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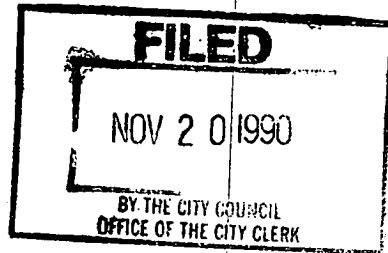
**DEPARTMENT OF  
PUBLIC WORKS**

**CITY OF SACRAMENTO  
CALIFORNIA**

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SACRAMENTO, CA  
95814-2819

TRANSPORTATION DIVISION  
November 20, 1990

916-449-5307  
FAX 916-448-8450



City Council  
Sacramento, California

Honorable Members in Session:

**SUBJECT: SOUTH NATOMAS TRAFFIC MONITORING**

**SUMMARY**

This report informs the City Council of the completion of the 1989-1990 South Natomas Traffic Monitoring (SNTM) Report as required by the South Natomas Community Plan. The SNTM Report, which provides the results of level of service (LOS) analysis for eight South Natomas intersections, will be provided under separate cover.

This report is for information only.

**BACKGROUND INFORMATION**

The City Council adopted the South Natomas Community Plan (SNCP) on November 29, 1988. An implementation measure required by the SNCP is a commitment to an annual traffic monitoring program.

Eight intersections in South Natomas were identified to begin in fiscal year 1988-89 (1989). The 1989-90 (1990) SNTM Report provides the results of the first two year monitoring program. Annual studies begin with manually collecting vehicle movement counts for both the AM and PM peak hours at each study intersection (see figure 1). Each location is analyzed for level of service using an intersection capacity method for signalized/non-signalized intersections from the 1980 publication of the Transportation Research Board, Interim Materials on Highway Capacity (Circular 212 planning method) and the 1985 Highway Capacity Manual's (HCM) operational method for signalized/non-signalized intersections. The 1987 levels of service incorporated in the 1988 SNCP were calculated using the Circular 212 planning method for signalized intersection. The 1990 report shows a comparison of the 1990, 1989, and 1987, levels of service.

Results of the study indicate two of the eight intersections exceed 80% of capacity: Garden Highway and Truxel Road; and West El Camino Avenue and Northgate Boulevard. Based on the findings presented in the SNTM Report, the LOS and vehicular capacity at the study locations are within the parameters set forth in the SNCP. Therefore staff does not recommend any changes to the intersections. The intersections will be monitored closely and when LOS begins to fall below the standards set in the SNCP, staff will make recommendations for action as well as funding.

City Council  
South Natomas Traffic Monitoring  
November 20, 1990  
Page 2

Copies of the report are available in the City Clerk's office.

FINANCIAL DATA

There is no impact to the City budget related to this report.

POLICY

The South Natomas Traffic Monitoring Report is provided in accordance with the implementation measures in the 1988 South Natomas Community Plan.

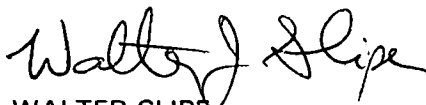
MBE/WBE EFFORTS

No goods or services are being purchased so there are no MBE/WBE efforts related to this item.

RECOMMENDATION

This report is for information only.

RECOMMENDATION APPROVED



WALTER SLIPE  
City Manager

Contact Person:  
Edward Williams, Assistant Engineer  
449-5307

EW:lm  
CA4-01.L  
11.0890

Respectfully submitted,



MARILYN KUNTEMEYER  
Supervising Engineer

APPROVED:

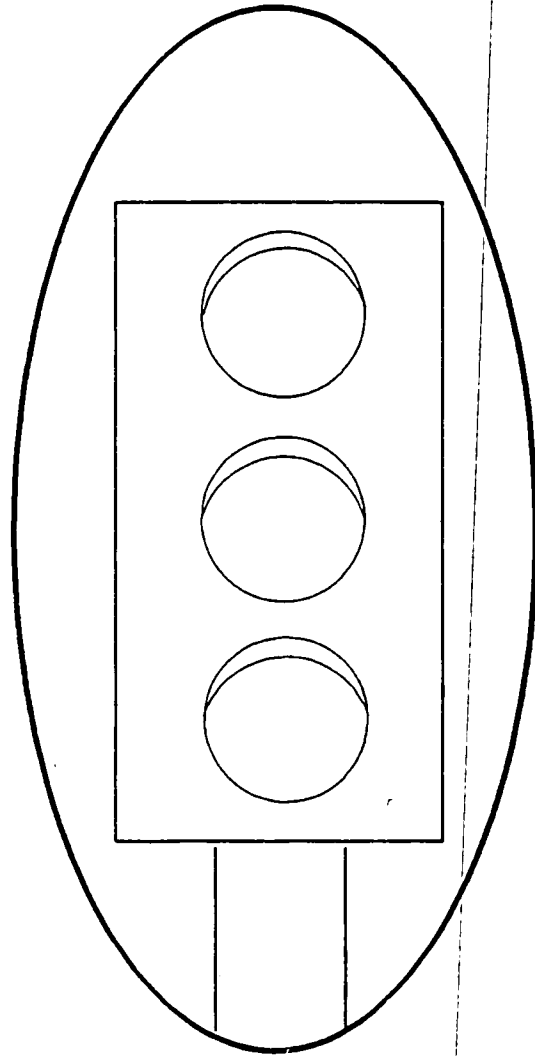


MELVIN H. JOHNSON  
Director of Public Works

November 20, 1990  
District Number 1

SOUTH  
NATOMAS

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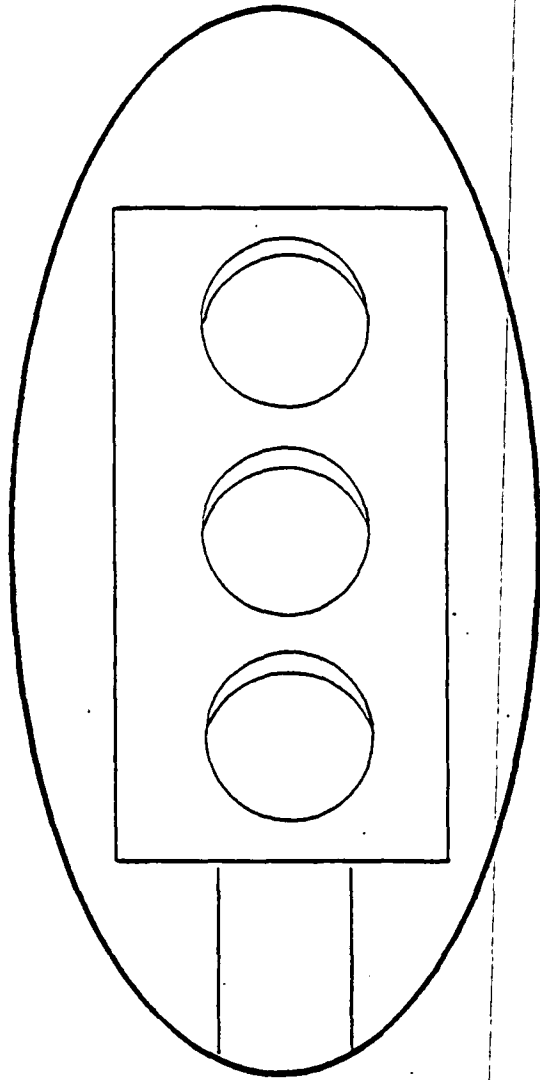


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TRAFFIC  
MONITORING

SOUTH  
NATOMAS

89



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TRAFFIC  
MONITORING

## INTRODUCTION

As an implementation measure of the South Natomas Community Plan, the City of Sacramento made a commitment to a traffic monitoring program for the South Natomas Community. The program specifies intersections in the South Natomas area to be analyzed annually as a basis for tracking the change in traffic patterns in South Natomas. The portion of the study required for the fiscal year 1989-90 is addressed in this report.

The City Council adopted the South Natomas Community Plan (SNCP) on November 29, 1988. An implementation measure of the SNCP was a commitment to an annual traffic monitoring program (Appendix A). Eight intersections in South Natomas, east of Interstate 5, were identified for studies to begin in fiscal year 1988-89. Additional intersections, west of Interstate 5, will be added to the program in fiscal year 1990-91.

For the first two years of the monitoring program, the following intersections were evaluated:

1. Northgate Boulevard and I-80 W.B. Ramps
2. Northgate Boulevard and I-80 E.B. Ramps
3. San Juan Road and Truxel Road
4. San Juan Road and Northgate Boulevard
5. West El Camino and Truxel Road
6. West El Camino and Northgate Boulevard
7. Garden Highway and Truxel Road
8. Garden Highway and Northgate Boulevard

Figure 1 illustrates the locations of the above intersections monitored in 1990, with the AM and PM peak hour turning movements at the intersections shown. These intersections were also evaluated during the environmental review for the SNCP (see Appendix B).

The 1987 levels of service incorporated in the SNCP were calculated using an intersection capacity method for signalized intersections from the 1980 publication of the Transportation Research Board, Interim Materials on Highway Capacity (Circular 212).

City staff's 1990 analysis used the Circular 212 planning method as well as the 1985 Highway Capacity Manual's (HCM) operational method for signalized locations. For unsignalized locations, staff utilized the Circular 212 and HCM methods where applicable. Although Circular 212 is often used to evaluate existing intersections, it is intended to be used as a planning tool. The HCM focuses on existing intersections and offers a more complete analysis method. The HCM method is much more sensitive to existing geometry and signal phasing. The Circular 212 capacity analysis was appropriate for the SNCP environmental review, but staff believes that the 1985 HCM method will give a more accurate picture of congestion in South Natomas, as it requires more detailed information about an intersection.

Tables 1 and 2 define the levels of service (LOS) for the Circular 212's signalized and unsignalized intersections respectively. Table 3 defines the level of service for the HCM method of analysis.

Tables 4 and 5 list the results of the 1990 analysis for AM and PM peak hour traffic operations, along with the LOS from the South Natomas Traffic Impact Analysis of 1988 (1987 count data). Tables 6 and 7 show a comparison of results of the 1989 and 1990 analyses.

The 1990 analysis produced approximately the same results as the 1989 study. Four of the eight intersections analyzed indicated a significant change in LOS from the 1988 analysis. They are San Juan Road and Truxel Road, Northgate Boulevard and San Juan Road, Garden Highway and Truxel Road, and Garden Highway and Northgate Boulevard. The changes are as follows:

### SAN JUAN ROAD AND TRUXEL ROAD

The intersection of San Juan Road and Truxel Road (Location 3, Figure 1) was shown to operate at Los "A" in 1988. Because the intersection is a 4-way stop, the LOS was determined by modeling the location as a signalized 2 phase intersection. However, City staff feels that the method is no longer appropriate for this location as the geometry of the intersection and number of pedestrians cannot be accurately modeled using the Circular 212 planning method. Using approximations for capacity from the 1985 HCM and engineering judgment, staff estimates that AM and PM peak hour LOS to be middle or low "C" and at times borders on "D" (refer to Tables 4 and 5).

### NORTHGATE BOULEVARD AND SAN JUAN ROAD

The intersection of Northgate Boulevard and San Juan Road (Location 4, Figure 1) has experienced a significant increase in LOS. The increased operating efficiency is a direct result of the intersection expansion and signal upgrade installed in late Fall, 1988 (refer to Tables 4 and 5).

### GARDEN HIGHWAY AND TRUXEL ROAD

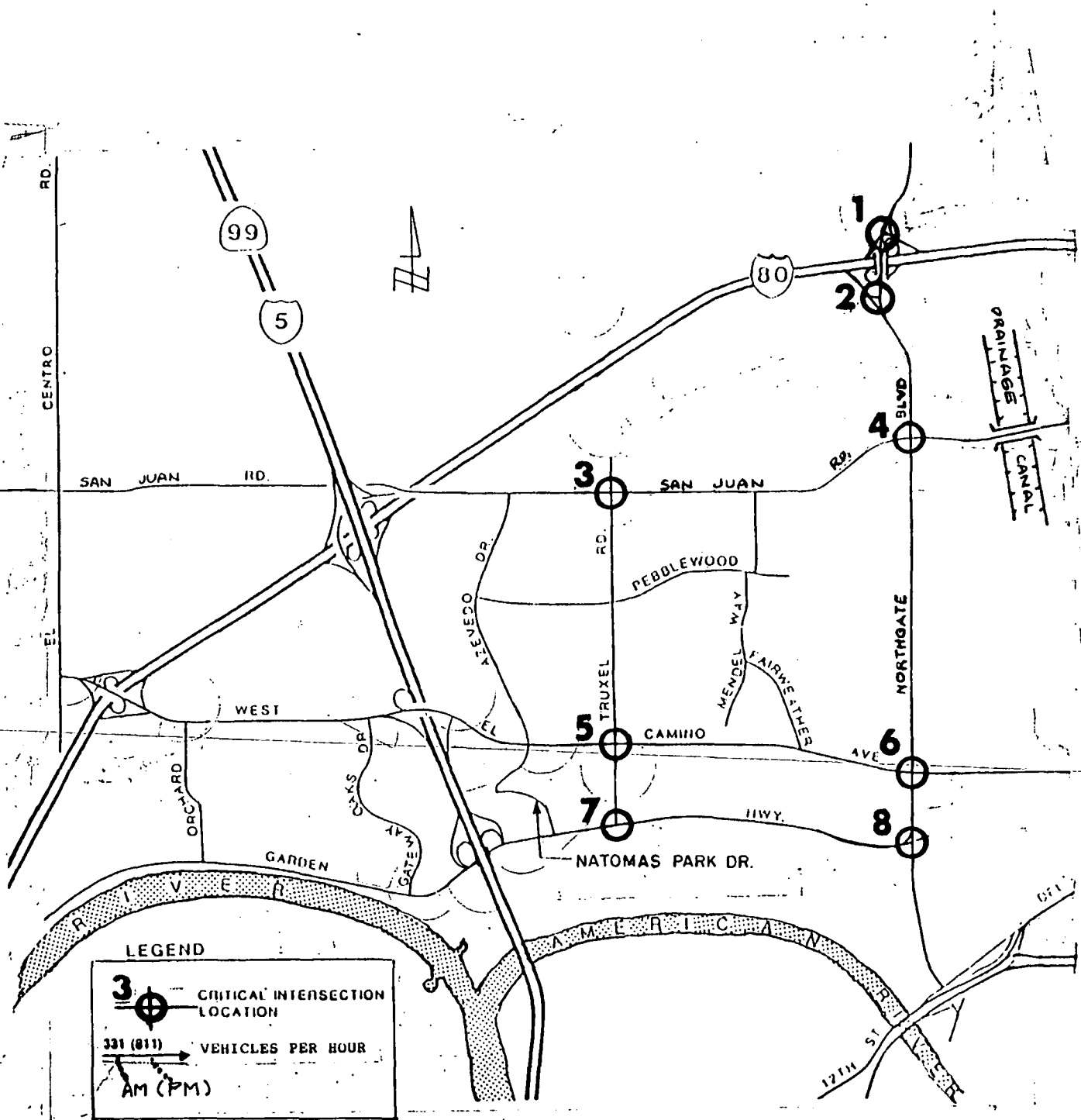
The unsignalized intersection of Garden Highway and Truxel Road (Location 7, Figure 1) was modeled as a signalized location as a traffic signal is scheduled for this location in the future. However, staff has analyzed the intersection under actual operating conditions which indicate a highly congestive condition. Operations will improve when the signal is installed.

### GARDEN HIGHWAY AND NORTHGATE BOULEVARD

The intersection of Garden Highway and Northgate Boulevard (Location 8, Figure 1) has shown a decrease in LOS from A to B during the AM peak hour. The decrease is due primarily to an increase in traffic volumes.

Results of the study indicate two of the eight intersections exceed 80% of capacity: Garden Highway and Truxel Road; and West El Camino Avenue and Northgate Boulevard. Based on the findings presented in this report, the LOS and vehicular capacity at the study locations are within the parameters set forth in the SNCP. Therefore staff does not recommend any changes to the study intersections. The intersections will be monitored closely and when LOS begins to fall below the standards set in the SNCP, staff will make recommendations for action as well as funding.

EW:lm  
EW6-06.L



**MONITORED INTERSECTION LOCATIONS**

SPRING 1990

FIGURE 1.

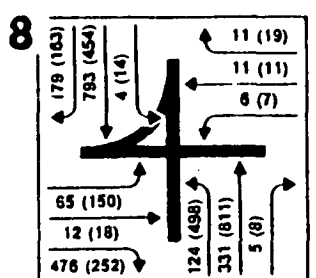
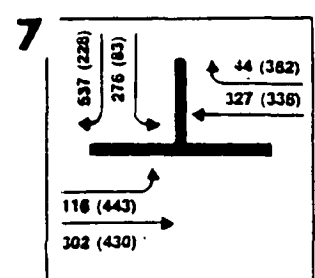
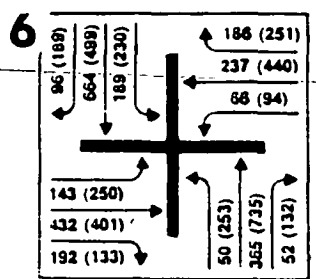
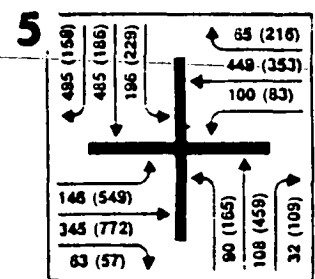
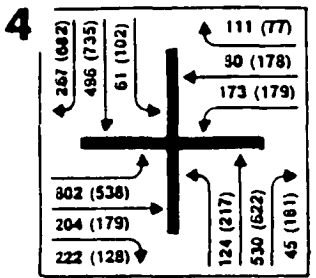
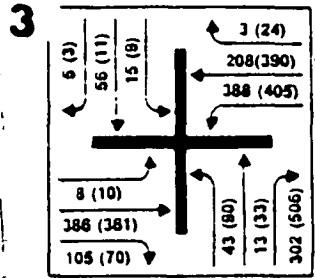
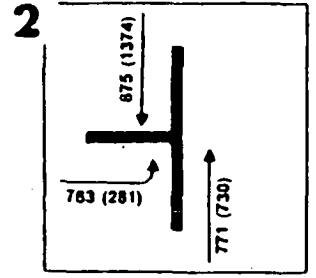
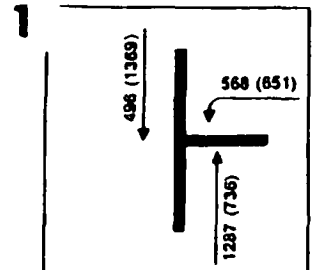




TABLE 1

LEVEL OF SERVICE DEFINITIONS (CIR. 212)  
SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	INTERSECTION
"A"	Uncongested operations, all queues clear in a single-signal cycle. V/C - 0.00 - .60
"B"	Uncongested operations, all queues clear in a single cycle. V/C - 0.61 - 0.70
"C"	Light congestion, occasional backups on critical approaches. V/C - 0.71 - 0.80
"D"	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. V/C - 0.81 - 0.90
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). V/C - 0.91 - 1.00
"F"	Total breakdown, stop-and-go operation. V/C > 1.00

**TABLE 2****LEVEL OF SERVICE AND EXPECTED DELAY FOR  
RESERVE CAPACITY RANGES (CIR. 212)****UNSIGNALIZED INTERSECTIONS**

<b>RESERVE CAPACITY</b>	<b>LEVEL OF SERVICE</b>	<b>EXPECTED TRAFFIC DELAY</b>
400 or more	A	Little or no delay
300 to 399	B	Short traffic delays
200 to 299	C	Average traffic delays
100 to 199	D	Long traffic delays
0 to 99	E	Very long traffic delays
Less than 0	E	Failure - extreme congestion
(Any value)	F	Intersection blocked by external causes

TABLE 3

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (1985 HCM)

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	$\leq 5.0$
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	$> 60.0$



TABLE 4

## INTERSECTION ANALYSIS

## AM PEAK

INTERSECTION NUMBER	INTERSECTION	CIR.212 1987		CIR.212 1989-90		HCM OPERATIONAL 1989-90	
		V/C	LOS	V/C	LOS	(SEC/VEH)	LOS
1.	Northgate Blvd./ I-80 W.B. Ramp	*.53	A	*.61	B	10.5	B
2.	Northgate Blvd./ I-80 E.B. Ramp	*.46	A	*.55	A	10.7	B
3.	San Juan Rd./Truxel Rd. -(Unsignalized, 4-way stop) -(Assume, 2 phase signal)	Not Analyzed *.55	A	Not Analyzed *.58	A	** Not Applicable	C
4.	Northgate Blvd./ San Juan Rd.	*.87	D	*.60	B	20.0	C
5.	W. El Camino Ave./ Truxel Rd.	*.40	A	*.42	A	18.0	C
6.	W. El Camino Ave./ Northgate Blvd.	*.63	B	*.59	A	20.6	C
7.	Garden Hwy./Truxel Rd. (Unsignalized, stop on minor leg)	*.44	A	** .88	D	**	F
8.	Garden Hwy./ Northgate Blvd.	*.48	A	*.63	B	12.1	B

\* Circular 212 planning method for signalized intersections

\*\* Circular 212 or HCM for unsignalized intersections

TABLE 5

## INTERSECTION ANALYSIS

## PM PEAK

INTERSECTION NUMBER	INTERSECTION	CIR.212 1987		CIR.212 1989-90		HCM OPERATIONAL 1989-90	
		V/C	LOS	V/C	LOS	(SEC/VEH)	LOS
1.	Northgate Blvd./ I-80 W.B. Ramp	*.55	A	*.67	B	13.7	B
2.	Northgate Blvd./ I-80 E.B. Ramp	*.45	A	*.55	A	4.6	A
3.	San Juan Rd./Truxel Rd. -(Unsignalized, 4-way stop) -(Assume, 2 phase signal)	Not Analyzed *.50	A	Not Analyzed *.58	A	** Not Applicable	C
4.	Northgate Blvd./ San Juan Rd.	*.99	E	*.66	B	24.6	C
5.	W. El Camino Ave./ Truxel Rd.	*.56	A	*.56	A	22.4	C
6.	W. El Camino Ave./ Northgate Blvd.	*.88	D	*.89	D	44.1	E
7.	Garden Hwy./Truxel Rd. (Unsignalized, stop on minor leg)	*.54	A	** .93	E	**	F
8.	Garden Hwy./ Northgate Blvd.	*.65	B	*.64	B	10.7	B

\* Circular 212 planning method for signalized intersections

\*\* Circular 212 or HCM for unsignalized intersections

TABLE 6

## INTERSECTION ANALYSIS

## AM PEAK

INTERSECTION NUMBER	INTERSECTION	CIR.212 1988-89		HCM OPERATIONAL 1988-89		CIR 212 1989-90		HCM OPERATIONAL 1989-90	
		V/C	LOS	DELAY (SEC/VEH)	LOS	V/C	LOS	DELAY (SEC/VEH)	LOS
1.	Northgate Blvd./ I-80 W.B. Ramp	*.59	A	11.7	B	*.61	B	10.5	B
2.	Northgate Blvd./ I-80 E.B. Ramp	*.58	A	11.3	B	*.55	A	10.7	B
3.	San Juan Rd./Truxel Rd. -(Unsignalized, 4-way stop) -(Assume, 2 phase signal)	Not Analyzed *.55	A	** Not Applicable	C	Not Analyzed *.58	A	** Not Applicable	C
4.	Northgate Blvd./ San Juan Rd.	*.49	A	24.2	C	*.60	B	20.0	C
5.	W. El Camino Ave./ Truxel Rd.	*.46	A	20.8	C	*.42	A	18.0	C
6.	W. El Camino Ave./ Northgate Blvd.	*.64	B	17.3	C	*.59	A	20.6	C
7.	Garden Hwy./Truxel Rd. (Unsignalized, stop on minor leg)	** .82	D	**	F	** .88	D	**	F
8.	Garden Hwy./ Northgate Blvd.	*.63	B	21.6	C	*.63	B	12.1	B

\* Circular 212 planning method for signalized intersections

\*\* Circular 212 or HCM for unsignalized intersections

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TABLE 7

## INTERSECTION ANALYSIS

## PM PEAK

INTERSECTION NUMBER	INTERSECTION	CIR.212 1988-89		HCM OPERATIONAL 1988-89		CIR 212 1989-90		HCM OPERATIONAL 1989-90	
		V/C	LOS	DELAY (SEC/VEH)	LOS	V/C	LOS	DELAY (SEC/VEH)	LOS
1.	Northgate Blvd./ I-80 W.B. Ramp	*.70	B	11.5	B	*.67	B	13.7	B
2.	Northgate Blvd./ I-80 E.B. Ramp	*.59	A	9.1	B	*.55	A	4.6	A
3.	San Juan Rd./Truxel Rd. -(Unsignalized, 4-way stop) -(Assume, 2 phase signal)	Not Analyzed *.61	A	** Not Applicable	C	Not Analyzed *.58	A	* Not Applicable	C
4.	Northgate Blvd./ San Juan Rd.	*.52	A	24.9	C	*.66	B	24.6	C
5.	W. El Camino Ave./ Truxel Rd.	*.59	A	23.8	C	*.56	A	22.4	C
6.	W. El Camino Ave./ Northgate Blvd.	*.95	E	29.3	D	*.89	D	44.1	E
7.	Garden Hwy./Truxel Rd. (Unsignalized, stop on minor leg)	** .93	E	**	F	** .93	E	**	F
8.	Garden Hwy./ Northgate Blvd.	*.65	B	10.8	B	*.64	B	10.7	B

\* Circular 212 planning method for signalized intersections

\*\* Circular 212 or HCM for unsignalized intersections

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APPENDIX A

EXCERPT FROM SNCP

ADOPTED 11/29/88

- B. City would establish a traffic monitoring program for the plan areas east of Interstate 5 as follows:
1. Monitoring would begin in Fiscal Year 1988-89 and would be conducted on an annual basis;
  2. The intersections that would be monitored would be:
    - a. Garden Highway and Northgate Boulevard
    - b. West El Camino and Northgate Boulevard
    - c. San Juan Road and Northgate Boulevard
    - d. San Juan Road and Truxel Road
    - e. West El Camino and Truxel Road
    - f. Garden Highway and Truxel Road
    - g. Northgate Boulevard and I-80
  3. If the level of service on these intersections is equal to or exceeds 80 percent of capacity during the peak hour at 5 of the 7 locations:
    - a. A traffic analysis would be conducted and made available to the public.
    - b. ~~The traffic analysis would be used to determine the priorities in which FBA projects should be built.~~
    - c. The City would consider supplemental TSM measures such as development of a shuttle van service and construction of an additional roadway/bicycle/pedestrian link between North and South Natomas west of I-5.
    - d. Development money earmarked for transportation from new projects in the area would be restricted to construction of projects that would improve circulation east of I-5.
  4. If the level of service at Northgate Boulevard and I-80 (X.B.2.g) is equal to or exceeds 80 percent of capacity during the peak hour, the City would work with Caltrans to investigate options to improve intersection operation at this location.

APPENDIX B

EXCERPT

1988 SOUTH NATOMAS TRAFFIC IMPACT ANALYSIS

TABLE 4, PAGE 12

EXISTING INTERSECTION LOS

INT.	INTERSECTION	AM		PM	
		V/C	LOS	V/C	LOS
1.	Northgate Blvd./I-80 WB Ramps	0.53	A	0.55	A
2.	Northgate Blvd./I-80 EB Ramps	0.46	A	0.45	A
3.	San Juan Rd./Truxel Road	0.55	A	0.50	A
4.	San Juan Rd./W. Silver Eagle/Northgate Blvd. <sup>1</sup>	0.87	D	0.99	E
5.	W. El Camino Ave./I-80 WB Ramps	0.10	A	0.12	A
6.	W. El Camino Ave./I-80 EB Ramps	0.33	A	0.22	A
7.	W. El Camino Ave./Orchard Lane	0.29	A	0.27	A
8.	W. El Camino Ave./Gateway Oaks Dr.	0.24	A	0.35	A
9.	W. El Camino Ave./I-5 NB Ramps	0.69	B	0.43	A
10.	W. El Camino Ave./Azevedo Drive	0.65	B	0.61	B
11.	W. El Camino Ave./Truxel Road	0.40	A	0.56	A
12.	W. El Camino Ave./Northgate Blvd. <sup>1</sup>	0.63	B	0.88	D
13.	Garden Hwy./Gateway Oaks Dr.	0.31	A	0.42	A
14.	Garden Hwy./I-5 SB Ramps	0.24	A	0.34	A
15.	Garden Hwy./I-5 NB Ramps	0.44	A	0.49	A
16.	Garden Hwy./Creekside Oaks Dr. <sup>2</sup>	N/A	N/A	N/A	N/A
17.	Garden Hwy./Truxel Road	0.44	A	0.54	A
18.	Garden Hwy./Northgate Blvd.	0.48	A	0.65	B

1. Intersections which currently exceed the City's standard of LOS "C"

2. The Garden Highway/Creekside Oaks drive intersection was not open at the time traffic counts were conducted.

N/A Not Applicable

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