

Growth Management Program

Year 2018 Traffic Conditions Report

Prepared for:

City of Carlsbad
1635 Faraday Avenue
Carlsbad, CA 92008



Prepared by:

Jason Stack, TE
Principal Manager



5865 Avenida Encinas, Suite 142-B
Carlsbad, CA 92008

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1 INTRODUCTION

This traffic conditions report was prepared to evaluate and document the year 2018 roadway conditions and to assess changes in traffic patterns from previous years. A total of twenty (20) roadway segments are included and monitoring and evaluation was performed by collecting 24-hour mid-block roadway segment traffic counts.

2 BACKGROUND

This report is prepared annually as part of the Growth Management Program (GMP). The City of Carlsbad adopted the GMP in 1986 which put conditions on how growth could occur in the city and to ensure that public infrastructure was delivered concurrently with development. In turn, a Local Facilities Management Plan (LFMP) was adopted for each of the 25 local facility management zones. These LFMPs demonstrated that the local public facilities, including transportation, would be sufficient to meet the forecast level of growth in each of the zones. The LFMP also established thresholds for public facilities, which are monitored and reported to City Council on an annual basis.

As part of the GMP, the city prepares an annual traffic monitoring report for critical roadway segments throughout the City. This is necessary to comply with the City's Growth Management Ordinance and Local Facilities Management Plan. The Local Facilities Management Plan states:

“Implement a comprehensive livable streets network that serves all users of the system-vehicles, pedestrians, bicycles and public transit. Maintain LOS D or better for all modes that are subject to this multi-modal level of service (MMLOS) standards, as identified in Table 3-1 of the General Plan Mobility Element, excluding LOS exempt intersections and streets approved by the City Council.”

Since 1988, the City has conducted annual traffic monitoring by collecting traffic counts including 24-hour mid-block roadway segment counts and morning and evening peak hour intersection turning movement counts. The data is then used to conduct operational analysis on the roadways and intersections which allows the city to identify existing and/ or future areas with deficient capacity. The current year's traffic volumes and level of service are compared with the previous year's traffic volumes and level of service to determine changes which may be the result of new development or changed traffic patterns.

3 PREVIOUS MONITORING AND ANALYSIS METHODOLOGY

The City of Carlsbad historically monitored traffic by collecting traffic count data during the summer season. Traffic count data was collected and monitored at both roadway segments and intersections. Since 2011, the City began collecting pedestrian and bicycle count data in addition to vehicular data. However, the pedestrian and bicycle data has been collected for informational purposes only.

Historically, the city evaluated intersections using Intersection Capacity Utilization (ICU) methodology and evaluated roadway segments using the peak hour volume to capacity ratio method. Carlsbad's application of ICU methodology was unique in that it evaluated peak hour intersection conditions using the following



unadjusted ideal roadway capacity values of a) 2,000 vehicles-per-hour -per-lane (vphpl) for thru movements, and b) 1,800 vphpl for left turn movements. The “Carlsbad ICU Methodology” was not consistent with the Highway Capacity Manual (HCM) as it did not adjust the capacity values to account for factors that typically reduce ideal roadway capacity (e.g., signal timing and lost time). Similarly, segments were analyzed using an unadjusted ideal roadway capacity value of 1800 vphpl which did not account for factors that reduce the capacity (e.g., signal spacing and traffic speed). Results using the Carlsbad ICU method for intersection analysis and peak hour volume to capacity method for roadway segment analysis did not adequately reflect the actual conditions observed in the field.

4 CHANGES TO THE MONITORING AND ANALYSIS METHODOLOGY

At the time this report was prepared, the city was in the process of developing a Growth Management Program Annual Traffic Monitoring Procedures Manual which provides guidance to prepare future annual traffic conditions reports.

Starting in 2017, the city collected traffic count data during the fall season to comply with traffic engineering practice that typically collects traffic count data during the spring and fall seasons when schools are in session. The traffic count data collected during summer season was found to be generally higher in comparison to the more recent fall season data collection and reflects the city’s summer tourist season. Moving forward it may be more conservative to monitor traffic growth and roadway conditions during the summer season.

The city accepted the HCM as the analysis method for roadway conditions with the September 2015 General Plan Update. It requires the analysis to be consistent with the most recent version of the HCM. Starting this year (2018), the GMP monitors and reports conditions for roadway segments only and monitoring intersection conditions is no longer required.

The city also recently developed service volume tables which utilize HCM 2010 methodology to evaluate roadway conditions. The roadway segment service volume tables consider key geometric and operational factors including type of facility, number of lanes, intersection cycle length, distance between intersections, and other factors related to lane capacity and signal operations. Two roadway segment service volume tables were derived; 1) the specific corridor roadway service volume table and 2) the generalized data roadway service volume table. The specific corridor service volume table was derived specifically for each roadway subject to Auto Multi Modal Level of Service (MMLOS) in the city’s General Plan Mobility Element. The generalized data service volume table defines general capacities for arterial and industrial street roadway classifications. Both service volume tables provide peak hour roadway capacities in the peak direction of travel. The service volume tables are included in **Appendix A**.

The service volume tables were developed based on the input parameters available at the time. In the future service volume tables will be validated and updated according to field observations. For example, the “arrival type” is an evaluation of the percentages of vehicles that arrive at an intersection during a green light. This value typically reflects professional judgement and not statistical data. The new traffic signal controllers installed as part of the Advanced Traffic Management System CIP project will report the



actual percentages of vehicles arriving during a green light. This will provide input parameters based on data rather than estimates.

The service volumes are used for LOS reports and to identify potentially congested roadway segments and isolated intersections that need further analysis. The HCM defines the service volume LOS method as a planning level analysis that provides a means of quickly assessing one or more urban street facilities to determine which facilities need to be more carefully evaluated (with operational analysis) to ameliorate existing or pending problems. In practice this is typically applied to longer arterial corridors rather than individual segments. The LOS reported for the arterial may be better than individual segments or intersections. When LOS D is reported for an arterial further LOS analysis should be conducted for specific segments and/ or isolated intersections.

5 MONITORING LOCATIONS

The circulation system in the City of Carlsbad includes the following major arterials: Palomar Airport Road, El Camino Real, Melrose Drive, La Cosa Avenue, Rancho Santa Fe Road, Cannon Road, College Boulevard and Aviara Parkway/ Alga Road. To monitor traffic on these arterials, the city has identified key segment locations based on land uses, roadway network, traffic pattern and locations that would foretell a better growth trend. The city added new monitoring locations and removed previous monitoring locations for 2018. Two new locations were added 1) Rancho Santa Fe Road between Camino Junipero and La Costa Avenue and 2) Rancho Santa Fe Road between Calle Barcelona and Olivenhain Road. Monitoring locations for the year 2018 are listed on **Table 1** and shown in **Figure 1** on page 6.

Table 1
Roadway Segment Monitoring Locations

Location Number	Roadway	Roadway Segment Limits
1	Palomar Airport Rd.	Paseo Del Norte and Armada Dr.
2	Palomar Airport Rd.	Camino Vida Roble and El Camino Real
3	Palomar Airport Rd.	El Camino Real and El Fuerte
4	Palomar Airport Rd.	Melrose Dr. and City Limits
5	El Camino Real	Plaza Dr. and Marron Rd.
6	El Camino Real	Tamarack Ave. and Cannon Rd.
7	El Camino Real	Cannon Rd. and College Blvd.
8	El Camino Real	College Blvd. and Palomar Airport Rd
9	El Camino Real	Aviara Pkwy. - Alga Rd. and La Costa Ave.
10	El Camino Real	La Costa Ave. and Leucadia Blvd.
11	Melrose Dr.	City Limits and Palomar Airport Rd.
12	La Costa Ave.	Piraeus St. and El Camino Real
13	Rancho Santa Fe Rd.	City Limits and Camino Junipero
14	Rancho Santa Fe Rd.	Camino Junipero and La Costa Ave.
15	Rancho Santa Fe Rd.	Calle Barcelona and Olivenhain Rd.
16	Cannon Rd.	Paseo Del Norte and Car Country Dr.
17	Cannon Rd.	El Camino Real and College Blvd.



Location Number	Roadway	Roadway Segment Limits
18	College Blvd.	Carlsbad Village Dr. and Cannon Rd.
19	College Blvd.	Aston Ave. and Palomar Airport Rd.
20	Alga Rd.	Corintia St. and El Fuerte St.

6 DATA COLLECTION

Traffic count data for 2018 was collected in the month of October on a typical weekday (Tuesday, Wednesday or Thursday). 24-hour traffic counts were collected at mid-block roadway segments using mechanical tube counters. STC coordinated with the city to select the specific site for placement of machine counters. The count program included the 20 roadway segment monitoring locations, nine additional 24-hour roadway segment traffic counts, and 18 intersection peak hour turning movement counts. The peak hour turning movement counts were collected between 7:00 AM and 9:00 AM and 4:00 PM and 6:00 PM. The additional counts were collected for information only. The traffic count data is included in **Appendix B**.

The 2018 daily roadway segment volumes are shown on **Figure 2** and the peak hour roadway segment volumes are shown on **Figure 3**.

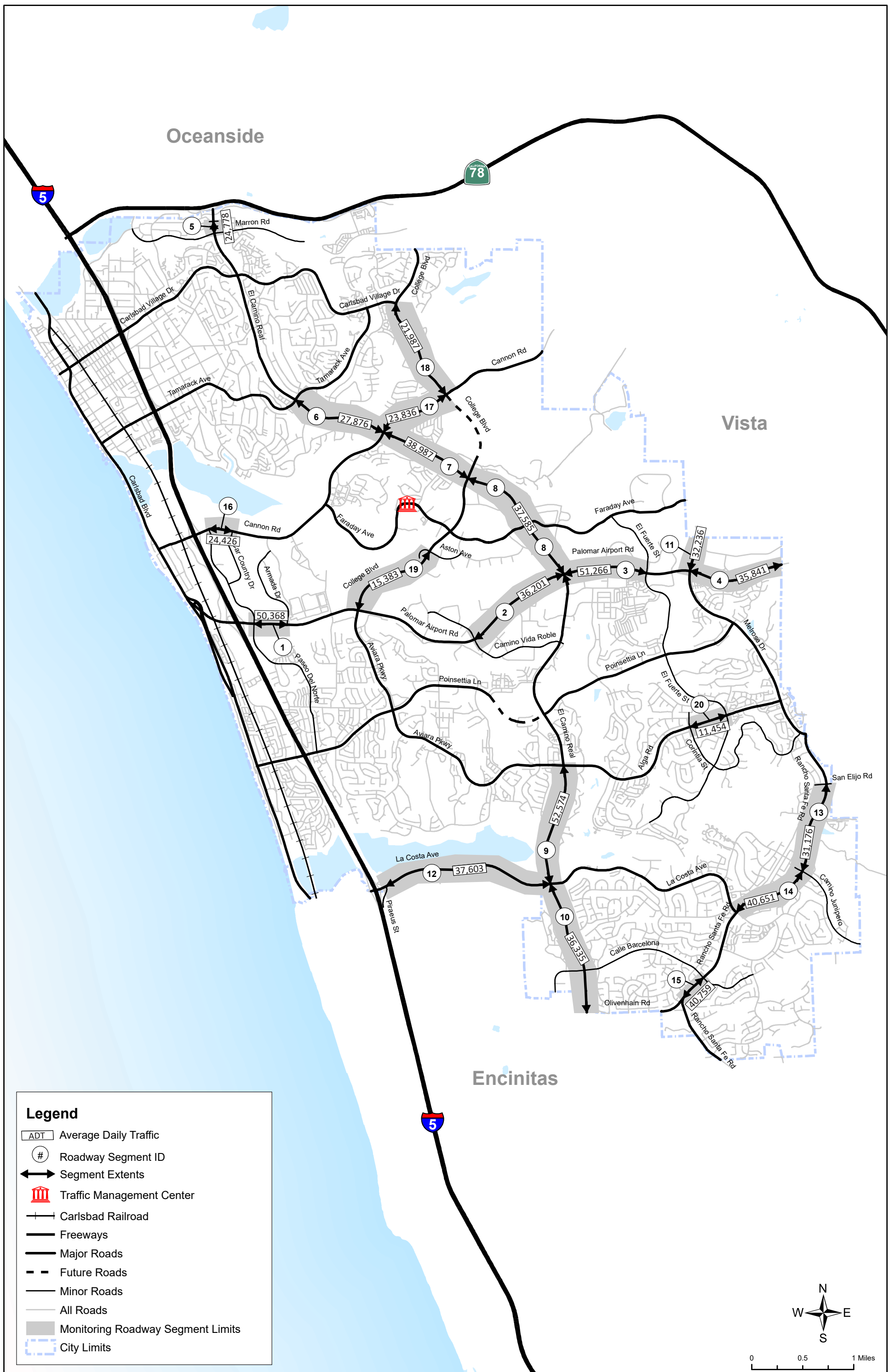


Figure 2
Year 2018 Daily Roadway Segment Volumes



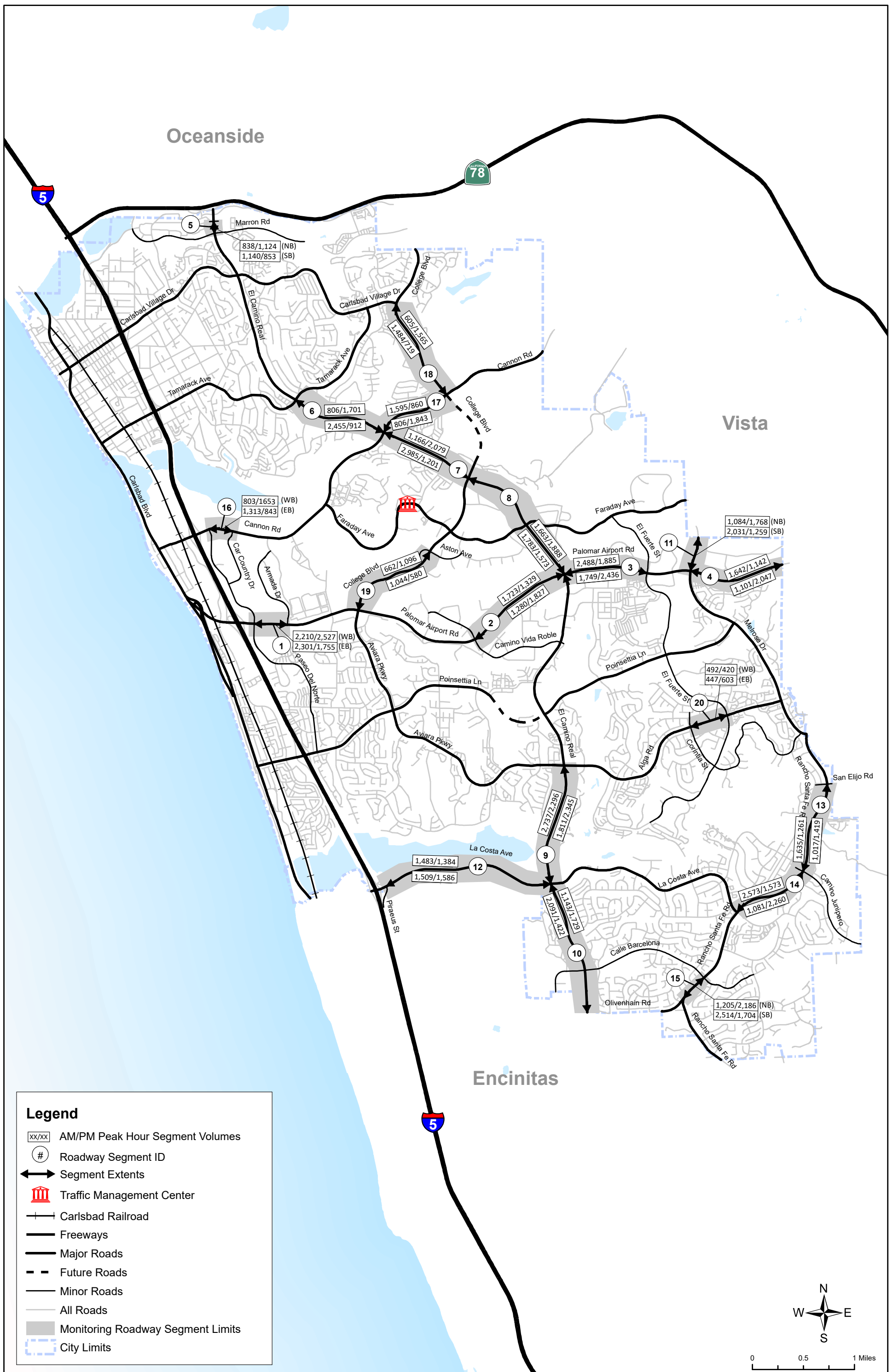


Figure 3
Year 2018 Peak Hour Roadway Segment Volumes





7 ROADWAY SEGMENT CONDITION

The roadway segment morning and evening peak hour conditions were evaluated for both direction of travel. The peak hour directional volumes were derived from the 24-hour roadway segment count data and compared to the service volume tables to determine the operating conditions. The specific corridor service volume table was used for segments subject to auto MMLOS and the generalized data service volume table was used for segments not subject to Auto MMLOS. The 2018 roadway segment conditions are summarized on **Table 2**. The roadway segment conditions are graphically illustrated on **Figure 4** for the morning peak hour and **Figure 5** for the evening peak hour. **Figure 6** illustrates deficient roadway segments.

As shown on Table 2 on the following page, six roadway segments operate at unacceptable level of service (LOS) E or F in at least one direction of travel and during at least one peak hour. Five of the roadway segments operate at unacceptable LOS F in at least one direction of travel and during at least one peak hour. Three roadway segments operate at unacceptable LOS E in at least one direction of travel and during at least one peak hour. Following are the roadway segments that operate at unacceptable LOS E or F in 2018:

- El Camino Real between City Limits and Marron Rd. (LOS E – both directions of travel during both AM and PM peak hour).
- El Camino Real between Cannon Rd. and College Blvd. (LOS F – southbound direction during AM peak hour and northbound direction during PM peak hour).
- El Camino Real between Aviara Pkwy.-Alga Rd. and La Costa Ave. (LOS F – southbound direction during both AM and PM peak hour).
- Melrose Dr. between City Limits and Palomar Airport Rd. (LOS F – southbound direction during AM peak hour and LOS E – southbound direction during PM peak hour).
- Cannon Rd. between El Camino Real and College Blvd. (LOS E - westbound direction during AM peak hour and LOS F - eastbound direction during PM peak hour).
- College Blvd. between Aston Ave. and Palomar Airport Rd. (LOS F – southbound direction during PM peak hour).



Table 2
Year 2018 Peak Hour Roadway Segment Level of Service Summary

Roadway	Roadway Segment Limits	Lanes ¹ /Posted Speed/Median Type	AM Peak Hour				PM Peak Hour			
			NB/EB		SB/WB		NB/EB		SB/WB	
			Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
Palomar Airport Road	Paseo del Norte and Armada	7/45/D	2,301	D	2,210	C	1,755	D	2,527	D
	Camino Vida Roble and El Camino Real	6/55/D	1,280	C	1,723	C	1,827	C	1,329	C
	El Camino Real and El Fuerte	6/55/D	1,749	C	2,488	C	2,436	C	1,885	C
	Melrose Drive and City Limits	6/55/D	1,101	C	1,642	C	2,047	C	1,142	C
El Camino Real	City Limits and Marron Road	6/35/D	838	E	1,140	E	1,124	E	853	E
	Tamarack Avenue and Cannon Road	6/55/D	806	C	2,455	D	1,701	C	912	C
	Cannon Road and College Boulevard	5/55/D	1,166	C	2,985	F	2,079	F	1,201	B
	College Boulevard and Palomar Airport Road	6/55/D	1,663	B	1,783	B	1,888	B	1,573	B
	Aviara Parkway-Alga Road and La Costa Avenue	5/55/D	1,811	C	2,737	F	2,345	C	2,296	F
	La Costa Avenue and Leucadia Boulevard	6/55/D	1,143	C	2,091	D	1,729	C	1,422	C
Melrose Drive	City Limits and Palomar Airport Road	7/55/D	1,084	C	2,031	F	1,768	D	1,259	E
La Costa Avenue	Pireaus Street and El Camino Real	4/55/D	1,509	C	1,483	C	1,586	C	1,384	B
Rancho Santa Fe Road	City Limits and Camino Junipero	6/55/D	1,017	B	1,635	B	1,419	B	1,261	B
	Camino Junipero and La Costa Avenue	6/55/D	1,081	B	2,573	C	2,260	C	1,573	C
	Calle Barcelona and Olivenhain Road	6/50/D	1,205	C	2,514	C	2,186	C	1,704	C
Cannon Road	Paseo del Norte and Car Country	4/50/D	1,313	C	803	C	843	C	1,653	D
	El Camino Real and College Boulevard	4/50/D	806	D	1,595	E	1,843	F	860	D
College Boulevard	Carlsbad Village Drive and Cannon Road	4/45/D	605	C	1,484	D	1,565	D	719	C
	Aston Avenue and Palomar Airport Road	4/50/D	1,044	B	662	B	580	A	1,096	F
Alga Road	Corintia St and El Fuerte St	4/50/D	447	C	492	C	603	C	420	C

¹ Number of Lanes are at mid-block roadway segment in both directions.

D – Divided Median.

NB, SB, EB and WB – Northbound, Southbound, Eastbound and Westbound respectively.

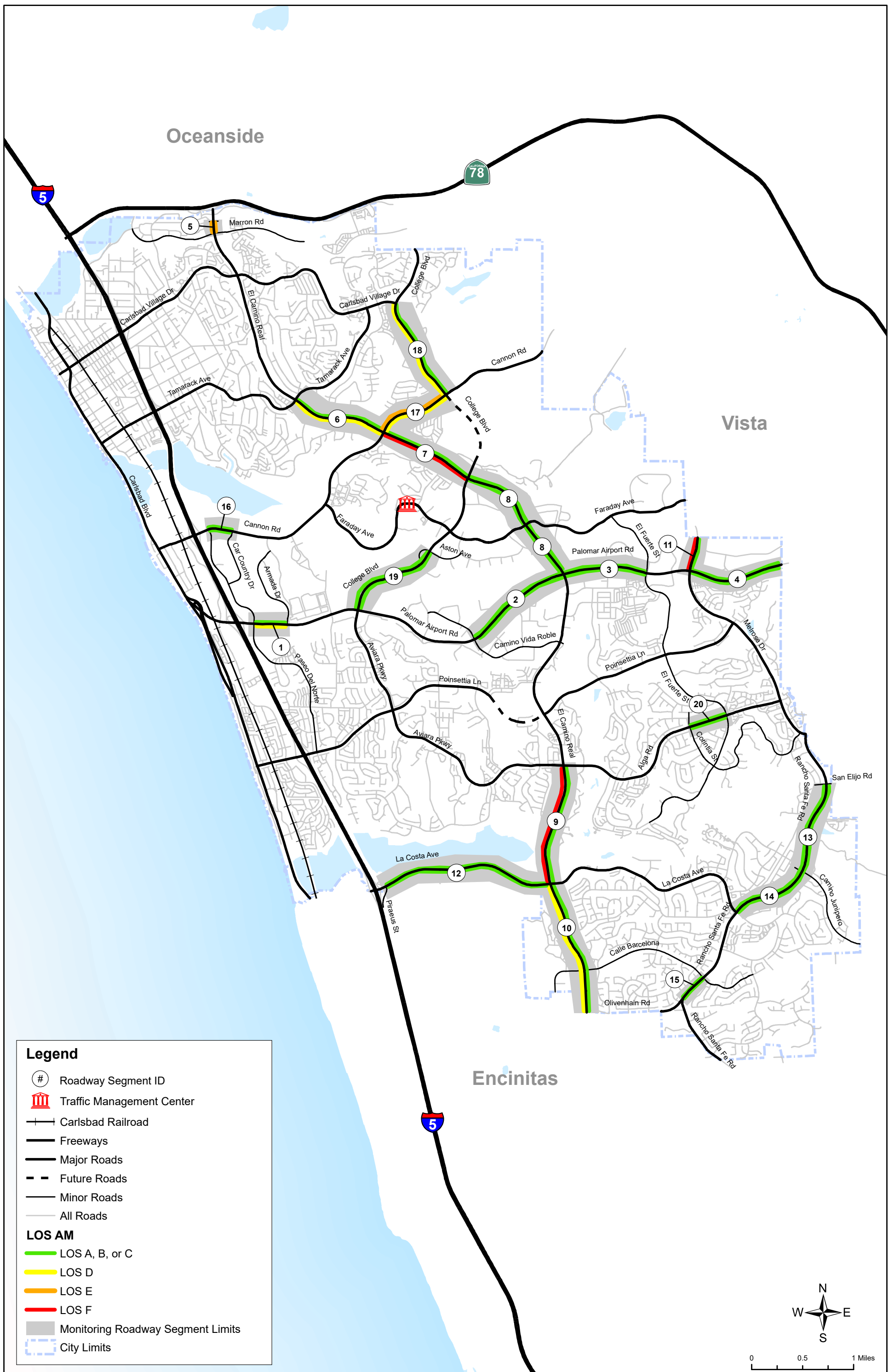


Figure 4
Year 2018 AM Peak Hour Roadway Segment Conditions



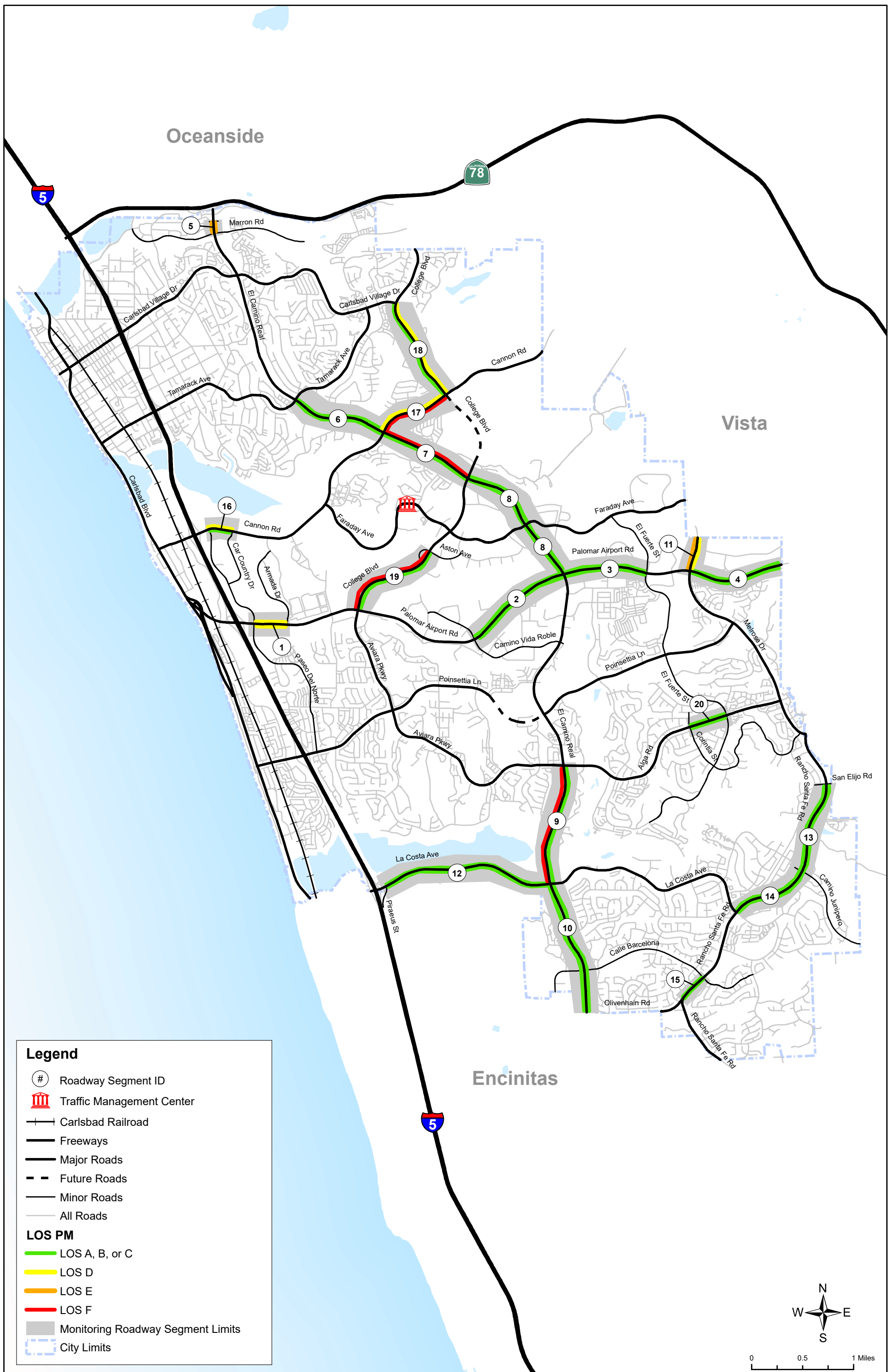


Figure 5
Year 2018 PM Peak Hour Roadway Segment Conditions



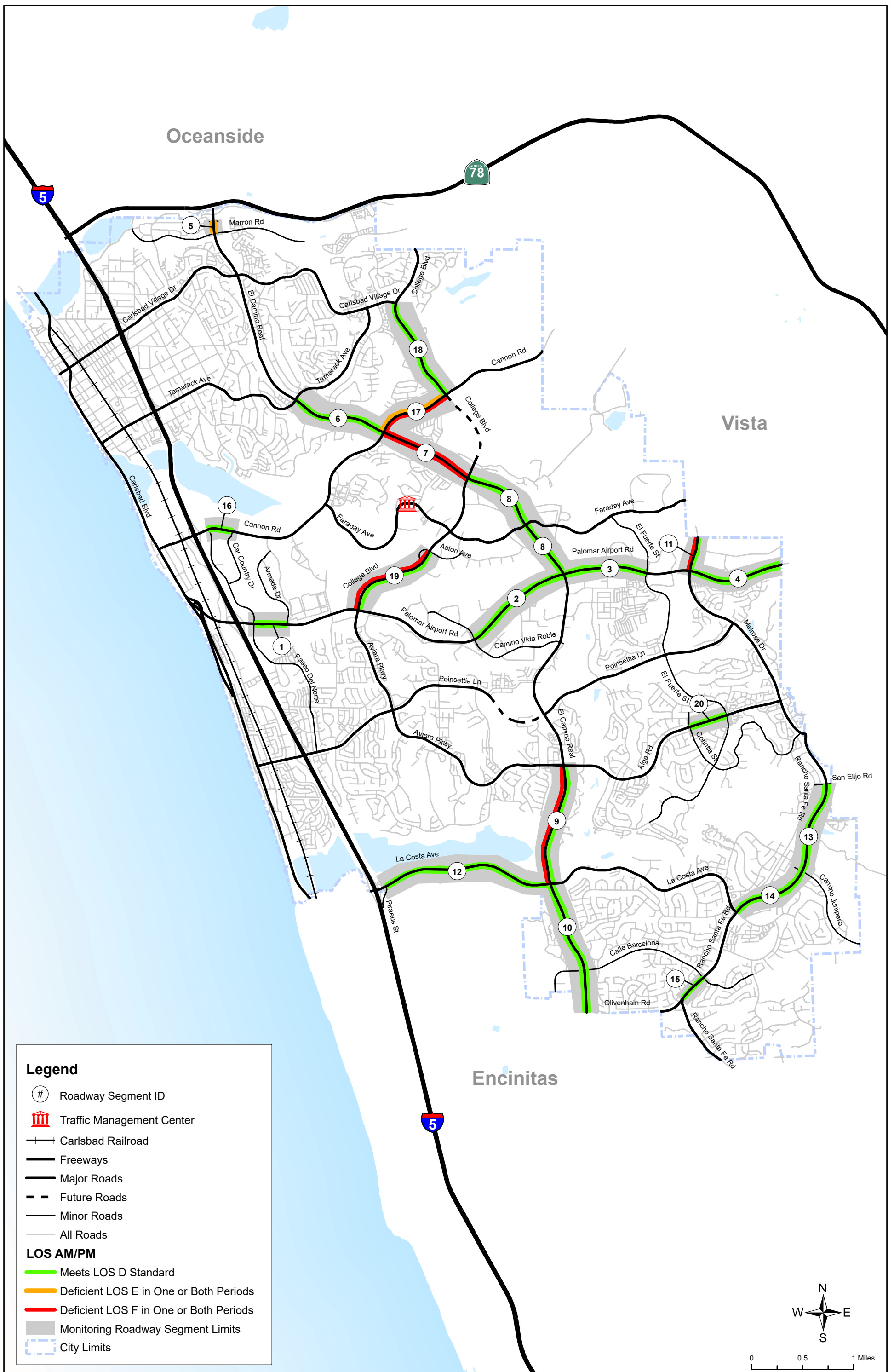


Figure 6
Year 2018 Deficient Roadway Segments





8 VOLUME TREND ANALYSIS

A summary of the roadway segment ADT from year 2007 through year 2018 is shown in **Table 3**. Line graphs showing the trend in traffic is included in **Appendix C**.

Comparing 2018 ADT and 2017 ADT show that there has been an overall increase in traffic of six percent (6%) citywide. 24 roadway segments showed increase in traffic volume and a five roadway segments showed decrease in traffic volume. The increase in traffic volume varied from one percent (1%) to thirty-nine percent (39%). The decrease in traffic volume varied from three percent (3%) to fifteen percent (15%). The largest increase in ADT from 2017 to 2018 occurred at following roadway segments:

- Carlsbad Boulevard between State Street and Mountain View Drive: increase of 39%.
- Carlsbad Boulevard between Cannon Road and Cerezo Drive: Increase of 20%.
- Rancho Santa Fe Road between La Costa Meadows Drive and San Elijo Road: increase of 19%.
- Rancho Santa Fe Road between Calle Barcelona and Olivenhain Road: increase of 27%.
- Poinsettia Lane between Paseo Del Norte and Batiquitos Drive: increase of 29%.
- Cannon Road between Hilltop Street and College Boulevard: increase of 19%.

The largest decrease in ADT from 2017 to 2018 occurred at following roadway segment locations:

- Palomar Airport Road between El Camino Real and Loker Avenue: decrease of 15%.



**Table 3
Roadway Segment Average Daily Traffic Summary**

Roadway Segment	Roadway Segment Limits	Summer 2007	Summer 2008	Summer 2009	Summer 2010	Summer 2011	Summer 2012	Summer 2013	Summer 2014	Summer 2015	Summer 2016	Fall 2017	Fall 2018
Palomar Airport Rd.	Paseo Del Norte and Armada Dr.	53,175	49,570	48,758	48,490	48,249	48,626	52,555	52,779	55,501	54,870	47,657	50,368
Palomar Airport Rd.	Yarrow Dr. and El Camino Real	33,820	33,523	30,786	34,030	33,440	35,154	34,017	37,900	38,433	38,882	37,486	36,201
Palomar Airport Rd.	El Camino Real and Loker Ave.	52,739	43,920	44,742	45,080	45,902	52,786	48,560	50,651	50,445	55,192	60,545	51,266
Palomar Airport Rd.	Melrose Dr. and Paseo Valindo	36,290	33,875	30,267	32,769	32,678	31,880	31,469	32,566	30,912	37,152	33,706	35,841
El Camino Real	Plaza Dr and Marron Rd	31,375	26,713	26,401	26,406	27,806	29,245	29,355	30,288	30,056	31,098	24,525	24,778
El Camino Real	Tamarack Ave. and Kelly Dr.	25,509	23,717	22,817	23,540	25,036	22,514	25,198	26,430	27,150	28,072	27,555	27,876
El Camino Real	Jackspar Dr. and College Blvd.	----	----	----	----	----	32,393	34,869	38,195	37,541	35,892	42,739	38,987
El Camino Real	Faraday Ave. and Palomar Airport Rd.	38,417	37,735	27,205	36,200	36,281	30,477	31,739	34,867	34,378	35,509	36,698	37,585
El Camino Real	Arenal Rd. and Costa Del Mar Rd.	50,905	43,213	44,112	46,203	47,151	49,760	49,299	51,393	51,499	53,804	49,663	52,574
El Camino Real	Levante St. and Calle Barcelona	39,667	31,275	31,399	32,042	33,507	35,782	35,434	36,495	37,873	37,773	33,675	36,335
Melrose Dr.	Lionshead Ave. and Palomar Airport Rd.	25,995	22,637	22,794	22,887	23,830	25,387	27,253	27,857	30,378	31,512	30,392	32,236
Carlsbad Blvd.	State St. and Mountain View Dr.	13,985	12,065	13,334	12,884	13,320	13,743	14,791	13,156	12,991	14,148	9,034	12,582
Carlsbad Blvd.	Acacia Ave. and Cherry Ave.	----	----	----	----	----	17,653	19,001	18,668	18,011	19,755	14,238	15,326
Carlsbad Blvd.	Tamarack Ave. and Tierra Del Oro	----	----	----	----	----	19,224	17,319	17,396	20,894	23,834	17,029	17,927
Carlsbad Blvd.	Cannon Rd. and Cerezo Dr.	18,163	15,485	16,378	16,882	16,565	16,128	16,755	17,714	16,668	20,704	13,610	16,300
Carlsbad Blvd.	Breakwater Rd. and Poinsettia Ln.	16,114	12,949	14,294	13,668	12,936	13,656	15,193	16,289	16,539	18,033	16,577	15,490
Carlsbad Blvd.	Avenida Encinas and La Costa Ave.	19,474	17,905	18,246	17,242	16,214	16,089	17,943	19,888	19,167	19,635	19,243	19,449
La Costa Ave.	Piraeus St and Saxony Rd.	33,245	32,254	33,475	32,767	33,742	35,371	38,373	37,795	38,415	39,539	34,874	37,603
La Costa Ave.	Romeria St. and Cadencia St.	12,492	11,819	12,370	12,190	12,196	12,043	12,087	12,266	12,861	12,248	12,578	13,107
Rancho Santa Fe Rd.	La Costa Meadows Dr. and San Elijo Rd.	34,674	31,222	25,313	28,786	27,187	30,793	28,979	28,959	29,512	29,389	26,231	31,176
Rancho Santa Fe Rd.	Camino Junipero and La Costa Avenue	----	----	----	----	----	----	----	----	----	----	37,009	40,651
Rancho Santa Fe Rd.	Calle Barcelona and Olivenhain Road	----	----	----	----	----	----	----	----	----	----	32,135	40,759
Poinsettia Ln.	Paseo Del Norte and Batiquiands Dr.	26,623	24,650	25,837	25,315	24,353	24,801	25,075	25,071	26,174	26,873	20,902	26,975
Tamarack Ave.	El Camino Real and La Portalada Dr.	8,453	8,428	7,906	8,808	8,663	7,905	7,705	7,669	7,390	8,892	9,297	9,005
Cannon Rd.	Paseo Del Norte and Car Country Dr.	22,778	21,709	23,284	24,370	25,717	25,420	26,399	23,460	24,702	26,504	22,377	24,426
Cannon Rd.	Hillandp St. and College Blvd.	19,396	16,586	16,553	17,793	17,462	17,764	18,561	19,281	18,814	17,773	19,983	23,836
College Blvd.	City Limits N and Tamarack Ave.	25,690	23,740	24,475	23,112	24,815	24,670	25,769	26,275	26,830	28,155	13,625	21,987
College Blvd.	Aston Ave. and Palomar Airport Rd.	13,718	13,810	13,992	13,873	13,635	13,806	13,744	14,710	14,762	14,237	14,214	15,383
Alga Rd.	Corinthia St. and El Fuerte St.	11,482	10,632	10,216	10,844	10,856	10,454	10,299	10,415	10,538	11,516	10,616	11,454



9 CONCLUSION

The purpose of the City of Carlsbad Growth Management Plan Annual Traffic Conditions Report is to monitor the growth in traffic on the City's arterial streets and to comply with the City's Growth Management Ordinance and Local Facilities Management Plan. The city has monitored traffic since 1988 by collecting traffic counts annually. For 2018, the city identified twenty (20) roadway segments for monitoring purposes. Until 2016, the city monitored traffic by collecting traffic count data during summer season. Starting in 2017, the City monitored traffic by collecting traffic count data during the fall season in October.

The results of the roadway segment analysis show that six roadway segments operate at unacceptable level of service (LOS) E or F in at least one direction of travel and during at least one peak hour. Five of the six roadway segments operate at unacceptable LOS F in at least one direction of travel and during at least one peak hour. Three roadway segments operate at unacceptable LOS E in at least one direction of travel and during at least one peak hour.

The traffic growth trend analysis was conducted by comparing 2018 ADT and 2017 ADT. The results of the trend analysis show that there has been an overall increase in traffic of six percent. 24 roadway segments showed increase in traffic volume and five roadway segments showed decrease in traffic volume. Arterials with the highest increase in traffic include Carlsbad Boulevard, Rancho Santa Fe Road, Poinsettia Lane and Cannon Road. No substantial change in traffic volume was observed along Palomar Airport Road and El Camino Real except for Palomar Airport Road between El Camino Real and Loker Avenue which showed a decrease in traffic of 15%.



APPENDIX A

Service Volume Tables



Roadway Service Volume Table - Specific Corridors

N/S Streets	Limits	Roadway Classification	Peak Direction				
			A	B	C	D	E
El Camino Real	City Limits to Marron Road	6/35/D	**	**	**	**	1400
	Marron Road to Carlsbad Village Drive	6/35/D	**	140	2070	2520	###
	Carlsbad Village Drive to Tamarack Avenue	6/55/D	1930	2850	2900	###	###
	Tamarack Avenue to Cannon Road	6/55/D	**	**	2400	2800	###
	Cannon Road to College Boulevard	2/55/D - NB	**	1060	1860	###	###
		3/55/D - SB	**	2150	2900	###	###
	College Boulevard to Palomar Airport Road	6/55/D	270	2750	2940	###	###
	Palomar Airport Road to Camino Vida Roble	6/55/D	**	**	1330	2510	2580
	Camino Vida Roble to Poinsettia Lane	2/55/D - NB	**	970	2020	2100	###
		3/55/D - SB	**	1470	2820	2900	###
	Poinsettia Lane to Aviara Parkway-Alga Road	6/55/D	**	**	2100	2820	2900
	Aviara Parkway-Alga Road to La Costa Avenue	3/55/D - NB	**	1390	2580	###	###
2/55/D - SB		**	800	1920	###	###	
La Costa Avenue to Leucadia Boulevard	6/55/D	**	**	1880	2820	2880	
College Boulevard	City Limits to Carlsbad Village Drive	4/45/D	**	**	930	1680	1770
	Carlsbad Village Drive to Cannon Road	4/45/D	**	**	1040	1760	1800
	El Camino Real to Aston Avenue	4/50/D	**	**	390	1440	1810
	Aston Avenue to Palomar Airport Road	2/50/D - NB	880	1680	###	###	###
2/50/D - SB		80	970	1040	###	###	
Aviara Parkway	Palomar Airport Road to Poinsettia Lane	4/45/D	**	**	**	1130	1630
Melrose Drive	City Limits to Palomar Airport Road	4/55/D - NB	**	**	1710	2740	2830
		3/55/D - SB	**	**	**	930	1630
	Palomar Airport Road to Poinsettia Lane	6/55/D	**	490	2720	2880	###
	Poinsettia Lane to Rancho Santa Fe Road	6/55/D	**	**	1400	2100	###
Rancho Santa Fe Road	City Limits to Camino Junipero	6/55/D	**	2520	3160	###	###
	Camino Junipero to La Costa Avenue	6/55/D	**	1400	2660	2700	###
	La Costa Avenue to Calle Barcelona	6/50/D	**	460	2410	2480	###
	Calle Barcelona to Olivenhain Road	6/50/D	**	540	2810	3040	###
E/W Streets	Limits	Roadway Classification	Peak Direction				
			A	B	C	D	E
Cannon Road	Avenida Encinas to Paseo del Norte	4/35/D	**	**	**	730	1320
	Paseo del Norte to Car Country	4/50/D	**	390	1630	1770	1800
	Car Country to Legoland Drive	4/50/D	**	1170	1660	1700	###
	Legoland Drive to Faraday Avenue	4/50/D	**	270	1280	1320	###
	Faraday Avenue to El Camino Real	4/50/D	**	**	1280	1620	###
	El Camino Real to College Boulevard	4/50/D	**	**	280	1310	1690
Faraday Avenue	Van Allen Way to El Camino Real	4/40/D	**	**	220	1400	1680
	El Camino Real to Melrose Drive	4/50/D	**	**	1370	1640	###
Palomar Airport Road	Carlsbad Boulevard to Avenida Encinas	2/35/U	**	520	760	###	###
	Avenida Encinas to Paseo del Norte	3/35/D - EB	**	**	**	**	250
		2/35/D - WB	**	**	**	**	650
	Paseo del Norte to Armada	3/45/D - EB	**	**	1640	2660	2740
		4/45/D - WB	**	**	2250	3570	3680
	Armada to Aviara Parkway	6/55/D	**	650	2760	2940	###
	Aviara Parkway to Camino Vida Roble	6/55/D	440	2720	2900	###	###
	Camino Vida Roble to El Camino Real	6/55/D	**	790	2140	###	###
	El Camino Real to El Fuerte	6/55/D	**	1290	2830	2900	###
El Fuerte to Melrose Drive	6/55/D	**	1230	2860	2940	###	
Melrose Drive to City Limits	6/55/D	**	340	2590	2900	###	
Poinsettia Lane	Avenida Encinas to Paseo del Norte	4/35/D	**	**	**	180	1190
	Paseo del Norte to Aviara Parkway	4/50/D	**	**	1330	1770	1840
La Costa Avenue	Piraeus Street to El Camino Real	4/55/D	**	1450	1700	###	###

** Indicates LOS cannot be achieved during peak hour (e.g., signal spacing is too close to achieve smooth traffic flows even at low volumes).

Indicates the capacity jumps to LOS F because intersection capacities have been reached. (i.e., travel speeds quickly degrade to LOS F).



Roadway Service Volume Table - Generalized Data

Segment Capacity Threshold for Arterial Streets

Hourly Volume in Peak Direction						
Lanes	Speed Limit	Median	B	C	D	E
1	35	Undivided	**	180	590	740
	35	Divided	**	190	630	780
2	35	Divided	**	520	1390	1540
	45	Divided	**	600	1560	1760
	50	Divided	**	850	1690	1820
	55	Divided	**	1050	1800	1890
3	35	Divided	**	680	2230	2540
	45	Divided	**	2040	2660	2700
	50	Divided	**	2360	2760	2800
4	55	Divided	390	2600	2870	2900
	45	Divided	**	2780	3560	3620

Segment Capacity Threshold for Industrial Streets

Hourly Volume in Peak Direction						
Lanes	Speed Limit	Median	B	C	D	E
1	25	Undivided	**	110	450	560
	25	Divided	**	140	610	720
	35	Undivided	**	180	590	740
	35	Divided	**	190	630	780
	40	Undivided	**	216	708	888
	40	Divided	**	228	756	936

Hourly Volume in Both Direction

Lanes	Speed Limit	Median	B	C	D	E
2	35	Undivided	**	340	1100	1380
	35	Divided	**	360	1170	1450
4	35	Divided	**	970	2580	2860
	45	Divided	**	1120	2890	3260
	50	Divided	**	1580	3130	3380
	55	Divided	**	1950	3340	3500
5	55	Divided	**	3395	4343	4455
6	35	Divided	**	1260	4130	4720
	50	Divided	**	4380	5120	5180
	55	Divided	730	4820	5320	5360
7	45	Divided	**	4483	5785	5878

Hourly Volume in Both Direction

Lanes	Speed Limit	Median	B	C	D	E
2	25	Undivided	**	200	800	990
	25	Divided	**	250	1080	1270
	35	Undivided	**	340	1100	1380
	35	Divided	**	360	1170	1450
	40	Undivided	**	408	1320	1656
	40	Divided	**	432	1404	1740

Annual Average Daily Traffic

Lanes	Speed Limit	Median	B	C	D	E
2	35	Undivided	**	4200	13700	17200
	35	Divided	**	4400	14600	18100
4	35	Divided	**	12100	32200	35800
	45	Divided	**	13900	36200	40800
	50	Divided	**	19700	39200	42200
	55	Divided	**	24400	41700	43800
6	35	Divided	**	15800	51700	59000
	50	Divided	**	54700	63900	64800
	55	Divided	9100	60200	66500	67000

Annual Average Daily Traffic

Lanes	Speed Limit	Median	B	C	D	E
2	25	Undivided	**	2200	8900	11000
	25	Divided	**	2800	12000	14100
	35	Undivided	**	4200	13700	17200
	35	Divided	**	4400	14600	18100
	40	Undivided	**	5040	16440	20640
	40	Divided	**	5280	17520	21720



APPENDIX B

Traffic Count Data



APPENDIX C

Volume Trend Line Graph

