

TRAFFIC IMPACT STUDY
16958 S. WESTERN AVENUE
TOWNHOMES PROJECT
City of Gardena, California
December 6, 2016

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1.0 INTRODUCTION

1.1 Traffic Study Overview

This traffic analysis has been prepared to identify and evaluate the potential traffic impacts of the proposed 16958 S. Western Avenue Townhomes project (“proposed project”). The proposed project is situated along the east side of Western Avenue, just south of 169th Place, within the City of Gardena, California. The existing development site is bounded by residential and commercial development to the north, commercial development to the south, residential development to the east, and Western Avenue to the west. The proposed project site location and general vicinity are shown in *Figure 1-1*.

The traffic analysis follows City of Gardena traffic study guidelines¹ and is consistent with traffic impact assessment guidelines set forth in the *2010 Congestion Management Program for Los Angeles County*.² The traffic analysis also utilizes the intersection threshold criteria set forth in the Los Angeles County Department of Public Works (LACDPW) traffic study guidelines.³ This traffic analysis evaluates potential project-related impacts at two study intersections in the vicinity of the project site. The study intersections were determined in consultation with City of Gardena staff. The Intersection Capacity Utilization method was used to determine Volume-to-Capacity ratios and corresponding Levels of Service at the study intersections. A review was conducted of Los Angeles County Metropolitan Transportation Authority intersection and freeway monitoring stations to determine if a Congestion Management Program transportation impact assessment analysis is required for the proposed project.

This study (i) presents existing traffic volumes, (ii) forecasts existing traffic volumes with the proposed project traffic volumes, (iii) forecasts future traffic volumes with ambient growth and the related projects, (iv) forecasts future traffic volumes with the proposed project traffic volumes, (v) determines project-related impacts, and (vi) recommends mitigation measures, where necessary.

¹ Community Development Element Circulation of the *Gardena General Plan 2006*.

² *2010 Congestion Management Program for Los Angeles County*, Los Angeles County Metropolitan Transportation Authority, October 2010.

³ *Traffic Impact Analysis Report Guidelines*, County of Los Angeles Department of Public Works, January 1, 1997.

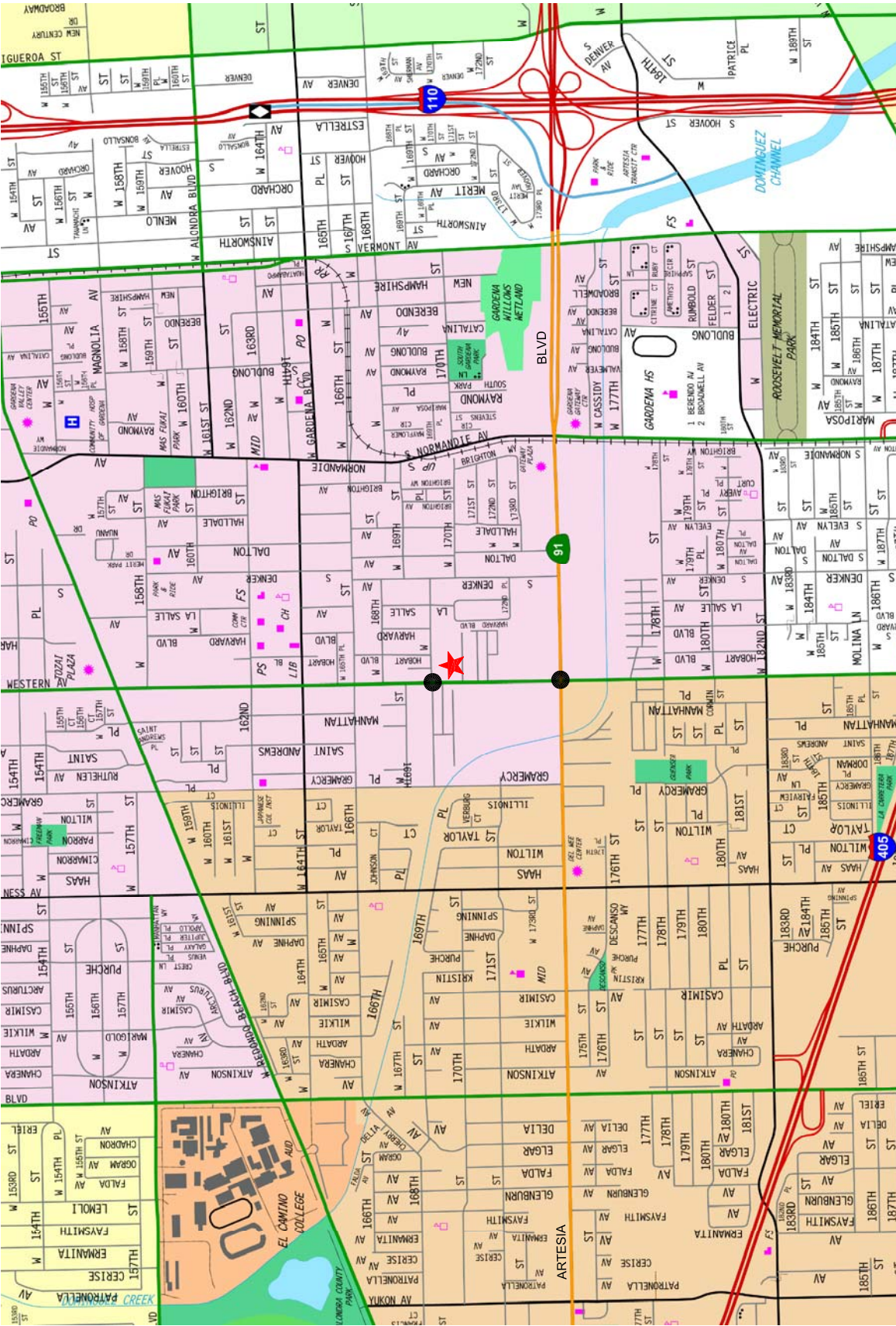
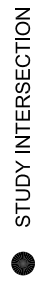


FIGURE 1-1
VICINITY MAP

MAP SOURCE: RAND MCNALLY & COMPANY



PROJECT SITE



STUDY INTERSECTION



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1.2 Study Area

Based on consultation with City of Gardena staff, a total of two study intersections has been identified for evaluation. These study locations provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. Further discussion of the existing street system and study area is provided in Section 4.0 herein.

The general location of the project in relation to the study locations and surrounding street system is presented in *Figure 1-1*. The traffic analysis study area is generally comprised of those locations which have the greatest potential to experience significant traffic impacts due to the proposed project as defined by the Lead Agency.

In the traffic engineering practice, the study area generally includes those intersections that are:

- a. Immediately adjacent or in close proximity to the project site;
- b. In the vicinity of the project site that are documented to have current or projected future adverse operational issues; and
- c. In the vicinity of the project site that are forecast to experience a relatively greater percentage of project-related vehicular turning movements (e.g., at freeway ramp intersections).

It is anticipated that all project-related trips will utilize major arterials (e.g., Western Avenue, Artesia Boulevard, etc.) to travel to and from the project site, and that local residential streets will not be used due to the circuitous and discontinuous configuration of these nearby roadways. As an example, exiting site-related motorists are not expected to utilize local roadways such as 169th Place, Denker Avenue, 170th Street and/or Dalton Avenue to access Artesia Boulevard to head to points east. These local roadways contain impedances such as stop signs, adjacent parked vehicles on both sides of the road, and multiple residential driveway curb cuts when compared to the southbound Western Avenue to eastbound Artesia Boulevard departure route. Further, it is important to note that a center two-way left-turn lane exists on Western Avenue in the vicinity of the project driveway which provides a refuge area for exiting site-related motorists such that a gap in only the northbound traffic flow (i.e., two northbound through travel lanes) is needed to head south on Western Avenue. The existing traffic signal at the Western Avenue/169th Place intersection also provides additional gaps in the opposing southbound traffic flow. Other travel routes through the residential neighborhoods (to access eastbound Artesia Boulevard) are not expected to occur as these routes would require three to five stops and/or turns compared to just one stop or turn with the direct Western Avenue to eastbound Artesia Boulevard route. Lastly, turning left onto Artesia Boulevard (e.g., from Denker Avenue) would require a gap in both the eastbound and westbound traffic flows (i.e., three through travel lanes in each direction). This is a difficult maneuver as no two-way left-turn lane is provided in the middle of Artesia Boulevard and no traffic signal is provided.

The locations selected for analysis herein were based on the above criteria, the proposed 16958 S. Western Avenue Townhomes project peak hour vehicle trip generation, the anticipated distribution of project vehicular trips and existing intersection/corridor operations.

1.3 Overview of Senate Bill 743

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743 (Steinberg, 2013). Among other things, SB 743 creates a process to change analysis of transportation impacts (Public Resources Code section 21000 and following) under the California Environmental Quality Act (CEQA), which could include analysis based on project vehicle miles traveled (VMT) rather than impacts to intersection Level of Service. On December 30, 2013, the State of California Governor's Office of Planning and Research (OPR) released a preliminary evaluation of alternative methods of transportation analysis. The intent of the original guidance documentation was geared towards projects within areas that are designated as transit priority areas first, to be followed by other areas of the State. OPR issued another draft discussion document last March, 2015, suggesting some new revisions to the formal CEQA guidelines. OPR has recently issued another guidance document (January 2016) and is requesting additional input. OPR has not issued a final guidance document with respect to implementing the traffic CEQA analysis component of SB 743; thus, this analysis utilizes existing, long-established protocols in accordance with CEQA, the existing CEQA Guidelines, and the City of Los Angeles' CEQA Thresholds guidance document.

2.0 PROJECT DESCRIPTION

2.1 Site Location

The proposed project site is located at 16958 South Western Avenue within the City of Gardena, California. The proposed project is situated along the east side of Western Avenue, just south of 169th Place. The existing development site is bounded by residential and commercial development to the north, commercial development to the south, residential development to the east, and Western Avenue to the west. The proposed 16958 S. Western Avenue Townhomes project site location and general vicinity are shown in *Figure 1-1*.

2.2 Existing Project Site

The existing project site comprises approximately 2.31 acres and is currently occupied by a recreational vehicle (e.g., boats, RVs, etc.) surface storage facility. A total of roughly 198 angle parking spaces are currently provided for recreational vehicles on the existing project site. All of the existing surface parking facility will be removed to accommodate development of the proposed project. An aerial photograph of the existing project site, the adjacent roadways, and the existing site access points is presented in *Figure 2-1*. As indicated in *Figure 2-1*, the existing project site currently accommodates vehicular access via two site driveways located along the westerly property frontage (i.e., along Western Avenue).

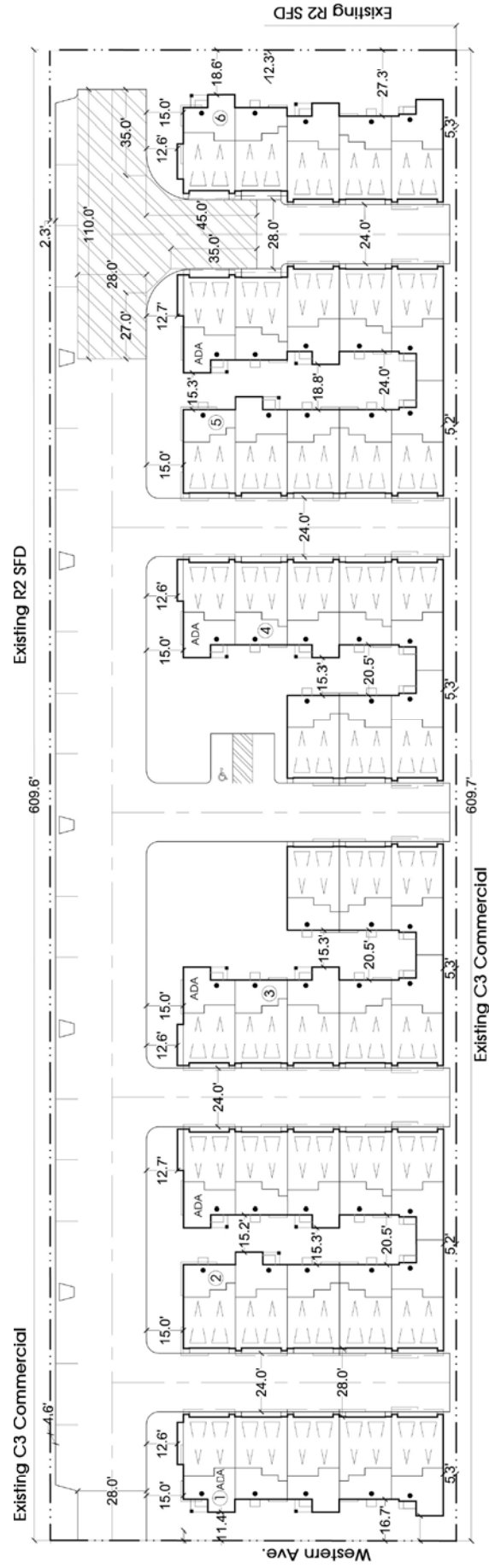
2.3 Project Description

The proposed project consists of the development of a multi-family residential complex with townhome type dwelling units. A total of 46 townhome dwelling units is planned to be provided within the proposed 16958 S. Western Avenue Townhomes project site. Construction of the proposed project is expected to commence in year 2017 with build-out in year 2019. The site plan for the proposed project is illustrated in *Figure 2-2*. Vehicular access to the proposed project is planned to be provided via a single driveway on Western Avenue. Further discussion of the project's site access and circulation scheme is provided in Section 3.0.

2.4 Project Parking

The number of parking spaces required to support the 16958 S. Western Avenue Townhomes project was calculated using the parking City Code requirements as contained in *Chapter 18.40 Off-Street Parking and Loading* of the City of Gardena Municipal Code and applied to the number of townhome dwelling units. Specifically, Section 18.40.040 (Number of spaces required) applies to the proposed land use associated with the proposed 16958 S. Western Avenue Townhomes project. The City's Code parking requirements for the proposed land use are as follows:

- “A. Two Family and Multiple-family dwellings: Two spaces in a garage or in an enclosed parking facility, per dwelling unit.”



SOURCE: WILLIAM HEZMALHALCH ARCHITECTS INC.



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FIGURE 2-2
SITE PLAN

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Direct application of the City Code parking requirements for the project site results in a City Code requirement of 92 parking spaces. A total of 115 parking spaces, including 92 resident spaces and 23 guest spaces, is planned to be provided as part of the proposed project. Accordingly, the planned site parking supply more than satisfies the City Code parking requirement for the proposed 16958 S. Western Avenue Townhomes project.

3.0 SITE ACCESS AND CIRCULATION

3.1 Existing Vehicular Site Access

As indicated in *Figure 2-1*, the existing project site currently accommodates vehicular access via two site driveways located along the westerly property frontage (i.e., along Western Avenue). The southerly driveway presently provides inbound access to the site and accommodates both left-turn and right-turn ingress turning movements. The internal drive-aisle is one-way allowing for a counterclockwise circulation scheme and back-in/head-out movements into/out of the recreational vehicle surface parking spaces. The northerly driveway presently provides outbound access from the site and accommodates both left-turn and right-turn egress turning movements. These access points will be closed as part of the proposed project.

3.2 Proposed Project Vehicular Site Access

As presented in *Figure 2-2*, vehicular access to the proposed project is planned to be provided via a single driveway on Western Avenue. The proposed project site driveway will be located along the westerly property frontage (i.e., along Western Avenue) at the northwest corner of the project site. The planned project site driveway will be situated in essentially the same location as the existing northerly site driveway. The proposed project site driveway will accommodate left-turn and right-turn vehicular ingress and egress turning movements. The project site driveway will be constructed to City of Gardena design standards.

3.3 Pedestrian Access

The proposed 16958 S. Western Avenue Townhomes project is located along a major corridor and in close proximity to numerous commercial business land uses. The project is well located to encourage pedestrian activity and walking as a transportation mode.⁴ Walkability is a term for the extent to which walking is readily available as a safe, connected, accessible and pleasant mode of transport. There are several criteria that are widely accepted as key aspects of the walkability of urban areas that should be satisfied. The underlying principle is that pedestrians should not be delayed, diverted, or placed in danger. The widely accepted characteristics of walkability are as follows:

- Connectivity: People can walk from one place to another without encountering major obstacles, obstructions, or loss of connectivity.
- Convivial: Pedestrian routes are friendly and attractive, and are perceived as such by pedestrians.

⁴ For example, refer to <http://www.walkscore.com/>, which generates a walkability score of approximately 81 (Very Walkable) out of 100 for the project site. Walk Score calculates the walkability of an address by locating nearby stores, restaurants, schools, parks, etc. Walk Score measures how easy it is to live a car-lite lifestyle—not how pretty the area is for walking.

- Conspicuous: Suitable levels of lighting, visibility and surveillance over its entire length, with high quality delineation and signage.
- Comfortable: High quality and well-maintained footpaths of suitable widths, attractive landscaping and architecture, shelter and rest spaces, and a suitable allocation of roadspace to pedestrians.
- Convenient: Walking is a realistic travel choice, partly because of the impact of the other criteria set forth above, but also because walking routes are of a suitable length as a result of land use planning with minimal delays.

The project site is situated within walking distance to retail, restaurant, and other commercial businesses within the area. Pedestrian amenities in the area foster a favorable environment for walking as a transportation mode, which is evidenced by the considerable level of pedestrian activity in the area. Further, regional and local public bus transit stops are provided nearby on Western Avenue, 169th Place and Artesia Boulevard.

4.0 EXISTING STREET SYSTEM

4.1 Study Intersections

Immediate access to the proposed 16958 S. Western Avenue Townhomes project site is via Western Avenue. The following two study intersections were selected for analysis in consultation with City staff in order to determine potential impacts related to the proposed project:

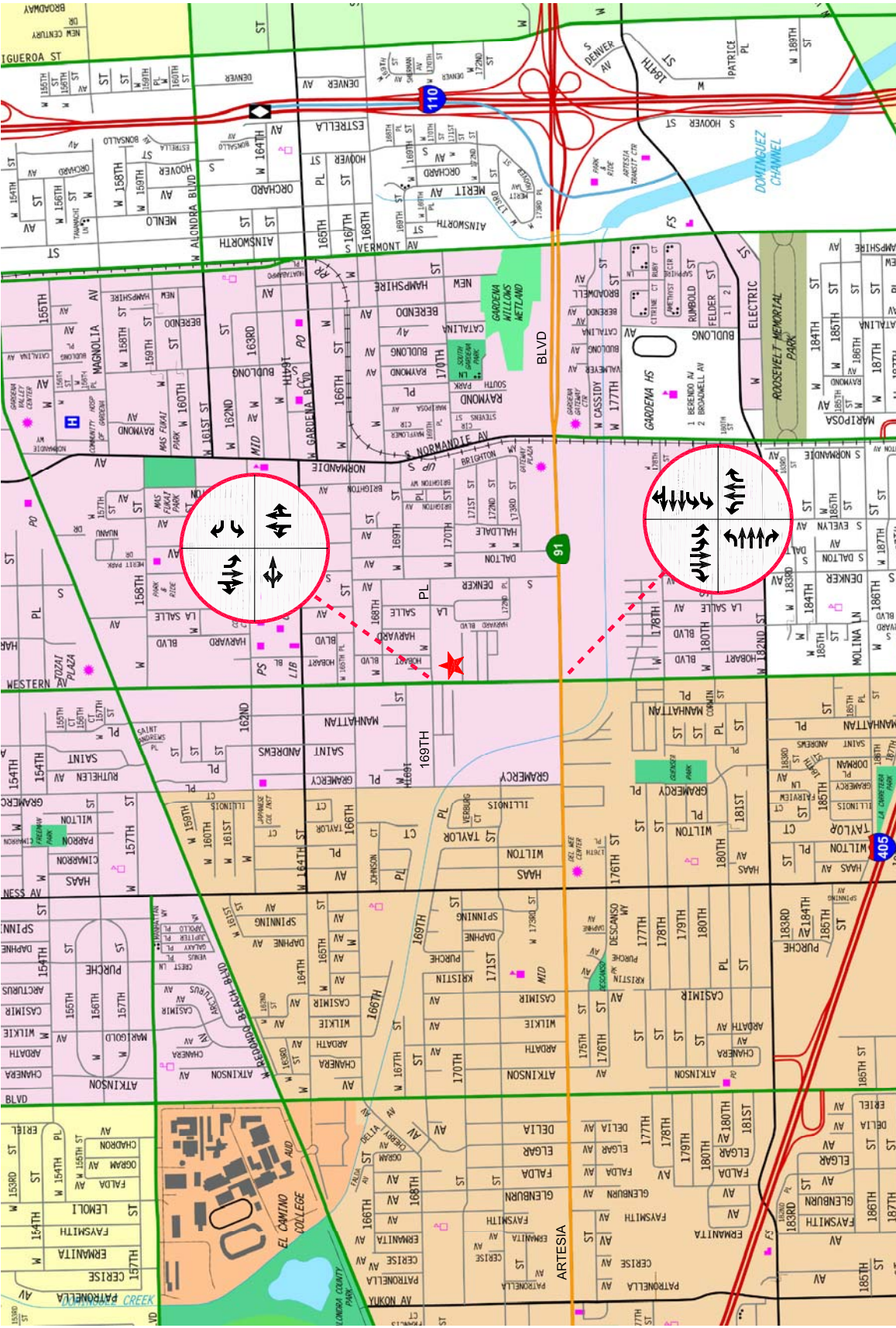
1. Western Avenue/169th Place
2. Western Avenue/Artesia Boulevard

Both of the study intersections are presently controlled by traffic signals. The existing roadway configurations and intersection controls at the study intersections are displayed in **Figure 4-1**.

4.2 Roadway Classifications

The City of Gardena utilizes the roadway categories recognized by regional, state and federal transportation agencies. There are four categories in the roadway hierarchy, ranging from freeways with the highest capacity to two-lane undivided roadways with the lowest capacity. The roadway categories are summarized as follows:

- *Freeways* are limited-access and high speed travel ways included in the state and federal highway systems. Their purpose is to carry regional through-traffic. Access is provided by interchanges with typical spacing of one mile or greater. No local access is provided to adjacent land uses.
- *Arterial* roadways are major streets that primarily serve through-traffic and provide access to abutting properties as a secondary function. Arterials are generally designed with two to six travel lanes and their major intersections are signalized. This roadway type is divided into two categories: principal and minor arterials. Principal arterials are typically four-or-more lane roadways and serve both local and regional through-traffic. Minor arterials are typically two-to-four lane streets that service local and commute traffic.
- *Collector* roadways are streets that provide access and traffic circulation within residential and non-residential (e.g., commercial and industrial) areas. Collector roadways connect local streets to arterials and are typically designed with two through travel lanes (i.e., one through travel lane in each direction) that may accommodate on-street parking. They may also provide access to abutting properties.
- *Local* roadways distribute traffic within a neighborhood, or similar adjacent neighborhoods, and are not intended for use as a through-street or a link between higher capacity facilities such as collector or arterial roadways. Local streets are fronted by residential uses and do not typically serve commercial uses.



NOT TO SCALE

MAP SOURCE: RAND MCNALLY & COMPANY
★ PROJECT SITE

FIGURE 4-1
EXISTING STREET SYSTEM

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4.3 Roadway Descriptions

A review of the important roadways in the project vicinity and study area is summarized in **Table 4-1**. As indicated in *Table 4-1*, the roadways within the project study area were reviewed in terms of the number of lanes provided, median types, posted speed limits, etc. Additionally, the roadway classifications of key roads in the project study area also are presented in *Table 4-1*.

4.4 Existing Public Bus Transit Service

Public bus transit service within the project study area is currently provided by Los Angeles County Metropolitan Transportation Authority (Metro) and City of Gardena Transit. A summary of the existing transit service, including the transit route, destinations and peak hour headways is presented in **Table 4-2**.

Table 4-1
EXISTING ROADWAY DESCRIPTIONS

Roadway	Classification [1]	Travel Lanes		Median Types [4]	Speed Limit
		Direction [2]	No. Lanes [3]		
Western Avenue	Arterial	N/S	4	2WLT	40
169th Street	Local Street	E/W	2	N/A	25
169th Place	Local Street	E/W	2	N/A	25
Artersia Boulevard	Arterial	E/W	6	RMI	45

Notes:

[1] Roadway classifications obtained from the *City of Gardena General Plan, 2006*.

[2] Direction of roadways in the project area: N/S - North/South; and E/W - East/West.

[3] Number of lanes in both directions of the roadway.

[4] Median type of the road: RMI - Raised Median Island; 2WLT - 2-Way Left-Turn Lane; and N/A-Not Applicable.

Table 4-2
EXISTING TRANSIT ROUTES [1]

ROUTE	DESTINATIONS	ROADWAY(S) NEAR SITE	NO. OF BUSES/TRAINS DURING PEAK HOUR		
			DIR	AM	PM
Metro 130	Redondo Beach to Cerritos via Hermosa Beach, Harbor Gateway, Compton, North Long Beach and Bellflower	Western Avenue, Artesia Boulevard	EB	2	2
			WB	3	2
Metro 344	Rancho Palos Verdes to Harbor Gateway via Rolling Hills Estates, Lawndale and Gardena	Western Avenue, Artesia Boulevard	NB	3	3
			SB	4	1
Gardena Transit Line 2	Torrance to Gardena via Harbor Gateway	Western Avenue, Artesia Boulevard, 169th Place	NB	4	4
			SB	6	4
			Total	22	16

[1] Sources: City of Los Angeles (Metro) and City of Gardena Transit websites, 2016.

5.0 TRAFFIC COUNTS

New manual counts of vehicular turning movements were conducted at each of the study intersections during the weekday morning (AM) and afternoon (PM) commute periods to determine the peak hour traffic volumes. The manual counts were conducted by an independent traffic count subconsultant (City Traffic Counters) at the study intersections from 7:00 to 9:00 AM to determine the weekday AM peak commute hour, from 4:00 to 6:00 PM to determine the weekday PM peak commute hour. In conjunction with the manual turning movement vehicle counts, a count of bicycle and pedestrian volumes were also collected during the peak periods. It is noted that all of the traffic counts were conducted when local schools were in session. Traffic volumes at the study intersections show the typical peak periods between 7:00 to 9:00 AM and 4:00 to 6:00 PM generally associated with metropolitan area weekday peak commute hours.

The weekday peak hour manual counts of vehicle movements at the study intersections are summarized in **Table 5-1**. The existing traffic volumes at the study intersections during the weekday AM and PM peak hours are shown in **Figures 5-1** and **5-2**, respectively. Summary data worksheets of the manual traffic counts at the study intersections are contained in **Appendix A**.

Table 5-1
EXISTING TRAFFIC VOLUMES [1]
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	DATE	DIR	AM PEAK HOUR		PM PEAK HOUR	
				BEGAN	VOLUME	BEGAN	VOLUME
1	Western Avenue/ 169th Place	09/27/2016	NB	7:15	1,178	5:00	1,339
			SB		1,123		1,297
			EB		3		4
			WB		97		45
2	Western Avenue/ Artesia Boulevard	09/27/2016	NB	7:30	923	5:00	1,138
			SB		830		926
			EB		1,046		1,572
			WB		1,455		1,367

[1] Counts conducted by City Traffic Counters

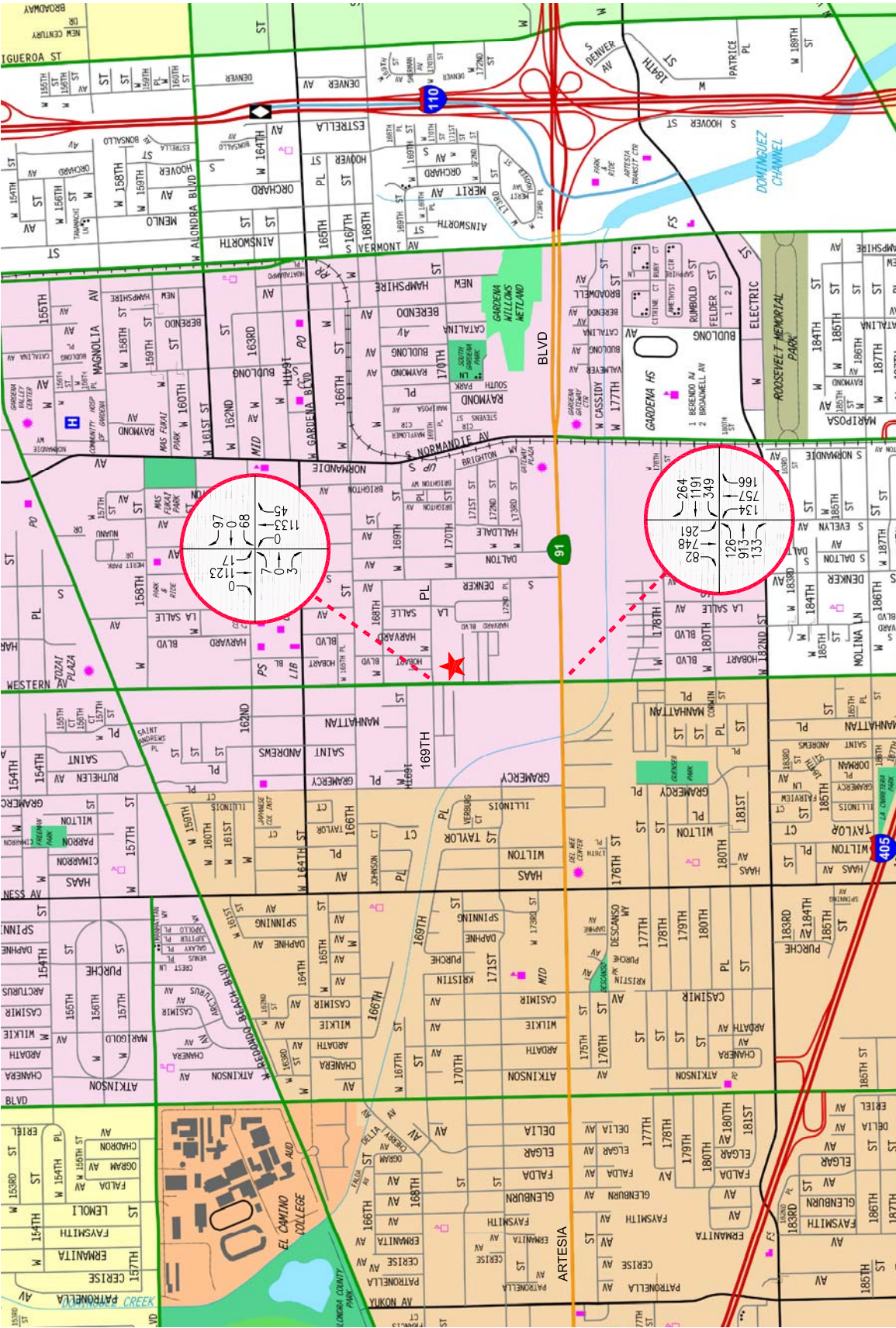
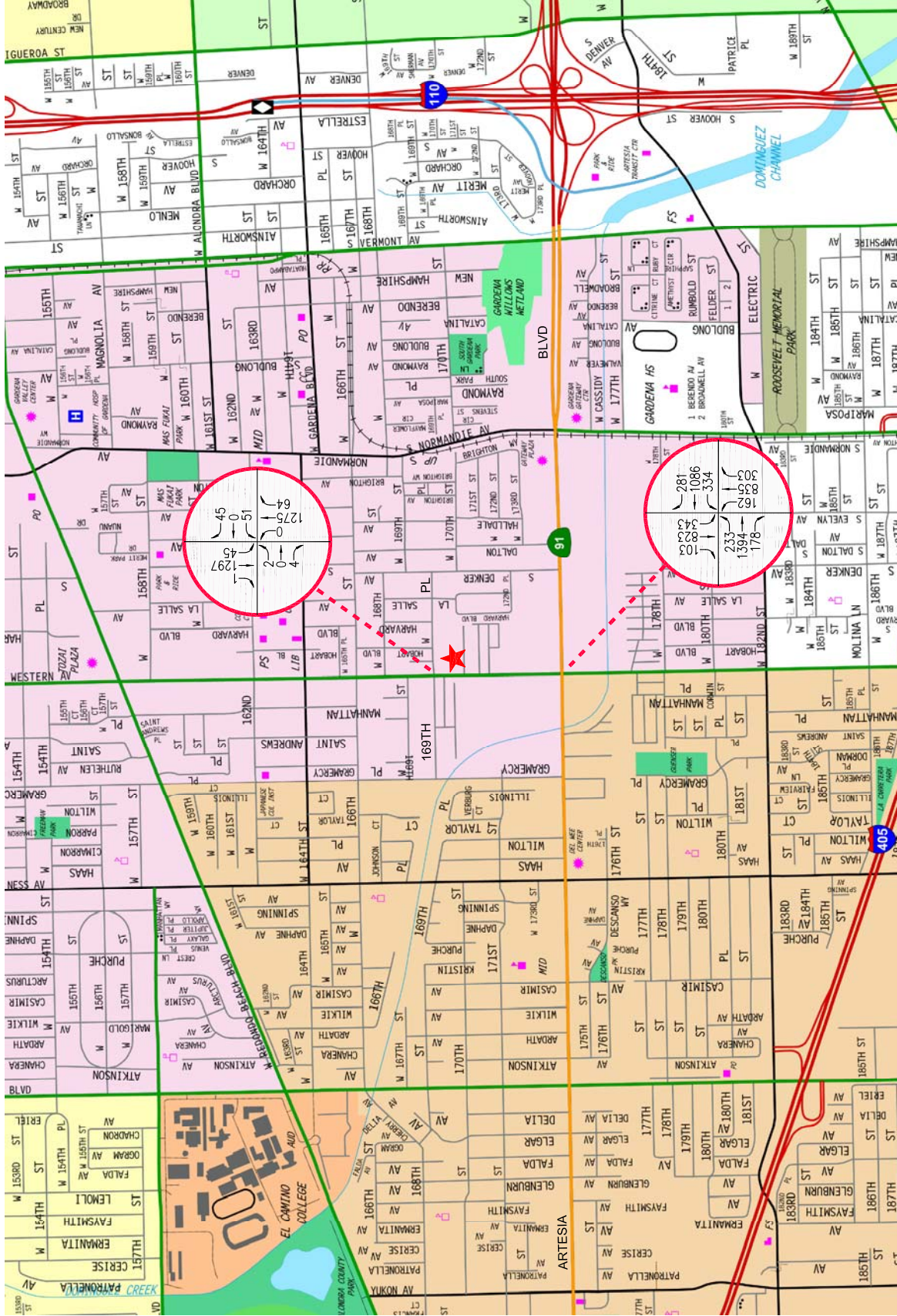


FIGURE 5-1
EXISTING TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

MAP SOURCE: RAND MCNALLY & COMPANY
PROJECT SITE

NOT TO SCALE

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MAP SOURCE: RAND MCNALLY & COMPANY



PROJECT SITE



NOT TO SCALE

FIGURE 5-2
EXISTING TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR

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6.0 CUMULATIVE DEVELOPMENT PROJECTS

The forecast of future pre-project conditions was prepared in accordance to procedures outlined in Section 15130 of the CEQA Guidelines. Specifically, the CEQA Guidelines provides two options for developing the future traffic volume forecast:

“(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the [lead] agency, or

(B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency.”

Accordingly, the traffic analysis provides a highly conservative estimate of future pre-project traffic volumes as it incorporates both the “A” and “B” options outlined in the CEQA Guidelines for purposes of developing the forecast.

6.1 Cumulative Growth

A forecast of on-street traffic conditions prior to occupancy of the proposed project was prepared by incorporating the potential trips associated with other known development projects (related projects) in the area. With this information, the potential impact of the proposed project can be evaluated within the context of the cumulative impact of all ongoing development. The list of related projects was based on information on file at the City of Gardena, City of Los Angeles and City of Torrance, as well as recently accepted traffic impact analysis reports prepared for projects in the vicinity of the proposed 16958 S. Western Avenue Townhomes project site. The list of related projects in the project site area is presented in **Table 6-1**. The location of the related projects is shown in **Figure 6-1**.

Traffic volumes expected to be generated by the related projects were calculated using rates provided in the Institute of Transportation Engineers’ (ITE) *Trip Generation Manual*⁵. The related projects’ respective traffic generation for the weekday AM and PM peak hours, as well as on a daily basis for a typical weekday, is summarized in **Table 6-1**. The distribution of the related projects traffic volumes to the study intersections during the weekday AM and PM peak hours are displayed in **Figures 6-2** and **6-3**, respectively.

⁵ Institute of Transportation Engineers *Trip Generation* manual, 9th Edition, 2012, Washington, D.C.

Table 6-1
RELATED PROJECTS LIST AND TRIP GENERATION [1]

MAP NO.	PROJECT STATUS	PROJECT NAME/NUMBER ADDRESS/LOCATION	LAND USE DATA		PROJECT DATA SOURCE	DAILY TRIP ENDS [2]	AM PEAK HOUR VOLUMES [2]		PM PEAK HOUR VOLUMES [2]			
			LAND-USE	SIZE			IN	OUT	TOTAL	IN	OUT	TOTAL
City of Gardena												
G1	Approved	Olson Urban Housing 15350 Van Ness Avenue	Condominiums	42 DU	[3]	244	3	15	18	15	7	22
G2	Approved	Water Pointe Commercial 1400 West Redondo Boulevard	Commerical	5,000 GLSF	[4]	214	3	2	5	9	10	19
G3	Approved	1147 West Gardena Boulevard	Single-Family Residential	4 DU	[5]	38	1	2	3	3	1	4
G4	Approved	15927 Brighton Avenue	Single-Family Residential	3 DU	[5]	29	1	1	2	2	1	3
City of Los Angeles												
LA1	Proposed	Home Depot 661 West Redondo Beach Boulevard	Retail	143,159 GLSF	[1]	2,040	(50)	37	(13)	87	27	114
City of Torrance												
T1	Proposed	CUP04-00004 1918 Artesia Boulevard	Church Expansion	55,000 GSF	[6]	501	19	12	31	14	16	30
T2	Proposed	CUP08-00020 (MOD11-00007) 18203 Western Avenue	Retail/Food Service	7,300 GSF	[7]	928	43	36	79	43	29	72
T3	Proposed	CUP15-00007 17502 Van Ness Avenue	Condominiums	6 DU	[3]	35	1	2	3	2	1	3
TOTAL						3,066	21	107	128	175	92	267

[1] Source: City of Gardena Planning Department, City of Los Angeles Department of Transportation (LADOT), and City of Torrance Community Development Department. Trip generation for the related projects are based on ITE "Trip Generation Manual", 9th Edition, 2012 (as referenced in the Project Data Source column).

[2] Trips are one-way traffic movements, entering or leaving.

[3] ITE Land Use Code 230 (Residential Condo/Townhouse) trip generation average rates.

[4] ITE Land Use Code 820 (Shopping Center) trip generation average rates.

[5] ITE Land Use Code 210 (Single-Family Detached Housing) trip generation average rates.

[6] ITE Land Use Code 560 (Church) trip generation average rates.

[7] ITE Land Use Code 932 (High-Turnover (Sit-Down) Restaurant) trip generation average rates.

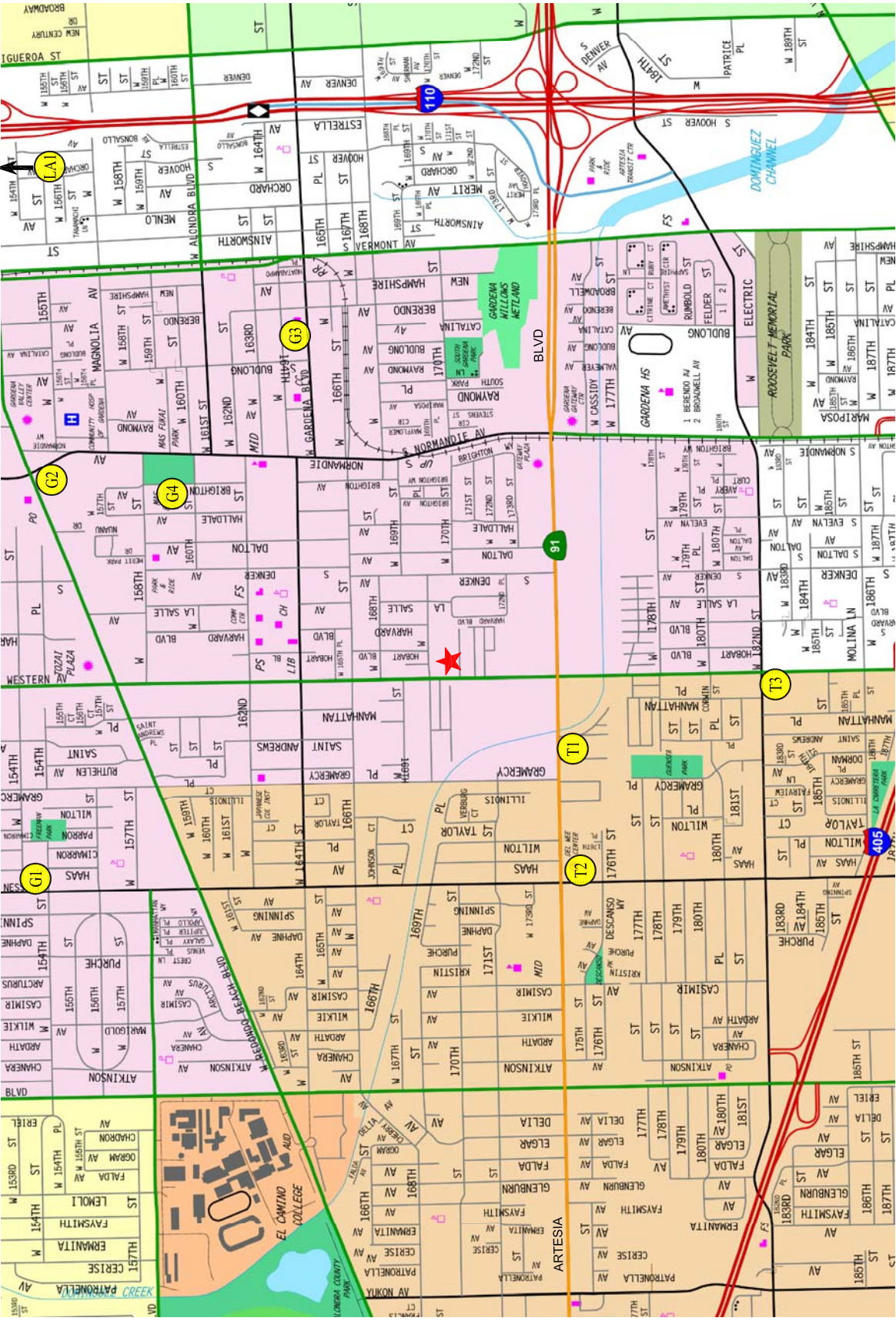


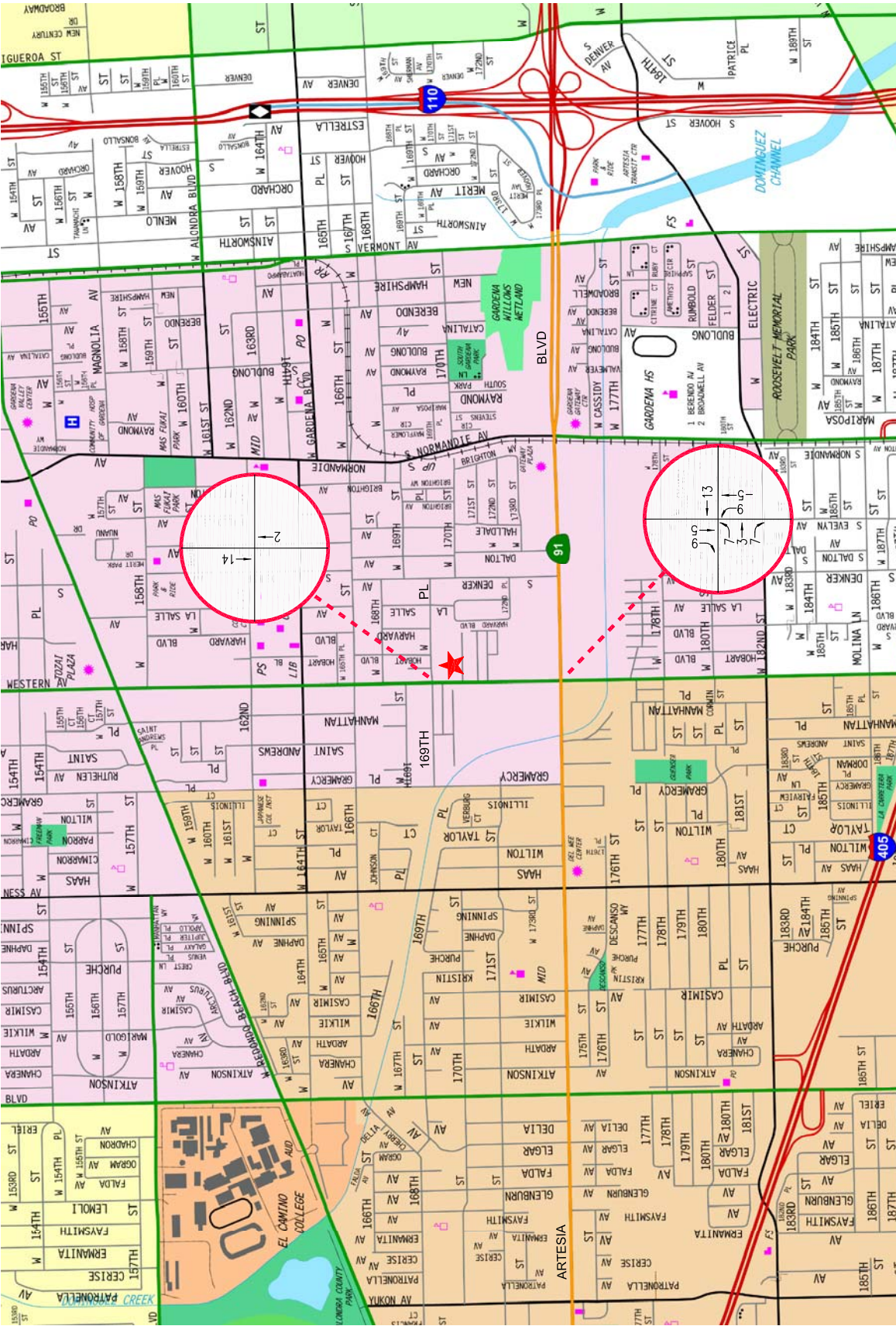
FIGURE 6-1
LOCATION OF RELATED PROJECTS

MAP SOURCE: RAND McNALLY & COMPANY

★ PROJECT SITE
LA CITY OF LOS ANGELES RELATED PROJECT
T CITY OF TORRANCE RELATED PROJECT

NOT TO SCALE

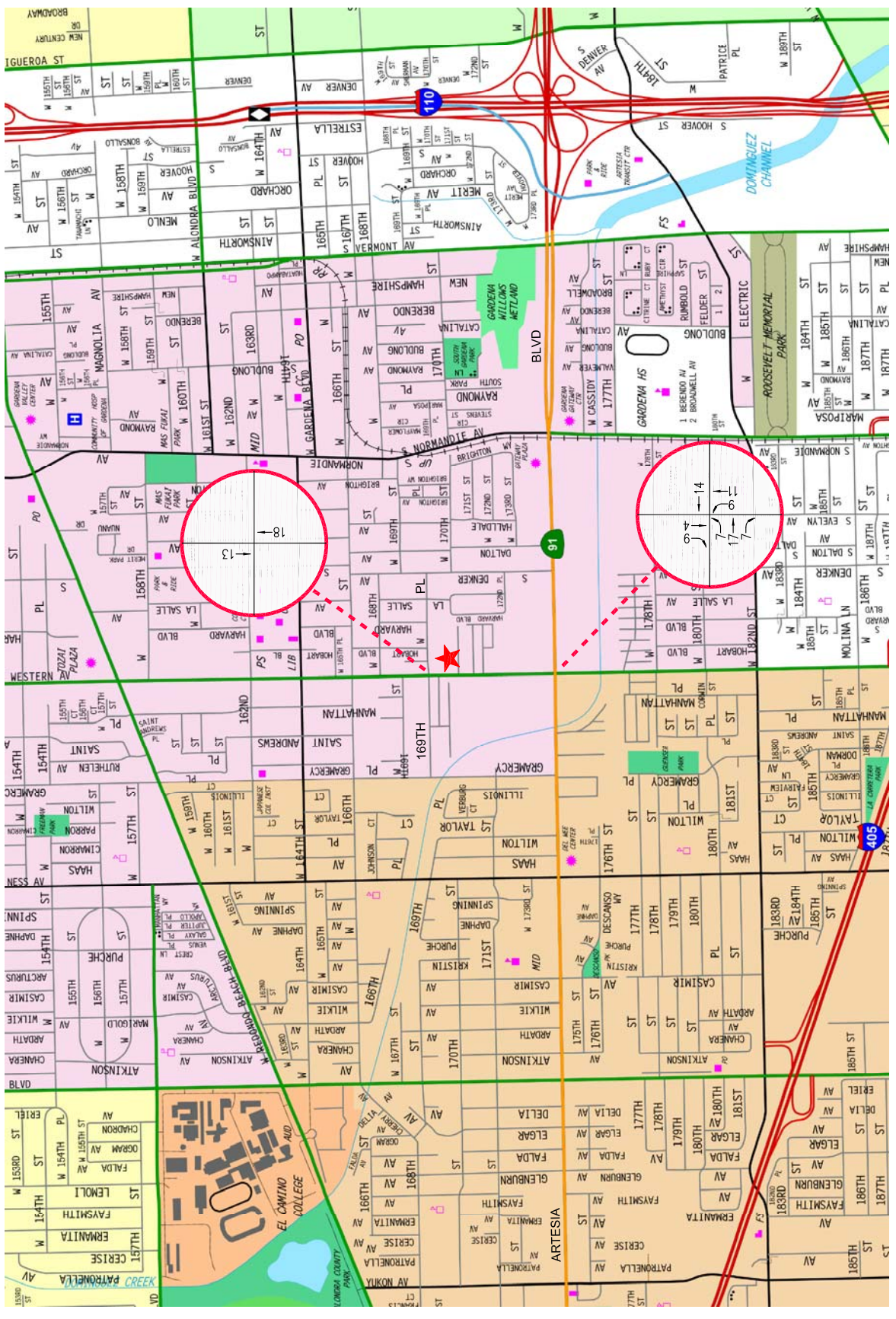
LINSCOTT, LAW & GREENSPAN, engineers



MAP SOURCE: RAND MCNALLY & COMPANY
★ PROJECT SITE
NOT TO SCALE

FIGURE 6-2
RELATED PROJECTS TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

MAP SOURCE: RAND MCNALLY & COMPANY
★ PROJECT SITE
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MAP SOURCE: RAND MCNALLY & COMPANY



PROJECT SITE

FIGURE 6-3
RELATED PROJECTS TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

6.2 Ambient Traffic Growth

In order to account for area-wide regional growth not included in this analysis, the existing traffic volumes were increased at an annual rate of one percent (1.0%) to the year 2019 (i.e., the anticipated year of project build-out). The ambient growth factor was based on general traffic growth factors provided in the *2010 Congestion Management Program for Los Angeles County* (the “CMP manual”). It is noted that based on review of the general traffic growth factors provided in the CMP manual for the project study area (i.e., RSA 18), it is anticipated that the existing traffic volumes are expected to increase at an annual rate of less than 1.0% per year between the years 2015 and 2020. Thus, application of the 1.0% annual growth factor allows for a conservative forecast of future traffic volumes in the area that likely overstates future traffic volumes. Further, it is noted that the CMP manual’s traffic growth rate is intended to anticipate future traffic generated by development projects in the project vicinity. Thus, the inclusion in this traffic analysis of both a forecast of traffic generated by known related projects plus the use of an ambient traffic growth factor based on CMP traffic model data results in a conservative estimate of future traffic volumes at the study intersections.

7.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the 16958 S. Western Avenue Townhomes project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic volumes on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic volumes. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (i.e., Levels of Service) conditions at the selected key intersections using existing and expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project's impacts identified.

7.1 Project Traffic Generation

Traffic volumes expected to be generated by the proposed 16958 S. Western Avenue Townhomes project and the existing site uses during the weekday AM and PM peak hours, as well as on a daily basis, were estimated using rates published in the ITE *Trip Generation Manual*. Traffic volumes expected to be generated by the proposed project were based upon rates per number of dwelling units. ITE Land Use Code 232 (Residential Townhome/Condominium) trip generation average rates were used to forecast the traffic volumes expected to be generated by the proposed project land use. Additionally, it is noted that no trip generation credit for the existing recreational vehicle storage facility on the project site has been employed in the trip generation forecasts in order to provide a conservative analysis.

The weekday trip generation rates and forecast of the vehicular trips anticipated to be generated by the proposed project are presented in **Table 7-1**. As presented in *Table 7-1*, the proposed project is expected to generate 20 vehicle trips (3 inbound trips and 17 outbound trips) during the weekday AM peak hour. During the weekday PM peak hour, the proposed project is expected to generate 24 vehicle trips (16 inbound trips and 8 outbound trips). Over a 24-hour period, the proposed project is forecast to generate 267 daily trip ends during a typical weekday (approximately 134 inbound trips and 134 outbound trips).

Table 7-1
PROJECT TRIP GENERATION [1]

LAND USE	SIZE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Townhomes [3]	46 DU	267	3	17	20	16	8	24
NET INCREASE		267	3	17	20	16	8	24

[1] Source: ITE "Trip Generation Manual", 9th Edition, 2012.

[2] Trips are one-way traffic movements, entering or leaving.

[3] ITE Land Use Code 230 (Residential Condominium/Townhouse) trip generation average rates.

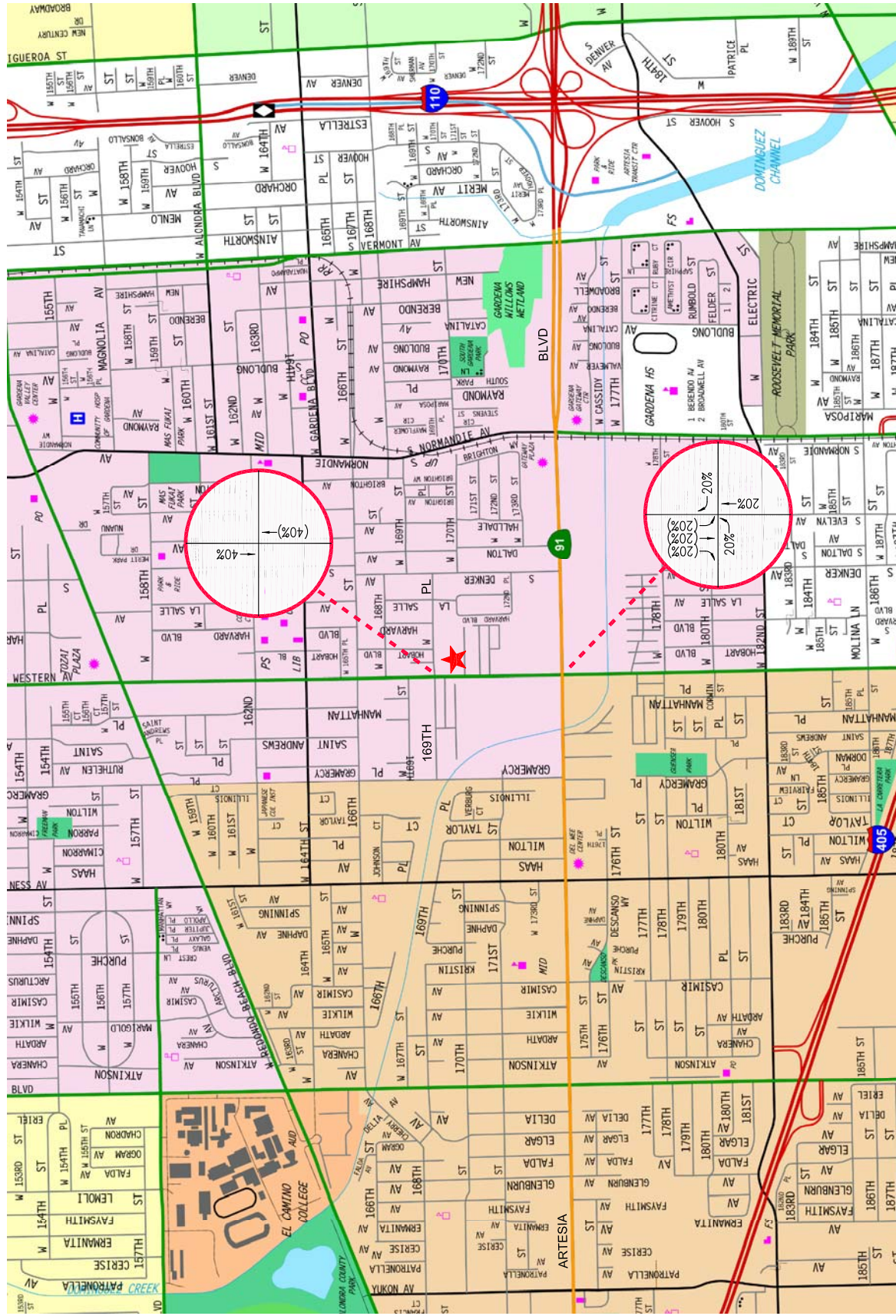
- Daily Trip Rate: 5.81 trips/dwelling unit; 50% inbound/50% outbound
- AM Peak Hour Trip Rate: 0.44 trips/dwelling units; 17% inbound/83% outbound
- PM Peak Hour Trip Rate: 0.52 trips/dwelling units; 67% inbound/33% outbound

7.2 Project Trip Distribution and Assignment

Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- The site's proximity to major traffic corridors (i.e., Western Avenue, Artesia Boulevard, etc.);
- The location and spatial proximity of nearby restaurants, banks, coffee shops and similar type businesses, as well as local schools;
- Expected localized traffic flow patterns based on adjacent roadway channelization and presence of traffic signals;
- Existing intersection traffic volumes;
- Existing site parcel access ingress/egress schemes;
- Ingress/egress scheme planned for the proposed project;
- Nearby population and employment centers; and
- Input from City staff.

The project traffic volume distribution percentages during weekday AM and PM peak hours at the study intersections are illustrated in **Figure 7-1**. The forecast project traffic volumes at the study intersections for the weekday AM and PM peak hours are displayed in **Figures 7-2** and **7-3**, respectively. The traffic volume assignments presented in **Figures 7-2** and **7-3** reflect the traffic distribution characteristics shown in **Figure 7-1** and the project traffic generation forecasts presented in **Table 7-1**.



NOT TO SCALE

MAP SOURCE: RAND MCNALLY & COMPANY



PROJECT SITE

XX = INBOUND PERCENTAGES

(XX) = OUTBOUND PERCENTAGES

FIGURE 7-1
PROJECT TRIP DISTRIBUTION

LINSCOTT, LAW & GREENSPAN, engineers

16958 S. WESTERN AVENUE TOWNHOMES PROJECT

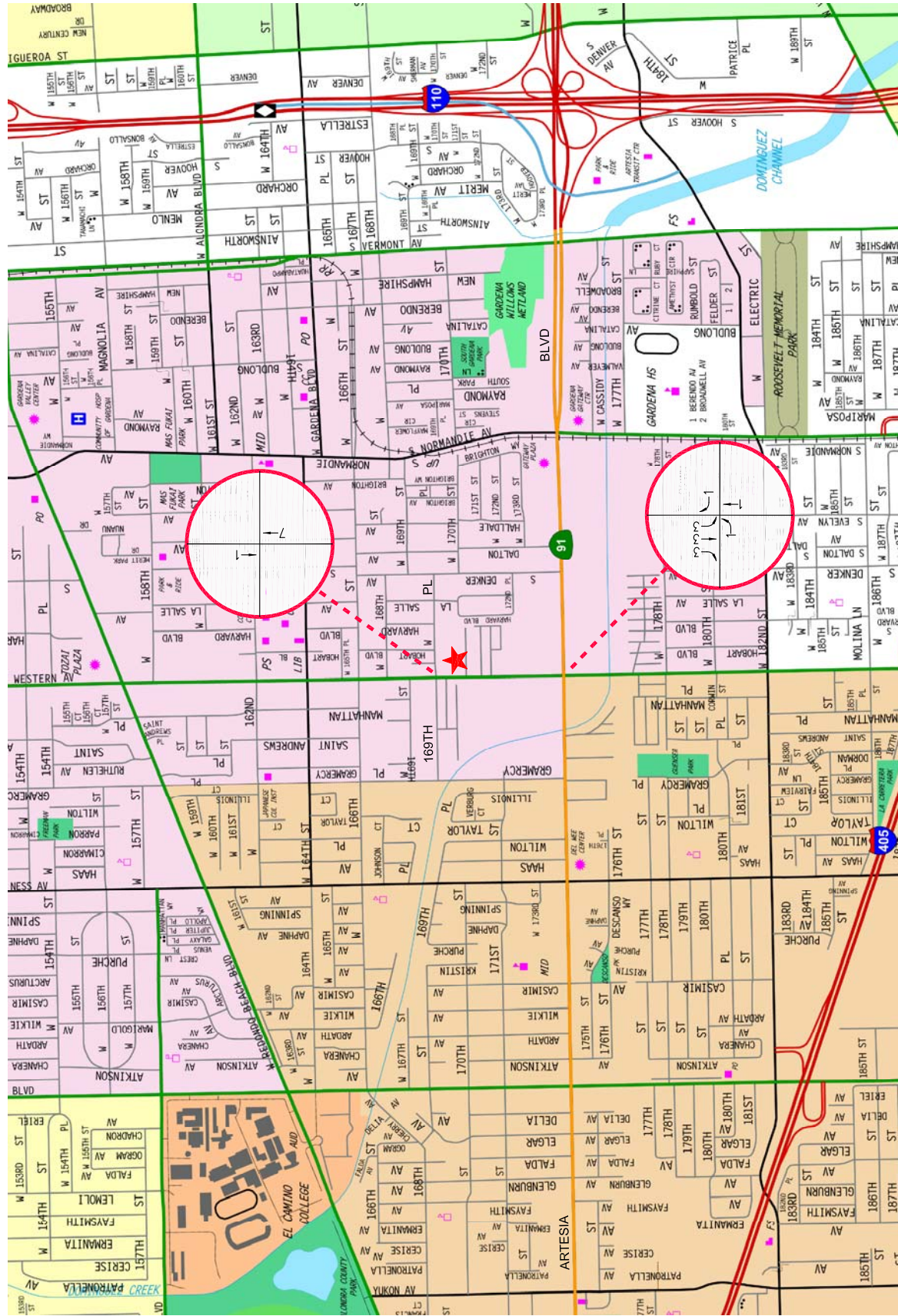
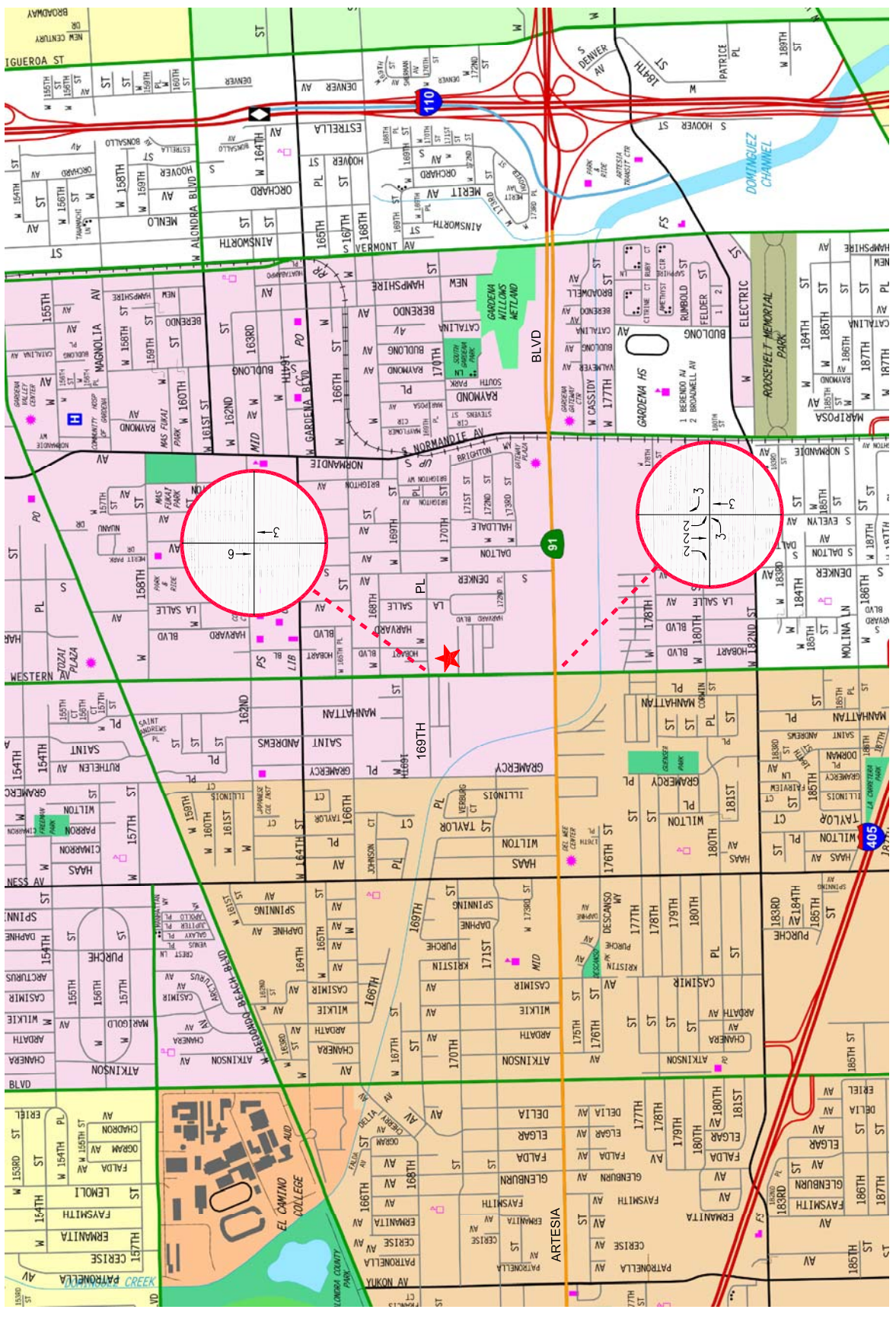


FIGURE 7-2
PROJECT TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

MAP SOURCE: RAND MCNALLY & COMPANY

★ PROJECT SITE

NOT TO SCALE



MAP SOURCE: RAND MCNALLY & COMPANY
★ PROJECT SITE

FIGURE 7-3
PROJECT TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

8.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

8.1 Intersection Analysis Methodology

The two study intersections were evaluated using the Intersection Capacity Utilization (ICU) method of analysis which determines Volume-to-Capacity (v/c) ratios on a critical lane basis. The overall intersection v/c ratio is subsequently assigned a Level of Service (LOS) value to describe intersection operations. Level of Service varies from LOS A (free flow condition) to LOS F (jammed condition). A description of the ICU method and corresponding Level of Service is provided in *Appendix B*.

8.2 Intersection Impact Criteria and Thresholds

While the City of Gardena has established performance criteria for evaluating the circulation system (refer to Table CI-2 of the Community Development Element Circulation Plan), there is no established impact criteria for study intersections. Accordingly, based on coordination with City staff, the significance of the potential project-generated traffic impacts was identified using the traffic impact analysis guidelines set forth in the LACDPW *Traffic Impact Analysis Report Guidelines*. According to the County's published guidelines, the impact is considered significant if the project-related increase in the v/c ratio equals or exceeds the threshold criteria presented in *Table 8-1*.

Table 8-1 COUNTY OF LOS ANGELES INTERSECTION IMPACT THRESHOLD CRITERIA		
Pre-Project v/c	Level of Service	Project Related Increase in v/c
0.71 to 0.80	C	equal to or greater than 0.04
0.81 to 0.90	D	equal to or greater than 0.02
0.91 or more	E / F	equal to or greater than 0.01

According to the City of Gardena performance criteria and County of Los Angeles requirements, the ICU calculations utilize a lane capacity of 1,600 vehicles per hour (vph) per lane for left-turn, through, and right-turn lanes, and 2,880 vph for dual left-turn lanes. Additionally, a clearance factor of 0.10 is included in the ICU calculations. The Sliding Scale Method requires mitigation of project traffic impacts whenever traffic generated by the proposed development causes an increase in the analyzed intersection v/c ratio by an amount equal to or greater than the values shown above.

The relative impact of the added project traffic volumes to be generated by the proposed 16958 S. Western Avenue Townhomes project during the weekday AM and PM peak hours was evaluated based on analysis of existing and future operating conditions at the study intersections, without and with the proposed project. The previously discussed capacity analysis procedures were utilized to evaluate the future v/c relationships and service level characteristics at each study intersection.

8.3 Intersection Traffic Impact Analysis Scenarios

Traffic impacts at the study intersections were analyzed for the following conditions:

- [a] Existing conditions.
- [b] Existing with project conditions.
- [c] Condition [b] with implementation of project mitigation measures, where necessary.
- [d] Condition (a) plus one percent (1.0%) annual ambient traffic growth through year 2019 and with completion and occupancy of the related projects (i.e., future without project conditions).
- [e] Condition [d] with completion and occupancy of the proposed project.
- [f] Condition [e] with implementation of project mitigation measures, where necessary.

The project traffic volumes were added for each new condition volumes (i.e., existing condition and future without project conditions) to determine the change in capacity utilization at the study intersections.

9.0 TRAFFIC ANALYSIS

The traffic impact analysis prepared for the study intersections using the ICU methodology and application of the City of Gardena significant traffic impact criteria is summarized in **Table 9-1**. The ICU data worksheets for the analyzed intersections are contained in *Appendix B*.

9.1 Existing Conditions

9.1.1 Existing Conditions

As indicated in column [1] of *Table 9-1*, Study Intersection No. 1, Western Avenue/169th Place, is presently operating at LOS A during both the weekday AM and PM peak hours under existing conditions. Study Intersection No. 2, Western Avenue/Artesia Boulevard, is currently operating at LOS D and LOS E during the weekday AM and PM peak hours, respectively, under existing conditions. As previously mentioned, the existing traffic volumes at the study intersections during the weekday AM, PM and Saturday AM peak hours are displayed in *Figures 5-1*, *5-2*, and *5-3*, respectively.

9.1.2 Existing With Project Conditions

As shown in column [2] of *Table 9-1*, application of the study intersection threshold criteria (refer to *Table 8-1*) to the “Existing With Project” scenario indicates that the proposed project is not expected to create significant impacts at either of the two study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no traffic mitigation measures are required or recommended for the study intersections under the “Existing With Project” conditions. The existing with project traffic volumes at the study intersections during the weekday AM and PM peak hours are illustrated in **Figures 9-1** and **9-2**, respectively.

9.2 Future Conditions

9.2.1 Future Without Project Conditions

The future cumulative baseline conditions were forecast based on the addition of traffic generated by the completion and occupancy of related projects, as well as the growth in traffic due to the combined effects of continuing development, intensification of existing developments and other factors (i.e., ambient growth). The v/c ratios at the study intersections are incrementally increased with the addition of ambient traffic and traffic generated by the related projects listed in *Table 6-1*. As presented in column [3] of *Table 9-1*, Study Intersection No. 1, Western Avenue/169th Place, is expected to operate at LOS A and LOS B during the weekday AM and PM peak hours, respectively, with the addition of growth in ambient traffic and related projects traffic under the future without project conditions. Study Intersection No. 2, Western Avenue/Artesia Boulevard, is expected to operate at LOS D and LOS E during the weekday AM and PM peak hours, respectively, with the addition of growth in ambient traffic and related projects traffic under the future without project conditions. The future without project (existing, ambient growth and related projects) traffic volumes at the study intersections during the weekday AM and PM peak hours are presented in **Figures 9-3** and **9-4**, respectively.

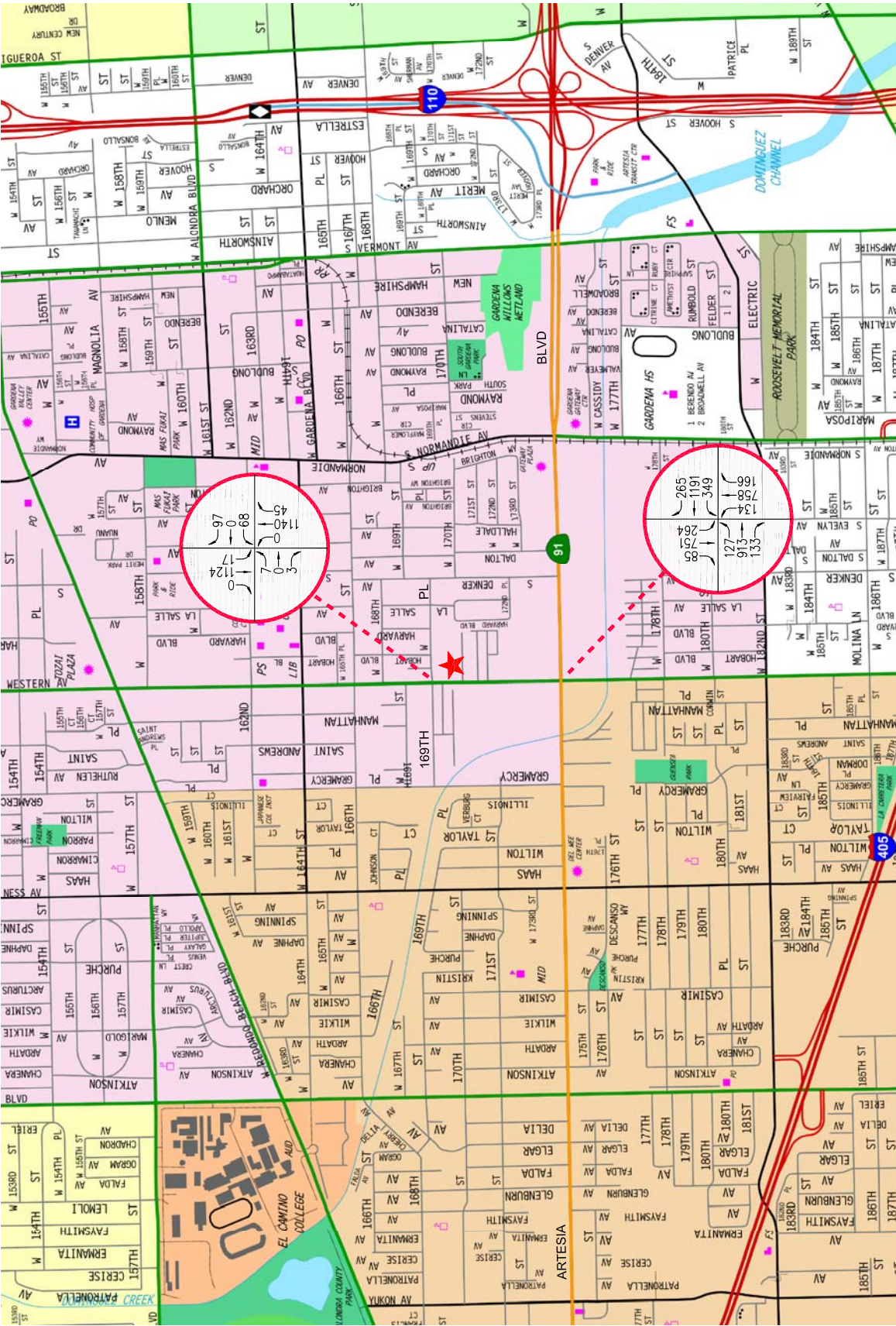
Table 9-1
SUMMARY OF VOLUME TO CAPACITY RATIOS
AND LEVELS OF SERVICE
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	PEAK HOUR	[1]		[2]		[3]	[4]	
			YEAR 2016 EXISTING V/C or LOS DELAY [a]	YEAR 2016 EXISTING W/ PROJECT V/C or LOS Delay [a]	CHANGE V/C or DELAY [(2)-(1)] [b]	SIGNIF. IMPACT [b]		YEAR 2019 FUTURE WITH PROJECT V/C or LOS DELAY [a]	CHANGE V/C or DELAY [(4)-(3)] [b]
1	Western Avenue/ 169th Place	AM	0.544 A	0.546 A	0.002 A	No	0.558 A	0.560 A	0.002 No
		PM	0.582 A	0.583 A	0.001 A	No	0.603 B	0.603 B	0.000 No
2	Western Avenue/ Artesia Boulevard	AM	0.809 D	0.811 D	0.002 D	No	0.836 D	0.838 D	0.002 No
		PM	0.910 E	0.915 E	0.005 E	No	0.946 E	0.950 E	0.004 No

[a] Level of Service (LOS) is based on the reported ICU value for signalized intersections and the delay value for unsignalized intersections.

[b] According to the County of Los Angeles Department of Public Works' *Traffic Impact Analysis Report Guidelines*, January 1, 1997, Page 6: an impact is considered significant if the project related increase in the volume-to-capacity ratio (v/c) equals or exceeds the thresholds shown below:

Level of Service	Pre-Project V/C	Project-Related Increase in V/C
C	> 0.700 - 0.800	equal to or greater than 0.040
D	> 0.800 - 0.900	equal to or greater than 0.020
E/F	> 0.900	equal to or greater than 0.010



MAP SOURCE: RAND MCNALLY & COMPANY
PROJECT SITE
NOT TO SCALE

FIGURE 9-1
EXISTING WITH PROJECT TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

LINSCOTT, LAW & GREENSPAN, engineers



MAP SOURCE: RAND MCNALLY & COMPANY

PROJECT SITE

FIGURE 9-2
EXISTING WITH PROJECT TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

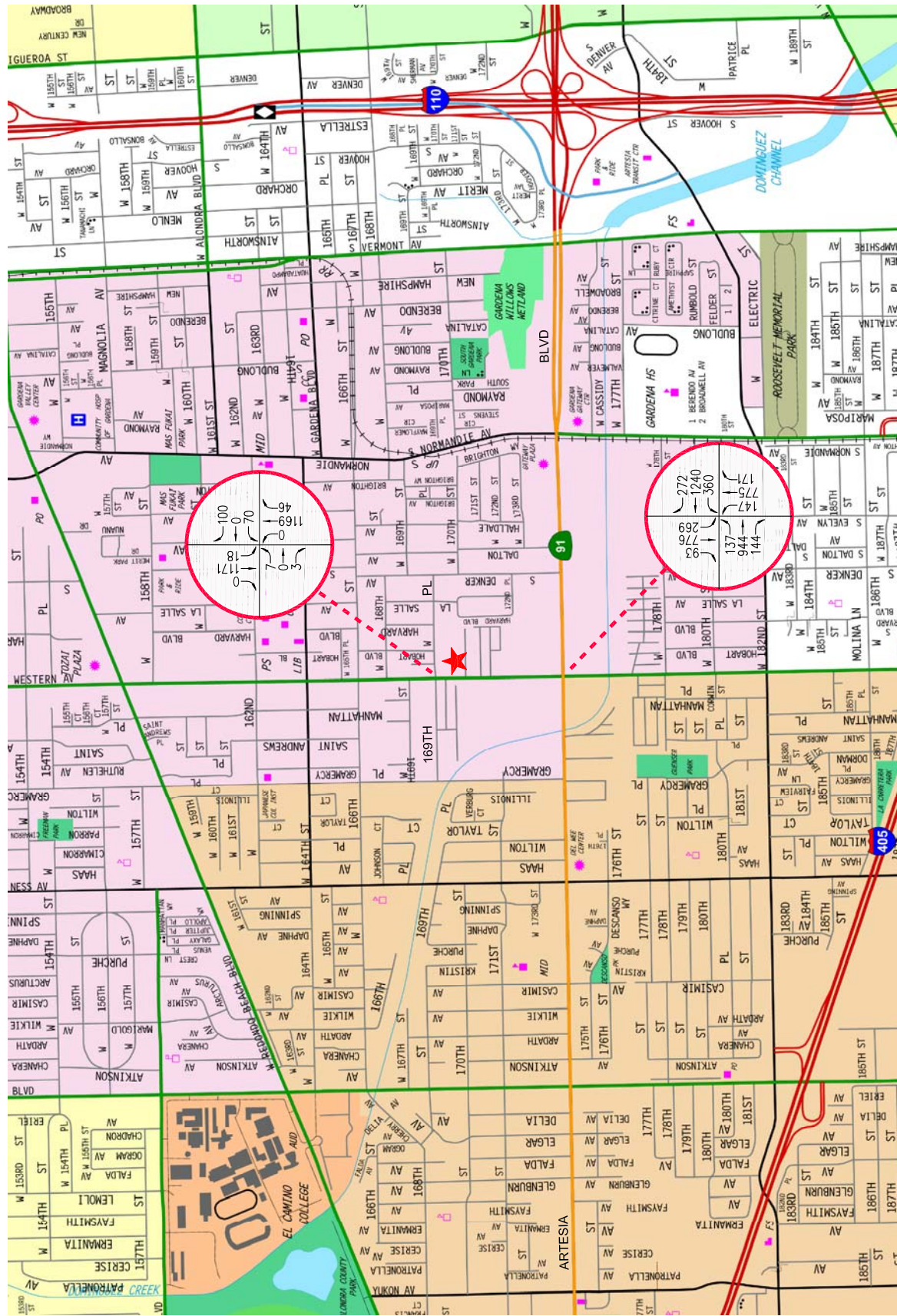



FIGURE 9-3
FUTURE WITHOUT PROJECT TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

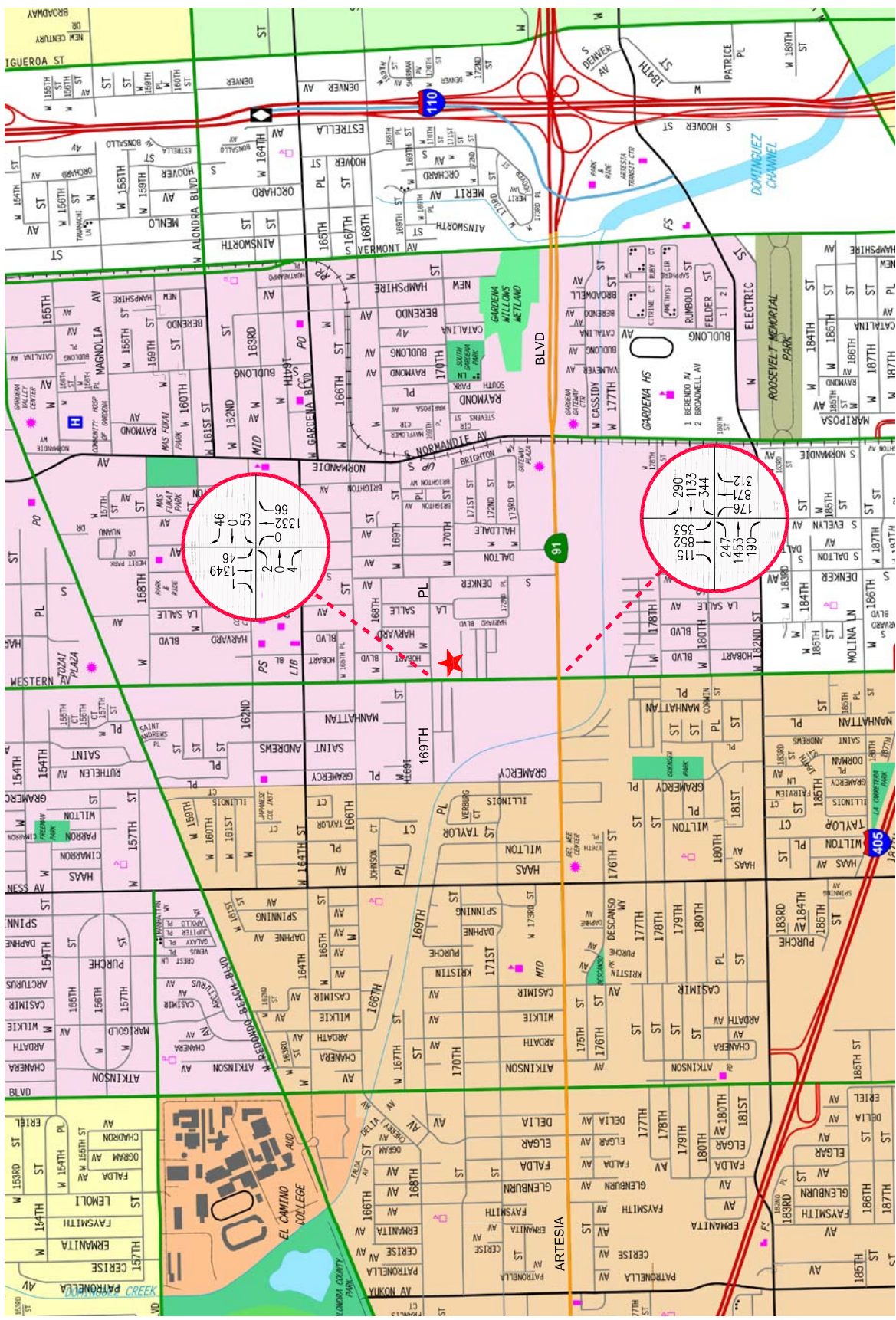

PROJECT SITE

MAP SOURCE: RAND MCNALLY & COMPANY

NOT TO SCALE

A compass rose with a circle containing the letter 'N' at the top. A stylized arrow points from the center towards the left edge of the circle.

LINSCOTT, LAW & GREENSPAN, engineers



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★ PROJECT SITE

FIGURE 9-4
FUTURE WITHOUT PROJECT TRAFFIC VOLUMES

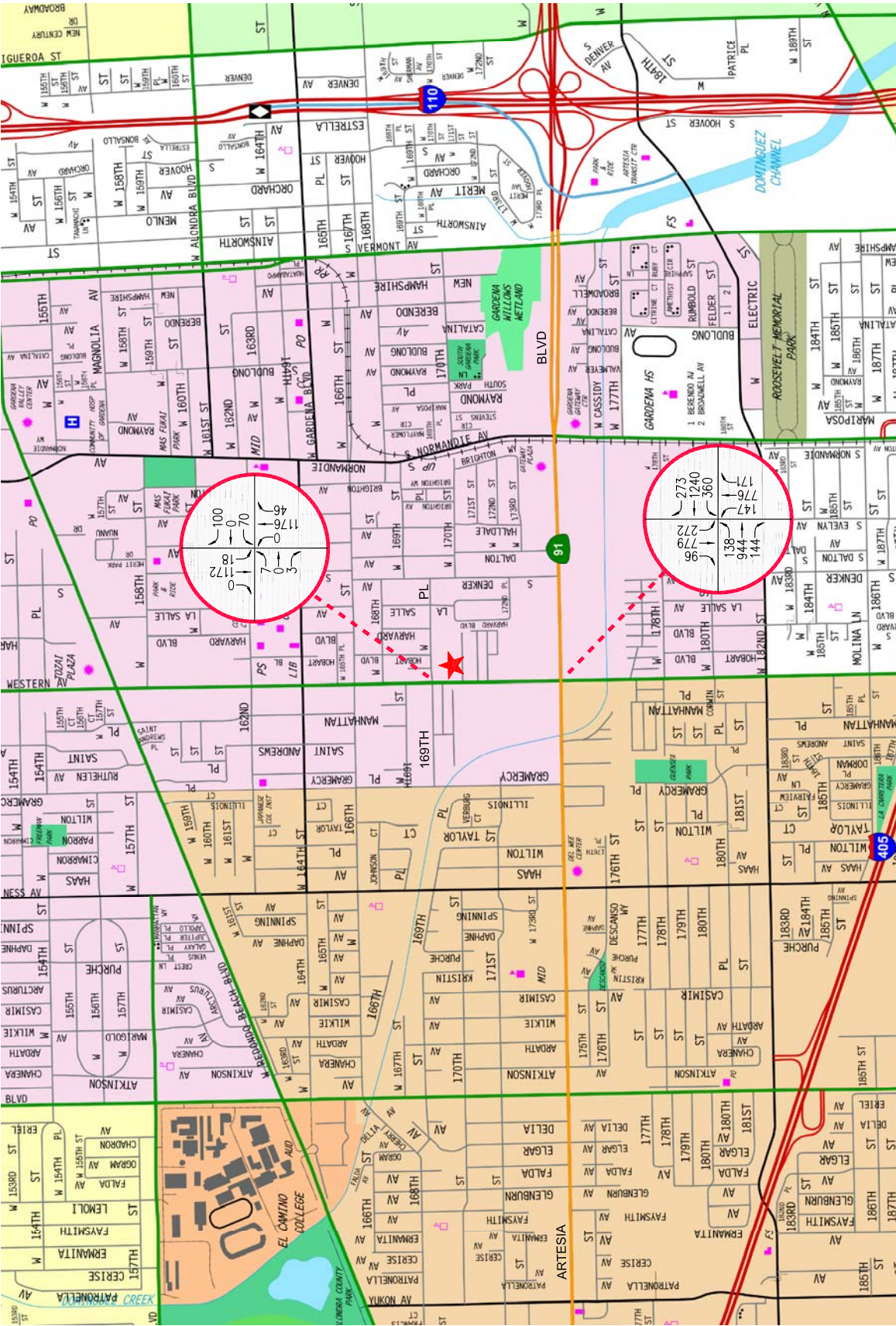
WEEKDAY PM PEAK HOUR

16958 S. WESTERN AVENUE TOWNHOMES PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

9.2.2 *Future With Project Conditions*

As shown in column [4] of *Table 9-1*, application of the study intersection threshold criteria (refer to *Table 8-1*) to the “Future With Proposed Project” scenario indicates that the proposed project is not expected to create significant impacts at either of the two study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no traffic mitigation measures are required or recommended for the study intersections. The future with project (existing, ambient growth, related projects and project) traffic volumes at the study intersections during the weekday AM and PM peak hours are illustrated in *Figures 9-5* and *9-6*, respectively.



NOT TO SCALE

MAP SOURCE: RAND MCNALLY & COMPANY



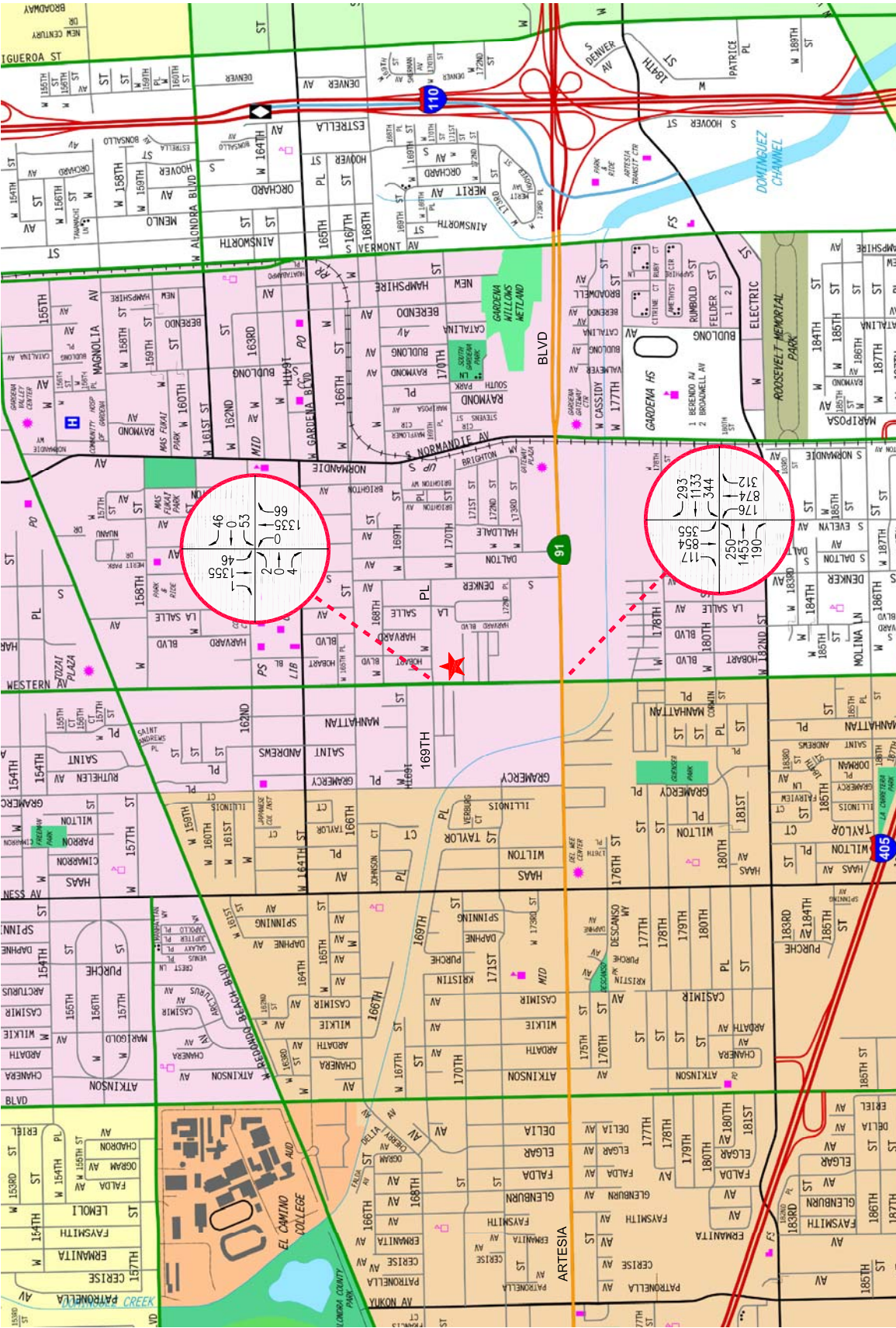
PROJECT SITE

FIGURE 9-5 FUTURE WITH PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

16958 S. WESTERN AVENUE TOWNHOMES PROJECT

LINSCOTT, LAW & GREENSPAN, engineers



MAP SOURCE: RAND MCNALLY & COMPANY
PROJECT SITE
NOT TO SCALE

FIGURE 9-6
FUTURE WITH PROJECT TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR
16958 S. WESTERN AVENUE TOWNHOMES PROJECT

10.0 TRANSPORTATION IMPROVEMENT MEASURES

The traffic analysis has been based on a conservative approach with respect to the analysis of potential project-related impacts. As summarized in Subsections 9.1.2 (Existing With Project Conditions) and 9.2.2 (Future With Project Conditions) herein, application of the study intersection threshold criteria (refer to *Table 8-1*) to the with proposed project scenarios indicates that the proposed project is not expected to create significant impacts at the two study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no formal traffic mitigation measures are required or recommended for the study intersections. However, it is recommended that appropriate sight distance be provided at the project sight driveway in order to safely accommodate vehicles exiting the site as well as for pedestrians approaching the driveway along the adjacent public sidewalk.

11.0 CONGESTION MANAGEMENT PROGRAM TRAFFIC IMPACT ASSESSMENT

The Congestion Management Program (CMP) is a state-mandated program that was enacted by the State Legislature with the passage of Proposition 111 in 1990. The program is intended to address the impact of local growth on the regional transportation system.

As required by the 2010 Congestion Management Program for Los Angeles County, a Traffic Impact Assessment (TIA) has been prepared to determine the potential impacts on designated monitoring locations on the CMP highway system. The analysis has been prepared in accordance with procedures outlined in the *2010 Congestion Management Program for Los Angeles County*, County of Los Angeles Metropolitan Transportation Authority, July 2010.

11.1 Intersections

The following CMP intersection monitoring locations in the project vicinity have been identified:

<u>CMP Station</u>	<u>Intersection</u>
No. 21	Artesia Boulevard/Vermont Avenue
No. 154	Western Avenue/190 th Street

The CMP TIA guidelines require that intersection monitoring locations must be examined if the proposed project will add 50 or more trips during either the weekday AM or PM peak hours. The proposed project will not add 50 or more trips during either the weekday AM or PM peak hours (i.e., of adjacent street traffic) at CMP monitoring intersections, as stated in the CMP manual as the threshold criteria for a traffic impact assessment. Therefore, no further review of potential impacts to intersection monitoring locations that are part of the CMP highway system is required.

11.2 Freeways

The following CMP freeway monitoring locations in the project vicinity have been identified:

<u>CMP Station</u>	<u>Segment</u>
No. 1033	SR-91 Freeway east of Alameda Street/Santa Fe Avenue
No. 1045	I-110 Freeway at Wilmington, south of "C" Street
No. 1046	I-110 Freeway at Manchester Boulevard

The CMP TIA guidelines require that freeway monitoring locations must be examined if the proposed project will add 150 or more trips (in either direction) during either the weekday AM or PM peak periods. The proposed project will not add 150 or more trips (in either direction) during either the weekday AM or PM peak hours to CMP freeway monitoring locations which is the threshold for preparing a traffic impact assessment, as stated in the CMP manual. Therefore, no

further review of potential impacts to freeway monitoring locations that are part of the CMP highway system is required.

11.3 Transit Impact Review

As required by the *2010 Congestion Management Program*, a review has been made of the potential impacts of the project on transit service. As discussed in Subsection 4.4 herein, existing transit service is provided in the vicinity of the proposed 16958 S. Western Avenue Townhomes project.

The project trip generation, as shown in *Table 7-1* was adjusted by values set forth in the CMP (i.e., person trips equal 1.4 times vehicle trips, and transit trips equal 3.5 percent of the total person trips) to estimate transit trip generation. Pursuant to the CMP guidelines, the proposed project is forecast to generate transit demand as calculated below:

- Weekday AM Peak Hour = $20 \times 1.4 \times 0.035 = 1$ Transit Trip
- Weekday PM Peak Hour = $24 \times 1.4 \times 0.035 = 1$ Transit Trip
- Weekday Daily Trips = $267 \times 1.4 \times 0.035 = 13$ Transit Trips

As shown in *Table 4-2*, three bus transit lines are provided adjacent to or in close proximity the project site. As outlined in *Table 4-2*, under the “No. of Buses During Peak Hour” column, these three transit lines provide services for an average of generally 22 and 16 buses during the weekday AM and PM peak hours. Therefore, based on the above calculated weekday AM and PM peak hour trips, this would correspond to less than one additional transit rider per bus. It is anticipated that the existing transit service in the project area will adequately accommodate the increase of project-generated transit trips. Thus, given the number of project-generated transit trips per bus, no project impacts on existing or future transit services in the project area are expected to occur due to the proposed project.

12.0 CONCLUSIONS

This traffic study has been prepared for the proposed 16958 S. Western Avenue Townhomes project located within the City of Gardena, California. The proposed project consists of the development of a multi-family residential complex with townhome type dwelling units. A total of 46 townhome dwelling units is planned to be provided within the proposed 16958 S. Western Avenue Townhomes project. Construction of the proposed project is expected to commence in year 2017 with build-out in year 2019.

In order to evaluate the potential impacts to the local street system, two study intersections were analyzed to determine changes in operation following occupancy and utilization of the proposed 16958 S. Western Avenue Townhomes project. It is concluded that the proposed project is not expected to create significant impacts at any of the study intersections. Incremental, but not significant, impacts are noted at the study intersections. Because there are no significant impacts, no formal traffic mitigation measures are required or recommended for the study intersections.

APPENDIX A

TRAFFIC COUNT DATA

CITY TRAFFIC COUNTERS

www.ctcounters.com

File Name : Western_169thPI

Site Code : 00000000

Start Date : 9/27/2016

Page No : 1

Groups Printed- Unshifted

	Western Ave Southbound			169th Place Westbound			Western Ave Northbound			169th Place Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	6	202	0	18	0	10	0	230	2	1	0	3	472
07:15 AM	3	237	0	15	0	33	0	272	8	4	0	1	573
07:30 AM	7	287	0	19	0	33	0	304	6	1	0	0	657
07:45 AM	3	323	0	20	0	20	0	291	13	1	0	2	673
Total	19	1049	0	72	0	96	0	1097	29	7	0	6	2375
08:00 AM	4	276	0	14	0	11	0	266	18	1	0	0	590
08:15 AM	9	262	1	28	0	12	0	217	7	1	0	0	537
08:30 AM	8	240	0	13	0	11	0	231	7	0	0	1	511
08:45 AM	4	233	0	13	0	12	2	264	10	0	0	1	539
Total	25	1011	1	68	0	46	2	978	42	2	0	2	2177
04:00 PM	11	277	0	9	0	6	0	320	15	2	0	0	640
04:15 PM	10	286	0	10	0	8	0	301	16	0	0	2	633
04:30 PM	14	282	0	17	0	5	0	296	15	3	0	1	633
04:45 PM	7	317	0	10	0	11	0	288	24	2	0	0	659
Total	42	1162	0	46	0	30	0	1205	70	7	0	3	2565
05:00 PM	10	326	0	16	0	7	0	312	12	0	0	0	683
05:15 PM	13	325	0	11	0	8	0	302	15	0	0	2	676
05:30 PM	10	352	0	15	0	14	0	329	23	2	0	2	747
05:45 PM	12	294	1	9	0	16	0	332	14	0	0	0	678
Total	45	1297	1	51	0	45	0	1275	64	2	0	4	2784
Grand Total	131	4519	2	237	0	217	2	4555	205	18	0	15	9901
Apprch %	2.8	97.1	0	52.2	0	47.8	0	95.7	4.3	54.5	0	45.5	
Total %	1.3	45.6	0	2.4	0	2.2	0	46	2.1	0.2	0	0.2	

CITY TRAFFIC COUNTERS

www.ctcounters.com

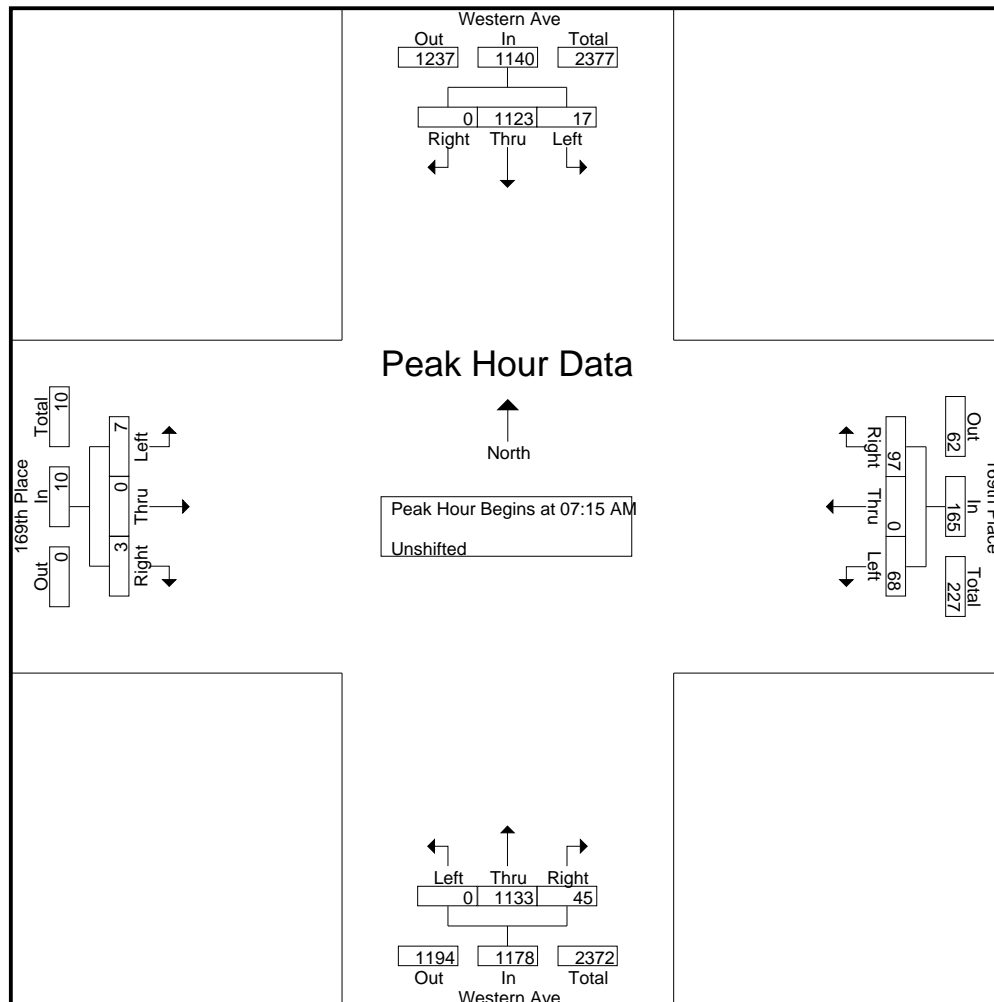
File Name : Western_169thPI

Site Code : 00000000

Start Date : 9/27/2016

Page No : 2

	Western Ave Southbound				169th Place Westbound				Western Ave Northbound				169th Place Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	237	0	240	15	0	33	48	0	272	8	280	4	0	1	5	573
07:30 AM	7	287	0	294	19	0	33	52	0	304	6	310	1	0	0	1	657
07:45 AM	3	323	0	326	20	0	20	40	0	291	13	304	1	0	2	3	673
08:00 AM	4	276	0	280	14	0	11	25	0	266	18	284	1	0	0	1	590
Total Volume	17	1123	0	1140	68	0	97	165	0	1133	45	1178	7	0	3	10	2493
% App. Total	1.5	98.5	0		41.2	0	58.8		0	96.2	3.8		70	0	30		
PHF	.607	.869	.000	.874	.850	.000	.735	.793	.000	.932	.625	.950	.438	.000	.375	.500	.926



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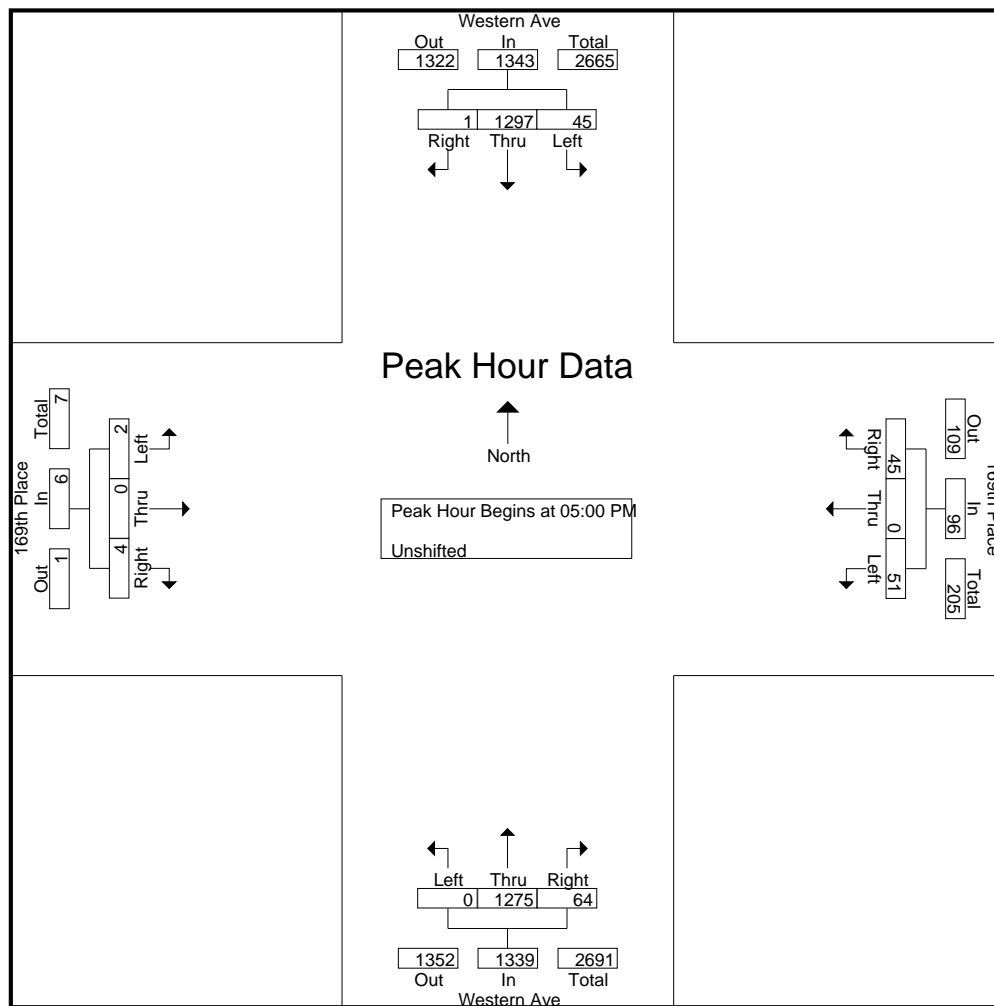
File Name : Western_169thPI

Site Code : 00000000

Start Date : 9/27/2016

Page No : 3

	Western Ave Southbound				169th Place Westbound				Western Ave Northbound				169th Place Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	10	326	0	336	16	0	7	23	0	312	12	324	0	0	0	0	683
05:15 PM	13	325	0	338	11	0	8	19	0	302	15	317	0	0	2	2	676
05:30 PM	10	352	0	362	15	0	14	29	0	329	23	352	2	0	2	4	747
05:45 PM	12	294	1	307	9	0	16	25	0	332	14	346	0	0	0	0	678
Total Volume	45	1297	1	1343	51	0	45	96	0	1275	64	1339	2	0	4	6	2784
% App. Total	3.4	96.6	0.1		53.1	0	46.9		0	95.2	4.8		33.3	0	66.7		
PHF	.865	.921	.250	.927	.797	.000	.703	.828	.000	.960	.696	.951	.250	.000	.500	.375	.932



CITY TRAFFIC COUNTERS

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File Name : Western_169thPI_BP

Site Code : 00000000

Start Date : 9/27/2016

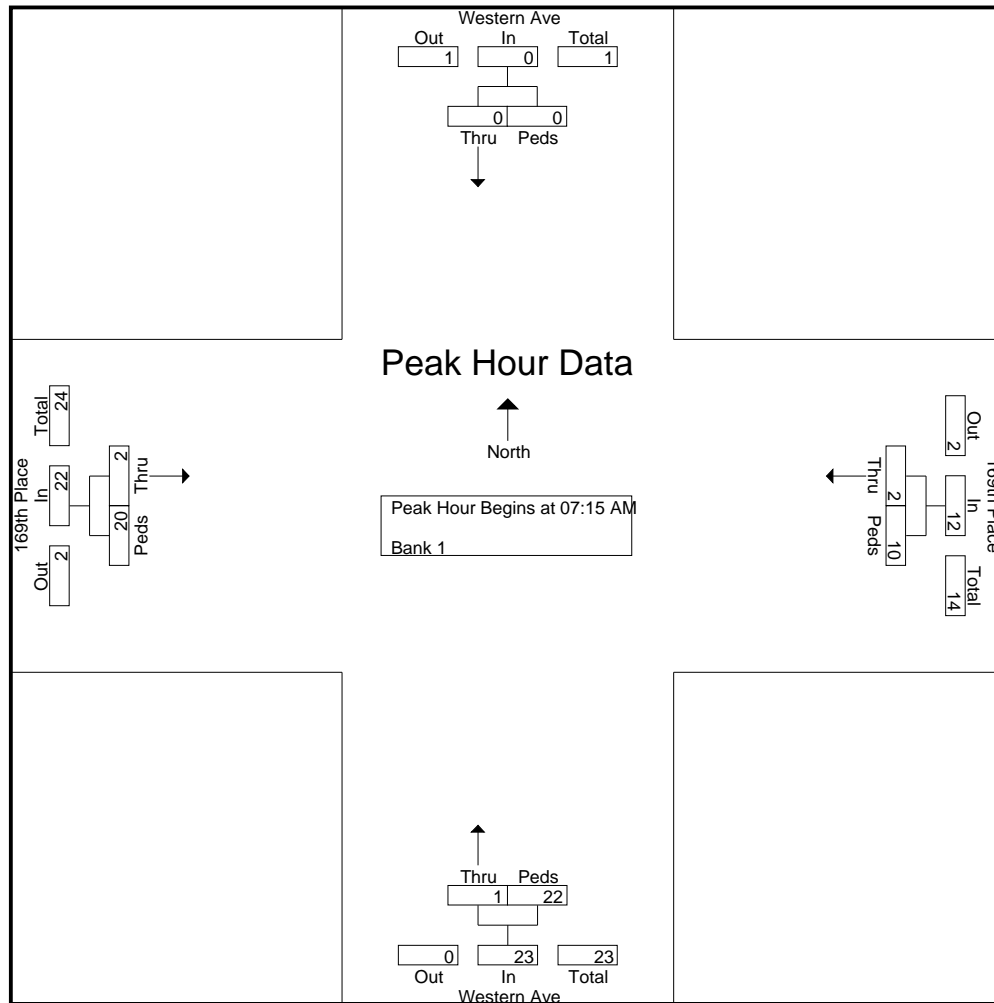
Page No : 1

Groups Printed- Bank 1

	Western Ave Southbound		169th Place Westbound		Western Ave Northbound		169th Place Eastbound		
Start Time	Thru	Peds	Thru	Peds	Thru	Peds	Thru	Peds	Int. Total
07:00 AM	0	1	1	4	0	1	0	4	11
07:15 AM	0	0	0	2	0	4	0	5	11
07:30 AM	0	0	0	7	1	8	0	2	18
07:45 AM	0	0	1	0	0	6	0	9	16
Total	0	1	2	13	1	19	0	20	56
08:00 AM	0	0	1	1	0	4	2	4	12
08:15 AM	0	0	1	0	0	3	1	3	8
08:30 AM	0	0	0	0	0	2	1	3	6
08:45 AM	0	1	2	0	0	1	1	5	10
Total	0	1	4	1	0	10	5	15	36
04:00 PM	0	1	0	0	0	2	1	1	5
04:15 PM	0	0	0	0	0	4	1	4	9
04:30 PM	0	0	0	0	1	1	6	0	8
04:45 PM	0	1	0	0	0	2	2	0	5
Total	0	2	0	0	1	9	10	5	27
05:00 PM	0	0	2	0	0	0	0	0	2
05:15 PM	0	0	2	1	4	2	0	2	11
05:30 PM	0	0	1	0	2	1	1	0	5
05:45 PM	1	0	0	2	0	2	0	2	7
Total	1	0	5	3	6	5	1	4	25
Grand Total	1	4	11	17	8	43	16	44	144
Apprch %	20	80	39.3	60.7	15.7	84.3	26.7	73.3	
Total %	0.7	2.8	7.6	11.8	5.6	29.9	11.1	30.6	

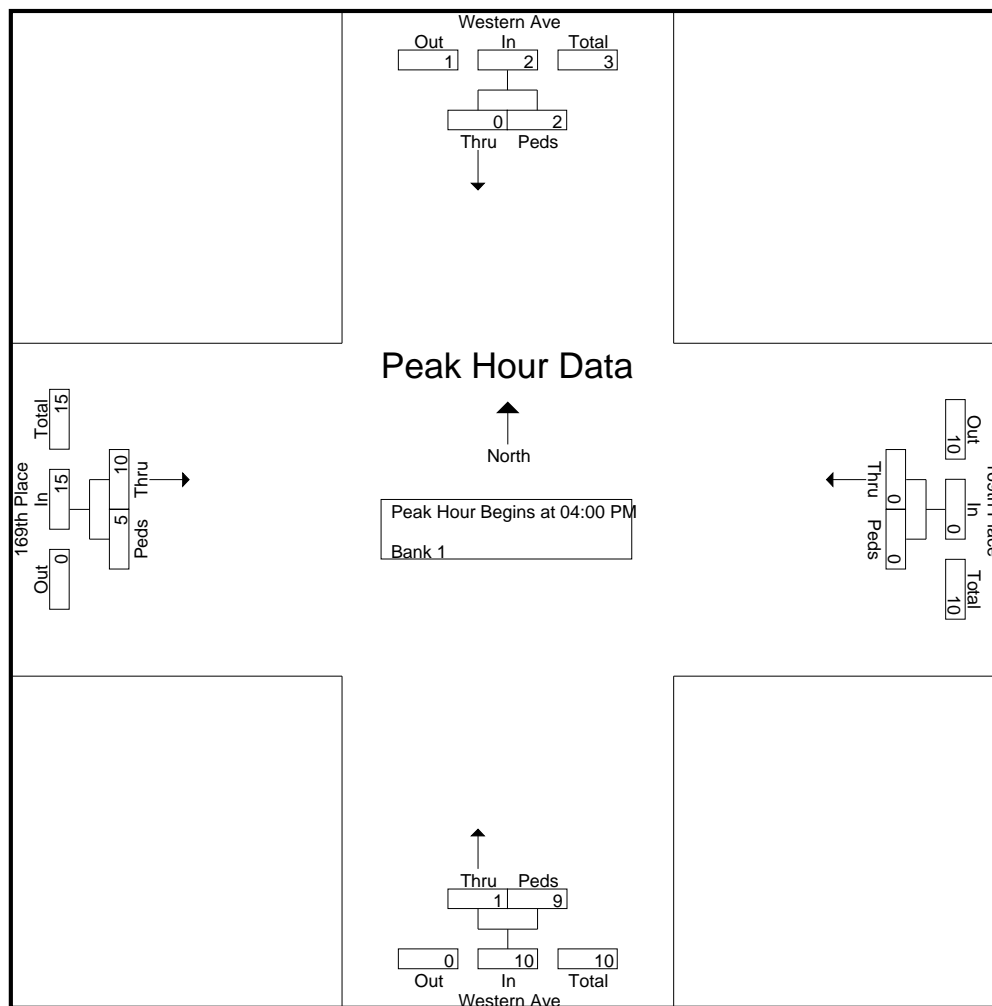
File Name : Western_169thPI_BP
Site Code : 00000000
Start Date : 9/27/2016
Page No : 2

	Western Ave Southbound			169th Place Westbound			Western Ave Northbound			169th Place Eastbound			
Start Time	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	0	0	2	2	0	4	4	0	5	5	11
07:30 AM	0	0	0	0	7	7	1	8	9	0	2	2	18
07:45 AM	0	0	0	1	0	1	0	6	6	0	9	9	16
08:00 AM	0	0	0	1	1	2	0	4	4	2	4	6	12
Total Volume	0	0	0	2	10	12	1	22	23	2	20	22	57
% App. Total	0	0		16.7	83.3		4.3	95.7		9.1	90.9		
PHF	.000	.000	.000	.500	.357	.429	.250	.688	.639	.250	.556	.611	.792



File Name : Western_169thPI_BP
Site Code : 00000000
Start Date : 9/27/2016
Page No : 3

	Western Ave Southbound			169th Place Westbound			Western Ave Northbound			169th Place Eastbound			
Start Time	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	1	1	0	0	0	0	2	2	1	1	2	5
04:15 PM	0	0	0	0	0	0	0	4	4	1	4	5	9
04:30 PM	0	0	0	0	0	0	1	1	2	6	0	6	8
04:45 PM	0	1	1	0	0	0	0	2	2	2	0	2	5
Total Volume	0	2	2	0	0	0	1	9	10	10	5	15	27
% App. Total	0	100		0	0		10	90		66.7	33.3		
PHF	.000	.500	.500	.000	.000	.000	.250	.563	.625	.417	.313	.625	.750



CITY TRAFFIC COUNTERS

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File Name : Western_Artesia

Site Code : 00000000

Start Date : 9/27/2016

Page No : 1

Groups Printed- Unshifted

	Western Ave Southbound			Artesia Blvd Westbound			Western Ave Northbound			Artesia Blvd Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	33	152	14	71	397	59	32	138	25	14	176	13	1124
07:15 AM	41	177	19	60	378	56	26	172	30	32	199	19	1209
07:30 AM	68	178	15	70	336	65	47	196	36	26	195	22	1254
07:45 AM	75	206	22	98	255	57	27	204	50	37	210	48	1289
Total	217	713	70	299	1366	237	132	710	141	109	780	102	4876
08:00 AM	53	176	24	86	306	76	25	207	34	29	265	31	1312
08:15 AM	65	188	21	95	294	66	35	150	46	34	243	32	1269
08:30 AM	51	179	14	79	307	64	34	163	35	31	204	34	1195
08:45 AM	69	162	18	91	325	68	43	196	42	36	182	38	1270
Total	238	705	77	351	1232	274	137	716	157	130	894	135	5046
04:00 PM	61	168	23	76	238	62	28	204	61	54	343	37	1355
04:15 PM	68	198	21	57	231	70	21	176	61	56	307	25	1291
04:30 PM	60	218	29	60	249	54	30	221	85	60	291	41	1398
04:45 PM	71	213	31	68	254	64	22	194	65	66	342	39	1429
Total	260	797	104	261	972	250	101	795	272	236	1283	142	5473
05:00 PM	88	193	22	97	295	70	35	181	83	42	359	42	1507
05:15 PM	85	194	29	66	265	70	40	204	51	51	378	37	1470
05:30 PM	103	200	27	89	245	71	42	215	86	66	308	49	1501
05:45 PM	67	236	25	82	281	70	45	235	83	74	349	50	1597
Total	343	823	103	334	1086	281	162	835	303	233	1394	178	6075
Grand Total	1058	3038	354	1245	4656	1042	532	3056	873	708	4351	557	21470
Apprch %	23.8	68.3	8	17.9	67.1	15	11.9	68.5	19.6	12.6	77.5	9.9	
Total %	4.9	14.1	1.6	5.8	21.7	4.9	2.5	14.2	4.1	3.3	20.3	2.6	

CITY TRAFFIC COUNTERS

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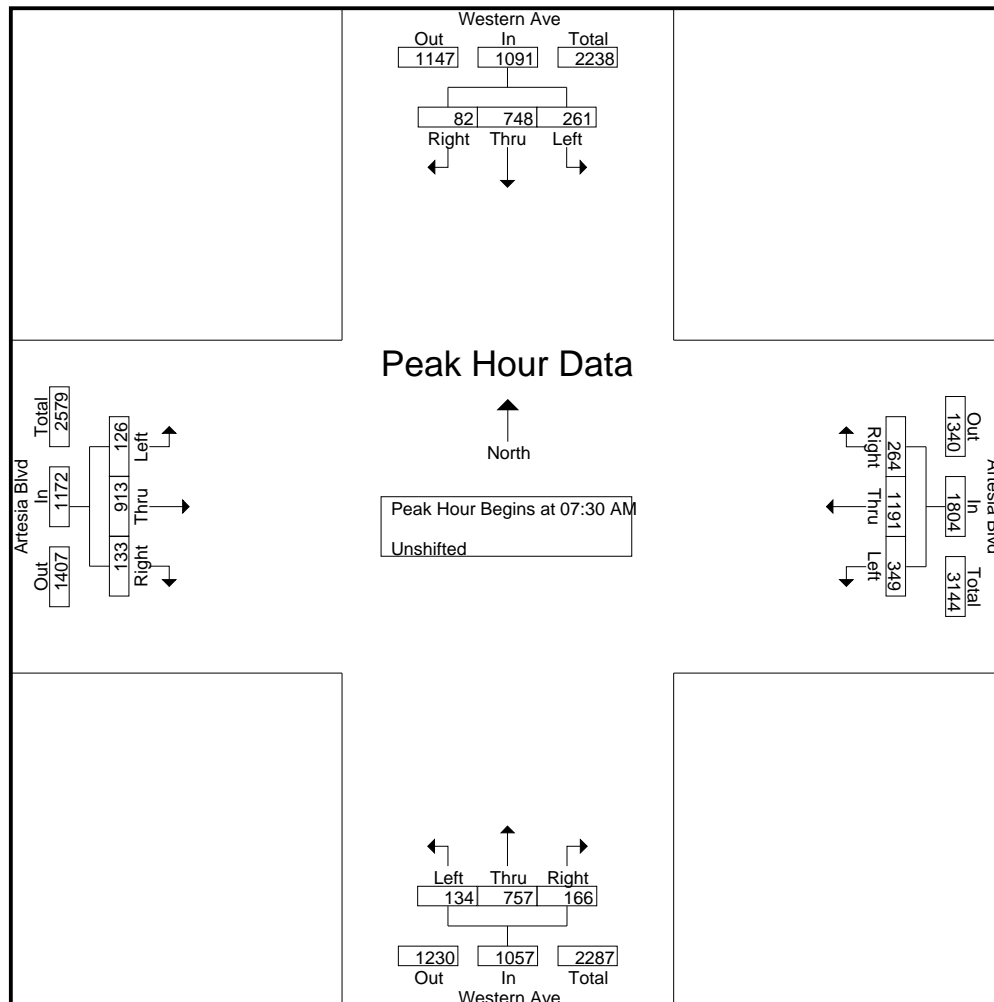
File Name : Western_Artesia

Site Code : 00000000

Start Date : 9/27/2016

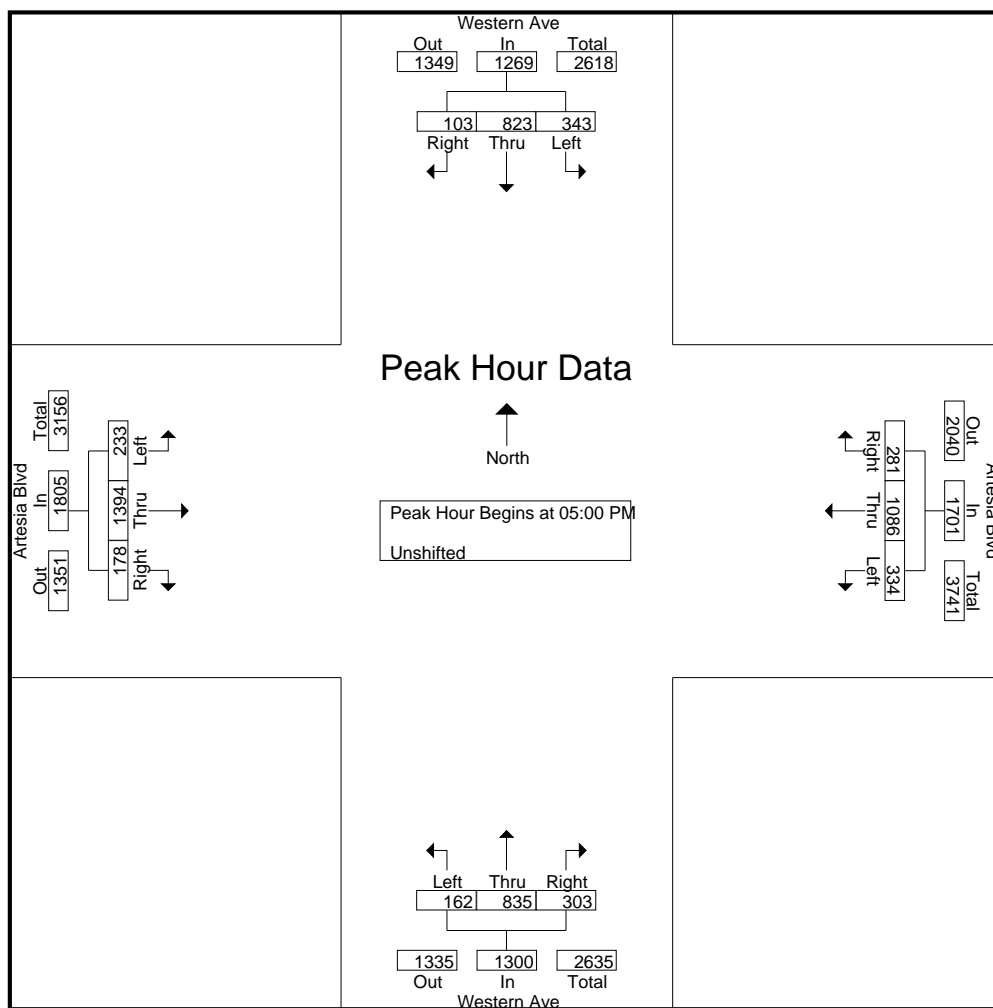
Page No : 2

	Western Ave Southbound				Artesia Blvd Westbound				Western Ave Northbound				Artesia Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	68	178	15	261	70	336	65	471	47	196	36	279	26	195	22	243	1254
07:45 AM	75	206	22	303	98	255	57	410	27	204	50	281	37	210	48	295	1289
08:00 AM	53	176	24	253	86	306	76	468	25	207	34	266	29	265	31	325	1312
08:15 AM	65	188	21	274	95	294	66	455	35	150	46	231	34	243	32	309	1269
Total Volume	261	748	82	1091	349	1191	264	1804	134	757	166	1057	126	913	133	1172	5124
% App. Total	23.9	68.6	7.5		19.3	66	14.6		12.7	71.6	15.7		10.8	77.9	11.3		
PHF	.870	.908	.854	.900	.890	.886	.868	.958	.713	.914	.830	.940	.851	.861	.693	.902	.976



File Name : Western_Artesia
Site Code : 00000000
Start Date : 9/27/2016
Page No : 3

	Western Ave Southbound				Artesia Blvd Westbound				Western Ave Northbound				Artesia Blvd Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	88	193	22	303	97	295	70	462	35	181	83	299	42	359	42	443	1507
05:15 PM	85	194	29	308	66	265	70	401	40	204	51	295	51	378	37	466	1470
05:30 PM	103	200	27	330	89	245	71	405	42	215	86	343	66	308	49	423	1501
05:45 PM	67	236	25	328	82	281	70	433	45	235	83	363	74	349	50	473	1597
Total Volume	343	823	103	1269	334	1086	281	1701	162	835	303	1300	233	1394	178	1805	6075
% App. Total	27	64.9	8.1		19.6	63.8	16.5		12.5	64.2	23.3		12.9	77.2	9.9		
PHF	.833	.872	.888	.961	.861	.920	.989	.920	.900	.888	.881	.895	.787	.922	.890	.954	.951



CITY TRAFFIC COUNTERS

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File Name : Western_Artesia_BP

Site Code : 00000000

Start Date : 9/27/2016

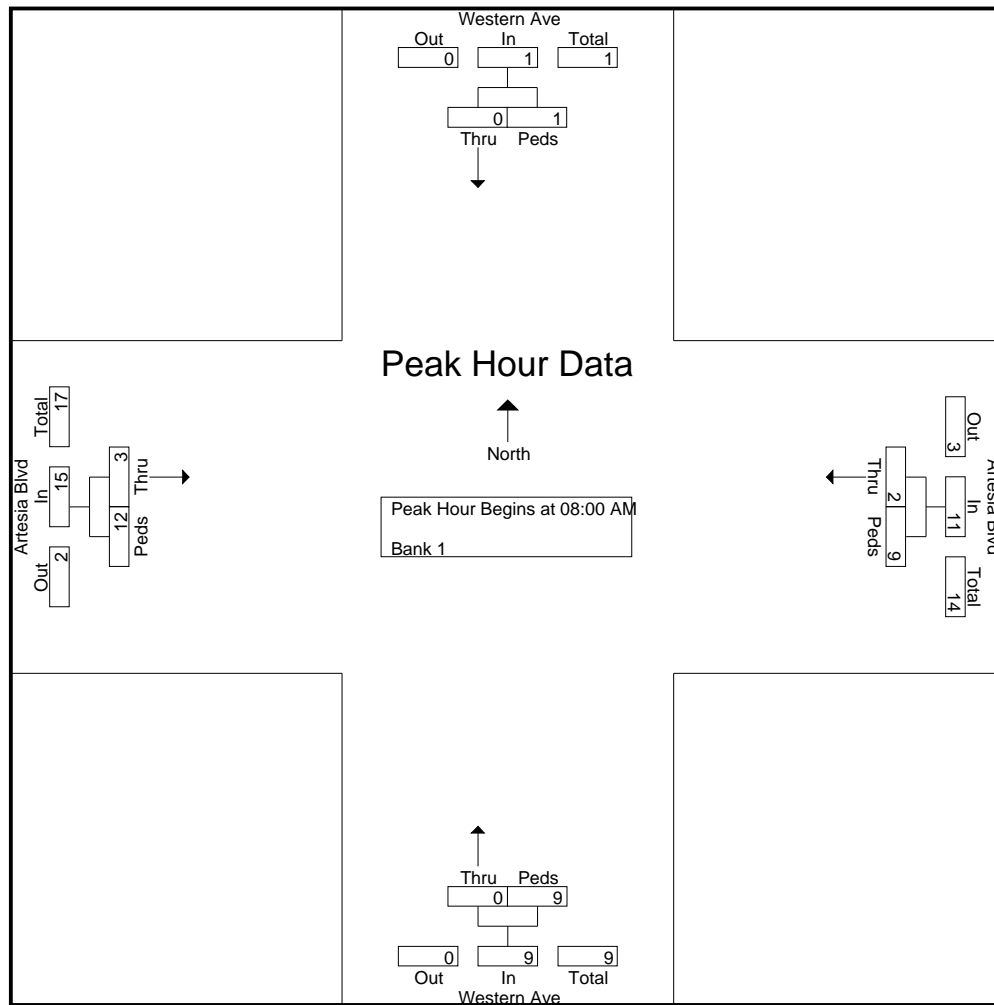
Page No : 1

Groups Printed- Bank 1

	Western Ave Southbound		Artesia Blvd Westbound		Western Ave Northbound		Artesia Blvd Eastbound		
Start Time	Thru	Peds	Thru	Peds	Thru	Peds	Thru	Peds	Int. Total
07:00 AM	0	1	1	2	0	2	0	3	9
07:15 AM	0	0	0	2	0	1	1	3	7
07:30 AM	0	0	0	4	0	0	2	1	7
07:45 AM	0	1	1	3	0	3	0	2	10
Total	0	2	2	11	0	6	3	9	33
08:00 AM	0	0	1	0	0	3	0	5	9
08:15 AM	0	0	0	0	0	2	1	2	5
08:30 AM	0	0	0	3	0	0	0	3	6
08:45 AM	0	1	1	6	0	4	2	2	16
Total	0	1	2	9	0	9	3	12	36
04:00 PM	0	2	2	2	0	4	1	6	17
04:15 PM	0	0	0	2	0	2	2	4	10
04:30 PM	0	0	0	0	0	4	1	3	8
04:45 PM	0	1	0	3	0	1	1	1	7
Total	0	3	2	7	0	11	5	14	42
05:00 PM	0	1	0	2	0	2	0	4	9
05:15 PM	0	0	0	6	0	1	0	1	8
05:30 PM	0	1	0	2	0	2	0	2	7
05:45 PM	0	0	2	4	0	3	0	1	10
Total	0	2	2	14	0	8	0	8	34
Grand Total	0	8	8	41	0	34	11	43	145
Apprch %	0	100	16.3	83.7	0	100	20.4	79.6	
Total %	0	5.5	5.5	28.3	0	23.4	7.6	29.7	

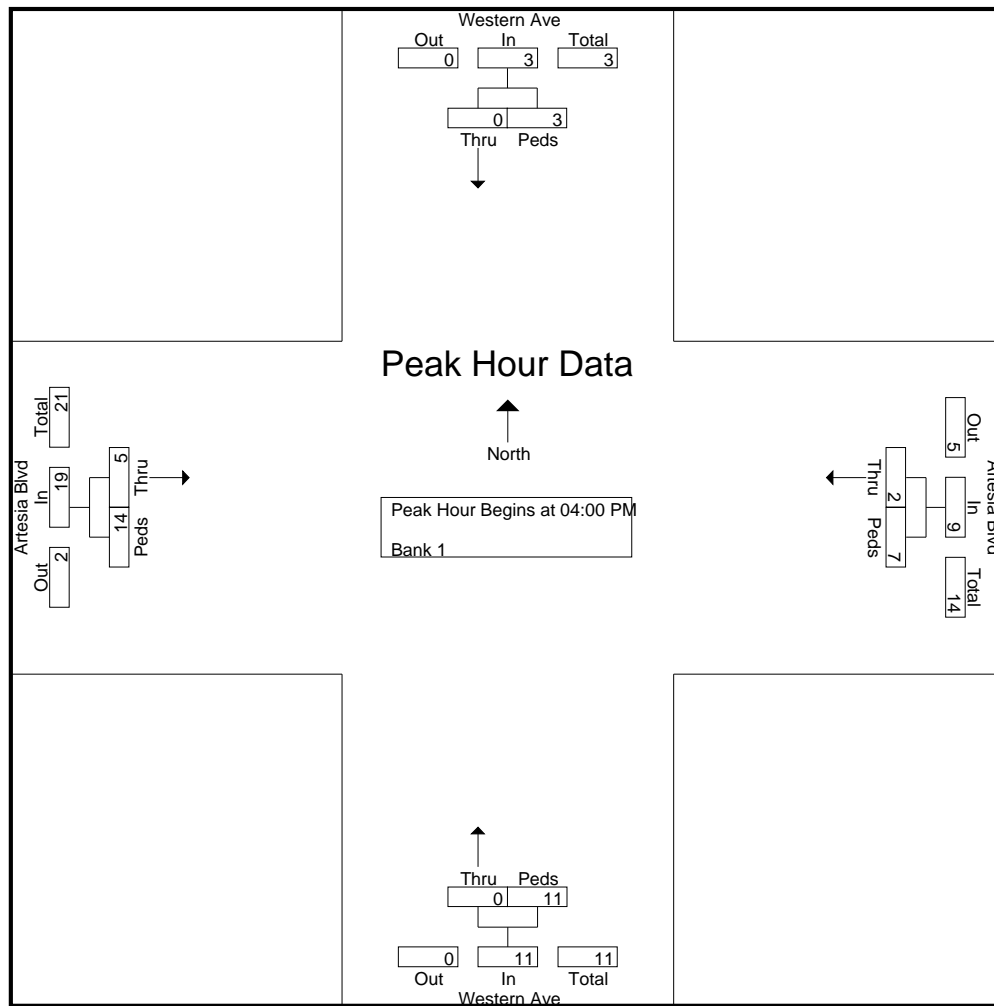
File Name : Western_Artesia_BP
Site Code : 00000000
Start Date : 9/27/2016
Page No : 2

	Western Ave Southbound			Artesia Blvd Westbound			Western Ave Northbound			Artesia Blvd Eastbound			
Start Time	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	0	0	1	0	1	0	3	3	0	5	5	9
08:15 AM	0	0	0	0	0	0	0	2	2	1	2	3	5
08:30 AM	0	0	0	0	3	3	0	0	0	0	3	3	6
08:45 AM	0	1	1	1	6	7	0	4	4	2	2	4	16
Total Volume	0	1	1	2	9	11	0	9	9	3	12	15	36
% App. Total	0	100		18.2	81.8		0	100		20	80		
PHF	.000	.250	.250	.500	.375	.393	.000	.563	.563	.375	.600	.750	.563



File Name : Western_Artesia_BP
Site Code : 00000000
Start Date : 9/27/2016
Page No : 3

	Western Ave Southbound			Artesia Blvd Westbound			Western Ave Northbound			Artesia Blvd Eastbound			
Start Time	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	2	2	2	2	4	0	4	4	1	6	7	17
04:15 PM	0	0	0	0	2	2	0	2	2	2	4	6	10
04:30 PM	0	0	0	0	0	0	0	4	4	1	3	4	8
04:45 PM	0	1	1	0	3	3	0	1	1	1	1	2	7
Total Volume	0	3	3	2	7	9	0	11	11	5	14	19	42
% App. Total	0	100		22.2	77.8		0	100		26.3	73.7		
PHF	.000	.375	.375	.250	.583	.563	.000	.688	.688	.625	.583	.679	.618



APPENDIX B

ICU AND LEVELS OF SERVICE EXPLANATION ICU DATA WORKSHEETS – WEEKDAY AM AND PM PEAK HOUR

INTERSECTION CAPACITY UTILIZATION (ICU) DESCRIPTION

Level of Service is a term used to describe prevailing conditions and their effect on traffic. Broadly interpreted, the Levels of Service concept denotes any one of a number of differing combinations of operating conditions which may occur as a roadway is accommodating various traffic volumes. Level of Service is a qualitative measure of the effect of such factors as travel speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

Six Levels of Service, A through F, have been defined in the 1965 *Highway Capacity Manual*, published by the Transportation Research Board. Level of Service A describes a condition of free flow, with low traffic volumes and relatively high speeds, while Level of Service F describes forced traffic flow at low speeds with jammed conditions and queues which cannot clear during the green phases.

The Intersection Capacity Utilization (ICU) method of intersection capacity analysis has been used in our studies. It directly relates traffic demand and available capacity for key intersection movements, regardless of present signal timing. The capacity per hour of green time for each approach is calculated based on the methods of the *Highway Capacity Manual*. The proportion of total signal time needed by each key movement is determined and compared to the total time available (100 percent of the hour). The result of summing the requirements of the conflicting key movements plus an allowance for clearance times is expressed as a decimal fraction. Conflicting key traffic movements are those opposing movements whose combined green time requirements are greatest.

The resulting ICU represents the proportion of the total hour required to accommodate intersection demand volumes if the key conflicting traffic movements are operating at capacity. Other movements may be operating near capacity, or may be operating at significantly better levels. The ICU may be translated to a Level of Service as tabulated below.

The Levels of Service (abbreviated from the *Highway Capacity Manual*) are listed here with their corresponding ICU and Load Factor equivalents. Load Factor is that proportion of the signal cycles during the peak hour which are fully loaded; i.e. when all of the vehicles waiting at the beginning of green are not able to clear on that green phase.

Intersection Capacity Utilization Characteristics		
Level of Service	Load Factor	Equivalent ICU
A	0.0	0.00 - 0.60
B	0.0 - 0.1	0.61 - 0.70
C	0.1 - 0.3	0.71 - 0.80
D	0.3 - 0.7	0.81 - 0.90
E	0.7 - 1.0	0.91 - 1.00
F	Not Applicable	Not Applicable

SERVICE LEVEL A

There are no loaded cycles and few are even close to loaded at this service level. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.

SERVICE LEVEL B

This level represents stable operation where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.

SERVICE LEVEL C

At this level stable operation continues. Loading is still intermittent but more frequent than at Level B. Occasionally drivers may have to wait through more than one red signal indication and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.

SERVICE LEVEL D

This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak hour, but enough cycles with lower demand occur to permit periodic clearance of queues, thus preventing excessive backups. Drivers frequently have to wait through more than one red signal. This level is the lower limit of acceptable operation to most drivers.

SERVICE LEVEL E

This represents near capacity and capacity operation. At capacity (ICU = 1.0) it represents the most vehicles that the particular intersection can accommodate. However, full utilization of every signal cycle is seldom attained no matter how great the demand. At this level all drivers wait through more than one red signal, and frequently through several.

SERVICE LEVEL F

Jammed conditions. Traffic backed up from a downstream location on one of the street restricts or prevents movement of traffic through the intersection under consideration.

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

N-S St: Western Avenue
E-W St: 169th Place
Project: 16958 S. Western Avenue Townhomes Project/1-16-4192-1
File: ICU1

Western Avenue @ 169th Place
Peak hr: AM
Annual Growth: 1.00%

Date: 10/11/2016
Date of Count: 2016
Projection Year: 2019

INTERSECTION CAPACITY UTILIZATION

2016 EXISTING TRAFFIC				2016 EXISTING W/ PROJECT					2016 EXISTING W/ PROJECT + MITIGATION					2019 FUTURE PRE-PROJECT					2019 FUTURE WITH PROJECT				
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Amb. Grow. Volume	Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio		
NB Left	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0	0	0.000	0	0	0	0.000		
NB Thru	1133	3200	0.368 *	7	1140	3200	0.370 *	0	1140	3200	0.370 *	34	34	2	1169	3200	0.380 *	7	1176	3200	0.382 *		
NB Right	45	0	0.000	0	45	0	0.000	0	45	0	0.000	1	1	0	46	0	0.000	0	46	0	0.000		
SB Left	17	1600	0.011 *	0	17	1600	0.011 *	0	17	1600	0.011 *	1	1	0	18	1600	0.011 *	0	18	1600	0.011 *		
SB Thru	1123	3200	0.351	1	1124	3200	0.351	0	1124	3200	0.351	34	34	14	1171	3200	0.366	1	1172	3200	0.366		
SB Right	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0	0	0.000	0	0	0	0.000		
EB Left	7	0	0.004 *	0	7	0	0.004 *	0	7	0	0.004 *	0	0	0	7	0	0.004 *	0	7	0	0.004 *		
EB Thru	0	1600	0.006	0	0	1600	0.006	0	0	1600	0.006	0	0	0	0	1600	0.006	0	0	1600	0.006		
EB Right	3	0	0.000	0	3	0	0.000	0	3	0	0.000	0	0	0	3	0	0.000	0	3	0	0.000		
WB Left	68	1600	0.043	0	68	1600	0.043	0	68	1600	0.043	2	2	0	70	1600	0.044	0	70	1600	0.044		
WB Thru	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0	0	0.000	0	0	0	0.000		
WB Right	97	1600	0.061 *	0	97	1600	0.061 *	0	97	1600	0.061 *	3	3	0	100	1600	0.063 *	0	100	1600	0.063 *		
Yellow Allowance			0.100 *				0.100 *				0.100 *						0.100 *				0.100 *		
ICU			0.544				0.546				0.546						0.558				0.560		
LOS			A				A				A						A				A		

* Key conflicting movement as a part of ICU
1 Counts conducted by: City Traffic Counters
2 Capacity expressed in veh/hour of green

LINSCOTT, LAW & GREENSPAN, ENGINEERS
600 S. Lake Avenue, Ste 500, Pasadena 91106
(626) 796.2322 Fax (626) 792.0941

INTERSECTION CAPACITY UTILIZATION

N-S St:	Western Avenue	Western Avenue @ 169th Place	Date:	10/11/2016
E-W St:	169th Place	Peak hr: PM	Date of Count:	2016
Project:	16958 S. Western Avenue Townhomes Project/1-16-4192-1	Annual Growth: 1.00%	Projection Year:	2019
File:	ICU1			

2016 EXISTING TRAFFIC				2016 EXISTING W/ PROJECT				2016 EXISTING W/ PROJECT + MITIGATION				2019 FUTURE PRE-PROJECT				2019 FUTURE WITH PROJECT				
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Amb. Grow. Volume	Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Thru	1275	3200	0.418 *	3	1278	3200	0.419 *	0	1278	3200	0.419 *	39	18	1332	3200	0.437 *	3	1335	3200	0.438 *
NB Right	64	0	0.000	0	64	0	0.000	0	64	0	0.000	2	0	66	0	0.000	0	66	0	0.000
SB Left	45	1600	0.028 *	0	45	1600	0.028 *	0	45	1600	0.028 *	1	0	46	1600	0.029 *	0	46	1600	0.029 *
SB Thru	1297	3200	0.406	6	1303	3200	0.408	0	1303	3200	0.408	39	13	1349	3200	0.422	6	1355	3200	0.424
SB Right	1	0	0.000	0	1	0	0.000	0	1	0	0.000	0	0	1	0	0.000	0	1	0	0.000
EB Left	2	0	0.001	0	2	0	0.001	0	2	0	0.001	0	0	2	0	0.001	0	2	0	0.001
EB Thru	0	1600	0.004 *	0	0	1600	0.004 *	0	0	1600	0.004 *	0	0	0	1600	0.004 *	0	0	1600	0.004 *
EB Right	4	0	0.000	0	4	0	0.000	0	4	0	0.000	0	0	4	0	0.000	0	4	0	0.000
WB Left	51	1600	0.032 *	0	51	1600	0.032 *	0	51	1600	0.032 *	2	0	53	1600	0.033 *	0	53	1600	0.033 *
WB Thru	0	0	0.000	0	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Right	45	1600	0.028	0	45	1600	0.028	0	45	1600	0.028	1	0	46	1600	0.029	0	46	1600	0.029
Yellow Allowance	0.100 *			0.100 *				0.100 *				0.100 *				0.100 *				
ICU	0.582			0.583				0.583				0.603				0.603				
LOS	A			A				A				B				B				

* Key conflicting movement as a part of ICU
1 Counts conducted by: City Traffic Counters
2 Capacity expressed in veh/hour of green

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N-S St: Western Avenue
E-W St: Artesia Boulevard
Project: 16958 S. Western Avenue Townhomes Project/1-16-4192-1
File: ICU2

Western Avenue @ Artesia Boulevard
Peak hr: AM
Annual Growth: 1.00%

Date: 10/11/2016
Date of Count: 2016
Projection Year: 2019

INTERSECTION CAPACITY UTILIZATION

2016 EXISTING TRAFFIC					2016 EXISTING W/ PROJECT + MITIGATION					2019 FUTURE PRE-PROJECT					2019 FUTURE WITH PROJECT				
Movement	1 Volume	2 Capacity	V/C Ratio		Added Volume	Total Volume	2 Capacity	V/C Ratio		Added Volume	Amb. Grow. Volume	Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	134	1600	0.084		0	134	1600	0.084		4	9	0	147	1600	0.092	0	147	1600	0.092
NB Thru	757	3200	0.237 *		1	758	3200	0.237 *		23	-5	0	775	3200	0.242 *	1	776	3200	0.243 *
NB Right	166	1600	0.104		0	166	1600	0.104		5	0	0	171	1600	0.107	0	171	1600	0.107
SB Left	261	2880	0.091 *		3	264	2880	0.092 *		8	0	0	269	2880	0.093 *	3	272	2880	0.094 *
SB Thru	748	3200	0.234		3	751	3200	0.235		23	5	0	776	3200	0.243	3	779	3200	0.243
SB Right	82	1600	0.051		3	85	1600	0.053		2	9	0	93	1600	0.058	3	96	1600	0.060
EB Left	126	1600	0.079 *		1	127	1600	0.079 *		4	7	0	137	1600	0.086 *	1	138	1600	0.086 *
EB Thru	913	4800	0.190		0	913	4800	0.190		28	3	0	944	4800	0.197	0	944	4800	0.197
EB Right	133	1600	0.083		0	133	1600	0.083		4	7	0	144	1600	0.090	0	144	1600	0.090
WB Left	349	2880	0.121		0	349	2880	0.121		11	0	0	360	2880	0.125	0	360	2880	0.125
WB Thru	1191	4800	0.303 *		0	1191	4800	0.303 *		36	13	0	1240	4800	0.315 *	0	1240	4800	0.315 *
WB Right	264	0	0.000		1	265	0	0.000		8	0	0	272	0	0.000	1	273	0	0.000
Yellow Allowance			0.100 *					0.100 *							0.100 *				0.100 *
ICU			0.809					0.811							0.836				0.838
LOS			D					D							D				D

* Key conflicting movement as a part of ICU
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INTERSECTION CAPACITY UTILIZATION

N-S St: Western Avenue
E-W St: Artesia Boulevard
Project: 16958 S. Western Avenue Townhomes Project/1-16-4192-1
File: ICU2

Western Avenue @ Artesia Boulevard
Peak hr: PM
Annual Growth: 1.00%

Date: 10/11/2016
Date of Count: 2016
Projection Year: 2019

2016 EXISTING TRAFFIC				2016 EXISTING WITH PROJECT				2016 EXISTING W/ PROJECT + MITIGATION				2019 FUTURE PRE-PROJECT				2019 FUTURE WITH PROJECT				
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	162	1600	0.101	0	162	1600	0.101	0	162	1600	0.101	5	9	176	1600	0.110	0	176	1600	0.110
NB Thru	835	3200	0.261 *	3	838	3200	0.262 *	0	838	3200	0.262 *	25	11	871	3200	0.272 *	3	874	3200	0.273 *
NB Right	303	1600	0.189	0	303	1600	0.189	0	303	1600	0.189	9	0	312	1600	0.195	0	312	1600	0.195
SB Left	343	2880	0.119 *	2	345	2880	0.120 *	0	345	2880	0.120 *	10	0	353	2880	0.123 *	2	355	2880	0.123 *
SB Thru	823	3200	0.257	2	825	3200	0.258	0	825	3200	0.258	25	4	852	3200	0.266	2	854	3200	0.267
SB Right	103	1600	0.064	2	105	1600	0.066	0	105	1600	0.066	3	9	115	1600	0.072	2	117	1600	0.073
EB Left	233	1600	0.146 *	3	236	1600	0.148 *	0	236	1600	0.148 *	7	7	247	1600	0.154 *	3	250	1600	0.156 *
EB Thru	1394	4800	0.290	0	1394	4800	0.290	0	1394	4800	0.290	42	17	1453	4800	0.303	0	1453	4800	0.303
EB Right	178	1600	0.111	0	178	1600	0.111	0	178	1600	0.111	5	7	190	1600	0.119	0	190	1600	0.119
WB Left	334	2880	0.116	0	334	2880	0.116	0	334	2880	0.116	10	0	344	2880	0.119	0	344	2880	0.119
WB Thru	1086	4800	0.285 *	0	1086	4800	0.285 *	0	1086	4800	0.285 *	33	14	1133	4800	0.296 *	0	1133	4800	0.297 *
WB Right	281	0	0.000	3	284	0	0.000	0	284	0	0.000	9	0	290	0	0.000	3	293	0	0.000
Yellow Allowance			0.100 *				0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.910				0.915				0.915					0.946				0.950
LOS			E				E				E					E				E

* Key conflicting movement as a part of ICU
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