APPENDIX D

Traffic Impact Analysis

ARCO MTBE PHASE OUT

TRAFFIC IMPACT ANALYSIS

OCTOBER 2000

AUSTIN-FOUST ASSOCIATES, INC.

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Chapter 1.0
INTRODUCTION

1.1 INTRODUCTION

This report presents the results of a traffic analysis performed for the proposed ARCO Project to modify their Los Angeles Refinery (LAR) to satisfy the California mandated phase out of methyl tertiary butyl ether (MTBE) from gasoline by Devember 31, 2002. This report has been prepared for submittal in support of the application for the project site.

1.2 PROJECT DESCRIPTION

The ARCO Los Angeles refinery (LAR) is proposing to make changes to the configuration of the refinery by modifying existing process operating units, constructing and installing new equipment, and providing additional ancillary facilities. To meet the oxygenate requirements of the California Air Resources Board (CARB) requirements, ethanol will be blended into the gasoline. The ethanol will not be blended at the refinery, as with MTBE, but at distribution facilities. Therefore, modifications to five distribution and one marine terminal in Southern California will be required. The terminals are located in the cities of Carson, Long Beach, Signal Hill, South Gate, and an unincorporated portion of San Bernardino County near the City of Colton, as illustrated in Figure 1-1.

The refinery is located at 1801 East Sepulveda Boulevard in the City of Carson. The irregularly shaped parcel that comprises the refinery is generally located between Wilmington Avenue on the west, 223rd Avenue on the north, Alameda Street on the east, and Sepulveda Boulevard on the south. The area of the refinery is approximately 680 acres.

The LAR and adjacent property are zoned MH (manufacturing heavy). The closest residential area is located southwest of the refinery and west of Wilmington Avenue. The Dominguez Channel, which originates in the area southeast of the Los Angeles International Airport and eventually flows into the East Channel of the Los Angeles Harbor, traverses the refinery property in a northwest to southeast direction.

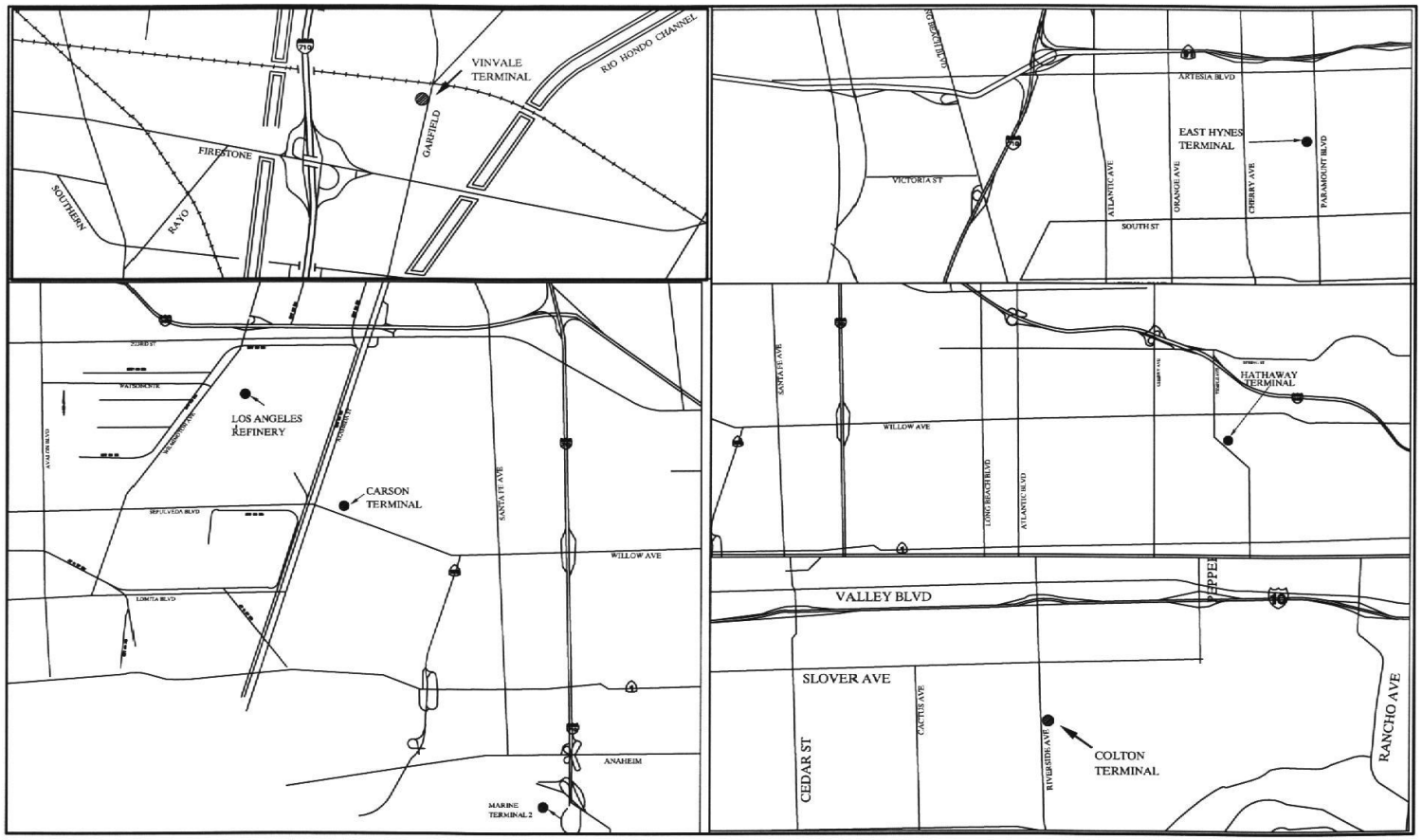

Figure 1-1

PROJECT VICINITY MAPS

The Carson Terminal is located at 2149 E. Sepulveda Boulevard. The Colton Terminal is located at 2395 South Riverside Avenue in an unincorporated portion of San Bernardino County. The East Hynes Terminal is located at 5905 Paramount Boulevard in the City of Long Beach. The Hathaway Terminal is located at 2350 Hathaway Drive in the City of Signal Hill. The Vinvale Terminal is located at 8601 South Garfield Avenue in the City of South Gate. The Marine Terminal 2 is located at 1300 Pier B Street within the Port of Long Beach.

The units, additions and modifications proposed as part of the MTBE Phase Out Project include the following:

1.2.1 Refinery Improvements

- Light hydro unit (LHU)
- ISO SIV unit
- No. 3 reformer fractionator
- Gasoline Fractionation Area
- Fluid catalytic cracking unit (FCCU) rerun bottoms splitter
- Conversion of SFIA depentanizer to a FCCU bottoms splitter
- North Hydrogen plant
- Conversion of existing MTBE unit to Selective Hydrogenation Unit (SHU)/ISO Octene Unit
- Modification of existing Cat Poly Unit to a Dimerization Unit
- Modification of Mid-Barrel Unit to Gasoline Hydrotreater
- Piping modification in tank farm
- Facilities and equipment for pentane off-loading at existing railcar pentane loading facility
- Piping modification, pump addition, and substation upgrades to ship pentane by pipeline
- Facilites and equipment for butane off-loading at existing railcar propylene loading facility at north east property

1.2.2 Distribution and Marine Terminal Improvements

Vinvale Terminal (City of South Gate)

The improvements at the Vinvale terminal include piping and metering modifications for off-loading ethanol and new meters to ensure control of the system. Additionally, piping would be modified to allow for the delivery and blending of ethanol.

Carson Terminal (City of Carson)

The only modifications required at the Carson Terminal include piping and metering modifications for off-loading and blending of ethanol.

Colton Terminal (Unincorporated San Bernardino County)

The only modifications required at the Colton Terminal include piping and metering modifications for off-loading and blending of ethanol.

East Hynes Terminal (City of Long Beach)

Improvements planned for the East Hynes Terminal include new pumps for ethanol injection, piping and metering modifications for ethanol offloading, and conversion of existing hydrocarbon storage tanks into ethanol service. Refrigerated storage tanks or spheres for pentane storage and distribution may be constructed at this location. The pentane would be received at the East Hynes Terminal via an existing pipeline from the LAR. A new pump would be added to assist the transferring of pentane to the Marine Terminal 2 via existing pipelines for loading on ships. An alternative to transporting the pentane via ships would be to use the existing common carrier pipeline from Southern California to storage facilities in Arizona.

Hathaway Terminal (City of Signal Hill)

At the Hathaway Terminal piping, metering, and truck loading modifications will be required for handling ethanol. As with East Hynes, existing storage tanks will be converted into ethanol service.

Marine Terminal 2 (City of Long Beach)

Modifications at Marine Terminal 2 include converting existing tanks into ethanol service and pentane service as well as modifications to piping and metering.

Los Angeles basin Pipelines

Numerous pipelines already transporting hazardous liquids exist within the Los Angeles Basin. These pipelines will be used to transport ethanol to the terminals for distribution and blending, and pentanes from LAR to others for sale.

1.3 ANALYSIS SCOPE

The traffic analysis examines the impacts of adding construction project generated traffic to existing traffic on the surrounding arterial network.

The traffic analysis material presented here is set out as follows:

Chapter 2.0 - Project Setting
Chapter 3.0 - Traffic Impact Analysis
Chapter 4.0 - Mitigation Measures

1.4 DEFINITIONS

Certain terms used throughout this report are defined below to clarify their intended meaning:

ADT - Average Daily Traffic.

ICU - Intersection Capacity Utilization. A factor used to measure the volume to capacity ratio for an intersection and determine the level of service.

LOS - Level of Service. A scale used to evaluate circulation system performance based on intersection ICU values or volume/capacity ratios of arterial segments. The levels range from "A" to "F", with LOS "A" representing free flow traffic and LOS "F" representing severe traffic congestion.

Peak Hour - This typically refers to the hour during the AM peak period (typically 7 AM - 9 AM) or the PM peak period (typically 3 PM - 6 PM) in which the greatest number of vehicle trips are generated by a given land use or are travelling on a given roadway.

VPD - Vehicles per Day. This has the same meaning as ADT but is generally used in a trip generation context rather than in reference to the highway volume of an arterial segment.

VPH - Vehicles per Hour.

V/C - Volume to Capacity Ratio. This is typically described as a percentage of capacity utilized by existing or projected traffic on a segment of arterial or an intersection turn movement.

Chapter 2.0

PROJECT SETTING

This chapter describes the project site in relation to the transportation setting. The existing circulation system is discussed, and existing traffic volumes and levels of service are summarized.

2.1 SURROUNDING HIGHWAY NETWORK

Regional facilities in the vicinity of the projects are illustrated in Figure 2-1, and provide excellent accessibility to the entire southern California region. Four major freeways bound the refinery (LAR) project vicinity which is centrally located between two north-south freeways, the Harbor Freeway (Route 110) and the Long Beach Freeway (Route 710). The San Diego Freeway (Interstate 405) lies immediately north of the project site and runs diagonally through the region. The Redondo Beach Freeway (Route 91) lies further to the north of the site and runs east-west. The San Bernardino Freeway (Interstate 10) provides regional access to the Colton Terminal.

In addition to the freeway system, Pacific Coast Highway (Route 1) is immediately south of the refinery site, paralleling the Pacific coastline. Freeway interchanges to the regional arterial highway network provide access at regular intervals.

In addition to the vehicular system, the project locations are exceptionally well serviced by a network of railroad facilities. This system provides an alternative mode of transportation for the distribution of goods and materials. The area is served by the Southern Pacific, Union Pacific, Santa Fe, Pacific Electric, and Harbor Belt Line railroads, with several main lines occurring near the refinery.

Construction traffic generated by the proposed project at the refinery location will access the site via Gate 16 or Gate 62 located on 223rd Street with overflow to the Southwest Tank Farm.

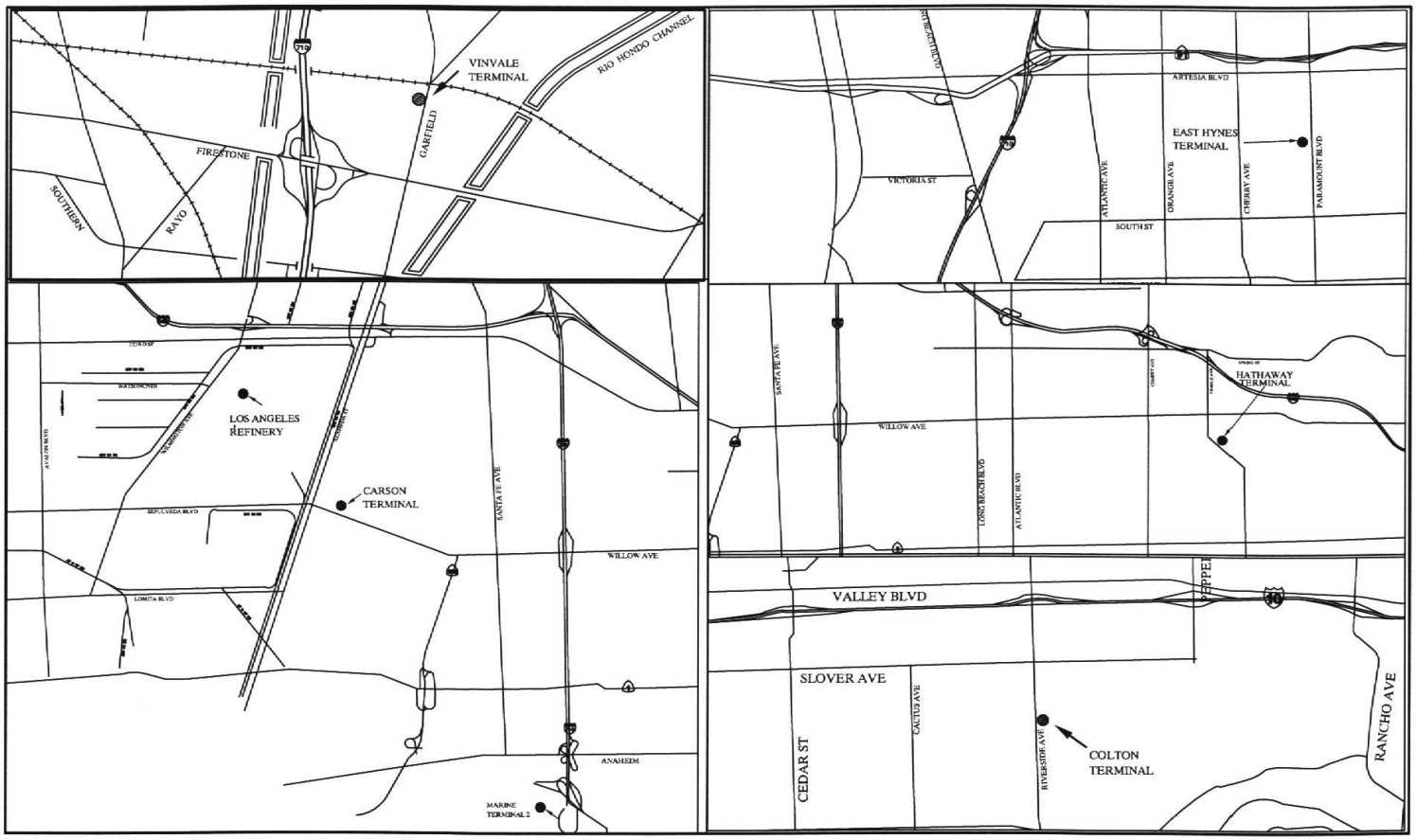

Figure 2-1

REGIONAL ACCESS VICINITY MAP

The anticipated construction traffic at the terminal locations is forecast to be small and will have impacts only during a short 2-3 month period. Access to these sites is available via direct access routes to regional roadway and freeway facilities. Intersections surrounding the various terminal locations have been included in this analysis. Impacts for the refinery site will be of a longer duration. Therefore this study more thoroughly addresses concerns regarding the impacts from construction traffic at the LAR.

2.2 EXISTING TRAFFIC CONDITIONS

The refinery is located at 1801 East Sepulveda Boulevard in the City of Carson, California less than one-quarter of a mile south of the San Diego Freeway (I-405). The irregularly shaped parcel that comprises the refinery is generally located between Wilmington Avenue on the west, 223rd Avenue on the north, Alameda Street on the east, and Sepulveda Boulevard on the south.

The following 27 intersections have been included in the traffic analysis:

1. Wilmington & I-405 NB on/off
2. Wilmington & I-405 SB on/off
3. Wilmington & 223rd Street
4. Wilmington & Watsoncntr
5. Wilmington & Sepulveda
6. Alameda & I-405 NB
7. Alameda & 223rd/Wardlow Access
8. Alameda & Sepulveda
9. I-405 SB on/off & 223rd/Wardlow
10. 223rd & Alameda/Wardlow access
11. Gate 16 & 223rd
12. Gate 62 & 223rd
13. Temple & Willow
14. Cherry & Willow
15. Cherry & I-405 EB Ramp
16. Cherry & I-405 WB Ramp
17. Temple & I-405 WB Ramp
18. I-710 NB off Ramps & Firestone
19. I-710 SB on Ramps & Firestone
20. Garfield & Firestone
21. I-710 on/off ramp & Pier B St
22. Riverside Dr & I-10 EB on/off ramp
23. Riverside Dr & I-10 WB on/off ramp
24. Riverside Dr & Slover Ave
25. Paramount & SR-91 EB Ramp
26. Paramount & SR-91 WB Ramp
27. Paramount & Artesia

Existing AM and PM peak hour turning movement volumes at these intersections were counted by Traffic Data Services, Inc. And are illustrated in Figures 2-2 through 2-5. Intersection capacity utilization (ICU) values are presented in Table 2-1 (actual ICU calculations are included in Appendix A) and are a means of representing peak hour volume/capacity ratios. The ICU is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity, then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic. Six intersections (Wilmington and I-405 SB on/off, I-710 NB ramp and Firestone, I-710 SB ramp and Firestone, Garfield and Firestone, Cherry and I-405 NB ramp and Paramount and Artesia) are presently operating at an unacceptable level of service during the AM or PM peak hour under existing conditions.

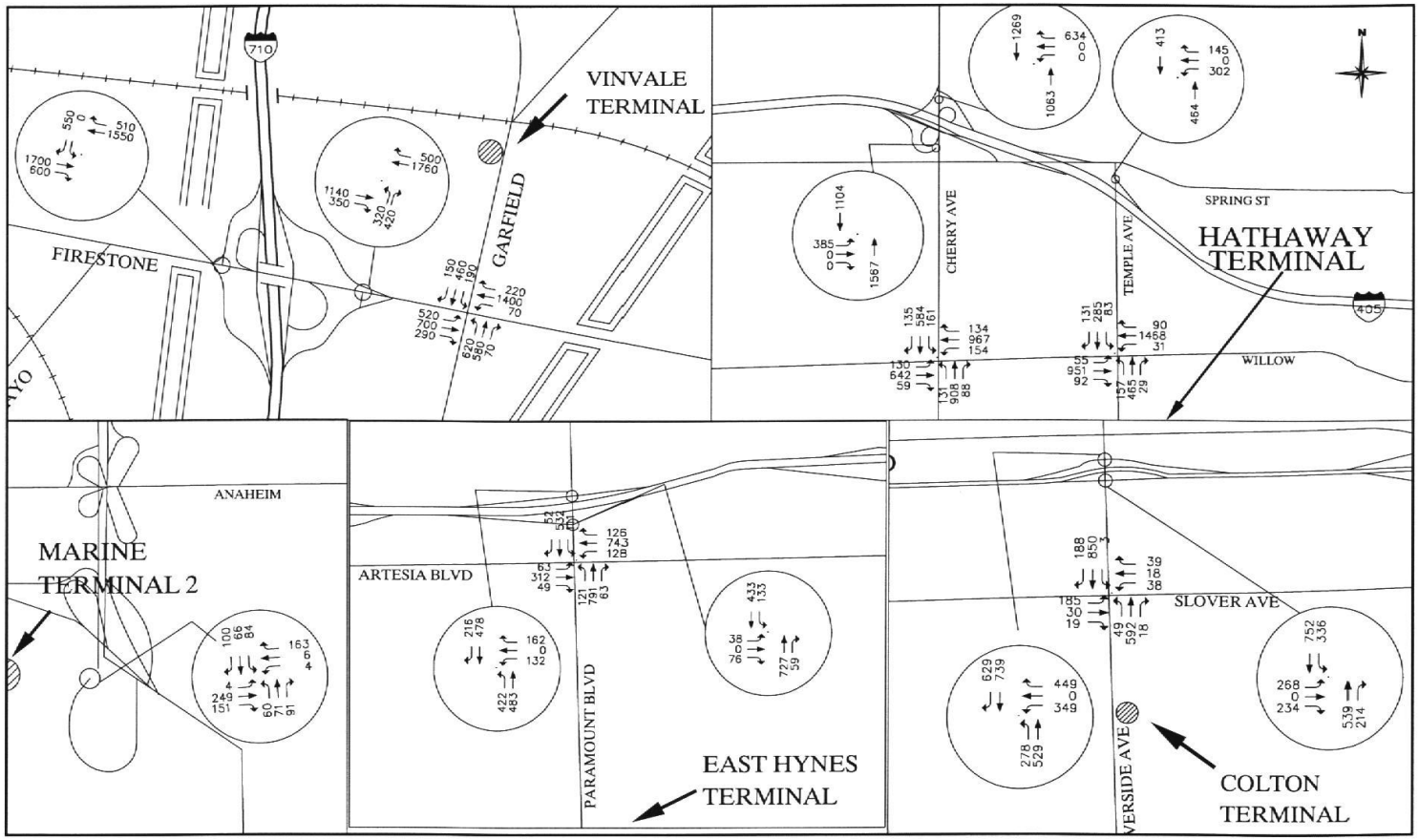

Figure 2-2

EXISTING AM
PEAK HOUR TURN VOLUMES

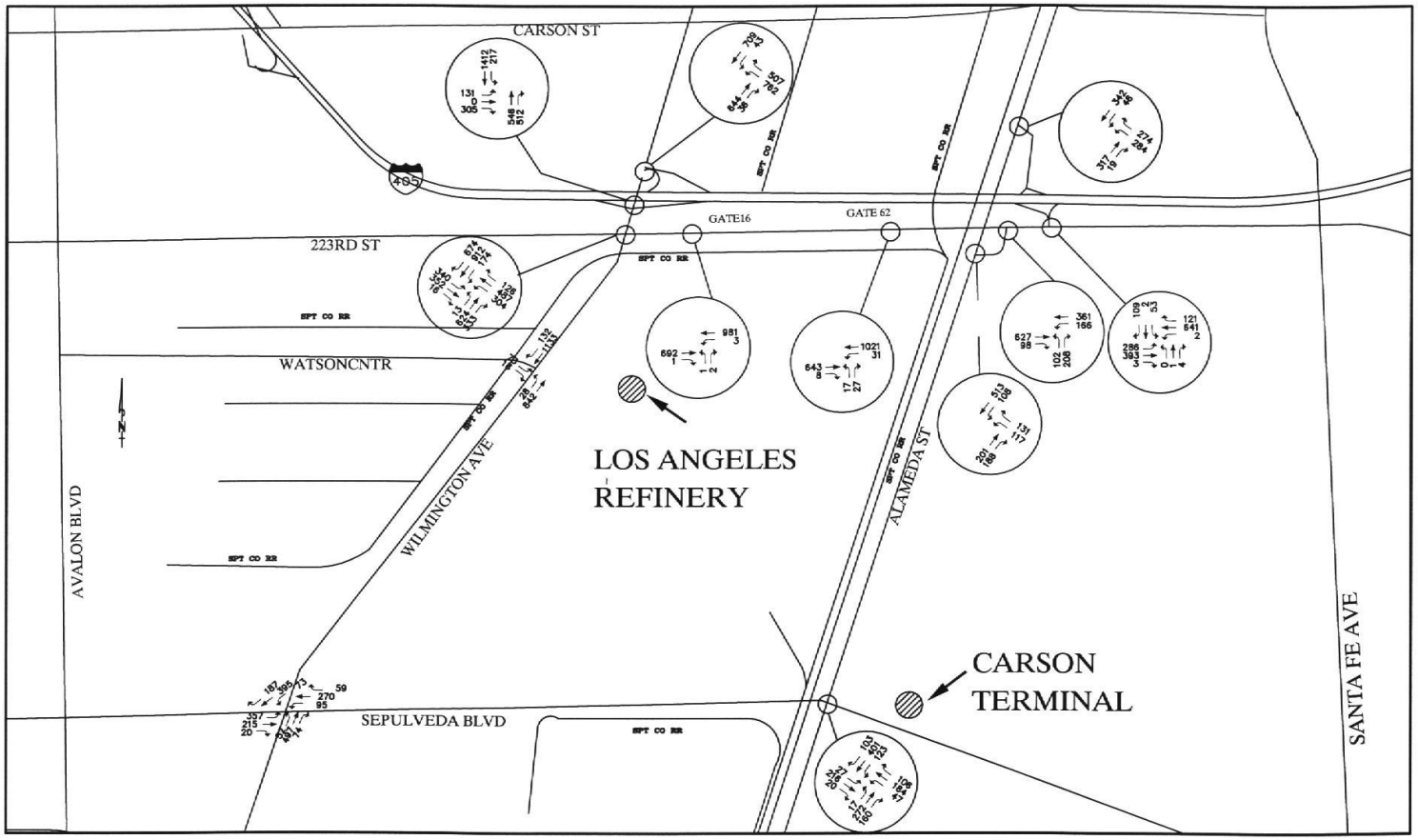

Figure 2-3

EXISTING AM
PEAK HOUR TURN VOLUMES (LAR)

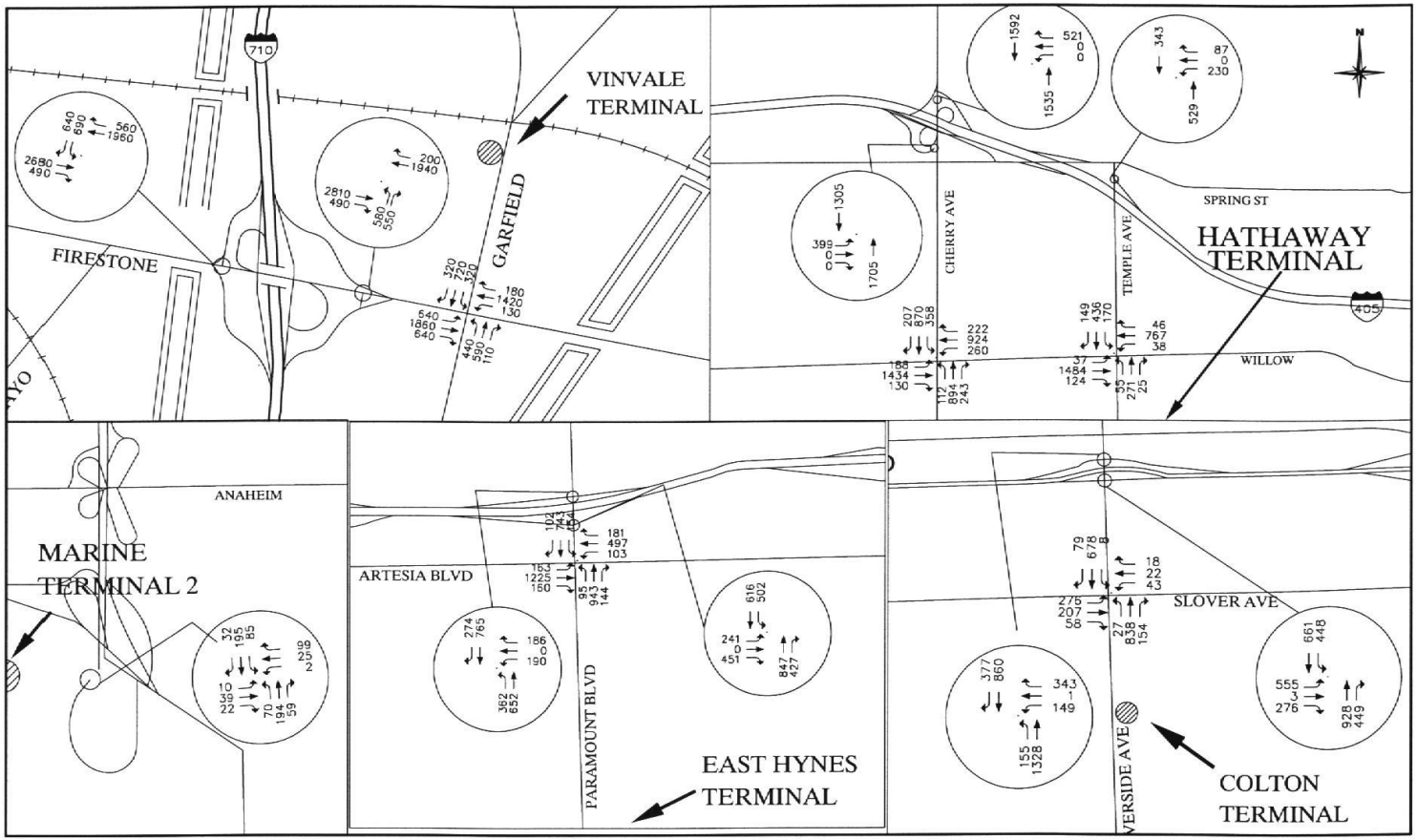

Figure 2-4

EXISTING PM
PEAK HOUR TURN VOLUMES

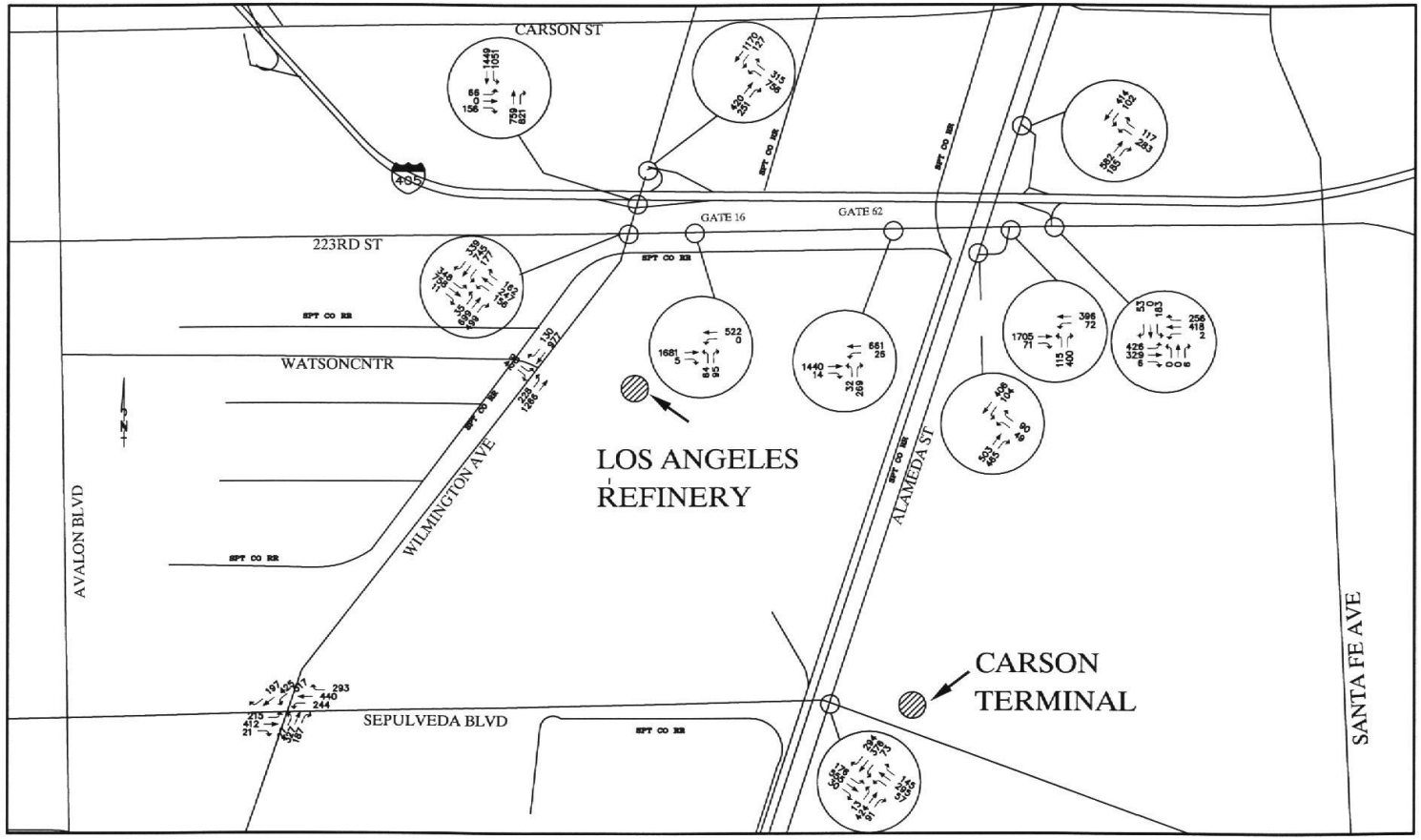

Figure 2-5

EXISTING PM
PEAK HOUR TURN VOLUMES (LAR)

Table 2-1
EXISTING LEVEL OF SERVICE SUMMARY

INTERSECTION	2000 EXISTING AM	PM
LAR and Carson Terminal		
1. Wilmington & I-405 NB on/off	.73	.67
2. Wilmington & I-405 SB on/off	.67	1.01 *
3. Wilmington & 223rd	.77	.79
4. Wilmington & Watson Center	.57	.68
5. Wilmington & Sepulveda	.63	.87
6. Alameda & I-405 NB	.41	.52
7. Alameda & 223/Wardlow Access	.31	.47
8. Alameda & Sepulveda	.51	.83
9. I-405 SB on/off & 223/Wardlow	.39	.49
10. 223rd & Alameda/Wardlow Access	.46	.82
11. Gate 16 & 223rd	.41	.73
12. Gate 62 & 223rd	.33	.72
Hathaway Terminal		
13. Temple & Willow	.68	.67
14. Cherry & Willow	.63	.83
15. Cherry & I-405 SB ramp	.69	.76
16. Cherry & I-405 NB ramp	.88	.91 *
17. Temple & I-405 NB ramp	.44	.41
Vinvale Termnal		
18. I-710 NB off ramp & Firestone	.63	1.03 *
19. I-710 SB on & Firestone	.63	1.00 *
20. Garfield & Firestone	.93*	1.00 *
LB Marine Terminal 2		
21. I-710 on/off ramp & Pier B St	.31	.32
Colton Terminal		
22. Riverside Dr & I-10 EB on/off ramp	.41	.53
23. Riverside Dr & I-10 WB on/off ramp	.79	.67
24. Riverside Dr & Slover Ave	.36	.45
East Hynes Terminal		
25. Paramount & SR-91 EB ramp	.43	.82
26. Paramount & SR-91 WB ramp	.59	.69
27. Paramount & Artesia	.70	.93 *

*Exceeds acceptable level of service

Level of service ranges: .00 - .69 B
.70 - .79 C
.80 - .84 D
.85 - .89 D+
.90 - .99 E
Above 1.00 F

Chapter 3.0
TRAFFIC IMPACT ANALYSIS

This chapter describes the potential impacts of the proposed development upon the surrounding arterial network. Traffic generated by development of the proposed project is added to the existing volumes presented in the previous chapter and the resulting capacity impacts are assessed.

3.1 TRIP GENERATION

As discussed in Chapter 1, the ARCO Los Angeles Refinery (LAR) is proposing to make changes to the configuration of the refinery by modifying existing process operating units, constructing and installing new equipment, and providing additional ancillary facilities. To meet the oxygenate requirements of the California Air Resources Board (CARB) requirements, ethanol will be blended into the gasoline. The ethanol will not be blended at the refinery, as with MTBE, but at distribution facilities. Therefore, modifications to five distribution and one marine terminal in Southern California will be required. The terminals are located in the cities of Carson, Long Beach, Signal Hill, South Gate, and an unincorporated portion of San Bernardino County near the City of Colton.

Construction of the proposed project at LAR is scheduled to begin January 2001 and be completed in December 2002. Construction is anticipated to take place four days per week, Monday through Thursday, from 6:00 a.m. to 5:00 p.m. Occasional night, Friday, or weekend shifts may be required to maintain the construction schedule.

The construction activities at the terminals will occur between January 2001 and be completed by December 2002. Actual construction time will vary at the terminal sites based on the types of construction and modifications required. The maximum duration for construction at an individual terminal will be twelve months. Construction activities will occur Monday through Thursday, from 6:00 a.m. to 5:00 p.m. Occasional night, Friday, or weekend shifts may be required

to maintain the construction schedule.

The following table summarizes the anticipated peak construction vehicles at the refinery and each terminal site.

CONSTRUCTION TRAFFIC SUMMARY

Location	Peak # Vehicles	Est Construction Time
Los Angeles Refinery (LAR)	350	24 months
Vinvale Terminal	10	2 months
Carson Terminal	5	2 months
Colton Terminal	5	2 months
East Hynes Terminal	5	3 months
Hathaway Terminal	10	2 months
Marine Terminal 2	45	12 months

An examination of this table indicates that the addition of construction workers will be relatively small at the terminal locations. At the refinery (LAR), the construction effort is anticipated to require a peak of 350 daily vehicles or 700 per day vehicles trips during the construction period.

Construction activities will occur during a four-day work week beginning at 6:00 AM until 5:00 PM Monday through Thursday. This results in an average construction project AM peak hour (6:00 AM to 7:00 AM) of 350 vehicle trips and an average PM peak hour (5:00 PM to 6:00 PM) of 350 vehicle trips. The AM peak hour of the adjacent street system occurs during the AM peak period of 7:00 AM to 9:00 AM as indicated in the Congestion Management Program (CMP) Guidelines. Traffic attributable to the construction of the project will arrive at the site before the AM peak period would begin and will not affect the AM peak hour ICU values. Therefore, the analysis examines impacts from traffic attributable to the proposed project only during the PM peak hour.

3.2 TRIP DISTRIBUTION

Distribution of project generated traffic was derived from observation of existing travel patterns in the vicinity of the project sites. An increase in vehicular movements will occur at the various project sites during the construction period. The anticipated construction traffic at the terminal locations is considered less than significant, ranging from a low of 5 vehicles to a high of 40 vehicles over a two to three month period. However, construction traffic at the refinery is forecast to peak at 350 vehicles. Hence, this analysis is focused on impacts at locations surrounding the refinery (LAR).

Impacts from project construction traffic at the LAR were analyzed using the two parking locations at Gate 16 and Gate 62. It is expected that most of the construction personnel would commute to the site in private automobiles even though ARCO would encourage construction contractor's employees to organize carpools. Construction commuters would enter the construction parking lots from 223rd Street at Gate 16 or Gate 62. Construction commuters would not enter through the Main Gate from Sepulveda Boulevard or Gate 7 from Wilmington Avenue.

Materials required to support the construction effort would be delivered to the refinery by truck and rail. Peak truck and rail usage would correspond to the peak manpower periods. Construction materials, heavy construction equipment, piping, and new equipment would be delivered throughout the construction period. All truck deliveries would be made through Gate 60. Railroad cars carrying heavy equipment would enter the project site from a rail line along Alameda Street.

To estimate the project-related traffic volumes at various points on the transportation system adjacent to the refinery and thereby establish the magnitude and extent of traffic impacts, a three-step process was utilized. First, the amount of traffic which would be generated during construction was determined. Second, the construction traffic was geographically distributed to appropriate residential, commercial, and industrial areas. Finally, the trips were assigned to specific roadways and the traffic increases were evaluated on a route-by-route basis.

The average daily truck traffic at the refinery during construction would be approximately 7 trucks per day. Since these would mainly consist of material deliveries, they would be spread throughout the work day with few deliveries occurring during the peak hour. Therefore, their contribution to overall traffic impacts would be negligible. As a conservative or "worst case" analysis, the maximum expected employees at the construction site was assumed to occur daily.

3.3 2000/EXISTING PLUS PROJECT TRAFFIC IMPACTS

The ARCO MTBE Phase Out Project would generate short-term impacts on traffic and circulation in the project vicinity during the construction period. The project would temporarily affect the present pattern of circulation of the labor force as well as rail and truck traffic associated with the construction and operation phases of the project.

Construction traffic related to the project would utilize existing parking areas at the refinery during construction. It would not affect the existing refinery facilities or the shipping and receiving facilities at the project site.

Roadways in the vicinity of the project would be impacted by the project's construction-related traffic. Project related construction traffic would contribute less than two percent of the daily traffic volume on these roadways.

To more carefully assess the impacts on the surrounding roadways, an intersection capacity utilization (ICU) analysis was conducted for the 27 intersections which would be most directly impacted by project construction traffic.

Analysis year-plus-project intersection volumes for the project were generated by adding the project intersection volumes to the existing Year 2000 background intersection volumes. PM peak hour 2000-plus-project turn volumes are illustrated in Figures 3-1 and 3-2, and corresponding ICUs based on existing lane configurations are summarized in Table 3-1 (actual ICU calculations are included in Appendix A). An examination of Table 4.6-1 indicates that the addition of construction traffic to existing intersection volumes does cause a .01 to .06 change in the ICU at some intersection locations around the LAR and the terminals. The additional construction traffic does not result in a significant impact as the level of service at these intersections will remain above LOS E or F.

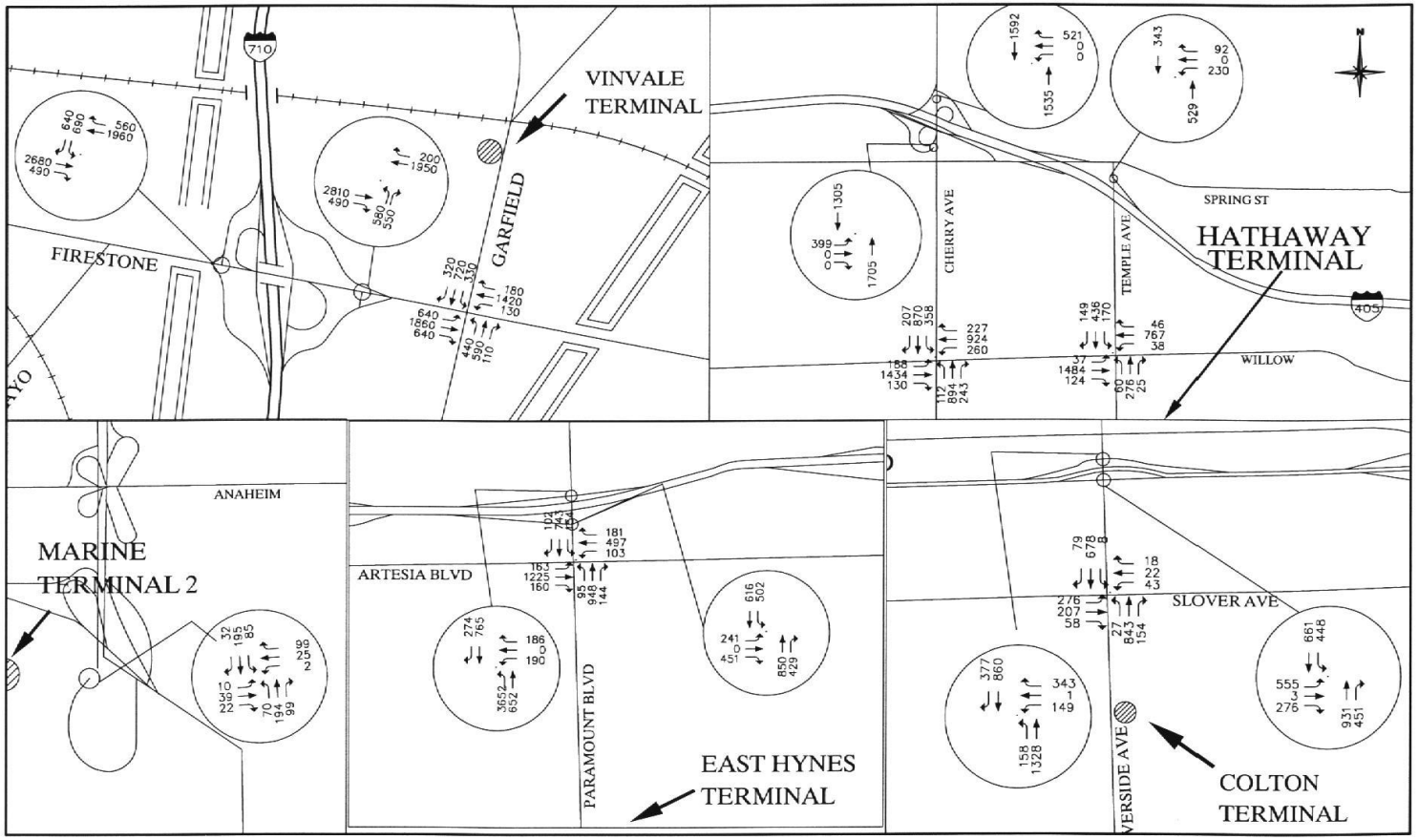

Figure 3-1

EXISTING+PROJECT PM
PEAK HOUR TURN VOLUMES

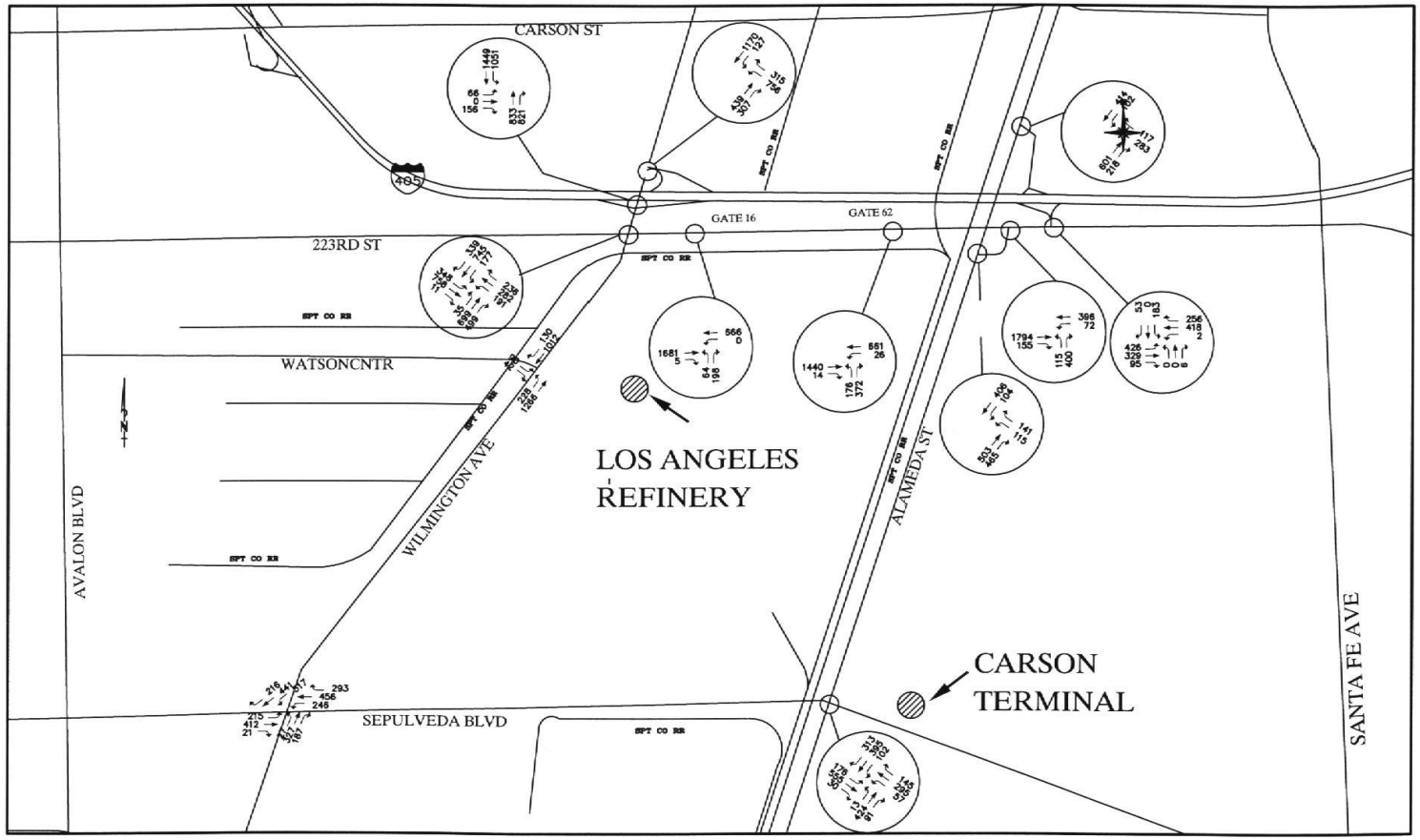

Figure 3-2

EXISTING+PROJECT PM
PEAK HOUR TURN VOLUMES (LAR)

Table 3-1
EXISTING+ PROJECT LEVEL OF SERVICE SUMMARY

INTERSECTION	(2000) EXISTING PM	EXISTNG+ PROJECT PM	% CHG
LAR and Carson Terminal			
1. Wilmington & I-405 NB on/off	.67	.67	-NC-
2. Wilmington & I-405 SB on/off	1.01	1.01	-NC-
3. Wilmington & 223rd	.79	.79	-NC-
4. Wilmington & Watson Center	.68	.69	.01
5. Wilmington & Sepulveda	.87	.87	-NC-
6. Alameda & I-405 NB	.52	.53	.01
7. Alameda & 223/Wardlow Access	.47	.48	.01
8. Alameda & Sepulveda	.83	.84	.01
9. I-405 SB on/off & 223/Wardlow	.49	.49	-NC-
10. 223rd & Alameda/Wardlow Access	.82	.85	.03
11. Gate 16 & 223rd	.73	.79	.06
12. Gate 62 & 223rd	.72	.78	.06
Hathaway Terminal			
13. Temple & Willow	.67	.68	.01
14. Cherry & Willow	.83	.83	-NC-
15. Cherry & I-405 SB ramp	.76	.76	-NC-
16. Cherry & I-405 NB ramp	.91	.91	-NC-
17. Temple & I-405 NB ramp	.41	.41	-NC-
Vinvale Terminal			
18. I-710 NB off ramp & Firestone	1.03	1.03	-NC-
19. I-710 SB on & Firestone	1.00	1.00	-NC-
20. Garfield & Firestone	1.00	1.00	-NC-
LB Marine Terminal 2			
21. I-710 on/off ramp & Pier B St	.32	.34	.02
Colton Terminal			
22. Riverside Dr & I-10 EB on/off ramp	.53	.54	.01
23. Riverside Dr & I-10 WB on/off ramp	.67	.67	-NC-
24. Riverside Dr & Slover Ave	.45	.45	-NC-
East Hynes Terminal			
25. Paramount & SR-91 EB ramp	.82	.83	.01
26. Paramount & SR-91 WB ramp	.69	.69	-NC-
27. Paramount & Artesia	.93	.94	.01

NC= No Change

Level of service ranges: .00 - .69 B
.70 - .79 C
.80 - .84 D
.85 - .89 D+
.90 - .99 E
Above 1.00 F

3.5 ON-SITE CIRCULATION AND PARKING

Sufficient on-site parking is available to accommodate the increased parking demand from construction workers at the five distribution terminals and one Marine terminal. The physical site of the refinery provides parking capacity well beyond the current operational requirements. The main parking lot at Gate 7 has 550 parking spaces. Several smaller parking lots are located within the ARCO property; these lots have a combined capacity of 400 vehicles. The contractor parking lot at Gate 62 has a capacity of approximately 1,300 vehicles for contractor employee use only. The facility currently employs approximately 1100 people. A weekday shift of 780 employees operates during typical daylight hours. The swing shift of 115 employees are present during each shift. On any given day, approximately 25 percent of the employees are not on the premises because of rotating shifts, vacations, and sick leave.

Excess off-street parking currently available at the project site would be sufficient to meet the demand by the labor force during peak construction periods. Approximately 1,300 parking spaces are available for construction contractors at 2000 East 223rd Street via Gate 62. Additional parking is available at the southwest tank farm area. The total number of parking spaces exceeds the maximum number of construction workers to allow for fluctuations in manpower and to provide ample maneuvering space for heavy trucks.

No new parking facilities would be needed to accommodate the new permanent employees hired to operate the new process units. The largest existing shift includes 780 employees at present, 25 percent of whom are usually not present because of sick leave, vacation, and rotating shifts. The main parking lots include 550 spaces. In addition to the 550 spaces, the project site has 400 parking spaces at the operational offices, maintenance offices, and administrative offices. Because of significant carpooling efforts by ARCO, the average occupancy of worker vehicles is 1.3 employees per car. The addition of 10 employees during the largest shift would not overburden the existing parking facilities at LAR. The addition of 10 employees or less at the terminals will not overburden the existing parking facilities at these locations.

Chapter 4.0

MITIGATION MEASURES

This chapter addresses the capacity deficiencies identified in the project impact analysis presented in the previous chapter.

Project construction traffic does not significantly change the ICU values at the study locations, therefore no mitigation is required because of project impacts.

No mitigation measures are proposed for the small increase in truck traffic to and from the refineries related to the transportation of methanol and materials required for blending with the refined gasoline.

Adequate off-street parking inside the refinery and at the terminals will be provided to accommodate the peak construction and operating labor force after completion of the project.

The entry point to the refinery for construction, commuter and delivery vehicles minimizes impacts on traffic and circulation patterns on the street system near the refinery, and maintains access for pedestrians, bicyclists, and motor vehicle traffic.

Scheduling of truck operations will disperse deliveries throughout the off-peak hours to minimize peak hour traffic impacts.

If required, truck operations for the delivery of over-size equipment and materials will be conducted to the maximum extent possible during off-peak hours to minimize traffic impacts. Deliveries of large or odd size materials and equipment will be shipped into the refinery over existing railroad lines.

APPENDIX A

INTERSECTION CAPACITY UTILIZATION