

4 ENVIRONMENTAL ANALYSIS

Carson Street, located south of the project, has on/off ramps with the Harbor and San Diego Freeways. Northbound Harbor Freeway traffic has a partial ramp interchange at 220th Street, approximately one quarter mile south of Carson Street. Carson Street is a major east-west arterial and currently is a 4-lane divided highway. A large number of retail/commercial centers are provided access from this street. Curbside parking is restricted during the AM and PM peak hours (7:00-9:00 a.m. and 4:00-6:00 p.m.). Two-hour parking is allowed at all other times. The speed limit is posted 35 miles per hour on this designated truck route.

Traffic Volumes

Figure 18 presents the baseline (1989) AM/PM peak hour traffic volumes at the key area intersections. It should be noted that the peak hour volumes presented in Figure 18 are the average of three counts conducted for each intersection during the AM and PM peak periods. (Manual turning movement count sheet summaries are presented in the full Traffic Study's Appendix B that is on file at the City of Carson Community Development Department.)

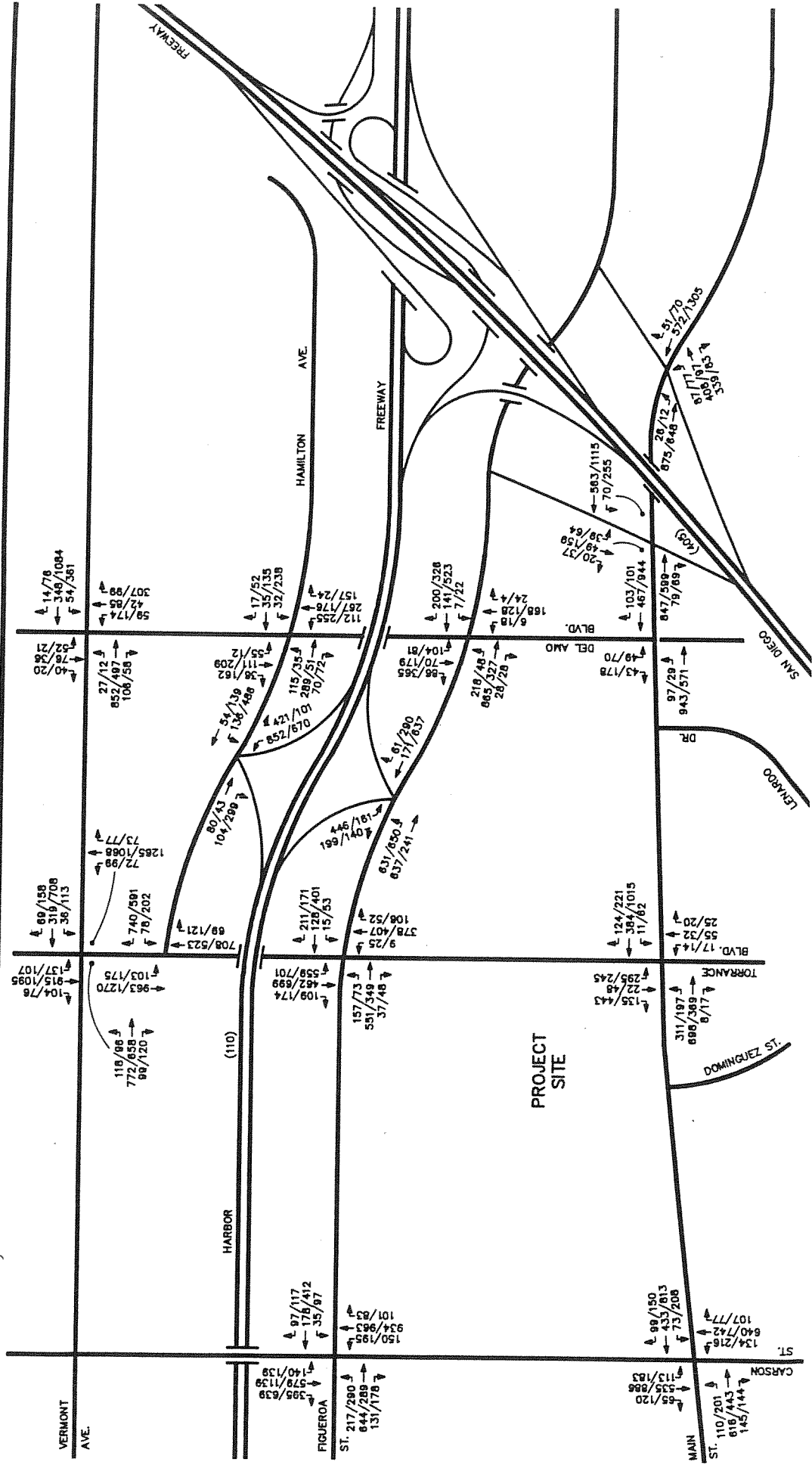
These data have been used in the intersection capacity calculations which follow the Intersection Capacity Utilization (ICU) Methodology to measure current Level of Service (LOS) conditions. The City's LOS criteria define ICU/LOS values of 0.89/D as acceptable. For intersections at freeway ramps the acceptable level is set at an ICU/LOS level of 0.94/E. By special exception the level has been set by the City at an ICU/LOS of 0.94/E for particular intersections, including the intersection of Figueroa Street/Torrance Boulevard. Based on these criteria, all fourteen key intersections in the study area are currently operating satisfactorily during the AM and PM peak commute periods. The ICU/LOS method of analysis is described later in this section (A complete technical description of the ICU/LOS method is included in the full traffic study's Appendix A.)

Daily traffic volumes for local area freeways have been compiled from the 1990 *Caltrans Traffic Volume* publication. The City Traffic Engineer has provided 24-hour machine traffic counts for local arterial streets, while supplemental 24-hour counts have been conducted by the Car Counter Company. Figure 19 presents the baseline key intersection ICU/LOS operating levels and daily traffic volume data.

Public Transit

The Blue Line rail line between Long Beach and downtown Los Angeles initiated operation in July 1990, and stops at a station at Del Amo, about four miles from the project site as the crow flies, but a five mile walk away. Traveling from the Del Amo Blue Line Station to the project site entails taking two buses and then

BASELINE AM/PM PEAK HOUR TRAFFIC VOLUMES



Not To Scale

KEY

XX/YY = AM PEAK HOUR/PM PEAK HOUR TRAFFIC VOLUME

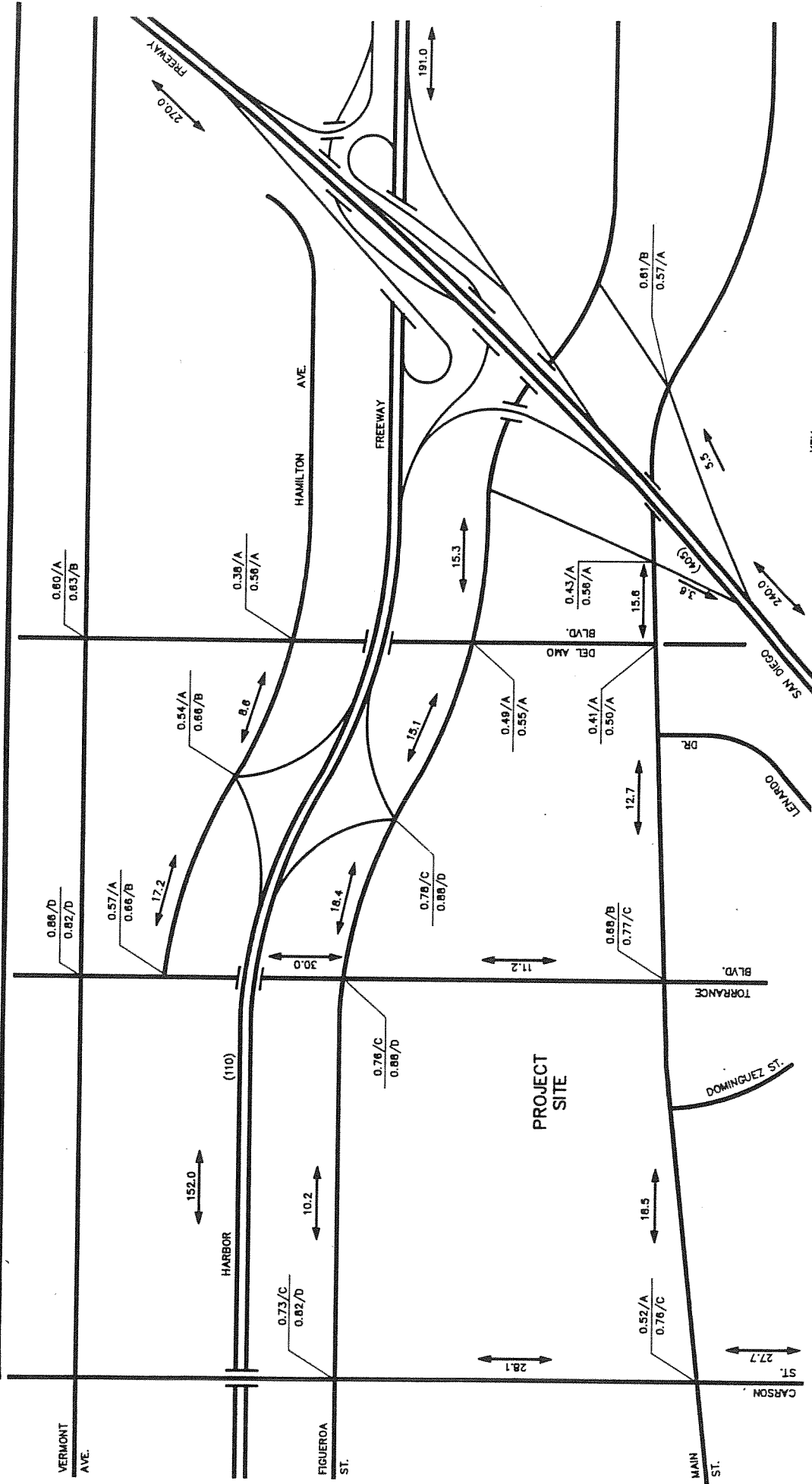
THE PLANNING CENTER

Golden Eagle Center Specific Plan EIR

SOURCE: Linscott, Law & Greenspan, Engineers

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

**BASELINE DAILY TRAFFIC VOLUMES
AND AMIPM PEAK HOUR INTERSECTION ICU/LOS**



KEY
 --- EXISTING DAILY TRAFFIC VOLUME (IN 1000's) - NON-DIRECTIONAL
 --- EXISTING DAILY TRAFFIC VOLUME (IN 1000's) - DIRECTIONAL
 Y.Y/Y - AM PEAK HOUR ICU/LOS
 ZZZ/Z - PM PEAK HOUR ICU/LOS



THE PLANNING CENTER

Linscott, Law & Greenspan, Engineers

SOURCE: Linscott, Law & Greenspan, Engineers

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

4 ENVIRONMENTAL ANALYSIS

walking approximately one-half of a mile. This station has a Park-n-Ride lot for commuters. An SCRTD "Park-n-Ride" lot exists on the west side of Hamilton, north of Torrance Boulevard adjacent to Alpine Village. This lot is primarily intended for commuters going into downtown Los Angeles in the morning and returning in the evening and has express and peak hour service. Southern California Rapid Transit District provides service on Main Street via Route # 205.

4.2.2 Environmental Impacts

Project traffic impacts are considered significant if the project added traffic causes road conditions to exceed the acceptable level set by the City of Carson. As previously noted the City's Level of Service (LOS) criteria define ICU/LOS values of 0.89/D as acceptable. For intersections at freeway ramps the acceptable level is set at an ICU/LOS level of 0.94/E. By special exception the level may be set by the City at an ICU/LOS of 0.94/E for particular intersections.

Project Conditions

The proposed project's potential impacts vary substantially depending on what road improvements are implemented in the vicinity. One key improvement under study is the widening of the Torrance Boulevard undercrossing at the I-110 Freeway. The project's potential impacts were studied under two scenarios: first, with the undercrossing widened, and alternately, with implementation of an interim mitigation measure. The interim mitigation would be to prohibit turning left from eastbound Torrance Boulevard to northbound Figueroa Street to alleviate projected congestion at Torrance Boulevard/Figueroa Street. Another key area improvement, construction of the Del Amo overcrossing of I-405, was also in doubt early in the planning process, so both scenarios were examined with and without the Del Amo overcrossing. Now however, funding for the Del Amo overcrossing appears to be firm²⁵. The EIR traffic analysis therefore is focused on two scenarios: project conditions with the Torrance Boulevard undercrossing widened and project conditions with the interim mitigation.

The interim mitigation measure might be selected because widening the undercrossing would cost approximately \$9 million (funding is uncertain) and the cooperation of both Los Angeles County and Caltrans would be needed, but has not been secured. Implementation of the interim mitigation measure would cause a shift in the traffic pattern for the area resulting in different project impacts and hence different proposed mitigations.

²⁵ Communication with George Schultz, City Engineer, City of Carson.

4 ENVIRONMENTAL ANALYSIS

In this report the two scenarios are distinguished by referring simply to the proposed project when future projected conditions include construction of the Torrance Boulevard undercrossing widening. When projected conditions instead include the interim mitigation this report includes reference to the interim mitigation.

Traffic Forecasting and Impact Evaluation Methods

To estimate the traffic impact characteristics of the proposed development, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic at the site on a peak hour and daily basis. The traffic generation potential of the site is estimated by multiplying accepted traffic generation rates by the number of square feet in the proposed development.

The second step of the evaluation process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations have been based largely on a review of the demographics of the area. The third step is traffic assignment, which involves the allocation of project traffic estimates to area links and intersections. Traffic assignment is typically based on minimization of travel time which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic approach distribution patterns are indicated by general percentage orientation, while traffic assignment is based on specific volume forecasts related to development conditions.

With the forecasting process complete and the project traffic assignments developed, the impact of the project is evaluated by comparing the operational conditions at key intersections near the project based on the year 1995 future traffic conditions both with and without the forecasted project traffic.

Traffic Generation Forecast

Traffic generation is expressed in vehicle trip ends (TE) where a trip end is defined as a one-way vehicular movement, either entering or departing the generating land use. Generation factors for the various facilities are based upon the number of trip ends per land use unit, typically in terms of 1,000 square feet (TE/1,000 SF). The trip generation factors used in this traffic forecasting procedure have been based upon rates prepared by the San Diego Association of Governments (SANDAG).

4 ENVIRONMENTAL ANALYSIS

The Institute of Transportation Engineers (ITE) Trip Generation, 4th Edition publication, describes retail shopping trips as one of three trip types: (1) Primary Trips, (2) Diverted Trips and (3) Pass-by Trips. Primary trips are those trips which generally follow a home-to-shop-to-home type pattern. A diverted trip is one in which the shopping destination is a secondary part of the primary trip, such as work-to-shop-to-home. The diverted trip generally involves a route diversion from one route to another to reach the desired destination. A pass-by trip comes directly from the traffic stream on the adjacent roadway system.

Current research indicates that the pass-by traffic component ranges from 30 to 70 percent of total trips for a shopping center. Generally, a small shopping center will reflect a greater percentage of pass-by trips than a large center because of the convenience and specialty service shops which attract passers-by from the adjacent stream of traffic.

Multiple use sites also experience some degree of reduction in traffic generation due to the interaction of trips made between uses within the site. The trip generation forecast for Golden Eagle Center reflects a slight reduction for the pass-by and multiple use traffic. A pass-by traffic reduction of 2.5 percent for both AM/PM peak hour has been applied to the trip forecast for retail/commercial uses. A reduction for the multiple use nature of the project of 12 percent was applied to the daily project traffic.

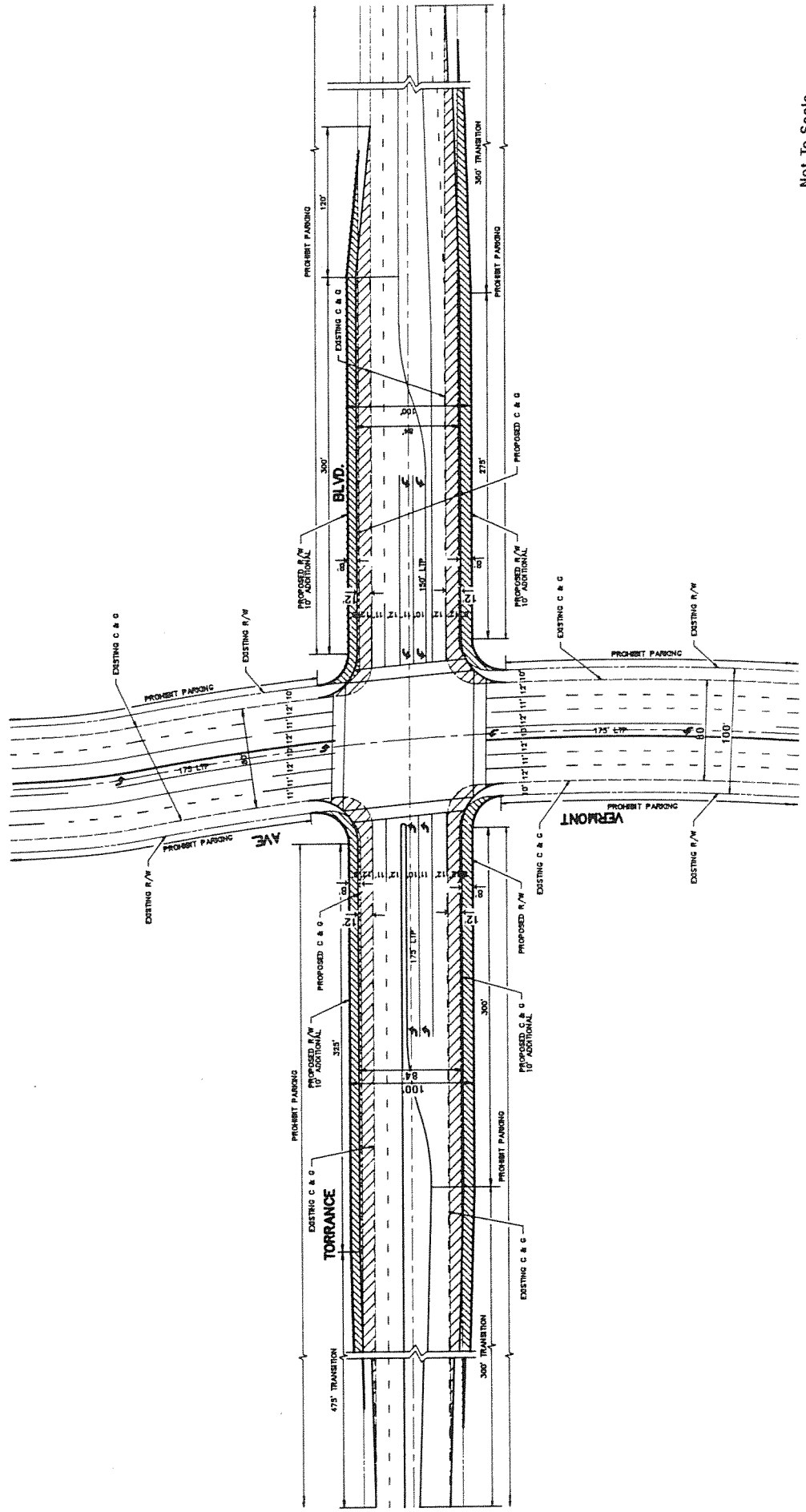
Table 2 summarizes the vehicle trip generation rates and the forecast project trips for the proposed Golden Eagle Center development on a peak hour and daily basis. As shown in Table 2, Golden Eagle Center is expected to generate 35,050 trips on a daily basis (one half arriving, one half departing), with 1,750 trips initiated during the AM peak hour (1,420 entering, 330 exiting) and 3,865 trips occurring during the PM peak hour (1,570 inbound, 2,295 outbound).

Based on LARTS (Los Angeles Regional Transportation Study) data, average trip lengths of 9.0 miles for office/industrial and 5.45 miles for commercial uses were combined with the project site trip generation forecast to yield a Vehicle Miles Travelled (VMT) estimate for project related traffic. On that basis, the project is expected to produce approximately 226,000 VMT daily miles travelled (151,120 non-work miles and 74,880 work miles).

4 ENVIRONMENTAL ANALYSIS

TABLE 2 TRAFFIC GENERATION FORECAST ¹							
GENERATION FACTORS							
Land Use Description	AM PEAK HOUR			PM PEAK HOUR			Daily 2-Way
	Inbound	Outbound	Total	Inbound	Outbound	Total	
Retail/Commercial (TE/1,000 SF)	0.70	0.30	1.00	2.25	2.25	4.50	50.0
Lodging - Hotel (TE/Room)	0.24	0.16	0.40	0.22	0.34	0.56	8.0
Office (> 100kSF) (TE/1,000 SF)	1.99	0.22	2.21	0.48	1.90	2.38	17.0
R & D (TE/1,000 SF)	1.15	0.13	1.28	0.11	1.01	1.12	8.0
Light Industrial (TE/1,000 SF)	0.79	0.09	0.88	0.19	0.77	0.96	8.0
GENERATION FORECAST							
Land Use Description	AM PEAK HOUR			PM PEAK HOUR			Daily 2-Way
	Inbound	Outbound	Total	Inbound	Outbound	Total	
Retail/Commercial (500,000 SF)	350 (340) ³	150 (145) ³	500 (485) ³	1,125 (1,095) ⁴	1,125 (1,095) ⁴	2,250 (2,190) ⁴	25,000
Lodging - Hotel (300 Rooms)	70	50	120	70	100	170	2,400
Office (> 100kSF) (204,363 SF)	405	45	450	100	390	490	3,470
Retail/Commercial (82,261 SF)	55 (55) ³	25 (25) ³	80 (80) ³	185 (180) ⁴	185 (180) ⁴	370 (360) ⁴	4,110
Office (> 100kSF) (194,060 SF)	385	45	430	90	370	460	3,300
Light Industrial (155,248 SF)	120	15	135	30	120	150	1,240
R & D (38,811 SF)	45	5	50	5	40	45	310
TOTALS	1,430 (1,420)³	335 (330)³	1,765 (1,750)³	1,605 (1,570)⁴	2,330 (2,295)⁴	3,935 (3,865)⁴	39,830 (35,050)⁵
¹ Forecast is rounded to the nearest 5 vehicles on a peak hour basis and to the nearest 10 vehicles on a daily basis. ² Source: San Diego Traffic Generators, September 1989. ³ Pass-by-trip reduction of 2.5% applied to AM Peak hour for retail/commercial land uses. ⁴ Pass-by-trip reduction of 2.5% applied to PM Peak hour for retail/commercial land uses. ⁵ Multi-use trip reduction of 12% was applied to the average daily trip total.							

INTERIM MITIGATION CONCEPT PLAN
VERMONT AV./TORRANCE BLVD.



Not To Scale



THE
PLANNING
CENTER

SOURCE: Linscott, Law & Greenspan, Engineers



4 ENVIRONMENTAL ANALYSIS

Traffic Distribution and Assignment

A general directional traffic distribution pattern has been furnished by the City of Carson Traffic Engineering Department which has been developed for the Amendment to the Carson Redevelopment Plan. Table 3 presents the general directional traffic distribution from the Redevelopment Amendment Study. Consideration of area demographics, location of other key area commercial centers, and capacities of local area streets located within the circulation network of the project site have been used to arrive at general traffic distribution patterns.

TABLE 3 REDEVELOPMENT PLAN AMENDMENT STUDY DIRECTIONAL DISTRIBUTION ¹	
Distribution Percentage	Orientation
20%	To the north and west via the Harbor and San Diego Freeways and Artesia Boulevard.
21%	To the north and east via the Long Beach and Artesia Freeways.
19%	To the south and east via the San Diego and Long Beach Freeways and Pacific Coast Highway.
7%	To the south and west via the Harbor Freeway and Pacific Coast Highway.
6%	To arterial streets to the north.
13%	To arterial streets to the west.
5%	To arterial streets to the south.
5%	To arterial streets to the east.
4%	Internal to the City of Carson.
100%	TOTAL

¹ Source: City of Carson Traffic Engineering Department.

Ambient Growth Conditions (Year 1995)

Because the traffic analysis considers the Del Amo Boulevard/I-405 overcrossing as completed, an adjustment was necessary to account for existing traffic redistribution to use Del Amo between Main Street and Avalon Boulevard. It was estimated that approximately 9,000 vehicles per day would use this connection and that these vehicles would be diverted from parallel arterial roadways. AM/PM

4 **ENVIRONMENTAL ANALYSIS**

peak hour traffic volumes were extracted from the daily volumes expected to utilize Del Amo Boulevard. These volumes were added to Del Amo Boulevard intersections from Main Street to Vermont Avenue. Peak hour adjustments were made at Carson Street and Torrance Boulevard intersections reflecting the diversion of traffic to Del Amo Boulevard.

Table 4 summarizes the projected Existing + Ambient Growth (Year 1995) AM/PM peak hour intersection operating conditions. As shown in Table 4 four intersections are expected to require mitigation as a result of Existing + Ambient Growth (Year 1995) AM/PM Peak Hour Volumes. The intersection ICU values are significantly impacted by the addition of Ambient Growth traffic volumes at the following intersections:

1. Figueroa Street/Torrance Boulevard (PM Peak Hour)
2. Figueroa Street/I-110 NB Ramp (PM Peak Hour)
3. Vermont Avenue/Torrance Boulevard (AM/PM Peak Hour)²⁶
4. Vermont Avenue/Del Amo Boulevard (PM Peak Hour)²⁷

Existing + Ambient Growth + Project Conditions

Two general distribution patterns have been applied to the proposed project. Figure 20 shows a general distribution pattern for the proposed retail/commercial uses. Figure 21 shows a general distribution pattern for the proposed office/R&D/industrial components. The principal difference in the two distribution patterns shown on Figures 20 and 21 is the greater orientation of trips to the local arterial streets for commercial/retail uses, while the office type uses have a larger attraction to the area freeway system.

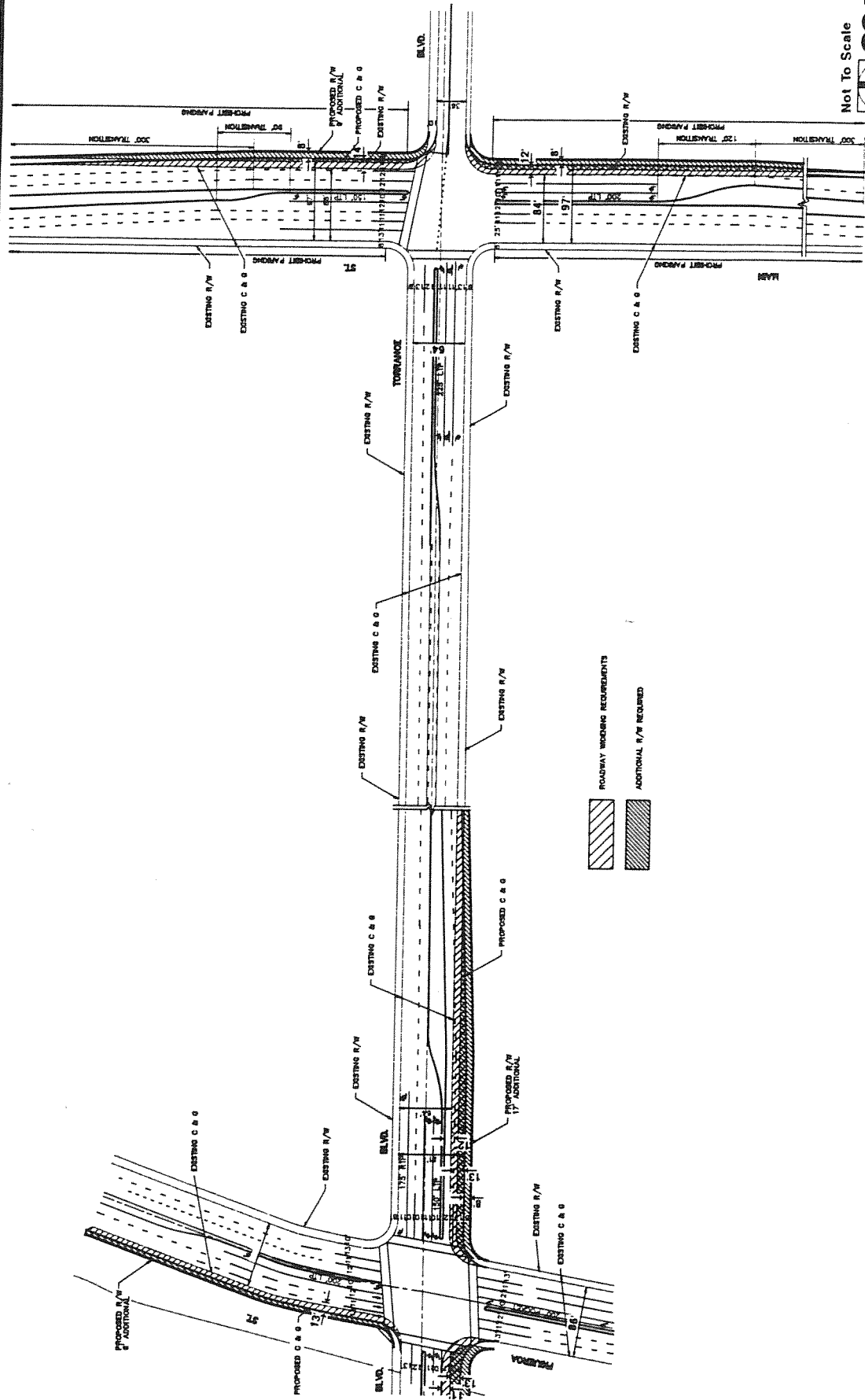
The anticipated AM and PM peak hour trips that would be generated by the Golden Eagle Center are presented in Figure 22. The intersection volumes have been estimated by applying the distribution pattern shown in Figures 20 and 21 to the daily and peak hour traffic forecasts presented previously in Table 2. Daily project traffic volumes presented in Figure 23 are total two-way volumes.

The project traffic volumes shown on Figure 22 have been added to the Existing Peak Hour and Ambient Growth (1995) Peak Hour Volumes. The resulting peak hour traffic volumes at completion of the project are depicted in Figure 24, which

²⁶ This intersection is located within the County of Los Angeles' jurisdiction.

²⁷ This intersection is located on the border of the County of Los Angeles/City of Los Angeles.

TORRANCE BLVD./FIGUEROA ST. TO MAIN ST.



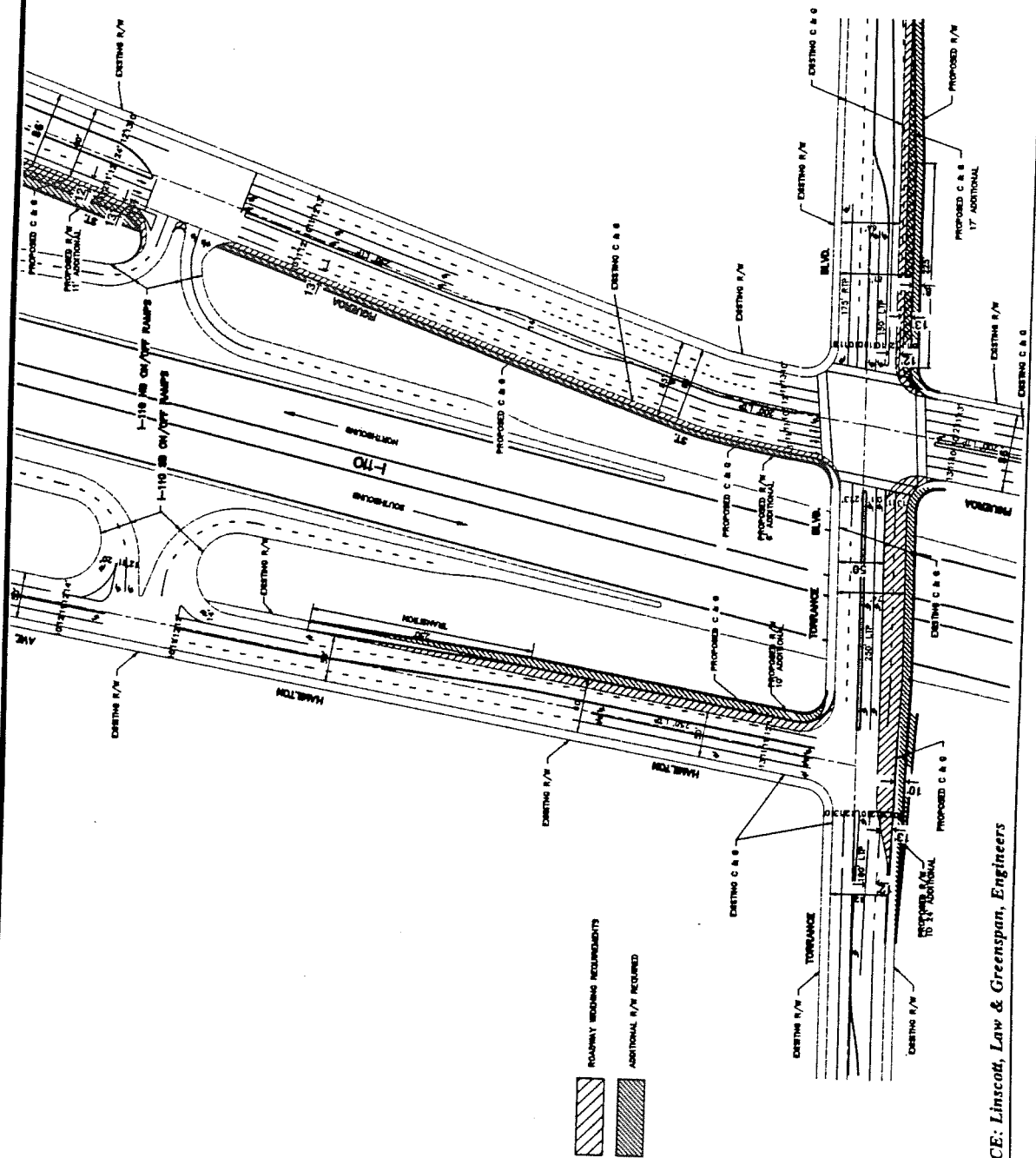
Not To Scale



SOURCE: Linscott, Law & Greenspan, Engineers



TORRANCE BLVD./HAMILTON AV.-FIGUEROA ST./I-110 RAMPS



SOURCE: Linscott, Law & Greenspan, Engineers

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

4 ENVIRONMENTAL ANALYSIS

3. **Vermont Avenue/Torrance Boulevard** - Add a northbound and southbound right-turn lane and a westbound through lane. The right-turn lanes can be accommodated within the existing roadway width. Approximately 12 feet of right-of-way and widening are necessary along the north side of Torrance Boulevard both east and west of Vermont. Eleven feet of additional right-of-way is required on the west side of Vermont Avenue north of Torrance Boulevard and the east side of Vermont south of Torrance. In addition, traffic signal modifications are necessary with this improvement. (Conceptual Plans are presented in Figure 34.)

(This mitigation measure requires the approval of the County of Los Angeles).

Impact of the mitigation measure: This widening would impact a commercial building (Alpine Village Inn) and vacant lot. These properties are located east of Vermont Avenue. The landscape berm on the west side of the intersection would also be affected.

4. **Figueroa Street/Carson Street** - Add an eastbound left-turn lane requiring approximately 12 feet of widening to accommodate a 250-foot right-turn pocket and transition area. Add a westbound left-turn lane and a right-turn lane requiring 12 feet of widening. Approximately 450 feet west and east of Figueroa Street should be designated as "No Stopping" areas. Traffic signal modifications are necessary on the northeast and southwest corners of the intersection. (The Conceptual Mitigation Plan for this intersection is presented in Figure 29.)

Impact of the mitigation measure: Widening would affect both the commercial properties located at the northeast corner and the Unocal Service Station pump islands located on the southwest corner. The landscaping and three parking spaces would be lost at the shopping center; two parking spaces would be lost at the adjacent building fronting Carson.

Along the northeast corner only 10 feet separate the existing roadway from the building housing the Sing Along Center (part of a small shopping center on the corner) where the proposed mitigation would take 12 feet. The mitigation would take the landscaping for the center, plus three parking spaces from the shopping center and two spaces from an adjacent office building fronting on Carson.

5. **Figueroa Street/Del Amo Boulevard** - Add a southbound right-turn lane by restriping within the existing roadway and prohibit parking on Figueroa Street. (Refer to Figure 32 for the Conceptual Plans for this location.)

4 ENVIRONMENTAL ANALYSIS

6. **Main Street/Carson Street** - Add a southbound right-turn lane on Main Street requiring approximately 11 feet of widening (north of Carson). A total of 265 feet on the west side of Main would be sufficient for a right-turn pocket and transition area. (Refer to Figure 29 for the Conceptual Plan.)

Impact of the Mitigation Measure: Right-of-way needs would impact a small commercial building along with pump islands at the service station located on the northwest corner of the intersection.

7. **Main Street/Torrance Boulevard** - Add a northbound left-turn lane, and on the southbound approach add a through lane and an exclusive right-turn lane. Approximately 12 feet of widening together with restriping modifications on the east side of Main (both north and south of Torrance Boulevard) are required to accommodate the two additional lanes. Convert the median on the eastbound approach to a left-turn lane and the number one eastbound through lane to a left/through combination lane by restriping. Traffic signal modification to provide for an east/west split phase on Torrance accompanied with protected lefts from Main Street are also necessary. "No Stopping" would be required on all four directional approaches. (Refer to Figure 30 for the Conceptual Plan.)

Impact of the mitigation measure: Additional right-of-way on the northeast corner would impact a vacant lot and some light industrial buildings north of the lot. Right-of-way needs on the southeast corner impact a second vacant lot and more light industrial businesses south of the lot.

8. **Main Street/Del Amo Boulevard** - Approximately 30 feet of additional pavement width (partial buildout of ultimate width) is required on the north side of Del Amo Boulevard, west of Main Street, to accommodate an eastbound left-turn lane and would continue to westbound through lanes. A southbound through lane would require 13 feet on the west side of Main Street (partial buildout of ultimate buildout). Installation of a left-turn lane requires 10 feet of widening, north of the existing improvement on the east side of Main Street for approximately 200 feet. Installation of a traffic signal is required. Parking prohibitions would be required on the west side of Main Street, north and south of Del Amo Boulevard. (Refer to Figure 33 for detailed drawings.)
9. **Hamilton Avenue/Torrance Boulevard** - On the southbound approach, convert the free right-turn lane to a controlled right-turn lane and a left/right option lane. In addition, it is necessary that the westbound free

4 ENVIRONMENTAL ANALYSIS

right-turn lane be converted to a through/right combination lane. The addition of an eastbound left-turn lane is an extension of Torrance Boulevard/Figueroa Street widening to improve alignment for eastbound vehicles. Ten feet of widening and Caltrans right-of-way are required along the east side of Hamilton Avenue. (Refer to Figure 31 for the Conceptual Plan.)

(This mitigation measure requires the approval of the County of Los Angeles and Caltrans).

Interim Mitigation - Ambient Growth Conditions

Under the interim mitigation condition, but without project traffic, the following four intersections were found to need mitigation due to ambient traffic growth. An additional intersection Main Street/Torrance Boulevard that would be close to a poor operating condition, could be improved by a simple modification.

1. **Figueroa Street/Del Amo Boulevard** - Add a southbound right-turn lane by restriping within the existing roadway. Prohibit parking on Figueroa Street.
2. **Hamilton Avenue/Del Amo Boulevard** - Add an eastbound right-turn lane by restriping. Parking would be prohibited on Del Amo Boulevard. Anticipated traffic volumes with the construction of the Del Amo/I-405 overcrossing are expected to require signalization of this intersection.

(This mitigation measure requires the approval of the City of Los Angeles and the County of Los Angeles).

3. **Vermont Avenue/Torrance Boulevard** - Add north and southbound through lanes by restriping within the existing road width. "No Stopping" provisions are required on both sides of Vermont Avenue. Add a westbound through lane requiring approximately 12 feet of right-of-way. Another 12 feet of right-of-way is needed for a second eastbound left-turn pocket. In addition, traffic signal modifications are necessary with this improvement.

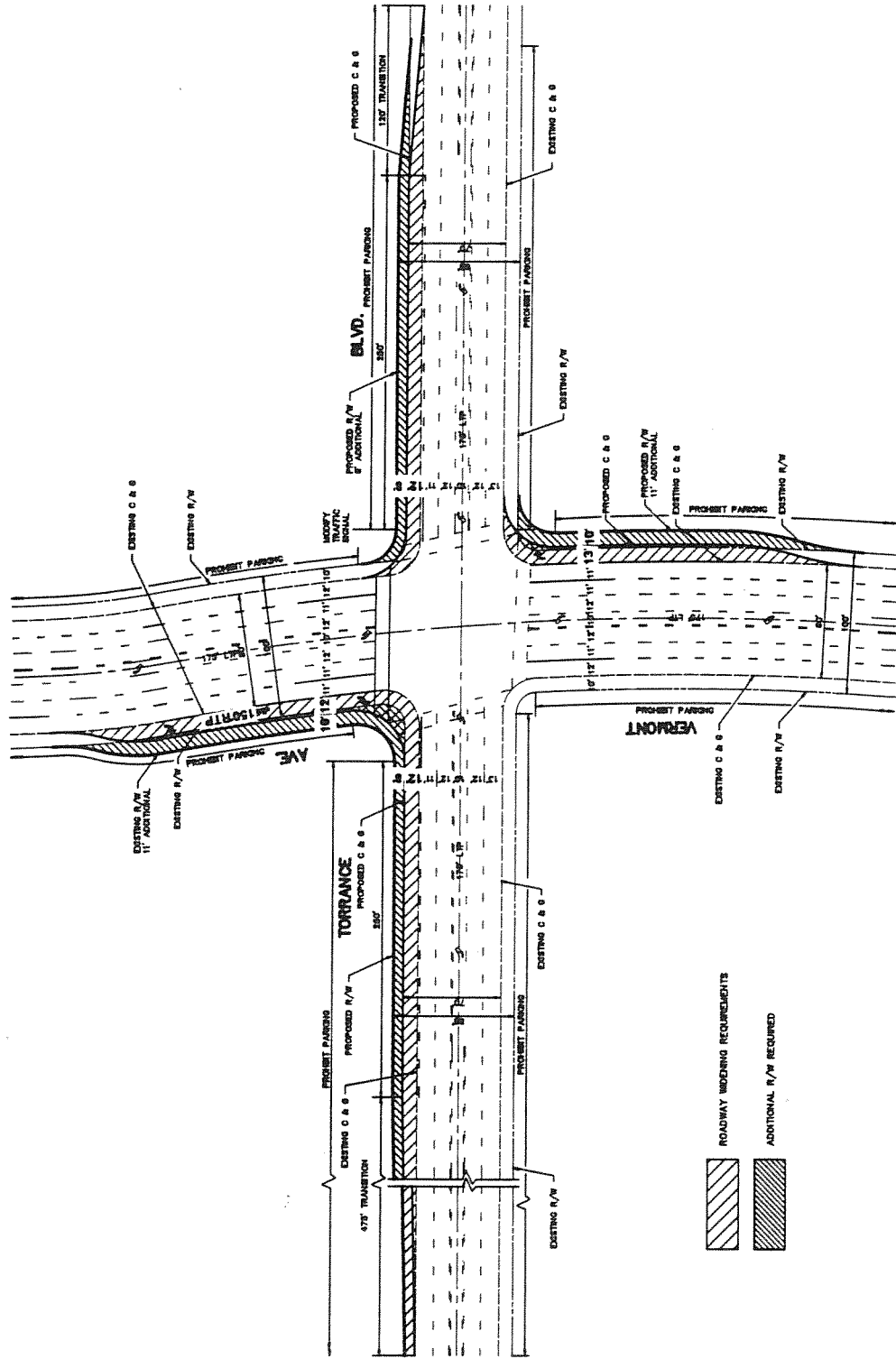
(This mitigation measure requires the approval of the County of Los Angeles).

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100



**PROJECT MITIGATION CONCEPT PLAN
VERMONT AV./TORRANCE BLVD.**



Not To Scale



THE
PLANNING
CENTER

SOURCE: Linscott, Law & Greenspan, Engineers



4 ENVIRONMENTAL ANALYSIS

Impact of the mitigation measure: This widening would impact a commercial building (Alpine Village Inn) and the corner lot. These properties are located east of Vermont Avenue. The landscape berm on the west side of the intersection would also be affected. These widening needs would impact the south side of Torrance for 500 feet east and west of the intersection. Single-family properties would have to reduce their front lawn setback. Widening would affect the flood control channel on the southwest corner. Right-of-way needs would impact the pump island clearance for a Mobil Service Station and some existing single-family dwellings.

4. **Vermont Avenue/Del Amo Boulevard** - Add a northbound right-turn lane and southbound left-turn lane within the existing street width by restriping. North and south of the intersection approximately 300 feet of "No Stopping" area is required on both sides of Vermont Avenue. Add an eastbound through lane on the west intersection leg by restriping. Traffic signal modifications are required at this location.

(This mitigation measure requires the approval of the County of Los Angeles and the City of Los Angeles).

5. **Main Street/Torrance Boulevard** - Convert the eastbound median to a left-turn pocket to improve operating conditions at the intersection.

Table 11 presents a summary of proposed mitigation measures for the four intersections that would require modification due to ambient growth.

4 ENVIRONMENTAL ANALYSIS

**TABLE 11
SUMMARY OF MITIGATION MEASURES
INTERIM MITIGATION - AMBIENT GROWTH (YEAR 1995)**

Intersection	Mitigation			
	Northbound	Southbound	Eastbound	Westbound
Figuroa Street/Del Amo Boulevard	--	Add Rt	--	--
Main Street/Torrance Boulevard	--	--	Convert Median to Lt	--
Hamilton Avenue/Del Amo Boulevard	--	--	Add Rt	--
Vermont Avenue/Torrance Boulevard	Add T	Add T	Add Lt ¹	Add T ¹ & Lt ²
Vermont Avenue/Del Amo Boulevard	Add Rt	Add Lt	Add T	--

1 Mitigation requires additional right-of-way
2 Mitigation reflects mirroring opposing dual left-turns

Note:
All mitigation shown above applies to a future street system with the extension of Del Amo Boulevard over the I-405 Freeway.

Legend:

Lt = Left-turn lane, T = Through lane, Rt = Right-turn lane

Interim Mitigation - 1995 Project Conditions

The seven intersections listed would require mitigation to avoid significant impacts based on projected conditions. The first two listed intersections would require additional improvements beyond those needed to accommodate anticipated ambient growth (Year 1995) and there are five new intersections that would also require mitigation due to project impacts. The intersections of Vermont Avenue with Torrance Boulevard and Vermont Avenue with Del Amo Boulevard do not require additional mitigation beyond what would be required to deal with ambient growth. The intersections are as follows:

1. Figuroa Street/Del Amo Boulevard (PM Peak Hour)
2. Hamilton Avenue/Del Amo Boulevard (PM Peak Hour)²⁹
3. Figuroa Street/Carson Street (AM/PM Peak Hour)
4. Figuroa Street/I-110 NB Ramp (PM Peak Hour)

²⁹ Intersection shared between City of Los Angeles and County of Los Angeles.

4 ENVIRONMENTAL ANALYSIS

5. Main Street/Carson Street (PM Peak Hour)
6. Main Street/Torrance Boulevard (AM/PM Peak Hour)
7. Main Street/Del Amo Boulevard (PM Peak Hour)

Table 12 provides a summary of the anticipated 1995 ICU/LOS intersection conditions with addition of project traffic. Table 12 also shows anticipated mitigated conditions assuming implementation of the mitigation measures described below.

1. **Figueroa Street/Del Amo Boulevard** - Add eastbound right-turn lane to Del Amo Boulevard. Two options are available: add a right-turn lane and allow dual right turns or add a free right turn lane. In addition, traffic signal modifications are required to provide for an East/West split phase.

(These improvements mitigate the intersection to an LOS F (ICU = 1.02) during the PM peak hour. The implementation of free eastbound right-turn lane would mitigate the location to an acceptable LOS C. However, because of the very short distance from Del Amo to the northbound I-110 on-ramp, concern was expressed by the City's traffic engineer that weaving conflicts could cause safety problems. Therefore the use of dual rights was analyzed (as suggested by the City's engineer) which resulted in an LOS F in the P.M. peak hour. Conceptual Plans implementing the dual eastbound right-turn lanes are illustrated in Figure 37. Figure 38 illustrates the conceptual plans which implement a free westbound right-turn lane).

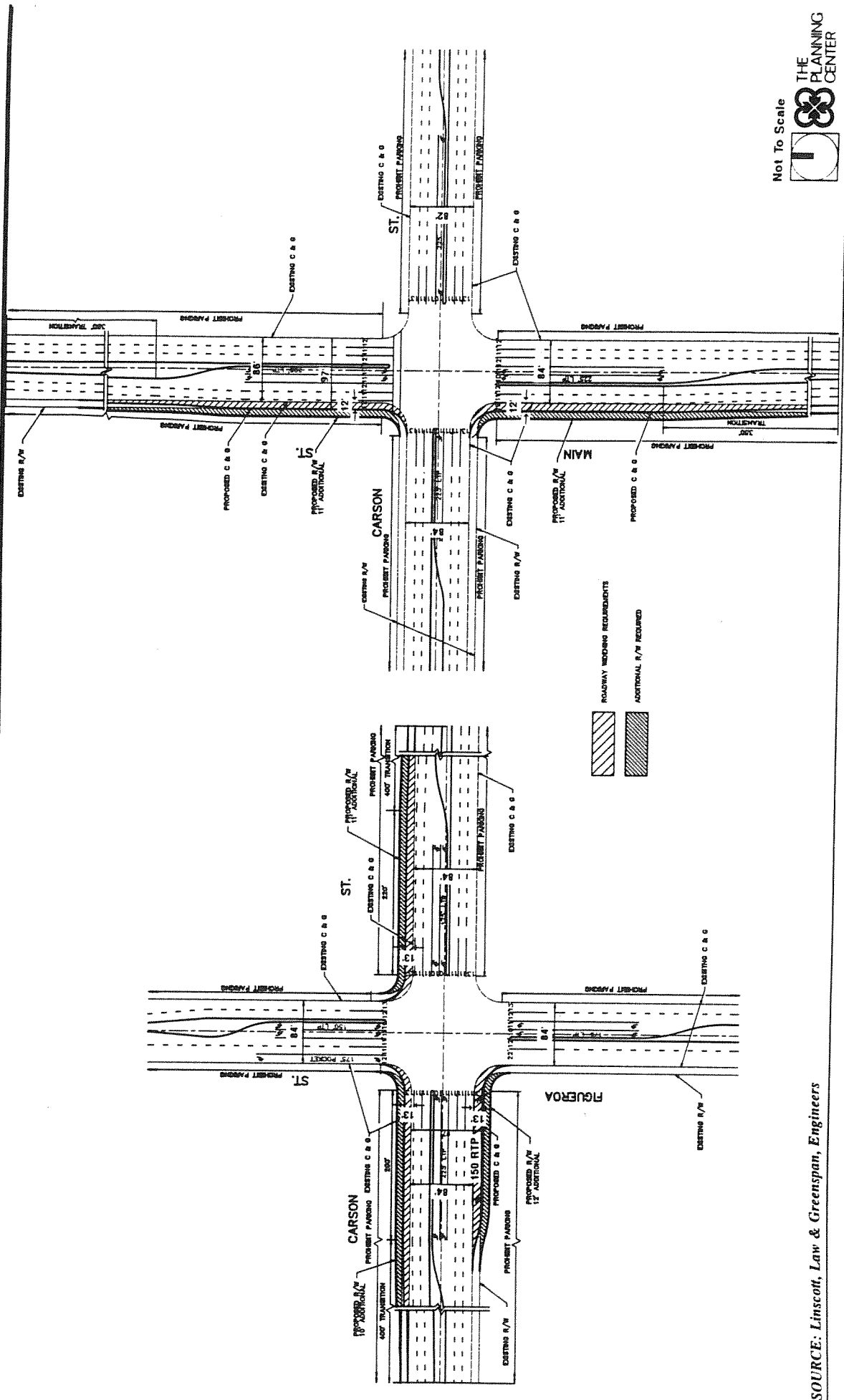
Impact of the mitigation measure: For option 2, widening and right-of-way on the southwest corner is required to facilitate the added right turn lane. Adding a free right-turn lane might create safety problems due to weaving as drivers in the two southbound through lanes merge to the right, to access the northbound I-110 ramp located just south of the intersection. The other alternative mitigation measure identified, the dual right turn option, would only partially mitigate the impact and long eastbound right turn queues could develop on Del Amo.

2. **Hamilton Avenue/Del Amo Boulevard** - Add a westbound left-turn lane with the existing roadway width by restriping. "No Stopping" restrictions are required on Del Amo Boulevard on the approach to Hamilton. (Figure 41 depicts the Conceptual Plans.)

(This mitigation measure requires the approval of the County of Los Angeles County and the City of Los Angeles).

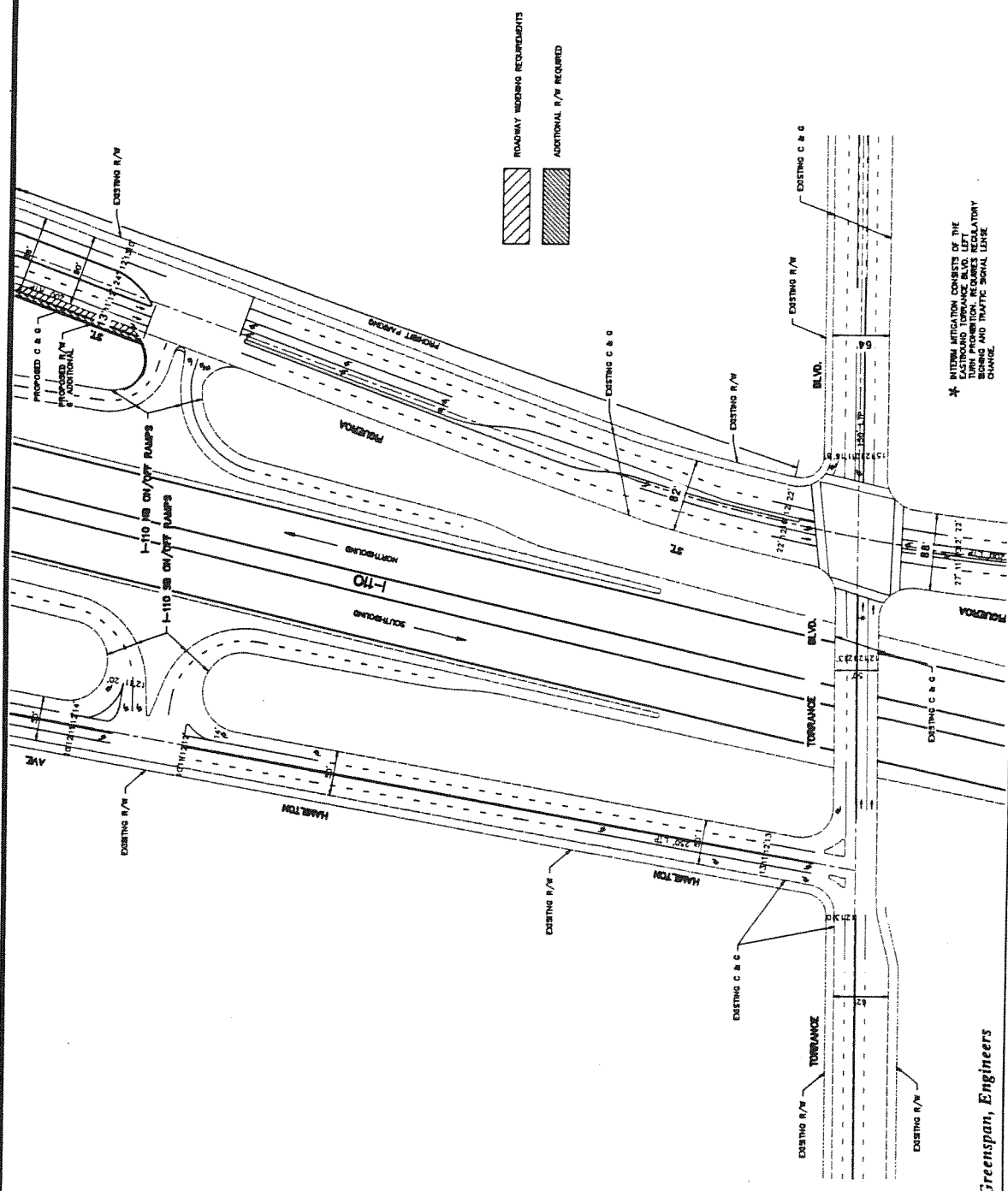
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

INTERIM MITIGATION CONCEPT PLAN
 CARSON ST./MAIN ST. - CARSON ST./FIGUEROA ST.





**INTERIM MITIGATION CONCEPT PLAN
 TORRANCE BLVD./HAMILTON AV.- FIGUEROA ST./I-110 RAMPS**

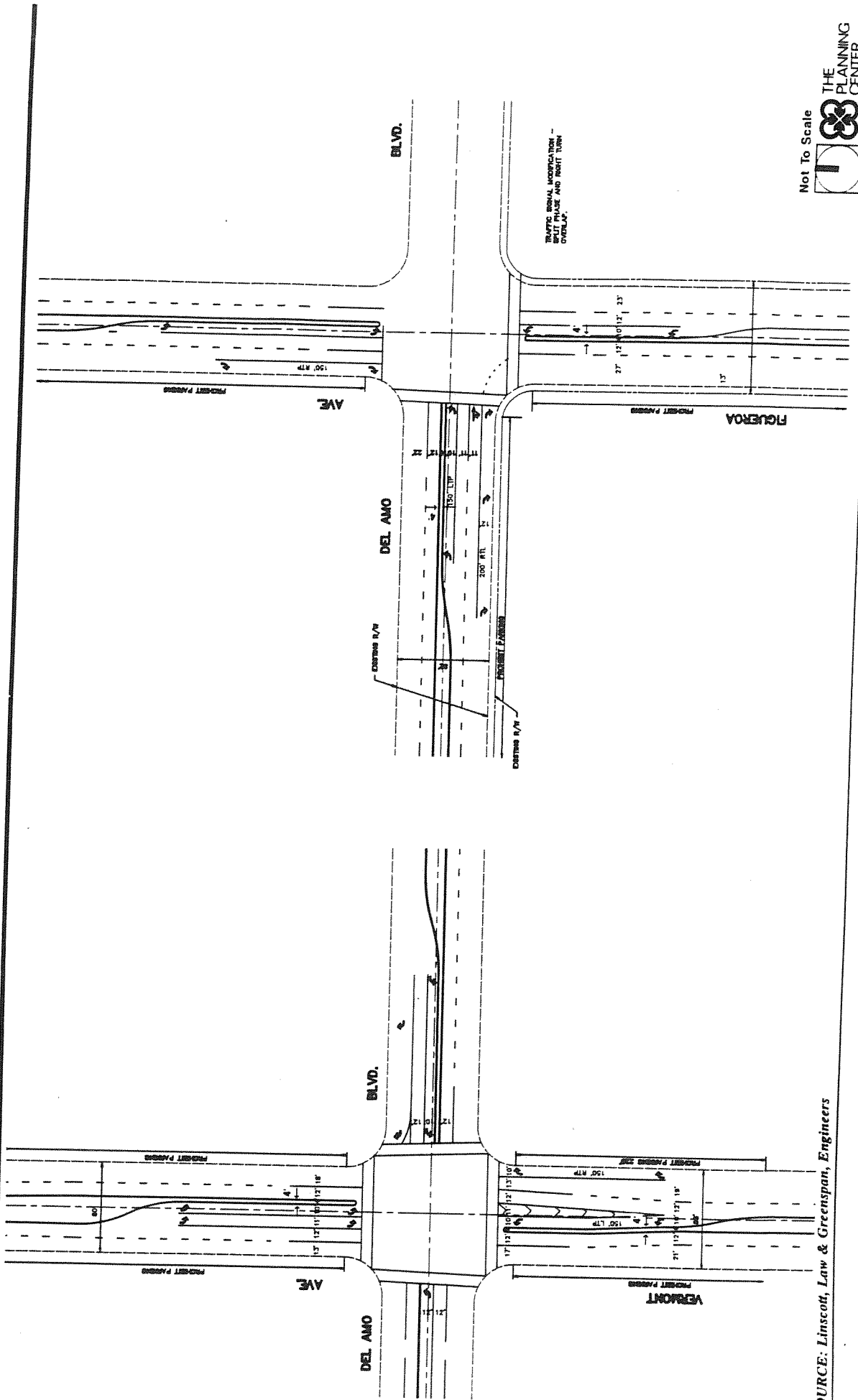


Not To Scale

THE PLANNING CENTER

SOURCE: Linscott, Law & Greenspan, Engineers

INTERIM MITIGATION CONCEPT PLAN
 DEL AMO BLVD./FIGUEROA AV.-DEL AMO BLVD./VERMONT AV.



4 ENVIRONMENTAL ANALYSIS

3. **Figueroa Street/Carson Street** - Add eastbound and westbound left-turn lanes and through lanes requiring widening and right-of-way on both sides of Carson. Striping modifications allow for the addition of a southbound right-turn lane. Signal modifications and "No Stopping" prohibitions on all four legs of the intersection are required. (Refer to Figure 35 for Conceptual Plans.)

Impact of mitigation measure: Some commercial retail and the pump islands at the Unocal Service Station, located on the southwest corner, would be impacted due to the mitigation measures proposed. On the northwest corner, the Kentucky Fried Chicken restaurant drive-thru driveway and commercial retail located west of the restaurant would be impacted. Right-of-way needs on the northeast corner include the parking lot of a commercial retail building and building frontage of an adjacent professional building. Pump islands of an Arco Service Station and adjacent commercial retail property located on the southeast corner would not be impacted by these improvements.

Along Carson Street at the northeast corner only 10 feet separate the existing roadway from the building housing the Sing Along Center (part of a small shopping center on the corner) where the proposed mitigation would take 11 feet. Even at 10 feet the mitigation would take the landscaping for the center, plus three parking spaces from the shopping center and two spaces from an adjacent office building fronting on Carson Street. The transition right-of-way take could be modified to avoid taking a mobile home at Carson Gardens.

The addition of east and westbound through lanes would require widening of the Carson Street bridge over the I-110. This portion of the mitigation would not be needed (with its potentially large cost) if the Torrance undercrossing were constructed.

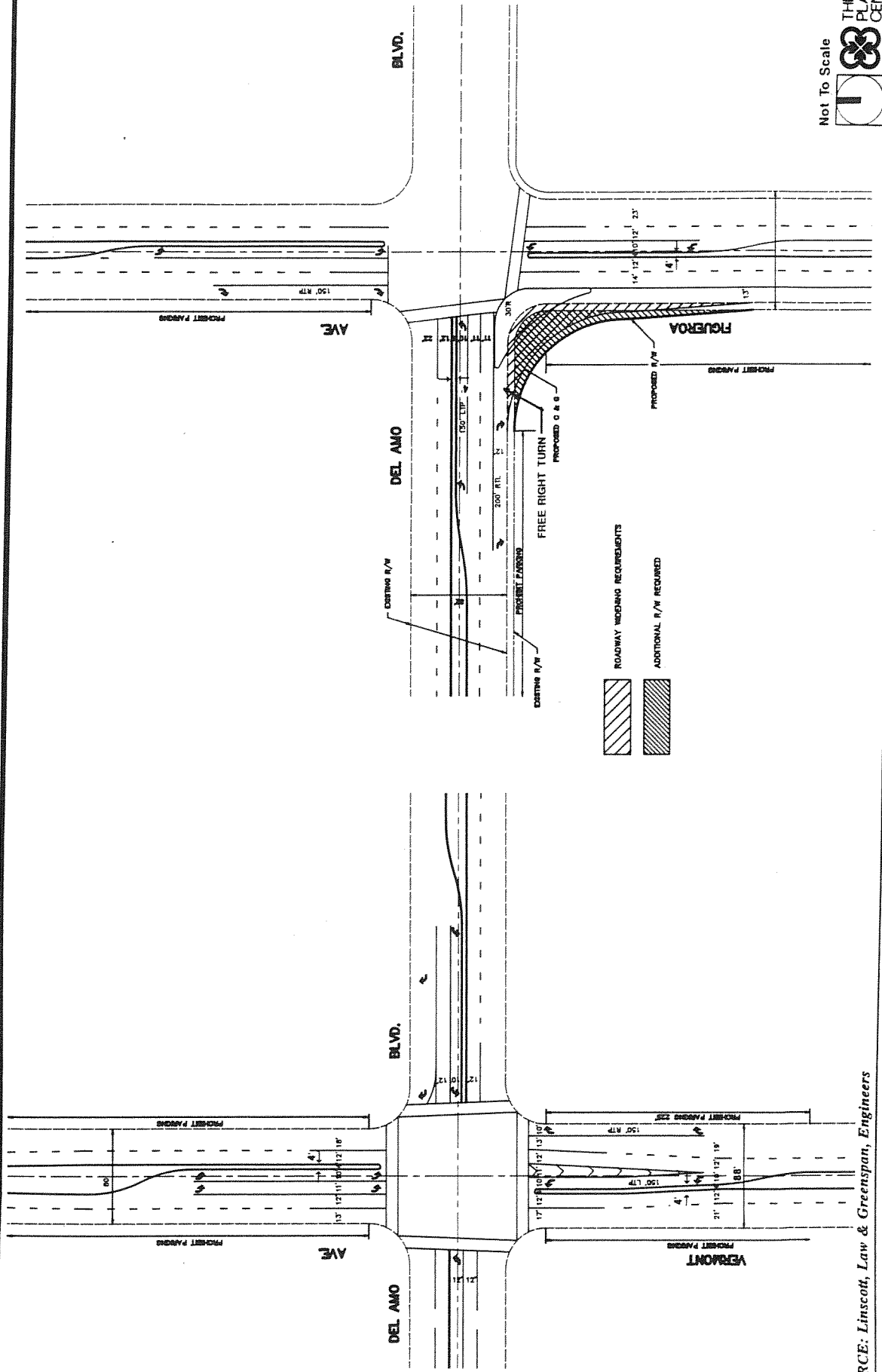
4 ENVIRONMENTAL ANALYSIS

**TABLE 12
INTERIM MITIGATION - PROJECT CONDITION LEVEL OF SERVICE
SUMMARY (ICU/LOS)**

Intersection	Peak Hour	Baseline Condition	Redistributed with Del Amo Boulevard and Interim Mitigation	Ambient Growth (Year 1995)	Mitigated Condition	Project Condition ³	Project Mitigated Condition	
FIGUEROA ST. @ Carson Street	AM	0.73/C	0.73/C	0.83/D	--	0.94/E	0.74/C ⁴	
	PM	0.82/D	0.78/C	0.88/D	--	1.04/F	0.89/D ⁴	
	@ Torrance Boulevard	AM	0.76/C	0.48/A	0.54/A	--	0.72/C	--
		PM	0.88/D	0.60/A	0.67/B	--	0.91/E	--
	@ I-110 NB Ramps	AM	0.78/C	0.67/B	0.77/C	--	0.89/D	0.66/B ⁴
		PM	0.88/D	0.75/C	0.85/D	--	1.27/F	0.84/D ⁴
@ Del Amo Boulevard	AM	0.49/A	0.60/A	0.69/B	0.69/B	0.81/D	0.88/D ⁴ (0.72/C) ¹	
	PM	0.55/A	0.88/D	1.00/E	0.89/D	1.16/F	1.02/F ⁴ (0.72/C) ¹	
MAIN ST. @ Carson Street	AM	0.52/A	0.50/A	0.55/A	--	0.64/B	0.61/B ⁴	
	PM	0.76/C	0.72/C	0.82/D	--	0.92/E	0.84/D ⁴	
	@ Torrance Boulevard	AM	0.68/B	0.69/B	0.80/C	--	1.01/F	0.64/B ⁴
		PM	0.77/C	0.78/C	0.89/D	--	1.32/F	0.82/D ⁴
	@ I-405 SB On-Ramps	AM	0.43/A	0.42/A	0.48/A	--	0.48/A	--
		PM	0.56/A	0.54/A	0.60/A	--	0.67/B	--
@ I-405 NB Off-Ramps	AM	0.61/B	0.60/A	0.67/B	--	0.73/C	--	
	PM	0.57/A	0.56/A	0.63/B	--	0.69/B	--	
@ Del Amo Boulevard	AM	0.41/A	0.48/A	0.53/A	--	0.71/C	0.63/B ⁴	
	PM	0.50/A	0.69/B	0.78/C	--	1.01/F	0.86/D ⁴	
HAMILTON AVE. @ Torrance Boulevard	AM	0.57/A	0.56/A	0.63/B	--	0.71/C	--	
	PM	0.66/B	0.56/A	0.63/B	--	0.83/D	--	
	@ I-110 SB Ramps	AM	0.54/A	0.65/B	0.73/C	--	0.77/C	--
		PM	0.66/B	0.76/C	0.87/D	--	0.94/E	--
	@ Del Amo Boulevard	AM	0.38/A	0.53/A	0.60/A	0.60/A	0.65/B	0.65/B
		PM	0.56/B	0.82/D	0.92/E	0.87/D	1.00/E	0.88/D
VERMONT AVE. @ Torrance Boulevard	AM	0.86/D	1.03/F	1.18/F	0.80/C ⁴	1.21/F ²	0.83/D ⁴	
	PM	0.82/D	1.03/F	1.17/F	0.80/C ⁴	1.25/F ²	0.86/D ⁴	
	@ Del Amo Boulevard	AM	0.60/A	0.77/C	0.88/D	0.76/C	0.93/E ²	0.79/C
		PM	0.63/B	1.07/F	1.22/F	0.84/D	1.29/F ²	0.87/D

1 Parenthetical values indicate ICU/LOS with the implementation of a free eastbound right-turn lane (see Figure 38.)
 2 These conditions would only apply if the mitigations for ambient growth were not implemented.
 3 Project Condition reflects service levels prior to implementation of ambient growth mitigations.
 4 Mitigation requires additional right-of-way.

**INTERIM MITIGATION CONCEPT PLAN
 DEL AMO BLVD./FIGUEROA AV.-DEL AMO BLVD./VERMONT AV.**



4 ENVIRONMENTAL ANALYSIS

4. **Figueroa Street/I-110 NB On-Ramp** - Add a northbound left-turn lane and a southbound right-turn lane. Striping modifications would accommodate the added northbound left-turn lane within the existing street width. The addition of an exclusive southbound right-turn lane would require approximately 6 feet of widening in Caltrans' right-of-way. Widening is necessary from north of the ramp for approximately 275 feet. Traffic signal modifications are necessary. (Figure 36 depicts the conceptual plan for this location.)

(This mitigation measure requires the approval of Caltrans).

5. **Main Street/Carson Street** - Widening along the west side of Main Street by 11 feet is required, 575 feet south of Carson and 450 feet north of Carson, to provide for a second northbound and southbound left-turn lane.

Impact of this mitigation measure: Building frontage of a commercial business and pump islands of a service station would be impacted on the northwest corner. The southwest corner would require the deletion of the Del Taco drive-thru driveway and parking/frontage of a commercial center to the south of Del Taco. Signal modifications would be required. (Refer to Figure 35 for Conceptual Plans for this location). In addition to affecting the Del Taco outlet, this mitigation would take the sun room at Alfredo's restaurant. An additional 11 feet of right-of-way is required for 225 feet south of Carson Street. Widening relocates the sidewalk which interferes with the restaurant building.

6. **Main Street/Torrance Boulevard** - Add a northbound left-turn lane by restriping within the existing street width. Add a southbound through lane and an exclusive right-turn lane. Approximately 9 feet of additional right-of-way on east side of Main Street north of Torrance Boulevard and 13 additional feet of right-of-way on east side of Main Street south of Torrance Boulevard together with restriping modifications on the east side of Main Street (both north and south of Torrance Boulevard) are required to accommodate the two additional lanes.

Convert the number one eastbound through lane to a left/through combination by restriping. Traffic signal modification to provide for an east/west split phase on Torrance accompanied with protected lefts from Main street, are also necessary. "Stopping" would be prohibited on all four directional approaches. (Refer to Figure 39 for the Conceptual Drawings.)

4 ENVIRONMENTAL ANALYSIS

Impact of this mitigation measure: Additional right-of-way on the northeast corner would impact a vacant lot and some light industrial buildings north of the lot. Right-of-way needs on the southeast corner impact a second vacant lot and more light industrial businesses south of the lot. The no parking prohibition would require elimination of approximately 22 on-street parking spaces.

7. **Main Street/Del Amo Boulevard** - Approximately 30 feet of additional pavement width is required on the north side of Del Amo Boulevard, west of Main Street, to accommodate an eastbound left-turn lane and two westbound through lanes. A southbound through lane would require 13 feet on the west side of Main Street. Installation of a left-turn lane requires ten (10) feet of widening, north of the existing improvement on the east side of Main Street for approximately 200 feet. Parking would be restricted on the west side of Main Street both north and south of Del Amo Boulevard. Presently, the eastbound approach is closed. With the opening of Del Amo Boulevard and the development of the parcel east of the intersection, it may be assumed that by 1995, volumes would increase sufficiently to warrant signalization of the intersection. (Refer to Figure 40 for detailed drawings.)

Vermont Avenue/Torrance Boulevard - No additional improvements beyond those specified in the Ambient Growth Condition are required. Note that this intersection is located in the County of Los Angeles. Figure 42 presents the Conceptual Plan.

Vermont Avenue/Del Amo Boulevard - No additional mitigation measures beyond those specified in the Ambient Growth Condition are required with the addition of Project Traffic. Note that this intersection is shared between the City and County of Los Angeles. Conceptual Plans are presented in Figure 37.

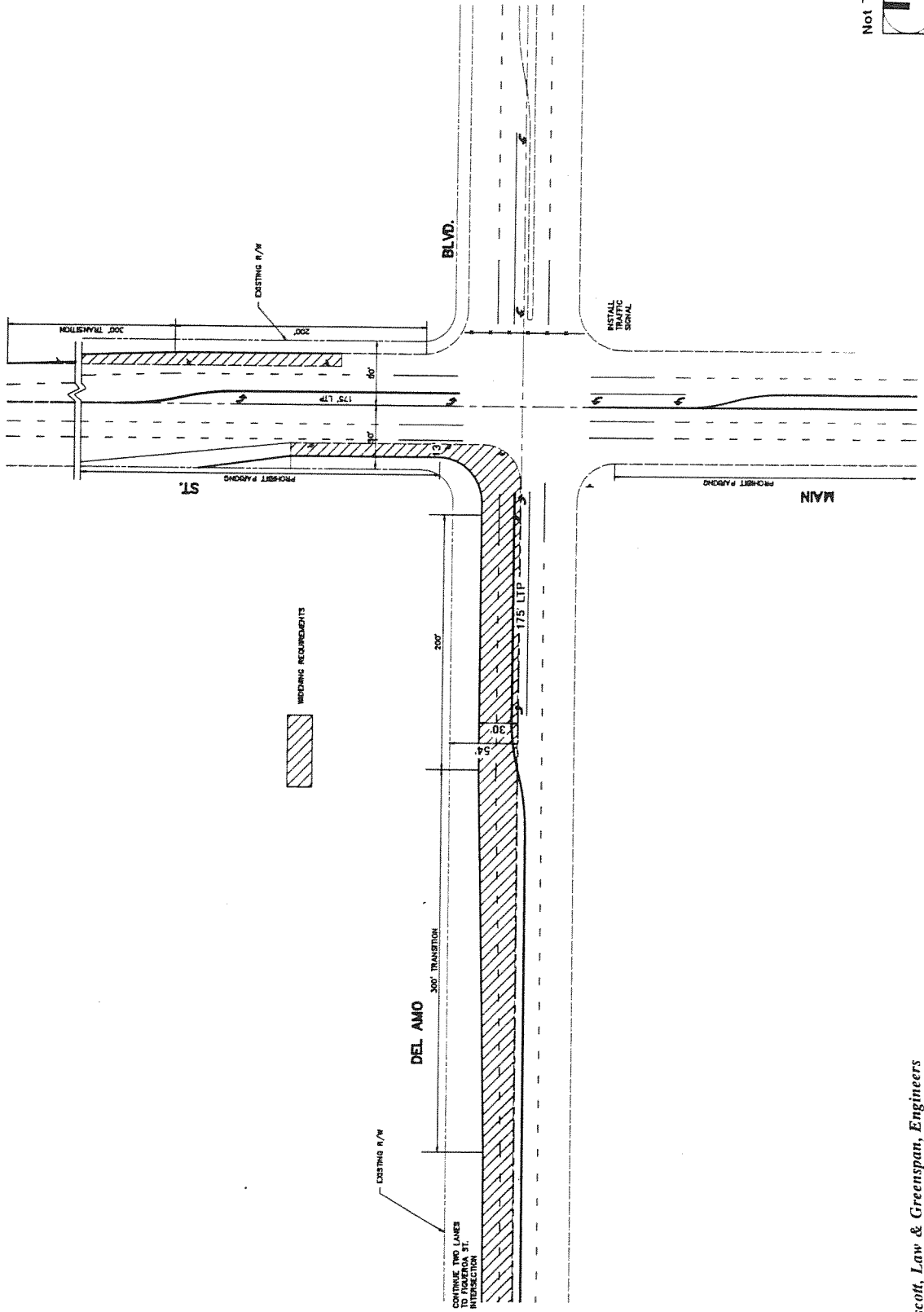
4.2.4 Level of Significance After Mitigation

Under the interim mitigation condition (no-left turn restriction from eastbound Torrance Boulevard to northbound Figueroa Street), the intersection of Figueroa Street at Del Amo Boulevard would be significantly impacted. Either the project's impact on LOS (ICU 1.02, LOS F) would be significant after mitigation of constructing dual right turn lanes, or the alternative mitigation of constructing a free right-turn lane might create a potential safety hazard.

Review of cumulative traffic conditions is presented in Chapter 5.

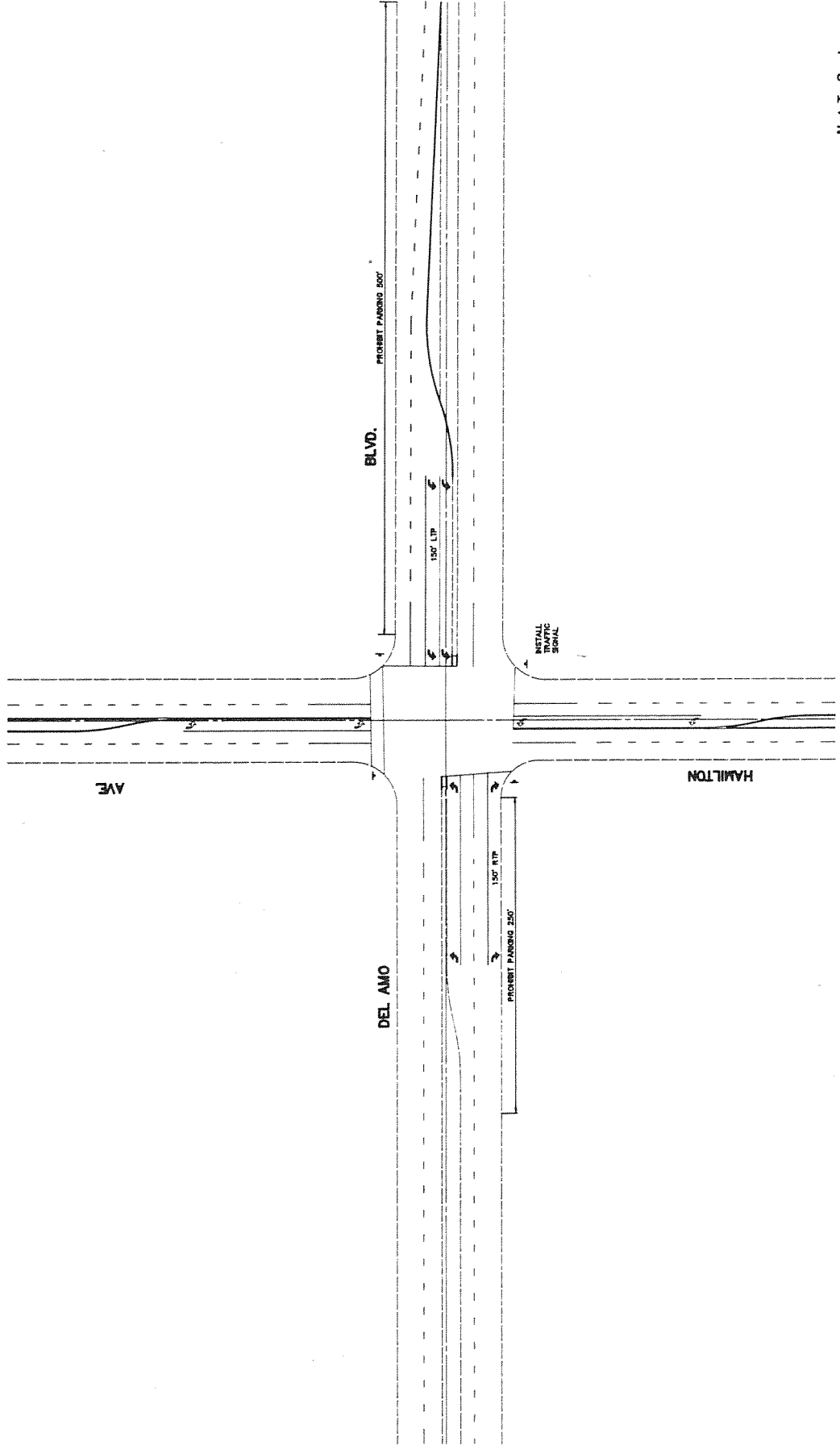


INTERIM MITIGATION CONCEPT PLAN
 DEL AMO BLVD./MAIN ST.



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

INTERIM MITIGATION CONCEPT PLAN
DEL AMO BLVD./HAMILTON AVE.





4 ENVIRONMENTAL ANALYSIS

4.3 AIR QUALITY

4.3.1 Environmental Setting

Regional Air Quality

The project site is within the South Coast Air Basin (SoCAB), which includes Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino Counties. Air quality conditions in the SoCAB come under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SoCAB does not attain the state and federal standards for four of the six criteria air pollutants. The basin is in compliance with the federal sulfur dioxide and lead standards, but the ambient carbon monoxide and particulate levels (PM₁₀) reach twice the standards. In addition, the SoCAB is the only area in the country that does not attain the federal nitrogen dioxide standard. These air contaminants exceed the more stringent state standards by an even higher margin.

Climate/Meteorology

The climate of the SoCAB is determined by its terrain and geographical location. The air basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern border and high mountains surround the rest of the basin. The region lies in the semipermanent high pressure zone of the eastern Pacific. The resulting climate is mild, tempered by cool ocean breezes. This mild climatological pattern is rarely interrupted; however, there do exist periods of extremely hot weather, winter storms, or Santa Ana wind conditions.

The annual average temperature varies little throughout the air basin, ranging from the low to the middle 60s measured in degrees Fahrenheit. With a more pronounced oceanic influence, the coastal areas show less variability in annual minimum and maximum temperatures than the inland areas. The climatological station nearest the study area is located in Torrance.³⁰ This station monitors a normalized monthly average temperature ranging from 55°F to 70°F, with an annual average temperature of 62.2°F. All areas in the air basin have recorded temperatures well above 100°F in recent years; 104°F was recorded in Torrance during 1989. January is typically the coldest month in the air basin, with a minimum of 27°F measured in Torrance in 1990.

³⁰ Source: California Climatological Data Annual Summary, 1990; National Oceanic and Atmospheric Administration.