds in the amount of \$189,284 be advanced to the project from the General Fund Contingency Reserve and \$189,284 from the Drainage Fund Reserve until such time as the District is formed and bonds are sold. Please see attached report to City Council.

PROJECT DESCRIPTION

See the attached report to City Council.

FINANCIAL

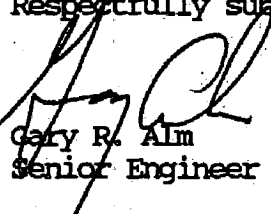
See the attached report to City Council.

Joint Transportation and Community Development
and Budget and Finance Committee
February 9, 1988
Page 2

RECOMMENDATION

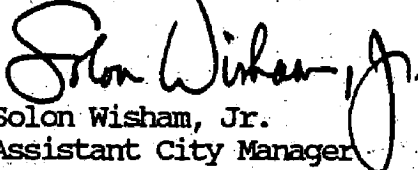
It is recommended that the attached resolution which authorizes the City Manager to negotiate and execute an agreement with a Special Tax Consultant/Benefit Engineer and with a real estate appraiser and that funds in the amount of \$189,284 be appropriated from the General Fund Contingency Reserve and \$189,284 from the Drainage Fund Reserve to fund one-half of the cost of these agreements and related staff expenses be forwarded to City Council for approval.

Respectfully submitted,



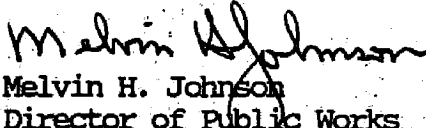
Gary R. Alm
Senior Engineer

RECOMMENDATION APPROVED:



Solon Wisham, Jr.
Assistant City Manager

APPROVED:



Melvin H. Johnson
Director of Public Works

February 9, 1988
District 1

February 9, 1988

RESOLUTION NO.

ADOPTED BY THE SACRAMENTO CITY COUNCIL ON DATE OF

**RESOLUTION AUTHORIZING NEGOTIATION AND EXECUTION OF AN
AGREEMENT WITH A SPECIAL TAX CONSULTANT/BENEFIT
ENGINEER AND WITH A REAL ESTATE APPRAISAL FIRM
AND APPROPRIATING FUNDS IN CONNECTION WITH THE
FORMATION OF THE NORTH NATOMAS MELLO ROOS COMMUNITY
FACILITIES DISTRICT**

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF SACRAMENTO, THAT:

1. The 1987-1988 Capital Improvement Budget is hereby modified by the addition of a project entitled North Natomas Mello Roos Community Facilities District with funding from the General Fund, Drainage Fund and Capital Grants Fund, as provided herein. Expenditure of funds is contingent on the receipt of signed participation and reimbursement agreements from landowners and deposit of associated funds to Capital Grants Fund 248.

2. The General Fund Budget is amended by increasing the Capital Improvement Project offset within the Engineering/Development Operating Budget (101-310-3136-4710) <\$27,788> due to offsets available from the Capital Project for North Natomas Mello Roos Community Facilities District and increase the General Fund Contingency (101-710-7012-4999) by \$27,788 based on new offsets available to the Public Works, Engineering, Development budget.

3. Funds in the amount of \$189,284 are transferred from the General Fund Contingency Reserve (101-710-7012-4999) and \$189,284 from the Drainage Fund Reserve (425-710-7012-4999) to the North Natomas Mello Roos Community Facilities District Project as follows:

101-500-XXXX-4802	Design	\$110,000
101-500-XXXX-4812	Appraisal	32,500
101-500-XXXX-4831	Indirect Costs	28,042
101-500-XXXX-4880	Staff	13,894
101-500-XXXX-4499	Miscellaneous Supplies	1,500
101-500-XXXX-4414	Contingency	3,348

425-500-XXXX-4802	Design	110,000
425-500-XXXX-4812	Appraisal	32,500
425-500-XXXX-4831	Indirect Costs	28,042
425-500-XXXX-4880	Staff	13,894
425-500-XXXX-4499	Miscellaneous Supplies	1,500
425-500-XXXX-4414	Contingency	3,348

	Total	\$378,568

4. Revenue in the amount of \$378,568 be recognized in the Capital Grants Fund (248-500-XXXX-3651) based on signed agreements with landowners for participation in the North Natomas Mello Roos Community Facilities District.

5. The amount of \$378,568 be budgeted in the Capital Grants Fund based on the receipt of anticipated revenues as follows:

248-500-XXXX-4802	Design	\$220,000
248-500-XXXX-4812	Appraisal	65,000
248-500-XXXX-4880	Staff	27,788
248-500-XXXX-4831	Indirect Costs	56,084
248-500-XXXX-4499	Miscellaneous Supplies	3,000
248-500-XXXX-4414	Contingency	6,696

	Total	\$378,568

6. The City Manager is authorized to negotiate and execute a consultant services agreement with Raymond Vail & Associates in an amount not to exceed \$440,000 for the purpose of providing special tax consultant/benefit engineer services for the North Natomas Mello Roos Community Facilities District.

7. The City Manager is authorized to negotiate and execute a consultant services agreement with a Real Estate Appraisal firm in an amount not to exceed \$130,000 for the purpose of preparing a real estate appraisal report and appraisals of individual parcels in North Natomas.

MAYOR

ATTEST:

CITY CLERK



DEPARTMENT OF
PUBLIC WORKS

OFFICE OF THE DIRECTOR

CITY OF SACRAMENTO
CALIFORNIA

CITY HALL
ROOM 207
915 I STREET
SACRAMENTO, CA
95814-2673

916-449-5283

February 9, 1988

City Council
Sacramento, California

MELVIN H. JOHNSON
DIRECTOR
LESLIE M. FRINK
DEPUTY DIRECTOR
REGINALD YOUNG
DEPUTY DIRECTOR

Honorable Members in Session:

SUBJECT: RESOLUTION AUTHORIZING NEGOTIATION AND EXECUTION OF AN AGREEMENT WITH A SPECIAL TAX CONSULTANT/BENEFIT ENGINEER AND WITH A REAL ESTATE APPRAISAL FIRM AND APPROPRIATING FUNDS IN CONNECTION WITH THE FORMATION OF THE NORTH NATOMAS MELLO ROOS COMMUNITY FACILITIES DISTRICT

SUMMARY

This report recommends that the City Manager be authorized to negotiate and execute an agreement with a special tax consultant/benefit engineer and with a real estate appraisal firm for services connected with forming the North Natomas Mello Roos Community Facilities District. It also recommends that funds in the amount of \$189,284 be advanced to the project from the General Fund Contingency Reserve and \$189,284 from the Drainage Fund Reserve until such time as the District is formed and bonds are sold. This request was reviewed by the Joint Transportation and Community Development and Budget and Finance Committee on February 9, 1988.

BACKGROUND

In accordance with the North Natomas Community Plan (ref. p. 57) and in conjunction with the Ralph Andersen Study, the Department of Public Works has completed the financing study and the Infrastructure Design Report for North Natomas. The Infrastructure Design Report provides a summary of the engineering studies completed to date, a financial section and specific recommendations pertaining to development of the Financing Plan.

In order to complete the Financing Plan, it is necessary to proceed with forming a Mello Roos Community Facilities District for North Natomas. During the formation process, the City will complete an appraisal of land values, determine the ability of the district to support bonded debt and confirm the development schedules of various landowner groups. This information will be essential in

finalizing the structure of other funding mechanisms and thus completion of the Financing Plan.

A draft copy of the Infrastructure Design Report is submitted herewith for informational purposes. A copy of the Andersen study is provided via separate cover. The Infrastructure Design Report together with the completed Financing Plan will be submitted at a later date for Council approval and adoption as part of the North Natomas Community Plan.

At the present time federal studies are underway to determine specific flood protection improvements needed for North Natomas and the surrounding area. While the results of these studies may affect initial development schedules for North Natomas, the landowners have expressed their desire to proceed with the North Natomas Mello Roos District and to complete the Financing Plan. With reference to the Infrastructure Design Report, flood protection improvements have not been included in the proposed Mello Roos District at this time. Following the completion of federal studies, the cost of these improvements may be included either during formation of the District or at a later date by amending the District.

PROJECT DESCRIPTION

The financing of certain public improvements for North Natomas is dependent upon the formation of a Mello Roos Community Facilities District. This district will be established in accordance with the Mello Roos Community Facilities Act of 1982 and is expected to include all or a major part of the 9,320 acre Community Plan area. Bond proceeds will be used to finance freeway, drainage, regional park and other public improvements as recommended in the Infrastructure Design Report. The total value of bonds to be issued is presently estimated at approximately \$200 million.

In order to proceed with the Mello Roos District, it is necessary to hire a special tax consultant/benefit engineer and a real estate appraisal consultant to provide services during the formation process. The services to be provided by each firm are discussed below.

REAL ESTATE APPRAISAL CONSULTANT

The ultimate security for the bonds issued under Mello Roos proceedings is the value of land within the district boundaries. Accordingly it is necessary to conduct a formal appraisal of land values and to include the appraisal report in the Official Statement of the Mello Roos bond offering.

In accordance with City guidelines for retention of professional consultants, the Department of Public Works has interviewed four (4) real estate appraisal firms qualified to perform MAI appraisals (Member, American Institute of Real Estate Appraisers). Haley, O'Brien and O'Brien, Inc. of San Francisco has been recommended as the most qualified firm for the project. Contract negotiations are presently underway and are expected to be completed within the next several days. In the event that an agreement on contract terms cannot be reached, the Department of Public Works will begin negotiations with Clark-Wolcott Co. Inc.

of Sacramento who is recommended as the next most qualified firm. Based on negotiations completed to date, the total fee for services will not exceed \$130,000.

SPECIAL TAX CONSULTANT/BENEFIT ENGINEER

This consultant will play a key role in assisting the City in establishing the Mello Roos District. The services to be provided include the preparation of the district boundary maps, area calculations, development of a phasing plan, cash flow analysis, tax rate formulas, engineering report and other miscellaneous tasks anticipated during the formation process.

In accordance with City guidelines for retention of professional consultants the Department of Public Works has requested and received proposals from four (4) firms qualified to provide these services. Raymond Vail & Associates (RVA) of Sacramento was selected as the firm most qualified for the project. The RVA proposal includes the firm of Dave Taussig and Associates of Los Angeles as a sub-consultant for work related to the special tax formulas. Based on negotiations completed to date, the total fee for services will not exceed \$440,000

FINANCIAL

The agreements for consultant services combine for a total of \$570,000. In addition to consultant services, an amount of \$55,575 has been budgeted in the 1987-88 operating budget to cover the cost of City staff time related to the project through the district formation process. An additional \$112,168 should be appropriated for indirect costs, \$6,000 for miscellaneous costs and \$13,392 for contingency. Thus the total project is estimated at \$757,136.


Ultimately the project cost will be paid for with proceeds of the first bond sale upon district formation. In the interim it is proposed that the major landowner groups provide one-half of the funding (\$378,568) and the City provide the remaining one-half (\$378,568). The City's share would be considered as a loan to the District and would be recovered with interest upon district formation. In the event the District was not formed, the City would be reimbursed through an agreement with the major landowner groups. This reimbursement agreement is in the process of being finalized and will be forwarded to Council in the near future. The subject consultant agreements will not be executed, until the reimbursement agreement is completed and approved by Council.

In consideration of the above costs, it is recommended that a new Capital Improvement Project entitled "North Natomas Community Facilities District" be established and that \$189,284 be appropriated from the General Fund Contingency Reserve and \$189,284 from the Drainage Fund Reserve to the North Natomas Community Facilities District Project to cover these costs. The net impact to the General Fund Contingency is \$161,496 due to the offset of \$27,788 already included in the Public Works operating budget. These amounts shall be a loan to the District and shall be recovered with interest from the proceeds of the bond sales upon district formation.

RECOMMENDATION

It is recommended that Council adopt the attached resolution authorizing the City Manager to negotiate and execute an Agreement with Raymond Vail & Associates, special tax consultant/benefit engineer and to negotiate and execute an Agreement with a Real Estate Appraiser to provide services during formation of the North Natomas Mello Roos Community Facilities District and that funds in the amount of \$189,284 be appropriated from the General Fund Contingency Reserve and \$189,284 from the Drainage Fund Reserve to fund one-half of the cost of these agreements and related staff expenses. This authorization for consultant agreements and appropriation of funds shall be contingent upon executing an agreement with the major landowner groups to provide additional funding and to assure reimbursement of funds to the City.

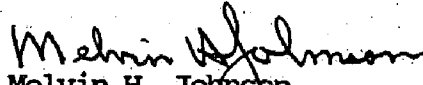
Respectfully submitted,


Gary R. Alm
Senior Engineer

RECOMMENDATION APPROVED:

APPROVED:

Walter J. Slipe
City Manager


Melvin H. Johnson
Director of Public Works

February 9, 1988
District 1

CITY OF SACRAMENTO
DEPARTMENT OF PUBLIC WORKS



INFRASTRUCTURE DESIGN REPORT
FOR
NORTH NATOMAS

PREPARED BY:
DEPARTMENT OF
PUBLIC WORKS
JANUARY 1988

NORTH NATOMAS
INFRASTRUCTURE DESIGN REPORT

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INTRODUCTION

This report has been prepared as a summary document to the infrastructure study phase for North Natomas. It contains an executive summary of each engineering study completed to date and provides an opportunity to review infrastructure needs in both a comprehensive and project specific manner. This report also includes a finance section which provides current cost projections, recommended funding sources and other pertinent information for use in development of the North Natomas Financing Plan.

The North Natomas Community Plan (NNCP) was adopted by the Sacramento City Council on May 13, 1986. The Plan provides for the following land use entitlements within the 9320 acre community plan area:

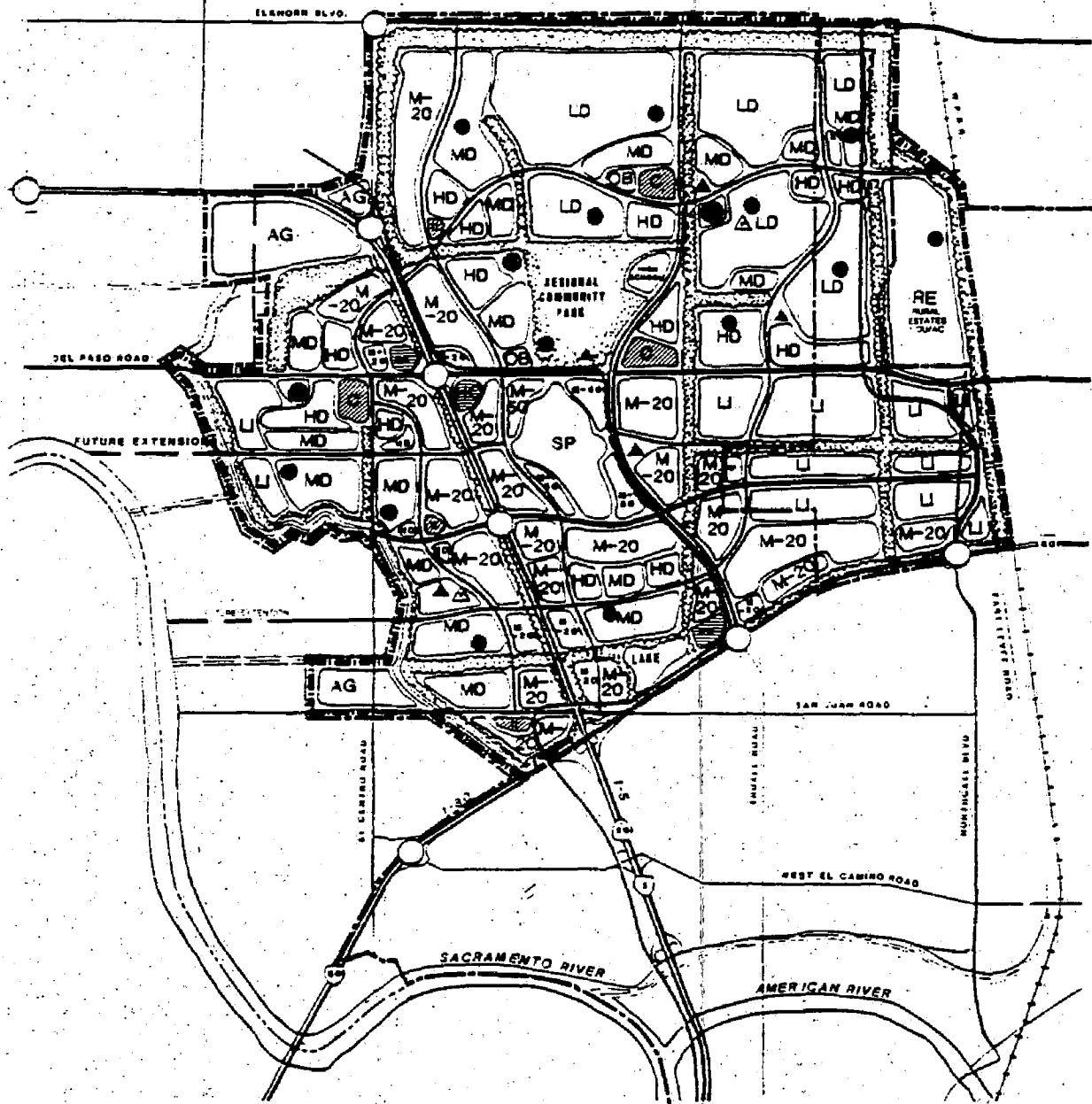
- o Residential uses - 2,883 acres
- o Commercial uses - 388 acres
- o Industrial uses - 2163 acres
- o Civic uses - 293 acres
- o Open space - 3,540 acres

The Plan envisions phased development over a 20 year buildout period. At full development, North Natomas will provide land for 67,000 new jobs and will support a residential population of 62,000. Adoption of the NNCP initiated an extensive engineering effort to study primary infrastructure that would be needed to serve the community. The following reports have been completed.

- Transportation Plan - November 1987
(Street and Freeway Improvements)
- Drainage Study - November 1987
- Sewer Collection System Study - December 1987
- Water Facilities Study - November 1987

Following completion of the environmental review process, these studies will be submitted for formal City Council approval and adoption as part of the NNCP.

NORTH NATOMAS COMMUNITY



PROPOSED LAND USE

HD HIGH DENSITY RESIDENTIAL (2200 AC)

MD MEDIUM DENSITY RESIDENTIAL (1200 AC)

LD LOW DENSITY RESIDENTIAL (700 AC)

COMMUNITY REDEVELOPMENT COMMERCIAL

HIWAY COMMERCIAL

M-20 MANUFACTURING, RESEARCH, DEVELOPMENT 20% OFFICE

M-50 MANUFACTURING, RESEARCH, DEVELOPMENT 50% OFFICE

LI LIGHT INDUSTRIAL

OB OFFICE BUSINESS

SP SPORTS COMPLEX

PAGE OPEN SPACE

SOFTENED BUFFER HIGHWAY TO TRAIL LANDSCAPING

AG AGRICULTURE

ELEMENTARY SCHOOL JUNIOR HIGH SCHOOL

CIVIC/PUBLIC USE (LIBRARY, FIRE STATION, MEDICAL CENTER)

4-LANE DIVIDED MAJOR HIGHWAY OR TRAIL 6-LANE DIVIDED PARKWAY

COMMUNITY PLAN STUDY AREA BOUNDARY CITY OF SACRAMENTO CITY LIMITS SACRAMENTO COUNTY BOUNDARY

PLANNING UNIT MAP, 1987

PRIMARY INFRASTRUCTURE

A special executive summary for each infrastructure study has been included in the Appendix of this report. The following is a brief description of improvements required under each infrastructure category.

Transportation (Major Streets and Freeways)

In accordance with the North Natomas Transportation Plan, the major street network will consist of approximately 34 miles of four, six, and eight lane roadways within and immediately adjacent to the Community Plan area. In addition to roadway improvements, street lighting, canal bridges, median landscaping and traffic signalization at all major intersections will be considered as primary infrastructure improvements.

Freeway improvements will include construction of two new interchanges, one at I-5 and North Market Boulevard, and one at I-80 and Truxel Road; construction of three new overcrossings along I-5; modification of two existing interchanges, one at I-5 and Del Paso and one at I-80 and Northgate; and associated lane widenings of I-5 and I-80.

Drainage

The North Natomas Drainage Study provides that the Community Plan area will be drained by two new major canal systems discharging into the Sacramento River. The area south of Del Paso Road will be served by the "San Juan System." The area to the north of Del Paso Road will be served by the "Del Paso System." Infrastructure includes construction of 2 large pump stations at the Sacramento River, approximately fourteen miles of canal work and approximately nineteen miles of underground pipeline ranging from 36 to 96-inch diameter.

The system proposed by the Drainage study will accommodate storm runoff from the Community Plan area and adjacent lands which are tributary to North Natomas. This system, in itself, is not related to the flood protection studies which are presently being conducted for the Sacramento and American River watershed.

Sewer

Within the Community Plan area, infrastructure will include approximately eighteen miles of trunk and interceptor sewers ranging from 12 to 54 inch diameter. Off-site infrastructure includes construction of a pump station and force main improvements. The sewer system will be owned, operated, and maintained by the County of Sacramento.

Water

Infrastructure for the water system will include approximately fourteen miles of water transmission main ranging from 18 to 36-inch diameter and three large storage tanks with booster pump stations at various locations within the Community Plan area. Total onsite storage is projected at 10 million gallons. Off-site infrastructure will include future treatment plant improvements and extension of two large diameter transmission mains across the American River to the North Natomas area.

PUBLIC FACILITIES/SERVICES

Fire, Library, Police, and Solid Waste.

The North Natomas Environmental Impact Report (EIR) identifies capital costs for Fire, Library, Police, and Solid Waste. The costs are related to the permanent facilities and equipment needed to support these services at full development of North Natomas. The estimates have been reviewed and updated in cooperation with the various City agencies and are included in the finance section of this report.

- Fire: Construction of three new fire stations and relocation of an existing station.
- Library: Construction of a 12,000 square feet library center on a 2-1/2 acre site.
- Police: Construction of one new police sub-station.
- Solid Waste: Additional equipment and maintenance facilities as needed.

Parks and Open Space

The Parks and Open Space System for North Natomas will consist of neighborhood and community parks, greenbelts, buffers, linear parkways, and landscaped freeway corridors. The "centerpiece" of this system will be a two hundred (200)

acre Regional Community Park located along Del Paso Road. Due to the lead time needed for advance planning of the Regional Park, the finance section of this report will address acquisition of the 200 acres and the perimeter improvements, required to serve the park property. A separate report entitled "Parks and Open Space Program for North Natomas" is being prepared to address on-site development and maintenance of the Regional Park as well as the other components of the Parks and Open Space System.

Planning/Studies

The NNCP requires that the City will be reimbursed for all planning expenses incurred during preparation of the Community Plan and related documents. At present, these items include the NNCP, drainage studies, transportation studies and associated environmental reports. A current cost projection of these activities has been included in the finance section of this report.

Flood Control

At the present time, Federal studies are under way to determine what additional flood protection is needed in the Natomas area. Depending on the results of these studies, it may be necessary for North Natomas to participate in the cost of certain off-site flood control improvements.

Ongoing Studies

While the primary infrastructure studies are complete, other studies both directly and indirectly related to North Natomas will be developed during the next several months.

<u>Study</u>	<u>Projected Completion Date</u>
Public Transit Plan - Regional Transit	July 1988
American River Crossing Study	March 1988
Transportation Systems Management Plan (TSM)	Sept 1988
Parks and Open Space Plan	Sept 1988
North Natomas School Study	July 1988
Flood Control Studies	July 1988

Once these studies have been completed, the cost of related improvements and/or mitigation measures can be included in the Finance Plan.

FINANCE UPDATE

Development Agreements

The NNCP requires that each developer enter into a "development agreement" with the City to guarantee financial participation in the cost of infrastructure, public facilities and monitoring programs required to implement the NNCP. On May 5, 1987, a draft form of the agreement was approved by City Council (Ordinance No. 87-036). Article 3 of the Development Agreement states:

"The developers shall participate in the Financing Plan, as made applicable to the development of the subject properties, and shall faithfully and timely comply with each and every provision thereof. Without limiting the foregoing, applications for special permits, subdivision maps or other land use entitlements and building permits may be made subject to the Developers participation in and compliance with the Financing Plan."

With this provision, it is important to recognize that the Financing Plan to be adopted by the City needs to address all costs of NNCP implementation including those related to ongoing studies and to clearly specify the level of financial participation that each developer (and/or landowner) will be responsible for.

Financing Plan

Prior to completion of the infrastructure studies, three reports related to the financial planning of North Natomas were prepared. An initial study entitled "Fiscal and Financial Analysis" was completed in 1985 as part of the Environmental Impact Report. Two later reports were submitted by Ralph Andersen & Associates, the most recent in September 1987.

While each of these reports are conceptual in nature, they provide useful information in terms of preliminary recommendations and identification of potential problem areas. In review of the financial analysis prepared to date, it becomes apparent that development of a long term Financing Plan, as intended

by the NNCP, will be dependent on identifying the total cost relating to development and implementation of the NNCP. Accordingly, the ongoing studies need to be completed to the extent that all improvement and public facilities costs can be determined. In addition, land values need to be appraised to demonstrate the ability of the land to support bonded debt for the Mello Roos and special assessment districts.

In consideration of these factors the following schedule is recommended to complete the financial planning for North Natomas:

- o Initiate and obtain landowner approval for a Mello Roos Community Facilities District to finance the infrastructure and public facilities as recommended herein.

- o Establish a Landscaping and Lighting District to provide a funding source for the Parks and Open Space Plan.

- o Develop a long term Financing Plan which identifies funding sources for all improvements including those associated with ongoing studies.

- o In conjunction with final city approval of the Mello Roos District, adopt this Infrastructure Design Report and the Financing Plan as an element of the North Natomas Comprehensive Plan.

Cost Projections

Based on the studies completed to date, the current engineers estimate for North Natomas infrastructure and public facilities is summarized as follows:

Major Streets	\$135,421,000
Freeways	28,604,000
Drainage	118,830,000
Sewer	30,623,000
Water	48,042,000
Public Facilities/Services	<u>26,935,000</u>
TOTAL	\$388,455,000

The estimate is based on 1987 construction prices. Improvement costs have been compared with similar projects in the local Sacramento area. The estimate includes an allowance for engineering, administration, and contingencies. Land costs are estimated on an assumed average value of \$50,000 per acre. A detailed breakdown of this estimate is shown on Table 1.

Other North Natomas costs not included in this estimate are the subject of ongoing studies. These include the North Natomas Public Transit Plan, American River Crossing Study, Transportation Systems Management Plan (TSM), Parks and Open Space Plan, School Study and the Flood Control Study.

Sources Of Financing

For the purposes of this report, four financing categories have been considered for the primary infrastructure, public facilities and services described herein.

- o Mello Roos Community Facilities District
- o Fee Revenue
- o Landscape and Lighting District
- o Other Financing Sources

It is recommended that the Mello Roos district be established first. Information developed during formation of this district, such as appraised land values and development schedules of the various landowner groups will be essential in finalizing the structure of the other financing methods and completion the Financing Plan.

Mello Roos Community Facilities District

This financing mechanism will be established in accordance with the Mello Roos Community Facilities Act of 1982. Although similar to assessment district bond financing, it provides the needed flexibility in staging bond issues and thus, to a certain degree, allowing infrastructure costs to be phased with development. It also requires that the improved land has sufficient appraised value to support the costs before bonds can be sold.

It is contemplated that the District will include the entire Community Plan area. Agreements with the County of Sacramento will be necessary to include the unincorporated areas. The costs will be spread by levying a special tax to all properties within the District as approved by the landowners and authorized by City Council.

In consideration of infrastructure priorities, development phasing and cost, the following items are recommended for financing under the Mello Roos District.

Drainage	\$118,830,000
Freeways	28,604,000
Regional Park	15,018,000
Fire, Library, and Police	8,437,000
Planning/Studies	<u>2,500,000</u>
Subtotal Project Cost	\$173,389,000
Bond Issuance	<u>26,008,000</u>
Total District Cost	\$199,397,000

This list is considered to represent the minimum infrastructure and public facilities required to insure implementation of the NNCP. It is not intended to preclude the addition of other required improvements including major streets. Subject to sufficient appraised land values and agreement among property owners, additional infrastructure and/or public facilities can be included. This can be done during the initial formation process or at a later date by amending the district.

Fee Revenue

City and County agencies will typically use fee revenue to fund the cost of regional infrastructure and/or improvements that will serve a large community or area. In the case of North Natomas, fee revenue generated from development of the Community Plan area becomes an important funding source to be considered in the long term financing plan.

Major Streets. All streets shown on the Master Transportation Plan are classified as "Major Streets." As such, the City has the authority to contribute

towards the cost by using the Major Street Construction Fund. Pursuant to Section 38.140 of the City Code, this fund receives revenue from an excise tax (commonly referred to as "Major Street Tax"), which is collected city wide through the building permit process. This fund is set up for use in a number of transportation related improvements and is distributed on a regional basis depending on the public need priority.

Under this program, the City may reimburse developers for a portion of the major street construction cost in North Natomas. In accordance with City Code, the reimbursement is limited to a specific portion of the street and is subject to the availability of adequate funds.

For North Natomas, it is recommended that reimbursement agreements be executed with developers who construct the major streets. The agreements will provide for reimbursement of eligible costs after acceptance of improvements and at such time when funds become available from tax revenue generated from North Natomas development. A break down of the total major street cost and estimated reimbursements is indicated on Table 4.

Sewer. Sanitary sewer service for North Natomas will be the responsibility of Sacramento County. County Sanitation District No. 1 (CSD-1) will be responsible for all local collection systems. The Sacramento Regional County Sanitation District (SRCSO) will provide for transport, treatment, and disposal of wastewater.

Construction of major sewer infrastructure (pipelines and pump stations of greater than one million gallons per day capacity) will be funded by these agencies through the collection of connection fees and service charges. Facilities of lesser capacity are the responsibility of the developer. SRCSO is currently preparing a cash flow analysis to compare North Natomas fee revenue to anticipated expenditures. This analysis will be included as a supplement to the Sewer Collection System Study being prepared for SRCSO by the engineering firm of CH2M Hill.

SRCSO has indicated that North Natomas developers will be allowed to construct

trunk and interceptor sewers within the Community Plan area. After completion and acceptance of these facilities, the developers will be reimbursed for eligible costs within a specified period of time through an agreement with SRCSD.

With regard to the EPA penalty (reference NNCP Page 127), the SRCSD is preparing two ordinances to impose a special connection fee surcharge to applicable areas of the District. Fee revenue will be used to reimburse developers who will have made funding available to SRCSD to pay the penalty.

Water. In accordance with the Water System Study for North Natomas (see Appendix), it is recommended that the entire cost of water infrastructure can be financed by fee revenue collected by the City. To facilitate initial development, it is recommended that the City can enter into agreements with developers to allow private construction and initial financing of certain portions of on-site infrastructure such as transmission mains, water tanks, etc. Under terms of the agreement, the City would accept and acquire the completed improvement as a public facility and reimburse the developer for eligible construction costs. All other water infrastructure will be constructed by the City on an "as needed" basis as development proceeds.

Solid Waste. In accordance with standard City policy, the entire cost of additional solid waste facilities and equipment necessary for North Natomas will be financed by the City's Solid Waste Enterprise Fund. Fee revenue from North Natomas (user fees) is projected to meet or exceed cost allocations.

Landscaping and Lighting District

The 1972 Landscaping and Lighting Act allows creation of a special assessment district to fund the cost of certain improvements and the subsequent maintenance of those improvements. Annual assessments are levied on benefitting properties within the district. It is recommended that a Landscape and Lighting District be considered as the primary financing mechanism for the North Natomas Parks and Open Space Plan currently being prepared by the City. Once this plan has been completed and costs have been identified, implementation of the District can proceed. Improvement and maintenance costs expected to be financed by the District include, neighborhood and community parks, greenbelts, linear parkways,

bikeway systems, landscaped freeway corridor, and the North Natomas share of the 200 acre Regional Community Park.

Other Financing Sources

Other sources of financing include developer funding, special assessment districts, future Mello Roos financing, and local funding, etc. The improvements which fall into this category include a portion of the major street cost and all improvements associated with the ongoing studies (see page 4). Following formation of the initial Mello Roos district, it is anticipated that the remaining studies will be completed to the extent that a specific funding source for each improvement can be identified in the Financing Plan.

NORTH NATOMAS INFRASTRUCTURE DESIGN REPORT

FUNDING SOURCE SUMMARY

	PROJECT COST	MELLO ROOS DISTRICT	CITY/COUNTY CONTRIBUTION	LANDSCAPING & LIGHTING DIST	OTHER SOURCES
Major Streets	\$135,421,000		\$ 9,812,000 ⁽¹⁾		\$125,609,000
Freeways	28,604,000	\$ 28,604,000			
Drainage	118,830,000	118,830,000			
Sewer	30,623,000		30,623,000 ⁽²⁾		
Water	48,042,000		48,042,000 ⁽³⁾		
Regional Park	15,018,000	15,018,000			
Fire, Library, Police	8,437,000	8,437,000			
Solid Waste	980,000		980,000 ⁽⁴⁾		
Planning/Studies	2,500,000	2,500,000			
Parks & Open Space Plan	TBD			TBD	
(5) Ongoing Studies	TBD				TBD
TOTAL	\$388,455,000	\$173,389,000	\$ 89,457,000		

(1) Major Street Construction Fees (See Table 3)

(2) Sewer Connection Fees (County)

(3) Water Development Fees

(4) User Fees (Solid Waste Enterprise Fund)

(5) Ongoing studies include Schools, Public Transit, American River Crossing, Transportation System Management (TSM), Monitoring Program Study and Flood Control

TBD Indicates cost "To be Determined" upon completion of study or plan.

NORTH NATOMAS INFRASTRUCTURE DESIGN REPORT

PROJECTED FEE REVENUES AND ALLOCATIONS

FEE CLASSIFICATION	PROJECTED REVENUE	PROPOSED ALLOCATION	IMPROVEMENT	COMMENTS
Major Street Construction Tax	\$ 20,800,000	\$ 9,812,000	Major Streets	Revenue @ 0.8% building permit valuation. Permit Valuation per Andersen Study 9/87
Sewer		(3)		
San. Dist. NO. 1 (Trunk Fee)	not available	30,623,000	Sewer Infrastructure	Revenue study underway by County of Sacramento
Regional San. Dist. (CIE Fee)	" "			
Annexation Fee	" "			
Surcharge Fee (EPA)	6,100,000	6,100,000	EPA Fee	Revenue study underway by County of Sacramento
Water Connection Fees	48,042,000	48,042,000	Water Infrastructure & Treatment Plant	Revenue: \$32.1 million North Natomas, \$15.9 million regional
Solid Waste User Fees	980,000	980,000	Solid Waste Equip. & Facilities	Revenue will meet or exceed cost allocation. Source: City of Sacramento
Residential Construction	10,275,000	-0-		Revenue @ \$315 per residential dwelling unit for 32,618 units. Source: City of Sacramento.

Notes:

1. Allocation costs based on current year dollars.
2. Revenue projections based on present rate schedules.
3. County of Sacramento allocation.

NORTH NATOMAS INFRASTRUCTURE DESIGN REPORT

MAJOR STREET FUND CONTRIBUTION SUMMARY

	CLASS	WIDTH (FT)	LENGTH (LF)	BASIC STREET COST	MAJOR STREET FUND CONTRIBUTION
MAJOR STREETS					
Truxel Rd., San Juan to I-80	6-LN	136	1,800	\$ 1,005,300	\$ 110,000
Truel Rd., I-80 to Del Paso	8-LN	158	8,250	5,051,700	800,000
Del Paso Rd., I-5 to Truxel	8-LN	158	5,400	3,306,300	524,000
Del Paso Rd., Truxel to Northgate	6-LN	136	9,600	5,360,700	586,000
N. Market, I-5 to Truxel	6-LN	136	4,000	2,233,500	244,000
N. Market, Truxel to S. Loop	4-LN	100	1,700	891,600	68,000
E. Commerce, San Juan to S. Loop	4-LN	100	3,300	1,731,400	132,000
E. Commerce, S. Loop to Del Paso	6-LN	136	8,300	4,633,900	506,000
S. Loop Rd., I-5 to Commerce	4-LN	100	1,000	524,600	40,000
S. Loop Rd., E. Commerce to Del Paso	6-LN	136	11,400	6,364,800	695,000
San Juan Rd., I-5 to E. Commerce	4-LN	100	800	420,000	32,000
Northgate, I-80 to N. Market (1)	6-LN	136	2,400	1,636,400	0
Northgate, N. Market to Del Paso (1)	4-LN	100	5,800	4,150,000	232,000
Midway Rd., I-5 to E. Commerce	4-LN	80	800	420,000	32,000
Del Paso Rd., W. Boundary to I-5	6-LN	136	6,300	3,517,200	384,000
N. Market, El Centro to I-5	6-LN	136	2,750	1,535,700	168,000
N. Commerce, San Juan to El Centro	4-LN	100	11,400	5,980,100	456,000
S. Loop Rd., El Centro to I-5	4-LN	100	5,000	2,623,200	200,000
San Juan Rd., W. Boundary to I-5	4-LN	100	8,000	4,196,900	320,000
El Centro, San Juan to Del Paso	6-LN	136	10,200	5,695,000	622,000
Midway Rd., El Centro to I-5	4-LN	80	2,800	1,469,000	112,000
Truxel Rd., Del Paso to Elkhorn	6-LN	136	10,800	6,030,600	659,000
E. Commerce, Del Paso to N. Loop	6-LN	136	4,500	2,513,300	275,000
E. Commerce, N. Loop to Elkhorn	6-LN	136	6,900	3,852,800	421,000
N. Loop Rd., I-5 to Elkhorn	4-LN	100	9,900	5,193,000	396,000
E.s Loop Rd., Truel to Del Paso	4-LN	100	6,600	3,463,000	264,000
Elkhorn Rd., SR-99 to Northgate	6-LN	136	15,900	8,878,000	970,000
Northgate, Del Paso to Elkhorn	4-LN	100	10,800	5,666,100	432,000
El Centro, Del Paso to I-5	4-LN	100	3,300	\$ 1,731,400	\$ 132,000
TOTAL MAJOR STREETS ---->			179,700	\$100,075,500	\$9,812,000

NOTE: Contribution amount based on estimated cost of pavement, base course, sub-base and median curb for the center portion of the street measured from a point twenty-five (25) feet from the face of each exterior curb.

Preliminary Cost Spread

The purpose of this section is to present a preliminary spread of costs related to the Mello Roos financing. It is intended as a "first cut" at the distribution of costs to properties within the Community Plan area and may be used as a guide to initiate the Mello Roos district. It is not a representation of the Mello Roos special tax nor does it preclude the use of alternative formulas at such time when the special tax is determined.

One of the primary advantages with Mello Roos is the flexibility allowed in spreading costs and selecting the special tax formulas. Unlike assessment districts, there is no prerequisite under the Mello Roos Act to demonstrate direct benefit in relation to the special tax. In general, as long as the methodology is generally fair and equitable, the special tax can be structured in any manner that most effectively accommodates the needs of the Community Plan Area.

For this preliminary cost spread, the "Dwelling Unit Equivalent" (DUE) method is utilized. This method is similar to the approach used by other City and County agencies in the local area. Improvement costs are distributed on the basis of land use in consideration of the benefit, use and/or general welfare derived from the improvement.

To evaluate both residential and non-residential property in a comparable manner, a DUE factor is assigned to each land use category for a particular improvement. The DUE reflects the financial responsibility of one acre of a given land use as compared to one acre of land designated for single family use (i.e. rural estates, one dwelling unit per acre). A description of computations for the "DUE" methodology can be found in the North Natomas EIR.

Drainage. The DUE factors for drainage are designed to spread the cost of infrastructure in an equitable manner that is approximately proportional to the bonding capacity of the property. Bonding capacity is determined by the 3:1 value to lean ratio as well as maximum annual tax allowable for residential properties. Estimated property values are taken from the financial section of

the North Natomas EIR.

Freeway Improvements. The DUEs for freeway improvements are based on projected traffic generation as measured by peak hour trips per acre for each land use category.

Regional Park. The 200 acre Regional Park will be of benefit to both residential and non-residential land uses. The DUEs are based on values used in the EIR.

Fire, Library, and Police. The DUEs values for Fire and Police services are proportional to the building area (square footage) for each land use category. Library DUEs are based on the assumption that each employee benefits one-third times that of a resident. (Ref: North Natomas EIR).

Planning/Studies. The NNCP requires that this cost be divided equally by each acre receiving urban land use designations. Accordingly, the DUE value reflects a uniform distribution of cost. (Ref: NNCP, Page 127).

The improvements considered in this preliminary cost spread are indicated in the table below. The "District Cost" that is distributed to the various land uses, is defined as the estimated project cost plus a fifteen percent (15%) allowance for bond issuance expenses. Table 5 indicates the DUE factors utilized. Tables 6, and 7 indicate results of the cost distribution.

	Project Cost	Bond Issuance	District Cost
Drainage	\$118,830,000	\$17,824,000	\$136,654,000
Freeways	28,604,000	4,291,000	32,895,000
Regional Park	15,018,000	2,253,000	17,271,000
Fire, Library, Police	8,437,000	1,265,000	9,702,000
Planning Studies	<u>2,500,000</u>	<u>375,000</u>	<u>2,875,000</u>
TOTAL	173,389,000	26,008,000	199,397,000

NORTH NATOMAS INFRASTRUCTURE DESIGN REPORT

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DWELLING UNIT EQUIVALENT (DUE) SUMMARY

TABLE 5

LAND USE	DRAINAGE INFASTRUCT	FREEWAY IMPROV.	REGIONAL PARK	FIRE & POLICE	LIBRARY	PLANNING/ STUDIES
NONRESIDENTIAL						
MRD - 50	6.7	21.3	5.9	7.9	5.9	1.0
MRD - 20	4.9	14.2	3.9	6.4	3.9	1.0
Light Industrial	3.8	12.0	2.6	5.5	2.6	1.0
Office / Business	9.8	34.8	7.2	8.3	7.2	1.0
C. Commercial	6.1	46.7	3.9	4.5	3.9	1.0
H. Commercial	4.3	47.0	3.9	3.4	3.9	1.0
Sports Complex	5.2	12.0	0.0	5.5	0.0	1.0
RESIDENTIAL						
Low Density	1.8	7.0	7.0	5.3	7.0	1.0
Medium Density	2.2	7.6	9.0	6.0	9.0	1.0
High Density	3.8	11.0	13.3	11.0	13.3	1.0
Rural Estates	1.0	1.0	1.0	1.0	1.0	1.0

LAND USE KEY

MRD-50 = Manufacturing Research Dev. (50% Office)
 MRD-20 = Manufacturing Research Dev. (20% Office)
 C. Commercial = Community Commercial
 H. Commercial = Highway Commercial

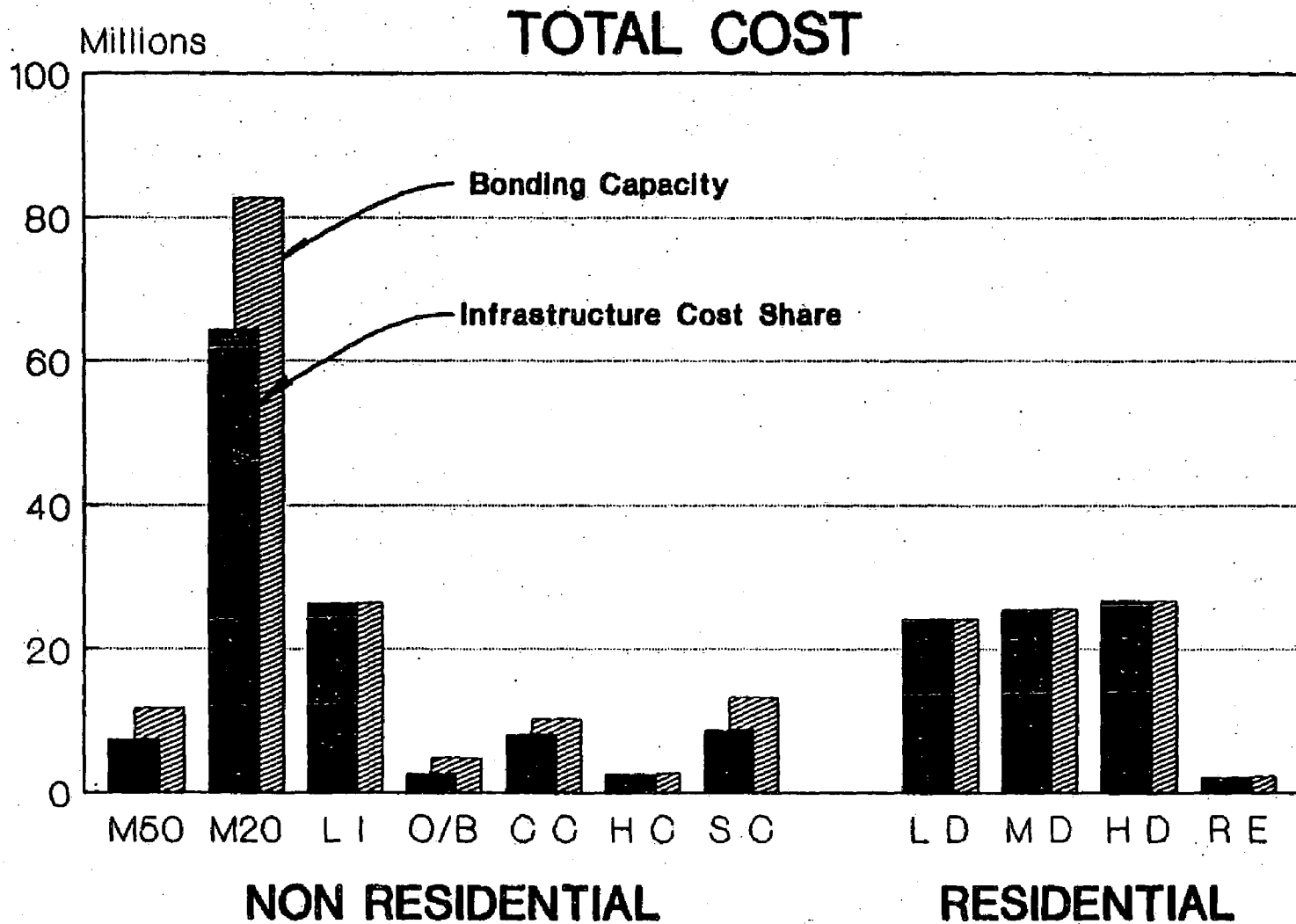
PRELIMINARY COST SPREAD

LAND USE	DRAINAGE COST PER		FREEWAYS COST PER		REGIONAL PARKS COST PER	
	ACRE	DU	ACRE	DU	ACRE	DU
NONRESIDENTIAL						
MRD - 50	46,968		10,805		2,996	
MRD - 20	33,988		7,203		1,980	
Light Industrial	26,660		6,087		1,320	
Office / Business	68,536		17,654		3,657	
C. Commercial	42,642		23,690		1,981	
H. Commercial	30,011		23,841		1,980	
Sports Complex	36,570		6,088		0	
RESIDENTIAL						
Low Density	12,772	1,825	3,551	507	3,555	508
Medium Density	15,563	1,297	3,855	321	4,570	381
High Density	26,381	1,199	5,580	254	6,754	307
Rural Estates	6,979	6,979	507	507	508	508

LAND USE	FIRE & POLICE COST PER		LIBRARY COST PER		PLANNING/STUDIES COST PER		TOTAL COST PER	
	ACRE	DU	ACRE	DU	ACRE	DU	ACRE	DU
NONRESIDENTIAL								
MRD - 50	1,493		538		511		63,311	
MRD - 20	1,210		356		511		45,248	
Light Industrial	1,040		237		511		35,855	
Office / Business	1,568		657		511		92,583	
C. Commercial	850		356		512		70,031	
H. Commercial	643		357		511		57,343	
Sports Complex	1,040		0		512		44,210	
RESIDENTIAL								
Low Density	1,002	143	639	91	511	73	22,030	3,147
Medium Density	1,134	95	822	69	511	43	26,455	2,206
High Density	2,079	95	1,214	55	511	23	42,519	1,933
Rural Estates	189	189	91	91	511	511	8,785	8,785

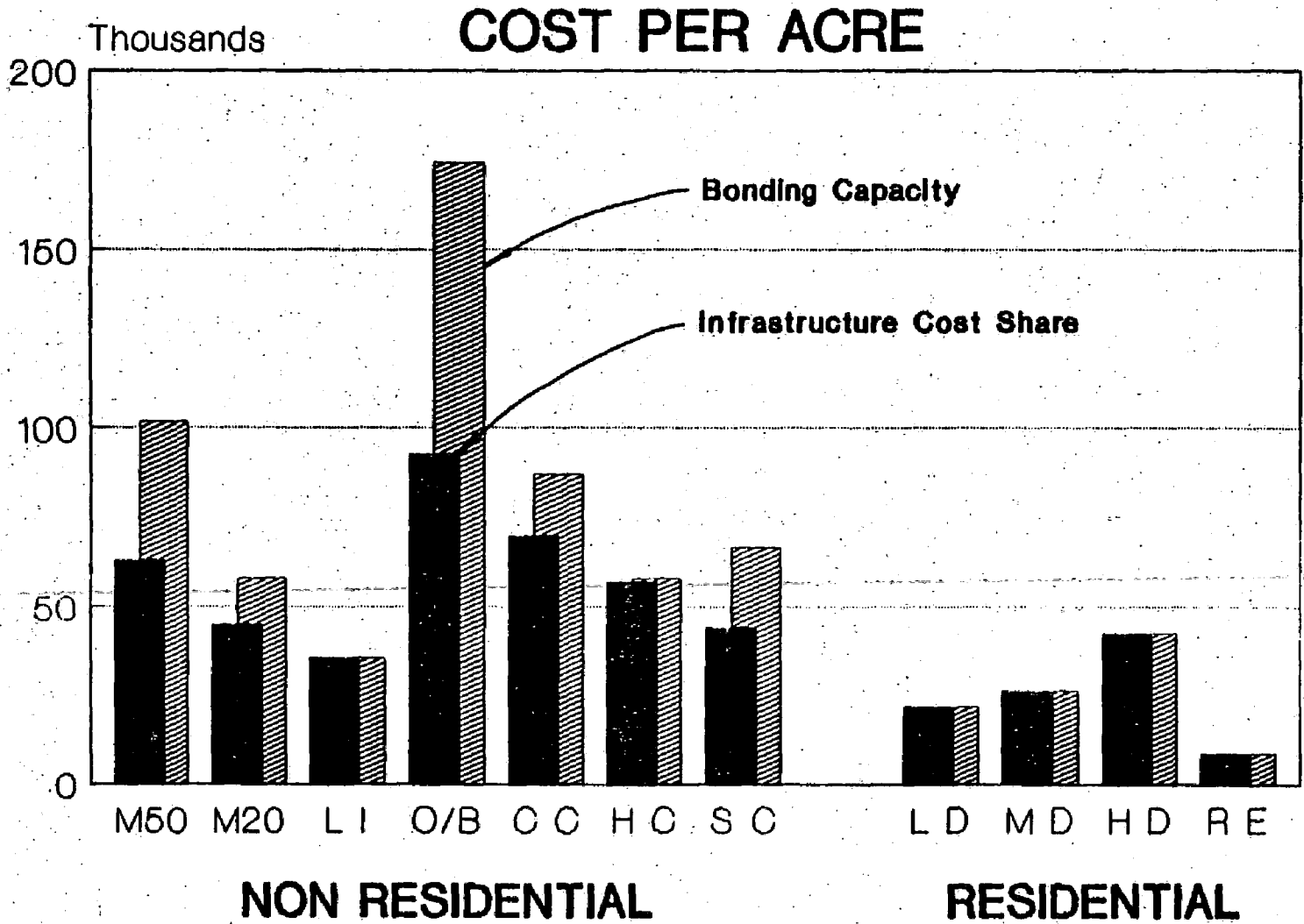
N. NATOMAS INFRASTRUCTURE DESIGN REPORT

PRELIMINARY COST SPREAD



N. NATOMAS INFRASTRUCTURE DESIGN REPORT

PRELIMINARY COST SPREAD



NORTH NATOMAS INFRASTRUCTURE DESIGN REPORT
PRELIMINARY COST SPREAD

TABLE 7

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TOTAL COST - TOTAL AREA

LAND USE	DRAINAGE INFRASTRUCT	FREEWAY IMPROV.	REGIONAL PARK	FIRE & POLICE	LIBRARY	PLANNING/ STUDIES	TOTAL	PERCENT OF TOTAL
NONRESIDENTIAL								
MRD - 50	5,495,300	1,264,200	350,500	174,700	63,000	59,800	7,407,500	3.7%
MRD - 20	48,364,700	10,250,400	2,818,100	1,721,600	506,600	727,700	64,389,100	32.3%
Light Industrial	19,648,300	4,486,400	973,000	766,300	174,900	376,900	26,425,800	13.3%
Office / Business	1,919,000	494,300	102,400	43,900	18,400	14,300	2,592,300	1.3%
C. Commercial	5,074,400	2,819,100	235,700	101,200	42,400	60,900	8,333,700	4.2%
H. Commercial	1,380,500	1,096,700	91,100	29,600	16,400	23,500	2,637,800	1.3%
Sports Complex	7,314,000	1,217,500	0	207,900	0	102,300	8,841,700	4.4%
	89,196,100	21,628,600	4,570,800	3,045,200	821,700	1,365,400	120,627,900	60.5%
RESIDENTIAL								
Low Density	14,010,500	3,895,400	3,899,400	1,099,100	701,000	561,000	24,166,400	12.1%
Medium Density	15,080,800	3,735,800	4,428,500	1,099,100	796,200	495,500	25,635,900	12.9%
High Density	16,567,100	3,504,300	4,241,300	1,305,900	762,500	321,100	26,702,200	13.4%
Rural Estates	1,800,600	130,900	131,000	48,800	23,600	131,900	2,266,800	1.1%
	47,458,900	11,266,400	12,700,200	3,552,800	2,283,300	1,509,600	78,771,300	39.5%
	136,655,000	32,895,000	17,271,000	6,598,000	3,105,000	2,875,000	199,399,200	100.0%

LAND USE SUMMARY

The purpose of this section is to further refine the land use designations set forth in the NNCP and identify the general location and quantity of land needed for infrastructure and public facilities. Using Del Paso Road and Interstate 5 as dividing lines, the Community Plan area may be separated into four quadrants. Table 8 indicates the distribution of land uses in each of these quadrants. Table 9 provides an estimate of land acreage needed for drainage, major street, freeway and light rail right-of-way.

During formation of the Mello Roos District, the method by which land will be obtained for public right-of-way and/or public use will need to be determined. While the NNCP specifies dedication in most instances, the question of how land can be dedicated in manner that is equitable to all property owners will need to be addressed.

It is anticipated that a plan can be developed in cooperation with the landowners, that establishes a set procedure for acquiring the land needed as development proceeds. This plan would be prepared in conjunction with the Mello Roos district formation and will specify the location and approximate acreage as related to individual parcels. It is recommended that this plan be included as part of the North Natomas Finance Plan prior to adoption by City Council.

LAND USE DISTRIBUTION (ACRES)

LAND USE	N.N.C.P.	SOUTH OF DEL PASO			NORTH OF DEL PASO			PROPOSED
	TOTAL	I-5 EAST	I-5 WEST	TOTAL	I-5 EAST	I-5 WEST	TOTAL	TOTAL
NONRESIDENTIAL								
MRD - 50	117	117	0	117	0	0	0	117
MRD - 20	1,324	763	285	1,048	285	90	375	1,423
Light Industrial	727	630	107	737	0	0	0	737
Office / Business	28	0	0	0	28	0	28	28
C. Commercial	114	0	53	53	66	0	66	119
H. Commercial	46	31	0	31	0	15	15	46
Sports Complex	200	200	0	200	0	0	0	200
SUBTOTAL NET NONRES.	2,556	1,741	445	2,186	379	105	484	2,670
RESIDENTIAL								
Low Density	1,072	0	0	0	1,097	0	1,097	1,097
Medium Density	931	105	398	503	436	30	466	969
High Density	622	50	103	153	435	40	475	628
Rural Estates	258	0	0	0	258	0	258	258
SUBTOTAL NET RES.	2,883	155	501	656	2,226	70	2,296	2,952
TOTAL NET DEV. PROP.	5,439	1,896	946	2,842	2,605	175	2,780	5,622
CIVIC/PUBLIC								
Elementary School	78	6	18	24	54	0	54	78
Junior H. School	60	0	20	20	40	0	40	60
Senior H. School	40	0	0	0	40	0	40	40
Other Civic Uses	115	39	19	58	53	4	57	115
SUBTOTAL CIVIC	293	45	57	102	187	4	191	293
OPEN SPACE								
PARKS	(320)							
Regional Park	200	0	0	0	200	0	200	200
Other Park	120	40	20	60	56	4	60	120
BUFFERS & DRAINAGE	560							(547)
Freeway Corridor		60	40	100	8	8	16	116
Linear Parkway		21	0	21	53	0	53	74
Drainage Parkway		5	10	15	26	9	35	50
Drainage R/W		26	51	77	128	42	170	247
Natomas E. Main		32	0	32	28	0	28	60
GREENBELT	770	0	101	101	257	34	291	392
ROADS	1,700							(1824)
Freeways		15	6	21	1	0	1	22
Major Roads		167	76	243	145	8	153	396
Minor Roads & Exist R/W		474	237	711	651	44	695	1,406
AGRICULTURE	190	0	75	75	0	115	115	190
SUBTOTAL OPEN SPACE	3,540	840	616	1,456	1,553	264	1,817	3,273
COMM. PLAN GROSS	9,272	2,781	1,619	4,400	4,345	443	4,788	9,188

Truxel Rd., San Juan to I-80	6-LN	136	1,800	5.6				5.6
Truel Rd., I-80 to Del Paso	8-LN	158	8,250	29.9				29.9
Del Paso Rd., I-5 to Truxel	8-LN	158	5,400	10.9				10.9 E
Del Paso Rd., Truxel to Northgate	6-LN	136	9,600	14.5				14.5 E
N. Market, I-5 to Truxel	6-LN	136	4,000	12.5				12.5
N. Market, Truxel to S. Loop	4-LN	100	1,700	3.9				3.9
E. Commerce, San Juan to S. Loop	4-LN	100	3,300	7.6				7.6
E. Commerce, S. Loop to Del Paso	6-LN	136	8,300	25.9				25.9
S. Loop Rd., I-5 to Commerce	4-LN	100	1,000	2.3				2.3
S. Loop Rd., E. Commerce to Del Paso	6-LN	136	11,400	35.6				35.6
San Juan Rd., I-5 to E. Commerce	4-LN	100	800	1.3				1.3 E
Northgate, I-80 to N. Market (1)	6-LN	136	2,400	2.0				2 E
Northgate, N. Market to Del Paso (1)	4-LN	100	5,800	13.3				13.3
Midway Rd., I-5 to E. Commerce	4-LN	80	800	1.5				1.5 U
Del Paso Rd., W. Boundary to I-5	6-LN	136	6,300		8.1			8.1 E
N. Market, El Centro to I-5	6-LN	136	2,750		8.6			8.6
W. Commerce, San Juan to El Centro	4-LN	100	11,400		26.2			26.2
S. Loop Rd., El Centro to I-5	4-LN	100	5,000		11.5			11.5
San Juan Rd., W. Boundary to I-5	4-LN	100	8,000		12.9			12.9 E
El Centro, San Juan to Del Paso	6-LN	136	10,200		3.7			3.7 E
Midway Rd., El Centro to I-5	4-LN	80	2,800		5.1			5.1 U
Truxel Rd., Del Paso to Elkhorn	6-LN	136	10,800			33.7		33.7
E. Commerce, Del Paso to N. Loop	6-LN	136	4,500			14.0		14
E. Commerce, N. Loop to Elkhorn	6-LN	136	6,900			21.5		21.5
N. Loop Rd., I-5 to Elkhorn	4-LN	100	9,900			22.7		22.7
E. Loop Rd., Truxel to Del Paso	4-LN	100	6,600			15.2		15.2
Elkhorn Rd., SR-99 to Northgate	6-LN	136	15,900			13.1		13.1 E
Northgate, Del Paso to Elkhorn	4-LN	100	10,800			24.8		24.8
El Centro, Del Paso to I-5	4-LN	100	3,300				7.6	7.6
TOTAL MAJOR STREETS ---->			179,700	166.8	76.1	145.0	7.6	395.5
FREEWAYS								

Totals	Interchng	varies		15.0	6.0	1.0	0.0	22.0
LIGHT RAIL								

Totals	2-LN	40	26,400	13.7	0.0	10.5	0.0	24.2
DRAINAGE								

San Juan Canal System	major	varies		26.0	51.0			77.0
Offsite (San Juan)	major	varies			43.0			43.0
Del Paso Canal System	major	varies				128.0	37.0	165.0
Offsite (Del Paso)	major	varies					76.0	76.0
TOTAL DRAINAGE ---->				26.0	96.0	128.0	113.0	361.0

NOTES:

1. " E " indicates existing right of way has been taken into account. Acreage shown represents additional right of way needed.
2. " U " indicates (Undivided) street without center median.
3. All acreage is approximate and subject to final design.

**NORTH NATOMAS INFRASTRUCTURE
DESIGN REPORT**

A P P E N D I X

EXECUTIVE SUMMARIES

- A: TRANSPORTATION PLAN
- B: DRAINAGE STUDY
- C: SEWER COLLECTION SYSTEM STUDY
- D: WATER FACILITIES PLAN

TRANSPORTATION PLAN FOR NORTH NATOMAS

VEHICULAR CIRCULATION ELEMENT

EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this document is to summarize the vehicular circulation element of the North Natomas Transportation Plan. The circulation system was initially established in the North Natomas Community Plan (NNCP), which was adopted in May 1986. The draft Sacramento General Plan Update (SGPU) also addresses the circulation system proposed for the North Natomas area. As a result of recent SGPU traffic studies, some of the street lane designations within North Natomas have been revised. This report sets forth lane designations for all major streets in the Community Plan area including all revisions to date. The report also identifies access restrictions, typical street cross sections, typical intersection drawings, and general design criteria.

Existing Conditions

The Community Plan area is served by two interstate freeways (I-5 & I-80) and a state highway (SR99). (See figure 1). These facilities provide regional access in both a north-south and east-west direction. There is presently a grade separated interchange along I-5 at Del Paso Road and along I-80 at Northgate Boulevard. Del Paso Road, North Market Boulevard, San Juan Road and Elkhorn Boulevard are improved roadways which provide east-west access. El Centro Road and Northgate Boulevard are two existing north-south roads within North Natomas. El Centro Road is currently improved to two-lane rural standards. South of I-5, El Centro Road is a local facility, while north of I-5, it becomes SR99. Northgate Boulevard is a four lane road from the I-80 interchange to North Market Boulevard. The existing transportation network in the undeveloped North Natomas

Community is limited. There are no bikeways or bus service to the North Natomas area at this time. Traffic volumes on existing roads are low, which reflects the current undeveloped nature of the community.

As part of the City's General Plan Update process and in compliance with the North Natomas Community Plan recommendations, the City of Sacramento is presently studying the feasibility of providing additional roadway capacity across the American River. It is anticipated that the improvements will be located between Interstate 5 and Northgate Boulevard. Alternative concepts are being developed as part of this feasibility study. The study is scheduled to be completed in 1988.

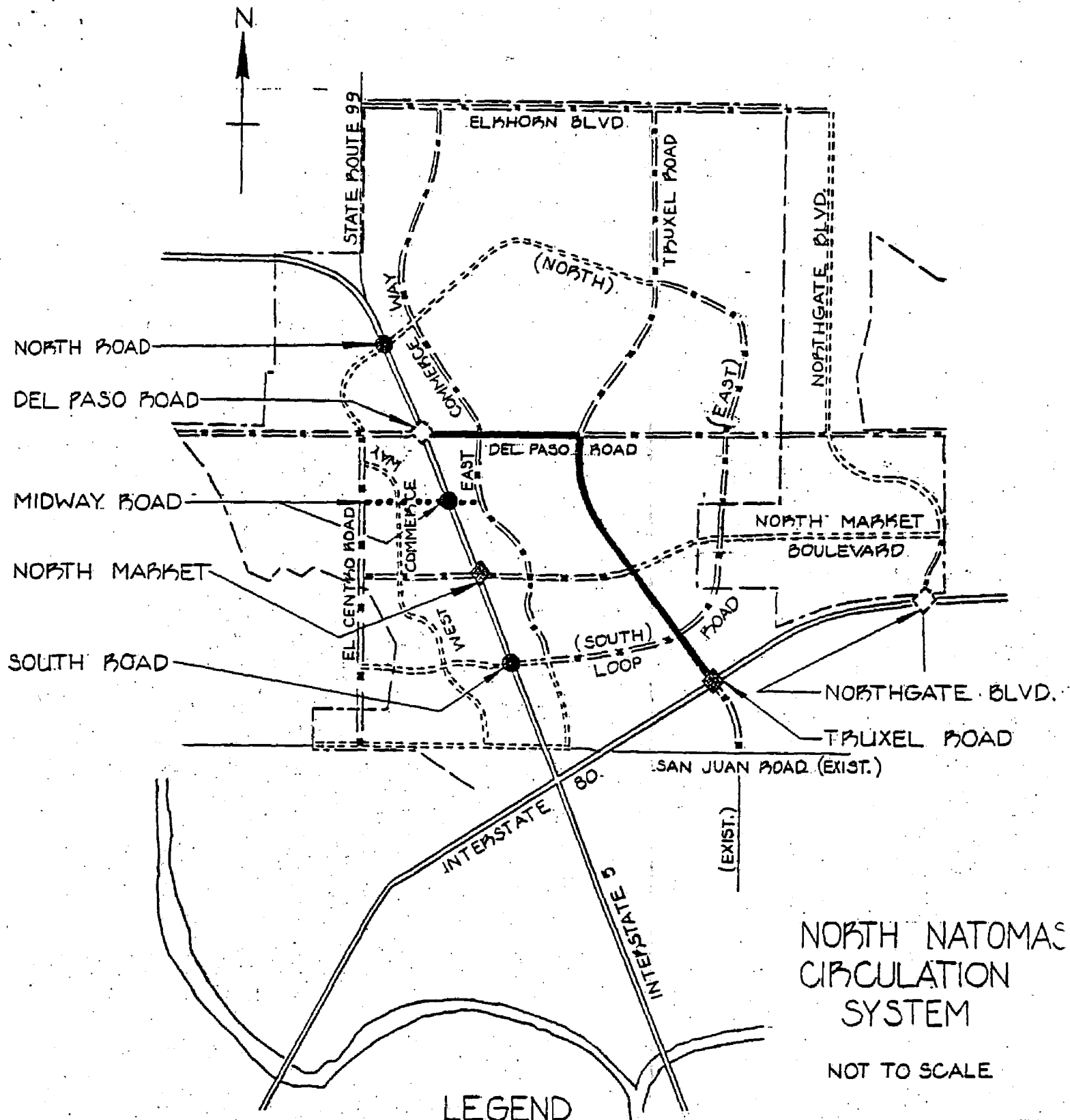
Infrastructure Summary

The transportation infrastructure required to serve development within North Natomas will include a network of major streets. This system will consist of approximately 34 miles of 4, 6, and 8 lane roadway improvements including street lighting, traffic signalization at all major intersections, canal bridges and landscaped medians. Freeway related infrastructure will include construction of two grade separated interchanges, three major road overcrossings, modification of two existing interchanges and related freeway lane widenings.

Freeway Interchanges

The I-5 and North Market Boulevard interchange will include a two lane westbound to southbound on-ramp and a two lane northbound to eastbound off-ramp. (See figure 1).








The I-80 and Truxel Road interchange will include a two lane southbound to eastbound on-ramp, a two lane eastbound off-ramp, a two lane southbound to westbound on-ramp, and a four lane westbound off-ramp.



NORTH NATOMAS CIRCULATION SYSTEM

NOT TO SCALE

LEGEND

- CITY LIMIT LINE 
- NEW INTERCHANGE 
- EXISTING INTERCHANGE — RAMP(S) TO BE MODIFIED 
- NEW OVERCROSSING 
- 8 LANE MAJOR STREET 
- 6 LANE MAJOR STREET 
- 4 LANE MAJOR STREET 

NOTE: ALL OTHER FEATURES

Modifications to the I-80 and Northgate Boulevard interchange include construction of an additional lane on the westbound off-ramp and an additional northbound lane on Northgate Boulevard from the westbound ramp.

Modifications of the Del Paso Road and I-5 interchange include widening the northbound off-ramp and the westbound to southbound on-ramp to accommodate an additional lane. (See figure 1).

Major Street Overcrossings

There are three major street overcrossings planned for Interstate 5. They are located at South Loop Road, Midway Road, and North Loop Road. Each overcrossing will accommodate four traffic lanes, sidewalks, and bikeway facilities.

Major Streets

These roads are designed as eight lane, six lane and four lane facilities with intersections at grade. The majority of major streets will be divided with a landscaped median. The major street system has been designed to provide safe and efficient travel for large traffic volumes, both within and through the North Natomas Community. The proposed circulation system is depicted in Figure 1. These roads serve as principal access routes to residential areas, shopping areas, places of employment, community facilities, recreational areas, and other places of assembly.

- a. **Eight Lane Divided Major:** These are high volume facilities with access limited to signalized intersections. There will be no driveway access. The roads are intended to move large traffic volumes in an efficient manner. Those road segments designated as eight lane divided arterials are:

- ° Del Paso Road, from I-5 to Truxel Road
- ° Truxel Road, from I-80 to Del Paso Road.

b. Six Lane Divided Major: These are high volume facilities with access limited to signalized intersections. There will be no driveway access. In many areas of the North Natomas Community, residential and industrial type of land uses will be separated by six-lane divided major roads. Those roads designated as six lane divided arterials are:

- ° Truxel Road, I-80 to San Juan Road
- ° Truxel Road, Elkhorn Boulevard to Del Paso Road
- ° North Market Boulevard, El Centro Road to Truxel Road
- ° Del Paso Road, Truxel Road to the Eastern Plan Boundary
- ° Del Paso Road, the Western Plan Boundary to I-5
- ° Northgate Boulevard, North Market Boulevard to I-80
- ° Elkhorn Boulevard, SR99 to Northgate Boulevard
- ° East Commerce Way, Elkhorn Boulevard to South Loop Road
- ° South Loop Road, East Commerce Way to Truxel Road
- ° East Loop Road
- ° El Centro Road, Del Paso Road to San Juan Road

c. Four Lane Divided Major: These provide inter and intra community travel, as well as access to local businesses and residential areas. There will be limited driveway access. They are controlled by traffic signals. The following road segments shall be four lane divided major:

- East Commerce Way, South Loop Road to San Juan Road
- Northgate Boulevard, Elkhorn Boulevard to North Market Boulevard
- Elkhorn Boulevard, Northgate Boulevard to Watt Avenue (County)
- Elkhorn Boulevard, SR99 to Metropolitan Airport (County)
- West Commerce Way, El Centro Road to San Juan Road
- North Loop Road, I-5 to Truxel Road
- South Loop Road, El Centro Road to East Commerce Way
- San Juan Road, the Western Plan Boundary to East Commerce Way
- North Market Boulevard, Truxel Road to existing segment of North Market Boulevard
- El Centro Road, I-5 to Del Paso Road

d. **Four Lane Undivided Major:** These are undivided roads with intersections at grade and partial control of access. They serve as secondary type of arterial facilities, carrying local through traffic within urban communities. Traffic control consists of either traffic signals or stop signs. These four lane major undivided roads serve as access to shopping areas, employment centers, recreational facilities, and places of assembly. They are striped for two lanes in each direction, with a center left turn lane. The following road segments shall be four lane undivided major:

- Midway Road, from East Commerce Way to El Centro Road (located between Del Paso Road and North Market Boulevard)
- North Loop Road extension, from Truxel Road to extension of Northgate Boulevard
- Road from Truxel Road to East Loop Road, between Del Paso Road and North Market Boulevard

- ° East Loop Road extension, from intersection with North Loop Road to Elkhorn Boulevard

Typical Cross Sections

In Figure 2, typical cross sections are shown for minor local, local, minor collector, and industrial roads. These sections are in accordance with approved City of Sacramento street standards. Collector and four-lane undivided major street sections have been revised to include two-way left turn lanes and bicycle lanes. The newly developed four, six and eight lane divided major street sections are also shown in Figure 2.

There are some existing roads which will be widened or realigned. A typical section of the Del Paso Road Widening is shown in Figure 3. A similar design will be required for the remaining roads where existing pavement adjoins a new pavement section. The design for Northgate Boulevard will require a retrofit section.

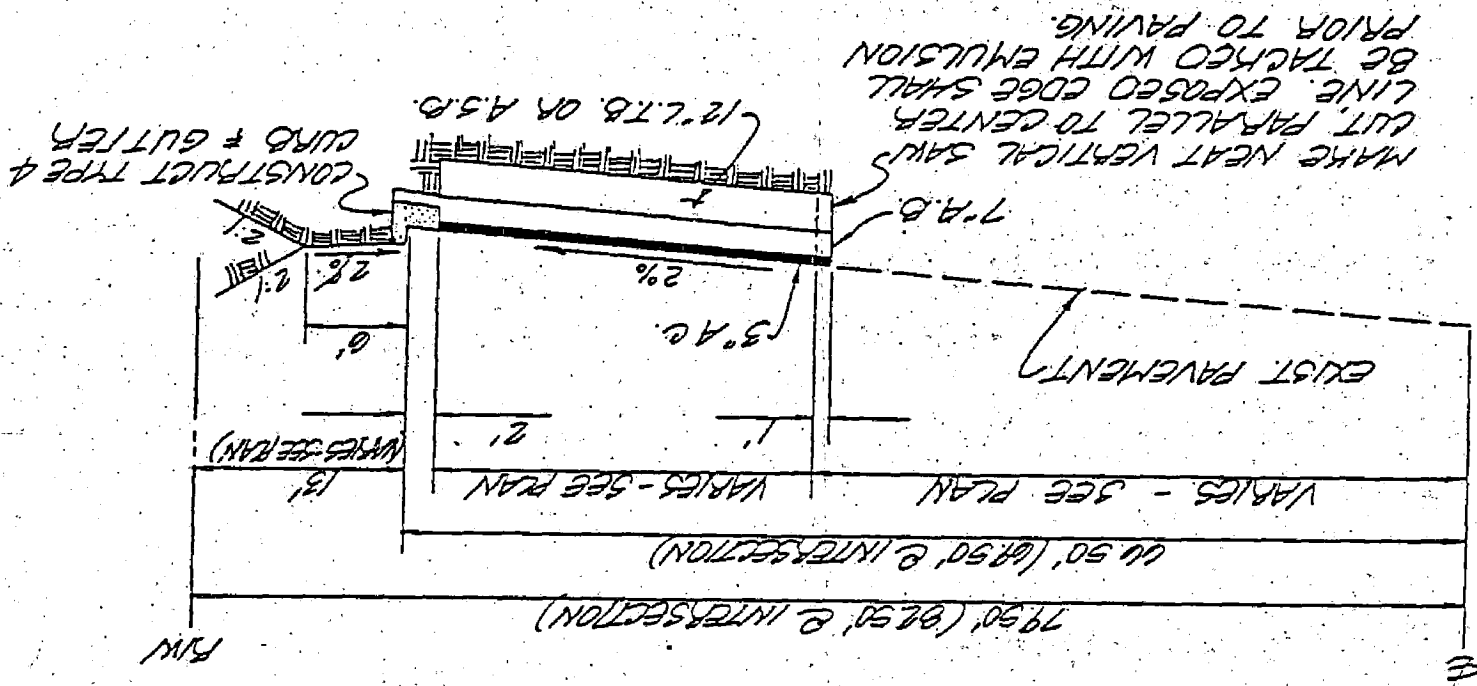
Channelization

The intersection of the major streets will include channelization for improved vehicular movement. The channelization design for all four, six and eight lane divided major streets will include dual left turn lanes and single exclusive right turn lanes. A typical channelized intersection is depicted in Figure 4.

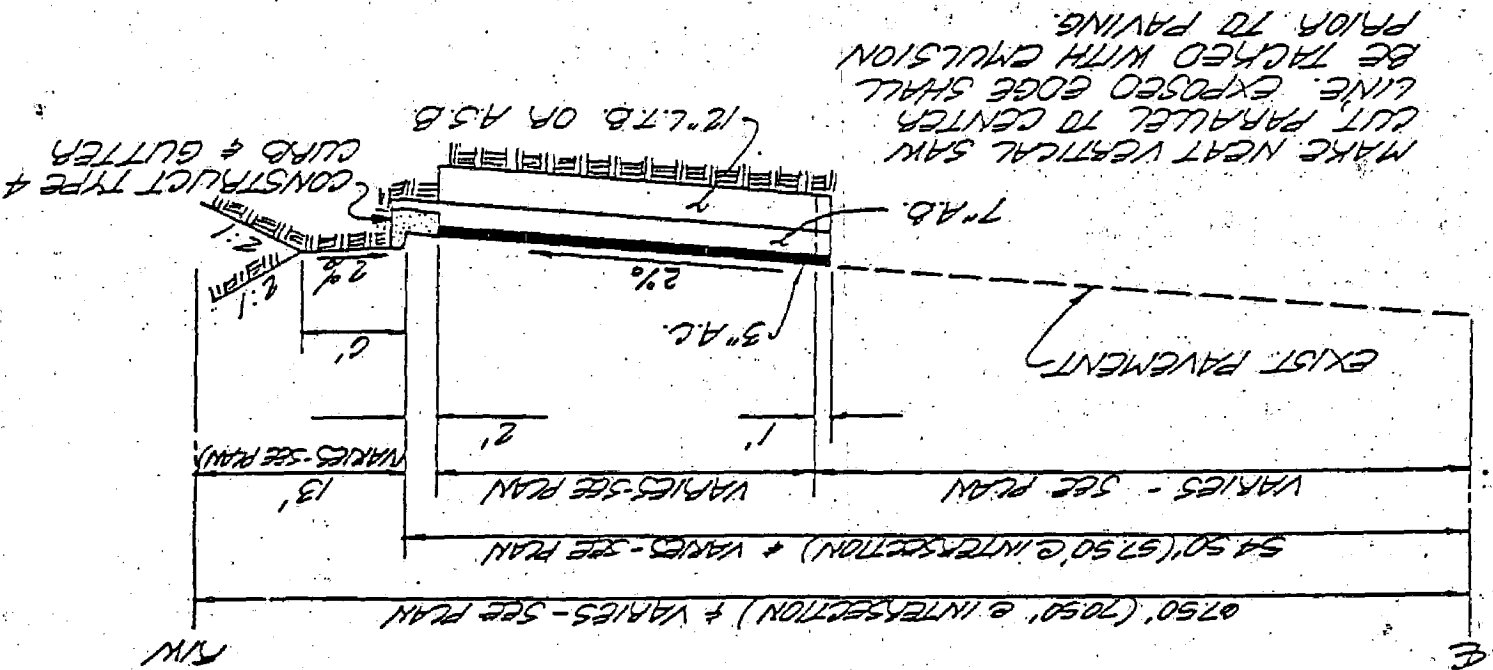
Also shown in Figure 4 is a typical channelized intersection for a major four-lane undivided street. The intersection design for all remaining street types will be done in accordance with approved City of Sacramento street standards.

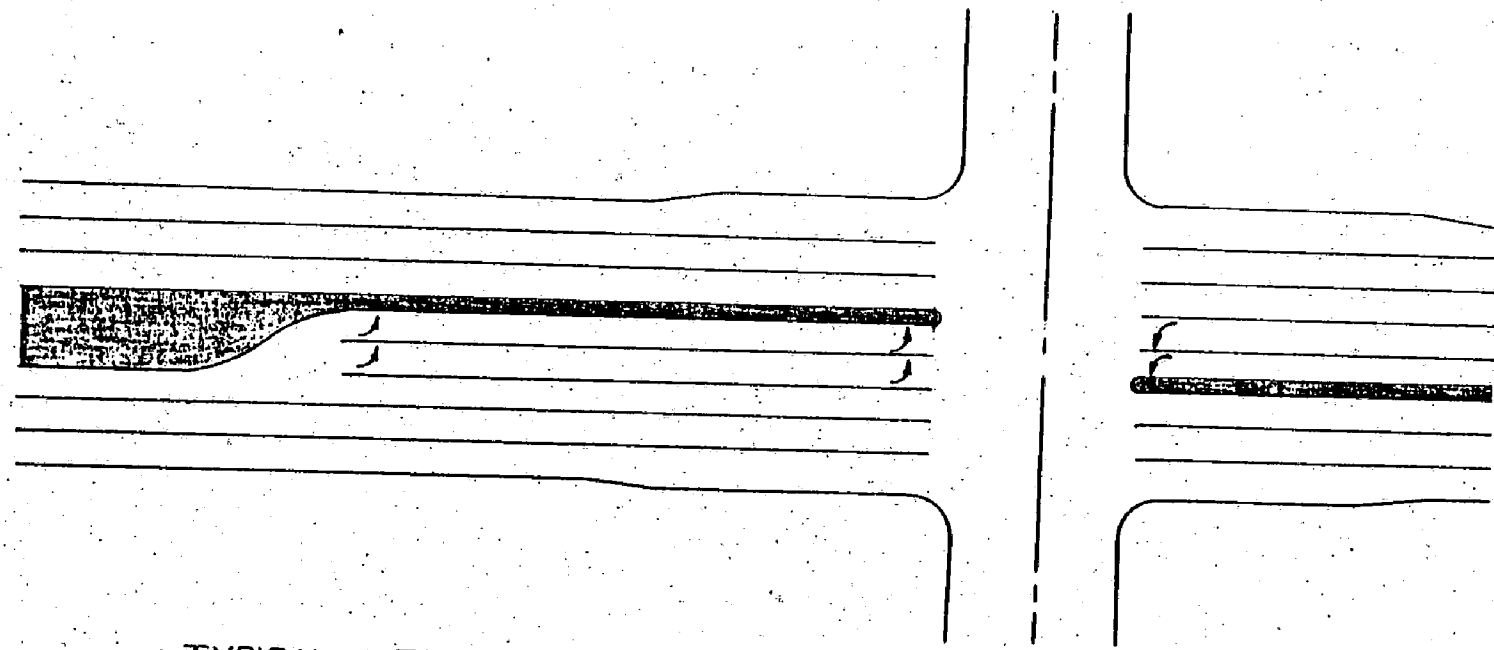
NOT TO SCALE

TYPICAL SECTION DEL PASO ROAD



TYPICAL SECTION DEL PASO ROAD





TYPICAL INTERSECTION FOR MAJOR DIVIDED STREETS

NORTH NATOMAS DRAINAGE STUDY

EXECUTIVE SUMMARY

INTRODUCTION

The City of Sacramento authorized a study to update the 1984 report Drainage Study North Natomas Area by Dewante & Stowell, to conform with the adopted North Natomas Community Plan. The study was also charged to resolve significant issues raised by the 1984 report and the Environmental Impact Report (EIR) for the Community Plan and to develop mitigation measures for these issues.

Existing Conditions and Facilities

Currently, drainage in the area is the responsibility of Reclamation District 1000 (RD 1000), which encompasses some 55,000 acres including the study area. Storm water runoff which must be disposed of by RD 1000 originates from agricultural lands, developed areas within the District, Sacramento Metropolitan Airport, and inflow from outside the District.

RD 1000 operates eight pump stations. The two major stations are the 1A and 1B complex at the southern end of the District, and Pump Station No. 8 which is located near Northgate Industrial Park. Pump Stations 1A and 1B are located adjacent to each other at the south end of Natomas Main Drainage Canal and have a combined capacity of 870 cfs discharging into the Sacramento River. Pump Station No. 8 is a new station located on Northgate Boulevard, 0.5 mile north of I-80, that discharges into the Natomas East Main Drain. The station has five pumps with a combined capacity of 340 cfs and has been constructed to accommodate two additional pumps to increase the total capacity to 570 cfs.

Planning and Design Criteria

The drainage system developed by the current study was designed to serve the needs of development based on the North Natomas Community Plan. The land use element of the Community Plan was used to determine the future land uses for design of the drainage system. Future land uses in the County north and west of the Community Plan area are assumed to be the present use, except for the Special Planning Area adjacent to the Metropolitan Airport. This assumption was based on a resolution adopted in 1984 by the County Board of Supervisors that urban services that would not be extended except to areas already designated for such use.

The design criteria for the canals, pump stations, and storm drains are based on the assumptions and recommendations from the 1984 Study. The recommendations of the EIR and Community Plan were taken into account as well. These criteria are listed in Table 1.

The hydrologic design of the canal system was based on the U.S. Department of Agriculture Soil Conservation Service, runoff-loss rate methodology.

Construction costs were estimated based on an Engineering News Record Construction Cost Index of 4400, corresponding to mid-1987. The construction costs were increased by 35% to account for the cost of engineering and administration, and to provide for contingencies.

Land values are expected to vary widely throughout the study area.

For purposes of this study, a value of \$50,000 per acre was selected as an "average" cost. An additional 25% factor was added to cover contingencies and acquisition costs.

DESIGN CRITERIA

PARAMETER	VALUES/REMARKS												
<u>Land Use</u>	<ul style="list-style-type: none"> ● Per North Natomas Community Plan - May 13, 1986 												
<u>Runoff</u>	<p data-bbox="1097 544 1300 572"><u>Storm Drains</u></p> <table data-bbox="1260 591 1544 668"> <thead> <tr> <th></th> <th data-bbox="1260 591 1365 619">Medium</th> <th data-bbox="1425 591 1495 619">High</th> </tr> <tr> <th></th> <th data-bbox="1260 640 1382 668">Density</th> <th data-bbox="1425 640 1544 668">Density</th> </tr> </thead> <tbody> <tr> <td data-bbox="1016 689 1604 717">● 10 yr</td> <td data-bbox="1211 689 1398 717">0.45 cfs/ac</td> <td data-bbox="1425 689 1604 717">0.50 cfs/ac</td> </tr> <tr> <td data-bbox="1016 738 1604 766">● 100 yr.</td> <td data-bbox="1211 738 1398 766">0.75 cfs/ac</td> <td data-bbox="1425 738 1604 766">0.80 cfs/ac</td> </tr> </tbody> </table>		Medium	High		Density	Density	● 10 yr	0.45 cfs/ac	0.50 cfs/ac	● 100 yr.	0.75 cfs/ac	0.80 cfs/ac
	Medium	High											
	Density	Density											
● 10 yr	0.45 cfs/ac	0.50 cfs/ac											
● 100 yr.	0.75 cfs/ac	0.80 cfs/ac											
<u>Hydraulic Design</u>	<p data-bbox="1097 789 1495 817"><u>Canals and Pump Stations</u></p> <ul style="list-style-type: none"> ● Unit Hydrograph method from SCS ● 100 year synthetic critical storm 												
<u>Pump Stations</u>	<p data-bbox="1097 1034 1300 1061"><u>Storm Drains</u></p> <ul style="list-style-type: none"> ● 10 yr. storm - no head ● 100 yr. storm - full head ● $n = 0.013$ ● $S_{min} = 0.001 \text{ ft/ft}$ <p data-bbox="1097 1278 1317 1306"><u>Open Channels</u></p> <ul style="list-style-type: none"> ● Unlined channel $n = 0.030$ ● Flow Depth = 8 ft. ● Freeboard = 3 ft. except at bridge = 4 ft. ● $S_{min} = 0.0001 \text{ ft/ft}$ <ul style="list-style-type: none"> ● 100 yr. storm with all pumps operating ● Diesel engine drive (w/electric summer pumps) ● Fully automated 												

Maintenance and operation costs were estimated at present price levels, and converted to present worth assuming a 20-year period of operations and an annual interest rate of 9.0%.

Other issues, in particular flows from outside the Community Plan area and environmental concerns, were taken into account in the planning and design of the drainage system.

Project Alternative Analysis

Several alternative projects were analyzed to develop the recommended project. All alternatives were evaluated based on cost, constructability and environmental impact. Project Alternatives analyzed include:

- o Channel lining alternatives
- o Channel side slope alternatives
- o Terraced canal cross section
- o Groundwater seepage into channels
- o Pump Station Design
- o System Control and Operation
- o Irrigation Structures
- o Flows from areas outside the community plan area
- o Detention Storage
- o Alternative Canal Routes between Elkhorn Boulevard and Del Paso Road East of 1-5
- o Alternative Projects north of Del Paso Road west of 1-5
- o Staged pumping alternative for north of Del Paso Road

Recommended Project

The recommended project has two inter-related, but separate, systems: the San Juan Canal System and the Del Paso Canal system. In general, the San Juan Canal drains the community plan area south of Del Paso Road and the Del Paso Canal drains the area north of Del Paso Road, including the SPA. The following paragraphs contain a general description of the projects, which is shown in Figure 1.

San Juan Canal System. The San Juan Canal system has three primary canals for conveying storm runoff to the San Juan pump station which discharges into the Sacramento River. These are the San Juan Canal, the East Drain, and the West Drain/K Canal.

The San Juan Canal is the major collector canal. The canal runs from the East Drain west to the pump station at the Sacramento River, a distance of about 15,000 feet. The East Drain portion of the system is a widened and deepened portion of the existing East Drain extending from about 500 feet south of Del Paso Road south to the junction with the San Juan Canal. The total length of the East Drain to be improved is about 7600 feet. The West Drain portion of the system is a widened and deepened section of the existing West Drain. The Drain runs from a point that runs just west of El Centro Road south to the San Juan Canal. The K Canal would parallel El Centro Road on the west side. The total lengths of the West Drain and the K Canal are 4600 feet and 3600 feet respectively.

The East Drain will be connected to the C-1 canal which is designed for a 10-year storm. The design of the San Juan Canal system handles 100-year storm overflows from the C-1 canal, assuming Pump Station No. 8 is improved to its full capacity

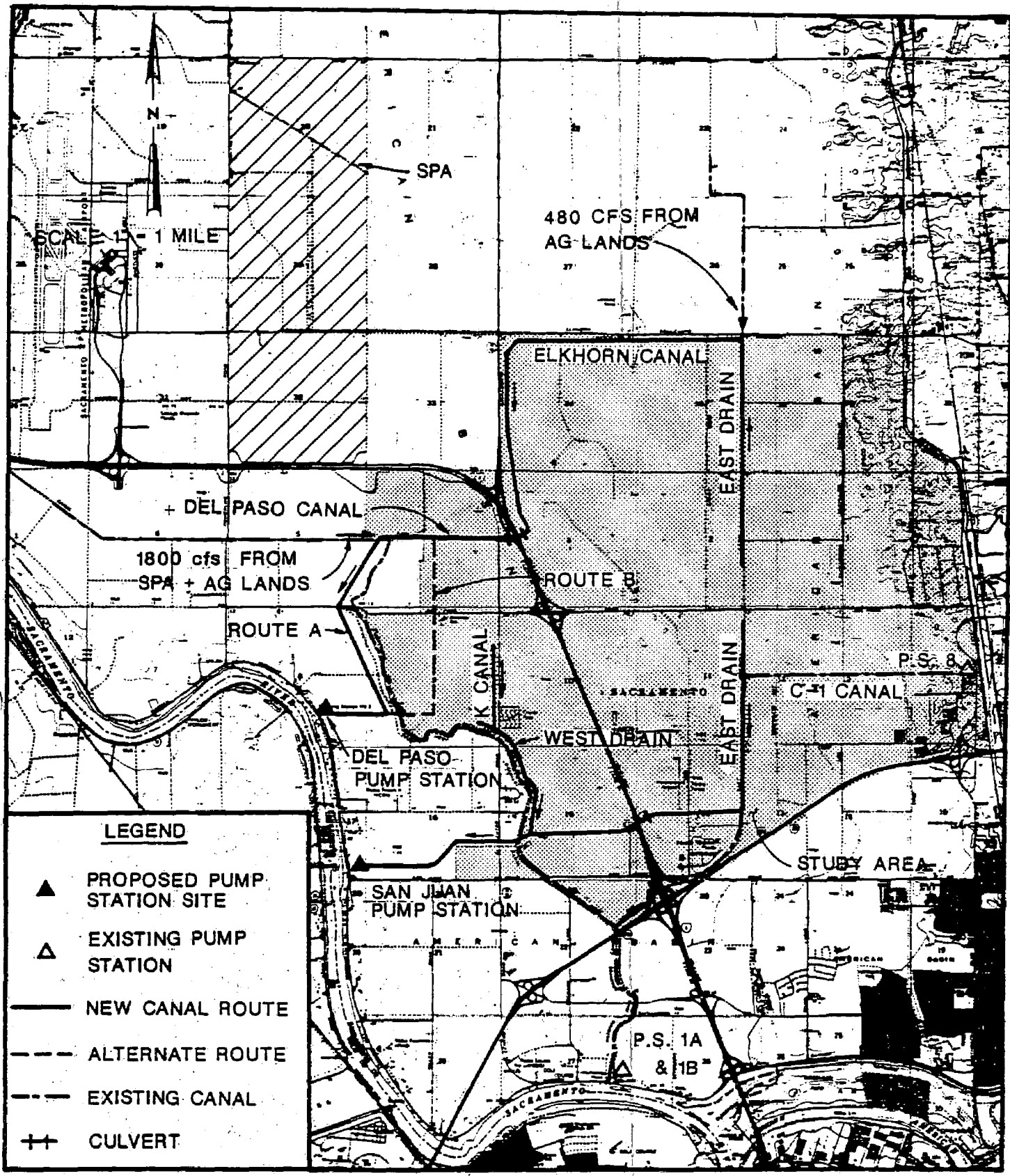


Fig. 1 RECOMMENDED PLAN

of 570 cfs. Flows from South Natomas do not contribute to design flows in the San Juan Canal system. Capacity is included in the San Juan system for the lands between the City limits and the Sacramento River and north of I-80 as far north as about 0.3 mile north of San Juan Road, an area of approximately 2010 acres. The additional capacity for these lands is based on the present land uses only.

Del Paso Canal System. The Del Paso Canal system has three primary canals for conveying storm runoff to the Del Paso Pump Station which discharges into the Sacramento River. These are the Del Paso Canal, the Elkhorn Canal, and the East Drain. More detailed descriptions of these three canals are contained in the following paragraphs.

The Del Paso Canal is the major collector for the system west of I-5. Two options for the route of this canal are provided, with the final choice to be made at the detailed design stage with input from the Environmental Impact Report for the drainage system. Route A starts at the culvert under I-5 and flows west to a point just west of Fishermans Lake. Route A then turns south paralleling the West Drain to an existing east-west canal where the route turns west following the route of the existing canal. Route B starts at the culvert under I-5 and flows west to a point about 2500 feet west of El Centro Road and then turns south. About 3800 feet south of Del Paso Road Route B turns back to the West, crosses Fishermans Lake and rejoins Route A. The east-west canal terminates in a pump station located near the site of RD 1000 Pump Station No. 3. The total length of the Del Paso Canal is about 15,000 feet for Route A and 14,000 feet for Route B.

The Elkhorn Canal is the major collector for the system east of I-5. This canal starts at the junction with the East Drain just south of Elkhorn Boulevard, flows

west paralleling Elkhorn Boulevard to State Highway 99 where it turns to the south. The Elkhorn Canal flows south paralleling State Highway 99 and I-5 to the west end of the culvert under I-5. The total length for the Elkhorn Canal is about 17,000 feet.

The East Drain portion of the system is a widened and deepened portion of the existing East Drain that starts about 700 feet north of Del Paso Road and flows north to the junction with the Elkhorn Canal. This flow pattern is the reverse of the present north to south pattern. The total length of the East Drain to be improved for the Del Paso Canal system is about 9800 feet.

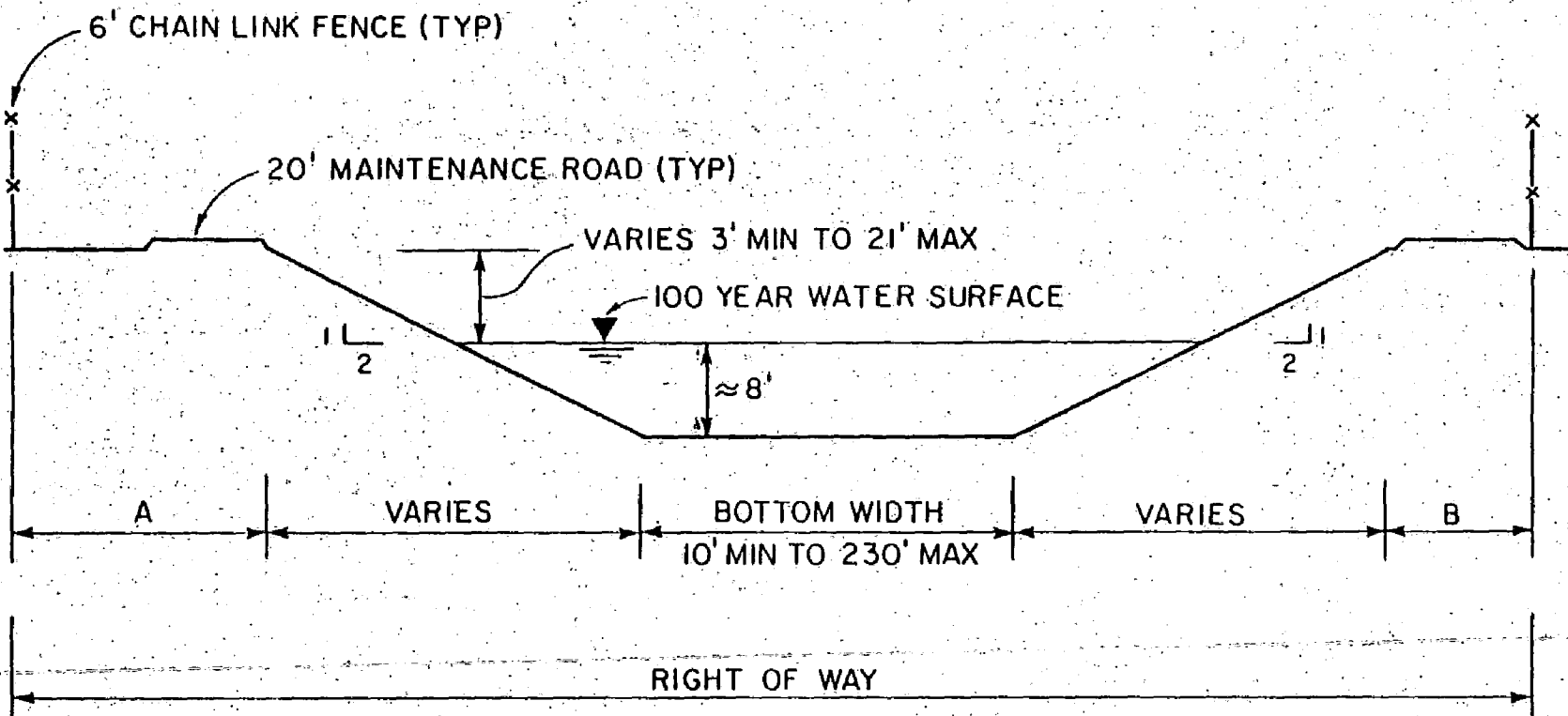
The Del Paso Canal system provides capacity to drain areas outside the study area. The most significant area is the SPA, which will contribute approximately 1300 cfs to the capacity of the Del Paso Canal and Pump Station when fully developed. Other areas contributing flow include the area tributary to the East Drain north of Elkhorn Boulevard and areas tributary to the West Drain west of the City limits. The inflows from these other areas account for runoff from the present land uses only.

Storm Drains. The lands surrounding the canal systems will drain into the canals via gravity storm drains. The storm drains are to be designed based on the 10-year storm for pipes smaller than 72 inches in diameter and the 100-year storm for pipes larger than 72 inches. Surcharged flow will be required to drain the 100-year flood, but the hydraulic gradeline should not cause street flooding. Storms with a return period of greater than 100 years may cause temporary flooding of streets.

Canals. The proposed canals are earth lined channels, with a trapezoidal cross-section as shown on Figure 2. The design side slopes of the canals are 2H:1V. Soils investigations indicate that a 2H:1V side slope should provide a stable channel bank throughout most of the study area. In some areas with particularly granular soils, use of a 3H:1V side slopes may be required as part of the final channel design. In general, the bottom slope of the channels is 0.001 ft/ft. The West Drain/K Canal system has channel bottom slopes of 0.0003 ft/ft. Channel velocities are generally on the order of 2.0 ft/sec.

Pump Stations. Two major pump stations are required for the recommended plan. The locations of these pump stations is shown on Figure 1. The capacity of the San Juan Pump Station is 2200 cfs and the capacity of the Del Paso Pump Station is 3700 cfs. The pump stations will each have multiple pumps with large diesel engine driven pumps for major storm pumping and smaller electric pumps for small storm pumping and canal level control. The San Juan Pump Station is anticipated to contain ten 1000 HP pumps powered by diesel engines and two 500 HP electric pumps. The Del Paso Pump Station is expected to contain ten 2000 HP diesel engine pumps and two 750 HP electric pumps. Pumps will be vertical mixed flow or propeller type pumps, as determined during final design.

Control of the pump stations will be automatic, based on the water levels in the canals. Because of the length of the canals and resulting delays in response to changing flows, remote level sensing well upstream of the pump stations will be required. The recommended locations for the pump level controls are at the El Centro Road Bridge for the San Juan Canal and the Del Paso Road Bridge for the Del Paso Canal.



<u>BOTTOM WIDTH</u>	<u>A</u>	<u>B</u>
10 - 60	20	20
60 - 230	40	40

(Not To Scale)

Fig. 2 TYPICAL CANAL SECTION

Interstate 5 Culverts. The San Juan Canal and Del Paso Canal will cross under I-5 in two culvert systems. Because of the high traffic densities on I-5, open cut construction will not be practical. It is anticipated that the culverts will be constructed by tunneling methods, with a concrete lining spun onto the tunnel liner plate. The San Juan canal culvert will require three 108 inch culverts with a length of 300 feet each. The Del Paso Canal culvert will be 400 feet long and will require six 120 inch diameter culverts.

Special Structures. Several special structures will be required to integrate the new drainage facilities with the existing infrastructure. These special structure are for control of water levels in existing canals and to provide continuity of Natomas Central Mutual Water Company irrigation ditches. Control structures to provide different winter water levels between the new canals and existing drainage canals will be required as listed below:

- o East Drain just north of Elkhorn Boulevard.
- o East Drain just south of the junction of the San Juan Canal and the East Drain.
- o Existing West Drain just south of the junction with the San Juan Canal and just west of El Centro Road.
- o Existing West Drain just south of the Del Paso Canal for Route A, or to the North and South of the Route B crossing for the Del Paso Canal.
- o Existing West Drain to the west of the junction with the canal carrying flows from the SPA.
- o Existing East Drain at Del Paso Road.

The Natomas Mutual Water Company uses a system of high line canals to deliver irrigation water to fields by gravity flow. The Del Paso Canal system will cross the routes of several high line canals. Flow in the irrigation canals will be maintained using appropriately sized steel pipes that span the canals in an aerial crossing on grade with the existing irrigation canals.

System Operation. The purpose of the new canals is to provide drainage for newly developed areas within the North Natomas Community Plan area. However, since the system will be connected with the existing drainage system of RD 1000, it must be operated to meet other requirements as well. The Natomas Central Mutual Water Company uses the existing RD 1000 canal system to transfer irrigation water throughout the summer. This operation must continue in the foreseeable future.

The Water Company currently maintains summer water levels in the canal system at about elevation 8.0 (USGS datum). Winter water levels for drainage in the new canals will be 4 to 7 feet lower than the summer water level. While automatic controls can be used throughout the winter to handle pumping operations during storm events, a great deal of non-automatic controlled pumping operation will be required. The operation of the pumps at the beginning and end of the irrigation season will require the most manual operation. At the beginning of the irrigation season, late spring rainfall can be stored in the system to slowly bring the canals up to the summer irrigation level. At the end of the irrigation season, water will slowly be pumped into the river to bring the water surface to elevations suitable for flood control.

Maintenance. A division of maintenance responsibility for the new canals, storm drains and pumping stations between RD 1000 and the City has yet to be formally worked out. Regardless of the responsible agency, the pump stations must be kept

in good operating order, especially the diesel engines. The new canals must be well maintained in inhibit unwanted vegetative growth and to maintain the design cross-section. The in-tract storm drain pipes must be maintained to prevent sedimentation in the pipes and to maintain the capacity of drainage inlets.

Cost Estimate. A detailed cost estimate of the recommended plan is contained in Table 2. The costs of the San Juan Canal system and the Del Paso Canal System have been separately identified. The total cost includes the present worth of maintenance and operation costs for a 20-year period at a 9.0% interest rate. Thirty-five percent has been added to construction costs to account for engineering costs and contingencies. A 25% contingency has been added to land values to provide for acquisition costs. The cost of the Del Paso Pump Station includes \$1,500,000 for constructing a slurry wall to protect the canal near the pump station from groundwater infiltration at high river stages. Additional costs not identified in Table 2 could arise from implementation of measures to mitigate environmental impacts that have not been identified at this time.

**DRAINAGE INFRASTRUCTURE
COST ESTIMATE OF RECOMMENDED PROJECT**

TABLE 2

	SAN JUAN SYSTEM	DEL PASO SYSTEM	TOTAL SYSTEM
CONSTRUCTION COSTS (a)			
Earthwork	\$3,060,000	\$12,080,000	\$15,140,000
I-5 Culvert	2,100,000	6,350,000	8,450,000
Storm Drains	5,670,000	7,890,000	13,560,000
Special Structures	150,000	500,000	650,000
Pump Stations	<u>11,650,000</u>	<u>22,690,000</u>	<u>34,340,000</u>
Subtotal	22,630,000	49,510,000	72,140,000
Contingencies, Etc (-35%)	7,920,000	17,330,000	25,250,000
Total Construction Cost	<u>30,550,000</u>	<u>66,840,000</u>	<u>97,390,000</u>
LAND COSTS			
Right-of-Way Costs (b)	5,140,000	12,010,000	17,150,000
Contingencies (-25%)	<u>1,290,000</u>	<u>3,000,000</u>	<u>4,290,000</u>
Total Construction and ROW	<u>\$36,980,000</u>	<u>\$ 81,850,000</u>	<u>\$118,830,000</u>
OPERATION AND MAINTENANCE COSTS			
O & M Canals (Annual)	165,000	210,000	375,000
O & M Pumps (Annual)	375,000	655,000	1,030,000
Power/Fuel (Annual)	73,000	207,000	280,000
Demand Charges (Annual)	<u>28,000</u>	<u>69,000</u>	<u>97,000</u>
Total Annual O & M	641,000	1,141,000	1,782,000
Present Worth of O & M	5,850,000	10,420,000	16,270,000
TOTAL SYSTEM COST	<u>\$42,830,000</u>	<u>\$92,270,000</u>	<u>\$135,100,000</u>

- (a) Costs at ENR CCI of 4400
 (b) Land Value = \$50,000 per acre
 (c) Present worth @ 9.0% and 20 years

NORTH NATOMAS SEWER COLLECTION SYSTEM STUDY

EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this sewer collection system study for the Sacramento Regional County Sanitation District (SCRSD) has been to assess current land use information and future development potential in the North Natomas study area and to evaluate alternative sewer collection systems to accommodate existing and future flows. These evaluations were based upon present worth costs and other non-monetary factors. The apparent best alternative was then used to develop a staged capital improvement plan to meet the needs of the area through the year 2010. This chapter presents the results of this evaluation and recommendations for the District to begin a program for system capacity expansion in accordance with expected future development.

Existing Facilities

The existing trunk sewer collection system was originally designed to serve the Natomas area as then conceived. Four major trunk sewer lines in the system serve the southern areas along El Centro Road, east of the East Drainage Canal and the South Natomas area. These areas drain by gravity to the Natomas Pump Station, which is located at the site of the former Natomas Wastewater Treatment Plant, near the intersection of I-80 and I-5.

The Natomas Pump Station, which has a capacity of 11.9 mgd, discharges into a 14,500-foot, 24-inch diameter force main that conveys raw sewage to the Dry Creek 2 Interceptor. The force main and gravity section of this line are collectively known as the Natomas 2 Interceptor.

Wastewater from the airport is collected via a gravity system with pipelines ranging in size from 6 to 15 inches in diameter and is then treated in wastewater ponds south of the airport. The treatment system ponds consist of two primary ponds, two secondary ponds, and one overflow pond. Effluent from the pond treatment and storage system irrigates a forage crop on land adjacent to the ponds.

Collection System Extensions

New trunk sewers were located in order to serve projected growth in the North Natomas Community Plan area and the Airport/SPA area. These areas of development were identified by an extensive review of land use information and predictions of future plans and policies. Trunk sewer alignments were identified by topographic analysis to generally follow the natural drainage. Sewers were designed to flow by gravity to the Natomas Pump Station.

Alternatives were considered to provide one or more lift stations in the collection system for comparison with the all-gravity alternatives.

Design Flow Development

Design flows were estimated by applying wastewater generation factors to the anticipated land use projections within the study area. The wastewater generation factors were based upon the County of Sacramento Department of Public Works Improvement Standards and SRCSD criteria in conjunction with more detailed information on the proposed developments that has become available over the past few years. The design flows include peak sanitary flow plus an allowance for infiltration/inflow.

Capital Improvements Plan

A capital improvements plan was developed for the District to provide for projected growth within the North Natomas Community Plan area, the Airport, and the Airport SPA. Growth in these areas has been planned through the year 2010. New facility improvements include approximately 18 miles of pipeline ranging in diameters from 12 to 54 inches. In addition, a new pump station will add an initial capacity of 20. A new 48-inch-diameter force main and its gravity outfall will convey the raw wastewater from the study area to the Dry Creek 2 Interceptor.

The recommended plan was divided into three stages based on the schedule of development. Stage I, the greatest amount of pipeline construction, is proposed to be completed by 1990. These pipelines facilities are the base system and will be extended to meet the development of subsequent stages. State II, proposed to be completed before 1995, will include the initial construction of the new pump station, the new 48-inch diameter force main, its gravity outfall and additional collection system facilities. During Stage III, proposed to be completed by 2000, the final collection system facilities will be installed and capacity of the new pump station will be increased to 46 mgd. Estimated costs for each stage are summarized in Table 2-1.

Recommendation Summary

Based on our evaluation of the anticipated growth in the North Natomas area, our recommendations are as follows:

1. Develop a program for implementing Alternative 2 Stage I improvements. Stage I is scheduled for completion by 1990.
2. Prepare a preliminary design for the construction of the Natomas Pump Station.

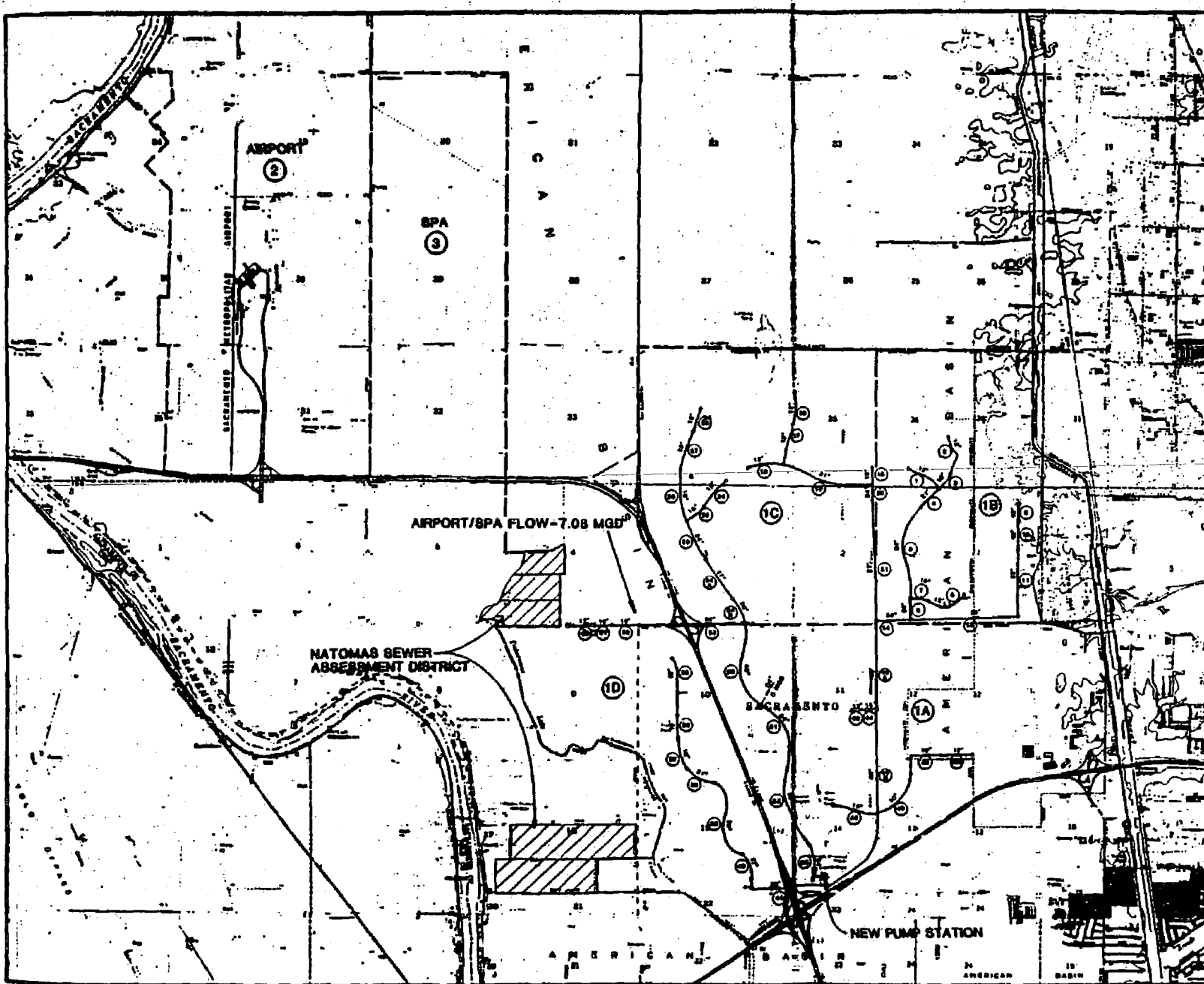
TABLE 2-1

**SEWER INFRASTRUCTURE
PHASED IMPROVEMENTS COST SUMMARY**

	<u>STAGE I</u> <u>1987-1990</u>	<u>STAGE II</u> <u>1990-1995</u>	<u>STAGE III</u> <u>1995-2000</u>	<u>TOTAL</u>
Alternative 2B				
Sewer	\$10,375,250	\$2,458,500	\$3,126,000	\$15,959,750
Pump Station	---	1,282,000	1,140,000	2,422,000
Force Main	---	<u>2,508,500</u>	---	<u>2,508,500</u>
Subtotal	\$10,375,250	\$6,249,000	\$4,266,000	\$20,890,250
15% Administrative and Engineering	<u>1,556,750</u>	<u>937,000</u>	<u>639,000</u>	<u>3,132,750</u>
Total	\$11,932,000	\$7,186,000	\$4,950,000	\$24,023,000

Notes:

1. Right-of-way acquisition costs are not included.
2. Costs reflect SRCSD ENR CCI of 5000 for July 1987.
3. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. Final costs will depend on actual labor and material costs, competitive market conditions, final project scope, and other variable factors.



1" = 2000'



LEGEND

- TRUNK SEWER
- ②⑥ SEGMENT NUMBER
- 27" PIPE SIZE
- - - DEVELOPMENT SUBAREA BOUNDARY
- ①A DEVELOPMENT SUBAREA NUMBER

FIGURE 7-6
ALTERNATIVE 2B
NORTH NATOMAS SEWER COLLECTION
SYSTEM STUDY

CH2M HILL

3. Update this sewer collection system study as necessary to incorporate changes in flow conditions resulting from changes in development type or size.

Recommended Plan

This section presents the recommended plan for sewer collection system improvements in North Natomas. Alternative 2 is the recommended plan. The staged capital improvement program and cost estimate are presented for the proposed improvements to the Natomas Pump Station and for new sewer collection facilities to serve unsewered areas within the North Natomas Community Plan study area. In addition, collection facilities will be provided to convey the Airport/SPA flows to the Natomas Pump Station. The recommended improvements have been developed for future peak wastewater flows expected during the year 2010 with an allowance for infiltration/inflow.

Natomas Pump Station

The existing Natomas Pump Station has a capacity of 11.9 mgd. Estimated future flows to the pump station from North Natomas, South Natomas, and the Airport/SPA exceed this capacity. Therefore, an additional pumping capacity will be required to meet future demand requirements.

An investigation conducted by CH2M HILL during July of 1987 concluded that expansion of the existing pump station would not be cost-effective. Rather, a new pump station should be constructed with an initial capacity of 20 mgd. The 20-mgd capacity will accommodate growth through the year 2000. Future capacity will handle the growth through the year 2010. The structure will be large enough for a total of 14 pumps, half of which will be installed initially.

To convey the additional flow to the Dry Creek 2 Interceptor, a 14,500-foot-long, 48-inch diameter force main will be constructed parallel to the existing 24-inch-

diameter force main. The force main was sized by assuming a velocity during peak flow of 5.7 feet per second. Initially the total flow from both the existing and new pump station will be conveyed in the 48-inch-diameter force main to ensure sufficient velocity and reduce the potential for the accumulation of solids.

New Pipeline Facilities

New sewer pipelines were sized in accordance with the unit flow rates projected for the proposed development. With the use of USGS quadrangle maps, pipe alignments were selected, where possible, to allow drainage along natural contours, minimizing the need for lift stations. The trunk and interceptor sewer alignments are preliminary in nature, based on the most current information available, in order to establish cost estimates.

Capital Improvement Plan

The recommendations presented in this report include estimates of long-term budget requirements necessary to implement the capital improvement plan. A staged construction schedule has been developed, with three stages to allow program implementation in order of priority in a logical sequence. Each stage is compatible with and expands the stage previously completed. The cost associated with these stages, for Alternative 2B, is shown in Table 2-1. A summary of these stages is provided below:

- o Stage I program includes:
 - 1. New pipeline facilities. New sewer pipelines will be constructed to serve areas that are expected to develop according to the proposed development schedule.
- o Stage II - III program includes:
 - 1. New pipeline facilities. Additional sewer pipelines will be constructed in response to growth in the development area.

2. New pumping facilities. New pumping facilities will be required to augment the existing Natomas Pump Station's present capacity. The new pump station will be constructed in two stages: a 20 mdg pump station will be built in Stage II and expanded in Stage III.

This plan is intended to assist the District in the implementation of a capital improvement plan. Periodically, this plan should be reviewed to evaluate actual development, and it should be corrected as necessary when changes occur that differ from the assumptions made in this report.

Environmental Issues

The North Natomas Community Plan adopted by the Sacramento City Council on May 13, 1986, and the environmental impact report for the Community Plan address environmental issues and mitigation measures for adverse impacts associated with plan development. Design and construction of the sewer collection system should conform to the environmental mitigation measures listed in the final environmental impact report and expanded below.

Service Area

It is assumed that all collected wastewater will be conveyed to the existing Regional Wastewater Treatment Plant, and restrictions on service area by the Environmental Protection Agency will be resolved by the County.

Soils and Geology

Subsurface soil conditions described in the environmental impact report for the Community Plan are high shrink-swell potential, settlement, lateral spreading, quick conditions (boiling), and high groundwater levels. These conditions are

not expected to have serious effects on sewer design and construction.

Site-specific soil investigations are recommended to determine actual subsurface conditions in order to confirm pipe bedding requirements and provide soil and groundwater information to prospective contractors for determining construction methods.

Pump station sites will require more detailed soils investigations for foundation and stability design. The required soils investigation for the pipelines, pump stations, and other structures are normal practice for civil engineering projects of this type.

Where the sewer lines will be located in high groundwater areas, special effort should be made to prevent groundwater infiltration into the sewer. Modern pipe joints are adequate for this purpose since the joints contain a rubber or other resilient-type gasket that provides a watertight seal.

Special attention should be given to pipe connections at manholes or other structures. Where practical, the lower portion of the manhole should be cast-in-place up to approximately 6 inches above the top of the incoming or outgoing pipe. The connection should provide for differential settlement between the pipe and structure, and the connection to the structure should be watertight. Cement mortar should not be used around plastic pipe without a rubber gasket or rubber sealant.

Where a high groundwater potential exists, an impermeable seal of concrete or highly impermeable soil should be placed in the pipe trench at appropriate intervals to control the movement of groundwater through the pipe bedding

Where a high groundwater potential exists, an impermeable seal of a concrete or highly impermeable soil should be placed in the pipe trench at appropriate intervals to control the movement of groundwater through the pipe bedding material.

Cultural Resources

No prehistoric archaeological sites have been identified in the plan area. When previously unidentified archaeological resources are encountered during construction, all work should be suspended in the immediate area until the historical value of the site can be determined by a qualified archaeologist.

Permits and Agreements

Encroachment permits or agreements will be required by several agencies prior to construction of the North Natomas sewer collection system. Table 9-2 lists these agencies. The table includes the estimated time to acquire a permit after submittal of an application. The time estimates assume that the application is complete; that all supporting data, drawings, and details of the crossing are included with the application; and that the designer has coordinated his activities with the permitting agency. The time to acquire the permit can be extended for a variety of reasons. The implementation plan for the sewer collection system should allow for unforeseen delays.

PERMIT INFORMATION

<u>Agency</u>	<u>What is Required</u>	<u>Reasonable Time to Acquire after Submittal</u>	<u>Comments</u>
California Department of Transportation (Caltrans)	Encroachment Permit	4 to 5 weeks	Assumes transverse crossing, environmental review of project completed by applicant, and Caltrans agreement with design details. Early coordination recommended.
Sacramento Municipal Utility District (SMUD)	Letter of Consent	4 to 6 weeks	Required for crossing utility where SMUD has formal right-of-way.
Reclamation District No. 1000	Encroachment Permit	1 week	After approval application sent to State Reclamation Reclamation Board.
State Reclamation Board	Encroachment Permit	6 to 8 weeks	
Natomas Central Mutual Water Company	Letter of Agreement	2 to 3 weeks	Requires Board of Directors agreement for crossing irrigation ditches.
U.S. Army Corps of Engineers	Letter	1 to 2 weeks	Assumes national permit adequate for crossing drainage canals with the following restrictions: <ol style="list-style-type: none"> 1. No endangered species impacted by project. 2. No riparian habitat removed at canal crossings. 3. Water quality not changes as a result of project. <p>If new permit required, allow 2 to 3 months.</p>
PG&E	Consent to Common Use	4 to 6 weeks	No known facilities in North Natomas.
City of Sacramento	Encroachment Permit	4 to 6 weeks	

NORTH NATOMAS WATER FACILITIES PLAN

EXECUTIVE SUMMARY

INTRODUCTION

All of the North Natomas area lying within the City limits is in the City's water rights place of use, that is, the area that may be served under the City's current surface water entitlements. Therefore, the City anticipates ultimately serving water to the entire area inside the City limits. The long range plan for serving water to any large area requires an orderly program for extension of major water transmission mains, construction of storage and pumping facilities, and expansion of production capacity in advance of new water demands.

The City authorized the consulting firm of Dewante and Stowell to prepare two reports on plans for a water system to serve the North Natomas Area. The first, "Water Study, North Natomas Area, December, 1984" developed water requirement data, design criteria, alternative sources, and cost estimates for the alternatives.

The second report, "Supplement to Water Study, North Natomas Area, April, 1985," contained water system cost estimates for five land use alternatives and one alternative for a stadium and sports arena only. Cost estimates for total development and for four phases were prepared. These estimates were based on more refined use data and facility plans than those in the first report.

Water use data for maximum day and maximum hour were estimated for each type of land use. The resulting overall use figures are consistent with the values

developed by the City from operating experience, or about 6,000 gallons per day per acre on the maximum day of use. Use during the maximum hour is approximately 1.7 times the maximum day average. Major water main sizing and spacing were based on the accepted criterion for velocity of 6 feet per second on maximum day. Therefore, the preliminary layout of the major transmission mains shown on Figure 1 is consistent with previous conceptual designs for similar areas by City staff and other consultants.

During most of the year, the primary source of supply will be the Sacramento River Water Treatment Plant. The ultimate plan calls for two transmission main crossings of the American River. The phasing of these two mains provides flexibility in planning. Should conditions change significantly during the development, the size of the second main could be increased or decreased as appropriate. Also, under ultimate water system expansion plans, an additional transmission main would be constructed easterly to the North Sacramento area to allow more direct feed from the American River Plant. This main would also back up the main on the 18th Street bridge that is currently the primary supply from the Sacramento River Plant to the North Sacramento Area. Should future conditions lead to a decision to build a treatment plant on the Sacramento River in the Natomas area, one of the mains crossing the American River could be reduced in size.

Implementation

The Dewante and Stowell report provided a four-phase program to reach ultimate demand. Each phase would involve an expansion of treatment plant capacity, transmission and storage additions, and appurtenances. The first phase would include some wells for groundwater supply. This assumes groundwater quantity and quality are satisfactory. City staff anticipates the drilling of a test well in

the general area of the sports complex in 1988-89 to determine the feasibility of substantial groundwater use to supplement surface water supplies during peak summer use periods and dry years. Not only is groundwater supply from wells generally competitive economically with distribution storage reservoirs and pumping stations, but also provides a certain element of reliability in the event of power outage at the treatment plant or transmission main break. Wells also provide interim supply during times of rapid growth while system expansion is being undertaken. An interconnection with the water system owned and operated by the County just east of the proposed sports complex would provide additional reliability.

The general water system plan developed in the Dewante and Stowell Report allows considerable flexibility. Proposed locations of transmission mains and reservoirs shown in Figure 1 may change as final street plans are adopted. However, cost estimates would not be expected to change significantly. Table 1 presents the estimated cost for the ultimate system. Table 2 separates the cost estimates into four phases.

Phasing of water treatment plant capacity expansions probably will not be based on North Natomas development only, since other areas of development may be served by the same plant. However, costs per acre of development should not vary significantly regardless of the size of expansion. For the entire area, the average cost per net acre served is expected to be about \$6,000 for major facilities. This figure is consistent with estimated costs for major water facilities for virtually all areas in the City.

System Design

In the North Natomas area, the proposed transmission main grid is similar to that in the rest of the City. Spacing of transmission mains is approximately one mile. Distribution mains, those 12-inch and smaller, will be included in street improvements for each subdivision. In high-density residential and non-residential areas, distribution mains will generally be 10-inch and 12-inch to assure adequate fire suppression flow. Lower density residential areas generally will be gridded with 6-inch and 8-inch mains. Where wells are constructed to provide supplemental groundwater supplies, the production capacities of the wells may determine main size.

Mains may be placed either in or on bridge structures or beneath freeways and canals. It has been more economical in most past freeway crossings to place mains beneath the freeways. Casings placed across right-of-way in advance of pavement construction will cost less than boring and jacking after construction of pavement. Therefore, anticipation of crossing locations in the early planning stages will help reduce costs of transmission mains.

Any plans for new bridge crossings of the American River, such as the extension of Truxel Road should be reviewed by Water Division staff to determine the feasibility of water transmission main accommodation.

Summary

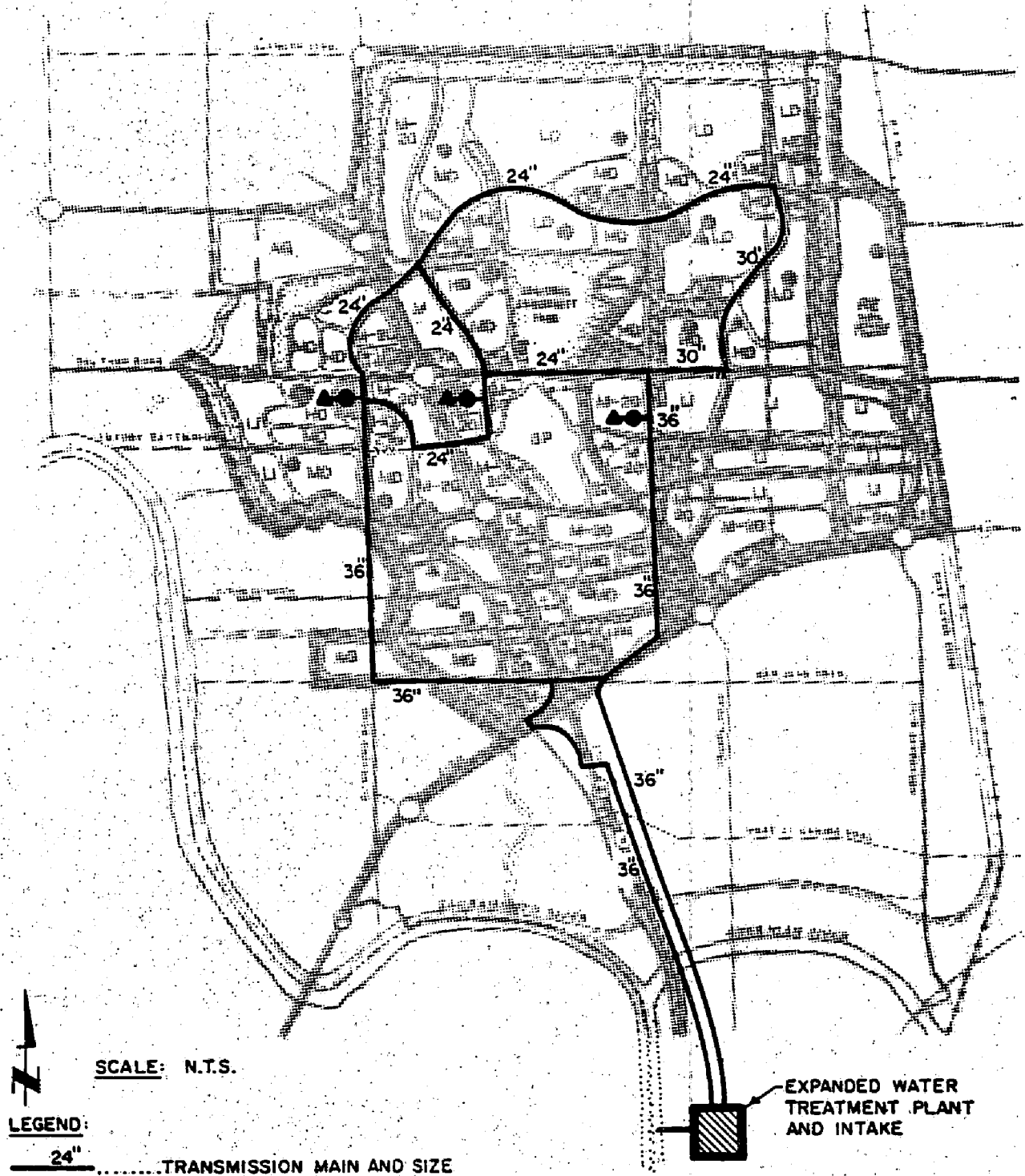
Water System design is generally more forgiving than design of sewer and drainage systems where gravity flow governs. In water systems, pumps can be operated at variable discharge pressures. Reservoirs and booster pumping statings can be added. In most areas, wells can be developed for supplemental supplies during high demand periods. In a phased program as with North Natomas, later mains can

be increased or decreased in size. All of these options will be used as appropriate in the North Natomas program. As development proceeds, income from the water system development fees will be used to extend and construct the major facilities needed. A certain amount of city debt financing can be anticipated, with development fees, water service fees to meet amortization needs.

WATER INFRASTRUCTURE

ITEM	COST
Treatment Plant	\$15,680,000
Treatment Plant Land	637,000
Existing Intake Mod.	370,000
Storage Tanks	
2 @ 3.0 mg	1,350,000
1 @ 4.0 mg	790,000
Booster Pump Station (3)	970,000
Trans. Main River Crossings (2)	960,000
Freeway Crossings (5)	900,000
Future Connection Provisions	1,100,000
Surge Control Facility	1,050,000
Telemetry Control System	50,000
Transmission Mains	
18" 3,300 LF @ \$85	450,000
24" 34,000 LF @ \$100	3,400,000
30" 8,000 LF @ \$120	960,000
36" 42,000 LF @ \$160	6,720,000
Transmission Main Valves	<u>200,000</u>
	35,587,000
Engineering, Administration and Contingencies @ 35%	<u>12,455,000</u>
TOTAL	48,042,000

NORTH NATOMAS WATER INFRASTRUCTURE



SCALE: N.T.S.

LEGEND:

24" TRANSMISSION MAIN AND SIZE

▲● BOOSTER PUMP STATION AND STORAGE TANK

EXPANDED WATER TREATMENT PLANT AND INTAKE

ULTIMATE WATER SYSTEM