

TRAFFIC IMPACT ANALYSIS REPORT  
**SENIOR CITIZEN HOUSING**

Torrance, California  
October, 2015

*Prepared for:*

**CITY OF TORRANCE**  
Community Development Department  
3031 Torrance Boulevard  
Torrance, CA 90503



*Under the Supervision of:*

Alan Leung, P.E.  
Mission Viejo  
CA, 92691

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# EXECUTIVE SUMMARY

## SENIOR CITIZEN HOUSING

Torrance, California  
September 2015

### **Project Description**

The proposed Senior Citizen Housing Project consists of developing a 76,217 square feet rectangular-shaped parcel of land in the City of Torrance. The Project site, which is currently vacant, is located near the northeast corner of Prairie Avenue and 176<sup>th</sup> Street. Within the subject property, it is proposed to build 12 units of one-bedroom senior condominiums and 50 units of two-bedroom senior condominiums. In addition, the project will consist of 2,949 square feet of commercial building area. The total building area of the project is 87,505 square feet with a floor area ratio (FAR) of 1.1. The proposed building is four-story high and supported by 94 on-site parking spaces.

The trip generation from the 9<sup>th</sup> Edition of ITE Trip Generation Manual for the 62 senior condominium units is expected to generate 224 daily trips (one half arriving, one half departing), with 13 trips (5 inbound, 8 outbound) produced in the AM peak hour and 17 trips (9 inbound, 8 outbound) produced in the PM peak hour on a “typical” weekday. Inside the residential development, there is a 2,949 square feet of commercial retail residing. The commercial retail targets the residents of the development and an internal trip reduction rate is applied to its trip generation. Based on discussion with the City, a conservative internal trip reduction rate of 50% is applied to the retail use. The retail use is expected to generate 1,089 daily trips with 46 trips (23 inbound and 23 outbound) and 51 trips (26 inbound and 25 outbound) during the AM and PM peak hours respectively.

The five (5) existing study intersections that have been selected for evaluation in this report provide both regional and local access to the study area. The intersections analyzed in this report are as follows:

1. Artesia Boulevard and Hawthorne Boulevard
2. Artesia Boulevard and Yukon Avenue
3. Prairie Avenue and 182<sup>nd</sup> Street
4. Prairie Avenue and Artesia Boulevard
5. Prairie Avenue and Redondo Beach Boulevard

### **Related Projects Description**

Per discussions with the City of Torrance, there are no related projects in the vicinity of the proposed senior citizen housing project.

### **Traffic Impact Analysis (ICU Methodology)**

#### *Existing Traffic Conditions (ICU Methodology)*

For the Existing traffic conditions, the level of service for the five (5) study intersections are listed below. These intersections operate at an acceptable level of service during the AM and

PM peak hours with the exception of Prairie Avenue and Redondo Beach Boulevard (PM at LOS “E”).

<u>Study Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU</u>	<u>LOS</u>	<u>ICU</u>	<u>LOS</u>
1. Artesia Boulevard and Hawthorne Boulevard	0.716	C	0.827	D
2. Artesia Boulevard and Yukon Boulevard	0.595	A	0.740	C
3. Prairie Avenue and 182 <sup>nd</sup> Street	0.763	C	0.858	D
4. Prairie Avenue and Artesia Boulevard	0.884	D	0.870	D
5. Prairie Avenue and Redondo Beach Boulevard	0.779	C	0.935	E

Existing With Project Traffic Conditions (ICU Methodology)

For the Existing With Project traffic conditions, the five (5) study intersections are listed below and four (4) of the five (5) intersections are forecast to operate at acceptable level of services during the AM and/or PM peak hours except the intersection of Prairie Avenue and Redondo Beach Boulevard (operates at LOS “E” during the PM peak hours).

<u>Study Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>ICU</u>	<u>LOS</u>	<u>ICU</u>	<u>LOS</u>
1. Artesia Boulevard and Hawthorne Boulevard	0.718	C	0.829	D
2. Artesia Boulevard and Yukon Boulevard	0.596	A	0.742	C
3. Prairie Avenue and 182 <sup>nd</sup> Street	0.764	C	0.860	D
4. Prairie Avenue and Artesia Boulevard	0.894	D	0.871	D
5. Prairie Avenue and Redondo Beach Boulevard	0.780	C	0.936	E

**None of the five (5) study intersections will have a significant impact under the Existing With Project traffic conditions when compared to the LOS criteria defined in this report. Since there are no significant impacts, no mitigation measures are required.**

**Traffic Impact Analysis (HCM Methodology)**

Existing Traffic Conditions (HCM Methodology)

For the Existing traffic conditions, the intersection delays relating to the level of service for the five (5) study intersections are listed below. These intersections operate at an acceptable level of service during the AM and/or PM peak hours with the exception of two (2) intersections: Prairie Avenue at Artesia Boulevard (PM at LOS “E”) and Prairie Avenue at Redondo Beach Boulevard (PM at LOS “E”).

<u>Study Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>Delay (s/v)</u>	<u>LOS</u>	<u>Delay (s/v)</u>	<u>LOS</u>
1. Artesia Boulevard and Hawthorne Boulevard	24.6	C	32.8	C
2. Artesia Boulevard and Yukon Boulevard	5.7	A	9.5	A
3. Prairie Avenue and 182 <sup>nd</sup> Street	29.1	C	33.4	C
4. Prairie Avenue and Artesia Boulevard	44.5	D	55.6	E
5. Prairie Avenue and Redondo Beach Boulevard	40.7	D	67.2	E

### **Existing With Project Traffic Conditions (HCM Methodology)**

For the Existing With Project traffic conditions, the intersection delays relating to the level of services for the five (5) study intersections are listed below. These intersections operate at an acceptable level of service during the AM and/or PM peak hours with the exception of two (2) intersections: Prairie Avenue at Artesia Boulevard (PM at LOS “E”) and Prairie Avenue at Redondo Beach Boulevard (PM at LOS”E”).

<b><u>Study Intersection</u></b>	<b><u>AM Peak Hour</u></b>		<b><u>PM Peak Hour</u></b>	
	<b><u>Delay (s/v)</u></b>	<b><u>LOS</u></b>	<b><u>Delay (s/v)</u></b>	<b><u>LOS</u></b>
1. Artesia Boulevard and Hawthorne Boulevard	24.6	C	53.0	C
2. Artesia Boulevard and Yukon Boulevard	5.7	A	9.4	A
3. Prairie Avenue and 182 <sup>nd</sup> Street	29.1	C	33.5	C
4. Prairie Avenue and Artesia Boulevard	44.9	D	56.1	E
5. Prairie Avenue and Redondo Beach Boulevard	40.7	D	67.3	E

**None of the five (5) study intersections will have a significant impact under the Existing With Project traffic conditions when compared to the LOS criteria defined in this report. Since there are no significant impacts, no mitigation measures are required.**

### **Built-out Year 2017 With Project Traffic Conditions Recommended Improvement**

The results of the Built-out Year 2017 with project traffic conditions plus an inflation rate of one percent applied per each year (from base year 2015) will not significantly impact any of the five studied intersections. As there are no significant impacts, no traffic mitigation measures are required or recommended for the intersections.

### **Site Access and Internal Circulation Evaluation**

The access locations are forecast to operate at acceptable levels of service during the AM and PM peak hours under the Existing With Project traffic conditions based on the *Intersection Capacity Utilization (ICU)* Method of Analysis.

The access locations are forecast to operate at acceptable levels of service during the AM and PM peak hours under the Existing With Project traffic conditions based on the *Highway Capacity Manual (HCM)* Method of Analysis.

The on-site circulation was evaluated in terms of vehicle-pedestrian conflicts. Based on our review of the preliminary site plan, the overall layout does not create significant vehicle-pedestrian conflict points and the roadway throat lengths are sufficient such that access to driveways is not impacted by internal vehicle queuing/stacking. Project traffic is expected to be relatively low and not anticipated to cause significant queuing/stacking at the Project access. Based on the review of the proposed site plan, the on-site circulation as well as the layout, spacing and throat length of the Project access is acceptable. Turning movements into and out of the Project site accesses will have minimum conflict and function at sufficient service levels.

# TRAFFIC IMPACT ANALYSIS REPORT

## SENIOR CITIZEN HOUSING

Torrance, California  
September 2015

### 1.0 INTRODUCTION

This traffic impact analysis evaluates the potential traffic impacts of the proposed Senior Citizen Housing (hereinafter referred to as Project), on the area traffic circulation. The proposed Project consists of developing 76,217 square feet rectangular-shaped parcel of land in the City of Torrance. The Project site, which is currently vacant, is located near the northeast corner of Prairie Avenue and 176<sup>th</sup> Street. Within the subject property, it is proposed to build 62 units of senior citizen condominium and 2,949 square feet of commercial establishment.

Vehicular access to the Project site (parking garage) will be provided via a driveway on Prairie Avenue just north of 176<sup>th</sup> Street. Ingress and egress to the Project driveway is limited to right-turn in and right-turn out only. The Project is anticipated to be completed and fully operational by Year 2017.

This report documents the findings and recommendations of a traffic impact analysis to determine the potential impacts the Project may have on the street network system in the vicinity of the Project site. The traffic impact analysis evaluates the operating conditions at five (5) existing study intersections and one (1) future Project driveway within the Project vicinity, estimates the trip generation potential of the Project, estimates the trip generation potential of the related projects and forecasts operating conditions without and with the Project. Information concerning related projects (planned and/or approved) in the vicinity of the Project has been researched at the City of Torrance. Based on discussion with the city, there are no planned and/or approved projects within the study area.

This traffic impact analysis has been prepared in accordance to the City of Torrance's traffic impact requirements and is consistent with the *Congestion Management Program (CMP) for Los Angeles County*. The Scope of Work for this traffic study was developed in conjunction with City of Torrance Public Works Department Staff.

The Project site has been reviewed and observations of adjacent area roadways and intersections was performed. Existing (i.e. baseline) peak period traffic information has been collected at five (5) study intersections on a "typical" weekday for use in the preparation of intersection level of service calculations.

## 1.1 Study Area

Five (5) existing study intersections have been selected for evaluation in this report providing access to the study area. The intersections analyzed in this report are as follows:

1. Artesia Boulevard and Hawthorne Boulevard
2. Artesia Boulevard and Yukon Avenue
3. Prairie Avenue and 182<sup>nd</sup> Street
4. Prairie Avenue and Artesia Boulevard
5. Prairie Avenue and Redondo Beach Boulevard

## 1.2 Traffic Impact Analysis Components

The Intersection Capacity Utilization (ICU), Highway Capacity Manual (HCM) and corresponding Level of Service (LOS) calculations at the study intersections were used to evaluate the potential traffic-related impacts associated with area growth, related projects, and the Project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or addresses the impact of the Project.

Included in this Traffic Impact Analysis are:

- Existing Traffic Counts,
- Estimated Project traffic generation/distributions/assignment,
- AM and PM peak hour LOS analyses for Existing (i.e. Baseline) Conditions,
- AM and PM peak hour LOS analyses for Existing (i.e. Baseline) Conditions with Project traffic,
- Project-Specific Traffic Improvements (if necessary), and
- Site Access and Internal Circulation Evaluation.

**Figure 1-1** presents a Vicinity Map, which illustrates the general location of the Project and depicts the study intersections and surrounding street system. **Figure 1-2** presents a Regional Map, which illustrates the general location of the Project, surrounding cities and the regional freeway system.

## 1.3 Traffic Impact Analysis Scenarios

The following scenarios are those for which ICU/Delay and corresponding LOS calculations have been performed at the study intersections for Existing (Year 2015 traffic conditions):

- A. Existing (i.e. Baseline) Traffic Conditions,
- B. Existing (i.e. Baseline) With Project Traffic Conditions,
- C. Scenario with Recommended Improvements, if any.

## 2.0 Project Description and Location

The proposed Project consists of developing a 76,217 square feet rectangular-shaped parcel of land in the City of Torrance. The Project site, which is currently vacant, is located east of Prairie Avenue and north of 176<sup>th</sup> Street. Within the subject property, the Applicant proposes to build 62 units of senior citizen condominium containing approximately 2,949 SF of commercial/retail services and 94 surface parking spaces.

**Figure 2-1** presents the existing site for the proposed Project. **Figure 2-2** presents the proposed site plan.

### 2.1 Site Access

As shown in **Figure 2-2**, vehicular access to the Project site will be provided via a proposed driveway located on the east side of Prairie Avenue fronting the project site. The existing landscape median on Prairie Avenue restricts access to the development to right-turn “in” and right-turn “out” only.

## 3.0 Analysis Conditions and Methodology

Regional access to the Project site is provided by the San Diego Freeway (I-405). The principal local network of streets serving the proposed Project are Prairie Avenue, Artesia Boulevard, Redondo Beach Boulevard, and Hawthorne Boulevard. The following discussion provides a brief synopsis of these key roadways. The descriptions are based on an inventory of existing roadway conditions.

### 3.1 Existing Street Network

**W. 182<sup>nd</sup> Street** is an east-west, four-lane undivided roadway, located south of the Project site. The posted speed limit on 182<sup>nd</sup> Street is 35 miles per hour (mph). Parking is permitted on both sides of the roadway within the vicinity of the project. Traffic signals exist at the intersections of W. 182<sup>nd</sup> Street at Prairie Avenue.

**Artesia Boulevard** is an east-west, four-lane divided roadway, located north of the Project site. The posted speed limit on Artesia Boulevard is 40 mph. Parking is permitted on either side of the roadway. Traffic signals exist at the intersections of Artesia Boulevard at Prairie Avenue.

**Redondo Beach Boulevard** is an east-west, four-lane undivided roadway located north of the Project site. The posted speed limit on Redondo Beach Boulevard is 35 mph. Parking is mostly



# SITE LOCATION MAP

FIGURE 2-1



allowed on both sides of the roadway. Traffic signals exist at the intersection of Redondo Beach Boulevard at Prairie Avenue.

**Prairie Avenue** is a north-south, five-lane divided roadway, located west of the Project site. The posted speed limit on Prairie Avenue is 35 mph. Parking is permitted on either side of the roadway within the vicinity of the Project. Prairie Avenue is also designated as a bike route.

**Hawthorne Boulevard** is a north-south, six-lane divided roadway located west of the Project site. The posted speed limit on Hawthorne Boulevard is 35 mph. Parking is permitted on both sides of the roadway. Traffic signals exist at the intersection of Hawthorne Boulevard at Artesia Boulevard.

**Yukon Avenue** is primarily a north-south, two-lane undivided roadway, located east of the Project site. The posted speed limit on Yukon Avenue is 25 mph. Parking is permitted on both sides of the roadway. A traffic signal exists at the intersection of Yukon Avenue at Artesia Boulevard.

**Figure 3-1** presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations.

### **3.2 Existing Public Transit**

The Metro Transit operates line 211 along Prairie Avenue in the vicinity of the project.

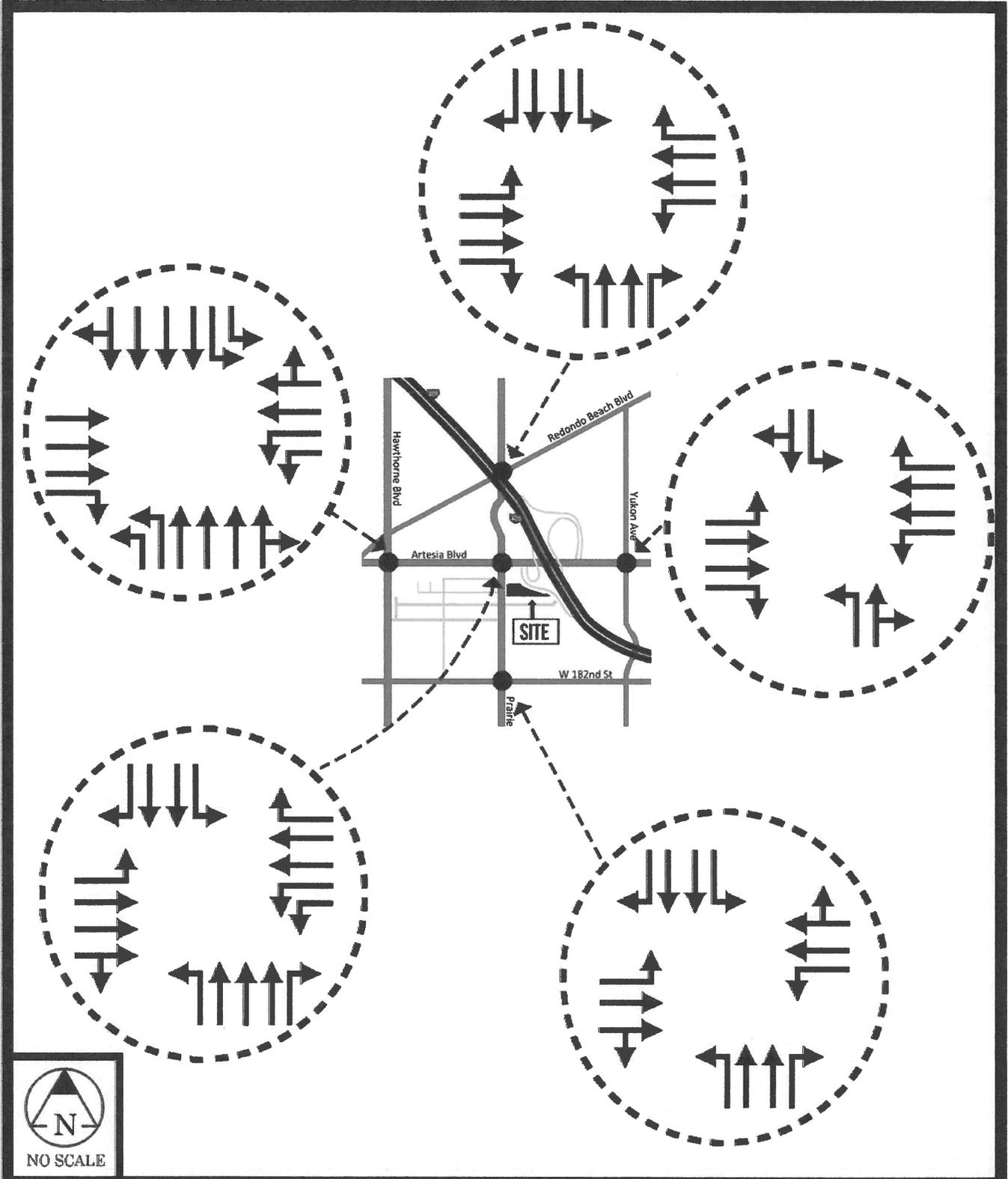
### **3.3 Existing Traffic Volumes**

Existing AM and PM peak hour traffic volumes for the five (5) study intersections evaluated in this report were collected by *Transportations Studies, Inc.* in August 2015. **Appendix B** contains the existing intersection turning movement traffic count data.

**Figures 3-2** and **3-3** present the existing AM and PM peak hour traffic volumes, respectively, for the five (5) study intersections.

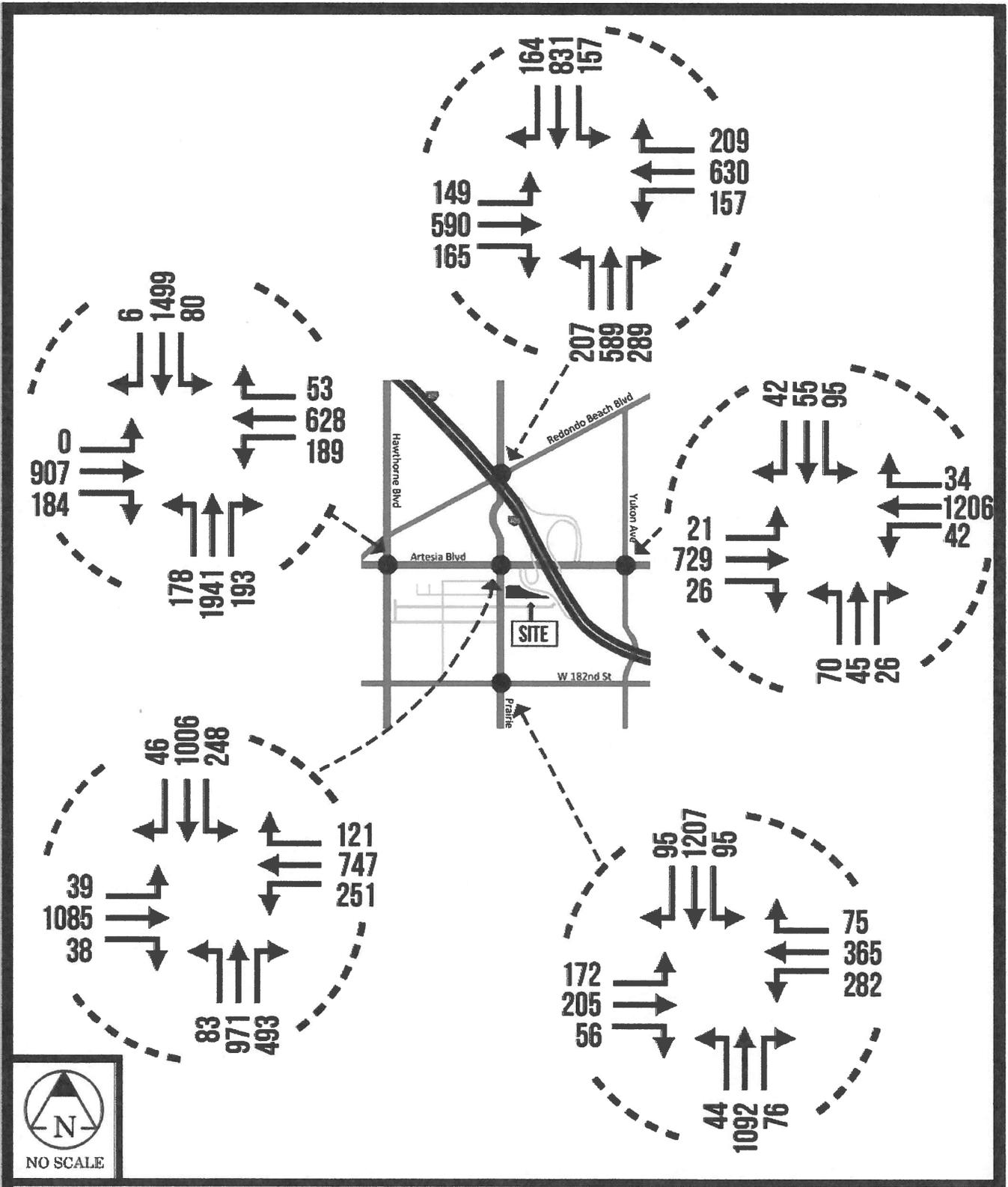
### **3.4 Level of Service (LOS) Analysis Methodologies**

AM and PM peak hour operating conditions for the study intersections were evaluated using both the *Intersection Capacity Utilization (ICU) Methodology* for signalized intersections and the methodology outlined in *Chapter 16 of the HCM 2000* for signalized intersections.



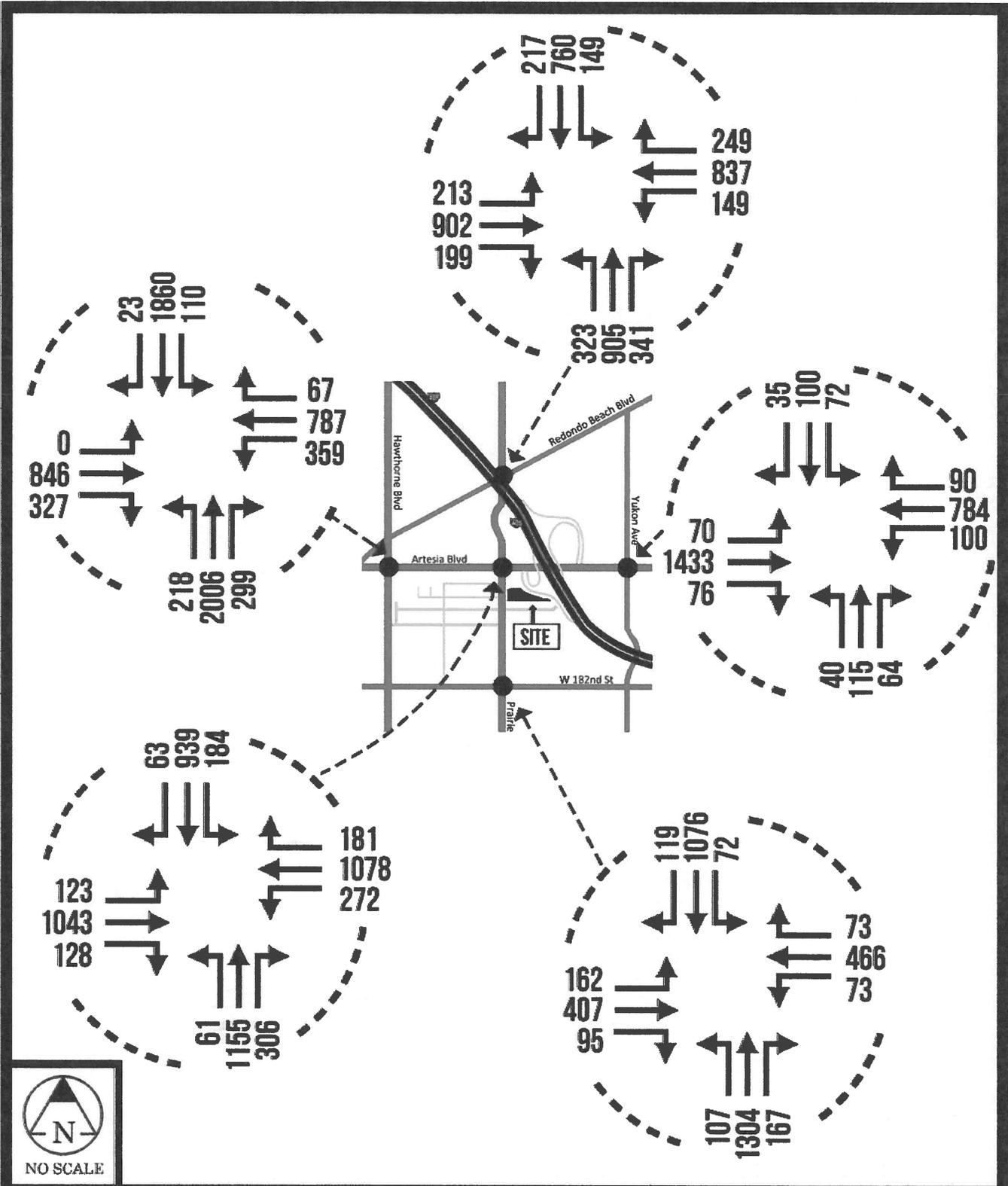
# EXISTING INTERSECTION LANE CONFIGURATION

FIGURE 3-1



# YEAR 2015 EXISTING AM PEAK TRAFFIC VOLUMES

FIGURE 3-2



**YEAR 2015 EXISTING PM PEAK TRAFFIC VOLUMES**

**FIGURE 3-3**

### **3.4.1 Intersection Capacity Utilization (ICU) Method of Analysis (Signalized Intersections)**

In conformance with the City of Torrance and LA County CMP requirements, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the *Intersection Capacity Utilization (ICU)* method of analysis. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements.

The ICU numerical value represents the percent signal (green) time and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing. Per LA County CMP requirements, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through and right-turn lanes and dual left-turn capacity of 2,880 vph. A clearance adjustment factor of 0.10 was added to each Level of Service calculation.

The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in **Table 3-1**.

### **3.4.2 Highway Capacity Manual (HCM) Method of Analysis (Signalized Intersections)**

The City of Torrance also requires that peak hour operating conditions for signalized intersections within the City be evaluated using the *Highway Capacity Manual 2000 (HCM 2000)* signalized intersection methodology. This methodology is consistent with Caltrans requirements. Based on the HCM operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions; in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents and when there are no other vehicles on the road.

In Chapter 16 of the HCM, only the portion of total delay attributed to the control facility (study intersection) is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. In contrast, in previous version of the HCM (1994 and earlier), delay included only stopped delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in **Table 3-2**.

### **3.5 Impact Criteria and Thresholds**

The relative impact of the added Project traffic volume generated by the proposed Project during the AM and PM peak hours was evaluated based on analysis of operating conditions at the key study intersections, without, then with, the proposed Project using the *Intersection Capacity Utilization (ICU) Methodology* and the *Highway Capacity Manual (HCM) Methodology*. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships, delay and service level characteristics at each study intersection. The significance of the potential impacts of the Project at each study intersection was then evaluated using the City's LOS standards and traffic impact criteria.

According to City of Torrance criteria, LOS D is the minimum acceptable condition that should be maintained during the AM and PM peak hours.

Impacts to local and regional transportation systems are considered significant if:

- An undesirable peak hour Level of Service (LOS) (i.e. LOS E or F) at any of the key signalized intersections is projected. The City of Torrance considers LOS D (ICU = 0.801 – 0.900) to be the minimum desirable LOS for all intersections. For the City of Torrance, the current LOS, if worse than LOS D (i.e. LOS E or F), should also be maintained; and
- The Project increases traffic demand at the key signalized study intersection by 2% of capacity (ICU increases  $\geq 0.020$ ), causing or worsening LOS E or F (ICU > 0.901).
- Based on the HCM/LOS method of analysis, this report identifies a significant traffic impact when the Project causes a change from LOS D to LOS E or F, or the Project causes an increase in delay of 2% or more at an intersection operating LOS E or F.

**TABLE 3-1**  
**LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (ICU**  
**METHODOLOGY) <sup>1</sup>**

Level of Service (LOS)	Intersection Capacity Utilization Value (ICU)	Level of Service Description
A	$\leq 0.600$	<b>EXCELLENT.</b> No vehicle waits longer than one red light and no approach phase is fully used.
B	0.601 – 0.700	<b>VERY GOOD.</b> An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	<b>GOOD.</b> Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	<b>FAIR.</b> Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.000	<b>POOR.</b> Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	$> 1.000$	<b>FAILURE.</b> Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

<sup>1</sup> Source: *Transportation Research Board Circular 212 – Interim Materials on Highway Capacity*

**TABLE 3-2**  
**LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM**  
**METHODOLOGY)<sup>2</sup>**

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	$\leq 10.0$	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	$> 10.0$ and $\leq 20.0$	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	$> 20.0$ and $\leq 35.0$	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	$> 35.0$ and $\leq 55.0$	Long traffic delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high $v/c$ ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	$> 55.0$ and $\leq 80.0$	Very long traffic delays. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high $v/c$ ratios. Individual cycle failures are frequent occurrences.
F	$\geq 80.0$	Severe congestion. This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high $v/c$ ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

<sup>2</sup> Source: *Highway Capacity Manual 2000*, Chapter 16 (Signalized Intersections)

## 4.0 Traffic Forecasting Methodology

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

Studies by the Institute of Transportation Engineers (ITE), Los Angeles County, ourselves and others have identified generalized factors which relate traffic characteristics with quantity and type of development. These traffic generation factors are useful in estimating the total future characteristics of a project yet to be constructed and occupied. Judgment is required on the part of the analyst to select the appropriate factors which best match the type of developments contemplated.

The quantity of floor area, density of development, availability of public transportation and regional location of the project all affect the traffic generation rate. While there are many different types of uses and many parameters upon which to estimate traffic (acreage, number of dwelling units, number of employees, etc.) the best factors for the kind of development contemplated would relate to the square footage of the commercial section of the development, and the number dwelling units of the residential section of the site.

In order to evaluate the quantity of traffic generated by the site, ITE traffic generation factors from the 9<sup>th</sup> Edition of the Traffic Generation Manual were applied to the proposed project, for the daily, the morning and the evening peak periods. As described earlier, the AM and PM peak hours relate to a one-hour period within the 7:00 to 9:00 AM and the 4:00 to 6:00 PM periods respectively.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound Project traffic. These origins and destinations are typically based on demographics and existing/expected future 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 segments and intersection turning movements throughout the study area.

With the forecasting process complete and Project traffic assignments developed, the impact of the Project is isolated by comparing operational (LOS) conditions at selected intersections using existing traffic volumes with and without forecast Project traffic. If necessary, the need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

## **5.0 Project Traffic Characteristics**

### **5.1 Project Trip Generation Forecast**

**Table 5-1** summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project.

The total combined trip generation for the proposed senior housing project is expected to generate 1,312 daily trips, with 59 trips (28 inbound, 31 outbound) produced in the AM peak hour and 68 trips (35 inbound, 33 outbound) produced in the PM peak hour on a “typical” weekday.

### **5.2 Project Trip Distribution and Assignment**

The directional trip distribution pattern at the key study intersections for the proposed Project is presented in **Figure 5-1**. The directional trip assignments at the key study intersections are presented in **Figures 5-2** and **5-3**.

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 carriers (i.e. Prairie Avenue, Artesia Boulevard, etc.),
- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals,
- the traffic-carrying capacity and travel speed available on roadways serving the Project site,
- existing intersection traffic volumes,
- ingress/egress availability at the Project site, and
- input from City staff.

# TABLE 5.1

## PROJECT TRAFFIC GENERATION

### Senior Housing Project - City of Torrance

Land Use	Size	Unit	Land Use Code	Average Daily Traffic		AM Peak Hour				PM Peak Hour							
				TE Rate	Trip End	Rate	In %	Out%	In	Out	Total Trip	Rate	In %	Out%	In	Out	Total Trip
1 Senior Housing (attached)	65	DU	252	3.44	224	0.20	34	66	5	8	13	0.25	55	45	9	8	17
2 Commercial Retail	2949	sq.ft.	852	737.99	2177	31.02	50	50	46	46	92	34.57	51	49	52	50	102
Internal Trips (Retail only) - 50%**					1089				23	23	46				26	25	51
Total Volumes Reduction					1089				23	23	46				26	25	51
<b>Proposed Project Net Traffic Generation</b>					<b>1312</b>				<b>28</b>	<b>31</b>	<b>59</b>				<b>35</b>	<b>33</b>	<b>68</b>

Note:

\* The Rate is the average number of Trip Ends generated per "SIZE" Unit (i.e. DU) per ITE Trip Generation Manual - 9th Edition. Trip End is a one-way vehicle movement entering or leaving the traffic generator.

\*\* Internal trip reduction applied to commercial retail. The retail is located inside the senior housing serving the residents of the development. Per discussion with the City, a conservative internal trip rate of 50% is applied.

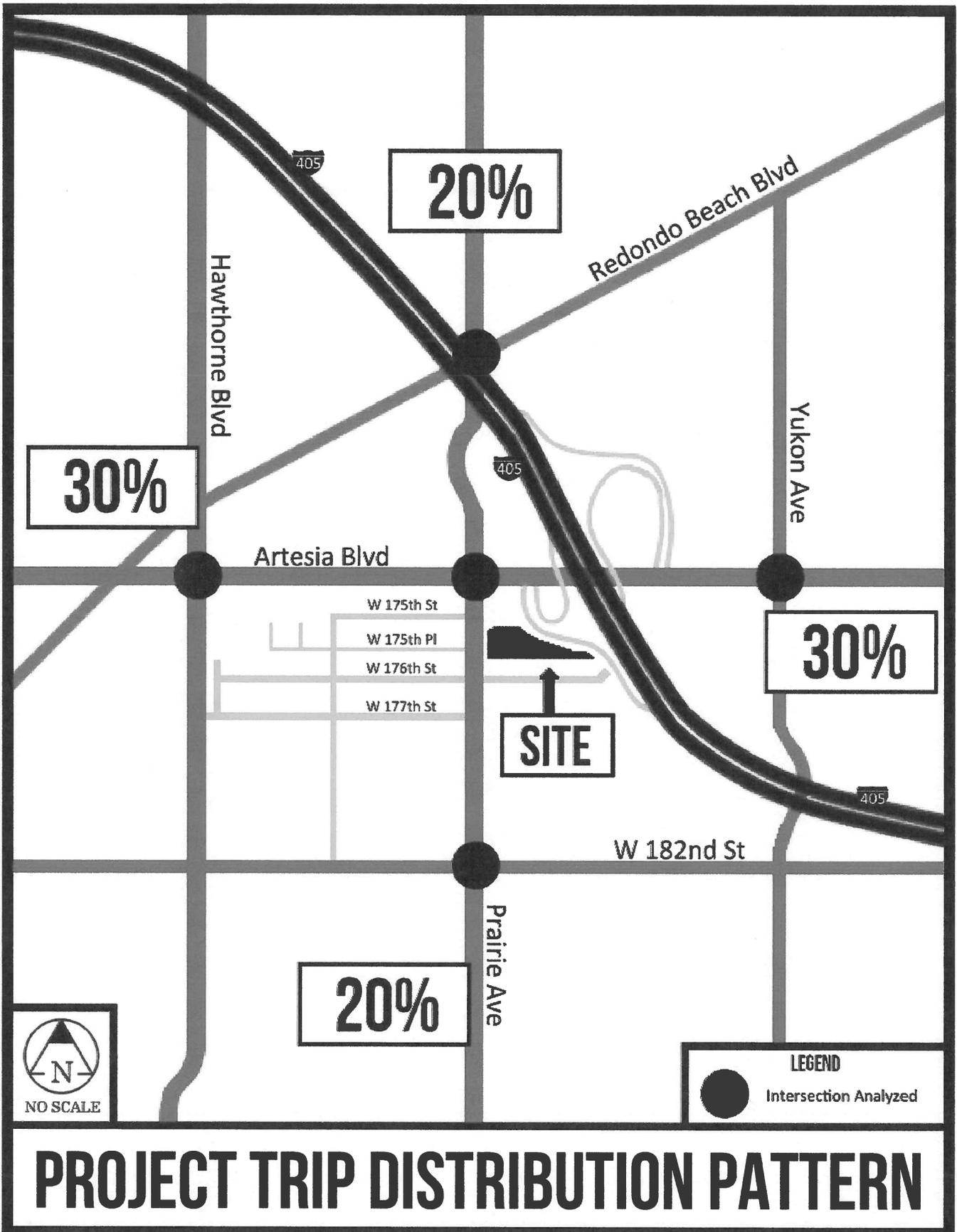
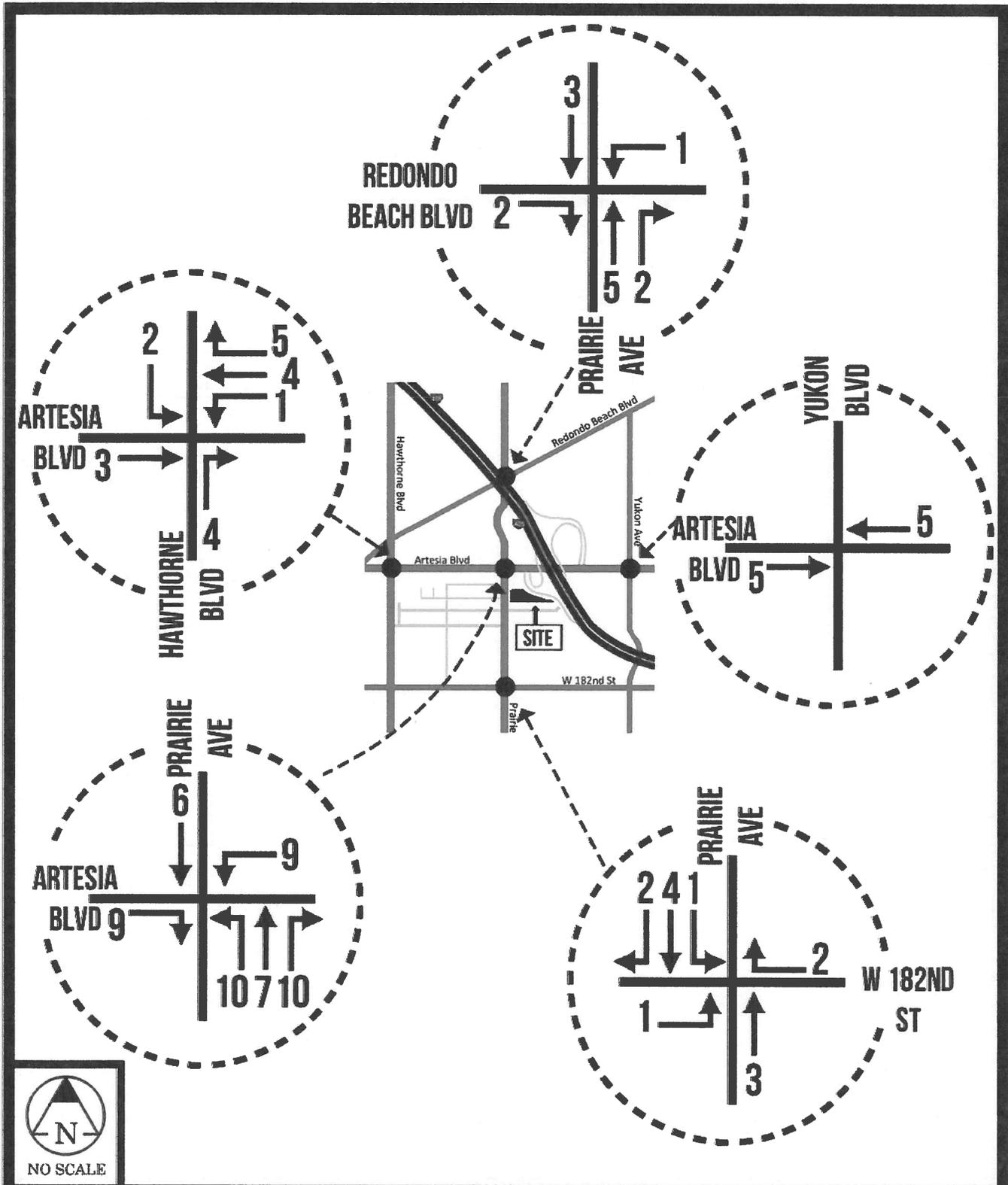
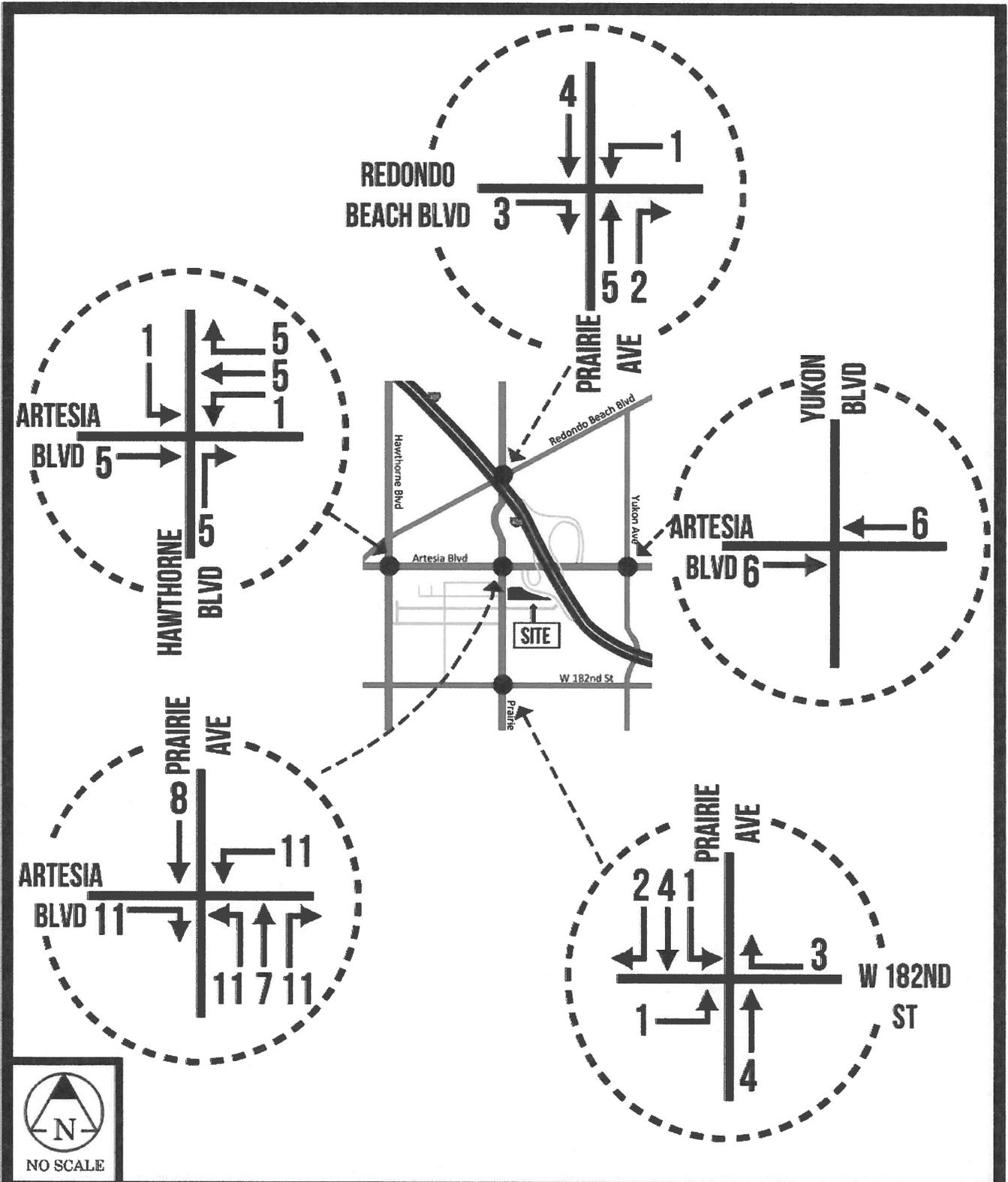


FIGURE 5-1



# PROJECT TRIP ASSIGNMENT - AM PEAK

FIGURE 5-2



# PROJECT TRIP ASSIGNMENT - PM PEAK

FIGURE 5-3

## **6.0 Future Traffic Conditions**

### **6.1 Existing with Project Traffic Volumes**

The estimates of Project-generated traffic volumes were added to the Existing traffic conditions to develop traffic projections for the Existing With Project traffic conditions. The anticipated Existing With Project AM and PM peak hour traffic volumes at the five (5) existing study intersections are presented in **Figures 6-1 and 6-2**, respectively.

### **6.2 Year 2015 Without Project Traffic Volumes**

#### **6.2.1 Ambient Growth Traffic**

The project is anticipated to be built within an 18 months period and therefore, ambient growth factor was not used in the analysis.

#### **6.2.2 Related Projects Traffic**

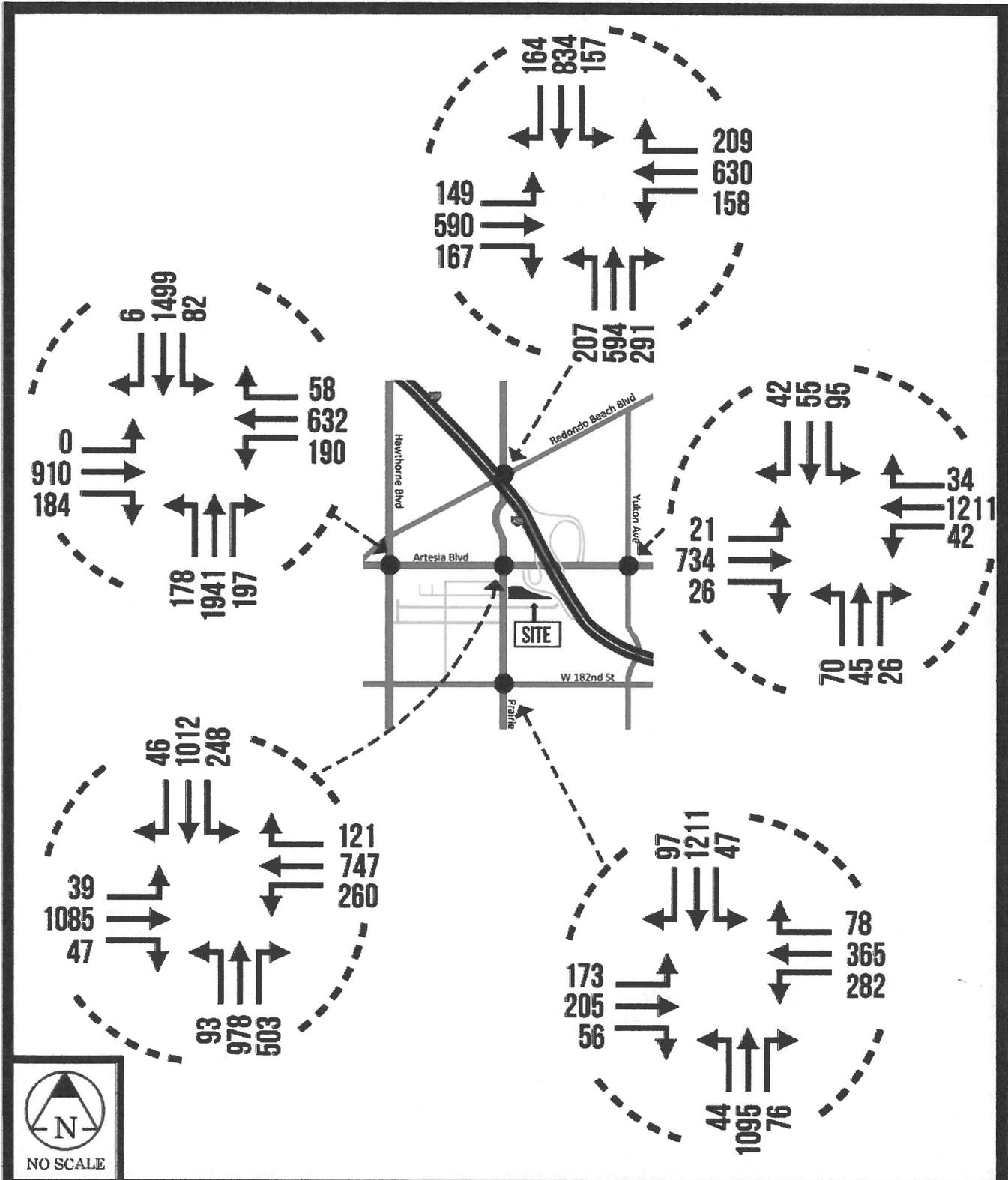
The City of Torrance identified that there are no nearby related projects within the Project study area (related projects, as defined by Section 15355 of the CEQA Guidelines, are “closely related past, present and reasonably foreseeable probable future projects”).

#### **6.2.3 Internal Trips**

The proposed senior housing project consists of 2,949 square feet of commercial retail, which its purpose is to serve the residents of this housing project. Internal trips are trips that occur internally in a multi-use site. To be conservative, the City of Torrance has approved an internal trip rate of 50%. It is assumed that at least half of the trip generated by the commercial retail are from the residents of the senior housing (via walking).

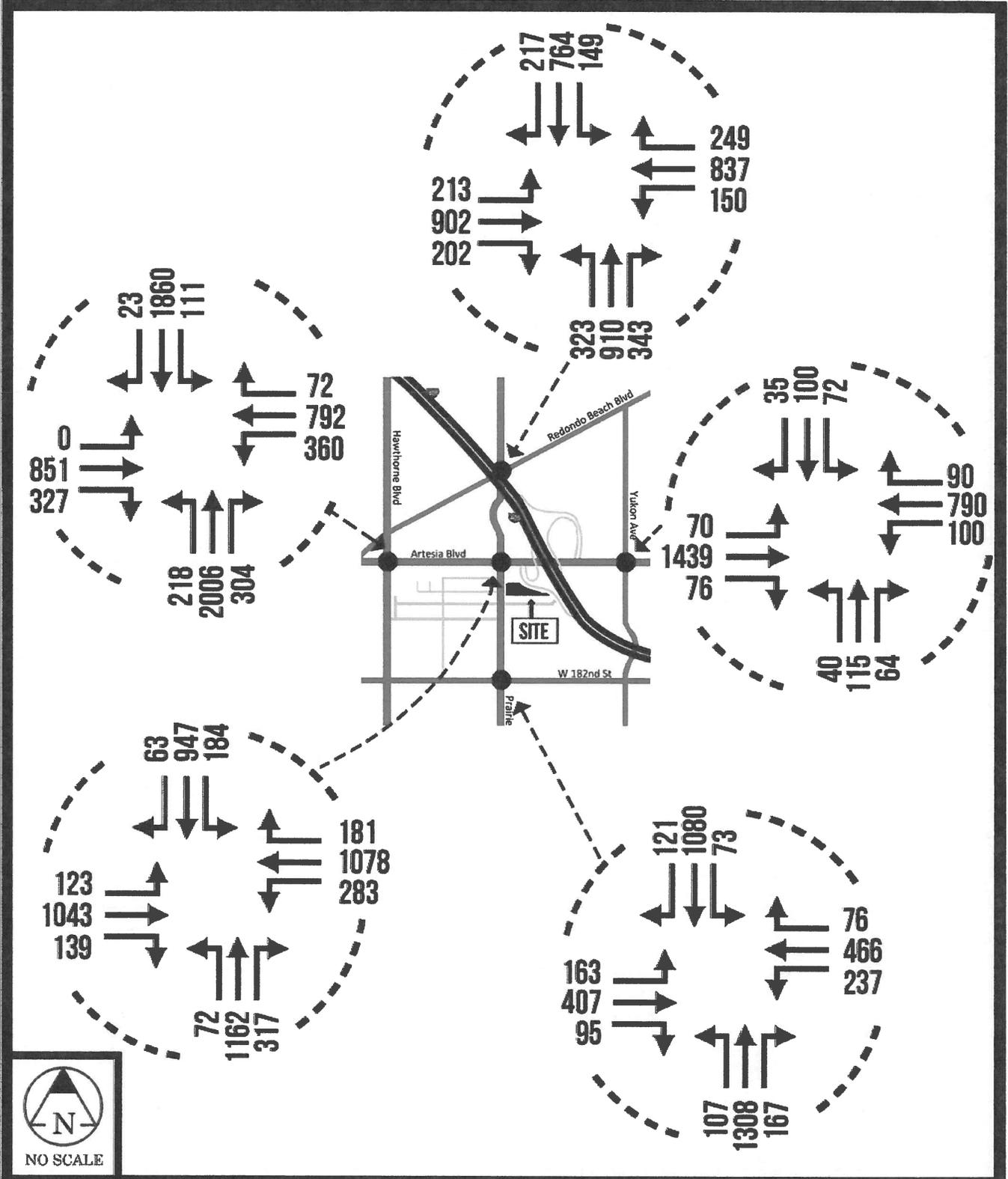
### **6.3 Year 2015 With Project Traffic Volumes**

The estimates of Project-generated traffic volumes were added to the Year 2015 with Project traffic conditions to develop traffic projections for the Year 2015 With Project traffic conditions. The anticipated Year 2015 With Project traffic conditions AM and PM peak hour traffic volumes at the five (5) key existing study intersections and one (1) future Project driveway are presented in **Figures 6-2 and 6-3**, respectively.



**YEAR 2015 WITH PROJECT AM PEAK HOUR TRAFFIC VOLUMES**

**FIGURE 6-1**



**YEAR 2015 WITH PROJECT PM PEAK HOUR TRAFFIC VOLUMES**

**FIGURE 6-2**

## **7.0 Existing Conditions Traffic Impact Analysis**

The existing conditions analysis establishes the basis for the future forecasts for the Project. The existing conditions analysis reflects existing traffic counts as well as existing lane configurations for all analyzed intersections.

### **7.1 Existing Conditions Intersection Capacity Analysis (ICU Methodology)**

*Table 7-1* summarizes the peak hour Level of Service results at the key study intersections for existing traffic conditions, with and without the Project, based on the *Intersection Capacity Utilization (ICU)* Method of Analysis. The first column (1) of ICU/LOS values in **Table 7-1** presents a summary of Existing AM and PM peak hour traffic conditions. The second column (2) in *Table 7-1* presents forecast Existing With Project traffic conditions. The third column (3) of **Table 7-1** shows the increase in ICU value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and the significance impact criteria defined in this report. The fourth column (4) of **Table 7-1** presents the Level of Service with the implementation of traffic mitigation improvements, if necessary.

#### **7.1.1 Existing Traffic Conditions (ICU Methodology)**

Review of column (1) of **Table 7-1** indicates that for the Existing traffic conditions, one (1) of the five (5) existing key study intersections currently operate at unacceptable level of services during the AM and/or PM peak hour when compared to the LOS standards defined in this report. The remaining four (4) existing key intersections currently operate at acceptable levels of service during the AM and PM peak hours. The intersection operating at adverse levels of service is Prairie Avenue and Redondo Beach Boulevard where during PM peak the level of service is operating at “E.”

#### **7.1.2 Existing With Project Traffic Conditions (ICU Methodology)**

Review of **Table 7-1** indicates that for the Existing With Project traffic conditions, the same one (1) of the five (5) key study intersections are forecast to operate at unacceptable level of services during the AM and/or PM peak hours when compared to the LOS standards defined in this report. The remaining four (4) study intersections are forecast to operate at acceptable levels of service during the AM and PM peak hours. The intersections operating at adverse levels of service is the same intersections in the existing condition, which is Prairie Avenue and Redondo Beach Boulevard.

**Review of Table 7-1 indicates that none of the five (5) study intersections will have a significant impact under the Existing With Project traffic conditions when compared to the LOS criteria defined in this report. Since there are no significant impacts, no mitigation measures are required.**

# TABLE 7-1

## INTERSECTION CAPACITY UTILIZATION (ICU) and LEVEL OF SERVICE (LOS)

### SENIOR HOUSING PROJECT

INTERSECTION	TIME PERIOD	Existing (Y 2015) Traffic Volumes		Existing + Project Traffic Volumes		Significant Impact		Existing with Project w/ Mitigation	
	AM PM	ICU	LOS	ICU	LOS	ICU Increase	Yes/No	ICU	LOS
1 Artesia Blvd. and Hawthorne Boulevard	AM	0.716	C	0.718	C	0.002	No	na	na
	PM	0.827	D	0.829	D	0.002	No	na	na
2 Artesia Blvd. and Yukon Avenue	AM	0.595	A	0.596	A	0.001	No	na	na
	PM	0.740	C	0.742	C	0.002	No	na	na
3 Prairie Avenue and 182nd Street	AM	0.763	C	0.764	C	0.001	No	na	na
	PM	0.858	D	0.860	D	0.002	No	na	na
4 Prairie Avenue and Artesia Blvd.	AM	0.884	D	0.894	D	0.010	No	na	na
	PM	0.870	D	0.871	D	0.001	No	na	na
5 Prairie Avenue and Redondo Beach Boulevard	AM	0.779	C	0.780	C	0.001	No	na	na
	PM	0.935	E	0.936	E	0.001	No	na	na

**Appendix C** contains the ICU/LOS calculation worksheets for the Existing Traffic Conditions (ICU Methodology).

## 7.2 Existing Conditions Intersection Capacity Analysis (HCM Methodology)

Utilizing the Highway Capacity Manual (HCM) Method of Analysis, **Table 7-2** summarizes the peak hour Level of Service results at the study intersections for existing traffic conditions, with and without the Project. **Table 7-2** indicates the Delay/LOS values for both Existing AM and PM peak hour traffic conditions. The same table, **Table 7-2**, presents forecast Existing With Project traffic conditions. Another column of **Table 7-2** shows the increase in Delay value due to the added peak hour Project trips and indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and the significance impact criteria defined in this report.

### 7.2.1 Existing Traffic Conditions (HCM Methodology)

Review of **Table 7-2** indicates that for the Existing traffic conditions, two (2) of the five (5) existing study intersections currently operate at unacceptable level of services during the PM peak hour when compared to the LOS standards defined in this report. The remaining three (3) existing study intersections currently operate at acceptable levels of service during the AM and PM peak hours. The intersections are operating at the following levels of service:

<u>Study Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>Delay (s/v)</u>	<u>LOS</u>	<u>Delay (s/v)</u>	<u>LOS</u>
1. Artesia Boulevard and Hawthorne Boulevard	24.6	C	32.8	C
2. Artesia Boulevard and Yukon Avenue	5.7	A	9.5	A
3. Prairie avenue and 182 <sup>nd</sup> Street	29.1	C	33.4	C
4. Prairie Avenue and Artesia Boulevard	44.5	D	55.6	E
5. Prairie Avenue and Redondo Beach Boulevard	40.7	D	67.2	E

### 7.2.2 Existing With Project Traffic Conditions (HCM Methodology)

Review of **Table 7-2** indicates that for the Existing With Project traffic conditions, two (2) of the five (5) study intersections are forecast to operate at unacceptable level of services during the PM peak hours when compared to the LOS standards defined in this report. The remaining three (3) study intersections are forecast to operate at acceptable levels of service during the AM and PM peak hours. The intersections' levels of service are:

<u>Study Intersection</u>	<u>AM Peak Hour</u>		<u>PM Peak Hour</u>	
	<u>Delay (s/v)</u>	<u>LOS</u>	<u>Delay (s/v)</u>	<u>LOS</u>
1. Artesia Boulevard and Hawthorne Boulevard	24.6	C	33.0	C

2. Artesia Boulevard and Yukon Avenue	5.7	A	9.4	A
3. Prairie avenue and 182 <sup>nd</sup> Street	29.1	C	33.5	C
4. Prairie Avenue and Artesia Boulevard	44.9	D	56.1	E
5. Prairie Avenue and Redondo Beach Boulevard	40.7	D	67.3	E

Review of **Table 7-2** indicates that none of the five (5) study intersections will have a significant impact under the Existing With Project traffic conditions when compared to the LOS criteria defined in this report. Since there are no significant impacts, no mitigation measures are required.

## TABLE 7-2

### Highway Capacity Manual (HCM) and LEVEL OF SERVICE (LOS)

#### SENIOR HOUSING PROJECT

INTERSECTION	TIME PERIOD	Existing (Y 2015) Traffic Volumes		Existing + Project Traffic Volumes		Significant Impact		Existing with Project w/ Mitigation	
	AM PM	Delay (s/v)	LOS	Delay (s/v)	LOS	Delay (s/v)	Yes/No	Delay (s/v)	LOS
1 Artesia Blvd. and Hawthorne Boulevard	AM	24.6	C	24.6	C	0.0	No	na	na
	PM	32.8	C	33.0	C	0.2	No	na	na
2 Artesia Blvd. and Yukon Avenue	AM	5.7	A	5.7	A	0.0	No	na	na
	PM	9.5	A	9.4	A	0.0	No	na	na
3 Prairie Avenue and 182nd Street	AM	29.1	C	29.1	C	0.0	No	na	na
	PM	33.4	C	33.5	C	0.1	No	na	na
4 Prairie Avenue and Artesia Blvd.	AM	44.5	D	44.9	D	0.4	No	na	na
	PM	55.6	E	56.1	E	0.5	No	na	na
5 Prairie Avenue and Redondo Beach Boulevard	AM	40.7	D	40.7	D	0.0	No	na	na
	PM	67.2	E	67.3	E	0.1	No	na	na

Note: s/v = delay in second per vehicle

## **8.0 Project-Specific Traffic Improvements**

### **8.1 Existing With Project Traffic Conditions Recommended Improvements**

#### **8.1.1 *ICU Methodology***

The results of the Existing With Project traffic conditions level of service analyses indicate that the proposed Project will not significantly impact any of the five (5) study intersections based on the *Intersection Capacity Utilization (ICU)* Method of Analysis. Since the Project has no significant impacts, no traffic mitigation measures are required or recommended for the intersections.

#### **8.1.2 *HCM Methodology***

Utilizing the Highway Capacity Manual (HCM) Method of Analysis, the Existing With Project traffic conditions level of service analyses indicate that the proposed Project will not significantly impact any of the five (5) study intersections. Thus, there are no required or recommended traffic mitigation for the intersections.

# **APPENDIX "A"**

## **EXISTING INTERSECTION GEOMETRY**

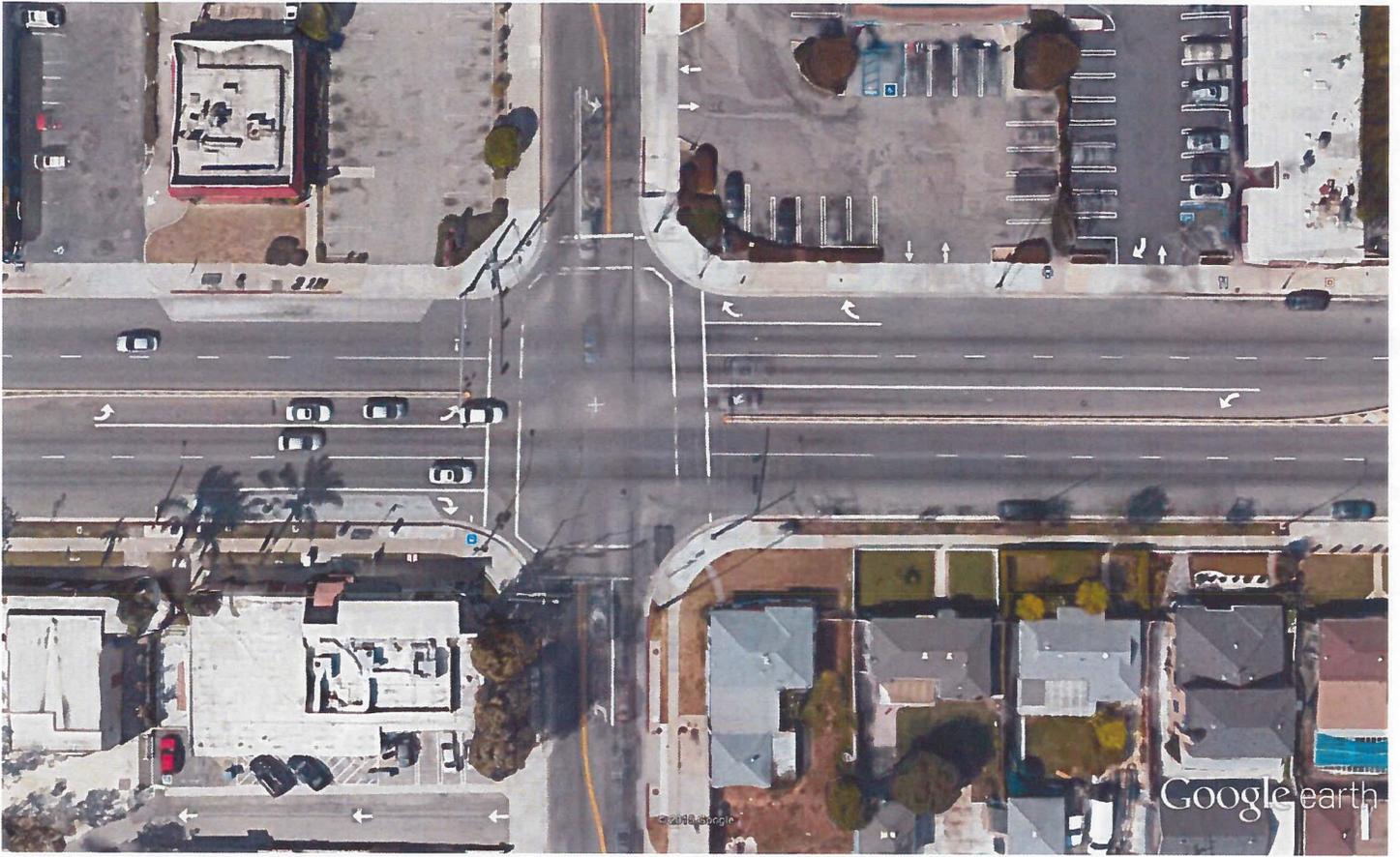


Google earth

miles  
km



## PRAIRIE AVE AND ARTESIA BLVD



Google earth

miles  
km



**ARTESIA BLVD AND YUKON AVE**



Google earth

miles  
km



**ARTESIA BLVD AND HAWTHORNE BLVD**

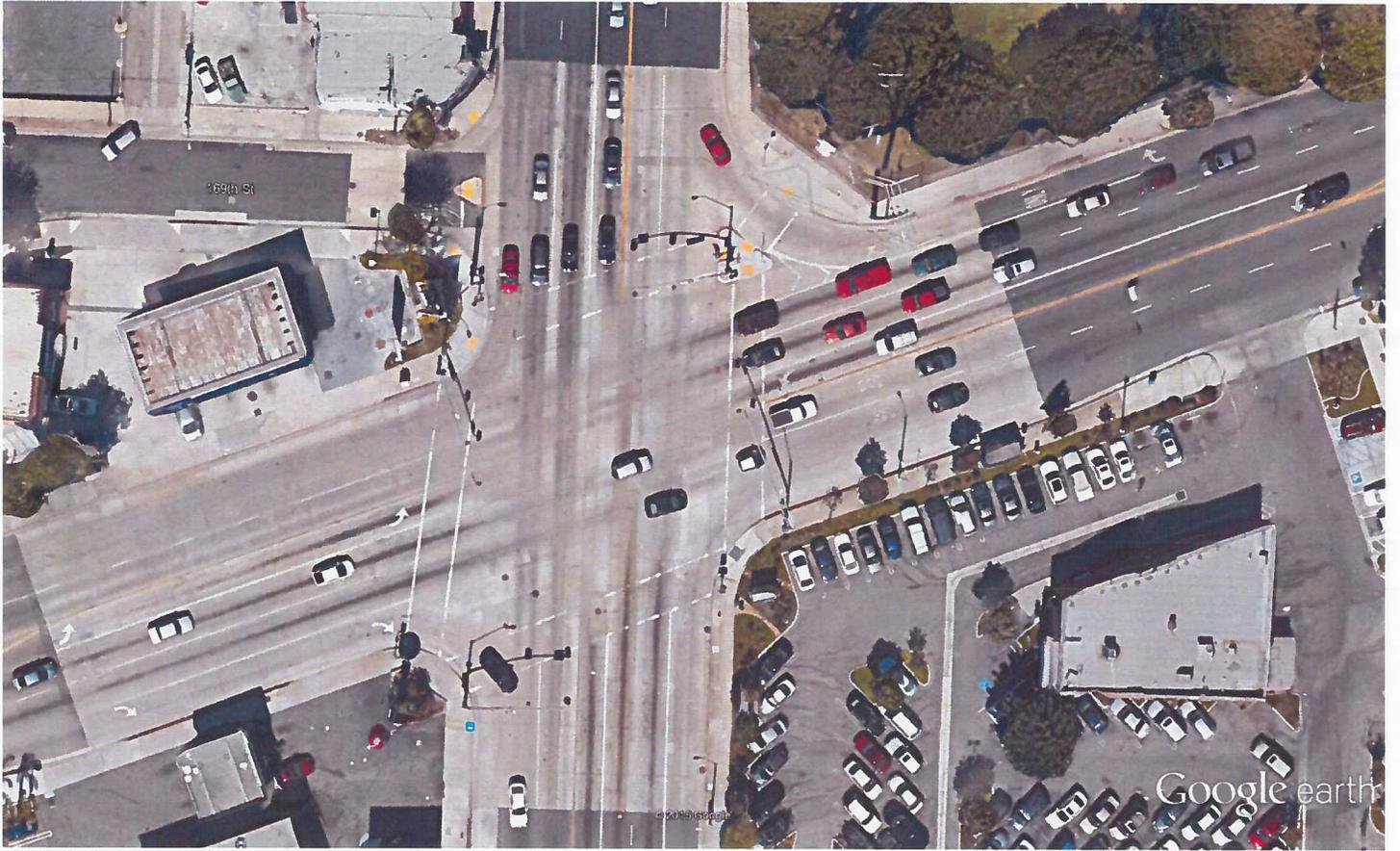


Google earth

miles  
km



**PRAIRIE AVE AND ARTESIA BLVD**



Google earth

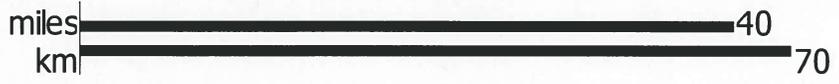
miles  
km



**PRAIRIE AVE AND REDONDO BLVD**



Google earth



**PRAIRIE AVE AND 182ND ST**

## **APPENDIX “B”**

### **EXISTING TRAFFIC COUNT DATA**

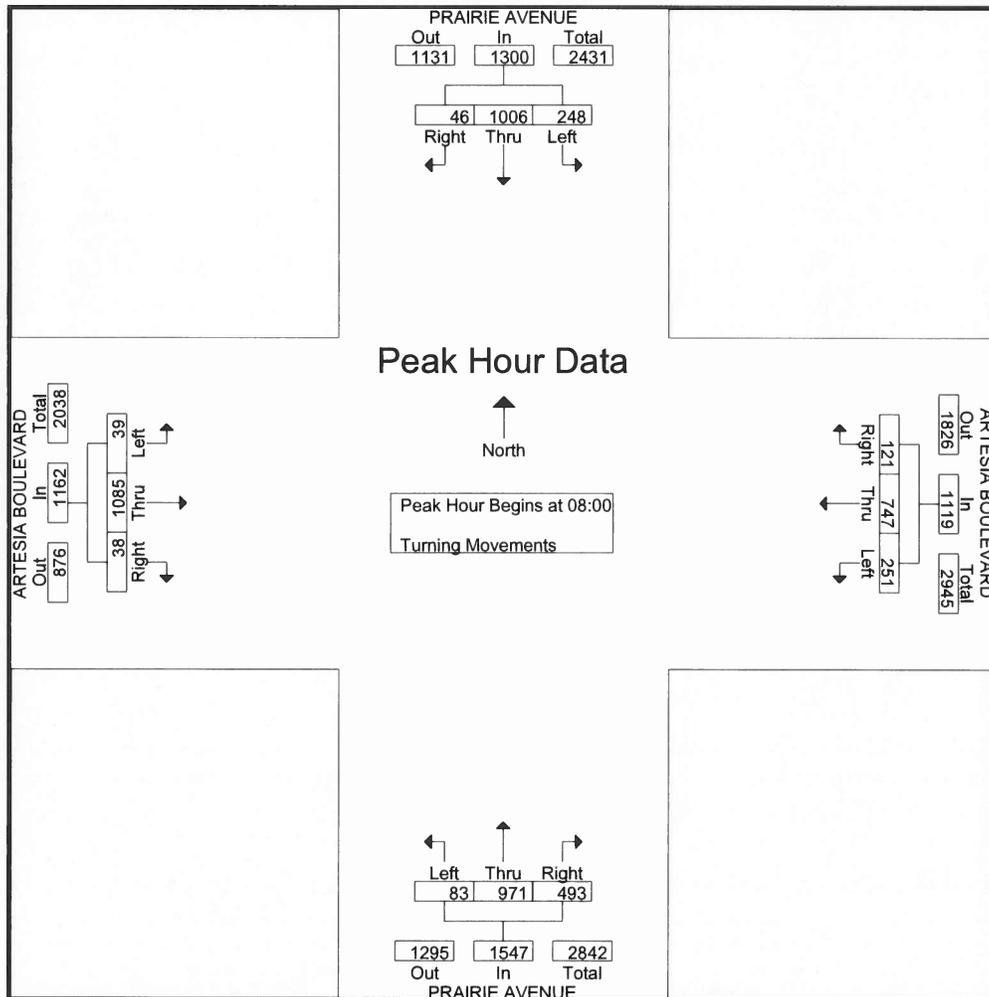
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 E-W Direction: ARTESIA BOULEVARD

File Name : h1508009  
 Site Code : 00000000  
 Start Date : 8/12/2015  
 Page No : 1

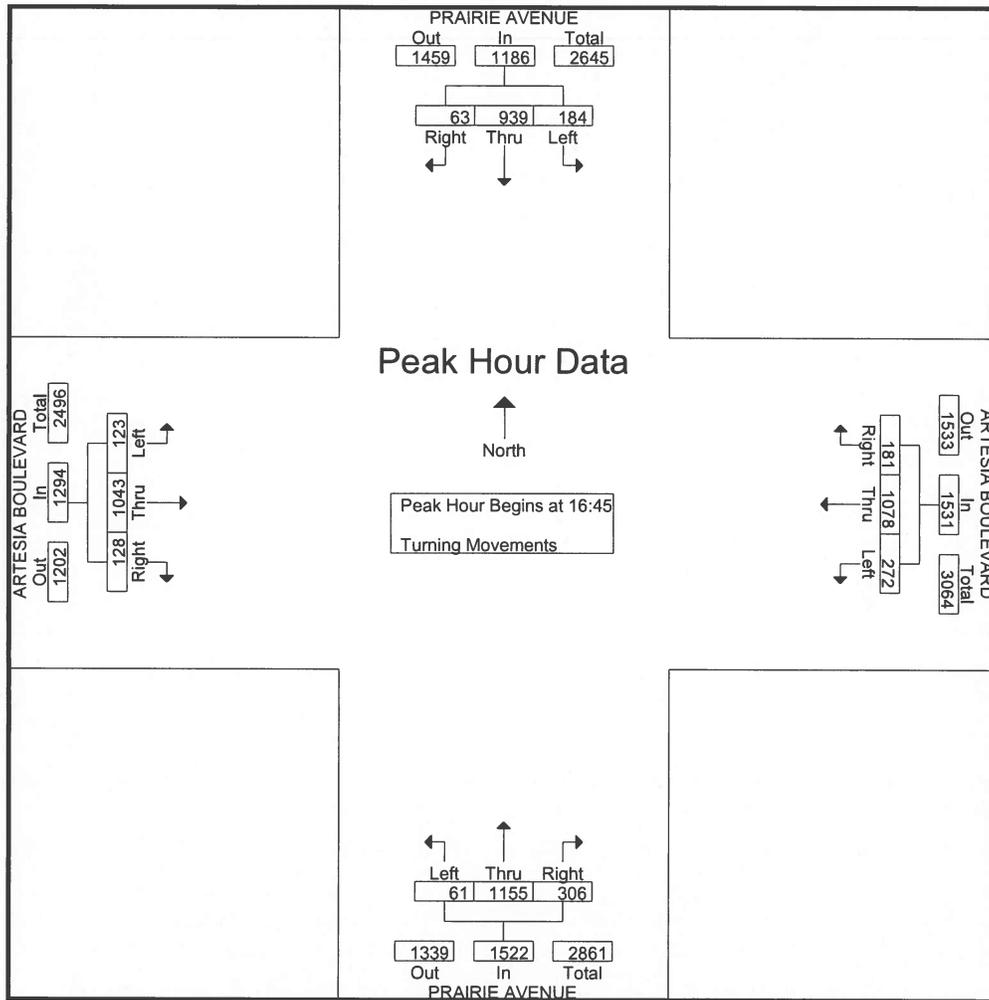
Groups Printed- Turning Movements

Start Time	PRAIRIE AVENUE Southbound			ARTESIA BOULEVARD Westbound			PRAIRIE AVENUE Northbound			ARTESIA BOULEVARD Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00	3	163	67	28	171	29	84	201	13	7	218	6	990
07:15	10	217	70	20	225	27	98	198	14	7	224	4	1114
07:30	4	250	80	23	238	47	137	232	13	11	243	9	1287
07:45	6	247	70	33	179	45	116	241	10	11	272	9	1239
Total	23	877	287	104	813	148	435	872	50	36	957	28	4630
08:00	10	252	58	39	188	54	124	227	19	6	280	8	1265
08:15	14	263	71	28	172	57	122	234	24	10	281	8	1284
08:30	9	247	63	26	193	60	114	256	15	10	281	10	1284
08:45	13	244	56	28	194	80	133	254	25	12	243	13	1295
Total	46	1006	248	121	747	251	493	971	83	38	1085	39	5128
16:00	15	214	50	39	238	72	65	225	12	28	264	19	1241
16:15	17	194	43	41	265	73	78	263	22	26	239	28	1289
16:30	9	237	62	42	267	60	97	272	13	21	246	27	1353
16:45	17	215	42	46	278	83	71	278	13	30	269	40	1382
Total	58	860	197	168	1048	288	311	1038	60	105	1018	114	5265
17:00	19	263	57	39	254	64	71	289	12	36	261	18	1383
17:15	13	226	38	39	283	60	83	286	13	33	278	33	1385
17:30	14	235	47	57	263	65	81	302	23	29	235	32	1383
17:45	14	223	36	43	284	63	78	274	18	28	246	34	1341
Total	60	947	178	178	1084	252	313	1151	66	126	1020	117	5492
Grand Total	187	3690	910	571	3692	939	1552	4032	259	305	4080	298	20515
Apprch %	3.9	77.1	19	11	71	18.1	26.6	69	4.4	6.5	87.1	6.4	
Total %	0.9	18	4.4	2.8	18	4.6	7.6	19.7	1.3	1.5	19.9	1.5	

Start Time	PRAIRIE AVENUE Southbound				ARTESIA BOULEVARD Westbound				PRAIRIE AVENUE Northbound				ARTESIA BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	10	252	58	320	39	188	54	281	124	227	19	370	6	280	8	294	1265
08:15	14	263	71	348	28	172	57	257	122	234	24	380	10	281	8	299	1284
08:30	9	247	63	319	26	193	60	279	114	256	15	385	10	281	10	301	1284
08:45	13	244	56	313	28	194	80	302	133	254	25	412	12	243	13	268	1295
Total Volume	46	1006	248	1300	121	747	251	1119	493	971	83	1547	38	1085	39	1162	5128
% App. Total	3.5	77.4	19.1		10.8	66.8	22.4		31.9	62.8	5.4		3.3	93.4	3.4		
PHF	.821	.956	.873	.934	.776	.963	.784	.926	.927	.948	.830	.939	.792	.965	.750	.965	.990



Start Time	PRAIRIE AVENUE Southbound				ARTESIA BOULEVARD Westbound				PRAIRIE AVENUE Northbound				ARTESIA BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	17	215	42	274	46	278	83	407	71	278	13	362	30	269	40	339	1382
17:00	19	263	57	339	39	254	64	357	71	289	12	372	36	261	18	315	1383
17:15	13	226	38	277	39	283	60	382	83	286	13	382	33	278	33	344	1385
17:30	14	235	47	296	57	263	65	385	81	302	23	406	29	235	32	296	1383
Total Volume	63	939	184	1186	181	1078	272	1531	306	1155	61	1522	128	1043	123	1294	5533
% App. Total	5.3	79.2	15.5		11.8	70.4	17.8		20.1	75.9	4		9.9	80.6	9.5		
PHF	.829	.893	.807	.875	.794	.952	.819	.940	.922	.956	.663	.937	.889	.938	.769	.940	.999



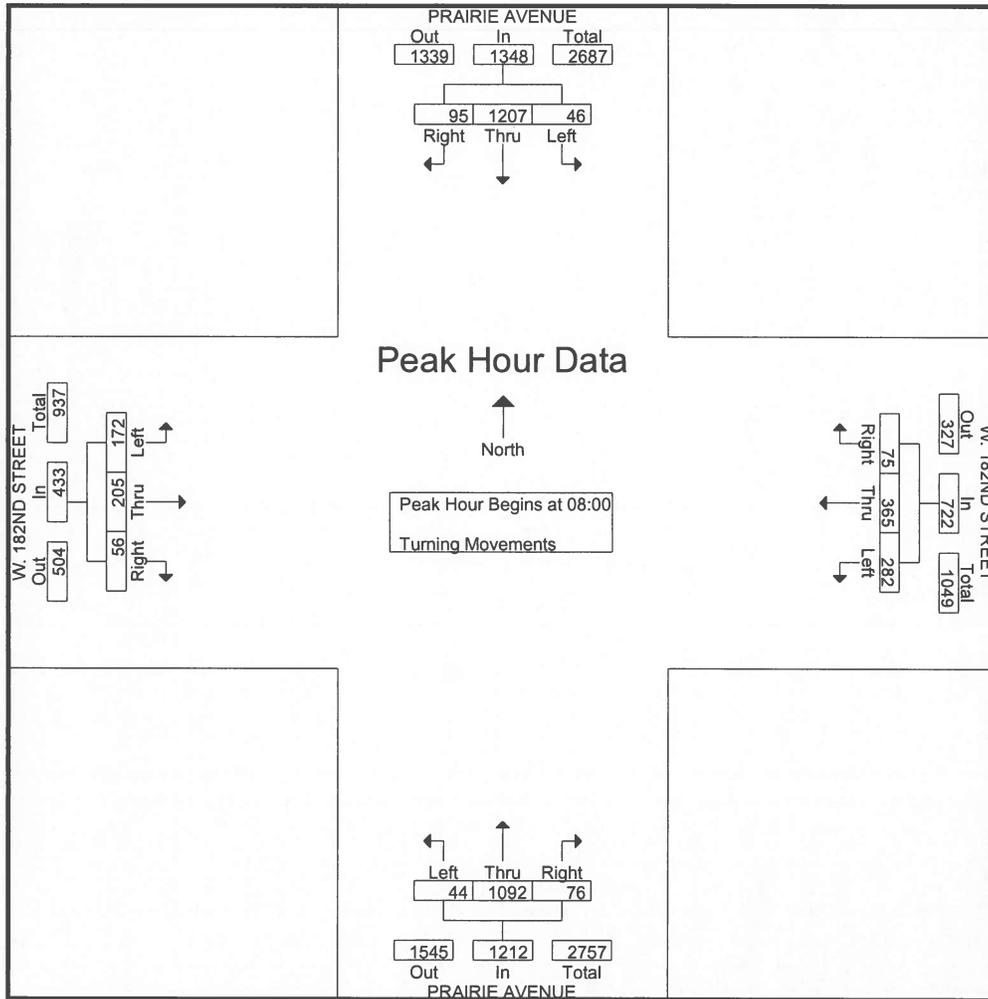
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 E-W Direction: 182ND STREET

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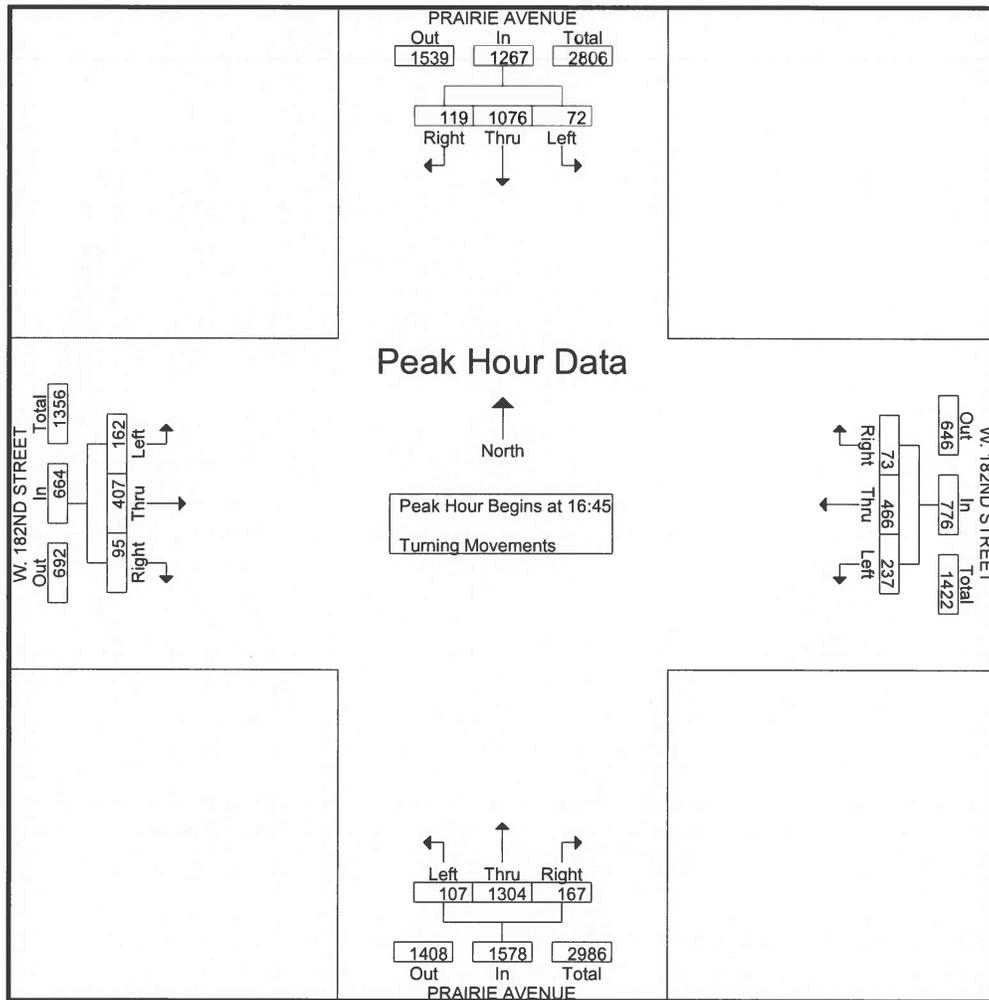
Groups Printed- Turning Movements

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	Right	Thru	Left										
07:00	13	148	9	26	46	37	11	190	17	6	22	22	547
07:15	11	210	5	15	66	36	14	211	8	7	35	43	661
07:30	12	216	3	14	72	60	11	226	12	11	36	55	728
07:45	22	292	8	14	79	53	19	316	13	17	45	45	923
Total	58	866	25	69	263	186	55	943	50	41	138	165	2859
08:00	13	246	8	12	74	71	18	219	6	8	42	36	753
08:15	22	323	15	24	74	66	13	296	15	19	31	39	937
08:30	20	299	12	21	92	60	21	269	10	13	54	48	919
08:45	40	339	11	18	125	85	24	308	13	16	78	49	1106
Total	95	1207	46	75	365	282	76	1092	44	56	205	172	3715
16:00	28	231	19	9	86	46	26	278	22	23	82	33	883
16:15	15	268	13	16	83	48	40	270	19	29	67	36	904
16:30	27	231	13	14	105	55	36	321	15	32	109	31	989
16:45	26	295	21	16	82	65	53	351	25	25	88	40	1087
Total	96	1025	66	55	356	214	155	1220	81	109	346	140	3863
17:00	28	260	16	15	129	59	37	303	27	21	104	36	1035
17:15	32	284	16	24	133	47	44	352	26	21	89	42	1110
17:30	33	237	19	18	122	66	33	298	29	28	126	44	1053
17:45	24	255	20	16	137	75	41	352	32	25	75	33	1085
Total	117	1036	71	73	521	247	155	1305	114	95	394	155	4283
Grand Total	366	4134	208	272	1505	929	441	4560	289	301	1083	632	14720
Apprch %	7.8	87.8	4.4	10.1	55.6	34.3	8.3	86.2	5.5	14.9	53.7	31.3	
Total %	2.5	28.1	1.4	1.8	10.2	6.3	3	31	2	2	7.4	4.3	

Start Time	PRAIRIE AVENUE Southbound				W. 182ND STREET Westbound				PRAIRIE AVENUE Northbound				W. 182ND STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	13	246	8	267	12	74	71	157	18	219	6	243	8	42	36	86	753
08:15	22	323	15	360	24	74	66	164	13	296	15	324	19	31	39	89	937
08:30	20	299	12	331	21	92	60	173	21	269	10	300	13	54	48	115	919
08:45	40	339	11	390	18	125	85	228	24	308	13	345	16	78	49	143	1106
Total Volume	95	1207	46	1348	75	365	282	722	76	1092	44	1212	56	205	172	433	3715
% App. Total	7	89.5	3.4		10.4	50.6	39.1		6.3	90.1	3.6		12.9	47.3	39.7		
PHF	.594	.890	.767	.864	.781	.730	.829	.792	.792	.886	.733	.878	.737	.657	.878	.757	.840



Start Time	PRAIRIE AVENUE Southbound				W. 182ND STREET Westbound				PRAIRIE AVENUE Northbound				W. 182ND STREET Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	26	295	21	342	16	82	65	163	53	351	25	429	25	88	40	153	1087
17:00	28	260	16	304	15	129	59	203	37	303	27	367	21	104	36	161	1035
17:15	32	284	16	332	24	133	47	204	44	352	26	422	21	89	42	152	1110
17:30	33	237	19	289	18	122	66	206	33	298	29	360	28	126	44	198	1053
Total Volume	119	1076	72	1267	73	466	237	776	167	1304	107	1578	95	407	162	664	4285
% App. Total	9.4	84.9	5.7		9.4	60.1	30.5		10.6	82.6	6.8		14.3	61.3	24.4		
PHF	.902	.912	.857	.926	.760	.876	.898	.942	.788	.926	.922	.920	.848	.808	.920	.838	.965



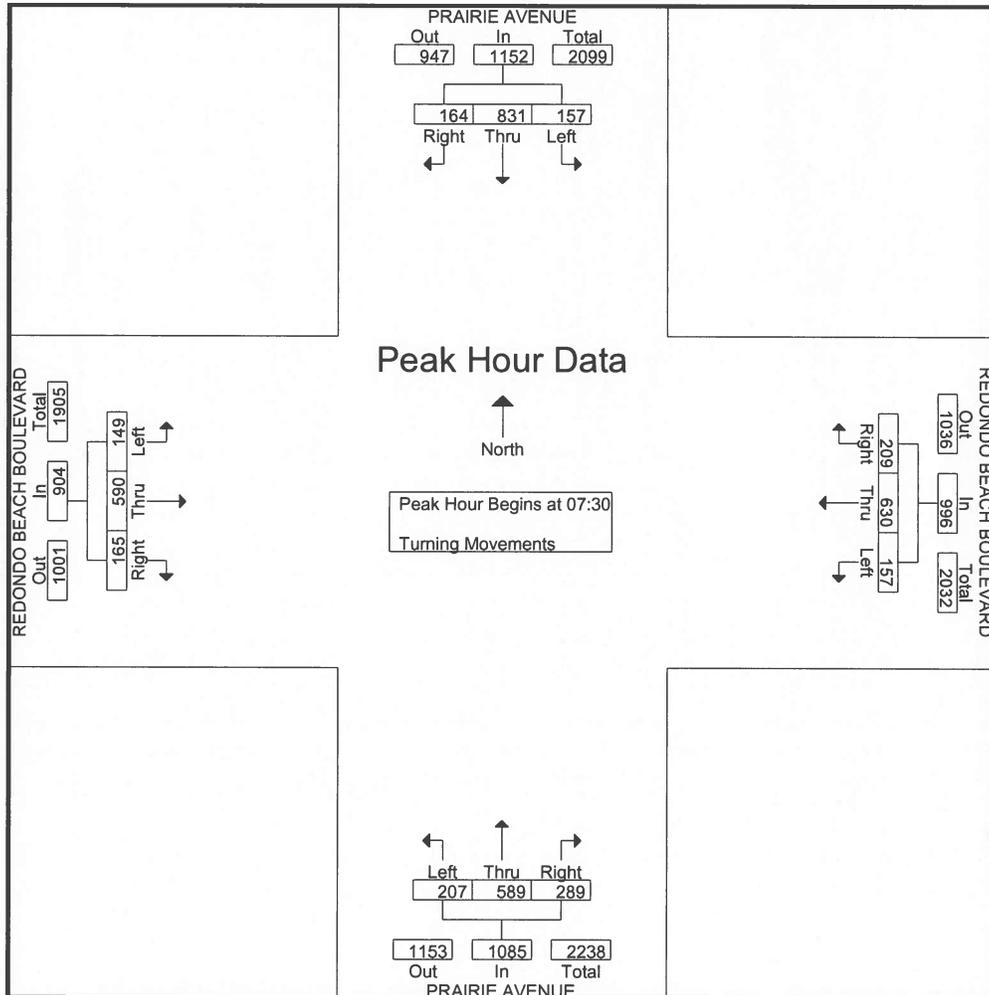
City: TORRANCE  
 N-S- Direction: PRAIRIE AVENUE  
 E-W Direction: REDONDO BEACH BOULEVARD

File Name : H1508011  
 Site Code : 00000000  
 Start Date : 8/12/2015  
 Page No : 1

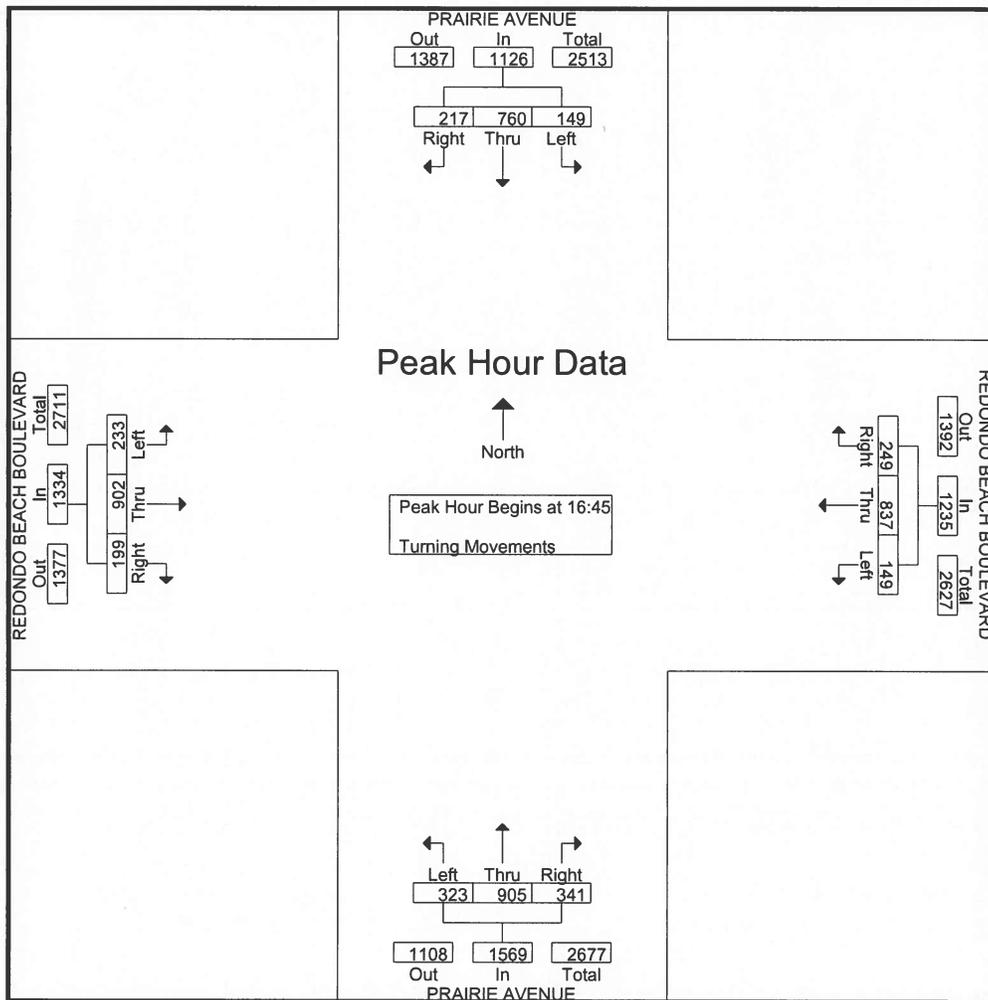
Groups Printed- Turning Movements

Start Time	PRAIRIE AVENUE Southbound			REDONDO BEACH BOULEVARD Westbound			PRAIRIE AVENUE Northbound			REDONDO BEACH BOULEVARD Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00	33	147	29	37	130	28	65	119	57	33	120	32	830
07:15	25	190	30	41	129	30	58	131	35	24	128	18	839
07:30	31	214	37	55	151	37	62	164	53	32	152	37	1025
07:45	45	215	41	76	156	41	58	178	49	45	180	40	1124
Total	134	766	137	209	566	136	243	592	194	134	580	127	3818
08:00	38	190	46	45	152	46	92	126	49	39	134	33	990
08:15	50	212	33	33	171	33	77	121	56	49	124	39	998
08:30	59	204	38	39	139	38	69	112	41	61	111	36	947
08:45	46	184	37	60	177	37	71	127	52	45	130	28	994
Total	193	790	154	177	639	154	309	486	198	194	499	136	3929
16:00	57	155	37	37	169	37	75	198	64	57	200	42	1128
16:15	44	192	35	57	216	35	73	172	55	50	172	57	1158
16:30	50	207	31	44	218	32	66	212	61	51	215	53	1240
16:45	60	201	43	49	221	43	79	217	83	63	216	62	1337
Total	211	755	146	187	824	147	293	799	263	221	803	214	4863
17:00	49	192	41	61	191	41	74	226	75	46	225	51	1272
17:15	51	204	31	77	206	31	93	242	74	44	241	61	1355
17:30	57	163	34	62	219	34	95	220	91	46	220	59	1300
17:45	50	174	30	58	211	30	102	239	89	40	240	57	1320
Total	207	733	136	258	827	136	364	927	329	176	926	228	5247
Grand Total	745	3044	573	831	2856	573	1209	2804	984	725	2808	705	17857
Apprch %	17.1	69.8	13.1	19.5	67	13.5	24.2	56.1	19.7	17.1	66.3	16.6	
Total %	4.2	17	3.2	4.7	16	3.2	6.8	15.7	5.5	4.1	15.7	3.9	

Start Time	PRAIRIE AVENUE Southbound				REDONDO BEACH BOULEVARD Westbound				PRAIRIE AVENUE Northbound				REDONDO BEACH BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	31	214	37	282	55	151	37	243	62	164	53	279	32	152	37	221	1025
07:45	45	<b>215</b>	41	<b>301</b>	<b>76</b>	156	41	<b>273</b>	58	<b>178</b>	49	<b>285</b>	45	<b>180</b>	<b>40</b>	<b>265</b>	<b>1124</b>
08:00	38	190	<b>46</b>	274	45	152	<b>46</b>	243	<b>92</b>	126	49	267	39	134	33	206	990
08:15	<b>50</b>	212	33	295	33	<b>171</b>	33	237	77	121	<b>56</b>	254	<b>49</b>	124	39	212	998
Total Volume	164	831	157	1152	209	630	157	996	289	589	207	1085	165	590	149	904	4137
% App. Total	14.2	72.1	13.6		21	63.3	15.8		26.6	54.3	19.1		18.3	65.3	16.5		
PHF	.820	.966	.853	.957	.688	.921	.853	.912	.785	.827	.924	.952	.842	.819	.931	.853	.920



Start Time	PRAIRIE AVENUE Southbound				REDONDO BEACH BOULEVARD Westbound				PRAIRIE AVENUE Northbound				REDONDO BEACH BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	60	201	43	304	49	221	43	313	79	217	83	379	63	216	62	341	1337
17:00	49	192	41	282	61	191	41	293	74	226	75	375	46	225	51	322	1272
17:15	51	204	31	286	77	206	31	314	93	242	74	409	44	241	61	346	1355
17:30	57	163	34	254	62	219	34	315	95	220	91	406	46	220	59	325	1300
Total Volume	217	760	149	1126	249	837	149	1235	341	905	323	1569	199	902	233	1334	5264
% App. Total	19.3	67.5	13.2		20.2	67.8	12.1		21.7	57.7	20.6		14.9	67.6	17.5		
PHF	.904	.931	.866	.926	.808	.947	.866	.980	.897	.935	.887	.959	.790	.936	.940	.964	.971



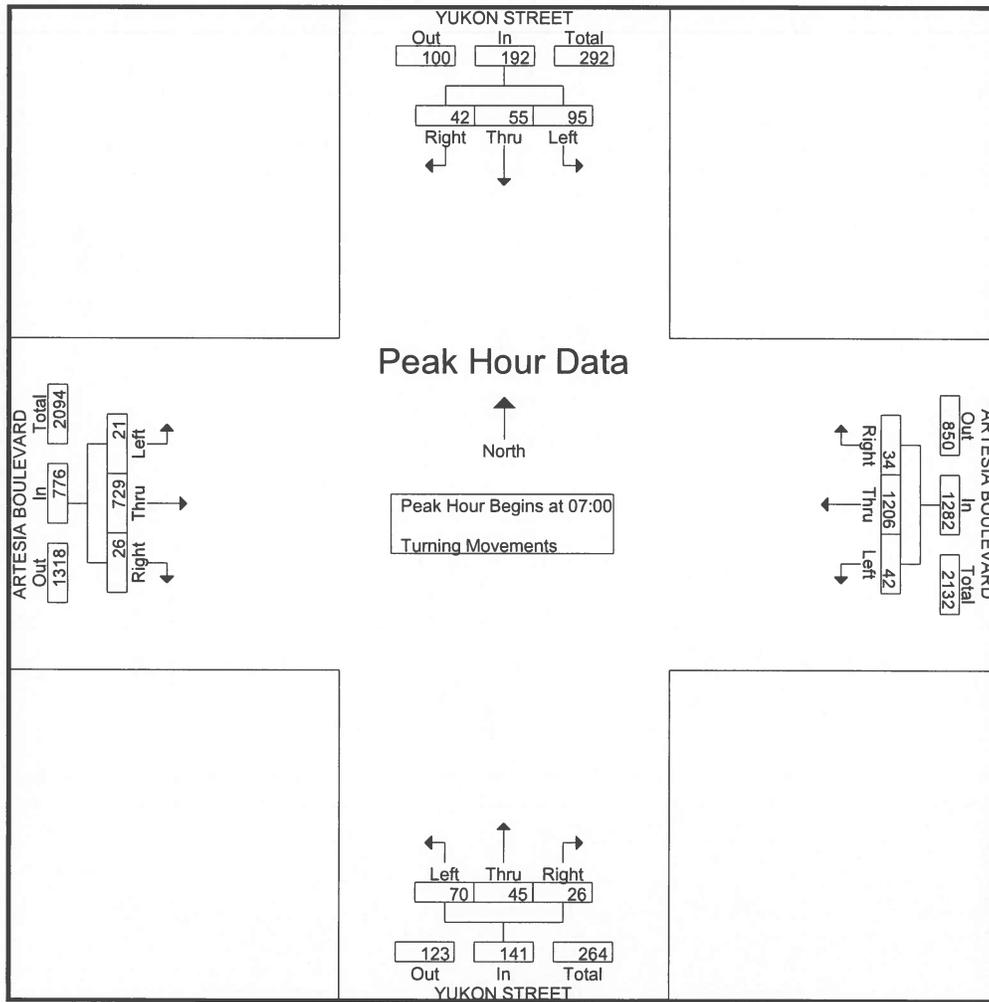
City: TORRANCE  
 N-S- Direction: YUKON STREET  
 E-W Direction: ARTESIA BOULEVARD

File Name : H1508012  
 Site Code : 00001883  
 Start Date : 8/12/2015  
 Page No : 1

Groups Printed- Turning Movements

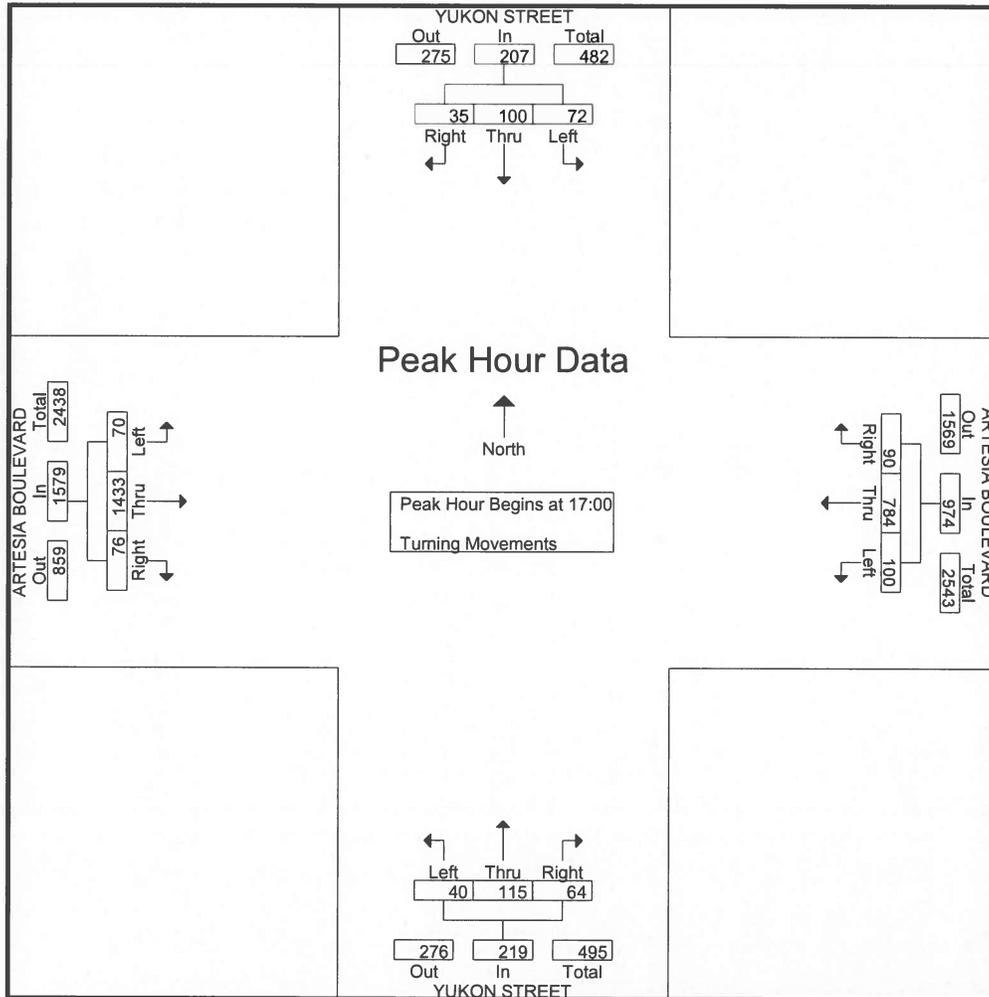
Start Time	YUKON STREET Southbound			ARTESIA BOULEVARD Westbound			YUKON STREET Northbound			ARTESIA BOULEVARD Eastbound			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
07:00	10	7	19	6	310	8	4	11	20	11	232	3	641
07:15	10	13	17	8	276	10	3	9	23	7	170	6	552
07:30	12	13	22	8	347	13	8	11	11	3	156	2	606
07:45	10	22	37	12	273	11	11	14	16	5	171	10	592
Total	42	55	95	34	1206	42	26	45	70	26	729	21	2391
08:00	5	26	23	14	258	8	3	9	22	6	126	8	508
08:15	12	25	20	11	226	12	4	12	16	5	152	6	501
08:30	10	33	18	8	282	9	9	10	9	11	127	4	530
08:45	21	34	13	7	351	17	12	20	15	6	185	8	689
Total	48	118	74	40	1117	46	28	51	62	28	590	26	2228
16:00	7	20	9	14	181	22	13	21	8	11	342	12	660
16:15	2	25	15	10	188	18	11	27	9	14	329	10	658
16:30	11	28	12	21	177	25	13	30	6	12	332	17	684
16:45	10	34	19	17	180	25	15	26	9	17	317	19	688
Total	30	107	55	62	726	90	52	104	32	54	1320	58	2690
17:00	5	25	13	18	204	20	27	18	11	14	379	16	750
17:15	11	33	14	28	188	36	21	36	9	16	349	16	757
17:30	11	17	27	26	193	19	9	34	9	21	358	18	742
17:45	8	25	18	18	199	25	7	27	11	25	347	20	730
Total	35	100	72	90	784	100	64	115	40	76	1433	70	2979
Grand Total	155	380	296	226	3833	278	170	315	204	184	4072	175	10288
Apprch %	18.7	45.7	35.6	5.2	88.4	6.4	24.7	45.7	29.6	4.2	91.9	3.9	
Total %	1.5	3.7	2.9	2.2	37.3	2.7	1.7	3.1	2	1.8	39.6	1.7	

Start Time	YUKON STREET Southbound				ARTESIA BOULEVARD Westbound				YUKON STREET Northbound				ARTESIA BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	10	7	19	36	6	310	8	324	4	11	20	35	11	232	3	246	641
07:15	10	13	17	40	8	276	10	294	3	9	23	35	7	170	6	183	552
07:30	12	13	22	47	8	347	13	368	8	11	11	30	3	156	2	161	606
07:45	10	22	37	69	12	273	11	296	11	14	16	41	5	171	10	186	592
Total Volume	42	55	95	192	34	1206	42	1282	26	45	70	141	26	729	21	776	2391
% App. Total	21.9	28.6	49.5		2.7	94.1	3.3		18.4	31.9	49.6		3.4	93.9	2.7		
PHF	.875	.625	.642	.696	.708	.869	.808	.871	.591	.804	.761	.860	.591	.786	.525	.789	.933



Start Time	YUKON STREET Southbound				ARTESIA BOULEVARD Westbound				YUKON STREET Northbound				ARTESIA BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
17:00	5	25	13	43	18	204	20	242	27	18	11	56	14	379	16	409	750
17:15	11	33	14	58	28	188	36	252	21	36	9	66	16	349	16	381	757
17:30	11	17	27	55	26	193	19	238	9	34	9	52	21	358	18	397	742
17:45	8	25	18	51	18	199	25	242	7	27	11	45	25	347	20	392	730
Total Volume	35	100	72	207	90	784	100	974	64	115	40	219	76	1433	70	1579	2979
% App. Total	16.9	48.3	34.8		9.2	80.5	10.3		29.2	52.5	18.3		4.8	90.8	4.4		
PHF	.795	.758	.667	.892	.804	.961	.694	.966	.593	.799	.909	.830	.760	.945	.875	.965	.984

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 17:00



City: TORRANCE  
 N-S- Direction: HAWTHORNE BOULEVARD  
 E-W Direction: ARTESIA BOULEVARD

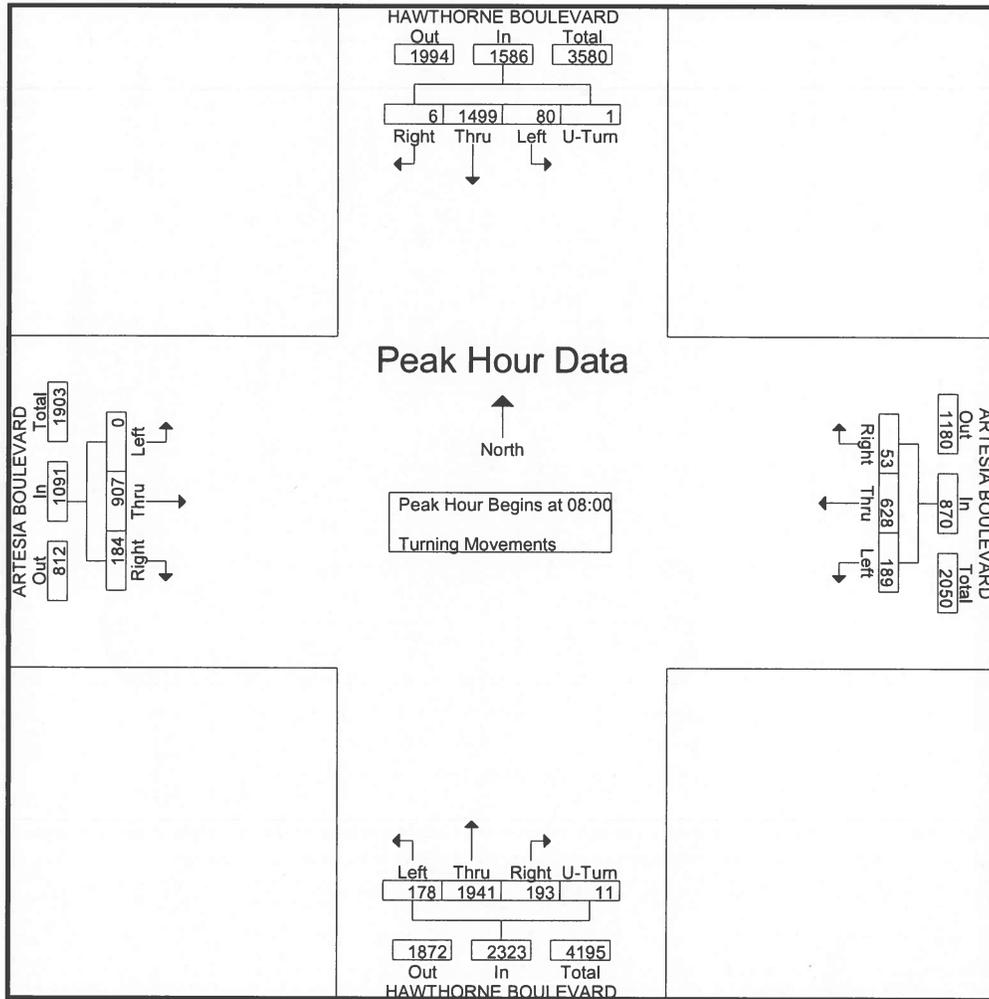
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 Site Code : 00000000  
 Start Date : 8/12/2015  
 Page No : 1

Groups Printed- Turning Movements

Start Time	HAWTHORNE BOULEVARD Southbound				ARTESIA BOULEVARD Westbound			HAWTHORNE BOULEVARD Northbound				ARTESIA BOULEVARD Eastbound			Int. Total
	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	
07:00	2	250	16	0	14	128	36	35	393	28	0	12	167	0	1081
07:15	1	261	13	1	17	175	39	31	364	33	0	31	222	0	1188
07:30	3	322	12	0	19	184	44	39	622	24	1	39	192	0	1501
07:45	1	319	23	0	20	153	33	49	500	48	3	52	225	0	1426
Total	7	1152	64	1	70	640	152	154	1879	133	4	134	806	0	5196
08:00	2	331	18	0	16	139	56	32	478	41	2	33	238	0	1386
08:15	3	384	21	0	7	136	39	52	462	27	3	49	245	0	1428
08:30	1	350	23	0	14	153	39	49	535	54	4	55	229	0	1506
08:45	0	434	18	1	16	200	55	60	466	56	2	47	195	0	1550
Total	6	1499	80	1	53	628	189	193	1941	178	11	184	907	0	5870
16:00	3	451	31	2	8	167	90	87	438	43	11	71	200	0	1602
16:15	9	407	30	2	13	188	87	58	476	52	7	71	176	0	1576
16:30	2	437	26	0	14	182	110	63	422	48	8	58	212	0	1582
16:45	5	449	18	0	15	186	106	82	465	46	14	78	235	0	1699
Total	19	1744	105	4	50	723	393	290	1801	189	40	278	823	0	6459
17:00	9	457	24	2	19	163	82	75	487	62	18	74	205	0	1677
17:15	6	463	32	2	16	196	88	72	536	66	8	80	222	0	1787
17:30	6	494	30	3	13	225	90	72	482	46	7	91	195	0	1754
17:45	2	446	24	3	19	203	99	80	501	44	15	82	224	0	1742
Total	23	1860	110	10	67	787	359	299	2006	218	48	327	846	0	6960
Grand Total	55	6255	359	16	240	2778	1093	936	7627	718	103	923	3382	0	24485
Apprch %	0.8	93.6	5.4	0.2	5.8	67.6	26.6	10	81.3	7.7	1.1	21.4	78.6	0	
Total %	0.2	25.5	1.5	0.1	1	11.3	4.5	3.8	31.1	2.9	0.4	3.8	13.8	0	

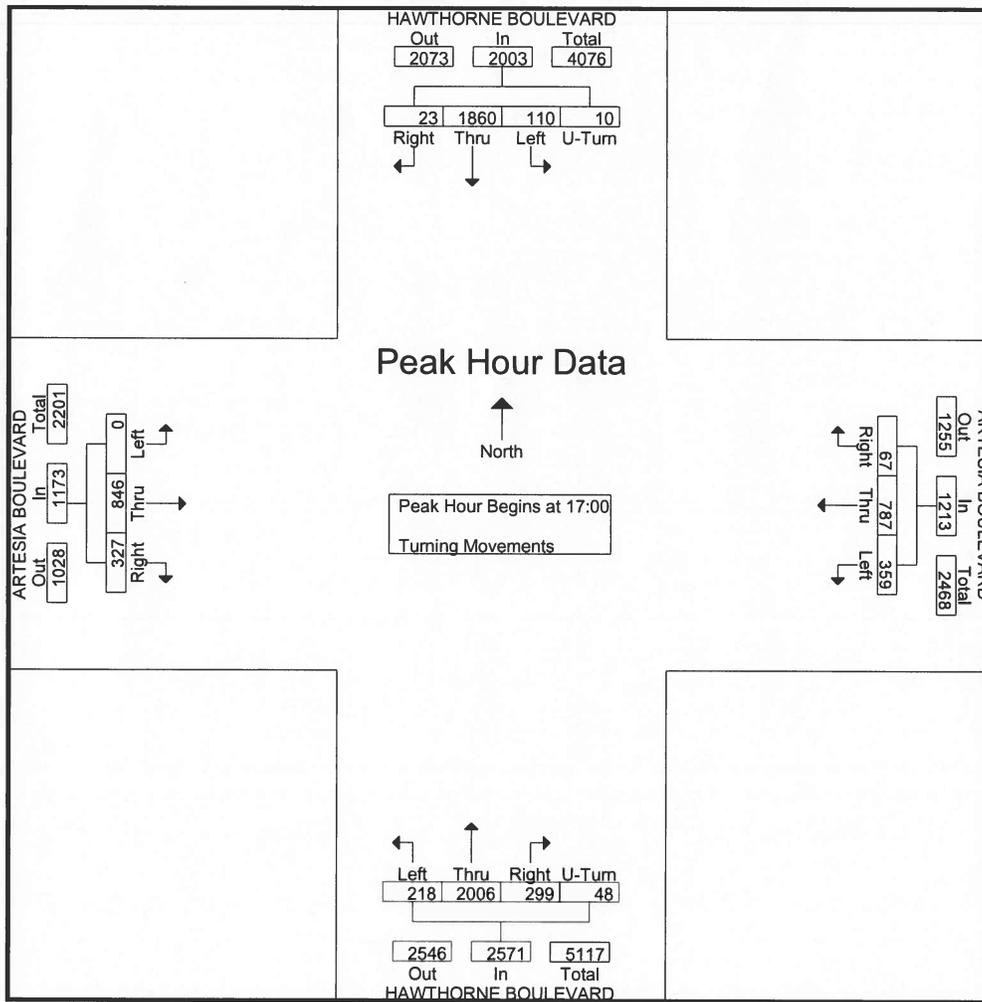
Start Time	HAWTHORNE BOULEVARD Southbound				ARTESIA BOULEVARD Westbound				HAWTHORNE BOULEVARD Northbound				ARTESIA BOULEVARD Eastbound				Int. Total		
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru		Left	App. Total
08:00	2	331	18	0	351	16	139	56	211	32	478	41	2	553	33	238	0	271	1380
08:15	3																		1428
08:30	1	350	23								535		4	642	55	245		294	
08:45	0	434	18	1	453	16	290	55	371	59	466	58	2	584	47	195	0	242	1550
Total Volume	6	1499	80	1	1589	53	628	189	870	193	1941	178	11	2323	194	907	0	1091	5870
% App. Total	0.4	94.5	5	0.1		0.1	72.2	21.7		8.3	83.8	7.7	0.5		19.4	83.1	0		
PHF	.909	.993	.970	.250	.975	.928	.785	.944	.903	.894	.907	.795	.888	.905	.838	.928	.609	.928	.947

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 08:00



Start Time	HAWTHORNE BOULEVARD Southbound					ARTESIA BOULEVARD Westbound				HAWTHORNE BOULEVARD Northbound					ARTESIA BOULEVARD Eastbound				Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	
17:00	9	457	24	2	492	19	163	82	264	75	487	62	18	642	74	205	0	279	1677
17:15	6	463	32	2	503	16	196	88	300	72	536	66	8	682	80	222	0	302	1787
17:30	6	494	30	3	533	13	225	90	328	72	482	46	7	607	91	195	0	286	1754
17:45	2	446	24	3	475	19	203	99		80	501	44	15	640	82	224	0	306	
Total Volume	23	1860	110	10	2003	67	787	359	1213	299	2006	218	48	2571	327	846	0	1173	6960
% App. Total	1.1	92.9	5.5	0.5		5.5	64.9	29.6		11.6	78	8.5	1.9		27.9	72.1	0		
PHF	.639	.941	.859	.833	.939	.882	.874	.907	.925	.934	.936	.826	.667	.942	.898	.944	.000	.958	.974

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 17:00



# **APPENDIX “C”**

## **INTERSECTION ANALYSIS - LEVEL OF SERVICE CALCULATION (ICU METHODOLOGY)**

## ICU ANALYSIS

<b>Intersection:</b> <u>Prairie Avenue and Redondo Beach Boulevard</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement	
<b>Northbound</b>	Left	207	1	1600	0.129	0.389	
	Thru	589	2	3200	0.184		
	Right	289	1	1600	0.181		
<b>Southbound</b>	Left	157	1	1600	0.098		
	Thru	831	2	3200	0.260		
	Right	164	1	1600	0.103		
<b>Eastbound</b>	Left	149	1	1600	0.093		0.290
	Thru	590	2	3200	0.184		
	Right	165	1	1600	0.103		
<b>Westbound</b>	Left	157	1	1600	0.098		
	Thru	630	2	3200	0.197		
	Right	209	1	1600	0.131		

0.100

**AM Inters      0.779**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement	
<b>Northbound</b>	Left	323	1	1600	0.202	0.440	
	Thru	905	2	3200	0.283		
	Right	341	1	1600	0.213		
<b>Southbound</b>	Left	149	1	1600	0.093		
	Thru	760	2	3200	0.238		
	Right	217	1	1600	0.136		
<b>Eastbound</b>	Left	213	1	1600	0.133		0.395
	Thru	902	2	3200	0.282		
	Right	199	1	1600	0.124		
<b>Westbound</b>	Left	149	1	1600	0.093		
	Thru	837	2	3200	0.262		
	Right	249	1	1600	0.156		

0.100

**PM Inters      0.935**

## ICU ANALYSIS

<b>Intersection:</b> <u>Prairie Avenue and Redondo Beach Boulevard</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing + Project</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	207	1	1600	0.129	0.390
	Thru	594	2	3200	0.186	
	Right	291	1	1600	0.182	
<b>Southbound</b>	Left	157	1	1600	0.098	
	Thru	834	2	3200	0.261	
	Right	164	1	1600	0.103	
<b>Eastbound</b>	Left	149	1	1600	0.093	0.290
	Thru	590	2	3200	0.184	
	Right	167	1	1600	0.104	
<b>Westbound</b>	Left	158	1	1600	0.099	
	Thru	630	2	3200	0.197	
	Right	209	1	1600	0.131	

0.100

**AM Inters: 0.780**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	323	1	1600	0.202	0.441
	Thru	910	2	3200	0.284	
	Right	343	1	1600	0.214	
<b>Southbound</b>	Left	149	1	1600	0.093	
	Thru	764	2	3200	0.239	
	Right	217	1	1600	0.136	
<b>Eastbound</b>	Left	213	1	1600	0.133	0.395
	Thru	902	2	3200	0.282	
	Right	202	1	1600	0.126	
<b>Westbound</b>	Left	150	1	1600	0.094	
	Thru	837	2	3200	0.262	
	Right	249	1	1600	0.156	

0.100

**PM Inters: 0.936**

## ICU ANALYSIS

<b>Intersection:</b> <u>Artesia Boulevard and Yukon Avenue</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	70	1	1600	0.044	0.105
	Thru	45	1	1600	0.044	
	Right	26	0	0	0.000	
<b>Southbound</b>	Left	95	1	1600	0.059	
	Thru	55	1	1600	0.061	
	Right	42	0	0	0.000	
<b>Eastbound</b>	Left	21	1	1600	0.013	0.390
	Thru	729	2	3200	0.228	
	Right	26	1	1600	0.016	
<b>Westbound</b>	Left	42	1	2880	0.015	
	Thru	1206	2	3200	0.377	
	Right	34	1	1600	0.021	

0.100

**AM Inters      0.595**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	40	1	1600	0.025	0.157
	Thru	115	1	1600	0.112	
	Right	64	0	0	0.000	
<b>Southbound</b>	Left	72	1	1600	0.045	
	Thru	100	1	1600	0.084	
	Right	35	0	0	0.000	
<b>Eastbound</b>	Left	70	1	1600	0.044	0.483
	Thru	1433	2	3200	0.448	
	Right	76	1	1600	0.048	
<b>Westbound</b>	Left	100	1	2880	0.035	
	Thru	784	2	3200	0.245	
	Right	90	1	1600	0.056	

0.100

**PM Inters      0.740**

## ICU ANALYSIS

<b>Intersection:</b> <u>Artesia Boulevard and Yukon Avenue</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing + Project</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	70	1	1600	0.044	0.105
	Thru	45	1	1600	0.044	
	Right	26	0	0	0.000	
<b>Southbound</b>	Left	95	1	1600	0.059	
	Thru	55	1	1600	0.061	
	Right	42	0	0	0.000	
<b>Eastbound</b>	Left	21	1	1600	0.013	0.391
	Thru	734	2	3200	0.229	
	Right	26	1	1600	0.016	
<b>Westbound</b>	Left	42	1	2880	0.015	
	Thru	1211	2	3200	0.378	
	Right	34	1	1600	0.021	

0.100

**AM Inters: 0.596**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	40	1	1600	0.025	0.157
	Thru	115	1	1600	0.112	
	Right	64	0	0	0.000	
<b>Southbound</b>	Left	72	1	1600	0.045	
	Thru	100	1	1600	0.084	
	Right	35	0	0	0.000	
<b>Eastbound</b>	Left	70	1	1600	0.044	0.485
	Thru	1439	2	3200	0.450	
	Right	76	1	1600	0.048	
<b>Westbound</b>	Left	100	1	2880	0.035	
	Thru	790	2	3200	0.247	
	Right	90	1	1600	0.056	

0.100

**PM Inters: 0.742**

## ICU ANALYSIS

<b>Intersection:</b> <u>Artesia Boulevard and Hawthorne Boulevard</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	178	2	2880	0.062	0.361
	Thru	1941	4	6400	0.333	
	Right	193	0	0	0.000	
<b>Southbound</b>	Left	80	2	2880	0.028	
	Thru	1499	4	6400	0.235	
	Right	6	0	0	0.000	
<b>Eastbound</b>	Left	0	0	1600	0.000	0.255
	Thru	907	3	4800	0.189	
	Right	184	1	1600	0.115	
<b>Westbound</b>	Left	189	2	2880	0.066	
	Thru	628	2	3200	0.213	
	Right	53	0	0	0.000	

0.100

**AM Inters 0.716**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	218	2	2880	0.076	0.398
	Thru	2006	4	6400	0.360	
	Right	299	0	0	0.000	
<b>Southbound</b>	Left	110	2	2880	0.038	
	Thru	1860	4	6400	0.294	
	Right	23	0	0	0.000	
<b>Eastbound</b>	Left	0	0	1600	0.000	0.329
	Thru	846	3	4800	0.176	
	Right	327	1	1600	0.204	
<b>Westbound</b>	Left	359	2	2880	0.125	
	Thru	787	2	3200	0.267	
	Right	67	0	0	0.000	

0.100

**PM Inters 0.827**

## ICU ANALYSIS

<b>Intersection:</b> <u>Artesia Boulevard and Hawthorne Boulevard</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing + Project</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	178	2	2880	0.062	0.362
	Thru	1941	4	6400	0.334	
	Right	197	0	0	0.000	
<b>Southbound</b>	Left	82	2	2880	0.028	
	Thru	1499	4	6400	0.235	
	Right	6	0	0	0.000	
<b>Eastbound</b>	Left	0	0	1600	0.000	0.256
	Thru	910	3	4800	0.190	
	Right	184	1	1600	0.115	
<b>Westbound</b>	Left	190	2	2880	0.066	
	Thru	632	2	3200	0.216	
	Right	58	0	0	0.000	

0.100

**AM Inters: 0.718**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	218	2	2880	0.076	0.400
	Thru	2006	4	6400	0.361	
	Right	304	0	0	0.000	
<b>Southbound</b>	Left	111	2	2880	0.039	
	Thru	1860	4	6400	0.294	
	Right	23	0	0	0.000	
<b>Eastbound</b>	Left	0	0	1600	0.000	0.329
	Thru	851	3	4800	0.177	
	Right	327	1	1600	0.204	
<b>Westbound</b>	Left	360	2	2880	0.125	
	Thru	792	2	3200	0.270	
	Right	72	0	0	0.000	

0.100

**PM Inters: 0.829**

## ICU ANALYSIS

<b>Intersection:</b> <u>Prairie Avenue and 182nd St.</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement	
<b>Northbound</b>	Left	44	1	1600	0.028	0.405	
	Thru	1092	2	3200	0.341		
	Right	76	1	1600	0.048		
<b>Southbound</b>	Left	46	1	1600	0.029		
	Thru	1207	2	3200	0.377		
	Right	95	1	1600	0.059		
<b>Eastbound</b>	Left	172	1	1600	0.108		0.258
	Thru	205	2	3200	0.082		
	Right	56	0	0	0.000		
<b>Westbound</b>	Left	282	1	1600	0.176		
	Thru	365	2	3200	0.138		
	Right	75	0	0	0.000		

0.100

**AM Inters      0.763**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement	
<b>Northbound</b>	Left	107	1	1600	0.067	0.453	
	Thru	1304	2	3200	0.408		
	Right	167	1	1600	0.104		
<b>Southbound</b>	Left	72	1	1600	0.045		
	Thru	1076	2	3200	0.336		
	Right	119	1	1600	0.074		
<b>Eastbound</b>	Left	162	1	1600	0.101		0.305
	Thru	407	2	3200	0.157		
	Right	95	0	0	0.000		
<b>Westbound</b>	Left	237	1	1600	0.148		
	Thru	466	2	3200	0.168		
	Right	73	0	0	0.000		

0.100

**PM Inters      0.858**

## ICU ANALYSIS

<b>Intersection:</b> <u>Prairie Avenue and 182nd St.</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing + Project</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	44	1	1600	0.028	0.406
	Thru	1095	2	3200	0.342	
	Right	76	1	1600	0.048	
<b>Southbound</b>	Left	47	1	1600	0.029	
	Thru	1211	2	3200	0.378	
	Right	97	1	1600	0.061	
<b>Eastbound</b>	Left	173	1	1600	0.108	0.258
	Thru	205	2	3200	0.082	
	Right	56	0	0	0.000	
<b>Westbound</b>	Left	282	1	1600	0.176	
	Thru	365	2	3200	0.138	
	Right	78	0	0	0.000	

0.100

**AM Inters: 0.764**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	107	1	1600	0.067	0.455
	Thru	1308	2	3200	0.409	
	Right	167	1	1600	0.104	
<b>Southbound</b>	Left	73	1	1600	0.046	
	Thru	1080	2	3200	0.338	
	Right	121	1	1600	0.076	
<b>Eastbound</b>	Left	163	1	1600	0.102	0.305
	Thru	407	2	3200	0.157	
	Right	95	0	0	0.000	
<b>Westbound</b>	Left	237	1	1600	0.148	
	Thru	466	2	3200	0.169	
	Right	76	0	0	0.000	

0.100

**PM Inters: 0.860**

## ICU ANALYSIS

<b>Intersection:</b> <u>Prairie Avenue and Artesia Boulevard</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	83	1	1600	0.052	0.463
	Thru	971	3	4800	0.202	
	Right	493	1	1600	0.308	
<b>Southbound</b>	Left	248	1	1600	0.155	0.321
	Thru	1006	2	3200	0.314	
	Right	46	1	1600	0.029	
<b>Eastbound</b>	Left	39	1	1600	0.024	0.321
	Thru	1085	3	4800	0.234	
	Right	38	0	0	0.000	
<b>Westbound</b>	Left	251	2	2880	0.087	0.100
	Thru	747	2	3200	0.233	
	Right	121	1	1600	0.076	

0.100

**AM Inters      0.884**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	61	1	1600	0.038	0.356
	Thru	1155	3	4800	0.241	
	Right	306	1	1600	0.191	
<b>Southbound</b>	Left	184	1	1600	0.115	0.414
	Thru	939	2	3200	0.293	
	Right	63	1	1600	0.039	
<b>Eastbound</b>	Left	123	1	1600	0.077	0.414
	Thru	1043	3	4800	0.244	
	Right	128	0	0	0.000	
<b>Westbound</b>	Left	272	2	2880	0.094	0.100
	Thru	1078	2	3200	0.337	
	Right	181	1	1600	0.113	

0.100

**PM Inters      0.870**

## ICU ANALYSIS

<b>Intersection:</b> <u>Prairie Avenue and Artesia Boulevard</u>	<u>AM &amp; PM</u>
<b>Project:</b> <u>Senior Housing</u>	<u>8/2015</u>
<b>Lane Capacity:</b> <u>1600</u>	<u>AL</u>
<b>Condition:</b> <u>Existing + Project</u>	

### AM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	93	1	1600	0.058	0.469
	Thru	978	3	4800	0.204	
	Right	503	1	1600	0.314	
<b>Southbound</b>	Left	248	1	1600	0.155	
	Thru	1012	2	3200	0.316	
	Right	46	1	1600	0.029	
<b>Eastbound</b>	Left	39	1	1600	0.024	0.326
	Thru	1085	3	4800	0.236	
	Right	47	0	0	0.000	
<b>Westbound</b>	Left	260	2	2880	0.090	
	Thru	747	2	3200	0.233	
	Right	121	1	1600	0.076	

0.100

**AM Inters: 0.895**

### PM PEAK

		Volume	No. of Lane	Lane Capacity	V/C	Critical Movement
<b>Northbound</b>	Left	72	1	1600	0.045	0.357
	Thru	1162	3	4800	0.242	
	Right	317	1	1600	0.198	
<b>Southbound</b>	Left	184	1	1600	0.115	
	Thru	947	2	3200	0.296	
	Right	63	1	1600	0.039	
<b>Eastbound</b>	Left	123	1	1600	0.077	0.414
	Thru	1043	3	4800	0.246	
	Right	139	0	0	0.000	
<b>Westbound</b>	Left	283	2	2880	0.098	
	Thru	1078	2	3200	0.337	
	Right	181	1	1600	0.113	

0.100

**PM Inters: 0.871**

## **APPENDIX “D”**

### **INTERSECTION ANALYSIS LEVEL OF SERVICE CALCULATION (HCM METHODOLOGY)**

# EXISTING CONDITION - HCM - AM PEAK

Artesia Blvd. and Hawthorne Blvd. - Existing AM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AMs

File Transfer Options Optimize Help

Artesia Blvd & Hawthorne Blvd.

Options >

Controller Type: Actuated-Coordin

Cycle Length: 90.0

Actuated C.L.: 90.0

Natural C.L.: 70.0

Max v/c Ratio: 0.82

Int. Delay: 24.6

Int. LOS: C

ICU: 75.7%

ICU LOS: C

Lock Timings

Offset Settings

Offset: 48.0

Reference Style: Begin of Green

Reference Phase: 2+6 - NBT SB

Master Intersectn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	↑↑↑	↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑		
Traffic Volume (vph)	0	907	184	189	620	53	178	1941	193	80	1499	6		
Turn Type		Perm	Prot				Prot			Prot				
Protected Phases		4		3	8		5	2		1	6			
Permitted Phases			4											
Detector Phases		4	4	3	8		5	2		1	6			
Minimum Initial (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0			
Minimum Split (s)		20.5	20.5	8.5	20.5		8.5	20.5		8.5	20.5			
Total Split (s)		26.0	26.0	12.0	38.0		13.8	43.5		8.5	38.2			
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5			
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0			
Lead/Lag		Lag	Lag	Lead			Lead	Lag		Lead	Lag			
Allow Lead/Lag Optimize?		Yes	Yes	Yes			Yes	Yes		Yes	Yes			
Recall Mode		None	None	None	None		None	Coord		None	Coord			
Actuated Effct. Green (s)		21.3	21.3	8.0	33.4		9.4	41.8		4.5	35.2			
Actuated g/C Ratio		0.24	0.24	0.09	0.37		0.10	0.46		0.05	0.39			
Volume to Capacity Ratio		0.82	0.42	0.67	0.57		0.54	0.79		0.51	0.65			
Control Delay (s)		32.6	11.9	42.1	22.3		38.4	20.9		42.0	22.8			
Level of Service		C	B	D	C		D	C		D	C			
Approach Delay (s)					26.6			22.2			23.8			
Approach LOS					C			C			C			
Queue Length 50th (ft)		193	34	59	168		54	324		25	220			
Queue Length 95th (ft)		242	95	#102	226		88	376		49	261			
Queueing Penalty		0	0	0	0		0	0		0	0			
Stops (vph)		826	64	179	514		163	1715		74	1180			
Fuel Used (g/hr)		17	2	9	28		6	57		2	35			
Dilemma Vehicles (#/hr)		51	0	0	38		0	119		0	84			

Number of lanes and sharing. (0 to 5, L, R)

# Artesia Blvd. and Yukon Ave. - Existing AM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AM.s

File Transfer Options Optimize Help

Artesia Blvd & Yukon Ave.

Options >

Controller Type:  
Actuated-Coordin

Cycle Length: 60.0  
Actuated C.L.: 60.0  
Natural C.L.: 50.0  
Max v/c Ratio: 0.50  
Int. Delay: 5.7  
Int. LOS: A  
ICU: 55.32  
ICU LOS: A

Lock Timings  
Offset Settings  
Offset: 22.0

Reference Style:  
Begin of Green  
Reference Phase:  
4+0 - EBTL W  
Master Intersctn.

TIMING WINDOW	EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR		PED	HOLD
	↑	↑↑	↑	↑↑	↓	↓↓	↑	↑↑	↑	↑↑	↓	↓↓	↑	↑↑	↑	↑↑	↓	↓↓	↑	↑↑	↑	↑↑	↓	↓↓		
Lanes and Sharing (#RL)	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1		
Traffic Volume (vph)	21	729	26	42	1206	34	70	45	26	95	55	42														
Turn Type	Perm		Perm		Perm		Perm		Perm		Perm		Perm		Perm		Perm		Perm		Perm		Perm			
Protected Phases	4		4		8		8		2		6		6		6		6		6		6		6			
Permitted Phases	4		4		8		8		2		6		6		6		6		6		6		6			
Detector Phases	4		4		8		8		2		6		6		6		6		6		6		6			
Minimum Initial (s)	4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0			
Minimum Split (s)	20.5		20.5		20.5		20.5		20.5		20.5		20.5		20.5		20.5		20.5		20.5		20.5			
Total Split (s)	38.0		38.0		38.0		38.0		38.0		38.0		22.0		22.0		22.0		22.0		22.0		22.0			
Yellow Time (s)	3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5		3.5			
All-Red Time (s)	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0			
Lead/Lag																										
Allow Lead/Lag Optimize?																										
Recall Mode	Coord		Coord		Coord		Coord		Coord		Coord		None													
Actuated Effct. Green (s)	44.7		44.7		44.7		44.7		44.7		44.7		10.1		10.1		10.1		10.1		10.1		10.1			
Actuated g/C Ratio	0.75		0.75		0.75		0.75		0.75		0.75		0.17		0.17		0.17		0.17		0.17		0.17			
Volume to Capacity Ratio	0.12		0.30		0.02		0.11		0.50		0.03		0.35		0.24		0.46		0.32		0.32		0.32			
Control Delay (s)	3.4		2.6		1.2		4.1		4.7		1.6		21.0		14.3		21.6		13.0		13.0		13.0			
Level of Service	A		A		A		A		A		C		B		B		C		B		B		B			
Approach Delay (s)			2.5						4.6				17.6				17.3									
Approach LOS			A						A				B				B									
Queue Length 50th (ft)	2		33		0		4		92		0		25		15		34		19		19		19			
Queue Length 95th (ft)	m4		m75		m0		17		172		8		53		43		69		51		51		51			
Queueing Penalty	0		0		0		0		0		0		0		0		0		0		0		0			
Stops (vph)	5		137		3		16		484		5		60		41		79		51		51		51			
Fuel Used (g/hr)	1		32		1		0		13		0		2		2		2		2		2		2			
Dilemma Vehicles (#/hr)	0		66		0		0		86		0		0		0		0		0		0		0			

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and 182nd St. - Existing AM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AM.syn

File Transfer Options Optimize Help

182nd St. & Prairie Ave

Options >

Controller Type: Actuated-Coordin

Cycle Length: 120.0

Actuated C.L.: 120.0

Natural C.L.: 80.0

Max v/c Ratio: 0.76

Int. Delay: 29.1

Int. LOS: C

ICU: 71.4%

ICU LOS: C

Lock Timings

Offset Settings

Offset: 48.0

Reference Style: Begin of Green

Reference Phase: 2+6 - NBTL SE

Master Intersctn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	1	1	1	1	1	1	1	1	1	1	1	1		
Traffic Volume (vph)	172	205	56	282	365	75	44	1092	76	46	1207	95		
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm		
Protected Phases	7	4		3	8		5	2		1	6			
Permitted Phases	4			8			2		2	6	6			
Detector Phases	7	4		3	8		5	2	2	1	6	6		
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	20.5	20.5	8.5	20.5	20.5		
Total Split (s)	20.5	20.5		29.0	29.0		9.0	60.8	60.8	9.7	61.5	61.5		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0		
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag		
Allow Lead/Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None		None	Coord	Coord	None	Coord	Coord		
Actuated Effct. Green (s)	28.9	14.3		40.1	21.6		68.1	64.1	64.1	69.2	64.7	64.7		
Actuated g/C Ratio	0.24	0.12		0.33	0.18		0.57	0.53	0.53	0.58	0.54	0.54		
Volume to Capacity Ratio	0.62	0.66		0.75	0.76		0.31	0.63	0.09	0.26	0.69	0.11		
Control Delay (s)	29.6	45.9		31.5	44.6		11.8	21.4	3.7	19.8	29.8	12.4		
Level of Service	C	D		C	D		B	C	A	B	C	B		
Approach Delay (s)		39.5			39.5			20.0			28.3			
Approach LOS		D			D			B			C			
Queue Length 50th (ft)	105	102		187	179		15	347	0	24	362	9		
Queue Length 95th (ft)	158	147		261	232		35	455	27	m38	m450	m33		
Queueing Penalty	0	0		0	0		0	0	0	0	0	0		
Stops (vph)	137	222		218	391		19	758	9	29	771	55		
Fuel Used (g/hr)	4	7		8	14		1	18	1	1	39	3		
Dilemma Vehicles (#/hr)	0	11		0	18		0	45	0	0	100	0		

Number of lanes and sharing. (0 to 5, L, R)

Windows taskbar: Windows, Internet Explorer, File Explorer, Synchro 5, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Music, Photos, Mail, Control Panel, System Tray.

# Prairie Ave. and Artesia Ave. - Existing AM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AM.syx

File Transfer Options Optimize Help

Artesia Blvd & Prairie Ave

Options >

Controller Type:  
Actuated-Coord

Cycle Length: 120.0

Actuated C.L.: 120.0

Natural C.L.: 75.0

Max v/c Ratio: 0.91

Int. Delay: 44.5

Int. LOS: D

ICU: 81.8%

ICU LOS: D

Lock Timings

Offset Settings  
Offset: 48.0

Reference Style:  
Begin of Green

Reference Phase:  
2+6 - NBT SB

Master Intersctn.

TIMING WINDOW	EBL			WBL			NBL			SBL			PED	HOLD
	EBL	EBT	EER	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lanes and Sharing (#RL)	3	↑↑↑		3	↑↑		3	↑↑↑		3	↑↑			
Traffic Volume (vph)	39	1085	38	251	747	121	93	971	493	248	1006	46		
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm		
Protected Phases	7	4		3	8		5	2		1	6			
Permitted Phases					8			2			6			
Detector Phases	7	4		3	8	8	5	2	2	1	6	6		
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)	8.5	20.5		8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5		
Total Split (s)	9.1	36.0		16.0	42.9	42.9	13.9	42.0	42.0	26.0	54.1	54.1		
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag		
Allow Lead/Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None	None	Coord	Coord	None	Coord	Coord			
Actuated Effct. Green (s)	5.2	31.7		12.0	40.3	40.3	9.6	39.3	39.3	21.1	50.9	50.9		
Actuated g/C Ratio	0.04	0.26		0.10	0.34	0.34	0.08	0.33	0.33	0.18	0.42	0.42		
Volume to Capacity Ratio	0.56	0.91		0.80	0.68	0.21	0.72	0.63	0.83	0.87	0.73	0.07		
Control Delay (s)	66.6	46.3		58.3	32.0	5.9	49.0	45.6	42.1	54.9	50.5	24.7		
Level of Service	E	D		E	C	A	D	D	D	D	D	C		
Approach Delay (s)	46.9			35.1			44.7			50.4				
Approach LOS	D			D			D			D				
Queue Length 50th (ft)	33	334		111	250	7	78	296	317	221	456	9		
Queue Length 95th (ft)	#84	#416		#177	308	47m	#146	341	#477	#354	532	m3		
Queueing Penalty	0	0		0	0	0	0	0	0	0	0	0		
Stops (vph)	39	1059		247	540	27	89	874	344	253	873	53		
Fuel Used (g/hr)	2	54		16	41	5	4	37	18	9	34	1		
Dilemma Vehicles (#/hr)	0	46		0	37	0	0	23	0	0	76	0		

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and Redondon Beach Blvd. - Existing AM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AM.s

File Transfer Options Optimize Help

Redondo Beach Blvd. & Prairie Ave

Options >		TIMING WINDOW													
Controller Type:		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Actuated-Coord															
Cycle Length:	120.0														
Actuated C.L.:	120.0														
Natural C.L.:	70.0														
Max v/c Ratio:	0.87														
Int. Delay:	40.7														
Int. LOS:	D														
ICU:	78.7%														
ICU LOS:	C														
<input type="checkbox"/> Lock Timings															
Offset Settings															
Offset:		48.0													
Reference Style:															
Begin of Green															
Reference Phase:		2+6 - NBT SB													
<input type="checkbox"/> Master Intersctn.															
Lanes and Sharing (#RL)		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)		149	590	165	157	630	203	207	589	289	157	831	164		
Turn Type		Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm		
Protected Phases		7	4		3	8		5	2		1	6			
Permitted Phases				4			8			2			6		
Detector Phases		7	4	4	3	8	8	5	2	2	1	6	6		
Minimum Initial (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)		8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5		
Total Split (s)		20.0	31.0	31.0	21.0	32.0	32.0	25.0	43.6	43.6	24.4	43.0	43.0		
Yellow Time (s)		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lead/Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag		
Allow Lead/Lag Optimize?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode		None	None	None	None	None	None	Coord	Coord	None	Coord	Coord			
Actuated Effct. Green (s)		14.6	26.0	26.0	15.4	26.7	26.7	19.2	46.1	46.1	16.5	43.4	43.4		
Actuated g/C Ratio		0.12	0.22	0.22	0.13	0.22	0.22	0.16	0.38	0.38	0.14	0.36	0.36		
Volume to Capacity Ratio		0.75	0.84	0.37	0.75	0.87	0.42	0.80	0.47	0.39	0.70	0.70	0.26		
Control Delay (s)		53.8	46.2	5.6	52.6	46.9	5.0	52.1	61.3	31.8	48.9	34.4	4.3		
Level of Service		D	D	A	D	D	A	D	E	C	D	C	A		
Approach Delay (s)		40.1				39.2			51.7			32.1			
Approach LOS		D				D			D			C			
Queue Length 50th (ft)		121	248	0	128	266	0	184	262	168	128	332	0		
Queue Length 95th (ft)		#211	318	58	#217	#342	63	#280	325	251	198	413	50		
Queueing Penalty		0	0	0	0	0	0	0	0	0	0	0	0		
Stops (vph)		142	550	20	151	591	23	206	525	307	147	705	18		
Fuel Used (g/hr)		5	19	3	7	28	6	7	21	9	3	15	1		
Dilemma Vehicles (#/hr)		0	24	0	0	26	0	0	91	0	0	35	0		

Number of lanes and sharing. (0 to 5, L, R)

# EXISTING CONDITION - HCM - PM PEAK

Artesia Blvd. and Hawthorne Blvd. - Existing PM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM.syb

File Transfer Options Optimize Help

Artesia Blvd & Hawthorne Blvd.

Options >

Controller Type: Actuated-Coordin

Cycle Length: 90.0

Actuated C.L.: 90.0

Natural C.L.: 80.0

Max v/c Ratio: 1.28

Int. Delay: 32.8

Int. LOS: C

ICU: 82.7%

ICU LOS: D

Lock Timings

Offset Settings

Offset: 48.0

Reference Style:

Begin of Green

Reference Phase: 2+6 - NBT SB

Master Intersectn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	0	4	4	4	4	4	4	4	4	4	4	4		
Traffic Volume (vph)	0	846	327	359	787	67	218	2006	299	110	1860	23		
Turn Type			Perm	Prot			Prot			Prot				
Protected Phases		4		3	8		5	2		1	6			
Permitted Phases		4		4										
Detector Phases		4	4	3	8		5	2		1	6			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0			
Minimum Split (s)	20.5	20.5	8.5	20.5			8.5	20.5		8.5	20.5			
Total Split (s)	26.0	26.0	12.0	38.0			13.8	43.5		8.5	38.2			
Yellow Time (s)	3.5	3.5	3.5	3.5			3.5	3.5		3.5	3.5			
All-Red Time (s)	1.0	1.0	1.0	1.0			1.0	1.0		1.0	1.0			
Lead/Lag	Lag	Lag	Lead				Lead	Lag		Lead	Lag			
Allow Lead/Lag Optimize?	Yes	Yes	Yes				Yes	Yes		Yes	Yes			
Recall Mode	None	None	None	None			None	Coord		None	Coord			
Actuated Effct. Green (s)	21.3	21.3	8.0	33.4			9.6	40.1		4.5	35.0			
Actuated g/C Ratio	0.24	0.24	0.09	0.37			0.11	0.45		0.05	0.39			
Volume to Capacity Ratio	0.76	0.77	1.28	0.71			0.65	0.88		0.70	0.82			
Control Delay (s)	32.0	24.4	150.8	24.1			38.8	24.1		52.0	25.1			
Level of Service	C	C	F	C			D	C		D	C			
Approach Delay (s)	29.9			61.6			25.4			26.6				
Approach LOS	C			E			C			C				
Queue Length 50th (ft)	177	127	~146	227			67	365		35	302			
Queue Length 95th (ft)	224	#256	#236	298			105	422		#77	352			
Queuing Penalty	0	0	0	0			0	0		0	0			
Stops (vph)	759	211	716	694			203	1980		110	1622			
Fuel Used (g/hr)	16	5	28	36			7	64		4	47			
Dilemma Vehicles (#/hr)	47	0	0	47			0	127		0	104			

Number of lanes and sharing. (0 to 5, L, R)

# Artesia Blvd. and Yukon Ave. - Existing PM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM.syn

File Transfer Options Optimize Help

Artesia Blvd & Yukon Ave.

Options >

Controller Type:  
Actuated Coordin

Cycle Length: 60.0  
Actuated C.L.: 60.0  
Natural C.L.: 80.0  
Max v/c Ratio: 0.68  
Int. Delay: 9.5  
Int. LOS: A  
ICU: 77.6%  
ICU LOS: C

Lock Timings

Offset Settings  
Offset: 22.0

Reference Style:  
Begin of Green

Reference Phase:  
4+8 - EBTL W  
Master Intersectn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	↑	↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↑		
Traffic Volume (vph)	70	1433	76	100	784	90	40	115	64	72	100	35		
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm				
Protected Phases			4			8			2			6		
Permitted Phases	4		4	8		8	2			6				
Detector Phases	4	4	4	8	8	8	2	2		6	6			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0			
Minimum Split (s)	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5		20.5	20.5			
Total Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	22.0	22.0		22.0	22.0			
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5			
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0			
Lead/Lag														
Allow Lead/Lag Optimize?														
Recall Mode	Coord	Coord	Coord	Coord	Coord	Coord	None	None		None	None			
Actuated Effct. Green (s)	43.7	43.7	43.7	43.7	43.7	43.7	11.1	11.1		11.1	11.1			
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.19	0.19		0.19	0.19			
Volume to Capacity Ratio	0.19	0.60	0.07	0.68	0.33	0.08	0.19	0.56		0.38	0.41			
Control Delay (s)	3.2	9.1	1.1	37.0	4.4	1.3	19.1	18.3		20.3	16.1			
Level of Service	A	A	A	D	A	A	B	B		C	B			
Approach Delay (s)		8.5			7.4			18.5			17.5			
Approach LOS		A			A			B			B			
Queue Length 50th (ft)	10	234	1	20	54	0	13	56		25	37			
Queue Length 95th (ft)	m17	m288	m3	#118	103	14	33	101		54	74			
Queuing Penalty	0	0	0	0	0	0	0	0		0	0			
Stops (vph)	15	588	6	94	280	9	34	131		61	87			
Fuel Used (g/hr)	3	67	3	2	8	1	1	4		1	2			
Dilemma Vehicles (#/hr)	0	127	0	0	57	0	0	0		0	0			

↑ e2      → e4

↓ e6      ← e8

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and 182nd St. - Existing PM

Synchro 5. Demo Version: C:\Program Files (x86)\Trafficware\Tonnance Study Existing PM.syn

File Transfer Options Optimize Help

182nd St. & Prairie Ave

Options >

Controller Type:  
Actuated-Coord

Cycle Length: 120.0

Actuated C.L.: 120.0  
Natural C.L.: 90.0

Max v/c Ratio: 1.01  
Int. Delay: 33.4  
Int. LOS: C  
ICU: 86.6%  
ICU LOS: D

Lock Timings

Offset Settings  
Offset: 48.0

Reference Style:  
Begin of Green

Reference Phase:  
2+6 - NBTL St

Master Intersectn.

TIMING WINDOW	EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR		PED	HOLD
	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓				
Lanes and Sharing (#RL)																										
Traffic Volume (vph)	162	407	95	237	466	73	107	1304	167	72	1076	119														
Turn Type	pm+pt		pm+pt		pm+pt		Perim		pm+pt		Perim															
Protected Phases	7	4		3	8		5	2		1	6															
Permitted Phases	4			8			2			6		6														
Detector Phases	7	4		3	8		5	2		2	1	6	6													
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0													
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	20.5		8.5	20.5	8.5	20.5	20.5												
Total Split (s)	20.5	20.5		29.0	29.0		9.0	60.8		60.8	9.7	61.5	61.5													
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5													
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0													
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lead	Lag	Lag													
Allow Lead/Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes													
Recall Mode	None	None		None	None		None	Coord		Coord	None	Coord	Coord													
Actuated Effct. Green (s)	32.4	18.4		41.5	23.6		66.6	62.6		62.6	67.1	61.4	61.4													
Actuated g/C Ratio	0.27	0.15		0.35	0.20		0.56	0.52		0.52	0.56	0.51	0.51													
Volume to Capacity Ratio	0.64	1.01		0.74	0.95		0.61	0.77		0.20	0.52	0.65	0.15													
Control Delay (s)	28.9	79.9		29.6	46.7		16.7	24.8		4.3	27.6	26.3	9.4													
Level of Service	C	E		C	D		B	C		A	C	C	A													
Approach Delay (s)	67.4				41.5		22.1				24.8															
Approach LOS	E				D		C				C															
Queue Length 50th (ft)	96	213		148	223		39	476		11	43	323	8													
Queue Length 95th (ft)	150	#364		217	292		#79	596		52	m67	m408	m39													
Queueing Penalty	0	0		0	0		0	0		0	0	0	0													
Stops (vph)	124	551		175	498		51	1030		22	51	634	52													
Fuel Used (g/hr)	4	19		7	18		1	24		1	2	34	3													
Dilemma Vehicles (#/hr)	0	19		0	22		0	54		0	0	88	0													

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and Artesia Ave. - Existing {PM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM.syn

File Transfer Options Optimize Help

Artesia Blvd & Prairie Ave

Options >		TIMING WINDOW													
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Controller Type:		Lanes and Sharing (#RL)													
Actuated-Coordination		Traffic Volume (vph)													
Cycle Length: 120.0		Turn Type													
Actuated C.L.: 120.0		Protected Phases													
Natural C.L.: 90.0		Permitted Phases													
Max v/c Ratio: 1.79		Detector Phases													
Int. Delay: 55.6		Minimum Initial (s)													
Int. LOS: E		Minimum Split (s)													
ICU: 88.5%		Total Split (s)													
ICU LOS: D		Yellow Time (s)													
Lock Timings		All-Red Time (s)													
Offset Settings		Lead/Lag													
Offset: 48.0		Allow Lead/Lag Optimize?													
Reference Style:		Recall Mode													
Begin of Green		Actuated Effct. Green (s)													
Reference Phase:		Actuated g/C Ratio													
2+6 - NBT SB		Volume to Capacity Ratio													
Master Intersctn.		Control Delay (s)													
		Level of Service													
		Approach Delay (s)													
		Approach LOS													
		Queue Length 50th (ft)													
		Queue Length 95th (ft)													
		Queueing Penalty													
		Stops (vph)													
		Fuel Used (g/hr)													
		Dilemma Vehicles (#/hr)													

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and Redondon Beach Blvd. - Existing PM

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM.sys6

File Transfer Options Optimize Help

Redondo Beach Blvd. & Prairie Ave

Options >

Controller Type:  
Actuated-Coordin

Cycle Length: 120.0

Actuated C.L.: 120.0  
Natural C.L.: 100.0

Max v/c Ratio: 1.15  
Int. LOS: E  
ICU: 93.6%  
ICU LOS: E

Lock Timings

Offset Settings  
Offset: 48.0

Reference Style:  
Begin of Green

Reference Phase:  
2+6 - NBT SB

Master Intersectn.

TIMING WINDOW	→			←			→			←			PED	HOLD
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lanes and Sharing (#RL)	↑	↑↑		↑↑	↑↑		↑↑	↑↑		↑↑	↑↑			
Traffic Volume (vph)	213	902	199	149	837	249	323	905	341	149	760	217		
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm		
Protected Phases	7	4		3	8		5	2		1	6			
Permitted Phases			4			8			2			6		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)	8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5		
Total Split (s)	20.0	31.0	31.0	21.0	32.0	32.0	25.0	43.6	43.6	24.4	43.0	43.0		
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag		
Allow Lead/Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	None	Coord	Coord	None	Coord	Coord		
Actuated Effct. Green (s)	16.0	28.9	28.9	15.1	28.0	28.0	21.0	43.9	43.9	16.1	39.0	39.0		
Actuated g/C Ratio	0.13	0.24	0.24	0.13	0.23	0.23	0.18	0.37	0.37	0.13	0.33	0.33		
Volume to Capacity Ratio	0.98	1.15	0.42	0.73	1.10	0.49	1.13	0.76	0.46	0.68	0.72	0.35		
Control Delay (s)	91.9	119.0	9.3	50.4	97.5	6.9	110.8	58.5	26.0	49.0	36.0	3.8		
Level of Service	F	F	A	D	F	A	F	E	C	D	D	A		
Approach Delay (s)	98.0			73.5			62.2			31.5				
Approach LOS	F			E			E			C				
Queue Length 50th (ft)	182	~488	23	121	~421	16	~324	377	149	121	295	0		
Queue Length 95th (ft)	#345	#625	93	195	#552	91 m#481	m461	m247	188	370	56			
Queueing Penalty	0	0	0	0	0	0	0	0	0	0	0	0		
Stops (vph)	250	1295	41	141	1087	40	439	773	258	139	652	21		
Fuel Used (g/hr)	9	47	3	7	49	7	16	32	9	3	14	1		
Dilemma Vehicles (#/hr)	0	31	0	0	30	0	0	111	0	0	32	0		

Number of lanes and sharing. (0 to 5, L, R)

# EXISTING CONDITION - HCM - AM PEAK w/ Project

Artesia Blvd. and Hawthorne Blvd. - AM Peak w/ Project

Synchro 5. Demo Version, C:\Program Files (x86)\Trafficware\Torrance Study Existing AM w Proj.syn

File Transfer Options Optimize Help

Artesia Blvd & Hawthorne Blvd.

Options >

Controller Type: Actuated-Coordin

Cycle Length: 90.0

Actuated C.L.: 90.0

Natural C.L.: 70.0

Max v/c Ratio: 0.82

Int. Delay: 24.6

Int. LOS: C

ICU: 75.8%

ICU LOS: C

Lock Timings

Offset Settings

Offset: 48.0

Reference Style: Begin of Green

Reference Phase: 2+6 - NBT SB

Master Intersctn.

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	0	910	184	190	632	58	178	1941	197	82	1499	6		
Traffic Volume (vph)														
Turn Type			Perm	Prot			Prot			Prot				
Protected Phases			4	3	8		5	2		1	6			
Permitted Phases			4											
Detector Phases			4	4	3	8	5	2		1	6			
Minimum Initial (s)			4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0			
Minimum Split (s)			20.5	20.5	8.5	20.5	8.5	20.5		8.5	20.5			
Total Split (s)			26.0	26.0	12.0	38.0	13.8	43.5		8.5	38.2			
Yellow Time (s)			3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5			
All-Red Time (s)			1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0			
Lead/Lag			Lag	Lag	Lead		Lead	Lag		Lead	Lag			
Allow Lead/Lag Optimize?			Yes	Yes	Yes		Yes	Yes		Yes	Yes			
Recall Mode			None	None	None	None	None	Coord		None	Coord			
Actuated Effect Green (s)			21.3	21.3	8.0	33.4	9.4	41.8		4.5	35.2			
Actuated g/C Ratio			0.24	0.24	0.09	0.37	0.10	0.46		0.05	0.39			
Volume to Capacity Ratio			0.82	0.42	0.68	0.58	0.54	0.79		0.52	0.65			
Control Delay (s)			32.6	11.9	42.5	22.4	38.4	20.9		42.0	22.8			
Level of Service			C	B	D	C	D	C		D	C			
Approach Delay (s)			29.1		26.7		22.2			23.8				
Approach LOS			C		C		C			C				
Queue Length 50th (ft)			193	34	59	171	54	325		25	220			
Queue Length 95th (ft)			243	95	103	228	88	376		50	261			
Queueing Penalty			0	0	0	0	0	0		0	0			
Stops (vph)			830	64	180	522	163	1719		78	1180			
Fuel Used (g/hr)			17	2	9	28	6	57		2	35			
Dilemma Vehicles (#/hr)			51	0	0	38	0	119		0	84			

Number of lanes and sharing. (0 to 5, L, R)

Windows Taskbar: Windows, Internet Explorer, File Explorer, Microsoft Word, Synchro 5, Firefox, VLC, etc.

# Artesia Blvd. and Yukon Ave. - AM Peak w/ Project

Synchro 5. Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AM w Proj.sy6

File Transfer Options Optimize Help

Artesia Blvd & Yukon Ave.

Options >

Controller Type:  
Actuated-Coordination

Cycle Length: 60.0

Actuated C.L.: 60.0  
Natural C.L.: 50.0

Max v/c Ratio: 0.50

Int. Delay: 5.7  
Int. LOS: A

ICU: 55.4%  
ICU LOS: A

Lock Timings

Offset Settings  
Offset: 22.0

Reference Style:  
Begin of Green

Reference Phase:  
4+8 - EBTL W

Master Intersctn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	21	734	26	42	1211	34	70	45	26	95	55	42		
Traffic Volume (vph)														
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm				
Protected Phases		4			8			2			6			6
Permitted Phases	4		4	8		8	2			6				
Detector Phases	4	4	4	8	8	8	2	2		6	6			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0			
Minimum Split (s)	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5		20.5	20.5			
Total Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	22.0	22.0		22.0	22.0			
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5			
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0			
Lead/Lag														
Allow Lead/Lag Optimize?														
Recall Mode	Coord	Coord	Coord	Coord	Coord	Coord	None	None		None	None			
Actuated Effect. Green (s)	44.7	44.7	44.7	44.7	44.7	44.7	10.1	10.1		10.1	10.1			
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75	0.17	0.17		0.17	0.17			
Volume to Capacity Ratio	0.12	0.30	0.02	0.11	0.50	0.03	0.35	0.24		0.46	0.32			
Control Delay (s)	3.5	2.7	1.2	4.1	4.7	1.6	21.0	14.3		21.6	13.0			
Level of Service	A	A	A	A	A	A	C	B		C	B			
Approach Delay (s)		2.6			4.6			17.6			17.3			
Approach LOS		A			A			B			B			
Queue Length 50th (ft)	2	35	0	4	93	0	25	15		34	19			
Queue Length 95th (ft)	m4	m75	m0	17	173	8	53	43		69	51			
Queuing Penalty	0	0	0	0	0	0	0	0		0	0			
Stops (vph)	5	142	3	16	488	5	60	41		79	51			
Fuel Used (g/hr)	1	32	1	0	13	0	2	2		2	2			
Dilemma Vehicles (#/hr)	0	69	0	0	86	0	0	0		0	0			

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and 182nd St. - AM Peak w/ Project

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing AM w Proj

File Transfer Options Optimize Help

182nd St. & Prairie Ave

**Options >**

Controller Type:  
Actuated-Coord

Cycle Length: 120.0

Actuated C.L.: 120.0  
Natural C.L.: 80.0

Max v/c Ratio: 0.76  
Int. Delay: 29.1  
Int. LOS: C  
ICU: 71.5%  
ICU LOS: C

Lock Timings  
Offset Settings  
Offset: 48.0

Reference Style:  
Begin of Green

Reference Phase:  
2x6 - NBTL ST  
Master Interschn.

TIMING WINDOW	EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR		PED	HOLD		
	Lanes and Sharing (#RL)	Traffic Volume (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phases	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Yellow Time (s)	All-Red Time (s)	Lead/Lag	Allow Lead/Lag Optimize?	Recall Mode	Actuated Effct. Green (s)	Actuated g/C Ratio	Volume to Capacity Ratio	Control Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Queue Length 50th (ft)	Queue Length 95th (ft)	Queueing Penalty	Stops (vph)	Fuel Used (g/hr)	Dilemma Vehicles (#/hr)	
Lanes and Sharing (#RL)	173	205	56	282	365	78	44	1095	76	47	1211	97																
Traffic Volume (vph)																												
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm																
Protected Phases	7	4		3	8		5	2		1	6																	
Permitted Phases	4			8			2		2	6																		
Detector Phases	7	4		3	8		5	2	2	1	6																	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0																	
Minimum Split (s)	8.5	20.5		8.5	20.5		8.5	20.5	20.5	8.5	20.5																	
Total Split (s)	20.5	20.5		29.0	29.0		9.0	60.8	60.8	9.7	61.5																	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5																	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0																	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag																	
Allow Lead/Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes																	
Recall Mode	None	None		None	None		None	Coord	Coord	None	Coord																	
Actuated Effct. Green (s)	28.9	14.3		40.1	21.5		68.1	64.1	64.1	69.2	64.7																	
Actuated g/C Ratio	0.24	0.12		0.33	0.18		0.57	0.53	0.53	0.58	0.54																	
Volume to Capacity Ratio	0.62	0.66		0.75	0.76		0.31	0.63	0.09	0.26	0.69																	
Control Delay (s)	29.7	45.9		31.5	44.6		11.8	21.5	3.7	19.7	30.0																	
Level of Service	C	D		C	D		B	C	A	B	C																	
Approach Delay (s)		39.5			39.5			20.0			28.4																	
Approach LOS		D			D			B			C																	
Queue Length 50th (ft)	106	102		187	180		15	348	0	25	366																	
Queue Length 95th (ft)	159	147		261	234		35	456	27	m38	m454																	
Queueing Penalty	0	0		0	0		0	0	0	0	0																	
Stops (vph)	137	222		218	393		19	762	9	29	780																	
Fuel Used (g/hr)	4	7		8	14		1	18	1	1	40																	
Dilemma Vehicles (#/hr)	0	11		0	18		0	46	0	0	100																	

Number of lanes and sharing. (0 to 5, L, R)

Prairie Ave. and Artesia Ave. - AM Peak w/ Project

Synchro 5, Demo Version, C:\Program Files (x86)\Trafficware\Torrance Study Existing AM w Proj.syn

File Transfer Options Optimize Help

Artesia Blvd & Prairie Ave

Options >

Controller Type:  
Actuated-Coord

Cycle Length: 120.0

Actuated C.L.: 120.0  
Natural C.L.: 80.0

Max v/c Ratio: 0.92

Int. Delay: 44.9  
Int. LOS: D

ICU: 82.7%  
ICU LOS: D

Lock Timings

Offset Settings  
Offset: 48.0

Reference Style:  
Begin of Green

Reference Phase:  
2+6 - NBT SB

Master Intersctn.

TIMING WINDOW	EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR		PED	HOLD	
	Lanes and Sharing (#RL)	Traffic Volume (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phases	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Yellow Time (s)	All-Red Time (s)	Lead/Lag	Allow Lead/Lag Optimize?	Recall Mode	Actuated Effect Green (s)	Actuated g/C Ratio	Volume to Capacity Ratio	Control Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Queue Length 50th (ft)	Queue Length 95th (ft)	Queueing Penalty			Stops (vph)
Lanes and Sharing (#RL)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Traffic Volume (vph)	39	1085	47	260	747	121	93	978	503	248	1012	46															
Turn Type	Prot			Prot		Perm	Prot		Perm		Perm		Perm														
Protected Phases	7	4		3	8		5	2		1	6																
Permitted Phases						8			2			6															
Detector Phases	7	4		3	8	8	5	2	2	1	6	6															
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0															
Minimum Split (s)	8.5	20.5		8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5															
Total Split (s)	9.1	36.0		16.0	42.9	42.9	13.9	42.0	42.0	26.0	54.1	54.1															
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5															
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0															
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag															
Allow Lead/Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes															
Recall Mode	None	None		None	None	None	None	Coord	Coord	None	Coord	Coord															
Actuated Effect Green (s)	5.2	31.8		12.0	40.5	40.5	9.6	39.2	39.2	21.1	50.7	50.7															
Actuated g/C Ratio	0.04	0.27		0.10	0.34	0.34	0.08	0.33	0.33	0.18	0.42	0.42															
Volume to Capacity Ratio	0.56	0.92		0.83	0.68	0.21	0.72	0.64	0.85	0.87	0.74	0.07															
Control Delay (s)	66.6	46.7		60.4	32.0	5.9	49.6	45.6	43.4	54.6	50.6	24.7															
Level of Service	E	D		F	C	A	D	D	D	D	D	C															
Approach Delay (s)	47.3			35.7			45.1			50.4																	
Approach LOS	D			D			D			D																	
Queue Length 50th (ft)	33	337		115	250	7	79	298	324	221	459	9															
Queue Length 95th (ft)	#84	#421		#188	308	47m	#148	343	#500	#354	535	m3															
Queueing Penalty	0	0		0	0	0	0	0	0	0	0	0															
Stops (vph)	39	1071		258	539	27	88	882	357	252	800	50															
Fuel Used (g/hr)	2	54		16	41	5	4	38	18	9	34	1															
Dilemma Vehicles (#/hr)	0	46		0	37	0	0	23	0	0	76	0															

Number of lanes and sharing. (0 to 5, L, R)



# EXISTING CONDITION - HCM - PM PEAK w/ Project

Artesia Blvd. and Hawthorne Blvd. - PM Peak w/ Project

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM w Proj

File Transfer Options Optimize Help

Artesia Blvd & Hawthorne Blvd.

Options >

Controller Type: Actuated-Coordin

Cycle Length: 90.0  
 Actuated C.L.: 90.0  
 Natural C.L.: 80.0  
 Max v/c Ratio: 1.28  
 Int. Delay: 33.0  
 Int. LOS: C  
 ICU: 82.9%  
 ICU LOS: D

Lock Timings

Offset Settings  
 Offset: 48.0

Reference Style: Begin of Green

Reference Phase: 2+6 - NBT SB

Master Intersctn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)	↑↑↑	↑	↑	↑↑	↑↑	↑↑	↑↑	↑↑↑	↑↑	↑↑	↑↑	↑↑		
Traffic Volume (vph)	0	851	327	360	792	72	218	2006	304	111	1860	23		
Turn Type		Perm	Prot				Prot							
Protected Phases		4		3	8		5	2		1	6			
Permitted Phases			4											
Detector Phases		4	4	3	8		5	2		1	6			
Minimum Initial (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0			
Minimum Split (s)		20.5	20.5	8.5	20.5		8.5	20.5		8.5	20.5			
Total Split (s)		26.0	26.0	12.0	38.0		13.8	43.5		8.5	38.2			
Yellow Time (s)		3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5			
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0			
Lead/Lag		Lag	Lag	Lead			Lead	Lag		Lead	Lag			
Allow Lead/Lag Optimize?		Yes	Yes	Yes			Yes	Yes		Yes	Yes			
Recall Mode		None	None	None	None		Coord			None	Coord			
Actuated Effct. Green (s)		21.3	21.3	8.0	33.4		9.6	40.1		4.5	35.0			
Actuated g/C Ratio		0.24	0.24	0.09	0.37		0.11	0.45		0.05	0.39			
Volume to Capacity Ratio		0.77	0.77	1.28	0.72		0.65	0.89		0.70	0.82			
Control Delay (s)		32.1	24.4	151.6	24.2		38.8	24.2		52.4	25.1			
Level of Service		C	C	F	C		D	C		D	C			
Approach Delay (s)		29.9			61.6			25.5			26.6			
Approach LOS		C			E			C			C			
Queue Length 50th (ft)		178	127	~146	231		67	366		35	302			
Queue Length 95th (ft)		225	#256	#236	302		105	423		#77	352			
Queuing Penalty		0	0	0	0		0	0		0	0			
Stops (vph)		765	211	722	705		203	1987		110	1622			
Fuel Used (g/hr)		16	5	29	36		7	65		4	47			
Dilemma Vehicles (#/hr)		47	0	0	48		0	127		0	104			

Number of lanes and sharing. (0 to 5, L, R)

Windows: Windows Explorer, Internet Explorer, Synchro 5, etc.

# Artesia Blvd. and Yukon Ave. - PM Peak w/ Project

Synchro 5. Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM w Proj.s

File Transfer Options Optimize Help

Artesia Blvd & Yukon Ave.

Options >

Controller Type:  
Actuated-Coord

Cycle Length: 60.0

Actuated C.L.: 60.0  
Natural C.L.: 80.0

Max v/c Ratio: 0.68

Int. Delay: 9.4  
Int. LOS: A

ICU: 77.7%  
ICU LOS: C

Lock Timings

Offset Settings  
Offset: 22.0

Reference Style:  
Begin of Green

Reference Phase:  
4+8 - EBTL w

Master Interschn.

TIMING WINDOW	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (BRL)	↑	↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↑	↑		
Traffic Volume (vph)	70	1439	76	100	790	90	40	115	64	72	100	35		
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm				
Protected Phases			4			8			2			6		
Permitted Phases	4		4	8		8	2			6				
Detector Phases	4	4	4	8	8	8	2	2		6	6			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0			
Minimum Split (s)	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5		20.5	20.5			
Total Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	22.0	22.0		22.0	22.0			
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5			
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0			
Lead/Lag														
Allow Lead/Lag Optimize?														
Recall Mode	Coord	Coord	Coord	Coord	Coord	Coord	None	None		None	None			
Actuated Effct. Green (s)	43.7	43.7	43.7	43.7	43.7	43.7	11.1	11.1		11.1	11.1			
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.19	0.19		0.19	0.19			
Volume to Capacity Ratio	0.20	0.61	0.07	0.68	0.33	0.08	0.19	0.56		0.38	0.41			
Control Delay (s)	3.2	9.0	1.1	37.0	4.4	1.3	19.1	18.3		20.3	16.1			
Level of Service	A	A	A	D	A	A	B	B		C	B			
Approach Delay (s)			8.3			7.4		18.5			17.5			
Approach LOS			A			A		B			B			
Queue Length 50th (R)	10	233	1	20	54	0	13	56		25	37			
Queue Length 95th (R)	m17	m281	m3	#118	104	14	33	101		54	74			
Queuing Penalty	0	0	0	0	0	0	0	0		0	0			
Stops (vph)	15	541	6	94	282	9	34	131		61	87			
Fuel Used (g/hr)	3	67	3	2	8	1	1	4		1	2			
Dilemma Vehicles (#/hr)	0	130	0	0	57	0	0	0		0	0			

Number of lanes and sharing: (0 to 5, L, R)

# Prairie Ave. and 182nd St. - PM Peak w/ Project

Synchro 5. Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM w Proj.s

File Transfer Options Optimize Help

182nd St. & Prairie Ave

Options >

Controller Type:  
Actuated-Coordin

Cycle Length: 120.0

Actuated C.L.: 120.0

Natural C.L.: 90.0

Max v/c Ratio: 1.00

Int. Delay: 33.5

Int. LOS: C

ICU: 86.8%

ICU LOS: D

Lock Timings

Offset Settings  
Offset: 48.0

Reference Style:  
Begin of Green

Reference Phase:  
2+6 - NBTL St

Master Intersctn.

TIMING WINDOW	EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR		PED	HOLD	
	Lanes and Sharing (#RL)	Traffic Volume (vph)	Turn Type	Protected Phases	Permitted Phases	Detector Phases	Minimum Initial (s)	Minimum Split (s)	Total Split (s)	Yellow Time (s)	All-Red Time (s)	Lead/Lag	Allow Lead/Lag Optimize?	Recall Mode	Actuated Effct. Green (s)	Actuated g/C Ratio	Volume to Capacity Ratio	Control Delay (s)	Level of Service	Approach Delay (s)	Approach LOS	Queue Length 50th (R)	Queue Length 95th (R)	Queuing Penalty			Stops (vph)
Lanes and Sharing (#RL)	163	407	95	237	466	76	107	1308	167	73	1080	121															
Traffic Volume (vph)	pm+pt			pm+pt			pm+pt			Perm	pm+pt		Perm														
Turn Type	7	4		3	8		5	2		1	6																
Protected Phases	4			8			2			2	6																
Permitted Phases	7	4		3	8		5	2		2	1	6															
Detector Phases	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0															
Minimum Initial (s)	8.5	20.5		8.5	20.5		8.5	20.5		8.5	20.5	20.5															
Minimum Split (s)	20.5	20.5		29.0	29.0		9.0	60.8		60.8	9.7	61.5															
Total Split (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5															
Yellow Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0															
All-Red Time (s)	Lead	Lag		Lead	Lag		Lead	Lag		Lag	Lag	Lag															
Lead/Lag	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes															
Allow Lead/Lag Optimize?	None	None		None	None		None	Coord		Coord	None	Coord															
Recall Mode	32.5	18.5		41.6	23.6		66.6	62.5		62.5	67.0	61.3															
Actuated Effct. Green (s)	0.27	0.15		0.35	0.20		0.56	0.52		0.52	0.56	0.51															
Actuated g/C Ratio	0.64	1.00		0.74	0.85		0.61	0.77		0.20	0.52	0.65															
Volume to Capacity Ratio	28.9	79.1		29.6	46.8		17.0	25.2		4.3	27.2	26.6															
Control Delay (s)	C	E		C	D		B	C		A	C	C															
Level of Service	66.8			41.6			22.4				25.0																
Approach Delay (s)	E			D			C				C																
Approach LOS	96	213		148	225		39	480		12	43	328															
Queue Length 50th (R)	152	#364		217	293		#80	601		52	m66	m411															
Queue Length 95th (R)	0	0		0	0		0	0		0	0	0															
Queuing Penalty	125	547		175	500		53	1036		22	52	646															
Stops (vph)	4	18		6	18		1	24		1	2	34															
Fuel Used (g/hr)	0	19		0	23		0	54		0	0	87															
Dilemma Vehicles (#/hr)																											

Number of lanes and sharing. (0 to 5, L, R)

# Prairie Ave. and Artesia Ave. - PM Peak w/ Project

Synchro 5. Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM w Proj...

File Transfer Options Optimize Help

Artesia Blvd & Prairie Ave

Options >

Controller Type: Actuated-Coordin

Cycle Length: 120.0

Actuated C.L.: 120.0

Natural C.L.: 90.0

Max v/c Ratio: 1.79

Int. Delay: 56.1

Int. LOS: E

ICU: 88.6%

ICU LOS: D

Lock Timings

Offset Settings

Offset: 48.0

Reference Style: Begin of Green

Reference Phase: 2x6 - NBT SB

Master Intersctn.

TIMING WINDOW	EBL			WBL			NBL			SBL			PED	HOLD
	EBT	EBR		WBT	WBR		NBT	NBR		SBT	SBR			
Lanes and Sharing (#RL)	↑↑↑	↑↑↑		↑↑	↑↑		↑↑↑	↑↑↑		↑↑	↑↑			
Traffic Volume (vph)	123	1043	139	283	1078	181	72	1162	317	184	947	63		
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm		
Protected Phases	7	4		3	8		5	2		1	6			
Permitted Phases					8			2				6		
Detector Phases	7	4		3	8	8	5	2	2	1	6	6		
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)	8.5	20.5		8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5		
Total Split (s)	9.1	36.0		16.0	42.9	42.9	13.9	42.0	42.0	26.0	54.1	54.1		
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag		
Allow Lead/Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None	None	None	Coord	Coord	None	Coord	Coord		
Actuated Effct. Green (s)	5.2	32.0		12.0	38.9	38.9	9.2	41.5	41.5	18.5	53.0	53.0		
Actuated g/C Ratio	0.04	0.27		0.10	0.32	0.32	0.08	0.35	0.35	0.15	0.44	0.44		
Volume to Capacity Ratio	1.79	0.95		0.90	1.02	0.32	0.57	0.72	0.50	0.73	0.66	0.09		
Control Delay (s)	270.5	51.9		69.5	64.3	7.2	36.9	48.1	27.3	42.5	55.2	24.0		
Level of Service	F	D		E	E	A	D	D	C	D	E	C		
Approach Delay (s)		72.5			58.5			43.3			51.6			
Approach LOS		E			E			D			D			
Queue Length 50th (ft)	~155	355		125	~508	22	60	369	166	159	430	0		
Queue Length 95th (ft)	#284	#453		#209	#643	75	m73	418	m258	m223	505	m5		
Queueing Penalty	0	0		0	0	0	0	0	0	0	0	0		
Stops (vph)	308	1152		294	1172	48	68	1093	180	180	905	75		
Fuel Used (g/hr)	13	58		19	70	8	3	46	10	6	34	2		
Dilemma Vehicles (#/hr)	0	47		0	40	0	0	22	0	0	79	0		

Number of lanes and sharing. (0 to 5, L, R)

Prairie Ave. and Redondon Beach Blvd. - PM Peak w/ Project

Synchro 5, Demo Version: C:\Program Files (x86)\Trafficware\Torrance Study Existing PM w Proj.sv

File Transfer Options Optimize Help

Redondo Beach Blvd. & Prairie Ave

Options >

Controller Type: Actuated-Coordin

Cycle Length: 120.0

Actuated C.L.: 120.0

Natural C.L.: 100.0

Max v/c Ratio: 1.15

Int. Delay: 67.3

Int. LOS: E

ICU: 93.7%

ICU LOS: E

Lock Timings:

Offset Settings

Offset: 48.0

Reference Style:

Begin of Green

Reference Phase: 2+6 - NBT SB

Master Intersectn.

TIMING WINDOW		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	PED	HOLD
Lanes and Sharing (#RL)		1	1	1	1	1	1	1	1	1	1	1	1		
Traffic Volume (vph)		213	902	202	150	837	249	323	910	343	149	764	217		
Turn Type		Prot	Perm	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Perm		
Protected Phases		7	4		3	8		5	2		1	6			
Permitted Phases				4		8				2			6		
Detector Phases		7	4	4	3	8	8	5	2	2	1	6	6		
Minimum Initial (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Minimum Split (s)		8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5	8.5	20.5	20.5		
Total Split (s)		20.0	31.0	31.0	21.0	32.0	32.0	25.0	43.6	43.6	24.4	43.0	43.0		
Yellow Time (s)		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Lead/Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag		
Allow Lead/Lag Optimize?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode		None	None	None	None	None	None	None	Coord	Coord	None	Coord	Coord		
Actuated Effct. Green (s)		16.0	28.9	28.9	15.1	28.0	28.0	21.0	43.9	43.9	16.1	39.0	39.0		
Actuated g/C Ratio		0.13	0.24	0.24	0.13	0.23	0.23	0.18	0.37	0.37	0.13	0.33	0.33		
Volume to Capacity Ratio		0.98	1.15	0.42	0.73	1.10	0.49	1.13	0.76	0.46	0.68	0.72	0.35		
Control Delay (s)		91.9	119.5	9.3	50.9	97.5	6.9	111.1	58.5	26.2	49.0	36.1	3.8		
Level of Service		F	F	A	D	F	A	F	E	C	D	D	A		
Approach Delay (s)		98.1				73.6			62.2				31.6		
Approach LOS		F				E			E				C		
Queue Length 50th (ft)		182	~490	23	121	~421	16	~323	380	150	121	297	0		
Queue Length 95th (ft)		#345	#625	94	196	#552	91m	#483	m463	m248	188	372	56		
Queueing Penalty		0	0	0	0	0	0	0	0	0	0	0	0		
Stops (vph)		250	1298	42	142	1087	40	440	776	263	139	656	21		
Fuel Used (g/hr)		9	47	4	7	49	7	16	32	10	3	14	1		
Dilemma Vehicles (#/hr)		0	31	0	0	30	0	0	111	0	0	32	0		

Number of lanes and sharing. (0 to 5, L, R)