



Endo Engineering Traffic Engineering Air Quality Studies Noise Assessments

November 19, 2001

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SUBJECT: La Quinta Old Town - Traffic Impact Study

Dear Mr. Marvin;

Endo Engineering is pleased to submit this analysis of the circulation impacts associated with the La Quinta Old Town development in the City of La Quinta. The project site is comprised of 6± acres located south of Calle Tampico, east of Avenida Bermudas, north of Avenida La Fonda, and on both sides of Desert Club Drive. The proposed project is a pedestrian-oriented specialty retail center expected to accommodate mostly small (one thousand square feet or less) retail and office tenants in one- and two-story buildings. The building floor area on-site will total approximately 127,000 square feet.

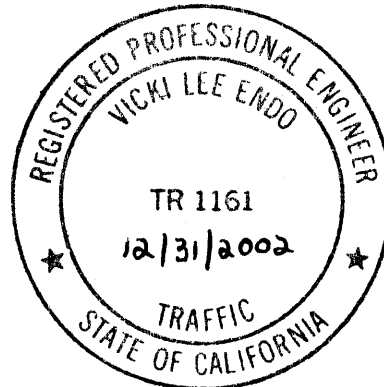
This study follows the format and methodology specified by Riverside County in their November 1991 *Traffic Impact Study Report Preparation Guide*. It details in graphic and narrative form: (1) existing circulation conditions; (2) conditions with and without project buildout in the year 2003; (3) year 2020 conditions with and without the project; and (4) recommended mitigation measures. We trust that the information provided herein will be of value to City staff in their review of the impacts and conditions of approval associated with the project. Should questions or comments develop regarding the findings and recommendations within this report, please do not hesitate to contact our offices at (949) 362-0020.

Cordially,

ENDO ENGINEERING

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TRAFFIC IMPACT STUDY
La Quinta Old Town

SOUTH OF CALLE TAMPICO
BETWEEN AVENIDA BERMUDAS AND DESERT CLUB DRIVE
NORTH OF AVENIDA LA FONDA

CITY OF LA QUINTA

November 19, 2001

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I. INTRODUCTION AND SUMMARY

I.A PURPOSE AND OBJECTIVES

The purpose of this report is to provide in graphic and narrative form: (1) existing roadway and traffic conditions; (2) probable traffic changes related to the proposed project; and (3) mitigation measures required to meet City of La Quinta minimum level of service requirements and traffic engineering design standards.

The scope of the study complies with Riverside County specifications as set forth in the November 1991 *Traffic Impact Study Report Preparation Guide* developed by the Transportation Planning and Development Review Division. The analysis herein employs the 1998 update to the *Highway Capacity Manual* (HCM) to analyze levels of service via the Highway Capacity Software (HCS) package prepared under FHWA sponsorship and maintained by the McTrans Center at the University of Florida Transportation Research Center.

I.B EXECUTIVE SUMMARY

Site Location and Study Area

The 6± acre project site is generally located south of Calle Tampico and north of Avenida La Fonda, between Avenida Bermudas and Desert Club Drive, in the City of La Quinta. The six key intersections include: (1) Calle Tampico @ Eisenhower Drive; (2) Calle Tampico @ Avenida Bermudas; (3) Calle Tampico @ Desert Club Drive; (4) Calle Tampico @ Washington Street; (5) Avenue 52 @ Avenida Bermudas; and (6) Avenue 52 @ Desert Club Drive.

Development Description

The proposed project is a pedestrian-oriented specialty retail center expected to accommodate mostly small (one thousand square feet or less) retail and office tenants in one-story and two-story buildings. The building floor area on-site will total approximately 127,000 square feet. Build-out of the project site is anticipated to occur by the year 2003.

The existing zoning on-site is VC (Village Core). The adopted General Plan Land Use designation on-site is VC (Village Commercial). The proposed project is consistent with the General Plan and zoning designations on-site.

Principal Findings

The City of La Quinta General Plan circulation policies require a minimum Level of Service "D". All of the key intersections will operate at acceptable levels of service, under all scenarios based upon the required lane configurations shown in Figure VI-2. None of the site access points will not meet traffic signal warrants or require signalization to provide acceptable levels of service.

Existing Conditions (Year 2000 Peak Season)

All of the key intersections are currently operating at acceptable levels of service during the peak travel hours in the peak season, except one. Motorists entering the intersection of

Avenida Bermudas and Avenue 52 during peak hours in the peak season experience substantial delay and levels of service that do not meet the La Quinta minimum LOS D performance standard. This intersection currently warrants signalization and will operate at acceptable levels of service, once signalized. The intersection of Eisenhower Drive and Calle Tampico currently provides acceptable levels of service without signalization but appears to exceed peak hour volume signal warrants during the evening peak hour in the peak season.

Year 2003 Conditions

The key intersections will operate at acceptable levels of service during peak hours in the year 2003 with or without the traffic generated by the proposed project, provided the intersection of Avenida Bermudas and Avenue 52 is signalized by the City of La Quinta as planned. When the proposed project is completed in the year 2003, the morning peak hour level of service on the minor street approach of the intersection of Desert Club Drive and Avenue 52 will drop from LOS C to LOS D. The projected increase in year 2003 average control delay at the intersection of Calle Tampico and Desert Club Drive that accompanies the addition of site traffic will cause the peak hour level of service to drop from LOS A to LOS B during the morning and evening peak hours. The increase in year 2003 intersection delay upon project completion will drop the evening peak hour level of service from LOS C to LOS D at the intersection of Washington Street and Calle Tampico.

Year 2020 Conditions

The key intersections will provide acceptable levels of service for year 2020 plus project conditions. The addition of site traffic volumes to year 2020 ambient traffic volumes will cause the level of service to drop from LOS A to LOS B during the peak hours at one key intersection (Desert Club Drive @ Calle Tampico). Existing intersection lane geometrics will be adequate to provide acceptable levels of service at all of the key intersections except Calle Tampico at Washington Street, where it will be necessary to add a second eastbound left-turn lane to achieve acceptable levels of service for projected year 2020 total traffic volumes. All of the key intersections will operate at acceptable levels of service during peak hours in the year 2020 with or without site traffic, provided the intersection of Avenida Bermudas and Avenue 52 is signalized by the City of La Quinta as planned

Conclusions

The proposed project appears to provide adequate site access and internal circulation. All of the key intersections will provide acceptable levels of service with the proposed project and existing intersection improvements upon project buildout except one, that warrants signalization today and is scheduled for signalization prior to 2003. All of the key intersections will operate at acceptable levels of service with year 2020 total traffic; however, the addition of a second eastbound left-turn lane at the intersection of Washington Street and Calle Tampico will be necessary to meet the City of La Quinta LOS D performance standard.

Recommendations

The following mitigation measures are recommended to reduce potential circulation impacts associated with the proposed project and site access.

1. The proposed internal circulation layout shall be subject to the review and approval of the City Traffic Engineer during the development review process to insure compliance with City of La Quinta minimum access and design standards.

2. Adequate off-street parking shall be provided by the project proponent per the parking requirements of the City of La Quinta.
3. STOP signs will control exiting site traffic and clear unobstructed sight distances shall be provided at the site driveways proposed on Calle Tampico, Avenida Bermudas, Desert Club Drive, and Avenida La Fonda.
4. Calle Tampico, Avenida Bermudas, Desert Club Drive, and Avenida La Fonda shall be fully improved adjacent to the project site as required by the City of La Quinta. Pedestrian crosswalks shall be installed on Avenida Bermudas and Desert Club Drive, as specified by the City.
5. The intersection of Eisenhower Drive at Calle Tampico currently provides acceptable levels of service without signalization but appears to exceed peak hour volume warrants during the evening peak hour in the peak season. It will require signalization to adequately serve future traffic volumes.
6. Motorists entering the intersection of Avenida Bermudas and Avenue 52 during peak hours in the peak season experience substantial delay and levels of service that do not meet the La Quinta minimum LOS D performance standard. This intersection currently warrants signalization and will operate at acceptable levels of service, once signalized.
7. The intersection of Washington Street and Calle Tampico should be improved to include dual eastbound left-turn lanes to provide adequate levels of service with projected year 2020 traffic volumes, as shown in Figure VI-2.
8. The project proponent shall participate in any improvements of area wide benefit by contributing funds on a "fair share" basis, based upon established fee programs (e.g. Traffic Signal Mitigation Fee).

II. PROPOSED DEVELOPMENT

II.A SUMMARY OF DEVELOPMENT

Project Location

The project site is generally located south of Calle Tampico and north of Avenida La Fonda, between Avenida Bermudas and Desert Club Drive, in the City of La Quinta. It is comprised of 6± acres.

Regional access is primarily provided by Eisenhower Drive and Washington Street. Local access is provided by Calle Tampico, Avenida Bermudas and Desert Club Drive. The project site has frontage on Calle Tampico and Avenida Bermudas, which permits direct site access to these master planned roadways.

Figure II-1 depicts the location of the project site, the study area and the key intersections analyzed. The six key intersections include:

- (1) Calle Tampico @ Eisenhower Drive,
- (2) Calle Tampico @ Avenida Bermudas,
- (3) Calle Tampico @ Desert Club Drive,
- (4) Calle Tampico @ Washington Street,
- (5) Avenue 52 @ Avenida Bermudas and
- (6) Avenue 52 @ Desert Club Drive.

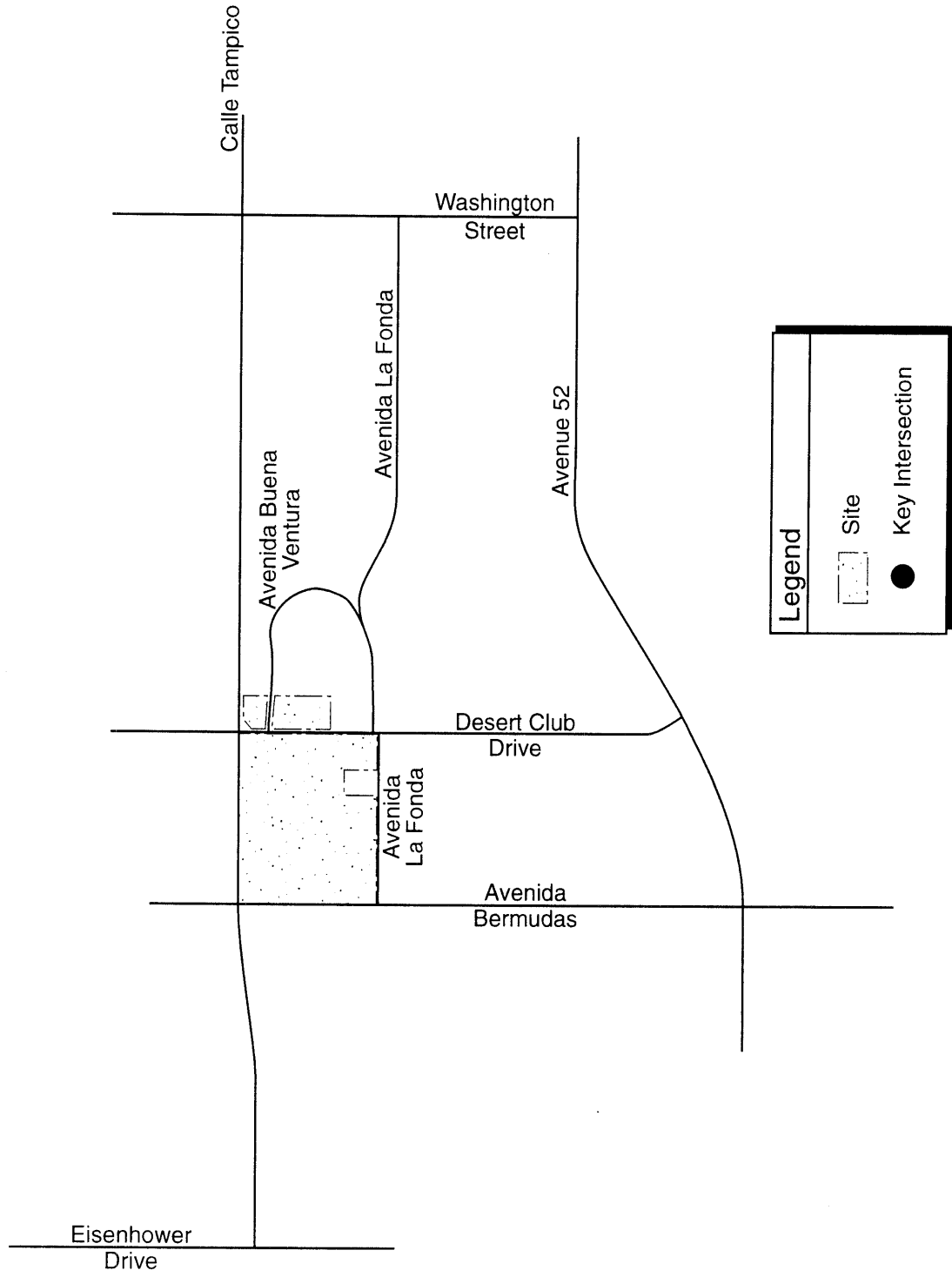
Project Land Use and Circulation Plan

As shown in Figure II-2, the Site Development Plan, the proposed project is a pedestrian-oriented specialty retail center expected to accommodate mostly small (one thousand square feet or less) retail and office tenants in one- and two-story buildings. The building floor area on-site will total approximately 127,000 square feet. Of that total, it is estimated that 20,000 square feet will be comprised of restaurants, a coffee shop, and an ice cream shop that operate all day. The restaurant expected to occupy half of that area (10,000 square feet), would accommodate dinner dining only, and provide valet parking. Office uses are expected to comprise 50,000 square feet of the floor area on-site. The remaining 57,000 square feet will be specialty retail uses. Build-out of the project site is anticipated to occur by the year 2003.

The project will be accessed via one right-turn only driveway on Calle Tampico, connected by an internal loop road to a right-turn only site driveway on Avenida La Fonda. The two Avenida Bermudas site driveways and two site driveways on Desert Club Drive will permit full access and be connected via the internal street proposed.

Parking lots proposed on-site will provide 162 off-street parking spaces. In addition, the on-site streets will accommodate 38 parking spaces. In order to provide these 200 parking spaces, 40 off-street parking spaces will be located in a project-owned parking lot located on the southeast corner of Desert Club Drive and Avenida Buena Ventura. Additional public parking will be available at the municipal parking lots located west of Avenida Bermudas and the project site.

Figure II-1
Site Location



Zoning and Land Use Category

The existing zoning on-site is VC (Village Core). The adopted General Plan Land Use designation on-site is VC (Village Commercial).

The proposed project is consistent with the General Plan and zoning designations on-site. A General Plan Amendment and zone change will not be necessary to develop the site as proposed.

Existing On-Site Land Uses

The project site is mostly vacant at present. There are 8 apartments located on-site, adjacent to Desert Club Drive, that will be removed when the project is implemented. There is a video rental store with approximately 1,500 square feet of building floor area.

Project Land Use Alternative

One development alternative would provide a boutique hotel with 30 rooms (15,000 square feet) on-site. This hotel would replace 7,000 square feet of retail space and 8,000 square feet of office space that would otherwise be associated with the proposed project.

III. AREA CONDITIONS

III. A STUDY AREA

The study area was developed through coordination with City of La Quinta staff. As shown in Figure II-1, the six key intersections include:

- (1) Calle Tampico @ Eisenhower Drive,
- (2) Calle Tampico @ Avenida Bermudas,
- (3) Calle Tampico @ Desert Club Drive,
- (4) Calle Tampico @ Washington Street,
- (5) Avenue 52 @ Avenida Bermudas and
- (6) Avenue 52 @ Desert Club Drive.

The project will take access from six driveways. One driveway is proposed on Calle Tampico and one is proposed on Avenida La Fonda (where left-turn access will be prevented by the medians). Two driveways are planned on Avenida Bermudas and two more are proposed on Desert Club Drive (all four of which will permit full access).

III. B STUDY AREA LAND USE

An Art Foundation headquarters building is located in the small “not a part” area shown on Figure II-2 adjacent to the north side of Avenida La Fonda, west of Desert Club Drive. This parcel is surrounded by the project site on the north, west and east. This land use will remain unchanged upon project completion

The Santa Rosa Plaza development is a cumulative project addressed herein that is proposed north of Calle Tampico and the project site. It includes a 145-room hotel, two restaurants (with 6,800 S.F. and 6,000 S.F.), 72 multi-family attached dwelling units, two office parks (with 10,800 S.F. and 13,500 S.F. respectively), and 12,000 S.F. of specialty retail.

The Vista Montana project is a second cumulative development located northwest of the project site (on the northeast corner of Calle Tampico and Eisenhower Drive). It includes 227 multi-family attached dwellings, 20,625 square feet of corporate office space, 20,000 square feet of retail space, and a distribution center for hotel supplies with 40,000 square feet of floor space.

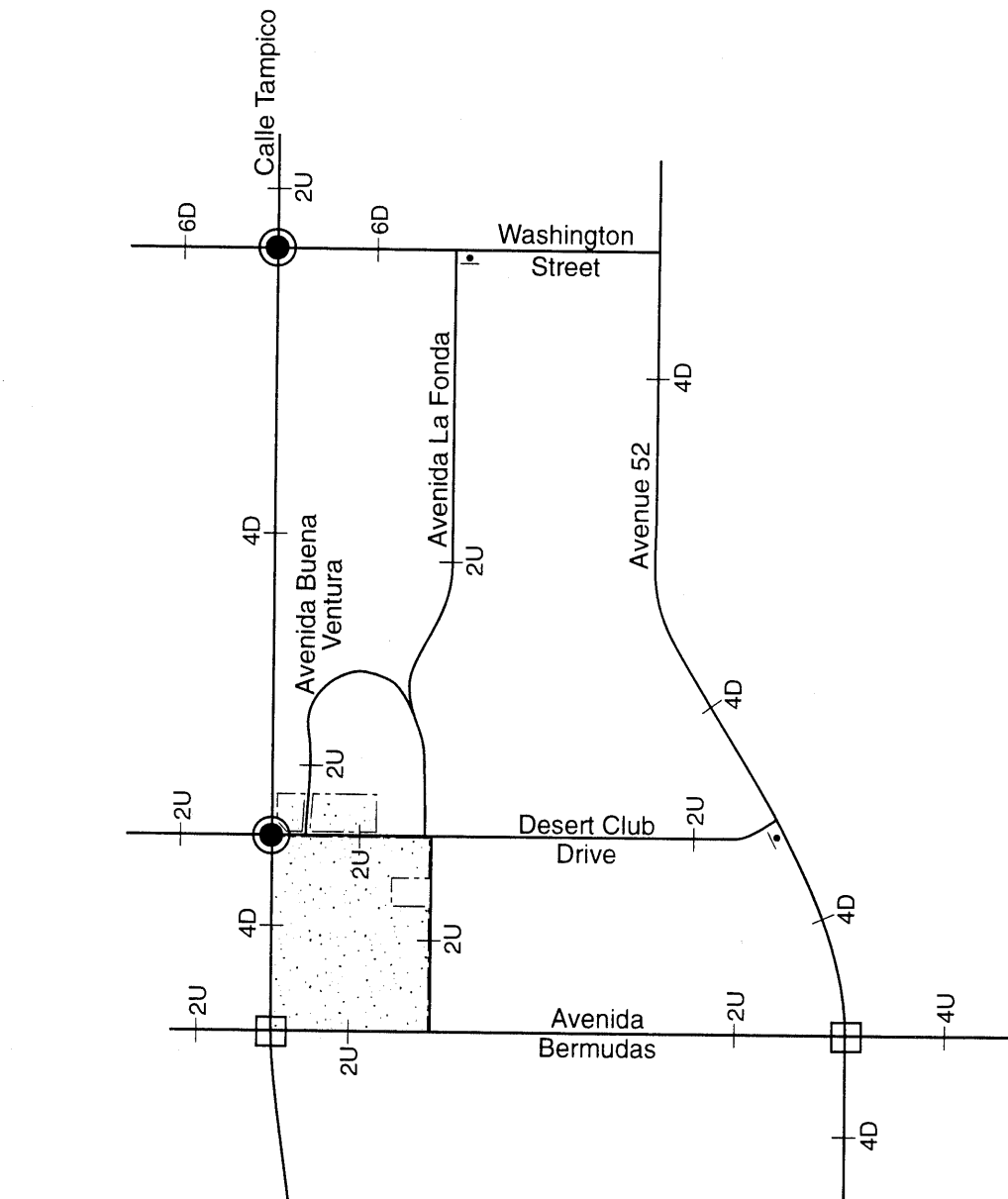
An Ace Hardware store is located west of the site, adjacent to Calle Tampico and Avenida Bermudas. The land uses south of the project site include a restaurant, retail uses, a library, and a post office. A telephone switching facility is located east of the site, on the northeast corner of Desert Club Drive and Avenida La Fonda.

III. C SITE ACCESSIBILITY

Area Roadway System

Figure III-1 illustrates the existing transportation system in the study area. Regional access is currently available from Eisenhower Drive, Avenue 52 and Washington Street. Direct

Figure III-1
Existing Transportation System



Legend

- 2U — Number of Through Lanes
- D = Divided U = Undivided
- STOP Sign
- All-Way Stop
- Signalized Intersection



project access is proposed from Calle Tampico, Avenida Bermudas, Desert Club Drive and Avenida La Fonda. Traffic control devices and mid-block lane geometrics are shown, based upon a field survey.

As shown therein, two of the key intersections are currently signalized. Three of the key intersections are controlled by four-way stop signs. The remaining key intersection is controlled by a stop sign on the minor leg. It should be noted that the intersection of Calle Tampico and Avenida Bermudas has signal standards installed but is awaiting signal controllers. The traffic signals should be operational at this intersection by the end of December, 2001.

Washington Street is a six-lane divided arterial and designated truck route in the study area. The posted speed limit is 50 mph. There are bike lanes on both sides of Washington Street. A bus stop is located on the east side of the roadway, north of Calle Tampico.

Eisenhower Drive is a four-lane divided roadway in the study area, except where it narrows to two lanes across a bridge, located north of Calle Tampico. The posted speed limit on Eisenhower Drive is 45 mph north of Calle Tampico and 35 mph south of Calle Tampico. Eisenhower Drive is a designated truck route in the study area.¹

Calle Tampico is a four-lane divided roadway and a designated truck route, between Eisenhower Drive and Washington Street. The posted speed limit is 45 mph in this area, except then children are present and the posted limit is 25 mph. Calle Tampico provides access to a school on Desert Club Drive, north of Calle Tampico. There are currently bike lanes on both sides of the roadbed. There are three bus stops along Calle Tampico, between Desert Club Drive and Washington Street.

Avenida Bermudas is a two-lane roadway with a bus stop near Calle Tampico. A four-way stop controls the intersection of Avenida Bermudas and Calle Tampico. A traffic signal was installed but is not operational pending arrival of the signal controller. It should be operational by the end of year 2001. Observed speeds are typically 25 mph along this roadway. Avenida Bermudas is a designated truck route south of Avenue 52.

Desert Club Drive is a two-lane roadway controlled by a traffic signal at Calle Tampico. There is a sidewalk along a portion of the east side of Desert Club Drive, north of Avenida La Fonda. The observed speeds along this roadway are typically 25 to 30 miles per hour.

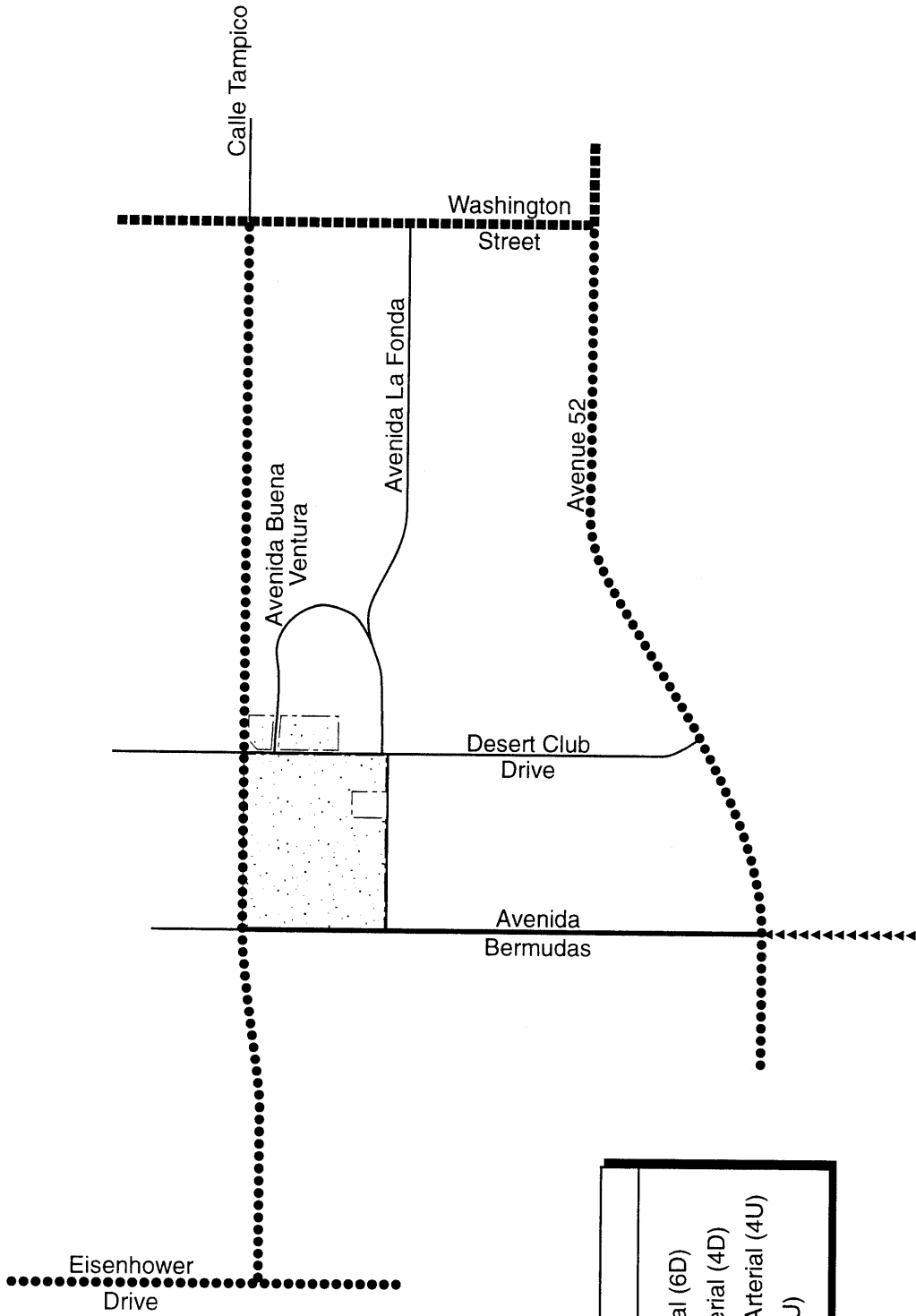
Avenida La Fonda is a two-lane divided roadway with diagonal on-street parking (58 spaces) in the middle of the roadbed (between Avenida Bermudas and Desert Club Drive). This parking reduces typical speeds adjacent to the project site on Avenida La Fonda to 20 miles per hour.

Adopted Circulation Element

Figure III-2 depicts the future transportation system in the project vicinity, based upon the currently adopted Circulation Element of the La Quinta General Plan (October 1992). Figure III-3 provides typical master planned street cross-sections for roadways in the City of La Quinta, including right-of-way requirements.

1. Truck routes determined by telephone communication with La Quinta Engineering Department staff on January 11, 2001.

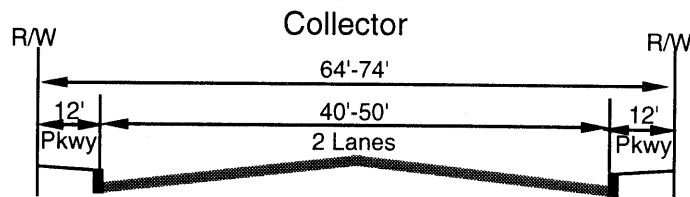
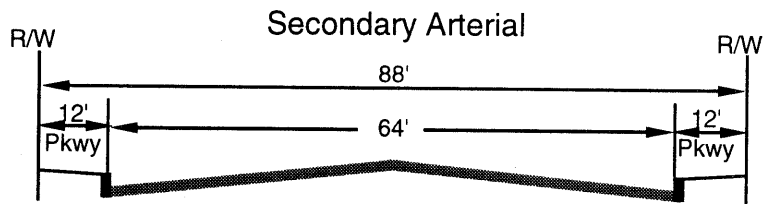
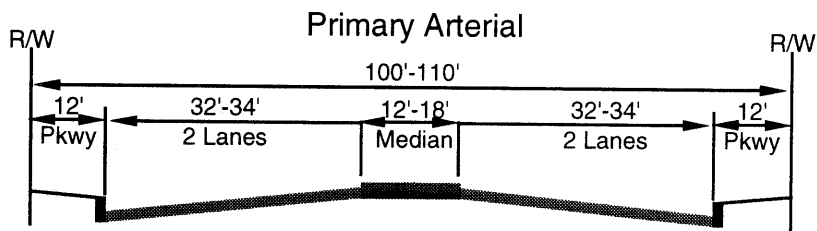
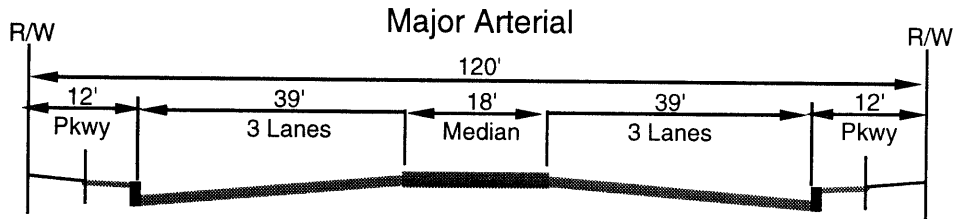
Figure III-2
Circulation System Policy Diagram
City of La Quinta



Legend	
■ ■ ■ ■	Major Arterial (6D)
● ● ● ●	Primary Arterial (4D)
▲ ▲ ▲ ▲	Secondary Arterial (4U)
—	Collector (2U)



Figure III-3
 Typical Street Cross-Sections
 (City of La Quinta)



As shown therein, Washington Street is master planned as a major arterial in the study area. Major arterials typically have six through lanes, a 120 foot right-of-way with a 96-foot roadbed, and an 18-foot median.

Eisenhower Drive, Avenue 52 (west of Washington Street) and Calle Tampico (west of Washington Street) are master planned as primary arterials in the study area. Primary arterials have 100 to 110-foot rights-of-way. They provide four travel lanes and a 12 to 18-foot median.

Avenida Bermudas is a master planned collector street, between Calle Tampico and Avenue 52. Collector streets provide two travel lanes within a roadbed that is typically 40 to 50 feet in width. The required right-of-way is typically 64 to 74 feet wide. South of Avenue 52, Avenida Bermudas is master planned as a secondary highway. Secondary highways typically provide a 4-lane undivided roadbed 64 feet wide within an 88-foot right-of-way.

Preferred General Plan Alternative

The future transportation system in the project vicinity, may ultimately be based upon the Preferred General Plan Alternative shown in the March 20, 2000 "Traffic Study For The Circulation Element Update of the La Quinta General Plan" (RKJK), rather than the currently adopted General Plan Circulation Element.

As shown therein, Washington Street is master planned as a major arterial in the study area. Avenue 52 (east of Avenida Bermudas) is master planned as a primary arterial in the study area. Eisenhower Drive is shown as a master planned secondary arterial (88-foot right-of-way and a 64-foot roadbed). Calle Tampico is shown as a master planned collector street. Avenida Bermudas is not shown as a master planned roadway, north of Avenue 52. South of Avenue 52, Avenida Bermudas is shown as a master planned secondary highway.

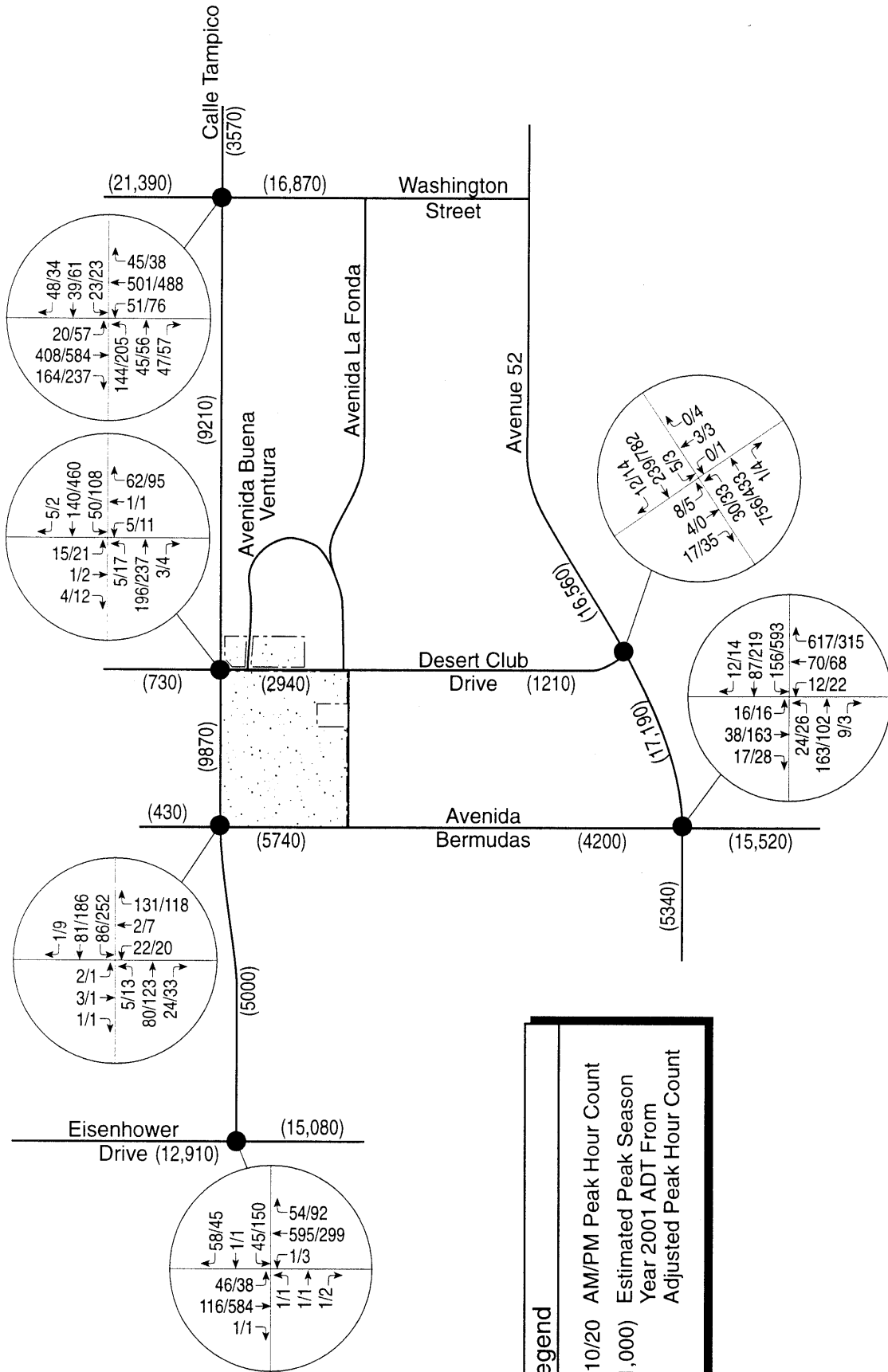
Traffic Volumes

Area traffic volumes exhibit a marked seasonal variation, with the late winter-early spring months representing the peak tourist season and exhibiting the highest traffic volumes. To analyze peak hour conditions at the four key intersections along Calle Tampico, morning and evening peak hour traffic counts were used that were made by Counts Unlimited, Inc. on December 19, 20 and 21, 2000. Two-hour manual traffic counts were made between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM. These counts were increased by 5 percent to reflect the annual growth in peak season traffic between 2000 and 2001.

New two-hour manual traffic counts were made at the two key intersections along Avenue 52 on August 8, 2001. These counts were increased by 31.25 percent to reflect the seasonal increase in travel between summer and winter 2001. With this adjustment, the volumes at these two intersections were consistent with the volumes at the other four key intersections.

Figure III-4 depicts the current (2001) peak season peak hour traffic volumes on roadway links in the study area. Current daily peak season volumes were estimated from the peak hour volumes at the key intersections by assuming that 7.5 percent of the daily traffic volume occurs during the evening peak hour. This assumption was consistent 24-hour traffic count data taken on Calle Tampico, opposite the site in August, 2001. It was also verified with the peak hour intersection analysis of Washington Street at Avenue 50 for the La Quinta General Plan Update currently underway (where the south leg of the intersection had a peak hour volume that was 7.5 percent of the daily volume).

Figure III-4
Current Traffic Volumes
(Year 2001 Peak Season)



Legend

- ▲ 10/20 AM/PM Peak Hour Count (1,000)
- Estimated Peak Season Year 2001 ADT From Adjusted Peak Hour Count



Scale: 1" = 650'



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Twenty-four hour machine traffic counts were made on August 8, 2001 along each of the four roadways that form the site boundaries. Since the proposed project is a pedestrian oriented specialty retail center, the daily traffic volumes on the streets that would be crossed by people walking to and from the proposed land uses are important. The count data is included in Appendix 1 and summarized in Table III-1.

**Table III-1
Existing Daily Traffic Volumes
Adjacent to the Site**

Traffic Count Location	Weekday Traffic Volume (Year 2001)		
	August ^a 24-Hour Count	Adjustment Factor	Peak ^b Season
Calle Tampico	7,213	31.25%	9,467
Avenida Bermudas	3,803	31.25%	4,991
Avenida La Fonda	931	31.25%	1,222
Desert Club Drive	1,726	31.25%	2,265

a. Total from 24-hour machine count made by Counts Unlimited, Inc. on August 8, 2001.

b. Seasonally adjusted daily volume estimate derived from 24-hour machine count made in August, 2001 by increasing it 31.25 percent to reflect "worst case" winter conditions.

The August 8, 2001 daily traffic count on Avenida La Fonda indicated that there are 931 vehicles per day (595 eastbound and 336 westbound) on this roadway. The count was made midway between Avenida Bermudas and Desert Club Drive. The morning peak hour volume (68 vehicles/hour) was 7.3 percent of the daily volume and occurred between 9:30 AM and 10:30 AM. The evening peak hour volume (91 vehicles/hour) occurred between 1:30 PM and 2:30 PM and comprised 9.8 percent of the daily volume.

The daily volume on Avenida Bermudas on August 8, 2001 was 3,803 vehicles per day (1446 northbound and 2357 southbound). The count was made half way between Calle Tampico and Avenida La Fonda. The morning peak hour volume (311 vehicles/hour) was 8.2 percent of the daily volume and occurred between 11:00 AM and 12:00 noon. The evening peak hour volume (340 vehicles/hour) occurred between 3:15 PM and 4:15 PM and comprised 8.9 percent of the daily volume.

Along Calle Tampico 7,213 vehicles per day (3,191 eastbound and 4,022 westbound) were counted on August 8, 2001. The count was made in the middle of the site frontage, between Avenida Bermudas and Desert Club Drive. The morning peak hour volume (496 vehicles/hour) was 6.9 percent of the daily volume and occurred between 11:00 AM and 12:00 noon. The evening peak hour volume (541 vehicles/hour) occurred between 3:30 PM and 4:30 PM and comprised 7.5 percent of the daily volume. This peak hour percentage was used to estimate daily volumes from the traffic counts at the six key intersections in the study area.

The daily volume on Desert Club Drive was 1,726 vehicles per day (1056 northbound and 670 southbound) on August 8, 2001. The count was made immediately south of the access for the existing apartments on-site, between Calle Tampico and Avenida La Fonda. The morning peak hour volume (145 vehicles/hour) was 8.4 percent of the daily volume and occurred between 11:00 AM and 12:00 noon. The evening peak hour volume (153

vehicles/hour) occurred between 12:00 noon and 1:00 PM and comprised 8.9 percent of the daily volume.

With an adjustment factor of 31.25 percent, the daily volumes on the roadways adjacent to the site during the peak season of 2001 can be estimated, as shown in Table III-1. They are: Avenida La Fonda (1,222 vehicles/day), Avenida Bermudas (4,991 vehicles/day), Calle Tampico (9,467 vehicles/day), and Desert Club Drive (2,265 vehicles/day).

Traffic Signal Warrants

Three existing key intersections are currently controlled by STOP signs. Based upon rural peak hour signal volume warrants and current peak season traffic volumes, the all-way stop intersection of Eisenhower Drive and Calle Tampico appears to currently warrant signalization. The City of La Quinta studied this intersection a few years ago and determined that signal warrants were not met and that the levels of service were acceptable at that time.

However, as cumulative developments in the area (such as the Embassy Suites or the Vista Montaña Village) are built, traffic volumes could change rapidly. Therefore, this intersection will be checked periodically to determine whether or not signalization is warranted.²

The all-way stop intersection of Avenida Bermudas and Calle Tampico has signal standards in place, but does not have controllers yet. The signal is scheduled to be operational by the end of the year 2001.

The intersection of Avenue 52 and Avenida Bermudas appears to currently meet rural peak hour volume signal warrants. The City recently determined that the process of signalizing this intersection could begin and it was added to the Capital Improvement Plan. A signal could be operational at this intersection by July of 2002.³

Transit Service

Transit service is provided by the SunLine Transit Agency. Bus service is provided along Washington Street, Eisenhower Drive, Calle Tampico, and Avenida Bermudas. Buses stop at the intersection of Calle Tampico and Avenida Bermudas twice each hour from 6:34 AM until 6:34 PM, seven days per week.

Existing Relevant TSM Programs

There are no Transportation System Management plans in effect in the study area at present. However, the City of La Quinta has adopted a Transportation Demand Management Ordinance (Municipal Code Chapter 9.162).

2. Telephone communication on November 14, 2001 with Mr. John Freeland, City of La Quinta.

3. Ibid.

IV. PROJECTED TRAFFIC

IV. A SITE TRAFFIC

Project-Related Trip Generation

The trip generation potential of on-site development was determined from the average trip generation rates published by the ITE in the "Trip Generation" manual (Sixth Edition: 1998), as shown in Table IV-1. The small retail uses proposed on-site are most appropriately categorized by the Specialty Retail Center (ITE Code 814) rates. To ensure a "worst case" assessment, the trip generation rates associated with the peak hour of the generator were assumed for the morning and evening peak hours. The ITE did not provide rates for the hours between 7:00 AM to 9:00 AM. The average ITE trip generation rate for the 4:00 PM to 6:00 PM interval was quite low, less than half the rate during the PM peak hour of the generator.

As shown in Table IV-1, the proposed land uses could generate up to 5,170 daily trips, of which 814 would occur during the morning peak hour (391 inbound and 423 outbound) and 626 would occur during the evening peak hour (357 inbound and 269 outbound).

The current trip generation from the 8 apartments and the 1,500 square foot video store (that currently exist on-site but will be removed) must be subtracted from the site traffic generation forecast. The existing land uses on-site generate an estimated 110 daily trips, of which 14 occur during the morning peak hour (6 inbound and 8 outbound) and 12 occur during the evening peak hour (7 inbound and 5 outbound). These trips are currently using the streets in the study area, but will be removed when the proposed project is built.

Once the current trip generation of the site is subtracted from the new trip generation that will be generated by the proposed development, the increase in trip generation associated with the project can be quantified. From Table IV-1 it can be seen that the proposed project will increase the traffic in the study area by 5,060 daily trips, of which 800 will occur during the morning peak hour (385 inbound and 415 outbound) and 614 would occur during the evening peak hour (350 inbound and 264 outbound).

For a conservative analysis, no reduction was assumed for pass-by trips that would be using adjacent streets (with or without the project) and would stop briefly at the site, then continue on their way. No adjustment was made for trip overlap on-site, where a person comes to the site to visit one land use and stays to visit another before leaving.

Table IV-1 also provides the estimated site traffic generation forecast for the alternative development on-site that would include a 30-room boutique hotel in place of 7,000 square feet of retail uses and 8,000 square feet of office floor area. This alternative would generate an increase of 4,700 daily trips (721 trips during the morning peak hour and 559 trips during the evening peak hour).

Project-Related Trip Distribution and Assignment

Traffic distribution is the determination of the directional orientation of traffic. It is based upon the geographical location of the site and land uses which will serve as trip origins and destinations. Traffic assignment is the determination of which specific routes project-related traffic will use, once the generalized traffic distribution is determined.

Table IV-1
Trip Generation Forecast^a

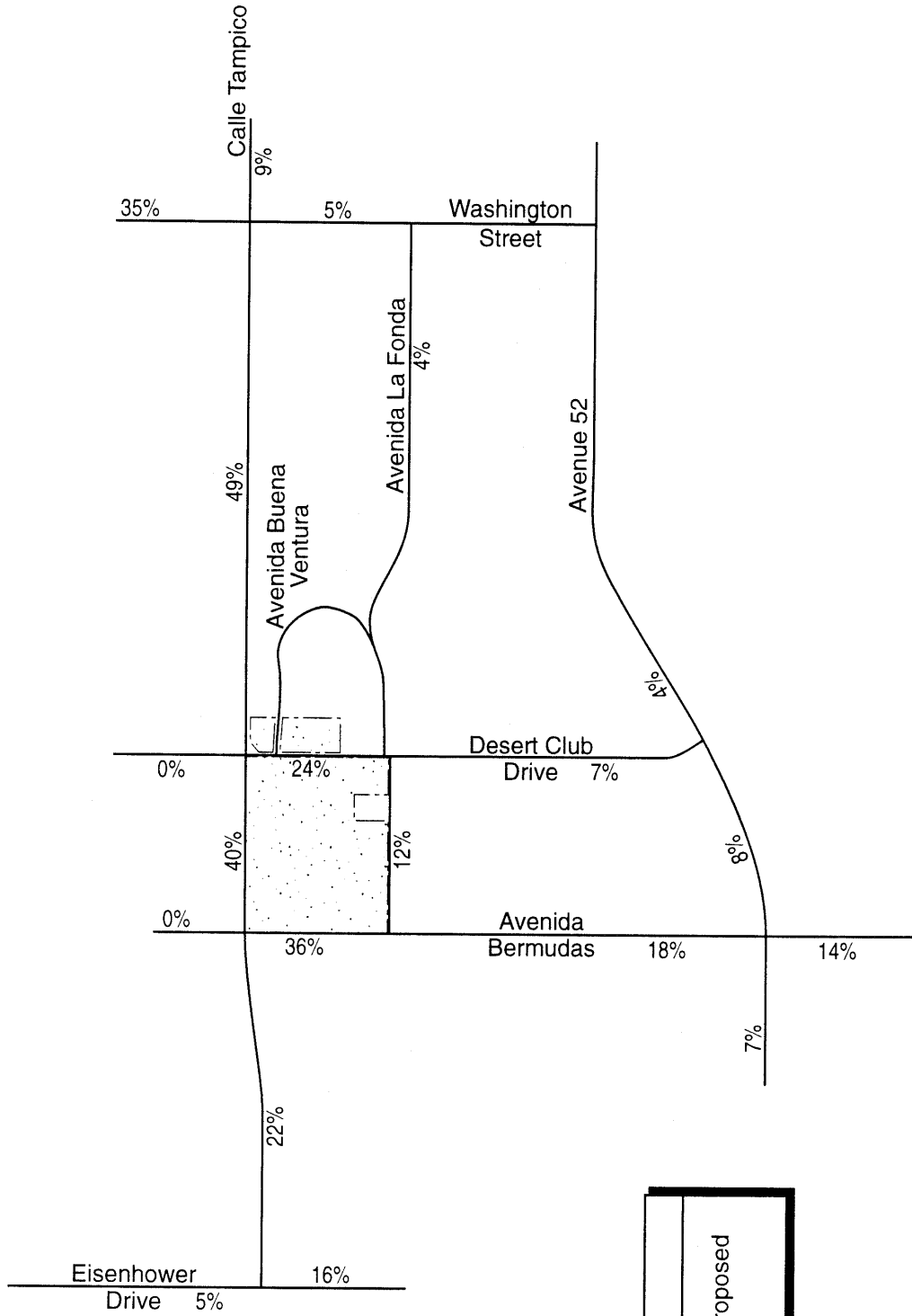
Land Use Category (ITE Code)	Land Use Quantity	AM Peak Hour			PM Peak Hour			Daily 2-Way
		In	Out	Total	In	Out	Total	
PROPOSED PROJECT								
Specialty Retail (814)	127 TSF	391	423	814	357	269	626	5,170
Existing to be Removed Apartments (220)	8 DU	-1	-3	-4	-3	-2	-5	-50
Specialty Retail (814)	1.5 TSF	-5	-5	-10	-4	-3	-7	-60
Total Removed		<u>-6</u>	<u>-8</u>	<u>-14</u>	<u>-7</u>	<u>-5</u>	<u>-12</u>	<u>-110</u>
Net Trip Generation		385	415	800	350	264	614	5,060
HOTEL ALTERNATIVE								
Specialty Retail (814)	112 TSF	345	373	718	315	237	552	4,560
Hotel Avg (310)	30 Room	10	7	17	10	9	19	250
Total Generated		<u>355</u>	<u>380</u>	<u>735</u>	<u>325</u>	<u>246</u>	<u>571</u>	<u>4,810</u>
Existing to be Removed Apartments (220)	8 DU	-1	-3	-4	-3	-2	-5	-50
Specialty Retail (814)	1.5 TSF	-5	-5	-10	-4	-3	-7	-60
Total Removed		<u>-6</u>	<u>-8</u>	<u>-14</u>	<u>-7</u>	<u>-5</u>	<u>-12</u>	<u>-110</u>
Net Trip Generation		349	372	721	318	241	559	4,700
CUMULATIVE PROJECTS								
Vista Montana Village		209	108	317	166	285	451	4,370
Relocated La Quinta Hotel Employees		113	3	116	23	105	128	1,630
Santa Rosa Plaza		164	126	290	183	164	347	4,030

a. Source: ITE "Trip Generation" manual (Sixth Edition; 1998)

The basic factors affecting route selection are minimizing time and distance. Other considerations might be the aesthetic quality of alternate routes, the number of turning maneuvers, the avoidance of congestion, site access and parking lot locations and turn restrictions at site driveways that can directly affect the site traffic assignment.

Figure IV-1 presents the percentage of project-related traffic projected to utilize the roadway links and key intersections in the study area, based upon the existing distribution of land uses, turning movements at intersections, and distributions shown in traffic studies for nearby projects. Figure IV-2 presents the net project-related (year 2003) peak hour turning movement volumes at the project driveways and key intersections in the study area. Daily site traffic volumes on the links throughout the study area are also shown in Figure IV-2.

Figure IV-1
 Directional Distribution of Site Traffic
 (Year 2003)

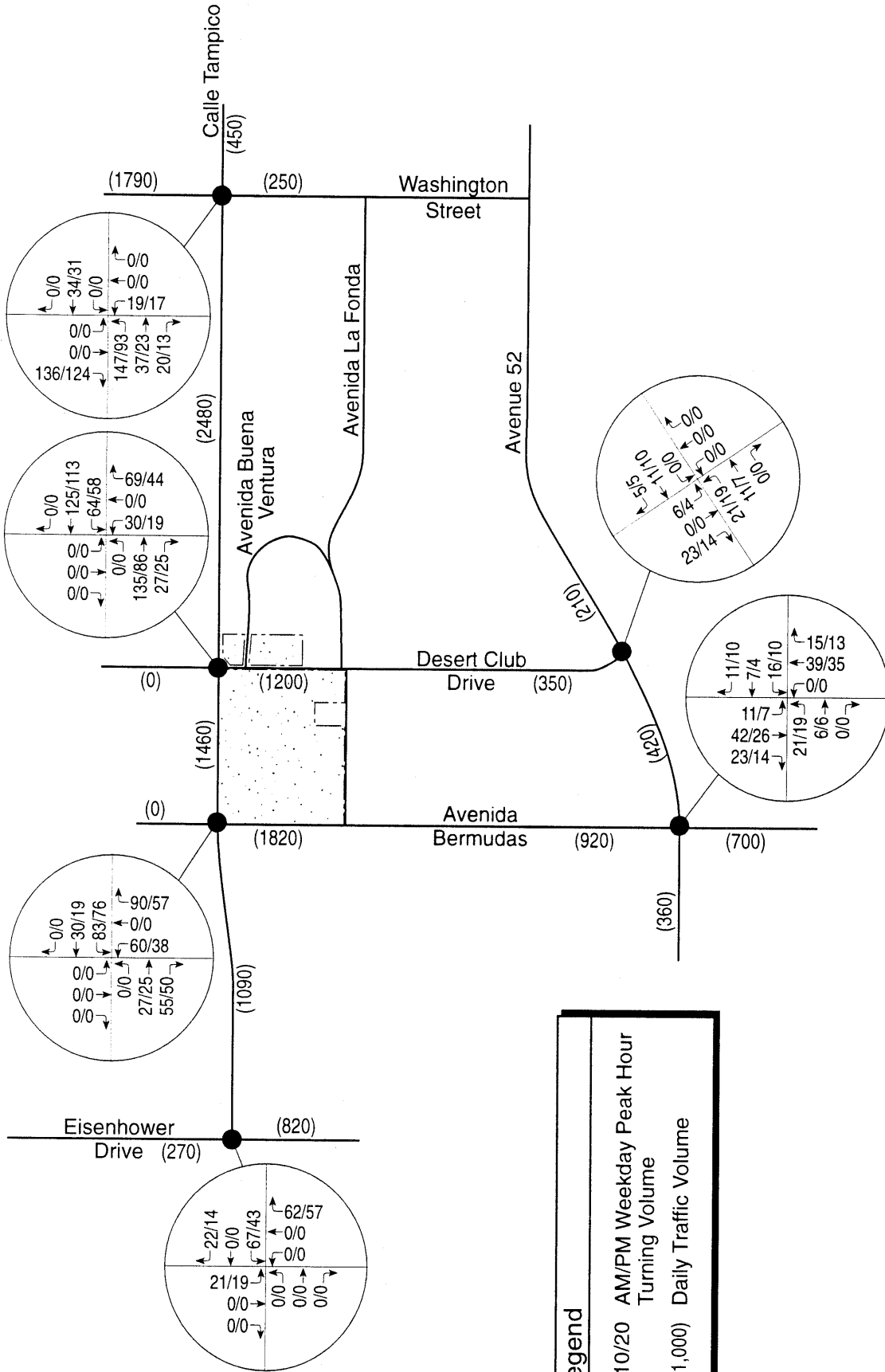


Legend
 10% Percent of Proposed Site Traffic



Scale: 1" = 650'

Figure IV-2
Site Traffic Volumes



IV. B THROUGH TRAFFIC

Estimated year 2003 non-site peak hour traffic volumes are provided in Figure IV-3. They were developed by increasing existing (year 2001) traffic volumes by a proportionate amount of the General Plan Traffic Model projected growth, and adding traffic from the adjacent cumulative projects. The year 2003 non-site daily traffic estimates are also shown in Figure IV-3. They were developed from projected peak hour volumes by assuming that 7.5% of the daily traffic occurs during the evening peak hour.

Estimated 2020 non-site traffic volume projections are shown in Figure IV-4. The post 2020 projections were derived from the General Plan Preferred Alternative traffic projections (Exhibit 4-A) in the "Traffic Study For the La Quinta General Plan Update" (RKJK; 3/20/00). Although the "Traffic Study For the La Quinta General Plan Update" has not been reviewed or approved by the City of La Quinta, city staff specified that these projections be used herein, as they were the best information available. The post 2020 General Plan Update traffic projections were assumed to include the traffic from the cumulative projects (Santa Rosa Plaza and Vista Montaña Village).

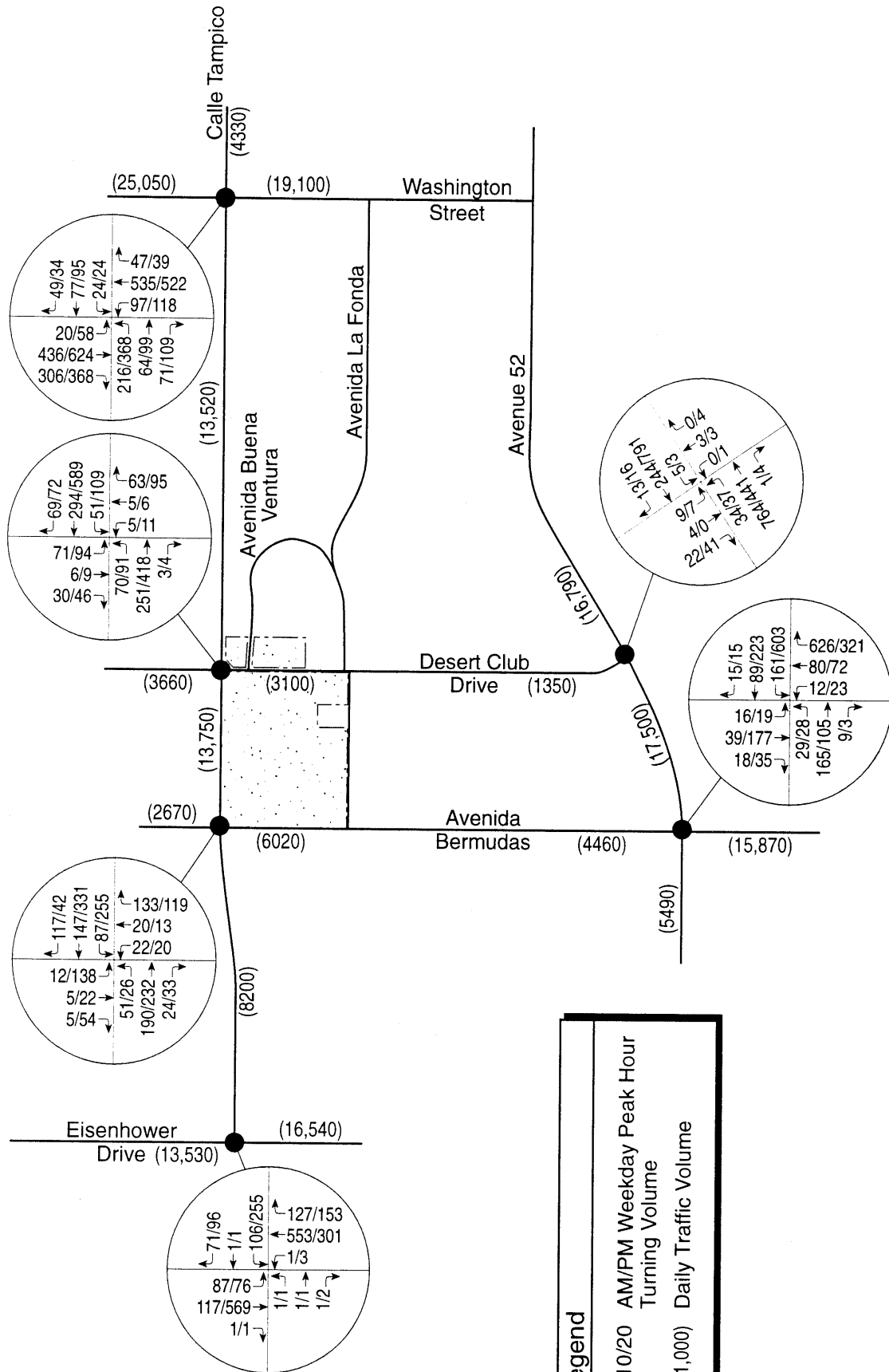
Along those roadway links where the General Plan Traffic Model projections were less than the existing-plus-cumulative project traffic, post 2020 non-site traffic volumes were assumed to be equal to existing volumes plus cumulative traffic plus a future traffic growth factor of 10 percent. Based upon this criteria, the only projections utilized from the "Traffic Study For the La Quinta General Plan Update" were two daily volumes on Washington Street (north and south of Calle Tampico).

IV. C TOTAL TRAFFIC

Figure IV-5 shows the year 2003 total traffic volumes within the study area upon project completion. The year 2003 total volumes shown in Figure IV-5 were developed by adding the site traffic (shown in Figure IV-2) to the 2003 non-site traffic (depicted in Figure IV-3).

Figure IV-6 shows the post 2020 total traffic volumes within the study area. The post 2020 total volumes shown in Figure IV-6 were developed by adding the site traffic (shown in Figure IV-2) to the post 2020 non-site traffic (depicted in Figure IV-4).

Figure IV-3
Estimated Non-Site Traffic
(Year 2003)



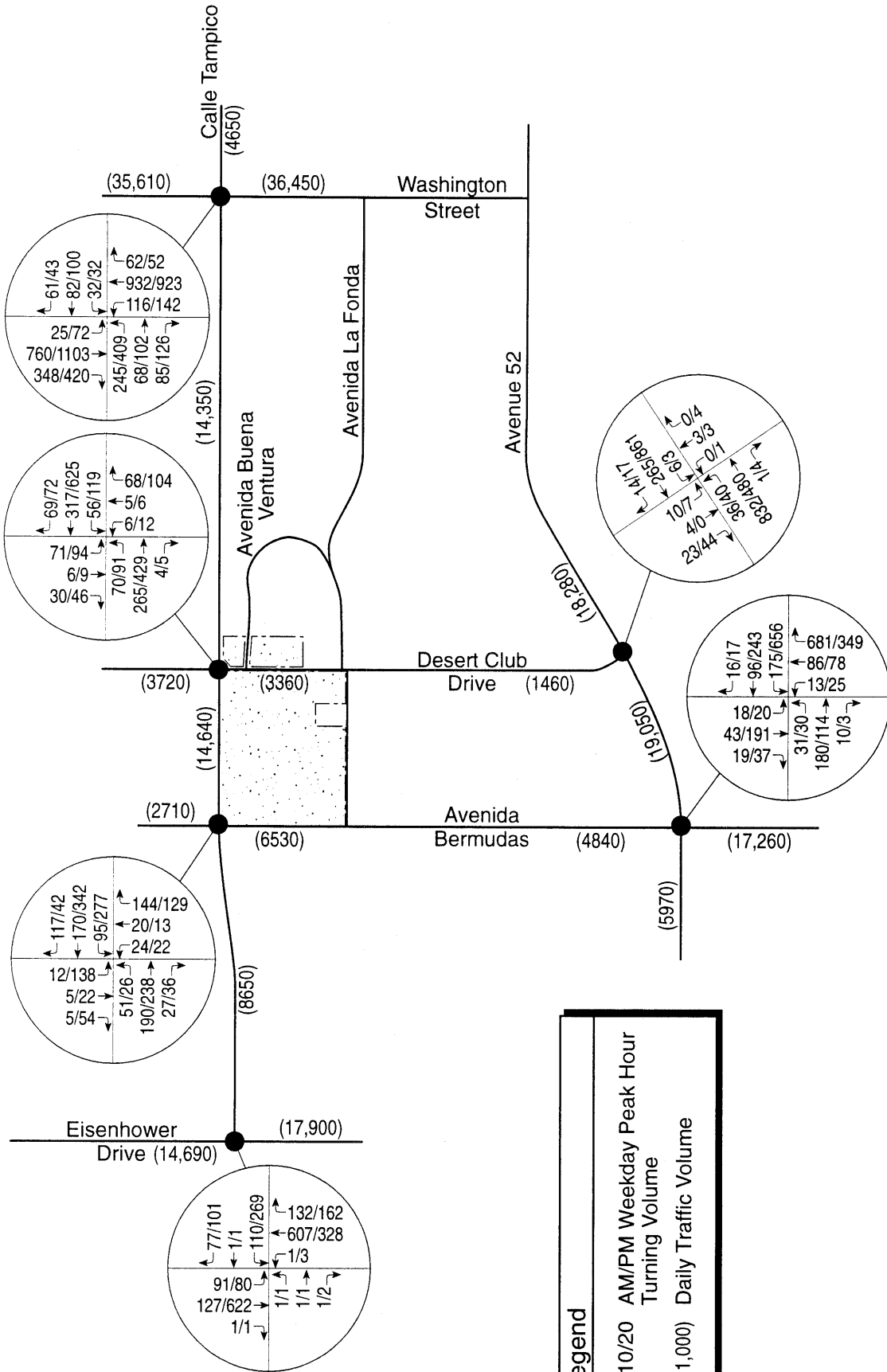
Legend

- ↑ 10/20 AM/PM Weekday Peak Hour Turning Volume
- (1,000) Daily Traffic Volume



Scale: 1" = 650'

Figure IV-4
Estimated Non-Site Traffic
(Year 2020)



Legend
↖ 10/20 AM/PM Weekday Peak Hour Turning Volume
(1,000) Daily Traffic Volume



Scale: 1" = 650'



Endo Engineering

Figure IV-5
Estimated Total Future Traffic
(Year 2003)

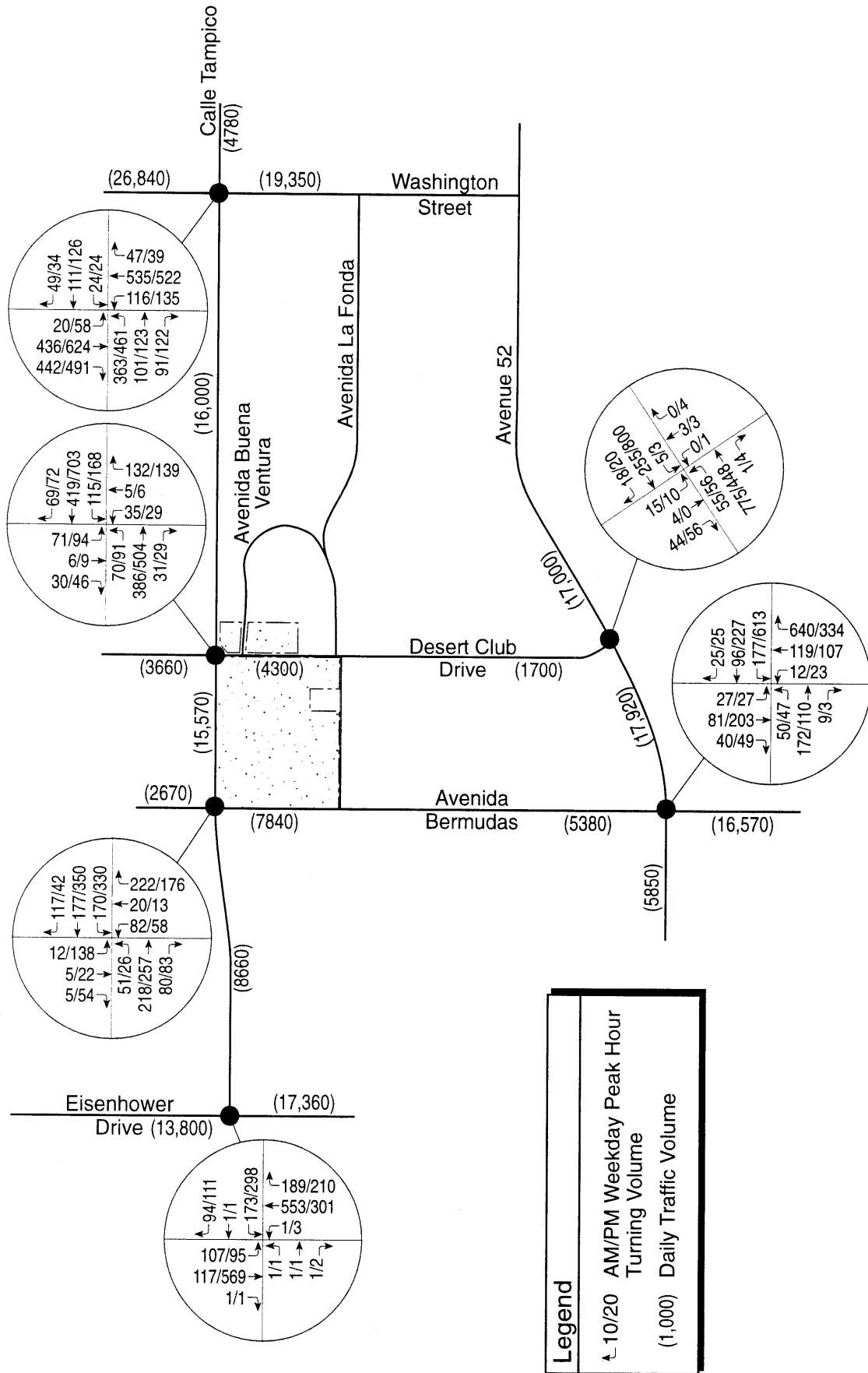
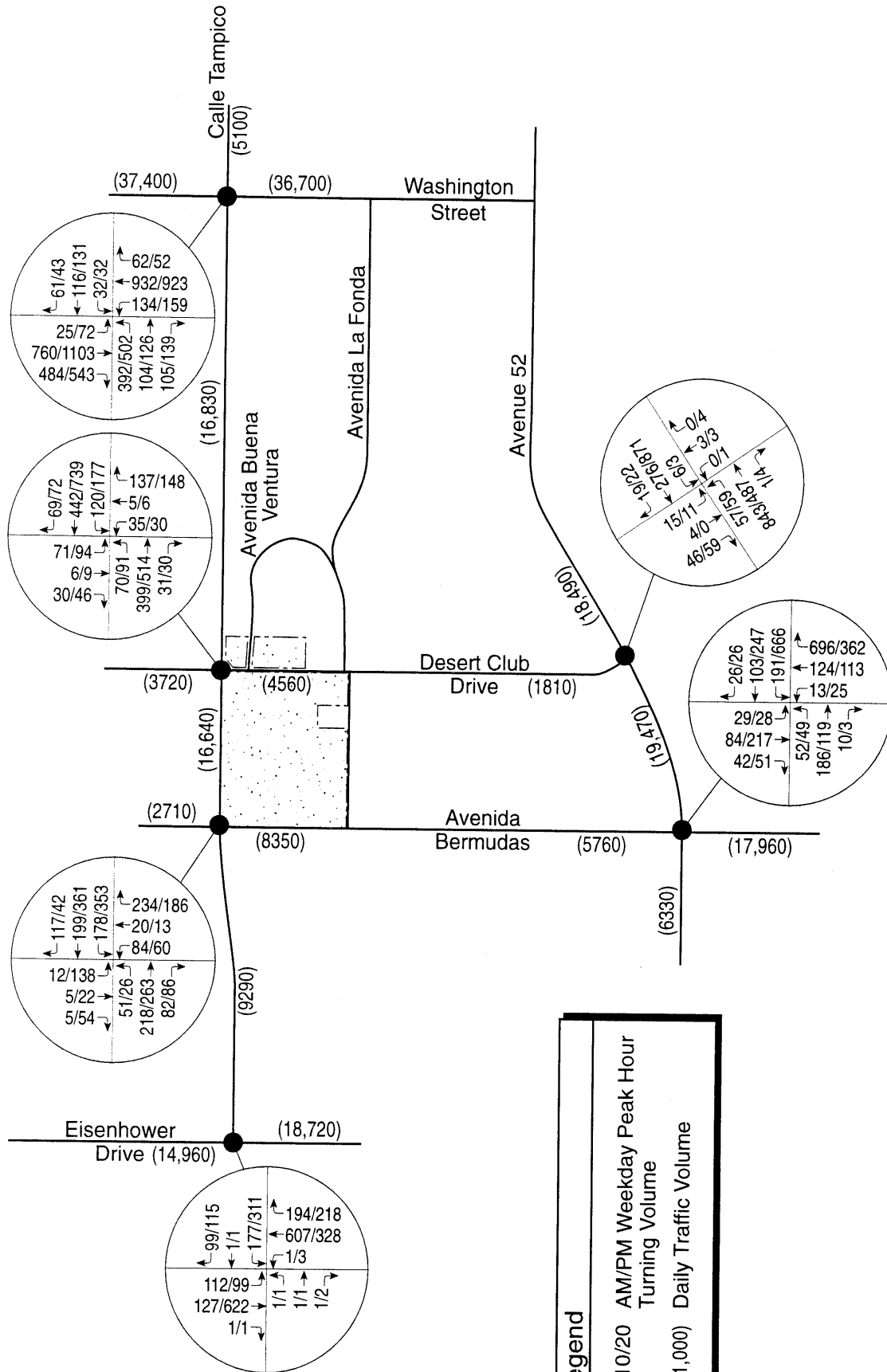


Figure IV-6
Estimated Total Future Traffic
(Year 2020)



Legend

- ↖ 10/20 AM/PM Weekday Peak Hour Turning Volume
- ↗ (1,000) Daily Traffic Volume



Scale: 1" = 650'

V. TRAFFIC ANALYSIS

The traffic analysis summarized below evaluates the key intersections at several points in time with and without the proposed project. These scenarios include:

- existing (year 2001) conditions;
- year 2003 ambient conditions;
- year 2003-plus-project buildout conditions;
- year 2020 ambient conditions; and
- year 2020-plus-project conditions.

Both of the year 2003 scenarios include two cumulative projects (Santa Rosa Plaza and Vista Montaña Village) that are approved but not constructed. For each scenario, peak season average weekday morning and evening peak hour conditions were evaluated to establish whether or not mitigation would be required to achieve the City of La Quinta traffic performance standard for planning and design purposes.

V.A SITE ACCESS

The bulk of the site is rectangular in shape and bounded by Calle Tampico, Avenida Bermudas, Avenida La Fonda, and Desert Club Drive. This permits direct site access to these roadways from six site driveways. The project will be accessed via one right-turn only driveway on Calle Tampico, connected by an internal roadway to a right-turn only site driveway on Avenida La Fonda. The two Avenida Bermudas site driveways and two site driveways on Desert Club Drive will permit full access and be connected via the internal street proposed.

These site driveways were not identified as (or evaluated like) key intersections. The site driveways on Calle Tampico and Avenida La Fonda will not allow left-turn movements across the medians, so delay is not of concern at these two locations. The future traffic volumes expected on Avenida Bermudas and Desert Club Drive are low enough that site driveways on these streets will operate at acceptable levels of service during peak hours without warranting signals.

Approximately half of the parking for the proposed development (200 spaces) will be located within the area bounded by Calle Tampico, Avenida Bermudas, Avenida La Fonda, and Desert Club Drive. The rest will be located east of Desert Club Drive, west of Avenida Bermudas, or in the median of Avenida La Fonda, adjacent to the site. To access these parking areas, people visiting the proposed development will have to walk across one of these three streets upon their arrival and again prior to their departure.

These pedestrians may be carrying shopping bags or pushing baby strollers. They may be young and walk very quickly, or elderly with a more sedate pace. They may be crossing the street in the peak hour or after dark. They will adversely affect the capacity of the roadway they cross. However, these roadways are two-lane streets with relatively low speed traffic. Future traffic volumes projected along these roadways indicate that there will be sufficient gaps in the vehicle stream for pedestrians to cross safely. Adequate lighting and sight distance will be necessary to ensure that these pedestrians can see and be seen by motorists. Specific design strategies to improve pedestrian safety will be developed as needed in the design review process.

V.B CAPACITY AND LEVEL OF SERVICE AND IMPROVEMENT ANALYSIS

Roadway capacity has been defined as the maximum number of vehicles that can pass over a given roadway during a given time period under prevailing roadway and traffic conditions. By comparison, levels of service are a relative measure of driver satisfaction, with values ranging from A (free flow) to F (forced flow). Levels of service (LOS) reflect a number of factors such as speed and travel time, traffic interruptions, vehicle delay, freedom to maneuver, driver comfort and convenience, safety and vehicle operating costs.

Peak hour traffic creates the heaviest demand on the circulation system and the lane configuration at intersections is the limiting factor in roadway capacity; consequently, peak hour intersection capacity analyses are useful indicators of "worst-case" conditions. The relationship between peak hour intersection capacity and levels of service is provided in Appendix 2 (Table A-2) for unsignalized intersections and Appendix 3 (Table A-3) for signalized intersections. The City of La Quinta has defined Level of Service "D" as the minimum adequate intersection service level during peak hours for planning and design purposes.

Existing Traffic Conditions

Unsignalized Intersection Analysis

Four of the six existing key intersections in the project vicinity are currently unsignalized and controlled by STOP signs. The measure of effectiveness for unsignalized intersections is the average approach control delay per vehicle. The 1998 update to the *Highway Capacity Manual* (TRB Special Report 209) includes an unsignalized intersection operational methodology which is the basis for determining unsignalized intersection delay. One of the key unsignalized intersections (Desert Club Drive @ Avenue 52) was evaluated with the methodology outlined in the 1998 *Highway Capacity Manual* (HCM). A general discussion of this methodology and the LOS criteria that apply are included in Appendix 2.

The Highway Capacity Software (HCS) package is a direct computerized implementation of the 1998 HCM procedures, prepared under FHWA sponsorship and maintained by the McTrans Center at the University of Florida Transportation Research Center. HCS Release 3.1b was employed to assess the intersection of Desert Club Drive @ Avenue 52. Computerized HCS worksheets for the intersection analyzed are included in Appendix 2.

Existing peak hour average approach control delay per vehicle values and the corresponding level of service values for this unsignalized key intersection are provided in Table V-1, assuming an eight percent truck mix and existing lane geometrics (as shown in Figure VI-1). It can be seen from Table V-1, that the delay at this intersection on the major left ranges from 9.5 to 9.8 seconds per vehicle, which corresponds to LOS A. The northbound approach has the most delay (23.1 to 19.3 seconds per vehicle). This corresponds to LOS C during the peak hours.

Three of the four unsignalized key intersections could not be analyzed with the 1998 HCM methodology. Eisenhower Drive at Calle Tampico, Calle Tampico at Avenida Bermudas, and Avenida Bermudas at Avenue 52 are all-way stop-controlled (AWSC) intersections with approaches that include more than two lanes. The 1998 HCM methodology for unsignalized intersections can evaluate one-lane or two-lane approaches, but cannot be used

Table V-1
Existing Unsignalized Intersection Peak Hour Delay and LOS Summary
(Peak Season Average Weekday)

Unsignalized Intersection	Existing Condition (2001 No Project)					
	Major Left		Approach With The Most Delay		Level of Service	
	Delay ^a	Level of Service	Move	Delay		
Eisenhower Drive @ Calle Tampico ^a - AM Peak Hour - PM Peak Hour	7	B	NB	9	B	
	9	B	SB	13	C	
Avenida Bermudas @ Calle Tampico ^a - AM Peak Hour - PM Peak Hour	2	A	NB	3	A	
	4	A	NB	5	B	
Avenida Bermudas @ Avenue 52 ^a - AM Peak Hour - PM Peak Hour	29	D	NB	48	F	
	31	E	NB	68	F	
Desert Club Drive @ Avenue 52 - AM Peak Hour - PM Peak Hour	9.5	A	NB	23.1	C	
	9.8	A	NB	19.3	C	

a. Intersection delay and LOS are shown for this all-way stop controlled intersection, based upon the methodology in TRB Circular 373. (See Appendix 2 for worksheets).

b. Delay=Average Approach Control Delay (seconds/vehicle). Assumes intersection geometrics shown on Figure VI-1 and an eight percent truck mix. Based upon the 1998 *Highway Capacity Manual* Unsignalized Operation Methodology implemented by the latest release (Version 3.1b) of the Highway Capacity Software (1998). NB=northbound lane. SB=southbound lane. LOS was determined from the delay (LOS A= ≤ 10 sec./veh.; LOS B= > 10 and ≤ 15 sec./veh.; LOS C= > 15 and ≤ 25 sec./veh.; LOS D= > 25 and ≤ 35 sec./veh.; LOS E= > 35 and ≤ 50 sec./veh.; LOS F= > 50 sec./veh.) per 1998 HCM page 10-25. Appendix 2 includes all of the HCS unsignalized intersection peak hour worksheets.

to evaluate three-lane approaches. Therefore, the methodology set forth in TRB Circular 373 was employed to evaluate these three unsignalized key intersections.¹

The type of delay determined with Circular 373 is average stopped vehicle delay. It is the total elapsed time from when a vehicle enters the end of the queue until it departs from the stopped line. The LOS criteria that correspond to average stopped delay are as follows. LOS A is less than 5 seconds per vehicle. LOS B is between 5 and 10 seconds per vehicle. LOS C is between 10 and 20 seconds per vehicle. LOS D is between 20 and 30 seconds per vehicle. LOS E is between 30 and 45 seconds per vehicle. LOS F corresponds to more than 45 seconds per vehicle.

The average stopped vehicle delay for the intersections of Calle Tampico with Eisenhower Drive and with Avenida Bermudas ranges from 2 to 9 seconds per vehicle. The corresponding peak hour level of service is LOS B at the intersection of Calle Tampico and Eisenhower Drive and LOS A at the intersection of Calle Tampico and Avenida Bermudas. The approaches with the most average stopped vehicle delay are currently operating with 3 to 13 seconds per vehicle of delay. This corresponds to LOS C or better operation.

Motorists entering the intersection of Avenida Bermudas and Avenue 52 during peak hours in the peak season experience substantial delay and levels of service that do not meet the La Quinta minimum LOS D performance standard. A check of peak hour rural signal warrants indicates that this intersection currently warrants signalization. Once signalized, it will operate at acceptable levels of service. Until that time, the major left experiences 29-31 seconds per vehicle of delay, which corresponds to LOS D in the morning and LOS E in the evening peak hours. The northbound approach has the most delay, with 48 seconds per vehicle during the morning peak hours and 68 seconds per vehicle during the evening peak hours. This corresponds to LOS F operation.

Signalized Intersection Analysis

Both capacity and levels of service must be considered to evaluate the overall operational characteristics of signalized intersections. Capacity at intersections is defined for each lane group. It is the maximum rate of flow that may pass through the intersection under prevailing traffic, roadway and signalization conditions. It is generally measured or projected for a 15-minute period and stated in terms of vehicles per hour.

A separate capacity and volume-to-capacity (V/C) ratio is computed for each lane group approaching the intersection. A composite V/C ratio for the sum of the critical lane groups within the intersection is computed.

The level of service is based on the average control delay per vehicle for various intersection movements. The following parameters affect levels of service: (1) V/C ratio; (2) quality of progression; (3) length of green phases; (4) cycle lengths; and (5) average control delay.

Delay is a measure of the quality of service to the road user. An intersection cannot operate beyond its capacity indefinitely without experiencing excessive delay. For planning purposes, it is critical that adequate future capacity be provided in terms of geometric design features. Delay may be improved significantly through coordination of signals and improved signal design.

1. TRB; *Interim Materials on Unsignalized Intersection Capacity*; Transportation Research Circular 373; July 1991.

The measures of effectiveness for signalized intersections are: V/C ratios, average control delay per vehicle, and levels of service. The 1998 update to the *Highway Capacity Manual* includes a signalized intersection operational methodology which is the basis for determining signalized intersection delay. The Highway Capacity Software (HCS) package is a direct computerized implementation of the 1998 HCM procedures. HCS-3 Release 3.1b was utilized herein to evaluate the key signalized intersection in the project vicinity. A general discussion of this methodology and the computerized HCS worksheets for the signalized intersections analyzed are included in Appendix 3.

The 1998 *Highway Capacity Manual* (HCM) signalized intersection capacity and level of service methodology addresses the capacity, V/C ratio, and level of service of intersection approaches as well as the level of service of the intersection as a whole. The analysis is undertaken in terms of the ratio of demand flow rate to capacity (V/C ratio) for individual movements or approach lane groups during the peak hour and the composite V/C ratio for the sum of critical movements or lane groups within the intersection. The composite V/C ratio is an indicator of whether or not the physical geometry and signal design provide sufficient capacity for the movements.

The level of service is based upon the average control delay per vehicle. Average control delay is the total time vehicles are stopped in an intersection approach during a specified time interval divided by the volume departing from the approach during the same time period. It does not include queue follow-up time (i.e. the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position).

A critical V/C ratio less than 1.00 indicates that all movements at the intersection can be accommodated within the defined cycle length and phase sequence by proportionally allocating green time. In other words, the total available green time in the phase sequence is adequate to handle all movements, if properly allocated.

It is possible to have unacceptable delays (LOS F) while the V/C ratio is below 1.00 (when the cycle length is long, the lane group has a long red time because of signal timing and/or the signal progression for the subject movements is poor). Conversely, a saturated approach (with V/C ratio ≥ 1.00) may have low delays if the cycle length is short and/or the signal progression is favorable. Therefore, an LOS F designation may not necessarily mean that the intersection, approach or lane group is overloaded and LOS A to LOS E does not automatically imply available unused capacity.

The peak hour average control delay and corresponding levels of service were determined at the two signalized key intersections with the methodology outlined in the 1998 HCM. The peak hour intersection delay, volume-to-capacity ratios, and level of service values at the key intersections evaluated are provided in Table V-2. As shown therein, the existing peak hour average control delay ranges from 8.2 to 23.2 seconds per vehicle at the signalized key intersections. This corresponds to LOS C or better operation.

Traffic Signal Warrants

The justification for the installation of a traffic signal at an intersection is based on the warrants adopted by Caltrans and the Federal Highway Administration. There are 11 types of traffic signal warrants including one for minimum vehicular volume, interruption of continuous traffic, minimum pedestrian volume, school crossings, progressive movement, accident experience, systems organization, a combination of warrants, a four-hour volume warrant, a peak hour delay warrant, and a peak hour volume warrant.

Table V-2
Existing Signalized Intersection
Peak Hour Delay and LOS Summary
(Peak Season Average Weekday)

Signalized Intersection	Existing (Year 2001)		
	Avg. Delay ^a (Sec./Veh.)	Critical V/C	LOS ^b
Desert Club Drive @ Calle Tampico - AM Peak Hour - PM Peak Hour	8.5	0.12	A
	8.2	0.24	A
Washington Street @ Calle Tampico - AM Peak Hour - PM Peak Hour	19.4	0.36	B
	23.2	0.49	C

- a. Average Delay = Average Control Delay (seconds per vehicle). Assumes existing intersection geometrics as shown on Figure VI-1 and an eight percent truck mix. Based upon the 1998 *Highway Capacity Manual* Signalized Operation Methodology implemented by the latest release (Version 3.1b) of the Highway Capacity Software (1998). See Appendix 3 for the signalized intersection HCS worksheets.
- b. LOS was determined from the delay (≤ 10 sec./veh. = LOS A; > 10 and ≤ 20 sec./veh. = LOS B; > 20 and ≤ 35 sec./veh. = LOS C; > 35 and ≤ 55 sec./veh. = LOS D; > 55 and ≤ 80 sec./veh. = LOS E; > 80 sec./veh. = LOS F) per 1998 HCM page 9-7.

The installation of a traffic signal should be considered if one or more of the warrants is met; however, the satisfaction of a warrant is not necessarily sufficient justification in and of itself for the installation of signals. Delay, congestion, approach conditions, driver confusion, future land use or other evidence of the need for right-of-way assignment beyond that which could be provided by stop signs must be demonstrated. Improper or unwarranted signal installations may cause: (1) excessive delay; (2) disobedience of the signal indications; (3) circuitous travel on alternate routes; and (4) increased accident frequency.²

Rural volume warrants (70 percent of the urban warrants) apply when the 85th percentile speed of traffic on the major street exceeds 40 mph in either an urban or a rural area, or when the intersection lies within the built-up area of an isolated community with a population under 10,000. Given this criteria, rural warrants were applied to the currently unsignalized key intersections.

It was determined (see Appendix 4 for worksheets) that two of the key intersections appear to meet peak hour signal warrants with existing peak season traffic volumes. The intersection of Eisenhower Drive at Calle Tampico currently provides acceptable levels of service without signalization but appears to exceed peak hour volume warrants during the evening peak hour in the peak season. The intersection of Avenida Bermudas at Avenue 52 does not currently meet the City minimum LOS D performance criteria.

2. Caltrans; *Traffic Manual*; Revised 3/1/95; pg. 9-1 and 9-2.

Year 2003 Traffic Conditions

Unsignalized Intersection Analysis

Table V-3 provides the unsignalized intersection average approach control delay per vehicle and LOS for the left-turn from the major street and the worst-case minor street approach at the intersection of Desert Club Drive and Avenue 52. Year 2003 conditions are shown with and without the proposed project. An eight percent truck mix and the lane geometrics shown in Figure VI-1 were assumed to develop the delay and LOS values in Table V-3. The lane geometrics assumed are existing intersection geometrics.

Before site traffic is added to the street network in the year 2003, this unsignalized key intersection will provide LOS C operation during peak hours on the "worst-case" minor street approach. Once project-related traffic volumes are added to year 2003 non-site volumes, the average approach control delay at this intersection will increase. Peak hour traffic associated with the proposed project will increase the average approach control delay by up to 2.3 seconds per vehicle during the morning peak hour and up to 1.6 seconds per vehicle during the evening peak hour at the intersection of Desert Club Drive and Avenue 52.

It can be seen from Table V-3 that the increased average approach control delay during peak hours will be sufficient to change the levels of service on the minor street approach. When the proposed project is completed in the year 2003, the morning peak hour level of service on the minor street approach of the intersection of Desert Club Drive and Avenue 52 will drop from LOS C to LOS D.

Signalized Intersection Analysis

The peak hour delay and levels of service were determined for the signalized key intersections with the methodology outlined in the 1998 HCM. The peak hour intersection delay, volume-to-capacity ratios, and level of service values at the key intersections evaluated are provided in Table V-4 for conditions with and without project-related traffic.

An eight percent truck mix and the existing intersection approach lane geometrics depicted in Figure VI-1 were assumed to develop the delay and LOS values in Table V-4. As shown therein, average control delay is projected to increase at all five signalized key intersections when site traffic is added to ambient traffic in the year 2003. The increased delay will drop the peak hour LOS at two intersections.

The projected increase in average control delay at the intersection of Calle Tampico and Desert Club Drive will drop the peak hour level of service from LOS A to LOS B during the morning and evening peak hours. At the intersection of Washington Street and Calle Tampico, the delay will increase by 5.8 seconds per vehicle during the morning peak hour and 4.3 seconds per vehicle during the evening peak hour. This change in intersection delay will drop the evening peak hour level of service from LOS C to LOS D at this intersection.

No other changes in levels of service are projected to occur in the year 2003 when site traffic is added to the street system in the study area. The key intersections will operate at acceptable levels of service during peak hours in the year 2003 with or without the additional traffic generated by the proposed project, provided the intersection of Avenida Bermudas and Avenue 52 is signalized by the City of La Quinta as planned.

Table V-3
Year 2003 Unsignalized Intersection
Peak Hour Delay and LOS Summary^a

Unsignalized Intersection	No-Project		With Project		Change In	
	Major Left Delay/LOS	Minor Approach Move Delay/LOS	Major Left Delay/LOS	Minor Approach Move Delay/LOS	Minor Approach Delay	Minor Approach LOS
Desert Club Drive @ Avenue 52 - AM Peak Hour - PM Peak Hour	9.5/A	NB 23.7/C	9.5/A	NB 26.0/D	2.3	C-D
	9.9/A	NB 19.9/C	10.1/B	NB 21.5/C	1.6	No

a. Delay=Average Approach Control Delay (seconds/vehicle). Assumes existing intersection geometrics shown on Figure VI-1 and an eight percent truck mix. Based upon the 1998 *Highway Capacity Manual* Unsignalized Operation Methodology implemented by the latest release (Version 3.1b) of the Highway Capacity Software (1998). NB=northbound. LOS was determined from the delay (LOS A= ≤ 10 sec./veh.; LOS B= $\Rightarrow 10$ and ≤ 15 sec./veh.; LOS C= $\Rightarrow 15$ and ≤ 25 sec./veh.; LOS D= $\Rightarrow 25$ and ≤ 35 sec./veh.; LOS E= $\Rightarrow 35$ and ≤ 50 sec./veh.; LOS F= $\Rightarrow 50$ sec./veh.) per 1998 HCM page 10-25. Appendix 2 includes all of the HCS unsignalized intersection peak hour worksheets.

Table V-4
Year 2003 Signalized Intersection Peak Hour Delay and LOS Summary^a
(Peak Season Average Weekday)

Signalized Intersection	No-Project			With Project			Change In	
	Avg. Delay (Sec./Veh.)	Critical V/C	LOS	Avg. Delay (Sec./Veh.)	Critical V/C	LOS	Avg. Delay (Sec./Veh.)	LOS
Eisenhower Drive @ Calle Tampico	- AM Peak Hour	6.7	0.32	A	9.4	0.40	2.7	No
	- PM Peak Hour	12.0	0.41	B	13.1	0.44	1.1	No
Avenida Bermudas @ Calle Tampico	- AM Peak Hour	4.3	0.12	A	6.0	0.27	1.7	No
	- PM Peak Hour	11.3	0.47	B	11.3	0.57	0.0	No
Desert Club Drive @ Calle Tampico	- AM Peak Hour	9.3	0.20	A	10.9	0.31	1.6	A-B
	- PM Peak Hour	9.5	0.34	A	10.5	0.40	1.0	A-B
Washington Street @ Calle Tampico	- AM Peak Hour	25.0	0.48	C	30.8	0.62	5.8	No
	- PM Peak Hour	30.9	0.67	C	35.2	0.78	4.3	C-D
Avenida Bermudas @ Avenue 52	- AM Peak Hour	5.6	0.42	A	7.5	0.43	1.9	No
	- PM Peak Hour	10.4	0.63	B	11.9	0.66	1.5	No

a. Average Delay = Average Control Delay (seconds per vehicle). Assumes existing intersection geometrics and an eight percent truck mix. Based upon the 1998 *Highway Capacity Manual* Signalized Operation Methodology implemented by the latest release (Version 3.1b) of the Highway Capacity Software (1998). LOS was determined from the delay (≤ 10 sec./veh.=LOS A; > 10 and ≤ 20 sec./veh.=LOS B; > 20 and ≤ 35 sec./veh.=LOS C; > 35 and ≤ 55 sec./veh.=LOS D; > 55 and ≤ 80 sec./veh.=LOS E; > 80 sec./veh. = LOS F) per 1998 HCM page 9-7. See Appendix 3 for the signalized intersection HCS worksheets.

Year 2020 Traffic Conditions

Unsignalized Intersection Analysis

Table V-5 provides the unsignalized intersection average approach control delay per vehicle and the corresponding LOS for the left-turn from the major street and the “worst-case” minor street approach at the intersection of Desert Club Drive and Avenue 52. Year 2020 traffic volumes with and without the proposed project and an eight percent truck mix were assumed. Existing intersection lane geometrics were assumed in the analysis of the unsignalized key intersections for the year 2020.

Without site traffic, the unsignalized intersection of Desert Club Drive and Avenue 52 will provide acceptable levels of service (LOS D or better operation) during peak hours on the “worst-case” minor street approach. Once project-related traffic volumes are added to year 2020 non-site volumes, the average approach control delay at this intersection will increase. Traffic associated with the proposed project will increase peak hour delay on the minor approach by 2.7 seconds per vehicle during the morning peak hour and 1.9 seconds per vehicle during the evening peak hour. It can be seen from Table V-5 that the increased average approach control delay during peak hours will be insufficient to change the level of service on the minor street approach at this intersection.

Signalized Intersection Analysis

The peak hour levels of service were determined at the signalized key intersections with the methodology outlined in the 1998 HCM. The peak hour intersection delay, volume-to-capacity ratios, and level of service values at the key intersections evaluated are provided in Table V-6 for conditions with and without site traffic.

Existing intersection lane geometrics were assumed for the year 2020 evaluation of signalized key intersections with one exception, as shown in Figure VI-2. It was necessary to assume the addition of a second eastbound left-turn lane on Calle Tampico at the intersection of Washington Street to achieve acceptable levels of service.

Year 2020 No-Project average control delay values during peak hours are projected to range from 4.7 seconds per vehicle to 27.8 seconds per vehicle. The year 2020 No-Project LOS values indicate that all of the signalized key intersections will provide level of service C or better operation during the morning and evening peak hours, prior to the introduction of site traffic. The addition of a second eastbound left-turn lane on Calle Tampico at the intersection of Washington Street is required to achieve acceptable operation during peak hours.

The addition of project-related traffic volumes to year 2020 non-site volumes will increase the average control delay during peak hours at the signalized key intersections by up to 5.1 seconds per vehicle. It will also cause the peak hour LOS value to drop from LOS A to LOS B during the peak hours at one of the five key intersections (Desert Club Drive @ Calle Tampico).

Table V-5
 Year 2020 Unsignalized Intersection Peak Hour Delay and LOS Summary^a
 (Peak Season Average Weekday)

Unsignalized Intersection	No-Project			With Project			Change In	
	Major Left Delay/LOS	Minor Approach Move	Minor Approach Delay/LOS	Major Left Delay/LOS	Minor Approach Move	Minor Approach Delay/LOS	Minor Approach Delay	Approach LOS
Desert Club Drive @ Avenue 52 - AM Peak Hour - PM Peak Hour	9.8/A 10.2/B	NB NB	26.6/D 22.4/C	9.8/A 10.5/B	NB NB	29.3/D 24.3/C	2.7 1.9	No No

a. Delay=Average Approach Control Delay (seconds/vehicle). Assumes existing intersection geometrics and an eight percent truck mix. Based upon the 1998 *Highway Capacity Manual* Unsignalized Operation Methodology implemented by the latest release (Version 3.1b) of the Highway Capacity Software (1998). NB=northbound. LOS was determined from the delay (LOS A= ≤ 10 sec./veh.; LOS B= ≤ 15 sec./veh.; LOS C= ≤ 25 sec./veh.; LOS D= ≤ 35 sec./veh.; LOS E= ≤ 50 sec./veh.; LOS F= ≤ 50 sec./veh.) per 1998 HCM page 10-25. Appendix 2 includes all of the HCS unsignalized intersection peak hour worksheets.

Table V-6
Year 2020 Signalized Intersection Peak Hour Delay and LOS Summary^a
(Peak Season Average Weekday)

Signalized Intersection	No-Project			With Project			Change In	
	Avg. Delay (Sec./Veh.)	Critical V/C	LOS	Avg. Delay (Sec./Veh.)	Critical V/C	LOS	Avg. Delay (Sec./Veh.)	LOS
Eisenhower Drive @ Calle Tampico - AM Peak Hour - PM Peak Hour	6.7	0.34	A	9.4	0.43	A	2.7	No
	12.2	0.44	B	13.5	0.47	B	1.3	No
Avenida Bermudas @ Calle Tampico - AM Peak Hour - PM Peak Hour	4.7	0.13	A	6.2	0.28	A	1.5	No
	11.6	0.49	B	11.4	0.60	B	-0.2	No
Desert Club Drive @ Calle Tampico - AM Peak Hour - PM Peak Hour	9.3	0.21	A	10.9	0.32	B	1.6	A-B
	9.5	0.35	A	10.7	0.42	B	1.2	A-B
Washington Street @ Calle Tampico - AM Peak Hour - PM Peak Hour	(Assumes Dual Eastbound Left Lanes)							
	23.1	0.56	C	27.4	0.65	C	4.3	No
Avenida Bermudas @ Avenue 52 - AM Peak Hour - PM Peak Hour	(Assumes Dual Eastbound Lefts)							
	27.8	0.76	C	32.9	0.83	C	5.1	No
Avenida Bermudas @ Avenue 52 - AM Peak Hour - PM Peak Hour	5.6	0.46	A	7.5	0.47	A	1.9	No
	11.1	0.69	B	12.8	0.72	B	1.7	No

a. Average Delay = Average Control Delay (seconds per vehicle). Assumes intersection geometrics shown on Figure VI-2 (i.e. the additional eastbound left-turn lane noted above) and an eight percent truck mix. Based upon the 1998 *Highway Capacity Manual* Signalized Operation Methodology implemented by the latest release (Version 3.1b) of the Highway Capacity Software (1998). LOS was determined from the delay (≤ 10 sec./veh.=LOS A; >10 and ≤ 20 sec./veh.=LOS B; >20 and ≤ 35 sec./veh.=LOS C; >35 and ≤ 55 sec./veh.=LOS D; >55 and ≤ 80 sec./veh.=LOS E; >80 sec./veh.=LOS F) per 1998 HCM page 9-7. See Appendix 3 for the signalized intersection HCS worksheets.

VI. FINDINGS AND CONCLUSIONS

VI.A SITE ACCESSIBILITY

The project has adequate access to serve the proposed land uses. The existing lane geometrics at the key intersections are shown in Figure VI-1. Signalization of the intersection of Avenida Bermudas and Avenue 52 is required to accommodate site traffic at acceptable levels of service in the year 2003. The addition of a second eastbound left-turn lane on Calle Tampico at Washington Street (as shown in Figure VI-2) is required to accommodate site traffic and cumulative traffic in the year 2020.

The commercial development area is within the central part of the project surrounded by Calle Tampico to the north, Avenida Bermudas to the west, Desert Club Drive to the east, and Avenida La Fonda to the south. The central portion of the project is served by six driveways, two full access driveways each on Avenida Bermudas and Desert Club Drive. There is a right-turn only driveway on Calle Tampico and another on Avenida La Fonda. Both Calle Tampico and Avenida La Fonda include a raised median which will prevent left-turn access.

Parking Considerations

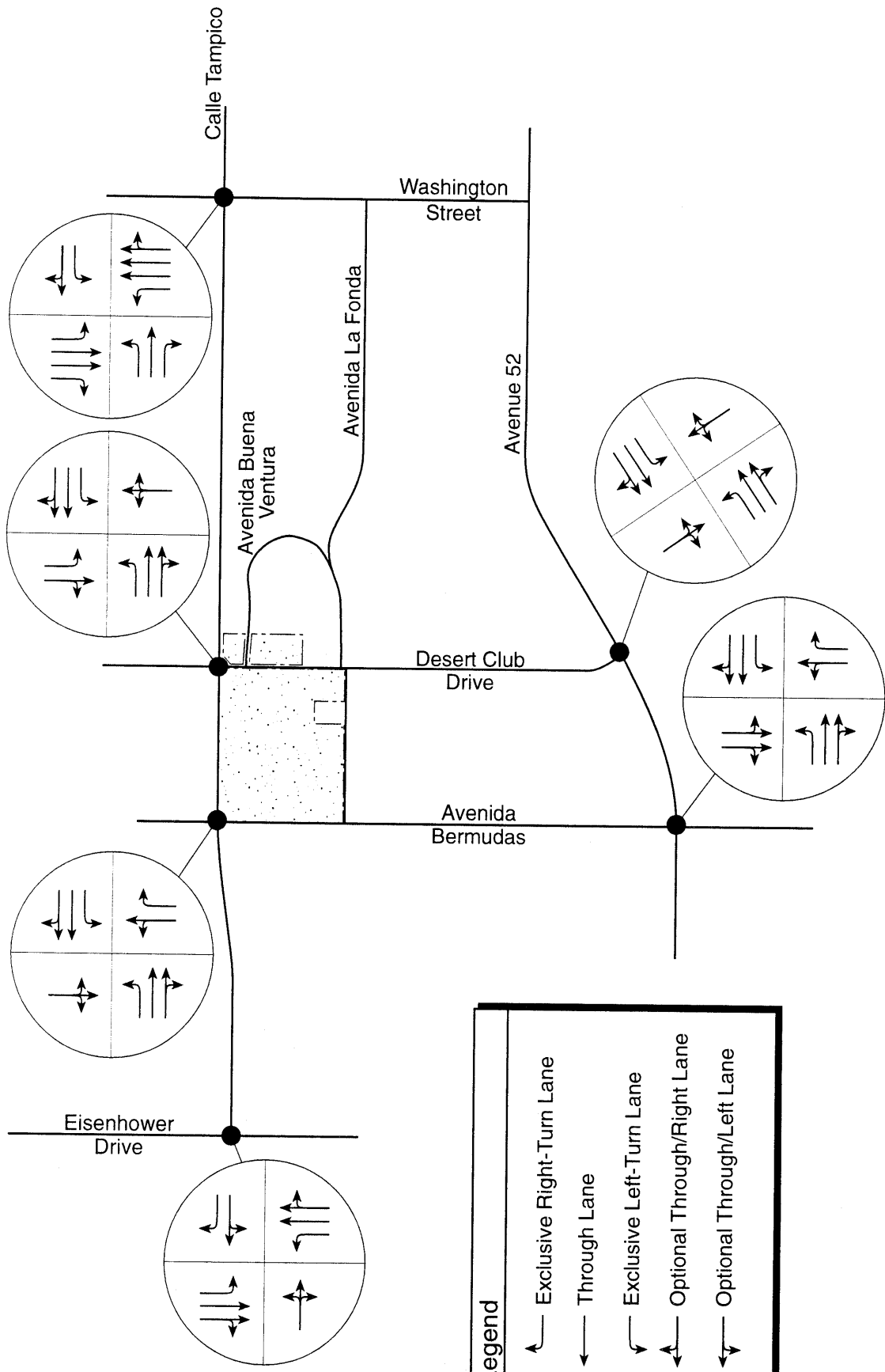
Site traffic will be distributed to several parking areas in the vicinity including: parking areas provided on-site, parking lots proposed adjacent to the site, and public parking areas provided by the City of La Quinta in the site vicinity. Approximately half of the project parking demand will be accommodated within the portion of the site bounded by Calle Tampico, Avenida Bermudas, Avenida La Fonda and Desert Club Drive. The remainder will be satisfied by the following parking areas: (1) a 15-space lot west of Avenida Bermudas and south of Calle Tampico; (2) a 137-space lot west of Avenida Bermudas opposite Avenida La Fonda; (3) 58 parking spaces in a median island on Avenida La Fonda opposite the site; and (4) a 40-space parking lot (part of the proposed project) east of Desert Club Drive and south of Avenida Buena Ventura. The project proponent also controls the southeast corner of the intersection of Calle Tampico and Desert Club Drive and could provide an additional 16 off-street parking spaces on this corner, if necessary.

Many of the parking areas will require pedestrians to cross one of the streets surrounding the project site. Visitors to the project site utilizing the parking lot located adjacent to Calle Tampico can cross Avenida Bermudas at the traffic signal. People utilizing the median parking on Avenida La Fonda can use a mid-block crosswalk to reach the median, but will probably opt instead to make uncontrolled crossings of Avenida La Fonda to minimize the distance walked. With the relatively low traffic volumes on Avenida La Fonda, this pedestrian movement is not expected to be difficult.

Pedestrian Treatments

The largest external parking lot is a public lot located west of Avenida Bermudas, (southwest of the project site) opposite Avenida La Fonda. To facilitate pedestrian access to this parking area, the proposed project includes a mid-block crosswalk located on Avenida Bermudas (north of Avenida La Fonda, between the two bus pullouts) south of the proposed site driveway.

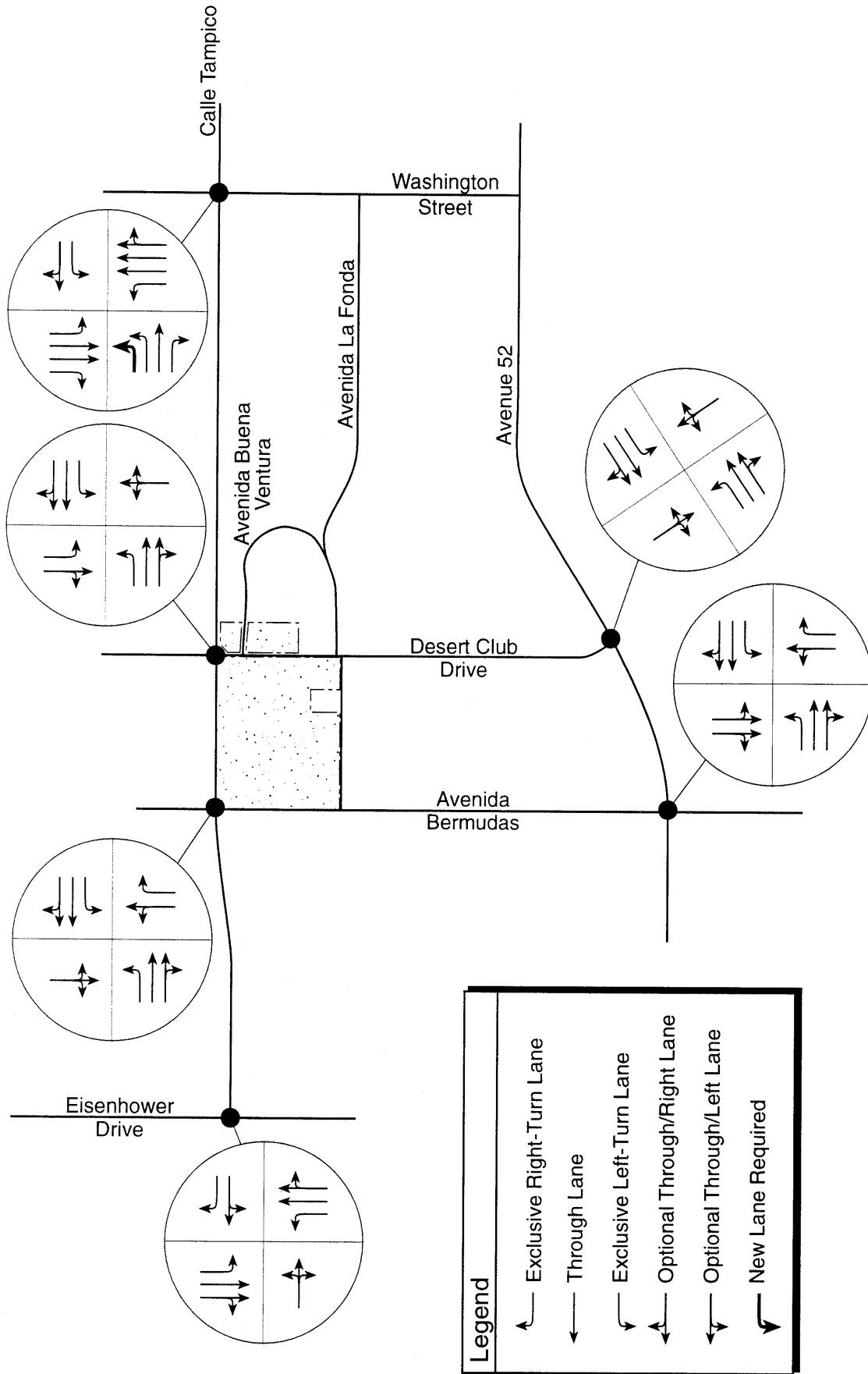
Figure VI-1
Existing Lane Geometrics



Legend	
	Exclusive Right-Turn Lane
	Through Lane
	Exclusive Left-Turn Lane
	Optional Through/Right Lane
	Optional Through/Left Lane



Figure VI-2
Required Year 2020 Lane Geometrics



The proposed crosswalk shall include two 14-foot travel lanes. A pedestrian refuge island is proposed to reduce the crossing distance, increase pedestrian and vehicle visibility, and control vehicle paths and speeds. It will also minimize vehicle delay and provide a stopping point for the storage and protection of slow walkers who cannot cross the entire street at once or require a safe place to wait until vehicle traffic clears.

Typically, pedestrian refuge islands are provided when the total length of a crosswalk is greater than 75 feet, or in areas where there are many elderly or handicapped pedestrians.¹ The island should be at least 4 feet wide and preferably 6 feet wide.² The island should be at least 20 feet long.³ If it has a raised barrier curb design, it must have an at-grade pedestrian travel path through the island or there must be sufficient space for curb ramping and a level waiting area large enough for a wheel chair to comply with the 1992 Americans With Disabilities Act (ADA).

Final design parameters for this mid-block pedestrian crossing shall include adequate lighting, signage, striping and vertical and horizontal sight distance to reduce the potential for conflicts. For the refuge island to provide an all weather traversable path, provisions for adequate drainage should also be incorporated in the design so that storm run-off does not impede the progress of pedestrians.

Sidewalks, curbs and gutters shall be provided adjacent to the site along all four streets that border the project site. Although sidewalks are present for short distances, missing links shall be completed. Sidewalks constructed on-site shall be a minimum of 5 feet wide with a 2-foot planting strip or 7 feet wide with no planting strip.⁴

A second crosswalk is proposed across Desert Club Drive, south of Avenida Buena Ventura. This crosswalk is proposed to provide access to the 40-space project parking lot located on the east side Desert Club Drive.

VI.B TRAFFIC IMPACTS

The following are the circulation impacts associated with the proposed project:

1. All of the key intersections currently provide LOS C or better operation during peak hours in the peak season except one.
2. Motorists entering the intersection of Avenida Bermudas and Avenue 52 during peak hours in the peak season experience substantial delay and levels of service that do not meet the La Quinta minimum LOS D performance standard. This intersection currently warrants signalization and will operate at acceptable levels of service, once signalized.
3. The intersection of Eisenhower Drive at Calle Tampico currently provides acceptable levels of service without signalization but appears to exceed peak hour volume warrants during the evening peak hour in the peak season.

1. ITE. Design and Safety of Pedestrian Facilities. 12/94.
2. U.S. Dept. of Transportation. Manual on Uniform Traffic Control Devices for Streets and Highways. Washington, D.C.: U.S. Govt. Printing Office, 1988.
3. U.S. Dept. of Transportation. Manual on Uniform Traffic Control Devices for Streets and Highways. Washington, D.C.: U.S. Govt. Printing Office, 1988.
4. ITE. Design and Safety of Pedestrian Facilities. 12/94.

4. The proposed project will increase the traffic in the study area by 5,060 daily trips, of which 800 will occur during the morning peak hour (385 inbound and 415 outbound) and 614 would occur during the evening peak hour (350 inbound and 264 outbound).
5. The alternative development on-site (that would include a 30-room boutique hotel in place of 7,000 square feet of retail uses and 8,000 square feet of office floor area) would generate an increase of 4,700 daily trips, with 721 trips during the morning peak hour and 559 trips during the evening peak hour.
6. When the proposed project is completed in the year 2003, the morning peak hour level of service on the minor street approach of the intersection of Desert Club Drive and Avenue 52 will drop from LOS C to LOS D.
7. The projected increase in year 2003 average control delay at the intersection of Calle Tampico and Desert Club Drive that accompanies addition of site traffic will cause the peak hour level of service to drop from LOS A to LOS B during the morning and evening peak hours.
8. The increase in year 2003 intersection delay upon project completion will drop the evening peak hour level of service from LOS C to LOS D at the intersection of Washington Street and Calle Tampico.
9. The key intersections will operate at acceptable levels of service during peak hours in the year 2003 with or without the additional traffic generated by the proposed project, provided the intersection of Avenida Bermudas and Avenue 52 is signalized by the City of La Quinta as planned.
10. The addition of site traffic volumes to year 2020 ambient traffic volumes will cause the level of service to drop from LOS A to LOS B during the peak hours at one key intersection (Desert Club Drive @ Calle Tampico).
11. Existing intersection lane geometrics will be adequate to provide acceptable levels of service at all of the key intersections except Calle Tampico at Washington Street, where it will be necessary to add a second eastbound left-turn lane to achieve acceptable levels of service for projected year 2020 total traffic volumes.
12. All of the key intersections will operate at acceptable levels of service during peak hours in the year 2020 with or without site traffic, provided the intersection of Avenida Bermudas and Avenue 52 is signalized by the City of La Quinta as planned.

VI.C OFF-SITE IMPROVEMENTS NEEDED

Figure VI-1 depicts the existing approach lane geometrics at the key intersections. All of the off-site key intersections currently operate at acceptable levels of service during peak hours except for one. The unsignalized intersection of Avenida Bermudas and Avenue 52 currently warrants signalization, and experiences substantial delays during peak season peak hour conditions. The unsignalized intersection of Eisenhower Drive and Calle Tampico also currently appears to meet rural peak hour signal warrants.

The existing eastbound left-turn lane at the intersection of Washington Street and Calle Tampico is approximately 100 feet long. During the peak hour of the peak season, the current average storage length demand is approximately 130 feet, and the recommended storage length is approximately 195 feet. During peak travel times, the queue for the left-

turning vehicles overflows the left-turn lane and extends into the eastbound through travel lane.

Existing approach lane geometrics shown in Figure VI-1 are adequate to accommodate year 2003 traffic volumes with the proposed project at acceptable levels of service. None of the key intersections require additional lanes to provide acceptable levels of service for year 2003+project traffic volumes.

Figure VI-2 illustrates the minimum lane requirements to accommodate post 2020 traffic volumes with the proposed project at acceptable levels of service. All of the key intersections will operate at acceptable levels of service with existing lane geometrics and the improvements proposed on-site to provide access, except one (the intersection of Washington Street and Calle Tampico).

Since the post 2020 traffic projections for Washington Street at Calle Tampico show substantial growth, this intersection will require the addition of a second eastbound left-turn lane to provide acceptable levels of service, with the proposed project. The length of the existing left-turn pocket is inadequate to serve current peak traffic volumes. Consideration should be given to increasing the eastbound left-turn storage length by adding a second left-turn lane. The dual eastbound left-turn pockets should provide a desirable design length of 220 feet (1.5 times the length of the average storage demand).

VI.D COMPLIANCE WITH GENERAL PLAN CIRCULATION POLICIES

The proposed circulation system is generally consistent with the La Quinta Circulation Element policies. The one driveway proposed on Calle Tampico will be restricted to right-turn movements and does not have to comply with the 1200-foot minimum intersection spacing standard for primary arterials. The driveway on Calle Tampico appears to comply with Circulation Policy 3-3.1.3 by maintaining 250 feet between the curb returns from the nearest intersection.

VI.E CMP SYSTEM IMPROVEMENTS NEEDED

No improvements are necessary to any CMP roadways to accommodate site traffic.

VII. RECOMMENDATIONS

VII.A SITE ACCESS/CIRCULATION PLAN

The following mitigation measures are recommended to reduce potential circulation impacts associated with the proposed project and ensure adequate site access.

1. The proposed internal circulation layout shall be subject to the review and approval of the City Traffic Engineer during the development review process to insure compliance with City of La Quinta minimum access and design standards.
2. Adequate off-street parking shall be provided by the project proponent per the parking requirements of the City of La Quinta.
3. STOP signs will control exiting site traffic and clear unobstructed sight distances shall be provided at the site driveways proposed on Calle Tampico, Avenida Bermudas, Desert Club Drive, and Avenida La Fonda.

VII.B ROADWAY IMPROVEMENTS

On-Site

1. Calle Tampico, Avenida Bermudas, Desert Club Drive, and Avenida La Fonda shall be fully improved adjacent to the project site as required by the City of La Quinta. Pedestrian crosswalks shall be installed on Avenida Bermudas and Desert Club Drive, as specified by the City.

Off-Site

1. The intersection of Eisenhower Drive at Calle Tampico currently provides acceptable levels of service without signalization but appears to exceed peak hour volume warrants during the evening peak hour in the peak season. It will require signalization to adequately serve future traffic volumes.
2. Motorists entering the intersection of Avenida Bermudas and Avenue 52 during peak hours in the peak season experience substantial delay and levels of service that do not meet the La Quinta minimum LOS D performance standard. This intersection currently warrants signalization and will operate at acceptable levels of service, once signalized.
3. The intersection of Washington Street and Calle Tampico should be improved to include dual eastbound left-turn lanes to provide adequate levels of service with projected year 2020 traffic volumes, as shown in Figure VI-2.
4. The project proponent shall participate in any improvements of area wide benefit by contributing funds on a "fair share" basis, based upon established fee programs (e.g. Traffic Signal Mitigation Fee).

VII.C TRANSPORTATION SYSTEM MANAGEMENT ACTIONS

The project will not have a significant impact on any Congestion Management Plan roadways and no TSM actions are planned or proposed.