TRAFFIC
STUDY
PM 30903

CITY OF LA QUINTA TARGET DEVELOPMENT
TRAFFIC IMPACT ANALYSIS
LA QUINTA, CALIFORNIA

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PM 30903

CITY OF LA QUINTA TARGET DEVELOPMENT TRAFFIC IMPACT ANALYSIS

La Quinta, California

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TRAFFIC IMPACT ANALYSIS
LA QUINTA, CALIFORNIA

1.0 INTRODUCTION AND SUMMARY

A. Purpose of Report and Study Objectives

The purpose of this traffic impact analysis is to evaluate the La Quinta Target development from a traffic circulation standpoint. The project site is located within the City of La Quinta.

Study objectives include (1) documentation of existing traffic conditions in the vicinity of the site, (2) evaluation of traffic conditions for the year of opening of the proposed project, and (3) determination of on-site and off-site improvements and system management actions needed to achieve the City of La Quinta level of service requirements.

B. Executive Summary

1. Site Location and Study Area

The project site is located east of Washington Street between State Highway III and 47th Avenue in the City of La Quinta. Exhibit 1-A illustrates the traffic analysis study area.

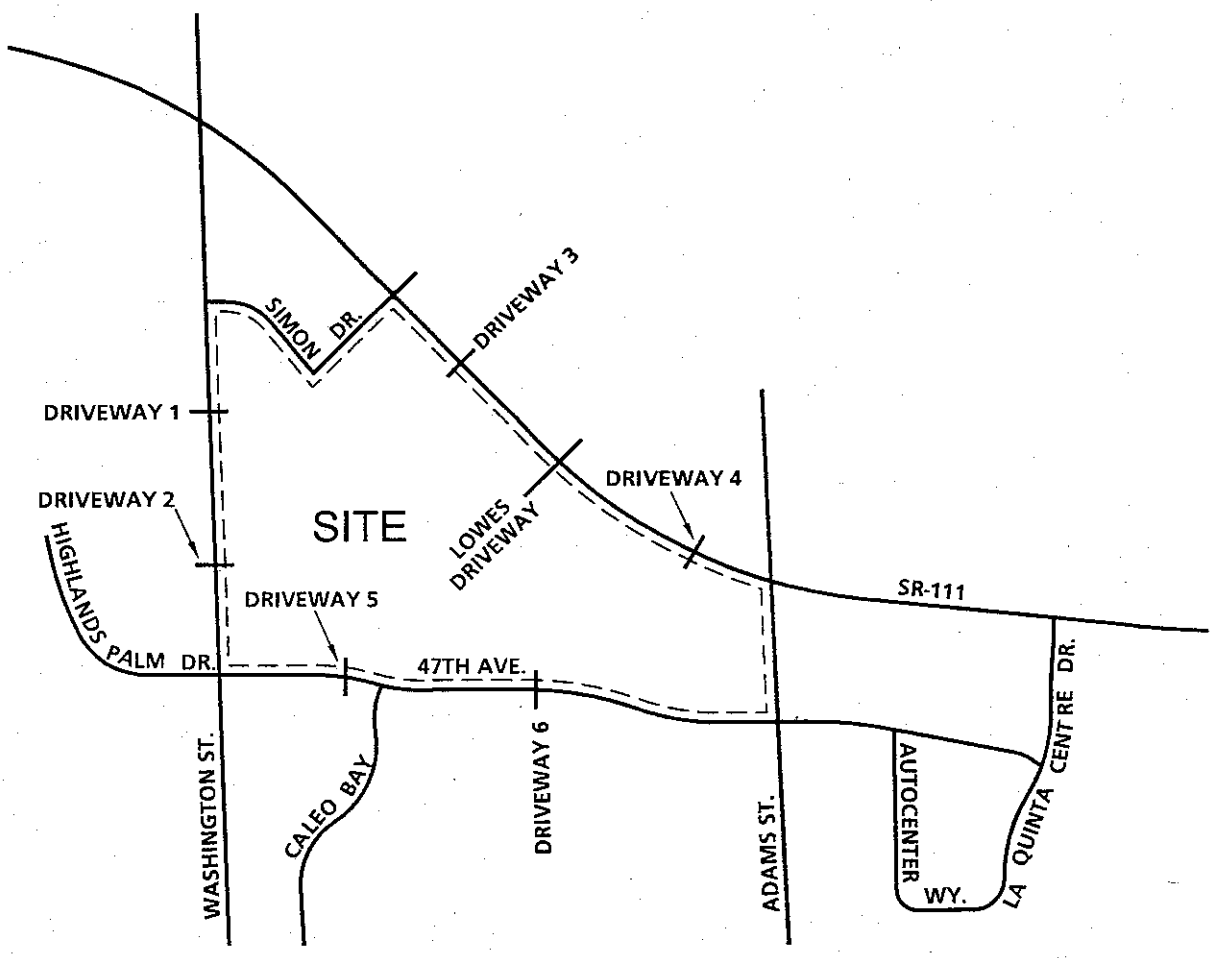
Pursuant to discussions with City of La Quinta staff, the study area includes the following intersections:

Washington Street (NS) at:

- Highway III (EW)

EXHIBIT 1-A

LOCATION MAP



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- Simon Drive (EW)
- 47th Avenue (EW)

Simon Drive (NS) at:

- Highway III (EW)

Lowe's Driveway (NS) at:

- Highway III (EW)

Adams Street (NS) at:

- Highway III (EW)
- 47th Avenue (EW)

2. Development Description

The proposed project would consist of developing a 508,000 square foot shopping facility within the existing Lowes development.

3. Principal Findings

a. Required Level of Service (LOS): The definition of an intersection deficiency has been obtained from the City of La Quinta General Plan. The City of La Quinta General Plan states that peak hour intersection operations of LOS "D" or better are generally acceptable. Therefore, any intersection operating at LOS "E" or "F" will be considered deficient.

b. Existing Level of Service: For existing conditions, the following intersections are operating at an unacceptable Level of Service:

Washington Street (NS) at:

- SR-111 (EW)

Adams Street (NS) at:

- 47th Avenue (EW)

Lane improvements are currently under construction at the Washington Street/SR-111 intersection.

c. Opening Year Level of Service: For Opening Year with project traffic conditions, the study area intersections are projected to operate at Level of Service "D" or better during the peak hours, with improvements already under construction or otherwise identified in this analysis (see Table 5-2).

4. Conclusions

The proposed development is projected to generate a net total of approximately 14,539 trip-ends per day with 316 vehicles per hour during the AM peak hour and 1,375 vehicles per hour during the PM peak hour. However, twenty-five percent of the trips entering and exiting the site are anticipated to be "pass-by" trips. These "pass-by" trips are defined as an intermediate stop on the way to a primary destination (see Appendix "C").

A traffic signal is warranted for the following intersection for Opening Year without project conditions:

Adams Street (NS) at:

- 47th Avenue (EW)

For Opening Year without project conditions, the following improvements at the intersection of Washington Street and Highway 111 were included in our calculations to reflect current construction activity at the intersection:

- Additional northbound thru lane
- Additional northbound free right turn lane

In addition to these improvements, a signal modification is needed to convert the signal phasing in the north-south direction from split phasing to protected left turn phasing.

For Opening Year with project conditions, the following additional improvement at the intersection of Washington Street and Highway 111 is needed:

- Modification of the traffic signal operation to provide a right turn overlap phase.

5. Recommendations

Site-specific circulation and access recommendations are depicted on Exhibit 7-A.

Sight distance at the project entrance should be reviewed with respect to standard CALTRANS/City of La Quinta sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

Traffic signing/striping should be implemented in conjunction with detailed construction plans for the project site.

Adequate on-site parking should be provided to meet City of La Quinta parking requirements.

The project should contribute towards a citywide roadway and traffic signal improvement program, as a result of infrastructure development fees for the City of La Quinta. These fees, if required, would be paid at the building permit stage of development.

Construct Washington Street from Simon Drive to 47th Street at its ultimate half-section width as an augmented major arterial.

Construct Adams Street from Highway 111 to 47th Street at its ultimate half-section width as a secondary arterial in conjunction with the development.

Construct Highway 111 from Simon Drive to Adams Street at its ultimate half-section width as a special class of major arterial with a right-of-way requirement of 172 feet established by CALTRANS.

Construct 47th Street from Washington Street to Adams Street at its ultimate half-section width as a collector in conjunction with development.

The following project driveways on Highway 111 shall be restricted to right turns only:

- Driveway 1
- Driveway 4

Provide full access to driveways 5 and 6 on 47th Street.

Driveway 2 shall be restricted to right turns in/out and left turns in only (no left turns out).

Construct a 150 foot left turn in pocket length for driveway 2 on Washington Street.

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2.0 PROPOSED DEVELOPMENT

A. Location

The project site is located east of Washington Street between State Highway 111 and 47th Avenue in the City of La Quinta.

B. Land Use and Intensity

The proposed project would consist of developing a 508,000 square foot shopping facility within the existing Lowe's development.

C. Site Plan

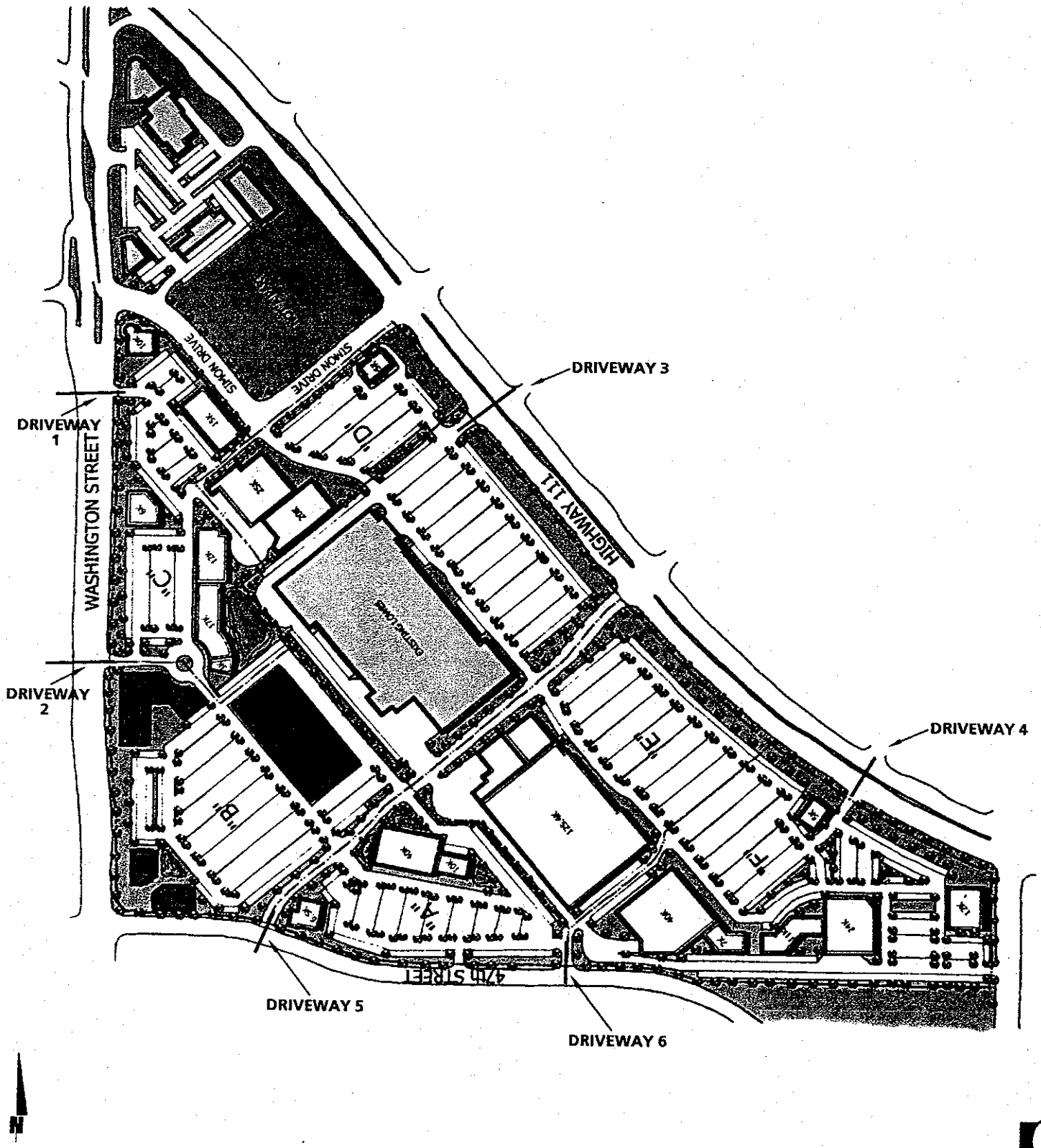
Exhibit 2-A illustrates the project site plan.

D. Phasing and Timing

The proposed project is anticipated for opening in Year 2004. This traffic analysis is based upon two years of background traffic growth (2004).

EXHIBIT 2-A

SITE PLAN



3.0 AREA CONDITIONS

A. Study Area

1. Area of Significant Traffic Impact

Pursuant to discussions with City of La Quinta staff, the study area includes the following intersections:

Washington Street (NS) at:

- Highway 111 (EW)
- Simon Drive (EW)
- 47th Avenue (EW)

Simon Drive (NS) at:

- Highway 111 (EW)

Lowe's Driveway (NS) at:

- Highway 111 (EW)

Adams Street (NS) at:

- Highway 111 (EW)
- 47th Avenue (EW)

B. Study Area Land Use

1. Existing Land Uses

Currently, the site is partially developed with an existing Lowe's Home Improvement store and traffic is currently being generated from the project. Adjacent uses include the following:

North – Commercial/Restaurant
South – Residential
East – Commercial
West – Commercial

2. Approved Future Development

Areawide growth calculations and traffic from cumulative projects were added to existing volumes in the vicinity of the site for Opening Year traffic conditions.

C. Site Accessibility

1. Area Roadway System

Exhibit 3-A identifies the existing roadway conditions for study area roadways. The number of through traffic lanes for existing roadways and the existing intersection controls are identified.

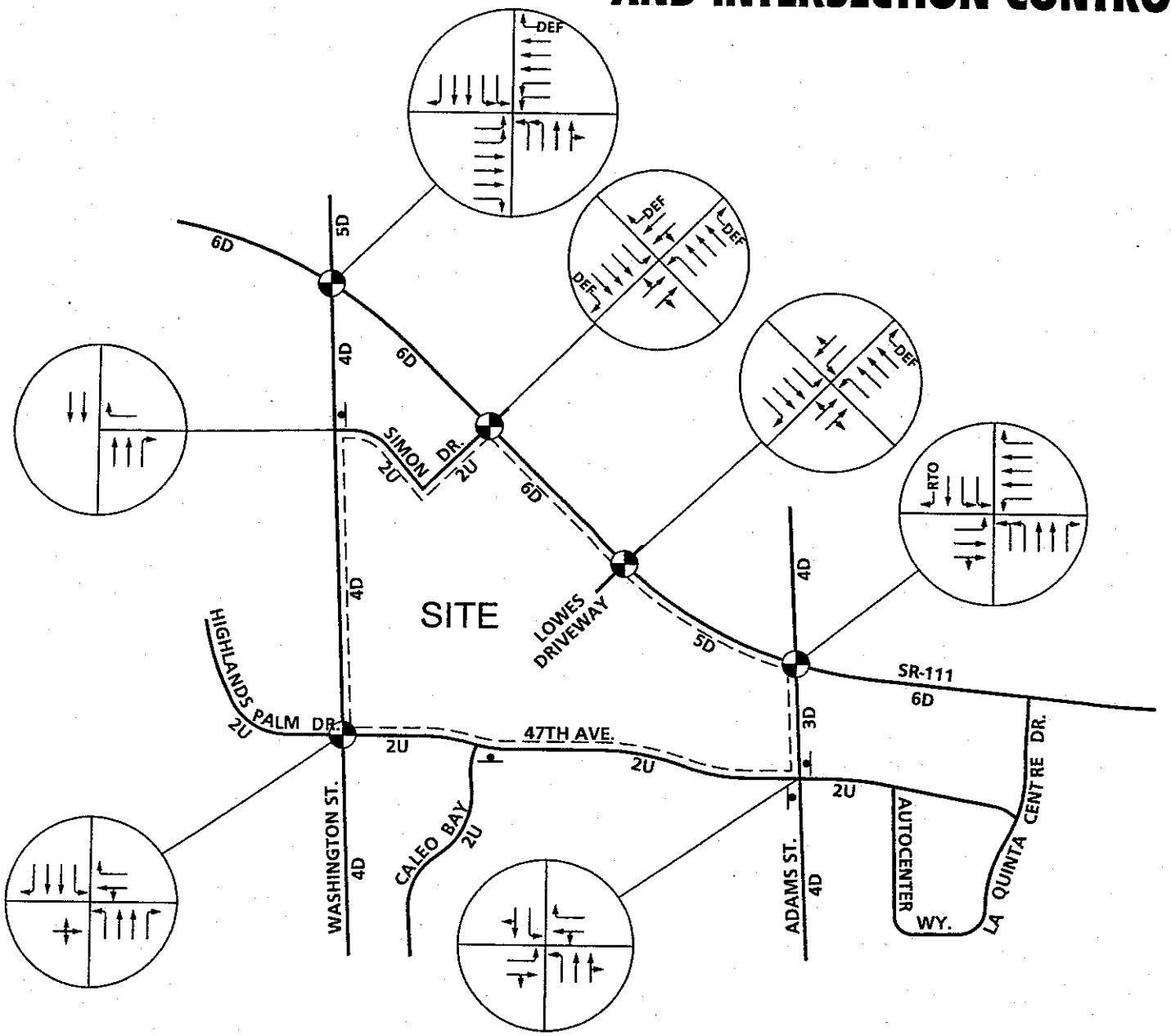
The City of La Quinta General Plan Circulation Element is depicted on Exhibit 3-B. Exhibit 3-C illustrates the City of La Quinta General Plan roadway cross-sections.

2. Traffic Volumes and Conditions

Existing average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-D. Existing ADT volumes are based upon traffic data factored up from peak hour counts conducted by Urban Crossroads, Inc., using the following formula for each intersection leg:

EXHIBIT 3-A

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



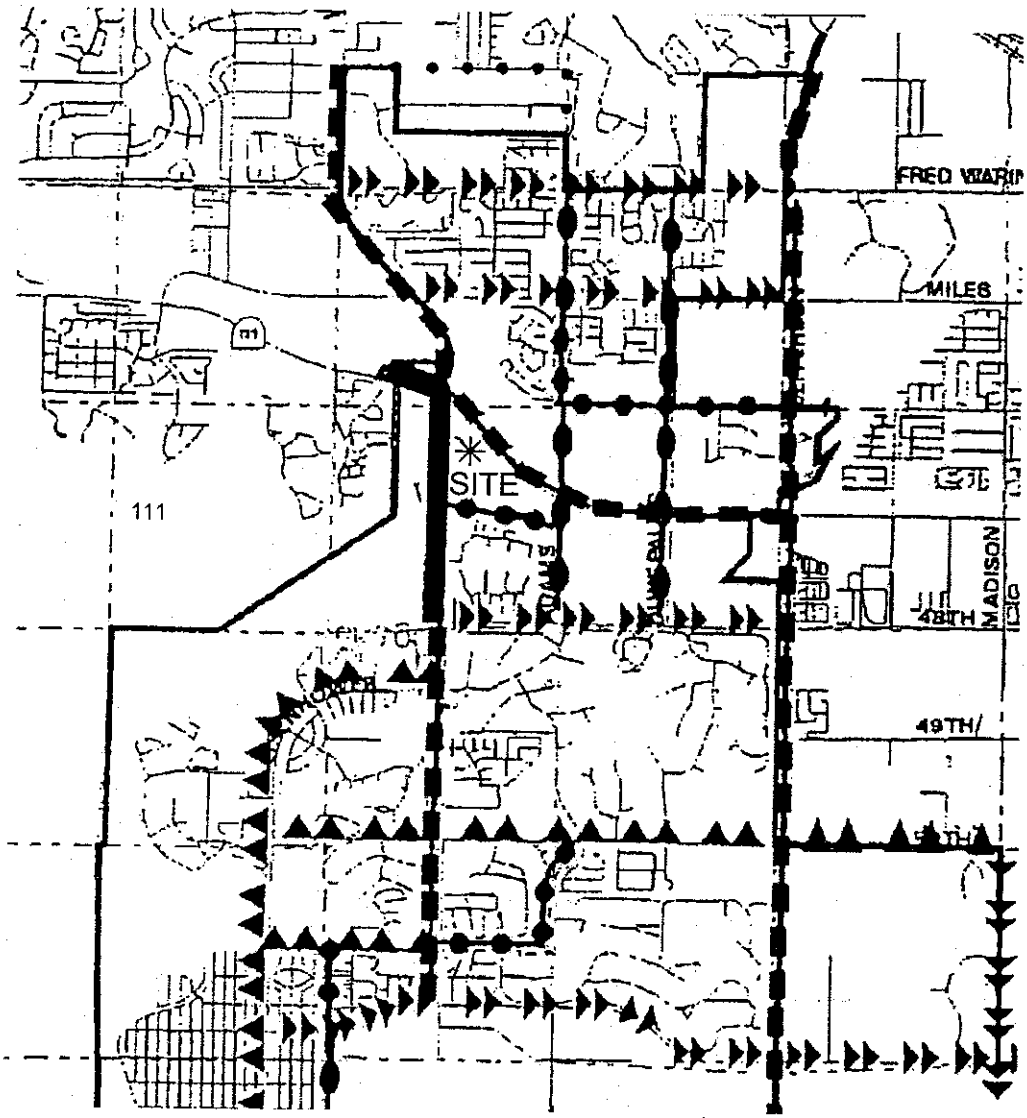
LEGEND:

- = TRAFFIC SIGNAL
- = STOP SIGN
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- RTO = RIGHT TURN OVERLAP PHASE
- DEF = DEFACTO RIGHT TURN LANE

N

EXHIBIT 3-B

CITY OF LA QUINTA
GENERAL PLAN CIRCULATION ELEMENT



CITY ROADWAY CLASSIFICATIONS

●	Freeway Interchanges	▲▲ ▲▲ ▲▲	Primary Arterial - B (4D)
▬	Augmented Major (8D)	●—●—●	Secondary Arterial (4U)
▬ ▬ ▬	Major Arterial (6D)	◆—◆—◆	Modified Secondary (2D)
▸▸ ▸▸ ▸▸	Primary Arterial - A (4D)	●—●—●—●	Collector (2U)

N

EXHIBIT 3-C

CITY OF LA QUINTA
GENERAL PLAN ROADWAY CROSS-SECTIONS

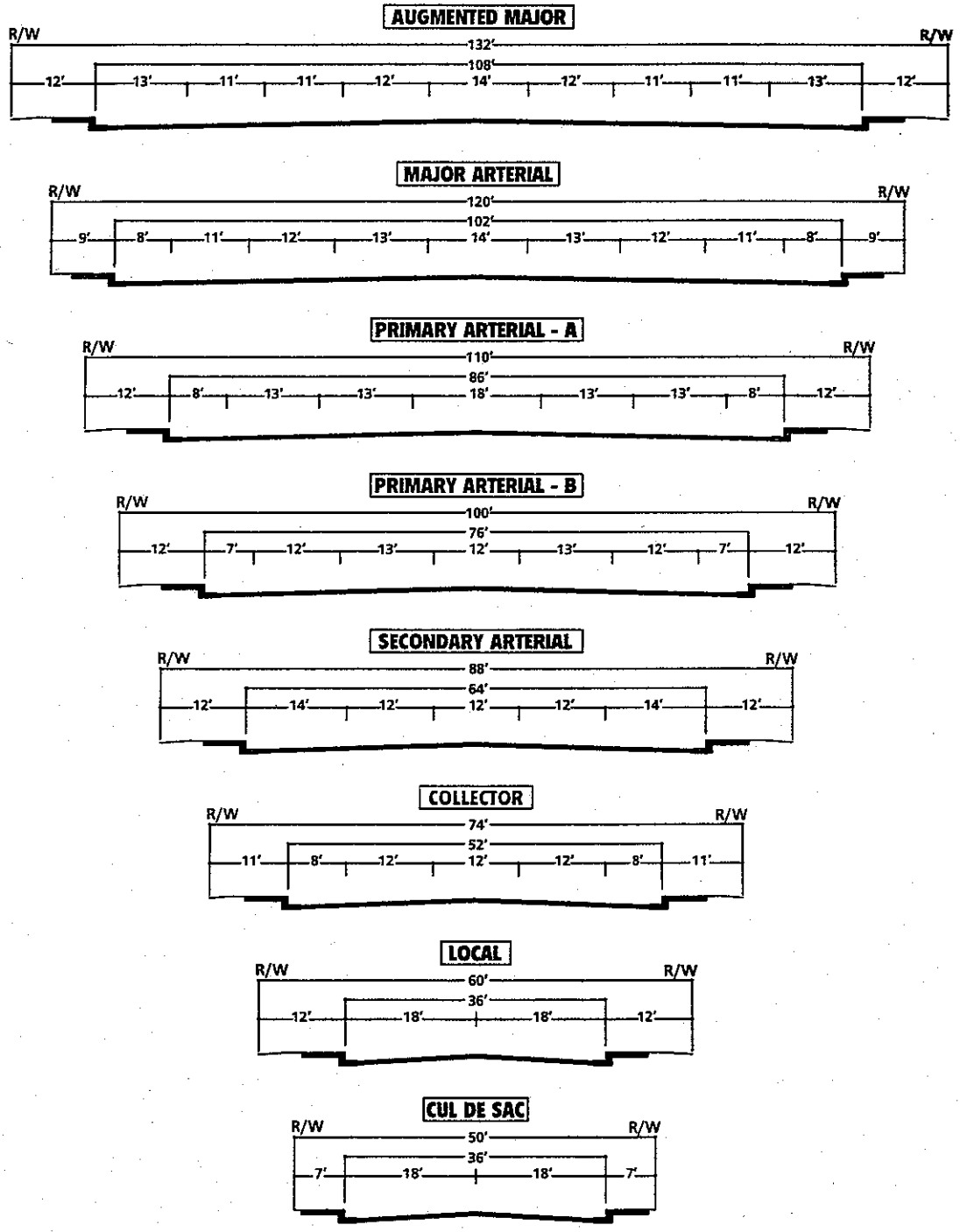
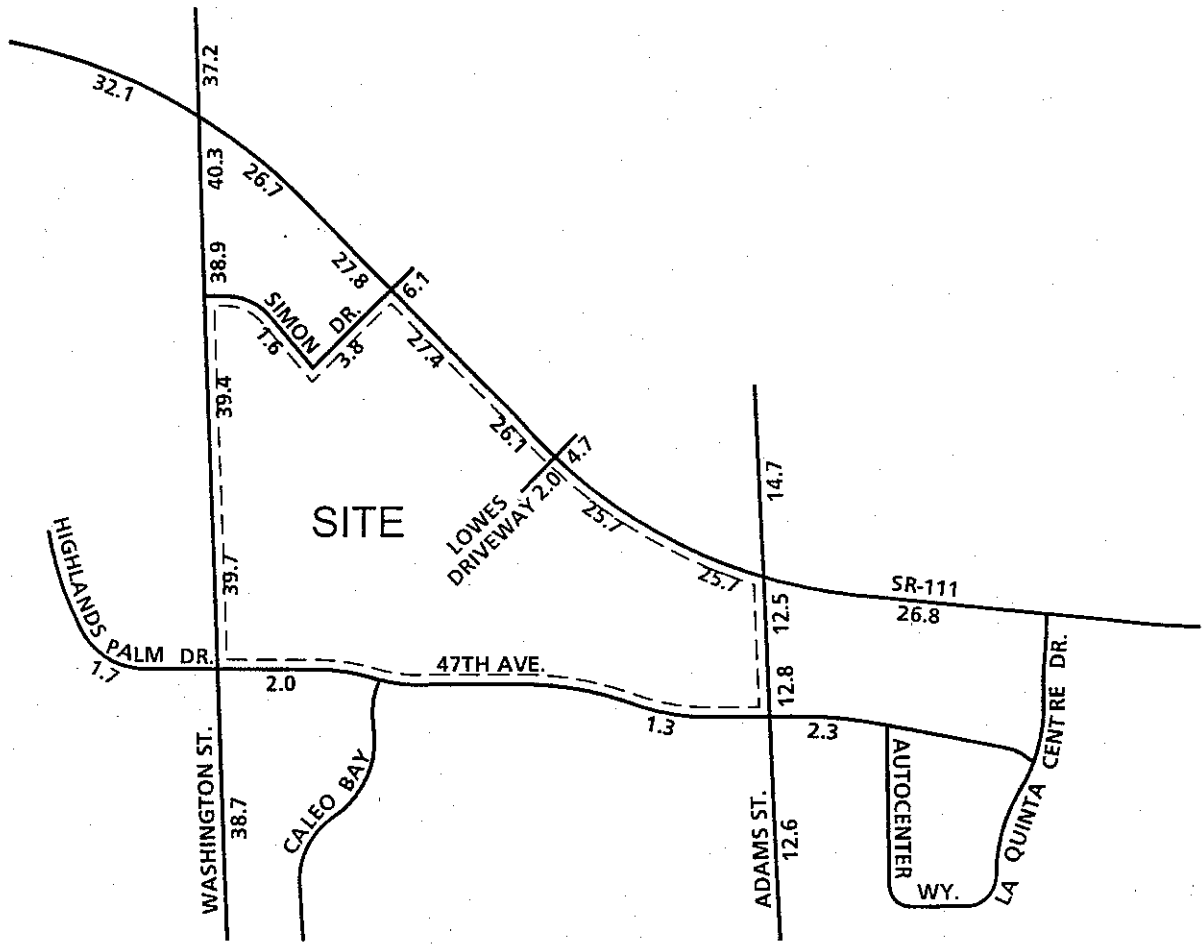


EXHIBIT 3-D

EXISTING AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)

N

PM Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume.

The current technical guide to the evaluation of traffic operations is the 2000 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209). The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are determined using the HCM methodology.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at signalized study intersections have been evaluated using an HCM intersection analysis program.

The study area intersections which are stop sign controlled with stop control on the minor street only have been analyzed using the unsignalized intersection methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street. Using data collected

describing the intersection configuration and traffic volumes at the study area locations, the level of service has been calculated. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movements.

The levels of service are defined for the various analysis methodologies as follows:

LEVEL OF SERVICE	AVERAGE TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	0 to 10.00	0 to 10.00
B	10.01 to 20.00	10.01 to 15.00
C	20.01 to 35.00	15.01 to 25.00
D	35.01 to 55.00	25.01 to 35.00
E	55.01 to 80.00	35.01 to 50.00
F	80.01 and up	50.01 and up

The LOS analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of three seconds per phase in accordance with HCM recommended default values. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate times for pedestrian crossings have also been considered in the signalized intersection analysis. Saturation flow rates of 1,900 vehicles per hour of green (vphg) have been assumed for all capacity analysis.

Existing peak hour traffic operations have been evaluated for study area intersections. The results of this analysis are summarized in Table 3-1,

TABLE 3-1

INTERSECTION ANALYSIS FOR EXISTING CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Washington St. (NS) at:																	
• SR-111 (EW)	TS	2	2	0	2	2	1	2	3	1	2	3	1	35.5	–[4]	D	F
• Simon Dr. (EW)	CSS	0	2	1	0	2	0	0	0	0	0	0	1	17.8	14.6	C	B
• 47th Ave. (EW)	TS	1	2	1	1	2	1	0	1	0	0.5	0.5	1	38.8	45.3	D	D
Simon Dr. (NS) at:																	
• SR-111 (EW)	TS	0.5	1.5	0	0.5	1.5	1	1	3	1	1	3	1	13.3	14.1	B	B
Lowe's Dwy. (NS) at:																	
• SR-111 (EW)	TS	0.5	1.5	0	1	1	0	1	2	1	1	3	1	11.5	14.1	B	B
Adams St. (NS) at:																	
• SR-111 (EW)	TS	2	2	1	2	1	1>	1	2	0	1	3	1	21.1	39.0	C	D
• 47th Ave.(EW)	CSS	1	2	0	1	1	0	1	1	0	0.5	0.5	1	29.0	35.2	D	E

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; >> = Free Right Turn; > = Right Turn Overlap;

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.5.1015 (2000). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal
CSS = Cross Street Stop

[4] – = Delay High, Intersection Unstable, Level of Service "F"

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along with the existing intersection geometrics and traffic control devices at each analysis location. Existing intersection level of service calculations are based upon manual AM and PM peak hour turning movement counts made for Urban Crossroads, Inc. in June, 2002 (see Exhibits 3-E and 3-F). The existing traffic counts were multiplied by 1.25 to reflect an additional peak seasonal difference of 25 percent. Traffic count worksheets are included in Appendix "A".

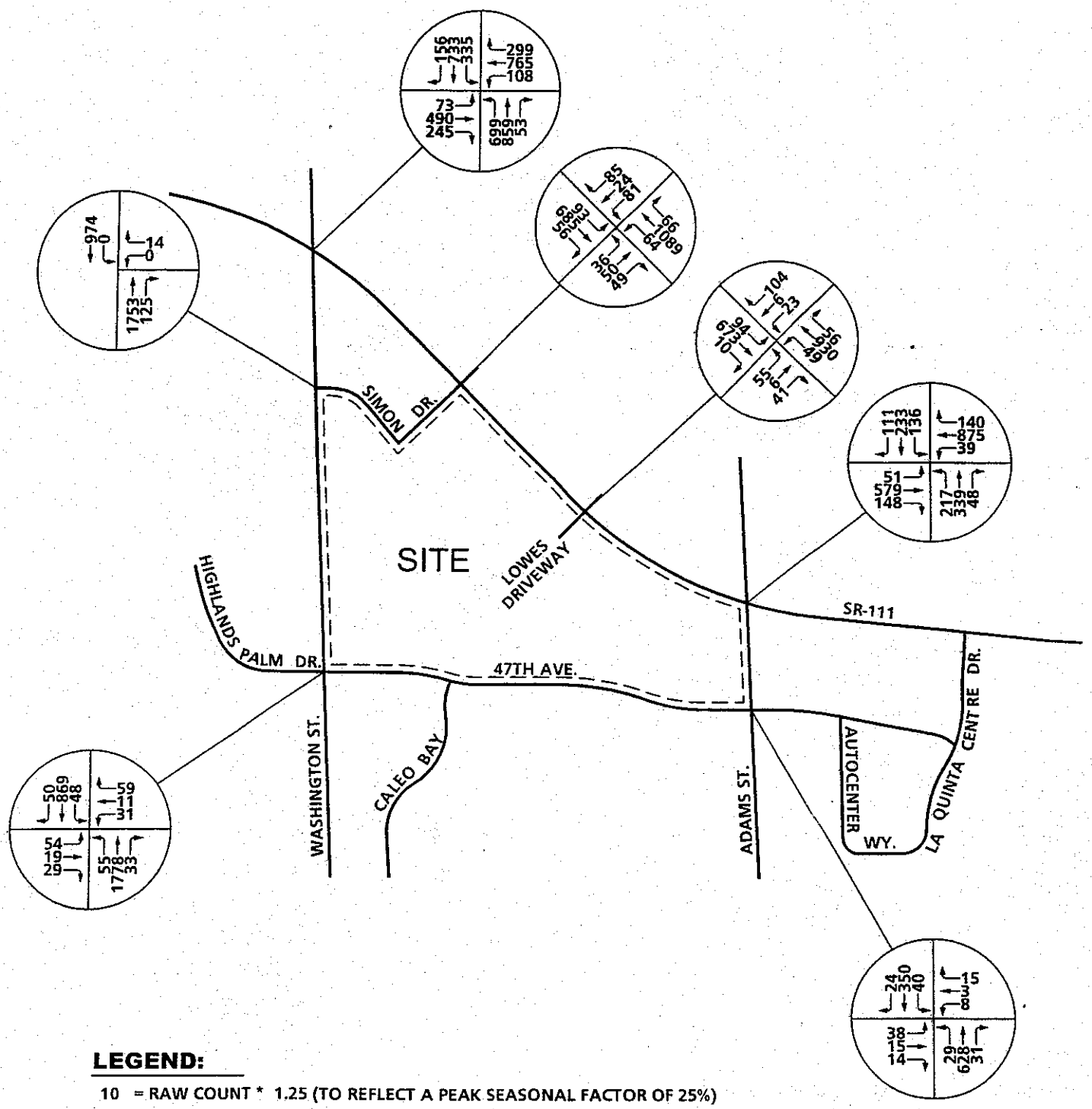
For existing traffic conditions, the intersections of Washington Street at Highway 111 and Adams Street at 47th Avenue are currently operating at an unacceptable Level of Service. Existing HCM calculation worksheets are provided in Appendix "B".

3. Transit Service

The study area is currently served by the Sunline Transit Agency Routes 70 and 111. There are currently transit routes on Washington Street and SR 111.

EXHIBIT 3-E

EXISTING AM PEAK HOUR INTERSECTION VOLUMES



LEGEND:

10 = RAW COUNT * 1.25 (TO REFLECT A PEAK SEASONAL FACTOR OF 25%)

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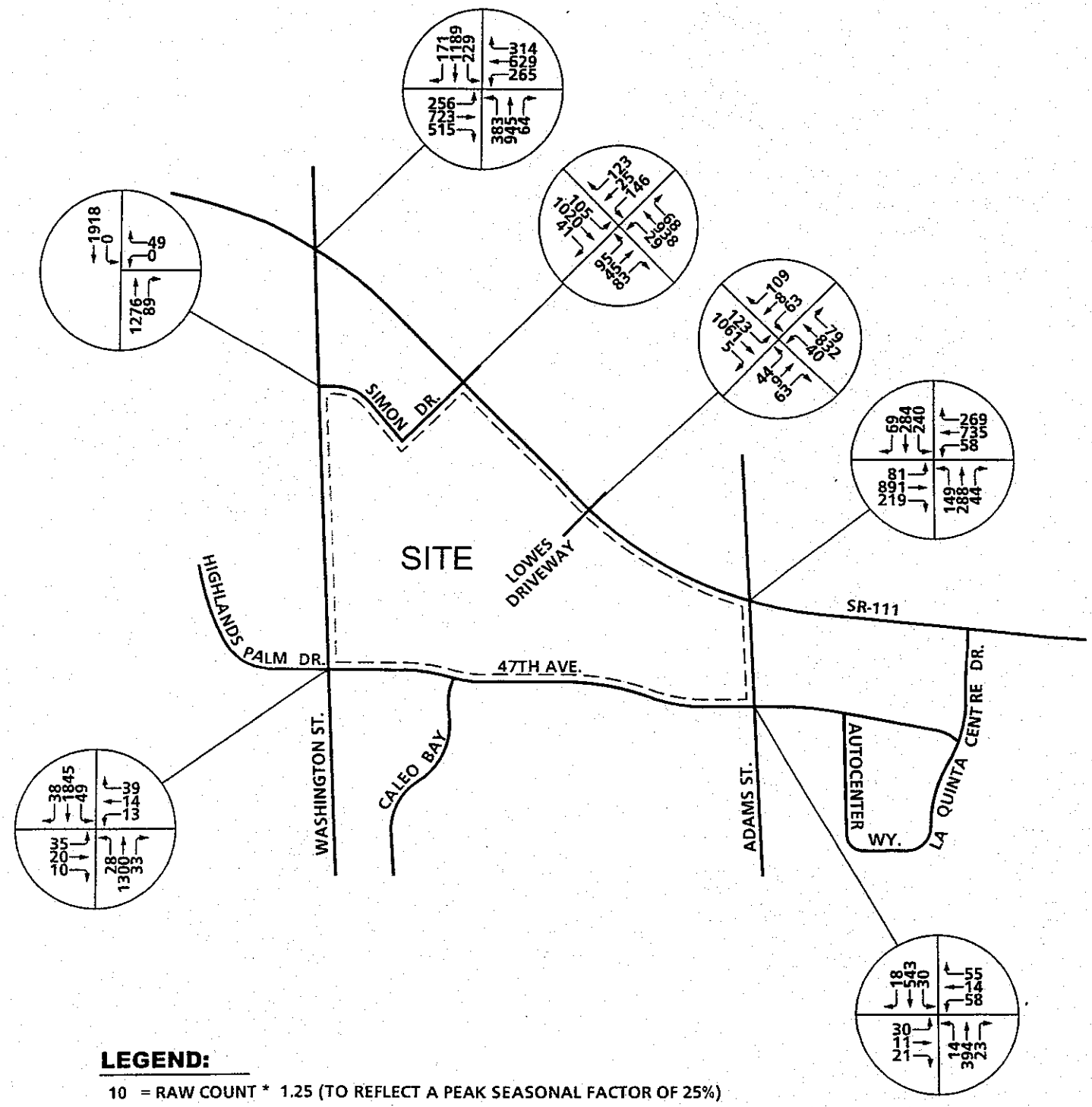
EXHIBIT 3-F

EXISTING PM PEAK HOUR INTERSECTION VOLUMES



LEGEND:

10 = RAW COUNT * 1.25 (TO REFLECT A PEAK SEASONAL FACTOR OF 25%)

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4.0 PROJECTED TRAFFIC

A. Site Traffic

1. Trip Generation

Trip generation represents the amount of traffic, which is attracted and produced by a development. The traffic generation for the project is based upon the specific land uses, which have been planned for the development. The proposed project would consist of developing a 508,000 square foot shopping center.

Trip generation rates for this project are shown in Table 4-1. The trip generation rates are based upon data collected by the Institute of Transportation Engineers (ITE).

Both daily and peak hour trip generation for the proposed project are shown in Table 4-2. The proposed development is projected to generate a total of approximately 14,539 trip-ends per day with 316 vehicles per hour during the AM peak hour and 1,375 vehicles per hour during the PM peak hour.

Traffic volumes shown in Table 4-2 consist of the total trips generated for the proposed project land use. Twenty-five percent of the trips entering and exiting the site are anticipated to be "pass-by" trips. These "pass-by" trips are defined as an intermediate stop on the way to a primary destination. Appendix "C" contains a further explanation of "Pass-By" trips.

2. Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical

TABLE 4-1

TRIP GENERATION RATES[1]

LAND USE	ITE CODE	QUANTITY	UNITS[2]	PEAK HOUR				DAILY
				AM		PM		
				IN	OUT	IN	OUT	
Commercial Retail - Project	820	508.0	TSF	0.51	0.32	1.73	1.88	38.16

[1] Source: Institute of Transportation Engineers (ITE), Trip Generation , Sixth Edition, 1997, Land Use Category 820.

[2] TSF = Thousand square feet

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TABLE 4-2

PROJECT TRIP GENERATION

LAND USE	ITE CODE	QUANTITY	UNITS[1]	PEAK HOUR				DAILY
				AM		PM		
				IN	OUT	IN	OUT	
Commercial Retail	820	508.0	TSF	259	163	879	955	19,385
Pass-By (25%)				-65	-41	-220	-239	-4,846
NET TRIP GENERATION				194	122	659	716	14,539

[1] TSF = Thousand square feet

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location of the site, the location of residential, commercial, employment and recreational opportunities and the proximity to the regional freeway system. The directional orientation of traffic was determined by evaluating existing and proposed land uses and highways within the community and existing traffic volumes.

The trip distribution for this study has been based upon near-term conditions, based upon those highway facilities which are either in place or will be contemplated over the next two years, which represents the opening occupancy time-frame for the project. The trip distribution patterns for the project are graphically depicted on Exhibits 4-A and 4-B.

3. Modal Split

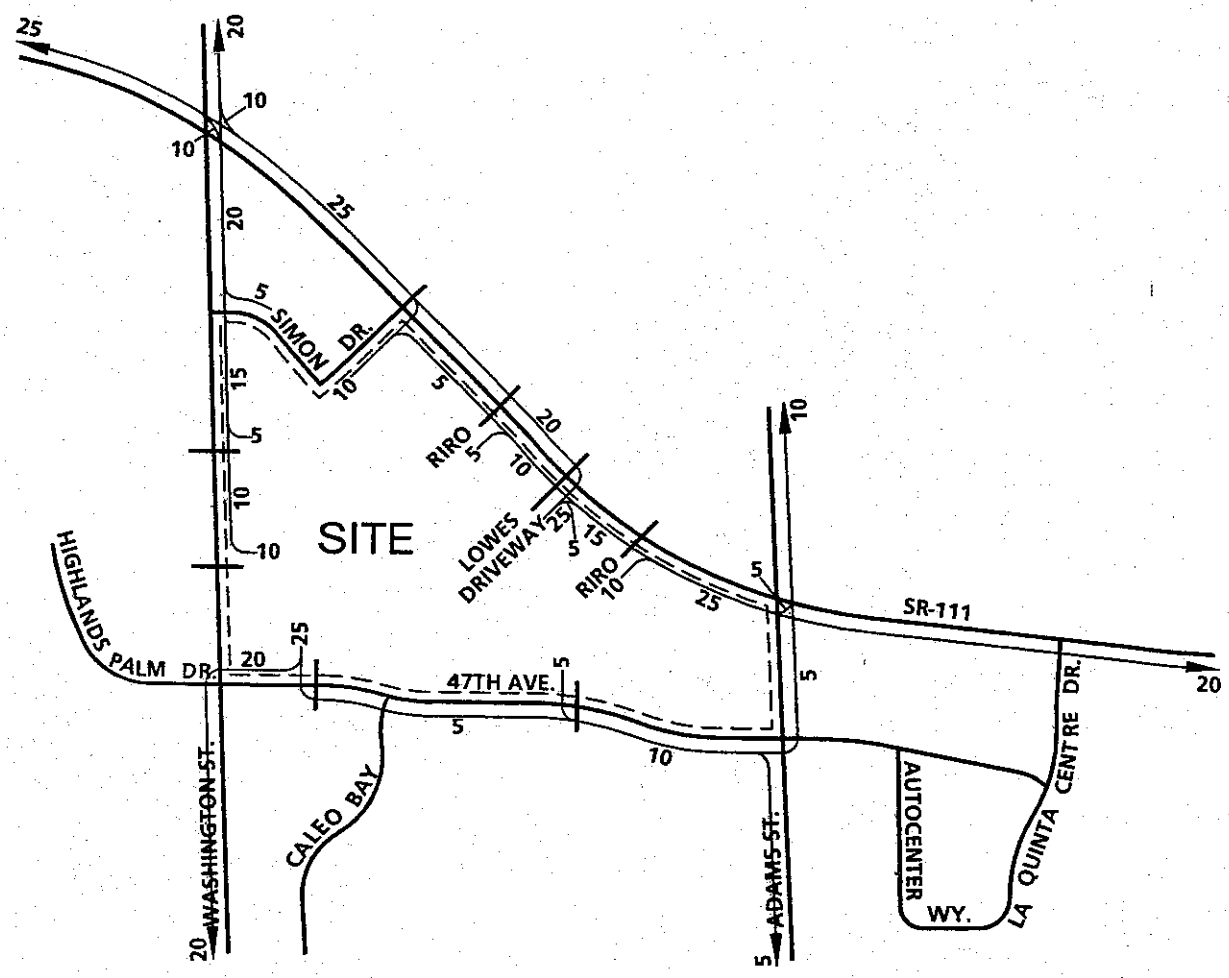
The traffic reducing potential of public transit has not been considered in this report. Essentially the traffic projections are "conservative" in that public transit might be able to reduce the traffic volumes.

4. Trip Assignment

The assignment of traffic from the site to the adjoining roadway system has been based upon the site's trip generation, trip distributions, proposed arterial highway and local street systems. Based on the identified project traffic generation and distributions, project related ADT volumes are shown on Exhibit 4-C. Project AM and PM peak hour intersection turning movement volumes are shown on Exhibits 4-D and 4-E, respectively.

EXHIBIT 4-A

PROJECT OUTBOUND TRIP DISTRIBUTION



LEGEND:

10 = PERCENT FROM PROJECT
RIRO = RIGHT IN/RIGHT OUT ONLY ACCESS

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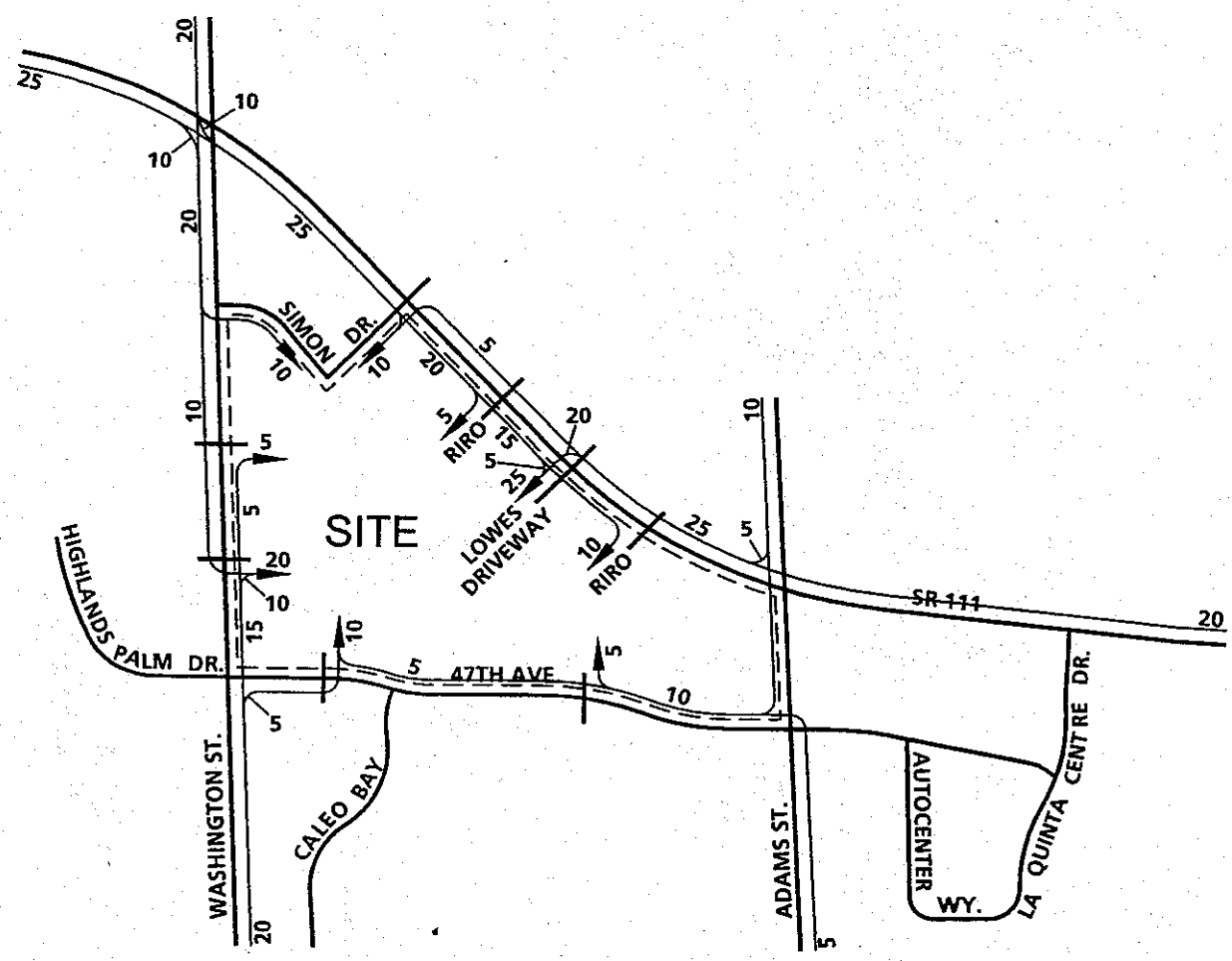
EXHIBIT 4-B

PROJECT INBOUND TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO PROJECT
RIRO = RIGHT IN/RIGHT OUT ONLY ACCESS

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