

MEMORANDUM

DATE: September 9, 2002

TO: Mr. Robert Stachelski, City of Huntington Beach
Ms. Mary Beth Broeren, City of Huntington Beach

FROM: Bill E. Darnell, P.E. *Bill E. Darnell*

D&A Ref. No: 960404

RE: Verification of Parkside Estates Base Traffic



This memorandum is prepared in response to questions raised regarding traffic volume data presented in our traffic study for Parkside Estates, dated June 27, 1997 (revised March 29, 2001). To verify and confirm our analysis, we collected new traffic data and reanalyzed the data for comparison against the results reached in our previous report.

In summary, we have concluded there are no additional impacts and, in fact, daily traffic on Graham Street is lower than previously reported.

EXISTING CONDITIONS

In September 2002, new traffic counts were obtained at the following intersections:

- Bolsa Chica/Warner
- Graham Street/Warner
- Graham Street/Glenstone
- Graham Street/Slater

Additionally, 24-hour machine counts were obtained for Graham Street between Warner and Glenstone and between Glenstone and Slater. These counts were taken on Wednesday, September 4 and 5, 2002, and include traffic on opening day for Marine View Middle School.

For reference, the traffic counts from our 1997 report (which represented 1996 traffic data) is provided on Figure 1. The 2002 traffic volume data is provided on Figure 2.

SHORT TERM CONDITIONS

The short term condition established in the 1997 report was revised in March 2001 to account for additional projects which were anticipated but not built, including Meadowlark (350 dwelling units), and the proposed Parkside Estates project.

Since publication of our previous reports with 1996 traffic count data, these projects have been constructed with the exception of Parkside Estates. Therefore, the 2002 traffic count data includes traffic associated with these units.

The cumulative condition for the 2002 data, therefore, includes the addition of project related (Parkside Estates) traffic and 15 students from Parkside Estates being transported to Marine View Middle School and the parents' return home, and can be compared to the short term condition presented in the 1997/2001 report.

The short term traffic volumes from the 1997 report (which include Meadowlark, Holly-Seacliff and the proposed Parkside Estates) are provided on Figure 3. The short term traffic volumes representing 2002 traffic data plus the proposed Parkside Estates project are provided on Figure 4.

COMPARISON OF 1996 DATA VERSUS 2002 DATA

Intersections

An analysis comparison was provided between the data from the 1997/2001 report (based on 1996 data) and the newly obtained 2002 data. Intersections were reanalyzed with the new volumes using the Intersection Capacity Utilization (ICU) methodology at signalized intersections, and the Highway Capacity Manual (HCM) for stop-controlled intersections.

The results of the intersection analysis are shown on Table 1. Table 2 summarizes the actual ICU or HCM differential between 1996 and 2002. As shown on Table 2, there is no significant difference in level of service at intersections with the new traffic volumes applied. Figure 5 provides a graphical comparison of the 1996 versus 2002 traffic analysis results.

Figure 6 provides a graphical comparison of the short term analysis results.

Volumes were overestimated at Graham Street/Warner and now results in improved capacity. The intersection of Bolsa Chica/Warner shows an increase of 4.5% in the morning peak and 7.6% in the evening peak for the existing condition, and 2.4% increase with project traffic in the morning and

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6.5% in the evening. The intersection of Graham Street/Slater shows less than two (2) seconds of increase at any time. The intersection of Graham Street/Glenstone shows an increase of six (6) seconds for the existing condition and nearly nine (9) seconds for the short term condition in the morning peak hour; while the evening peak hour differential is nominal.

Roadway Segments

Roadway segments on Graham Street were reanalyzed and compared to the previous reports. The results of the daily traffic analysis is provided on Table 3. As shown on Table 3, the overall change in volume to capacity (V/C) ratio has actually decreased with the new traffic counts. This is due to an overestimation of other project traffic in the 1997/2001 traffic report. Since that time, development has occurred and the resulting traffic is less than previously expected.

SUMMARY OF FINDINGS

Based on newly acquired traffic count data, it is evident that the previous studies for the Parkside Estates development included adequate estimation of other project traffic, in most instances overestimated the cumulative analysis volumes on Graham Street and at the Bolsa Chica/Warner intersection.

New traffic counts are similar to 1996 traffic counts and do not report deficient levels of service based on new analysis.

The addition of project traffic does not create additional impacts beyond any identified in the March 2001 traffic report.

All intersections and roadway segments analyzed in this supplemental memorandum operate at acceptable levels of service within their existing configurations and no new impacts or mitigation are identified by new analysis.

If you have any questions, please feel free to contact this office.

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TABLE 1 SUMMARY OF INTERSECTION CAPACITY										
	Existing Condition				Short Term Cumulative Condition					
	AM Peak		PM Peak		AM Peak		PM Peak		LOS	
	ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS	ICU/HCM	LOS
FROM 1996 TRAFFIC COUNTS (1997 REPORT)										
Bolsa Chica/Warner	0.625	B	0.624	B	0.654	B	0.645	B	0.645	B
Graham Street/Warner	0.552	A	0.620	B	0.620	B	0.697	B	0.697	B
Graham/Glenstone (stop)	10.53*	B	10.49*	B	11.62*	B	11.77*	B	11.77*	B
Graham/Slater (stop)	8.67*	A	10.01*	B	9.32*	A	11.20*	A	11.20*	B
FROM YEAR 2002 TRAFFIC COUNTS										
Bolsa Chica/Warner (signal)	0.670	B	0.700	B	0.678	B	0.710	B	0.710	C
Graham Street/Warner (signal)	0.471	A	0.596	B	0.503	A	0.640	A	0.640	B
Graham/Glenstone (stop)	17.03*	C	10.62*	B	21.32*	C	11.53*	C	11.53*	B
Graham/Slater (stop)	10.08*	B	10.89*	B	10.81*	B	11.91*	B	11.91*	B

ICU = Intersection Capacity Utilization

ICU analysis applied to signalized intersections, results measured in volume to capacity ratio

*HCM Version 4.1b applied to stop controlled intersections; results measured in seconds

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**TABLE 2
 SUMMARY OF CHANGE IN INTERSECTION CAPACITY UTILIZATION OR INTERSECTION DELAY**

Intersection	2002 Existing Condition		2002 Short Term Cumulative Condition	
	AM Peak	PM Peak	AM Peak	PM Peak
	Increase/(Decrease) versus 1996 Data		Increase/(Decrease) versus 1996 Data	
Bolsa Chica/Warner (signal)	0.045 (ICU)	0.076 (ICU)	0.024 (ICU)	0.065 (ICU)
Graham Street/Warner (signal)	(0.081) (ICU)	(0.024) (ICU)	(0.117) (ICU)	(0.057) (ICU)
Graham/Glenstone (stop)	6.50 (Delay/Seconds)	0.013 (Delay/Seconds)	9.70 (Delay/Seconds)	(0.24) (Delay/Seconds)
Graham/Slater (stop)	1.41 (Delay/Seconds)	0.880 (Delay/Seconds)	1.49 (Delay/Seconds)	0.71 (Delay/Seconds)

x.xxx = increased above 1996 data (1997 report)
 (x.xxx) = decreased below 1996 data (1997 report)
 Signalized intersections measured in ICU volume to capacity (V/C) ratio
 Stop controlled intersections measured in seconds

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TABLE 3 SUMMARY OF ROADWAY CAPACITY 1996 VERSUS 2002 DATA								
Intersection Location	Configuration		Existing Condition			Short Term Cumulative		
	Class.	LOS D Capacity	ADT	V/C	Change	ADT	V/C	Change
FROM 1996 TRAFFIC COUNTS								
Graham Street: Warner/Glenstone	2C	11,700	7,200	0.615	n/a	11,095	0.948	n/a
Graham Street: Glenstone/Slater	2C	11,700	7,200	0.615	n/a	10,710	0.915	n/a
FROM 2002 TRAFFIC COUNTS								
Graham Street: Warner/Glenstone	2C	11,700	8,381	0.716	0.101	9,611	0.821	(.127)
Graham Street: Glenstone/Slater	2C	11,700	7,295	0.623	0.008	8,115	0.693	(.222)

ADT = Average daily traffic
 V/C = volume to capacity ratio
 Change x.xxx = increased above 1996 data (1997 report)
 Change (x.xxx) = decreased below 1996 data (1997 report)

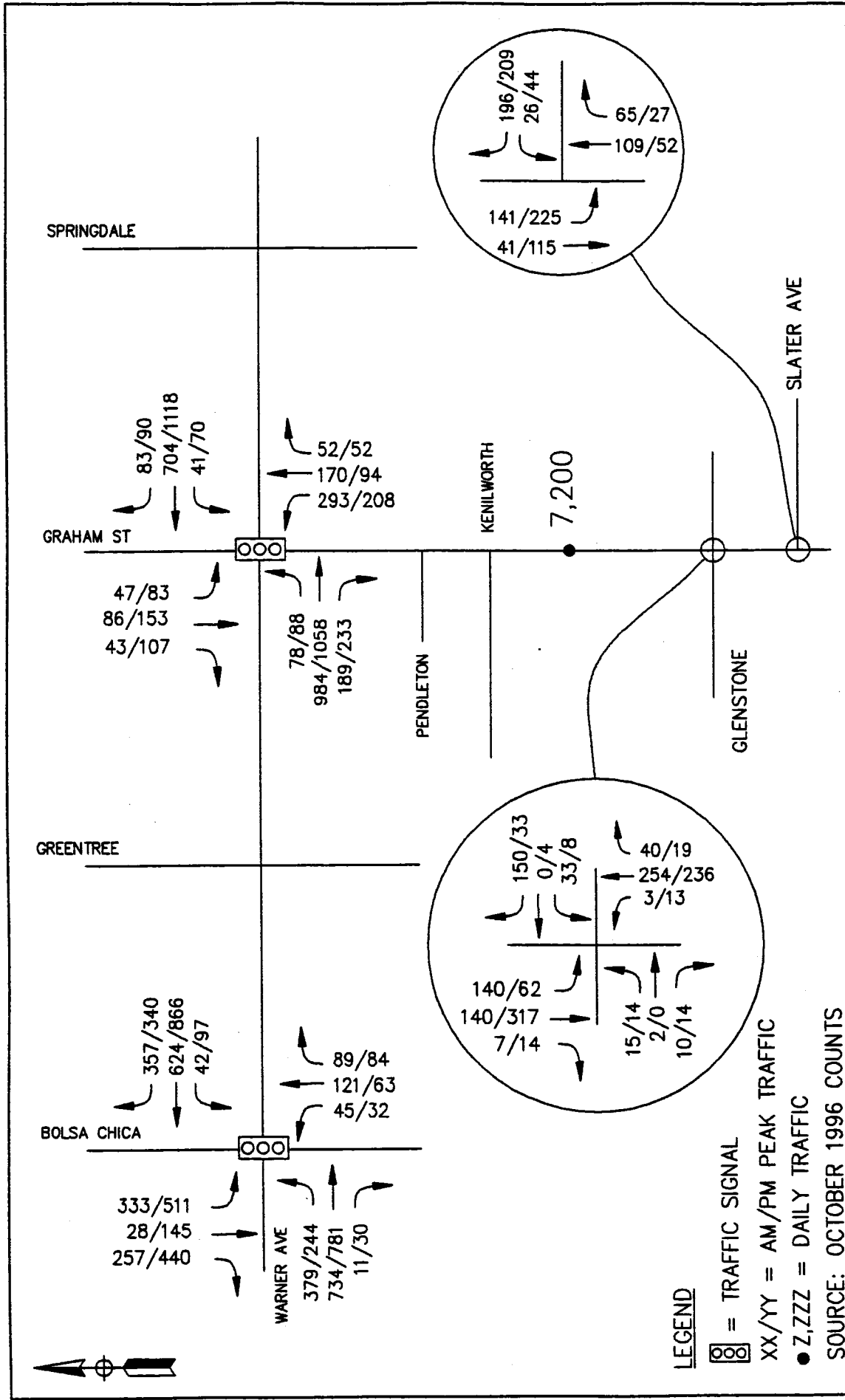


FIGURE 1
1996 EXISTING TRAFFIC VOLUMES

Darnell & ASSOCIATES, INC.

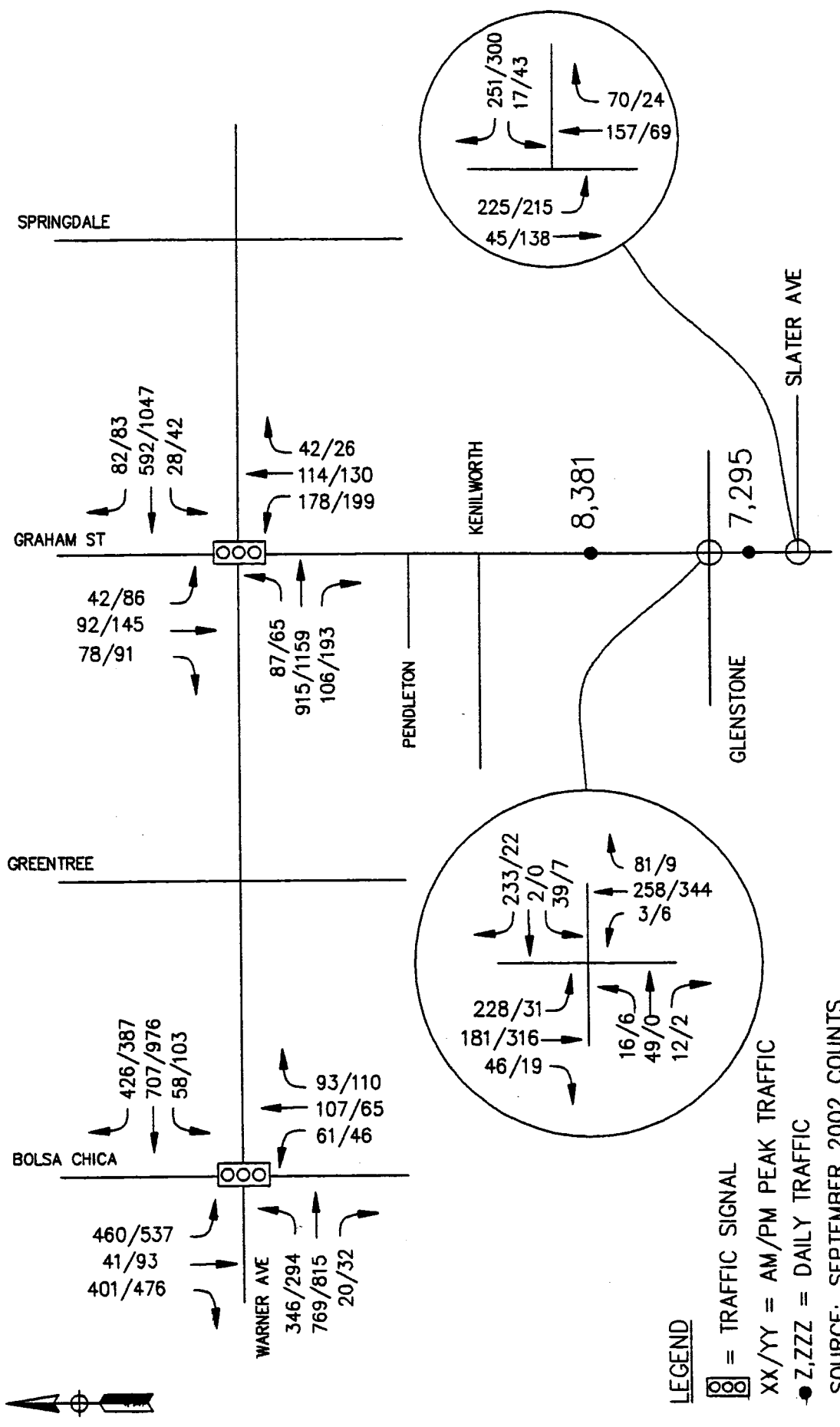


FIGURE 2
2002 EXISTING TRAFFIC VOLUMES

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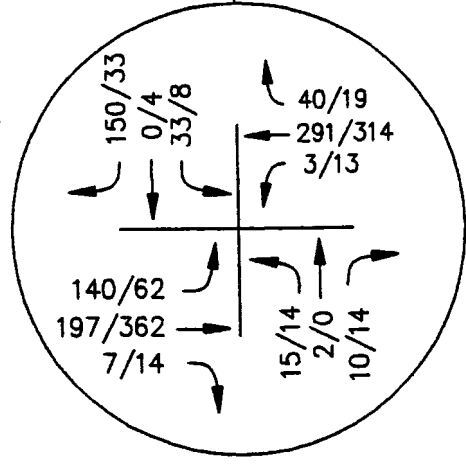
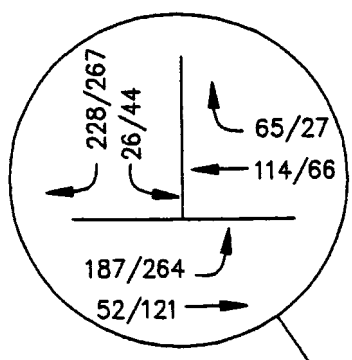
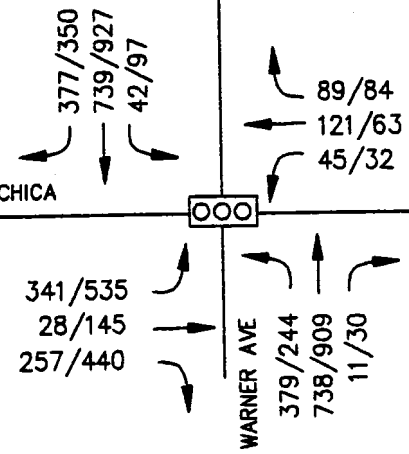
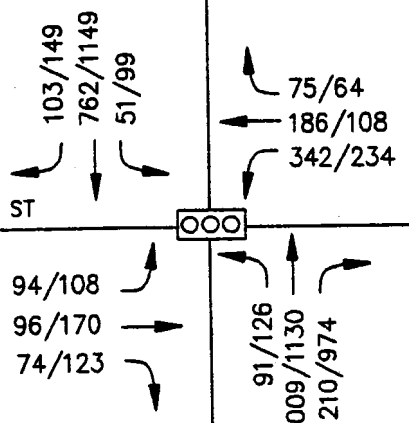
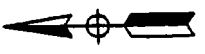
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SPRINGDALE

GRAHAM ST

GREENTREE

BOLSA CHICA



PENLETON

KENILWORTH

GLENSTONE

SLATER AVE

LEGEND

☐ = TRAFFIC SIGNAL

XX/YY = AM/PM PEAK TRAFFIC

● Z,ZZZ = DAILY TRAFFIC

FIGURE 3
1996 CUMULATIVE TRAFFIC

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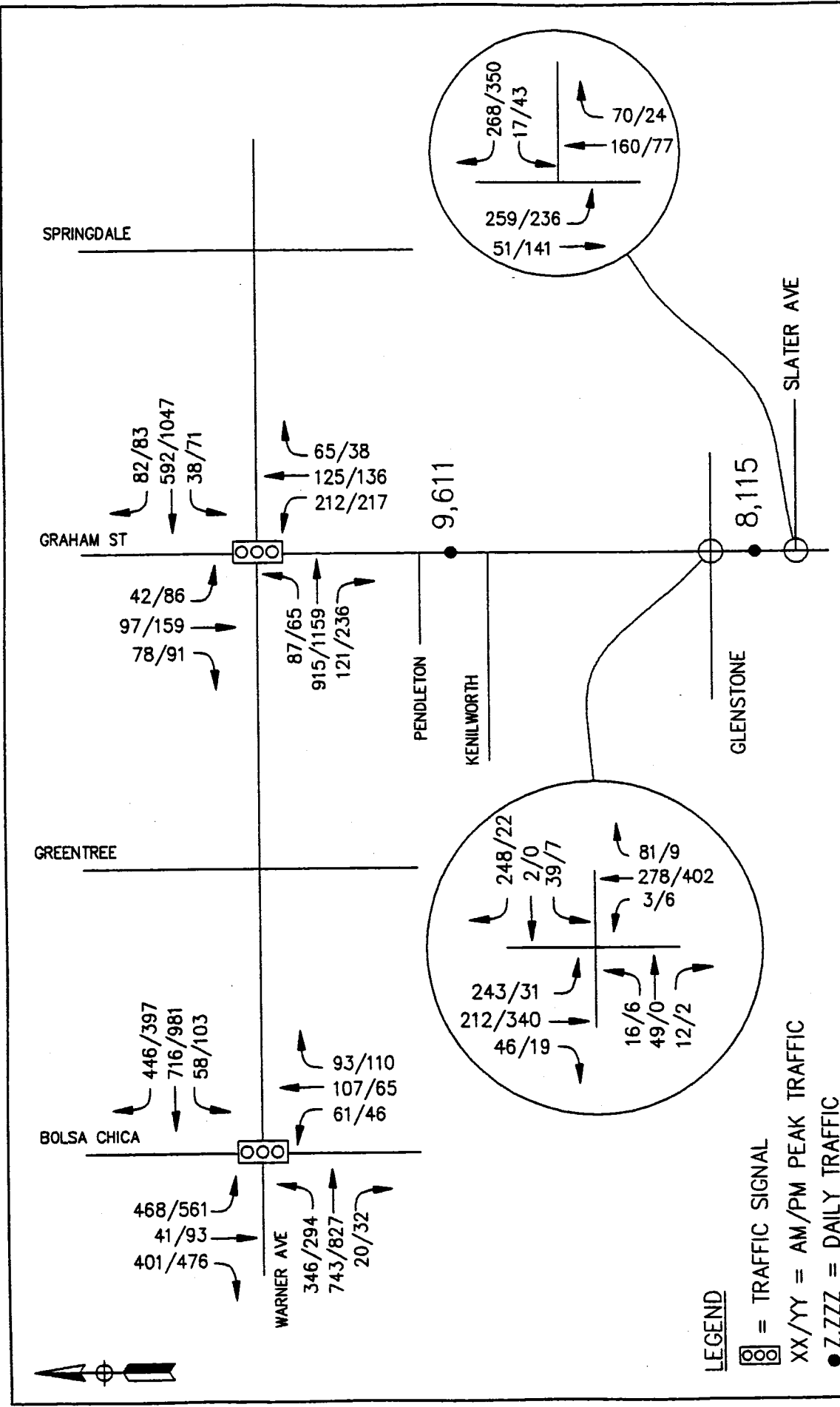
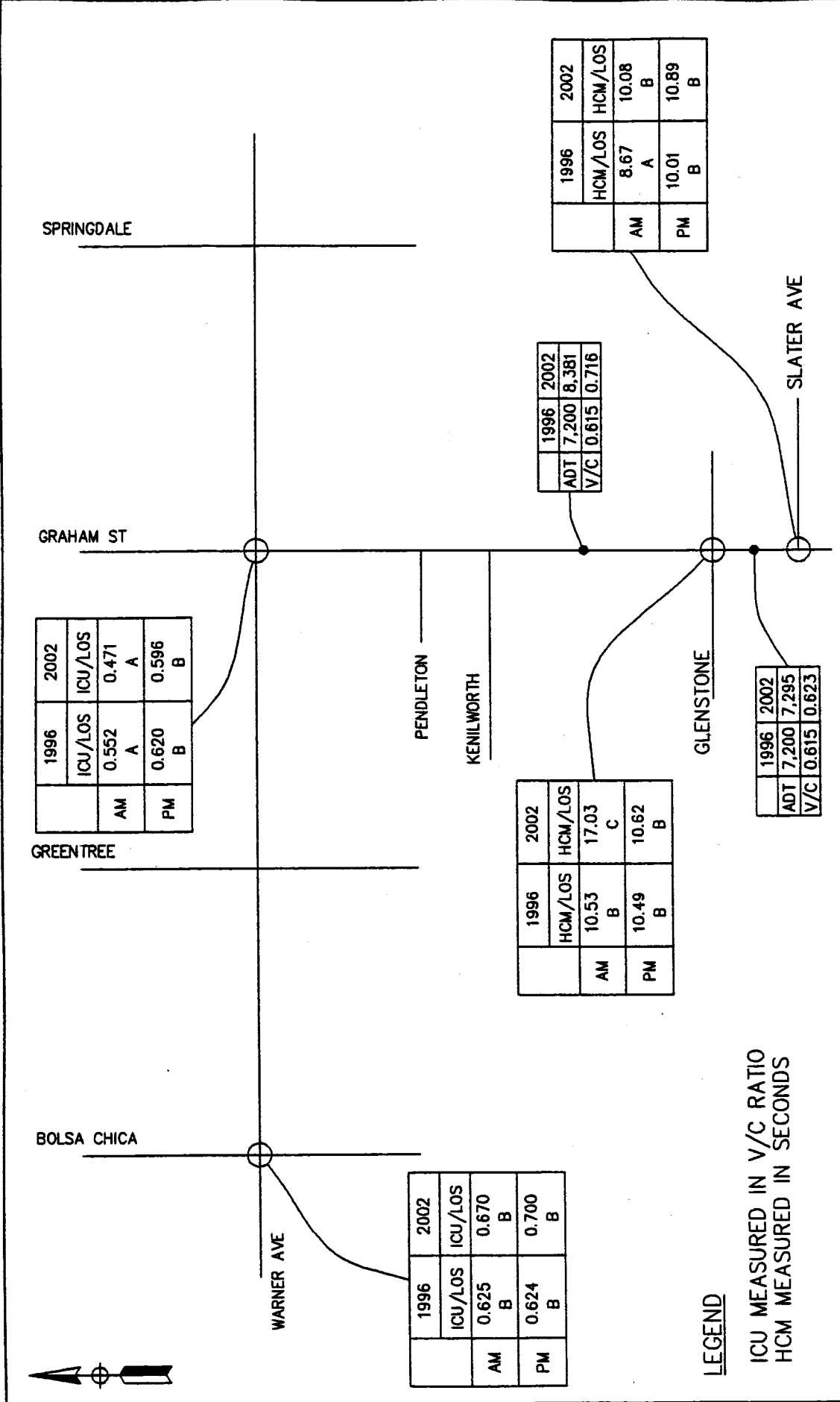


FIGURE 4
2002 CUMULATIVE TRAFFIC

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SPRINGDALE

GRAHAM ST

GREENTREE

BOLSA CHICA

WARNER AVE

PENDLETON

KENILWORTH

GLENSTONE

SLATER AVE

		1996	2002		
		ICU/LOS	ICU/LOS		
AM		0.552 A	0.471 A		
PM		0.620 B	0.596 B		

		1996	2002		
		ICU/LOS	ICU/LOS		
AM		0.625 B	0.670 B		
PM		0.624 B	0.700 B		

		1996	2002		
		HCM/LOS	HCM/LOS		
AM		10.53 B	17.03 C		
PM		10.49 B	10.62 B		

		1996	2002		
		ADT	ADT		
		7,200	8,381		
		V/C	0.615	0.716	

		1996	2002		
		HCM/LOS	HCM/LOS		
AM		8.67 A	10.08 B		
PM		10.01 B	10.89 B		

		1996	2002		
		ADT	ADT		
		7,200	7,295		
		V/C	0.615	0.623	

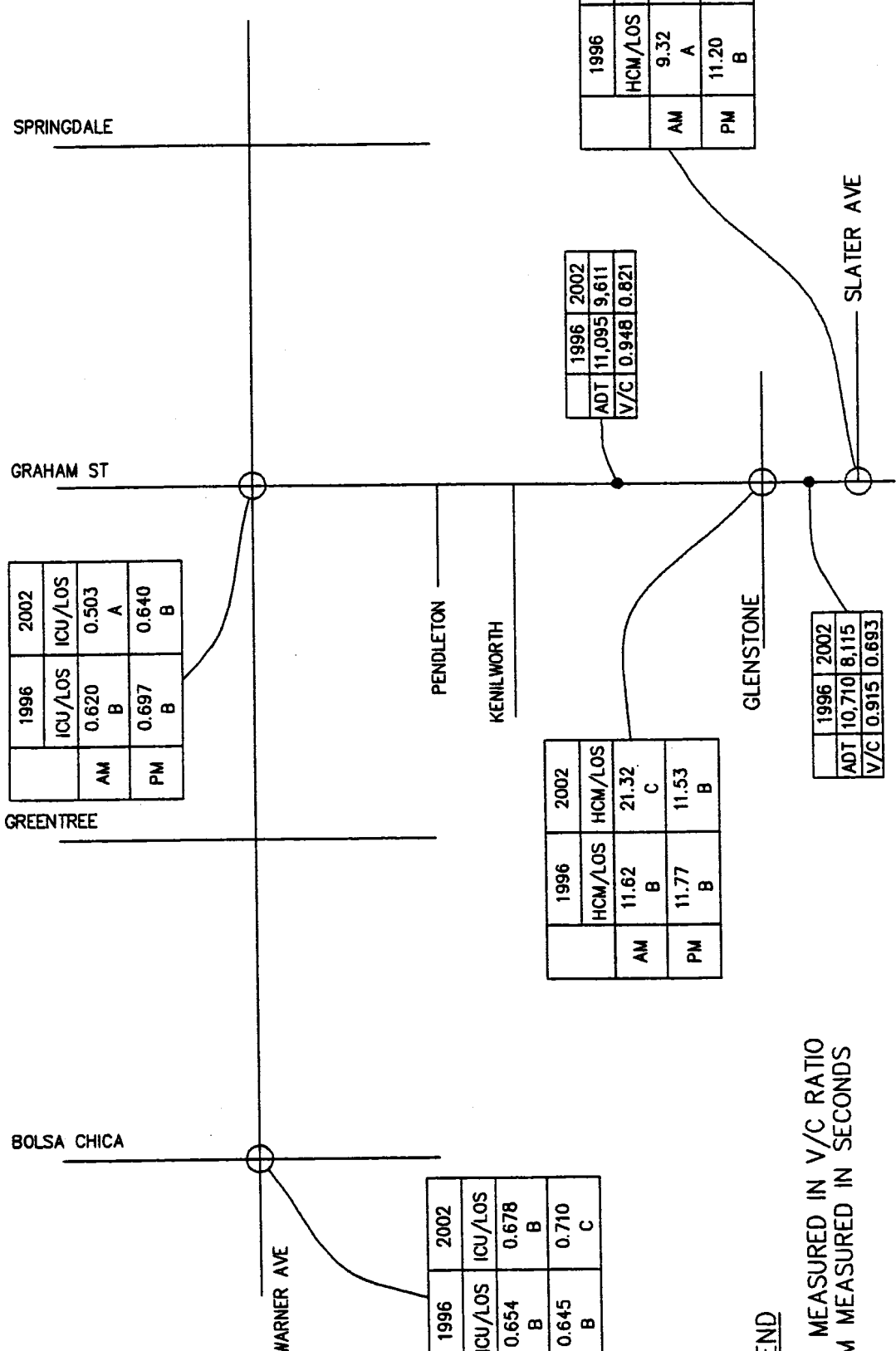
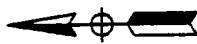
LEGEND

ICU MEASURED IN V/C RATIO
HCM MEASURED IN SECONDS

FIGURE 5
1996 VERSUS 2002 EXISTING TRAFFIC

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SPRINGDALE

GRAHAM ST

GREENTREE

BOLSA CHICA

WARNER AVE

PENDLETON

KENILWORTH

GLENSTONE

SLATER AVE

		1996	2002
		ICU/LOS	ICU/LOS
AM		0.620 B	0.503 A
PM		0.697 B	0.640 B

		1996	2002
		ICU/LOS	ICU/LOS
AM		0.654 B	0.678 B
PM		0.645 B	0.710 C

		1996	2002
		HCM/LOS	HCM/LOS
AM		11.62 B	21.32 C
PM		11.77 B	11.53 B

		1996	2002
ADT		11,095	9,611
V/C		0.94B	0.821

		1996	2002
		HCM/LOS	HCM/LOS
AM		9.32 A	10.81 B
PM		11.20 B	11.91 B

		1996	2002
ADT		10,710	8,115
V/C		0.915	0.693

LEGEND

ICU MEASURED IN V/C RATIO
 HCM MEASURED IN SECONDS

FIGURE 6
 1996 VERSUS 2002 CUMULATIVE TRAFFIC

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