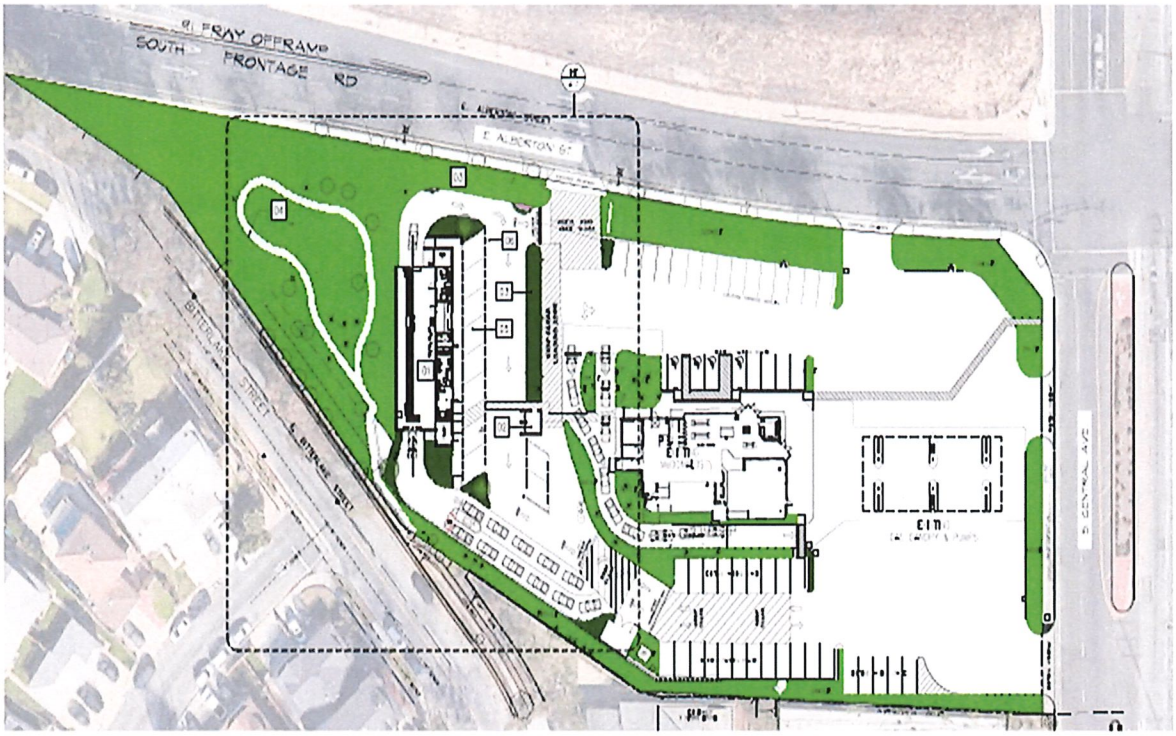
CARSON EXPRESS CARWASH PROJECT
CITY OF CARSON, CALIFORNIA

REVISED TRAFFIC AND CIRCULATION STUDY



February 10, 2024 **ATE Project #24051**

Prepared for:

Max Netty
Soundview Investment Partners
1875 Century Park East, #600
Los Angeles, CA 90067

APPROVED
2/10/25
JCM

ASSOCIATED TRANSPORTATION ENGINEERS
100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110-1686 • (805) 687-4418 • FAX (805) 682-8509

ASSOCIATED TRANSPORTATION ENGINEERS

100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110 • (805)687-4418 • FAX (805)682-8509 • main@atesb.com

Since 1978

Richard L. Pool, P.E.
Scott A. Schell

February 10, 2025 24051R03

Max Netty
Soundview Investment Partners
1875 Century Park East, #600
Los Angeles, CA 90067

REVISED TRAFFIC AND CIRCULATION STUDY FOR THE CARSON EXPRESS CARWASH PROJECT - CITY OF CARSON

Associated Transportation Engineers (ATE) has prepared the following revised traffic and circulation study for the Carson Express Carwash Project, proposed in the City of Carson. The study address comments provided by the City of Carson staff on the initial traffic and circulation study prepared for the Carson Express Carwash. The revised traffic and circulation study evaluates existing and future traffic operations in the Project study-area and reviews the Project's consistency with the policies outlined in the City's transportation assessment guidelines.

We appreciate the opportunity to assist you with this Project.

Associated Transportation Engineers

Richard L. Pool, P.E.
President

CONTENTS

TABLES

FIGURES

INTRODUCTION

The following study contains an analysis of the potential traffic and circulation impacts associated with the Carson Express Carwash Project (the "Project"), located in the City of Carson. Figure 1 illustrates the location of the Project site in the City of Carson. The study provides information regarding existing and future traffic conditions within the Project study-area and recommends improvements where necessary.

PROJECT DESCRIPTION

The Project application is for the construction of a 3,146 square feet automated carwash facility to create a new automated tunnel carwash on-site with the existing 4,709 square foot Chevron/McDonald's gas station convenience market with 12 fueling positions and McDonalds with a drive-through window. Carwash customers will be able to purchase a carwash at the carwash kiosk. The Project site is located at 17543 Central Avenue in the City of Carson. Figure 2 illustrates the Project site plan. As shown, access to the site will be provided via driveway connections to Central Avenue and Albertoni Street.

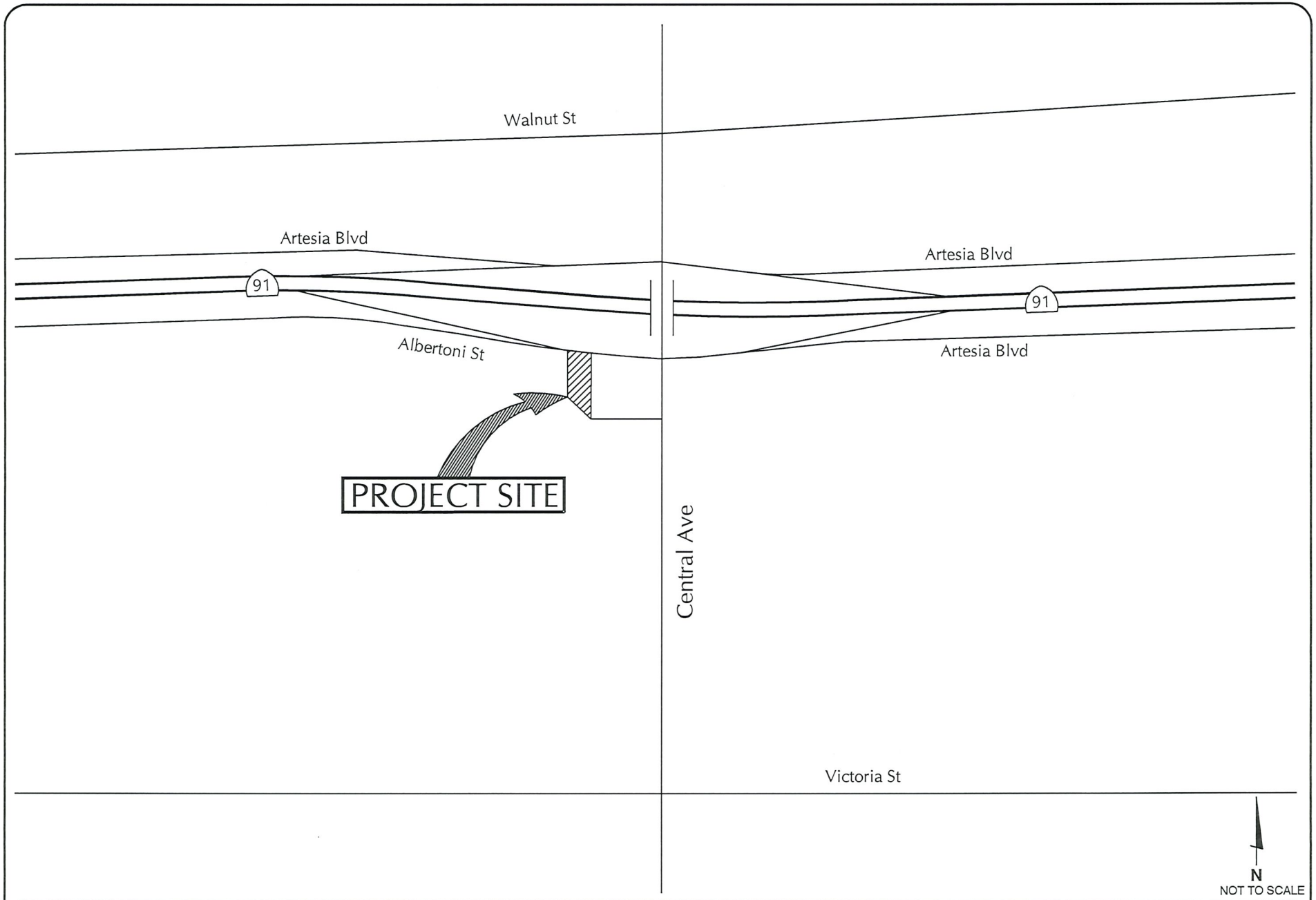
TRAFFIC SCENARIOS AND SCOPE OF WORK

The traffic study assesses potential traffic impacts for the following scenarios.

Traffic Scenarios
1) 2024 Conditions
2) 2024 + Project Conditions
3) 2027 (Near Term) Conditions
4) 2027 + Project

The traffic analysis evaluates the weekday AM and PM peak hour periods for 6 study-area roadway segments and 3 study-area intersections. The 2027 + Project scenario provides a cumulative analysis assuming a 0.5% growth rate and development of approved and pending projects expected by that time.

The scope of work and traffic assessment methodologies presented in this study were developed based on the requirements of the City of Carson. A Memorandum of Understanding (MOU) outlining the traffic study scope and methodologies was provided to City staff. A copy of the MOU is contained in the Technical Appendix for reference.

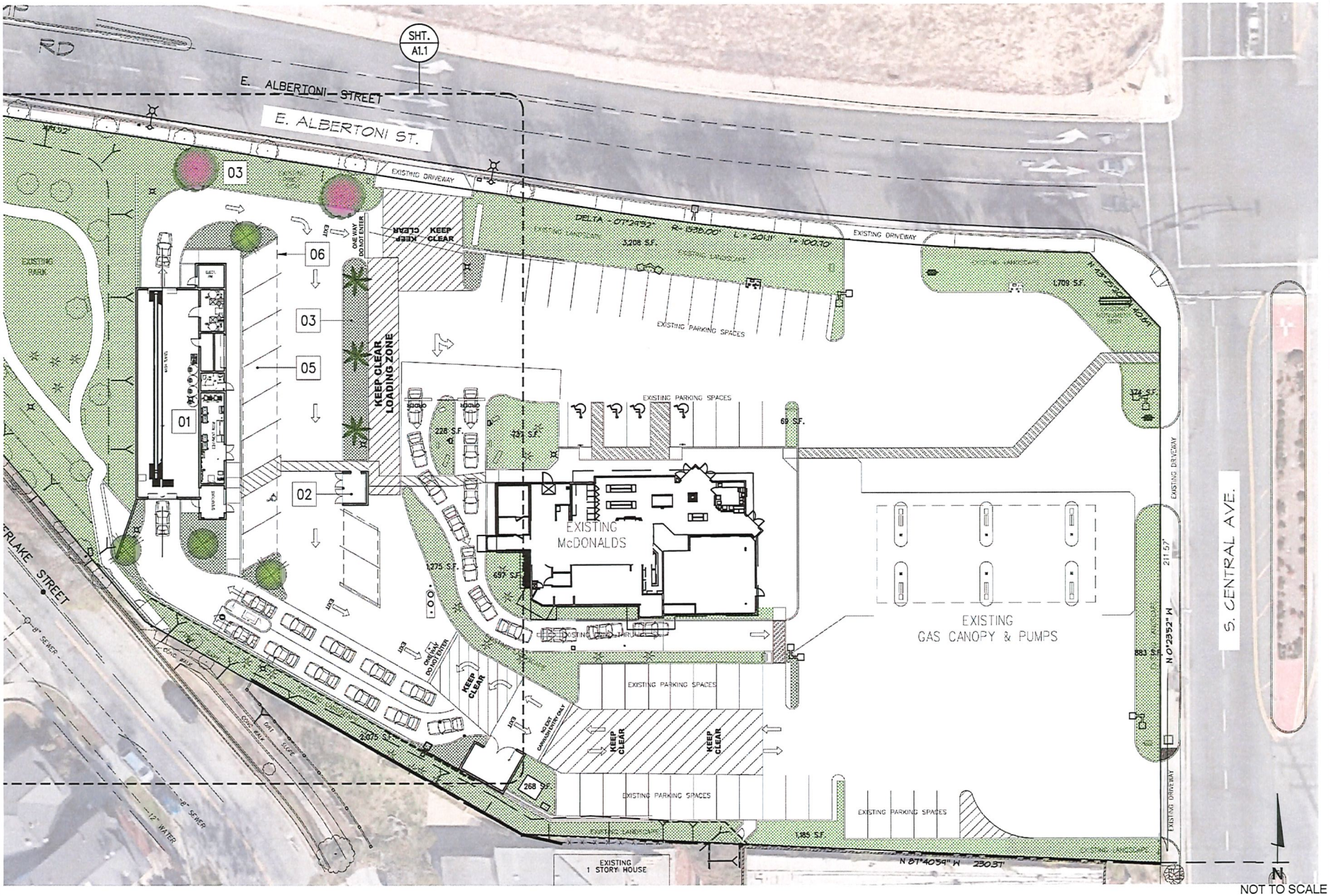


ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT SITE LOCATION/EXISTING STREET NETWORK

FIGURE 1

JH - ATE#24051



ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT SITE PLAN

FIGURE 2

JH - ATE#24051

EXISTING CONDITIONS

Street Network

The Project site is served by a network of highways, arterial roads and collector streets as illustrated in Figure 1. The following text provides a brief description of the major components of the study-area street network.

State Route 91, located north of the Project site is a major east-west route which passes through southern Los Angeles County, northern Orange County and western Riverside County. In Los Angeles County, State Route 91 operates as both an arterial highway and a controlled access freeway. This is a fully urbanized area, and State Route 91 is a part of the urban grid of arterial highways and freeways. State Route 91 is the principal route between the City of Carson and the adjacent cities of Redondo Beach and Torrance to the west, Compton, Lakewood, Norwalk, Fullerton and Anaheim, to the east. Primary access between the Project site and State Route 91 is provided via the Central Avenue interchange. The ramp intersections at the interchange are signalized.

Central Avenue, located along the Project's east frontage, is a 4-lane arterial roadway that extends north from Del Amo Boulevard and intersects with State Route 91 before entering into the City of Compton. The roadway provides a primary north-south surface street route through the City of Carson. Within the study area, Central Avenue is signalized at the Artesia Boulevard, Albertoni Street and Victoria Street intersections. Access to the Project site is via two existing driveways on Central Avenue.

Artesia Boulevard, located north of the Project, is an east-west roadway. In the study-area Artesia Boulevard functions as a frontage road on the north side of State Route 91. At the Central Avenue/Artesia Boulevard intersection, Artesia Boulevard merges with the State Route 91 on/off ramps. The Central Avenue/Artesia Boulevard Street intersection is signalized.

Albertoni Street, located along the Project's north frontage, is an east-west roadway. In the study-area Albertoni Street functions as a frontage road on the south side of State Route 91. At the Central Avenue/Albertoni Street intersection, Albertoni Street merges with the State Route 91 on/off ramps. The Central Avenue/Albertoni Street intersection is signalized. Access to the Project site is proposed via existing driveways on Albertoni Street.

Victoria Street, is located south of the Project is an east-west 4-lane divided arterial. The roadway extends east from Figueroa Street to Apra Street. It serves California State University at Dominguez Hills, businesses and residential neighborhoods east and west of Central Avenue. The Central Avenue/Victoria Street intersection is signalized.

Existing Intersection Operations

Because traffic flow on urban arterial roadways is most constrained at intersections, detailed traffic flow analyses focus on the operating conditions of critical intersections during peak travel periods (7:00 AM - 9:00 AM/4:00 PM - 6:00 PM). In rating intersection operations, the levels of service criteria (LOS A through F). The City of Carson considers LOS D or better acceptable for intersection operations.

Existing AM and PM peak hour traffic volumes for the study-area intersections were obtained from traffic counts conducted in October of 2024 when local schools were in session (count data included in Technical Appendix). The Year 2024 AM and PM peak hour traffic volumes for the study-area intersections are illustrated on Figure 3 and Figure 4 illustrates the existing lane geometries and traffic controls for the intersections.

Levels of service were calculated for the signalized intersections using the operations methodology outlined in the Highway Capacity Manual (HCM).[1] Levels of service are based on the average number of seconds of delay per vehicle during the peak 15-minute period within the overall peak hour.

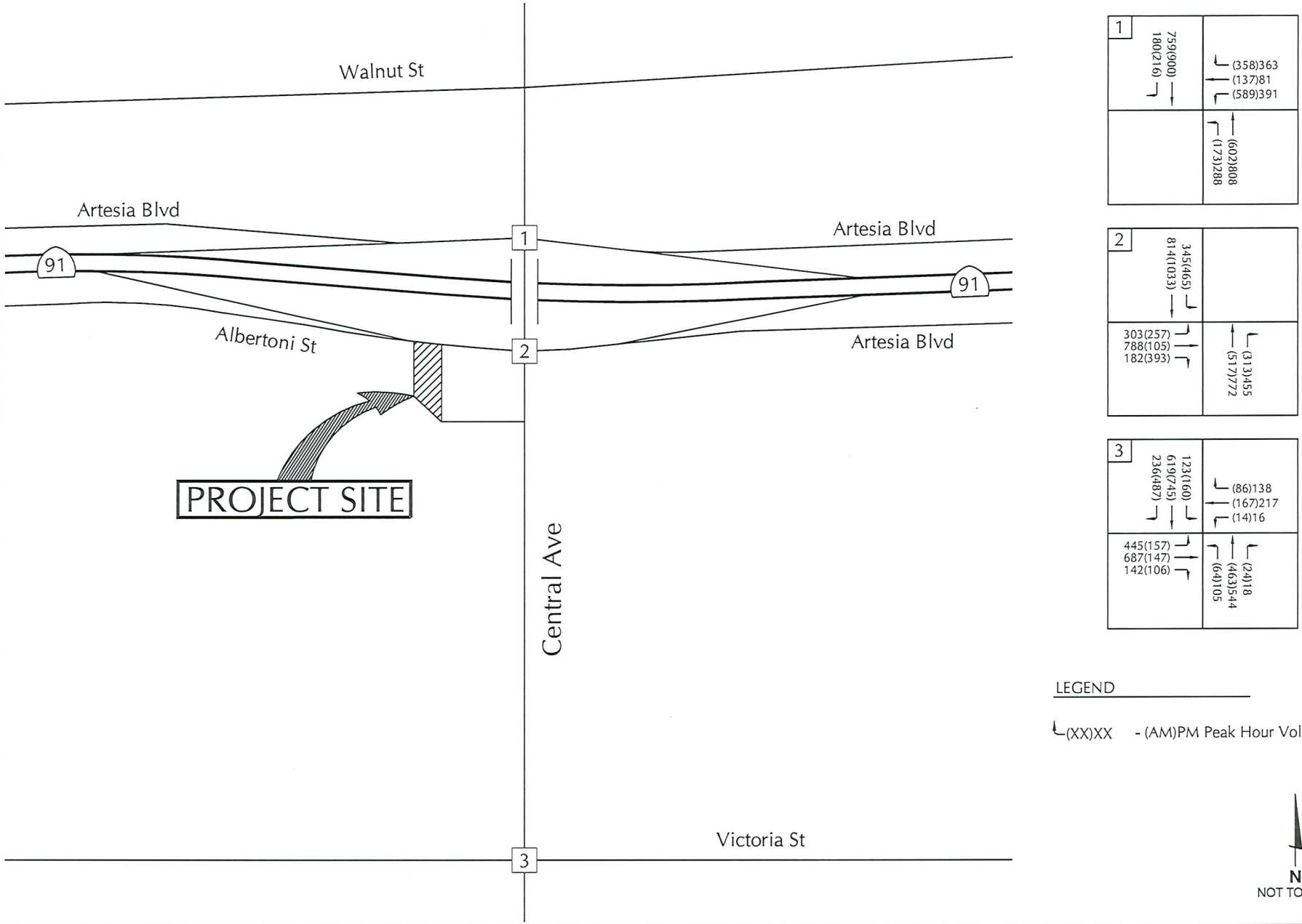
Table 1 lists the Year 2024 traffic controls and levels of service for the 3 study-area intersections (calculation worksheets included in Technical Appendix).

Table 1
Year 2024 Intersection Levels of Service

Intersection	Control	Delay/LOS	
		AM Peak Hour	PM Peak Hour
Central Avenue/Artesia Boulevard	Signal	30.2 sec./LOS C	24.1 sec./LOS C
Central Avenue/Albertoni Street	Signal	20.4 sec./LOS C	23.5 sec./LOS C
Central Avenue/Victoria Street	Signal	20.7 sec./LOS C	27.6 sec./LOS C

The data presented in Table 1 show that the study-area intersections operate in the LOS "C" range which meets the City's LOS D or better standard.

1 Highway Capacity Manual, Transportation Research Board, 6th Edition, 2016.



ASSOCIATED TRANSPORTATION ENGINEERS

YEAR 2024 TRAFFIC VOLUMES

FIGURE 3

JH - ATE#24051

ASSOCIATED TRANSPORTATION ENGINEERS

INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS

FIGURE 4

JH - ATE#24051

CITY OF CARSON GENERAL PLAN POLICY

The City of Carson has established LOS D or better as the acceptable standard for intersections with exceptions for transit-oriented districts, transit priority area, and central/neighborhood business districts. Locations currently operating at LOS E/F are exempt from the LOS D standard.

YEAR 2024 + PROJECT ANALYSIS

Project Trip Generation Estimates

The trip generation forecasts presented below follow the steps recommended for mixed-use projects in the Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition.[2] Given that the Project includes a mix of land uses, the trip generation steps include: 1) calculating trip generation based on ITE rates, 2) calculating internal trips (internal capture trips remain onsite and do not affect the adjacent street network), and 3) determining pass-by trips (pass-by trips affect driveways that provide Project access but do not affect the adjacent street network).

2 Trip Generation, Institute of Transportation Engineers, 11th Edition, 2020.

ITE Rates. ITE data for Car-Wash Automated (ITE #948) has 3 studies that only include weekday PM peak rates but do not include daily or AM peak hour rates and are therefore insufficient for analysis. Study data used for the proposed automated carwash was collected a similar site in the Los Angeles County area: 1) Highland Park Car Wash located at 5128 North Figueroa Street. This location operates an automated car wash facility similar to the Project site. Daily carwash trips were collected at the location for a 2-day period. The data showed an average of 525 carwashes per day. AM and PM peak hour data collected at the survey site shows that 7% of the carwashes occurred during the AM peak hour and 9% occurred during the PM peak hour. Trip rates for the Project were developed using the trip generation contained in the Technical Appendix.

Internal Capture. Some of the trips made to the new carwash facility will come from existing customers at the fueling pumps and thus will be internal to the site and not affect the study-area street network. The analysis assumed that 25% of the automated carwash customers would come from the service station or convenience market.

Pass-By Trips. The trip generation analysis also accounts "pass-by" trips pursuant to ITE recommended practices. These trips would be drawn from the existing traffic stream of the adjacent roadways and would affect the Project's driveways but would not affect the study-area street network beyond the Project site. Based on studies contained in the ITE Trip Generation Handbook, 62% of AM peak trips and 56% of PM peak hour trips generated by service stations with convenience markets would be pass-by trips. As a conservative assumption, the analysis assumes a 20% "pass-by" factor was applied to the automated carwash.

Summary. Worksheets showing the detailed trip generation calculations are attached. Table 2 summarizes the trip generation calculations for the proposed automated carwash tunnel.

Table 2
Proposed Gas Station and Carwash Trip Generation Estimates

Land Use	Size	ADT		AM Peak Hour		PM Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Carwash – Automated	1 Tunnel	1050.0[(a)]	1,050	76.00	76	96.00	96
- Internal Trips (25%)			262		19		24
- Pass-By Trips (20%)			210		15		19
Primary Trips			***578***		***42***		***53***

(a) Trip rate based on study of similar site in Los Angeles.

The data presented in Table 2 indicate that the proposed automated carwash facility is forecast to generate 578 average daily, 42 AM peak hour and 53 PM peak hour "primary" trips. The remaining 472 average daily trips (ADT), 34 AM peak hour trips and 43 PM peak hour trips are "internal" or "pass-by" trips.

Based on the trip generation estimates presented in Table 2, the proposed automated carwash facility would result in a net increase of 578 primary ADT, 42 primary AM peak hour trips and 53 primary PM peak hour trips. These primary trips would be new trips added to the adjacent street system.

Project Trip Distribution

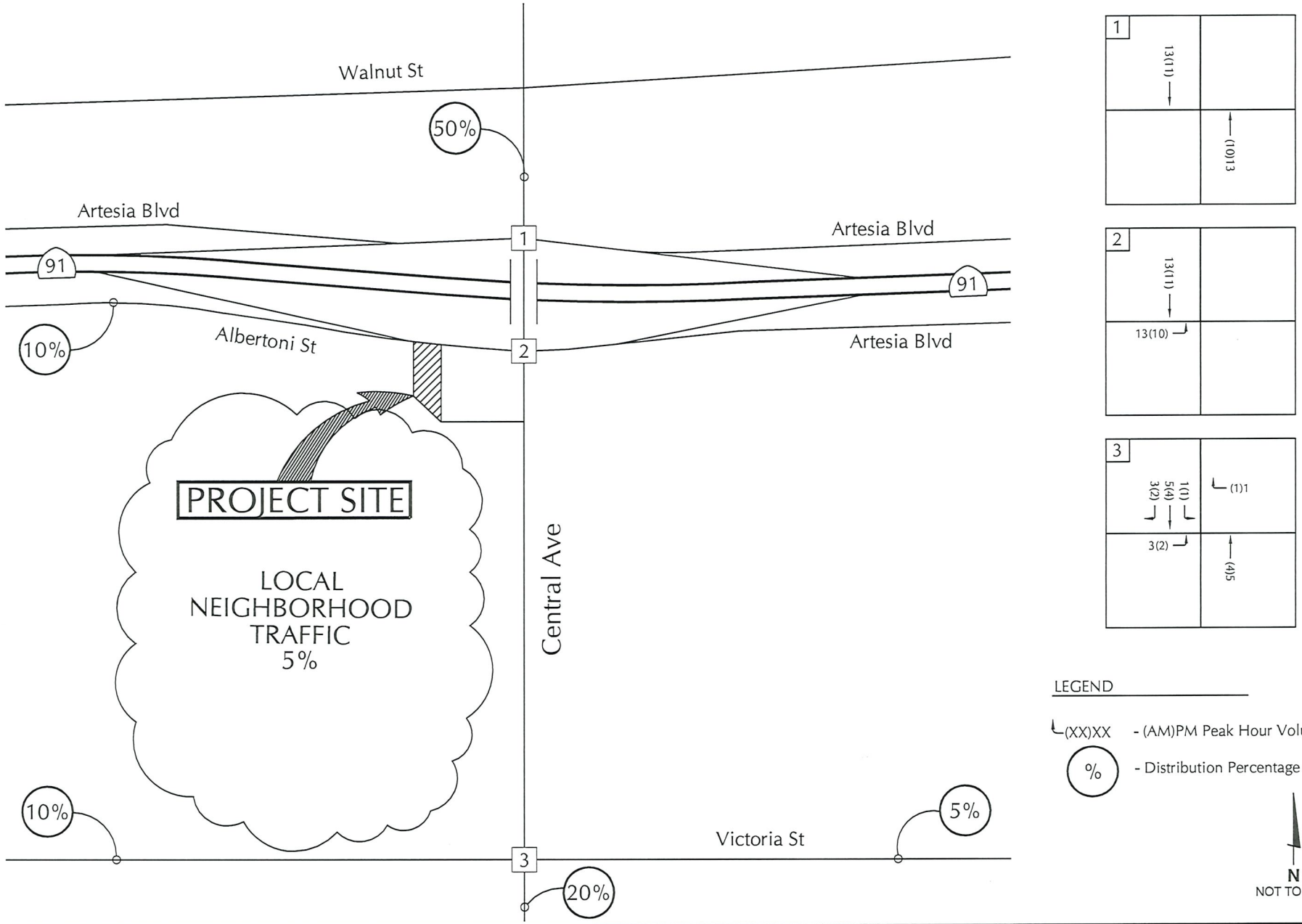
Project-generated traffic was distributed onto the study-area roadway system based on consideration of the residential development and other automated carwash facilities in and surrounding areas of the City. The Project trip distribution is presented in Table 3. Figure 5 illustrates the trip distribution and assignment of the Project generated AM and PM peak hour trips.

Table 3
Project Trip Distribution

Route	Origin/Destination	Percentage
Central Avenue	North	50%
	South	20%
Albertoni Street	West	10%
Victoria Street	East	5%
	West	10%
	Local Neighborhood	5%
	Total:	100%

Year 2024 + Project Intersection Levels of Service

Levels of service were calculated for the study-area intersections assuming the Year 2024 + Project traffic volumes shown on Figure 6. The overall cycle lengths are maintained with the allocation of green times for the various movements allowed to fluctuate within the programmed minimums and maximums in order to accommodate the change in traffic demands caused by the Project. Tables 4 and 5 compare the Year 2024 and Year 2024 + Project levels of service and identify impacts based on the applicable standards.

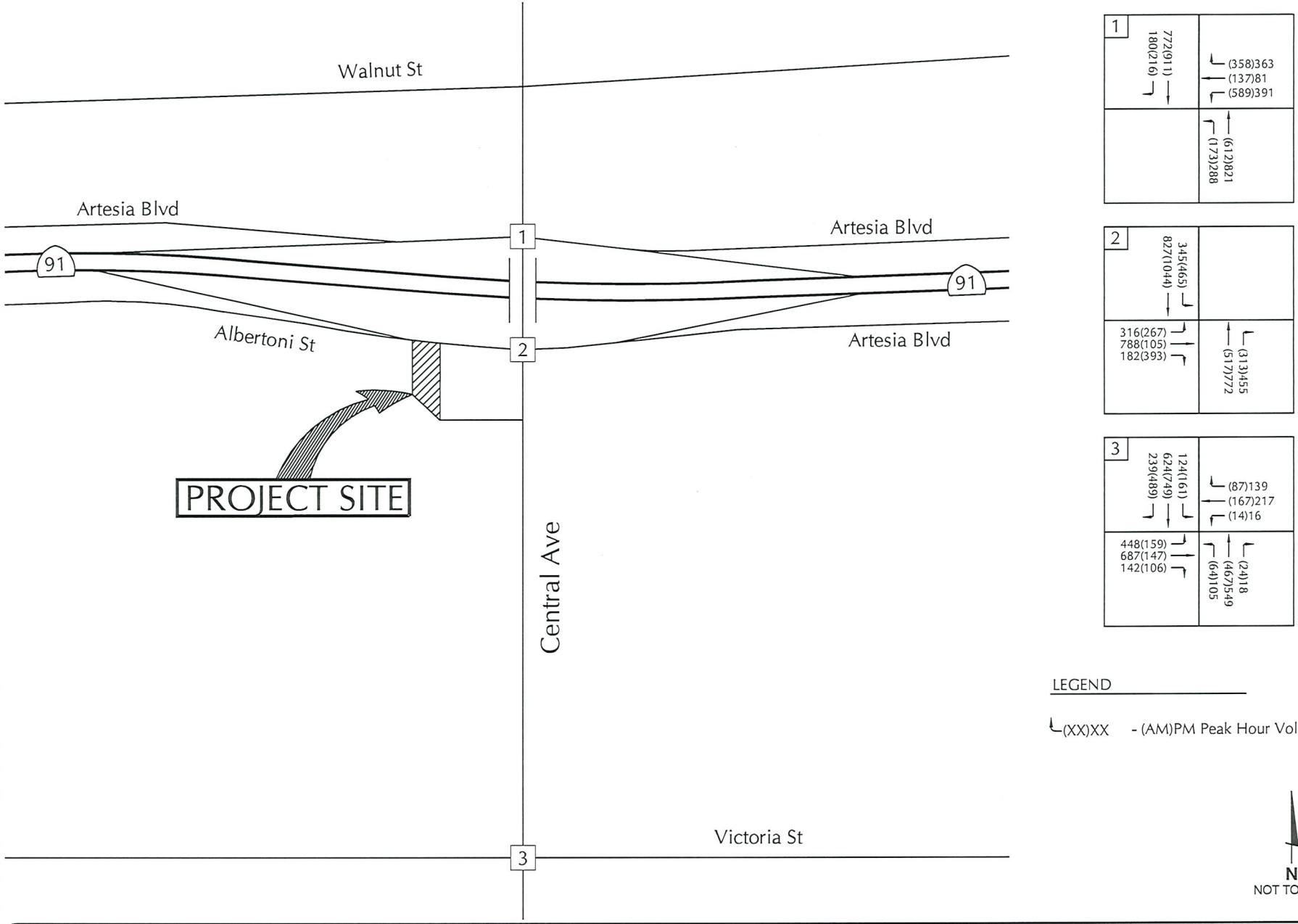


ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

FIGURE 5

JH - ATE#24051



ASSOCIATED TRANSPORTATION ENGINEERS

YEAR 2024 + PROJECT TRAFFIC VOLUMES

FIGURE 6

JH - ATE#24051

Table 4
Year 2024 + Project AM Peak Hour Levels of Service

Intersection	2024		2024 + Project		Delay	
	Delay	LOS	Delay	LOS	Change	Exceed?
Central Avenue/Artesia Boulevard	30.2 sec.	LOS C	30.3 sec.	LOS C	0.1	NO
Central Avenue/Albertoni Street	20.4 sec.	LOS C	20.4 sec.	LOS C	0.0	NO
Central Avenue/Victoria Street	20.7 sec.	LOS C	20.7 sec.	LOS C	0.0	NO

Table 5
Year 2024 + Project PM Peak Hour Levels of Service

Intersection	2024		2024 + Project		Delay	
	Delay	LOS	Delay	LOS	Change	Exceed?
Central Avenue/Artesia Boulevard	24.1 sec.	LOS C	24.1 sec.	LOS C	0.0	NO
Central Avenue/Albertoni Street	23.5 sec.	LOS C	23.5 sec.	LOS C	0.0	NO
Central Avenue/Victoria Street	27.6 sec.	LOS C	27.7 sec.	LOS C	0.1	NO

The data presented in Tables 4 and 5 indicate that the study-area intersections would continue to operate in the LOS "C" range with Year 2024 + Project volumes. The Project would not have an adverse effect on the study-area intersection based on General Plan policies.

YEAR 2027 (NEAR TERM OPENING YEAR) + PROJECT ANALYSIS

The City of Carson requires that roadway and intersection operations be analyzed for the opening year of the Project, which is assumed to be 2027 for this study.

Year 2027 Traffic Forecasts

Year 2027 traffic volumes were forecast for the study-area roadways and intersections assuming an ambient growth factor of 1.0017 percent applied to the 2024 volumes for a three-year period. The ambient growth factor was derived from the modeled traffic growth factors contained in the Los Angeles County 2010 Congestion Management Program (Exhibit D-1) for the Regional Statistical Area (RSA) for the City of Carson. The 2027 forecasts also assume development of the approved/pending projects proposed within the City of Carson. The list of approved and pending projects used for the analysis was provided by City staff and is presented in the Technical Appendix. Trip generation estimates were developed for approved/pending projects using the rates presented in the ITE, Trip Generation, 11th Edition. The trip assignment for the approved/pending projects was developed based on the location

of each project, recent traffic studies, existing traffic patterns observed in the study-area as well as a general knowledge of the population, employment, and commercial centers in Carson. The Cumulative-Added traffic volumes are illustrated in Figure 7. The Year 2027 traffic volumes are show on Figure 8.

Year 2027 + Project Intersection Analysis

Levels of service were calculated for the study-area intersections assuming the Year 2027 and Year 2027 + Project traffic volumes presented on Figure 9. Tables 6 and 7 compare the Year 2027 and Year 2027 + Project levels of service for the study-area intersections and identify Year 2027 impacts based on City thresholds.

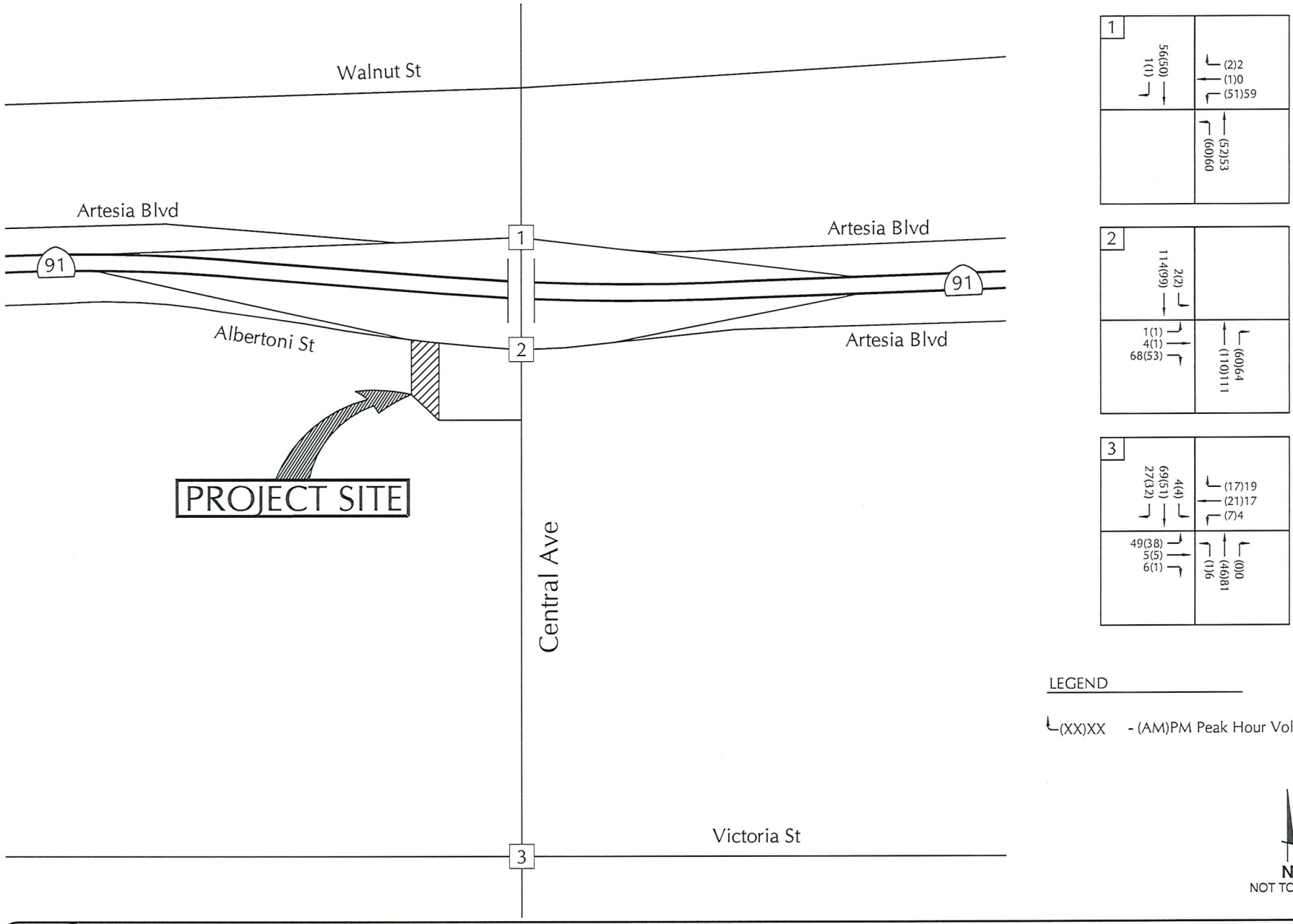
Table 6
Year 2027 + Project AM Peak Hour Levels of Service

Intersection	2027		2027 + Project		Delay	
	Delay	LOS	Delay	LOS	Change	Exceed?
Central Avenue/Artesia Boulevard	31.9 sec.	LOS C	29.2 sec.	LOS C	0.0	NO
Central Avenue/Albertoni Street	24.7 sec.	LOS C	29.4 sec.	LOS C	4.7	NO
Central Avenue/Victoria Street	22.4 sec.	LOS C	22.5 sec.	LOS C	0.1	NO

Table 7
Year 2027 + Project PM Peak Hour Levels of Service

Intersection	2027		2027 + Project		Delay	
	Delay	LOS	Delay	LOS	Change	Exceed?
Central Avenue/Artesia Boulevard	26.1 sec.	LOS C	26.4 sec.	LOS C	0.3	NO
Central Avenue/Albertoni Street	25.3 sec.	LOS C	28.3 sec.	LOS C	3.0	NO
Central Avenue/Victoria Street	29.1 sec.	LOS C	32.1 sec.	LOS C	3.0	NO

The data presented in Tables 6 and 7 indicate that the study-area intersections would operate in the LOS "C" range with Year 2027 + Project volumes. The Project would not have an adverse effect on the study-area intersection based on General Plan policies.

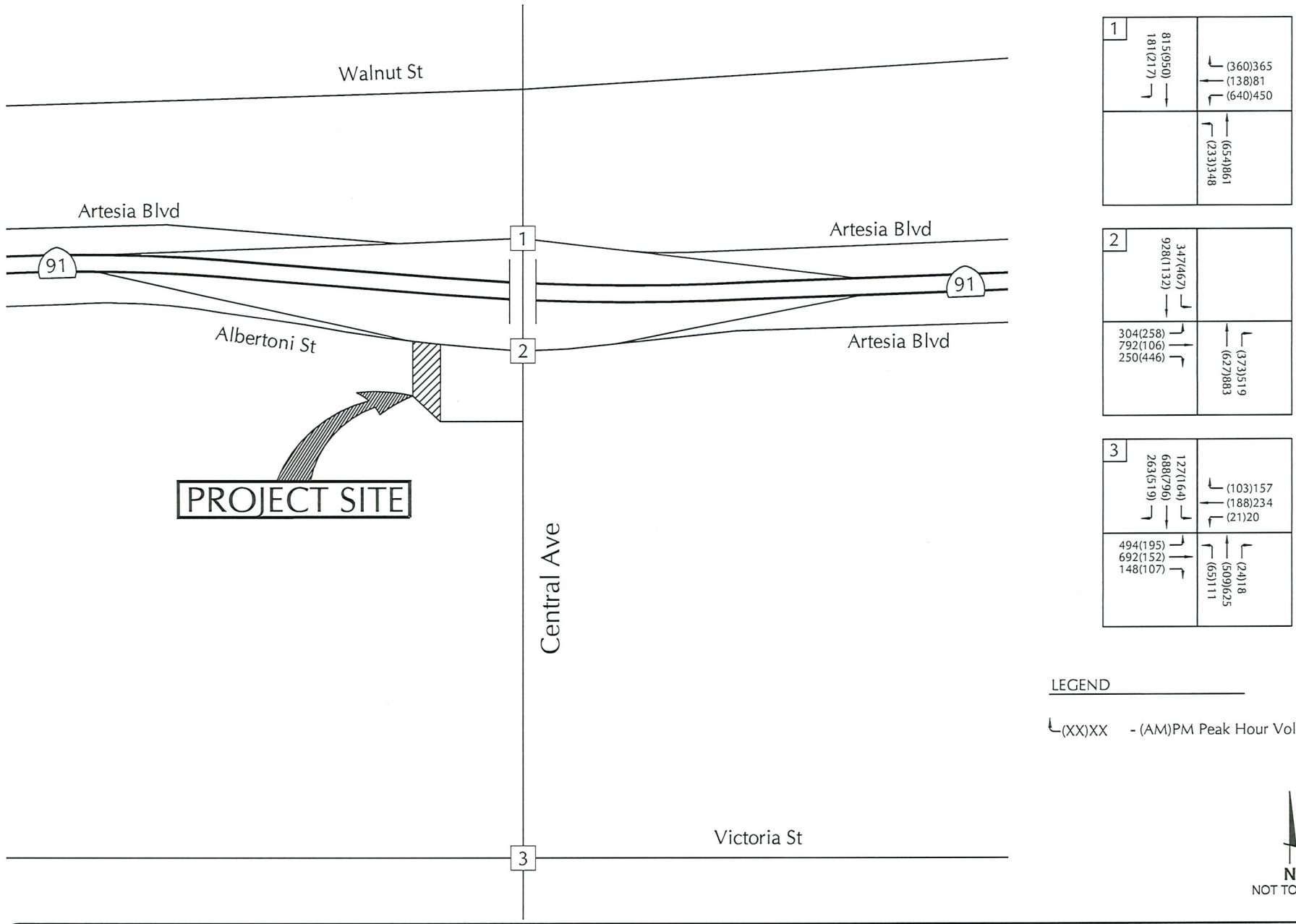


ASSOCIATED TRANSPORTATION ENGINEERS

CUMULATIVE-ADDED TRAFFIC VOLUMES

FIGURE 7

JH - ATE#24051

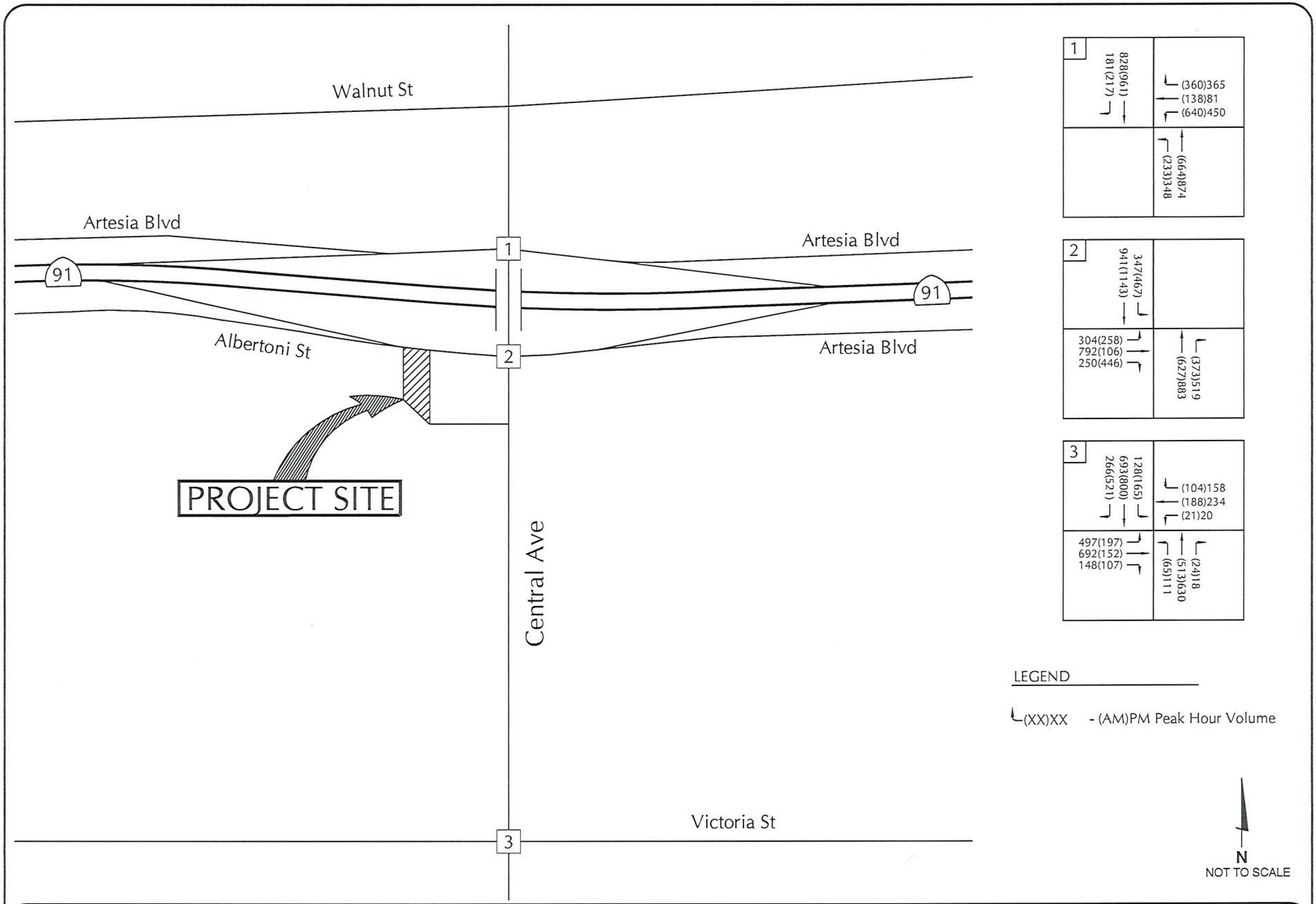


ASSOCIATED TRANSPORTATION ENGINEERS

YEAR 2027 TRAFFIC VOLUMES

FIGURE 8

JH - ATE#24051



Associated Transportation Engineers

YEAR 2027 + PROJECT TRAFFIC VOLUMES

FIGURE 9

JH - ATE#24051

SITE ACCESS AND CIRCULATION

As illustrated on the Project site plan (Figure 1), access to the Project site would be provided via driveway connections to Central Avenue and Albertoni Street. Figure 10 illustrates the Project driveway volumes. Central Avenue provides access to the Project site and serves the commercial, industrial and residential uses adjacent to the Project. Central Avenue is a 4-lane divided north-south roadway. Central Avenue is fully improved with curb, gutter, sidewalk and street lighting. The posted speed limit on Central Avenue is 40 MPH. The Project site's northern driveway allows right-turns inbound and outbound only due to a raised median. The Project site's southern driveway allows full access due to a break in the raised median. The existing Central Avenue driveway connections have been designed and constructed to City of Carson design standards. The Project would not be required to improve Central Avenue along its frontage or the existing driveways.

Albertoni Street also provides access to the Project site via two driveway connection. In the study-area Albertoni Street functions as a 2-lane east-west frontage road on the south side of State Route 91. At the intersection of Central Avenue, Albertoni Street merges with the eastbound State Route 91 on/off-ramps. Albertoni Street is partially improved with curb, gutter, sidewalk and street lighting. The posted speed limit on Albertoni Street is 45 MPH. The Project site driveways on Albertoni Street allow right-turns inbound and outbound only. The existing Albertoni Street driveway connections have been designed and constructed to City of Carson design standards. The Project would not be required to improve Albertoni Street along its frontage or the existing driveways.

An internal circulation system will provide access and connect the proposed automated carwash facility to Central Avenue and Albertoni Street. As illustrated on the site plan, the proposed internal circulation provides direct access and egress to the carwash tunnel. Carwash vehicles can enter via either Central Avenue or Albertoni Street and circulate through the site to enter the carwash tunnel drive through lane. The carwash drive through lane provides adequate space for 11 vehicles to queue in the drive through lane before effecting the parking area on the south side of the building. There is sufficient on-site queue space to allow additional carwash vehicles to queue on-site before effecting the operation of Central Avenue. Once the carwash is completed, carwash vehicles can immediately exit via Albertoni Street or circulate through the site and exit via Central Avenue. Carwash vehicles wishing to use the on-site vacuum/detailing facilities can circulate clockwise around the tunnel exit. Carwash vehicles circulating on-site will interface with Chevron/McDonalds customers. ATE has developed a transportation management plan (TMP) to address the on-site vehicle circulation and carwash drive through vehicle queues to limit any potential spillover into the public right-or-way.

PROJECT DRIVEWAY VOLUMES
FIGURE 10
JH - ATE#24051
N
NOT TO SCALE
Central Ave
Albertoni St
91
PROJECT SITE
10(9)
3(2)
9(7)
-5(-4)
15(13)
10(7)
(-4)-4
(13)14
0(0)
0(0)
(13)17
-1(0)
4(2)
LEGEND
XX(XX) - (AM)PM Peak Hour Volume
Associated
Transportation
Engineers

Project Driveway Operations

City staff requested that Project driveways be included in the level of service analysis. The analysis was completed using the Year 2024 and Year 2027 driveway volume forecasts which are illustrated on Figures 11 and 12. The results of the driveway analyses are presented below.

Central Avenue/Project Driveway

Vehicle delays and levels of service were calculated for the Central Avenue/Project Driveway intersection for the AM and PM peak hours assuming the 2024 and 2027 volumes (level of service worksheets contained in the Technical Appendix). Tables 8 and 9 summarize the delay and level of service forecasts for the driveway.

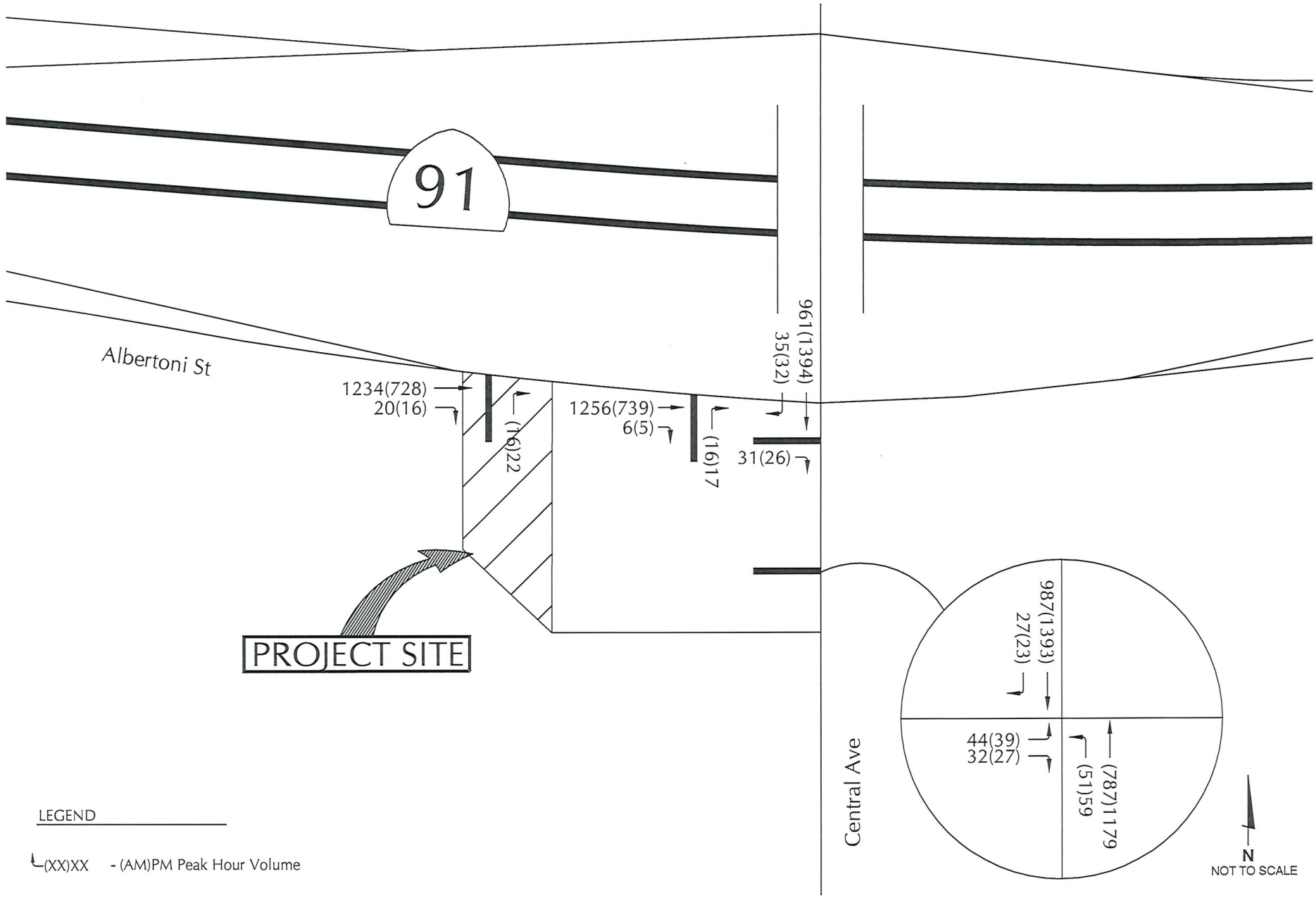
Table 8
Central Avenue/Project Southern Driveway Operations – AM Peak Hour

Intersection	Delay / LOS			
	2024		2027	
	Delay	LOS	Delay	LOS
Central Avenue/Project Driveway				
Eastbound Approach	46.2 Sec.	LOS E	66.6 Sec.	LOS F
Northbound Left-Turn	14.8 Sec.	LOS B	16.7 Sec.	LOS C

Table 9
Central Avenue/Project Southern Driveway Operations – PM Peak Hour

Intersection	Delay / LOS			
	2024		2027	
	Delay	LOS	Delay	LOS
Central Avenue/Project Driveway				
Eastbound Approach	30.6 Sec.	LOS D	41.3 Sec.	LOS E
Northbound Left-Turn	11.4 Sec.	LOS B	12.6 Sec.	LOS B

As shown in Tables 8 and 9, the delays for the outbound movements from the Project driveway equate to LOS D - F during the AM and PM peak hour periods (delays would be lesser during other hours of the day). The vehicle delays are related to exiting left-turn movements. It should be noted that there are other driveways available to exiting drivers. Restricting the Central Avenue southern driveway to right-turns out only would reduce potential vehicle delays at the driveway. Vehicles wishing to make left-turns to travel north on Central Avenue can use one of the two Albertoni Street driveways then make left-turns north at the signalized Central Avenue/Albertoni Street intersection which operates in the LOS C range. The LOS worksheets indicate that vehicle queuing for exiting vehicles would not be significant.

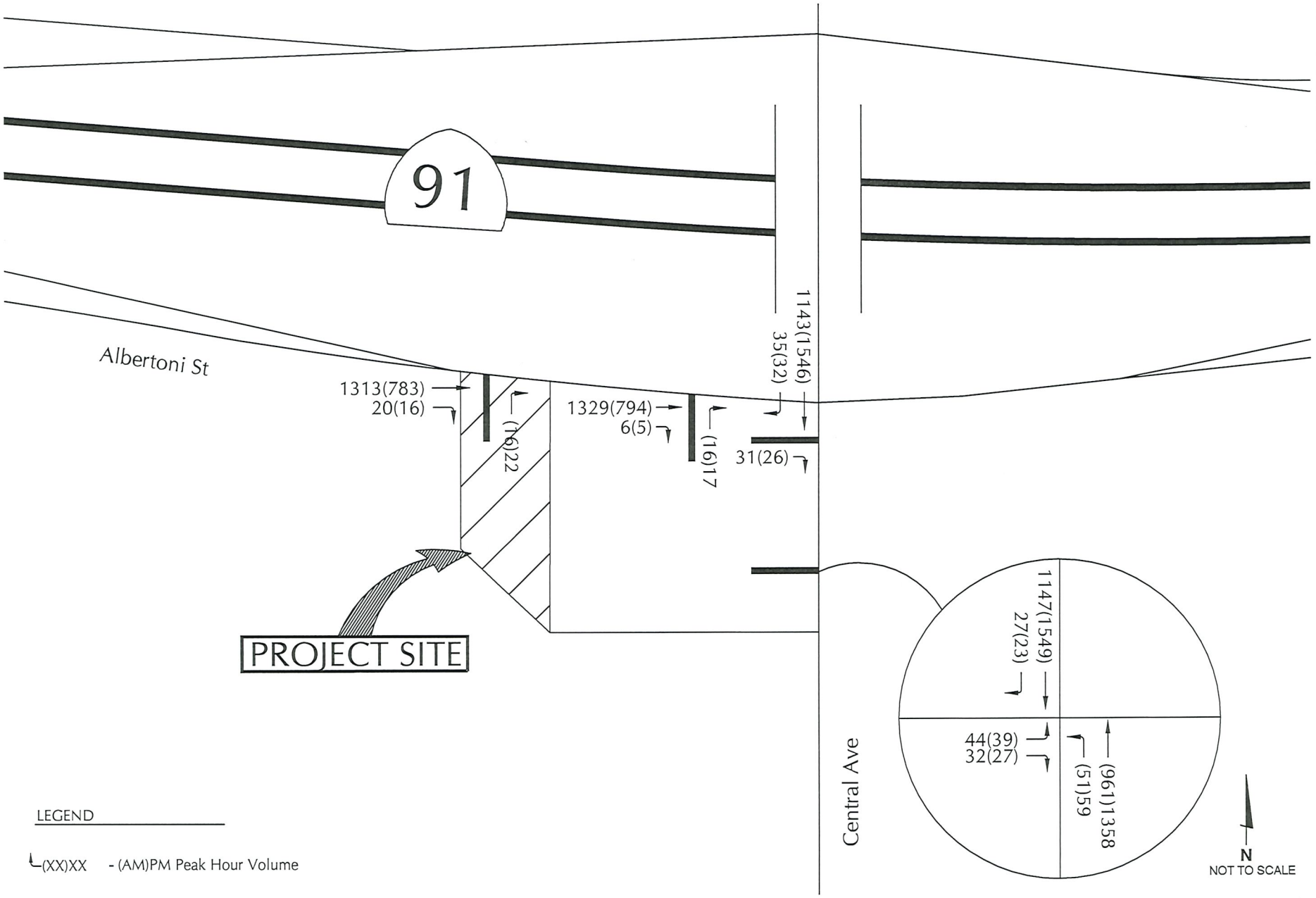


ASSOCIATED TRANSPORTATION ENGINEERS

YEAR 2024 + PROJECT DRIVEWAY VOLUMES

FIGURE 11

JH - ATE#24051



Associated Transportation Engineers

YEAR 2027 + PROJECT DRIVEWAY VOLUMES

FIGURE 12

JH - ATE#24051

Albertoni Street/Project Driveway

Vehicle delays and levels of service were calculated for the Albertoni Street/Project Driveway intersection for the AM and PM peak hours assuming the 2024 and 2027 volumes (level of service worksheets contained in the Technical Appendix). Tables 10 and 11 summarize the delay and level of service forecasts for the driveway.

Table 10
Albertoni Street/Project Western Driveway Operations – AM Peak Hour

Intersection	Delay / LOS			
	2024		2027	
	Delay	LOS	Delay	LOS
Albertoni Street/Project Driveway Northbound Right-Turn	12.3 Sec.	LOS B	12.7 Sec.	LOS B

Table 11
Albertoni Street/Project Western Driveway Operations – PM Peak Hour

Intersection	Delay / LOS			
	2024		2027	
	Delay	LOS	Delay	LOS
Albertoni Street/Project Driveway Northbound Right-Turn	17.5 Sec.	LOS C	17.4 Sec.	LOS C

As shown in Tables 10 and 11, the delays for the outbound movements from the Project driveway equate to LOS C during the AM peak and PM peak periods (delays would be lesser during other hours of the day). It should be noted that there are other driveways available to exiting drivers. The LOS worksheets indicate that vehicle queuing for exiting vehicles would not be significant.

Carwash Drive-Through Storage and Queuing

In order to evaluate the adequacy of the vehicle queue storage area provided at the proposed automated carwash facility, queue study data was obtained from surveys conducted at similar facilities. Queue data collected for the *Drive-Through Queue Generation Study* is summarized in Table 12. The carwash drive through queue data was collected over 12 days at 6 drive through carwash facilities located in Minnesota, five of the 6 were located at gas stations.

Table 12
National Carwash Queue Study Results

# Studies	Average Maximum Queue	Range of Maximum Queue	85th Percentile Queue
12 Days	4.42 Vehicles	1-10 Vehicles	6.2 Vehicles

The data presented in Table 12 indicates that the maximum peak queue observed was 10 vehicles and the 85th percentile peak queue observed was 6.2 vehicles. The 85th percentile represents the statistical maximum queue based on the range of the queue data. The national survey data suggest that carwash with drive through lanes should be able to accommodate 140 feet of vehicle stacking (7 vehicles).

Queue study data was also obtained from surveys conducted at a similar facility in Los Angeles: 1) Highland Park Car Wash located at 5128 North Figueroa Street. The local queue data collected is summarized in Table 13. The carwash drive through queue data was collected over 2 days on a Thursday and a Friday from 7:00 AM to 7:00 PM.

Table 13
Local Carwash Queue Study Results

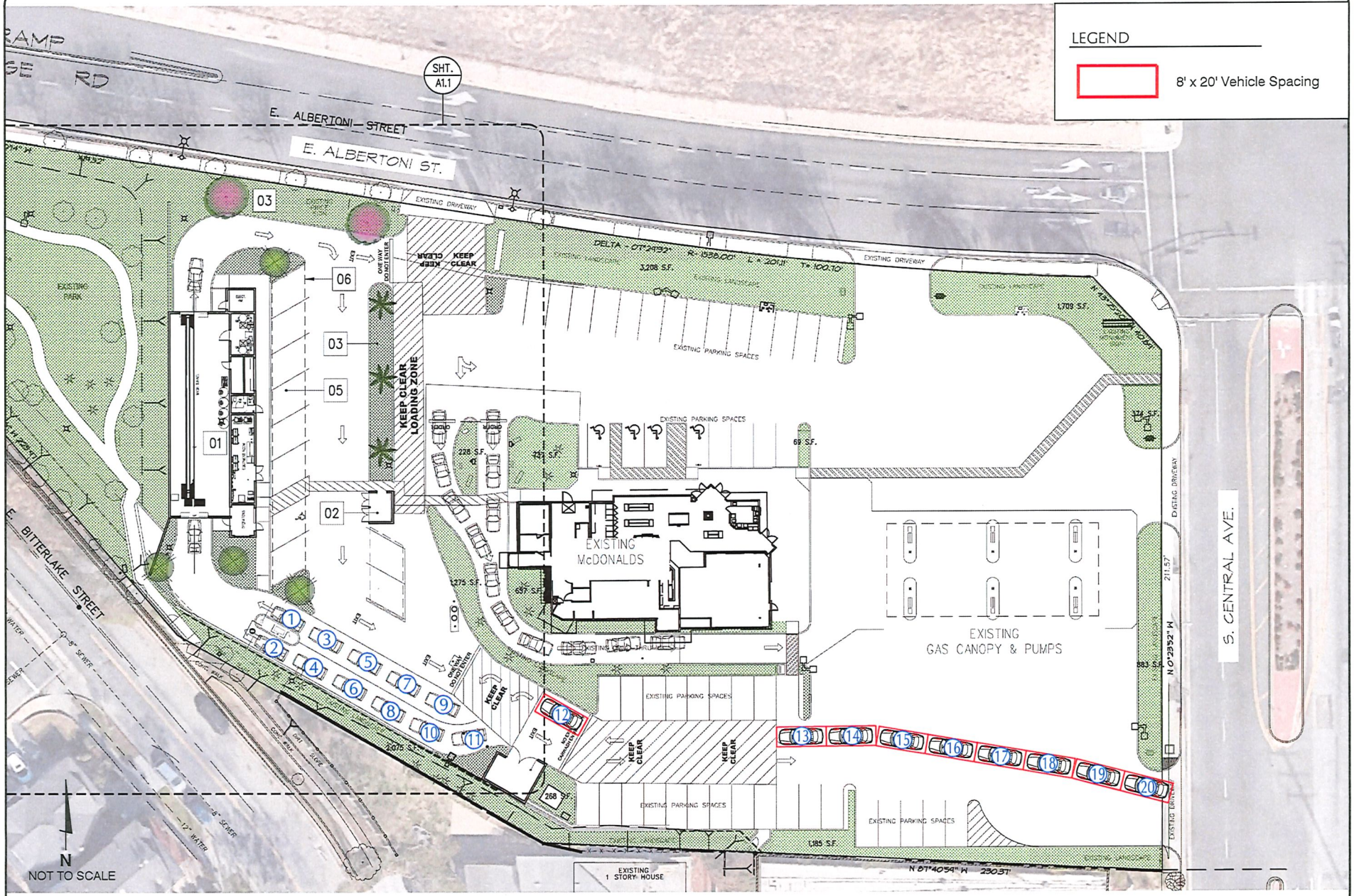
# Studies	Average Maximum Queue	Range of Maximum Queue	95th Percentile Queue
2 Days	1.5 Vehicles	8-10 Vehicles	5.0 Vehicles

The data presented in Table 13 indicates that the maximum peak queue observed was 10 vehicles and the 95th percentile peak queue observed was 5 vehicles.

The vehicle storage provided for the Project carwash drive through lane would accommodate the 85th percentile queues observed in the national studies and the 95th percentile queues observed in the local studies without blocking the parking spaces on the south side of the Chevron/McDonald's building or the Central Avenue driveway. The Project would also accommodate the maximum observed carwash queues without interfering with the McDonalds Drive through queues.

Site Circulation

City staff requested a circulation plan illustrating vehicles entering and exiting the carwash drive through lane. Figure 13 illustrates the site access plan and the on-site queue storage area. The proposed design would accommodate a queue of 11 vehicles entering the carwash without blocking the on-site parking spaces and a maximum queue of 20 vehicles to reach the driveway on Central Avenue. The McDonalds driveway through queues and the flow of traffic on Central Avenue and Albertoni Street would not be adversely affected by the carwash queue.



ASSOCIATED TRANSPORTATION ENGINEERS

MAXIMUM VEHICLE QUEUES - 20 VEHICLES

FIGURE 13

JH - ATE#24051

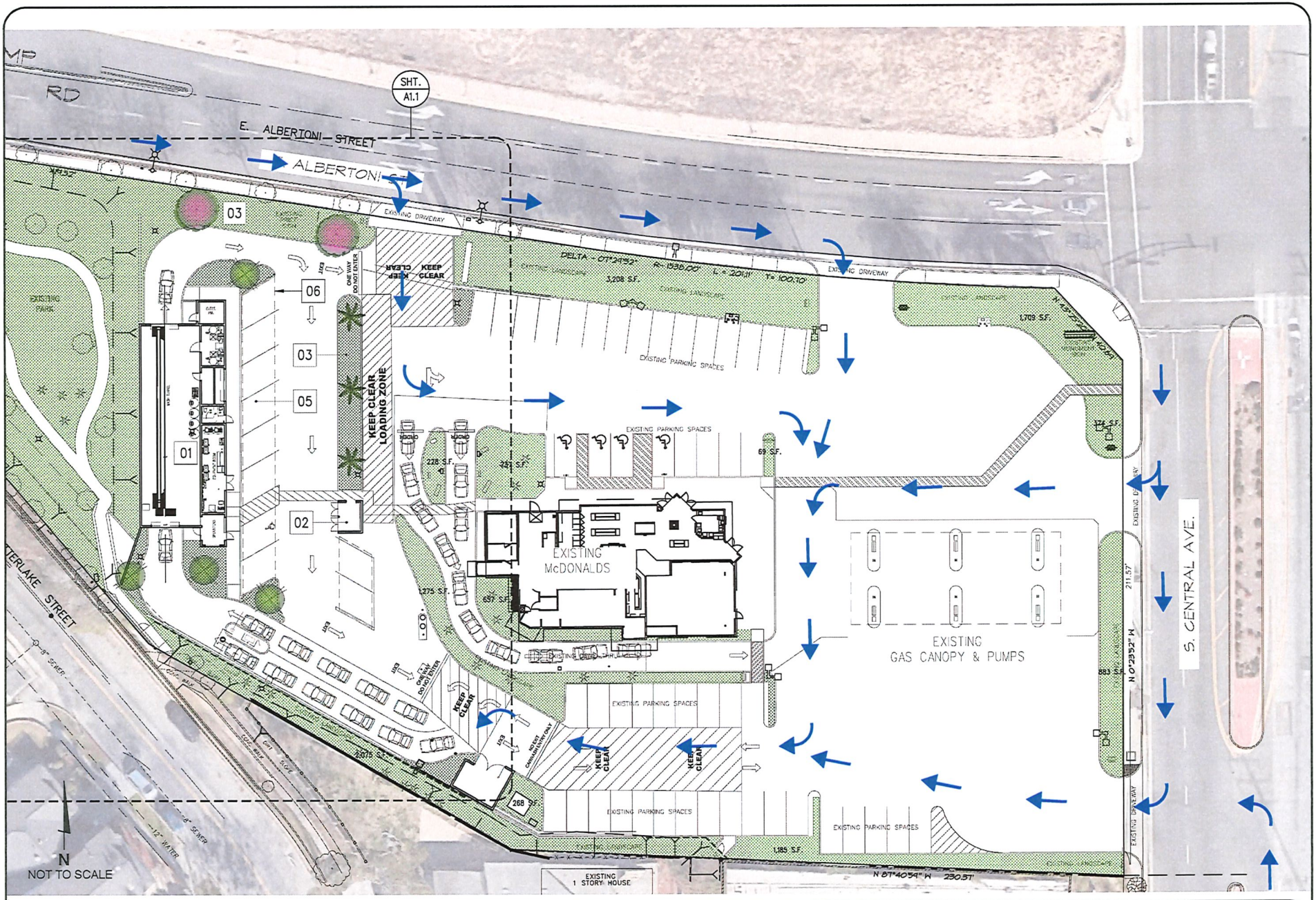
Figures 14 and 15 illustrate the circulation pattern for vehicles entering and exiting the driveways to and from the carwash drive-through lane. As shown, vehicles would enter the site from the driveways on Central Avenue and Albertoni Street and proceed to the car wash entrance located on the south side of the convenience store buildings. Vehicles exiting the car wash tunnel would proceed to the driveways on Albertoni Street or Central Avenue to exit the site.

Drive-Through Entry. An analysis was completed using the AutoTurn software to evaluate vehicles entering the site and circulating to the carwash drive-through lane. As illustrated on Figure 16, vehicles can maneuver into the carwash drive-through lane from the site driveways and the fuel pumps. Based on a review of the proposed site plan, the internal fuel pump and parking lot design would accommodate vehicle movements to the carwash entrance lane.

Figure 17 illustrates the proposed drive-through access plan, which incorporates pavement marking and directional signs. As shown on the left, pavement markings would be installed to direct vehicles entering the site from Central Avenue and Albertoni Street to the carwash drive-through lane. Additional signage could be provided onsite to direct vehicles from the fuel pumps to the carwash entrance lane. A "Keep Clear" zone would also be installed at the entrance to ensure that vehicles entering the car wash tunnel area do not block the Albertoni Street driveway.

Drive-Through Exit. Figure 18 illustrates the vehicle maneuvers for cars exiting the carwash tunnel. As shown on the figure, vehicles would exit the carwash tunnel at the northwest corner of the site and then proceed to exit the site via a right-turn on Albertoni Street or proceed east to Central Avenue. A YIELD legend is proposed to be incorporated near the drive-through exit (see Figure 19). Based on a review of the proposed site plan, the internal fuel pump and parking lot design would accommodate vehicle movements exiting the carwash tunnel.

The queue study data presented previously indicated that forecasted carwash drive-through queues (8 to 10 vehicles) would be accommodated in the stacking lane provided. As noted, the drive-through lane provides storage for 11 vehicles before the parking spaces located on the south side of the convenience store and storage for 20 vehicles to the driveway on Central Avenue. Thus, the site design would accommodate a queue of 20 (see Figure 12) vehicles extending to the south without interfering with operations on Central Avenue.

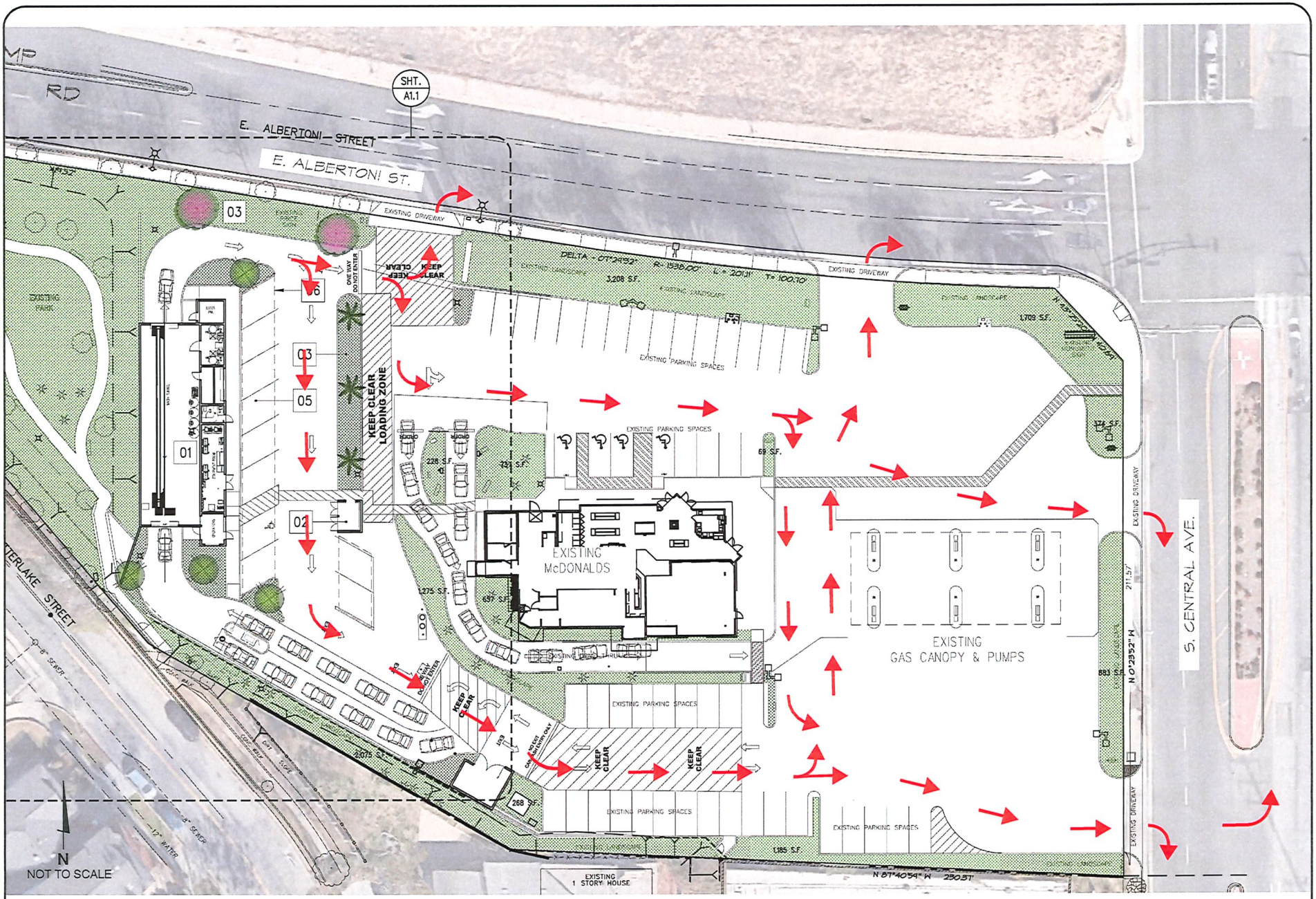


ASSOCIATED TRANSPORTATION ENGINEERS

INBOUND ACCESS ROUTES

FIGURE 14

JH - ATE#24051

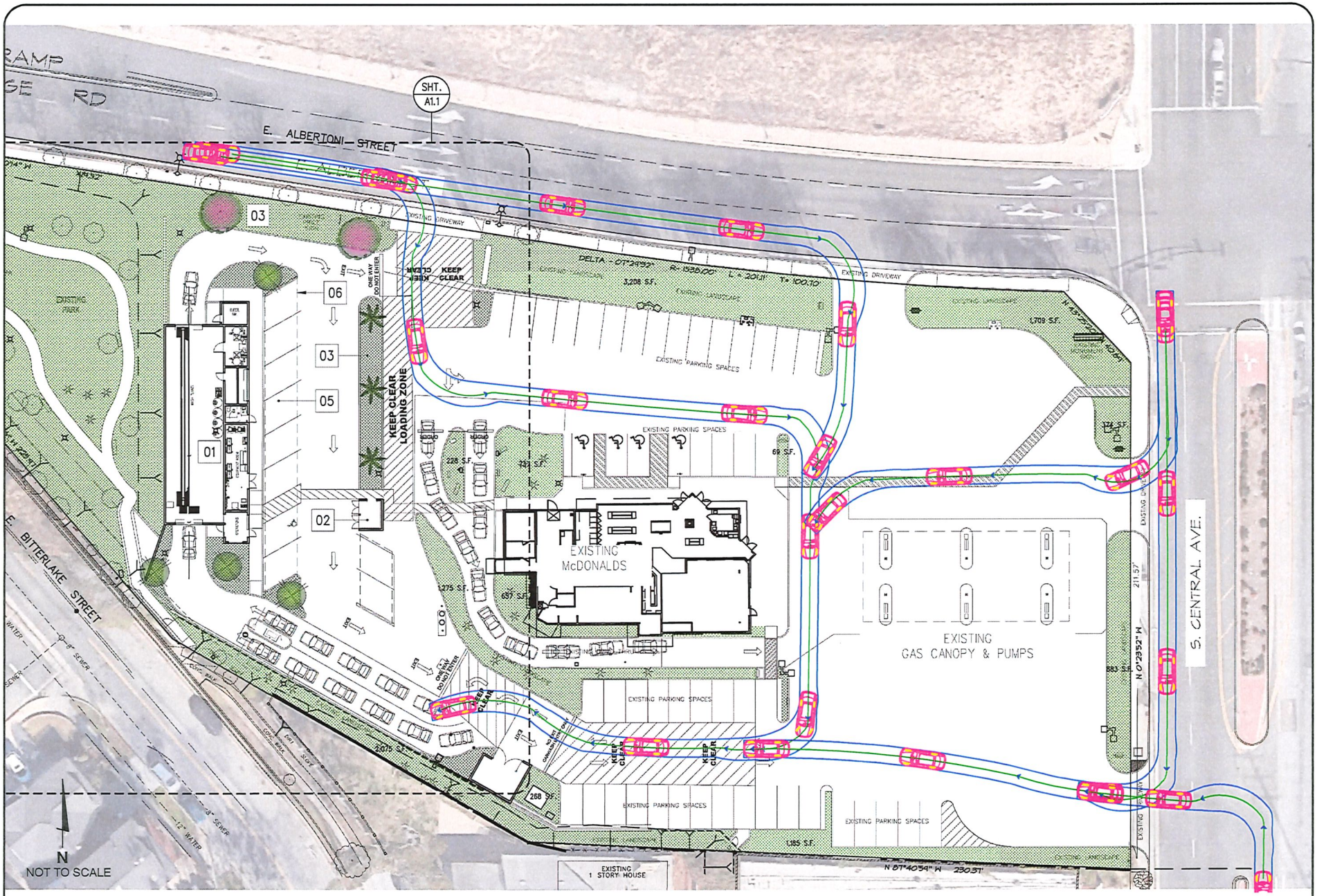


ASSOCIATED TRANSPORTATION ENGINEERS

OUTBOUND ACCESS ROUTES

FIGURE 15

JH - ATE#24051

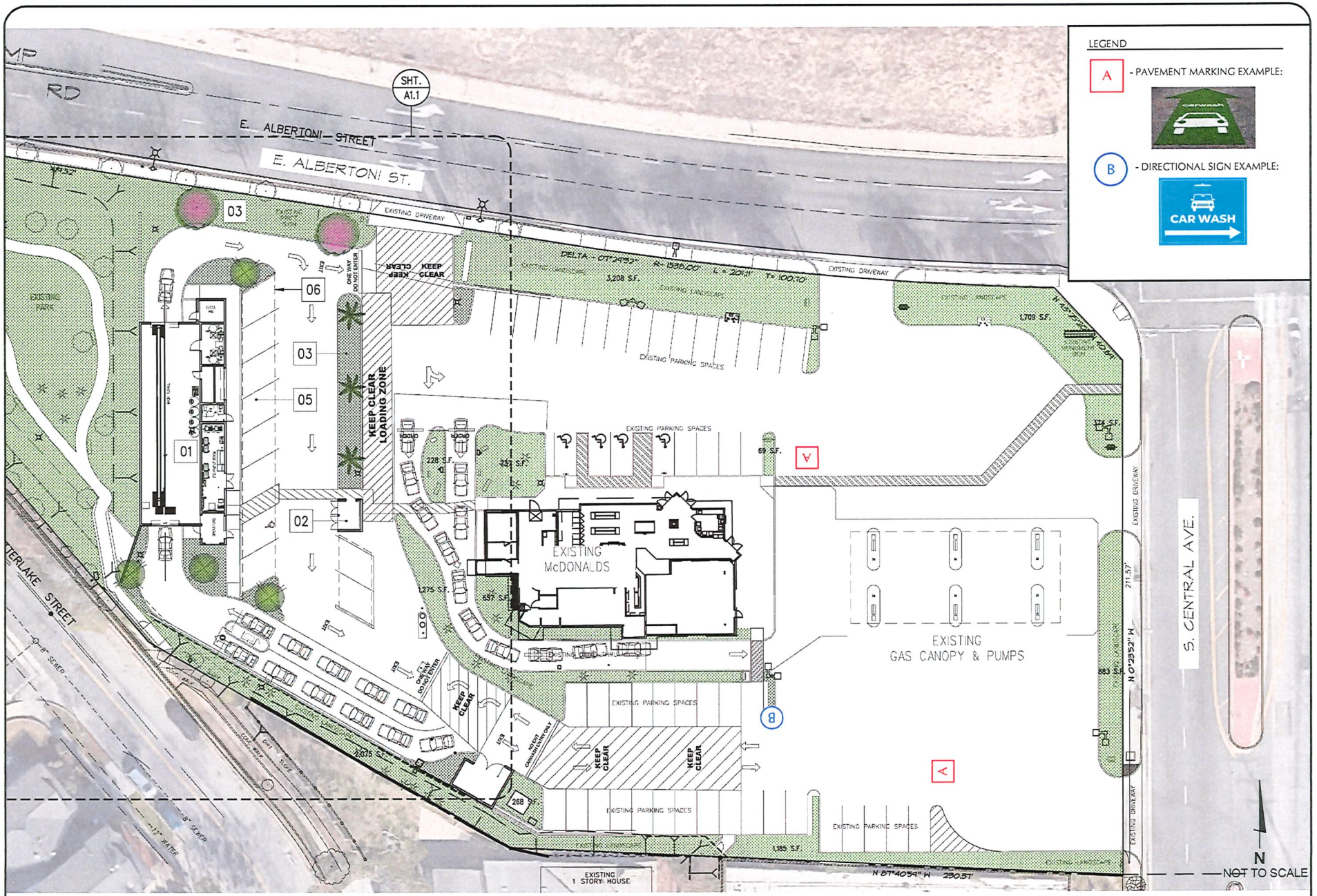


ASSOCIATED TRANSPORTATION ENGINEERS

INBOUND TURNING MOVEMENTS

FIGURE 16

JH - ATE#24051

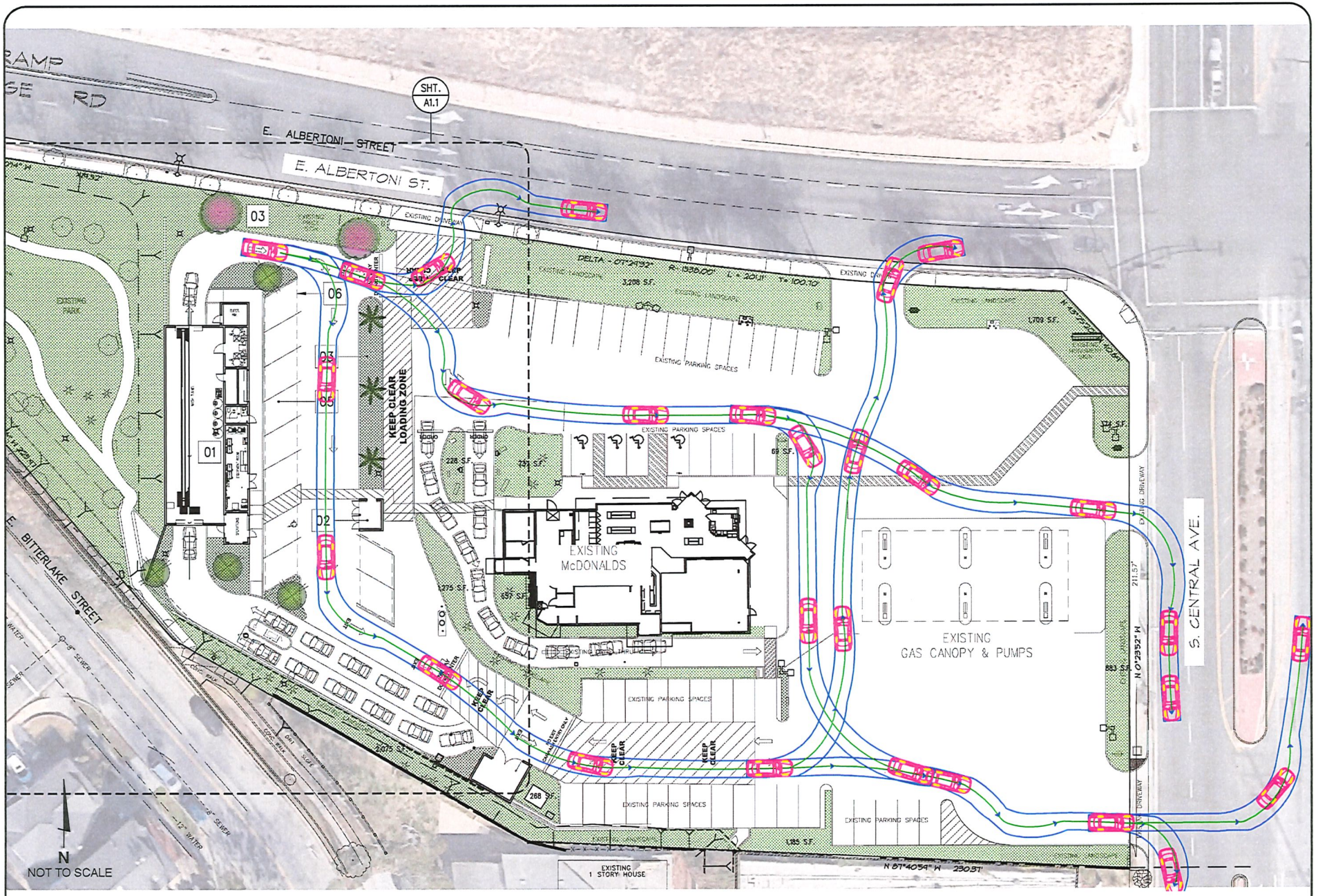


ASSOCIATED TRANSPORTATION ENGINEERS

PROPOSED PAVEMENT MARKINGS AND DIRECTIONAL SIGNS

FIGURE 17

JH - ATE#24051

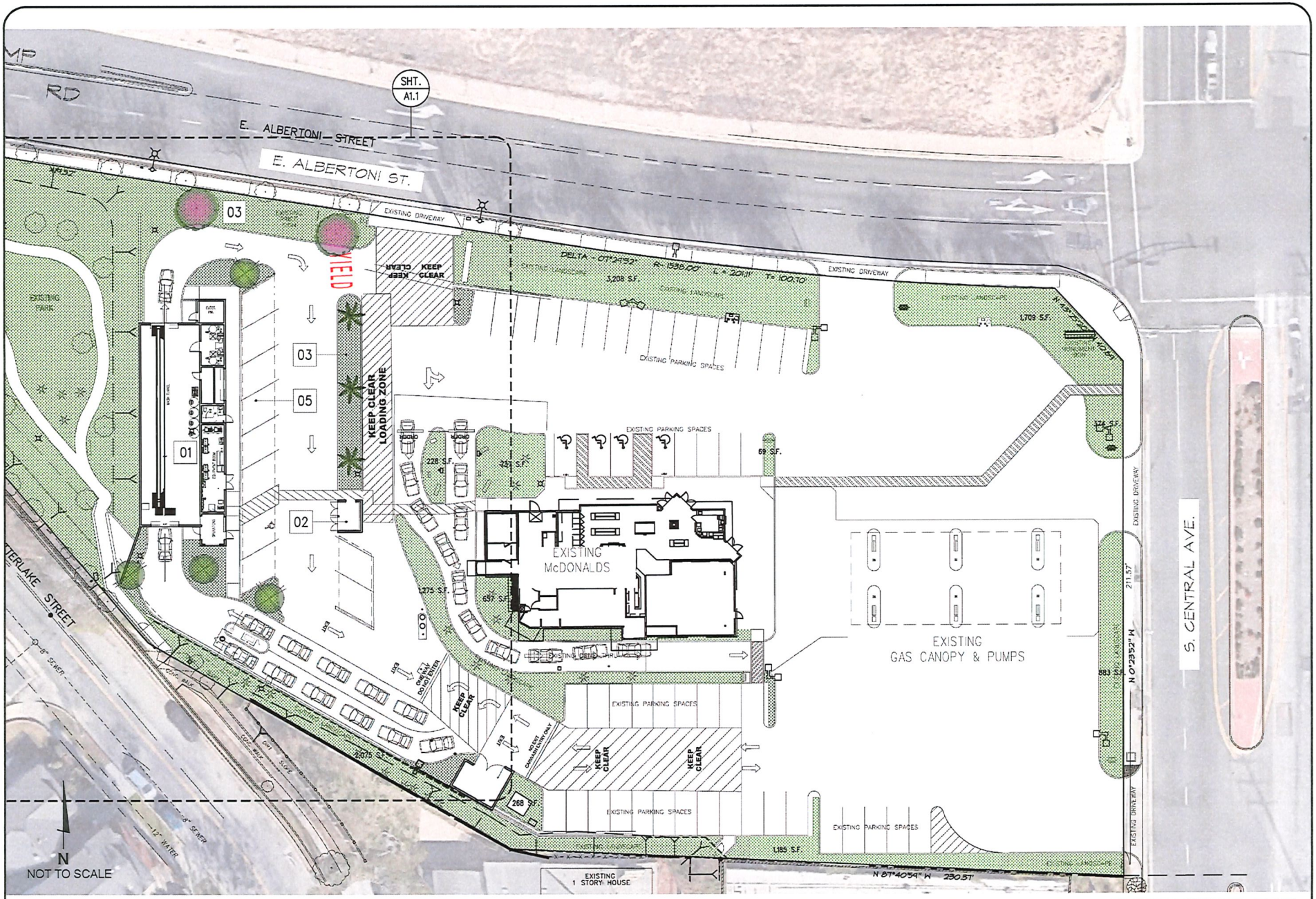


ASSOCIATED TRANSPORTATION ENGINEERS

OUTBOUND TURNING MOVEMENTS

FIGURE 18

JH - ATE#24051



ASSOCIATED TRANSPORTATION ENGINEERS

YIELD STRIPING AT CARWASH EXIT

FIGURE 19

JH - ATE#24051

TRANSIT, PEDESTRIAN AND BICYCLE FACILITIES

Transit Service

Metro, Long Beach Transit, Compton Renaissance Transit, Gardena Transit and Torrance Transit are the local transit providers for the City of Carson. The Project site is served by the LA Metro #53 Route (Downtown to CSU Domiguez Hills). The #53 Route operates on weekdays and weekends providing fixed route bus service on Central Avenue adjacent to the Project site. There is an existing transit stop with a bench located adjacent to the Project frontage on Central Avenue. The Project site is served by the Torrance Transit #6 Route (Del Amo Fashion Center to Artesia Station). The #6 Route operates on weekdays and weekends providing fixed route bus service on Central Avenue adjacent to the Project site. There is an existing transit stop with a bench located adjacent to the Project frontage on Central Avenue. The Project site is served by the Torrance Transit #13 Route (Redondo Beach to Artesia Station). The #13 Route operates on weekdays and weekends providing fixed route bus service on Central Avenue adjacent to the Project site. There is an existing transit stop with a bench located adjacent to the Project frontage on Central Avenue. The Project site is also served by Compton Renaissance Transit operated by the City of Compton. The Project does have the potential to incrementally increase transit ridership and the demand for transit service in the study-area, however the exiting transit service has capacity to accommodate these increases.

Pedestrian Facilities

Currently, sidewalks are provided along Central Avenue and Albertoni Street. The sidewalks connect the Project to Central Avenue where transit service is provided in the study-area. The Project site provides curb, gutter and sidewalk on Central Avenue and Albertoni Street along its frontage. The Project would not have an adverse effect on the pedestrian facilities in the study-area.

Bicycle Facilities

Central Avenue, Albertoni Street and Victoria Avenue are identified as part of the City of Carson Bikeway System. Class III bike lanes currently exist along Central Avenue, Albertoni Street and Victoria Street through the study-area. The Class III bike lanes connect the Project to the residential and commercial areas north, south, east and west of the Project. The Project would not have an adverse effect on the bike facilities in the study-area.

■ ■ ■

REFERENCES AND PERSONS CONTACTED

Associated Transportation Engineers

Richard L. Pool, P.E., Principal Engineer
Darryl F. Nelson, Senior Transportation Planner
Jiho Ha, Transportation Engineer II

References

Highway Capacity Manual, Highway Research Board Special Report 209, Transportation Research Board, National Research Council, 2021.

Trip Generation, Institute of Transportation Engineers, 11th Edition, 2017.

Circulation Element, City of Carson, October 2021

Persons Contacted

John Merrill, P.E., T.E., City of Carson

TECHNICAL APPENDIX

CONTENTS:

TRAFFIC STUDY MEMORANDUM OF UNDERSTANDING

ASSOCIATED TRANSPORTATION ENGINEERS

100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110 • (805)687-4418 • main@atesb.com

Since 1978

Richard L. Pool, P.E.
Scott A. Schell

August 13, 2024 24051L01

Mr. Max Netty
Soundview Investment Partners
1875 Century Park East, #600
Los Angeles, CA 90067

TRIP GENERATION, SITE ACCESS AND CIRCULATION, VMT ANALYSIS ASSUMPTIONS FOR THE CARSON CARWASH EXPRESS PROJECT - CARSON, CALIFORNIA

The following letter presents the trip generation, site access and circulation, Vehicle Miles Traveled (VMT) assumptions for the Carson Carwash Express development (the "Project"). It is our understanding that the trip generation and VMT assumptions will be submitted to the City in order to develop the scope of work the traffic study required as part of the Project's development application.

PROJECT DESCRIPTION

The current Project application is for the construction of a 3,146 square feet automated carwash facility to create a new automated tunnel carwash on-site with the existing 4,709 square foot Chevron/McDonald's gas station convenience market with 12 fueling positions and McDonalds with a drive-through window. Carwash customers will be able to purchase a carwash at the gas pump, the carwash kiosk or at the counter inside the convenience store. The Project site is located at 17543 Central Avenue in the City of Carson. Figure 1 (attached) illustrates the Project site plan. As shown, access to the site will be provided via driveway connections to Central Avenue and Albertoni Street.

PROJECT TRIP GENERATION

The trip generation forecasts presented below follow the steps recommended for mixed-use projects in the Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition.[1] Given

1 Trip Generation, Institute of Transportation Engineers, 11th Edition, 2020.

that the Project includes a mix of land uses, the trip generation steps include: 1) calculating trip generation based on ITE rates, 2) calculating internal trips (internal capture trips remain onsite and do not affect the adjacent street network), and 3) determining pass-by trips (pass-by trips affect driveways that provide Project access but do not affect the adjacent street network).

ITE Rates. The ITE trip rates for Service Station with Convenience Mart (ITE #945) were used in the trip generation analysis for the existing onsite facilities other than the carwash. Local study data was used to develop trip estimates for the existing and proposed drive-through carwash facilities since ITE data for that land use does not contain sufficient data points for the trip generation analysis.

ITE data for Car-Wash Automated (ITE #948) has 3 studies that only include weekday PM peak rates but do not include daily or AM peak hour rates and are therefore insufficient for analysis. Study data used for the proposed automated carwash was collected at 2 similar sites in the Santa Barbara - Goleta area: 1) Mesa Fuel Depot located at 1929 Cliff Drive in Santa Barbara, and 2) Walnut Shell located at 5097 Hollister Avenue in Goleta. Both of these services stations have fueling positions, convenience markets and automated car wash facilities similar to the Project site. Daily carwash transaction information was compiled for each location for a 12-month period (May 2018 - May 2019). The data showed an average of 124 carwashes per day. AM and PM peak hour transaction records show that 3.4% of the carwashes occurred during the AM peak hour and 9.5% occurred during the PM peak hour. Trip rates for this component of the Project were developed using the data (see attached worksheet that summarizes the transaction data and the trip rate calculations).

Internal Capture. Some of the trips made to the new carwash facility will come from existing customers at the fueling pumps and thus will be internal to the site and not affect the study-area street network. The analysis assumed that 25% of the automated carwash customers would come from the service station or convenience market. The 25% capture rate is conservative as the data collected at the two Santa Barbara-Goleta service station sites discussed previously showed a 45% internal capture rate.

Pass-By Trips. The trip generation analysis also accounts "pass-by" trips pursuant to ITE recommended practices. These trips would be drawn from the existing traffic stream of the adjacent roadways and would affect the Project's driveways but would not affect the study-area street network beyond the Project site. Based on studies contained in the ITE Trip Generation Handbook, 62% of AM peak trips and 56% of PM peak hour trips generated by service stations with convenience markets would be pass-by trips. As a conservative assumption, the analysis assumes a 40% pass-by factor. Similarly, to be conservative, a 20% "pass-by" factor was applied to the automated carwash.

Summary. Worksheets showing the detailed trip generation calculations are attached. Table 1 summarizes the trip generation calculations for the proposed gas station with a carwash tunnel.

Table 1
Proposed Gas Station and Carwash Trip Generation Estimates

Land Use	Size	ADT		AM Peak Hour		PM Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Carwash – Automated	1 Tunnel	249.00[(a)]	249	8.50	9	23.70	24
- Internal Trips (25%)			62		2		8
- Pass-By Trips (20%)			50		2		5
Primary Trips			***137***		***5***		***11***

(a) Trip rate based on studies of similar sites in Santa Barbara-Goleta.

The data presented in Table 1 indicate that the proposed automated carwash facility is forecast to generate 137 average daily, 5 AM peak hour and 11 PM peak hour "primary" trips. The remaining 112 average daily trips (ADT), 4 AM peak hour trips and 13 PM peak hour trips are "internal" or "pass-by" trips.

Based on the trip generation estimates presented in Table 1 the proposed automated carwash facility would result in a net increase of 137 primary ADT, 5 primary AM peak hour trips and 11 primary PM peak hour trips. These primary trips would be new trips added to the adjacent street system.

PROJECT TRIP DISTRIBUTION

Project-generated traffic was distributed onto the study-area roadway system based on consideration of the residential development and other automated carwash facilities in and surrounding areas of the City. The Project trip distribution is presented in Table 2. Figure 2 (attached) illustrates the trip distribution and assignment of the Project generated AM and PM peak hour trips.

Table 2
Project Trip Distribution

Route	Origin/Destination	Percentage
Central Avenue	North	50%
	South	40%
Albertoni Street	West	10%
	Total:	100%

STUDY-AREA FACILITIES

The City of Carson uses the County of Los Angeles TIA guidelines. Projects that are anticipated to generate a net 50 or more peak hour trips through an intersection or new 110 trips or more per day are required to prepare a Traffic Impact Analysis (TIA). If the City staff has determined

that a comprehensive traffic study is required, the following study-area facilities and scenarios would be evaluated. ATE will use counts collected in 2024 for the following study-area facilities.

Intersection

- Central Avenue/Albertoni Street (Signalized)
- Central Avenue/Project Driveways
- Albertoni Street/Project Driveways

Scenarios Evaluated

- Existing Conditions
- Existing + Project Conditions
- Cumulative (Existing + Approved Projects) Conditions
- Cumulative (Existing + Approved Projects) + Project Conditions

The study-area facilities will be evaluated based on the City of Carson Circulation Element thresholds.

SITE ACCESS AND CIRCULATION

As illustrated on the Project site plan (Figure 1), access to the Project site would be provided via driveway connections to Central Avenue and Albertoni Street. Figure 3 (attached) illustrates the Project driveway volumes. Central Avenue provides access to the Project site and serves the commercial, industrial and residential uses adjacent to the Project. Central Avenue is a 4-lane divided north-south roadway. Central Avenue is fully improved with curb, gutter, sidewalk and street lighting. The posted speed limit on Central Avenue is 40 MPH. The Project site's northern driveway allows right-turns inbound and outbound only due to a raised median. The Project site's southern driveway allows full access due to a break in the raised median. The existing Central Avenue driveway connections have been designed and constructed to City of Carson design standards. The Project would not be required to improve Central Avenue along its frontage or the existing driveways.

Albertoni Street also provides access to the Project site via two driveway connection. In the study-area Albertoni Street functions as a 2-lane east-west frontage road on the south side of State Route 91. At the intersection of Central Avenue, Albertoni Street merges with the eastbound State Route 91 on/off-ramps. Albertoni Street is partially improved with curb, gutter, sidewalk and street lighting. The posted speed limit on Albertoni Street is 45 MPH. The Project site driveways on Albertoni Street allow right-turns inbound and outbound only. The existing Albertoni Street driveway connections have been designed and constructed to City of Carson design standards. The Project would not be required to improve Albertoni Street along its frontage or the existing driveways.

An internal circulation system will provide access and connect the proposed automated carwash facility to Central Avenue and Albertoni Street. As illustrated on the site plan, the proposed internal circulation provides direct access and egress to the carwash tunnel. Carwash vehicles can enter via either Central Avenue or Albertoni Street and circulate through the site to enter the

carwash tunnel drive through lane. The carwash drive through lane provides adequate space for 11 vehicles to queue in the drive through lane before effecting the parking area on the south side of the building. There is sufficient on-site queue space to allow additional carwash vehicles to queue on-site before effecting the operation of Central Avenue. Once the carwash is completed, carwash vehicles can immediately exit via Albertoni Street or circulate through the site and exit via Central Avenue. Carwash vehicles wishing to use the on-site vacuum/detailing facilities can circulate clockwise around the tunnel exit. Carwash vehicles circulating on-site will interface with Chevron/Mc Donalds customers. ATE will develop a transportation management plan (TMP) to address the on-site vehicle circulation and carwash drive through vehicle queues to limit any potential spillover into the public right-or-way. On-site circulation figures will be provided as part of the traffic study.

Carwash Drive-Through Storage and Queuing

In order to evaluate the adequacy of the vehicle queue storage area provided at the proposed automated carwash facility, queue study data was obtained from surveys conducted at similar facilities. Queue data collected for the *Drive-Through Queue Generation Study* is summarized in Table 3. The carwash drive through queue data was collected over 12 days at 6 drive through carwash facilities located in Minnesota, five of the 6 were located at gas stations.

Table 3
National Carwash Queues Study Results

# Studies	Average Maximum Queue	Range of Maximum Queue	85th Percentile Queue
12 Days	4.42 Vehicles	1-10 Vehicles	6.2 Vehicles

The data presented in Table 3 indicates that the maximum peak queue observed was 10 vehicles and the 85th percentile peak queue observed was 6.2 vehicles. The 85th percentile represents the statistical maximum queue based on the range of the queue data. The national survey data suggest that carwash with drive through lanes should be able to accommodate 140 feet of vehicle stacking (7 vehicles).

Queue study data was also obtained from surveys conducted at local similar facilities in Long Beach: 1) Mobil located at Pacific Coast Highway in Long Beach, and 2) Mobil located at 6685 Atlantic Avenue in Long Beach. The local queue data collected is summarized in Table 6. The carwash drive through queue data was collected over 1 day on a Saturday from Noon to 6:00 PM.

Table 4
Local Carwash Queues Study Results

# Studies	Average Maximum Queue	Range of Maximum Queue	85th Percentile Queue
1 Day	2.66 Vehicles	1-8 Vehicles	3.0 Vehicles

The data presented in Table 4 indicates that the maximum peak queue observed was 8 vehicles and the 85th percentile peak queue observed was 3 vehicles.

The vehicle storage provided for the Project carwash drive through lane would accommodate the 85th percentile queues observed in the national and local studies without blocking the parking spaces on the south side of the Chevron/McDonald's building or the Central Avenue driveway. The Project would also accommodate the maximum observed queue without blocking the Central Avenue driveway.

VEHICLE MILES TRAVELED ANALYSIS

The City of Carson has adopted a new set of transportation assessment guidelines, in compliance with Senate Bill 743, which are based on a Vehicle Miles Traveled (VMT) metric rather than the traditional Level of Service (LOS) metric. Per the State's Natural Resource Agency Updated Guidelines for the Implementation of the CEQA adopted in 2018, VMT has been designated as the most appropriate measure of transportation impacts. "Vehicle Miles Traveled" refers to the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel. For land use projects, vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact.

CEQA Guidelines. The California Governor's Office of Planning and Research (OPR) published a technical advisory that includes recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures[2] The recommended VMT impact threshold for retail facilities is as follows:

> "Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact. Because new retail development typically redistributes shopping trips rather than creating new trips,[3] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts. By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant. Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project- specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are

2 Technical Advisory on Evaluating Transportation Impacts in CEQA, Governor's Office of Planning and Research, December 2018.

3 Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use, 2013.

likely in the best position to decide when a project will likely be local serving. Generally, however, retail commercial development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

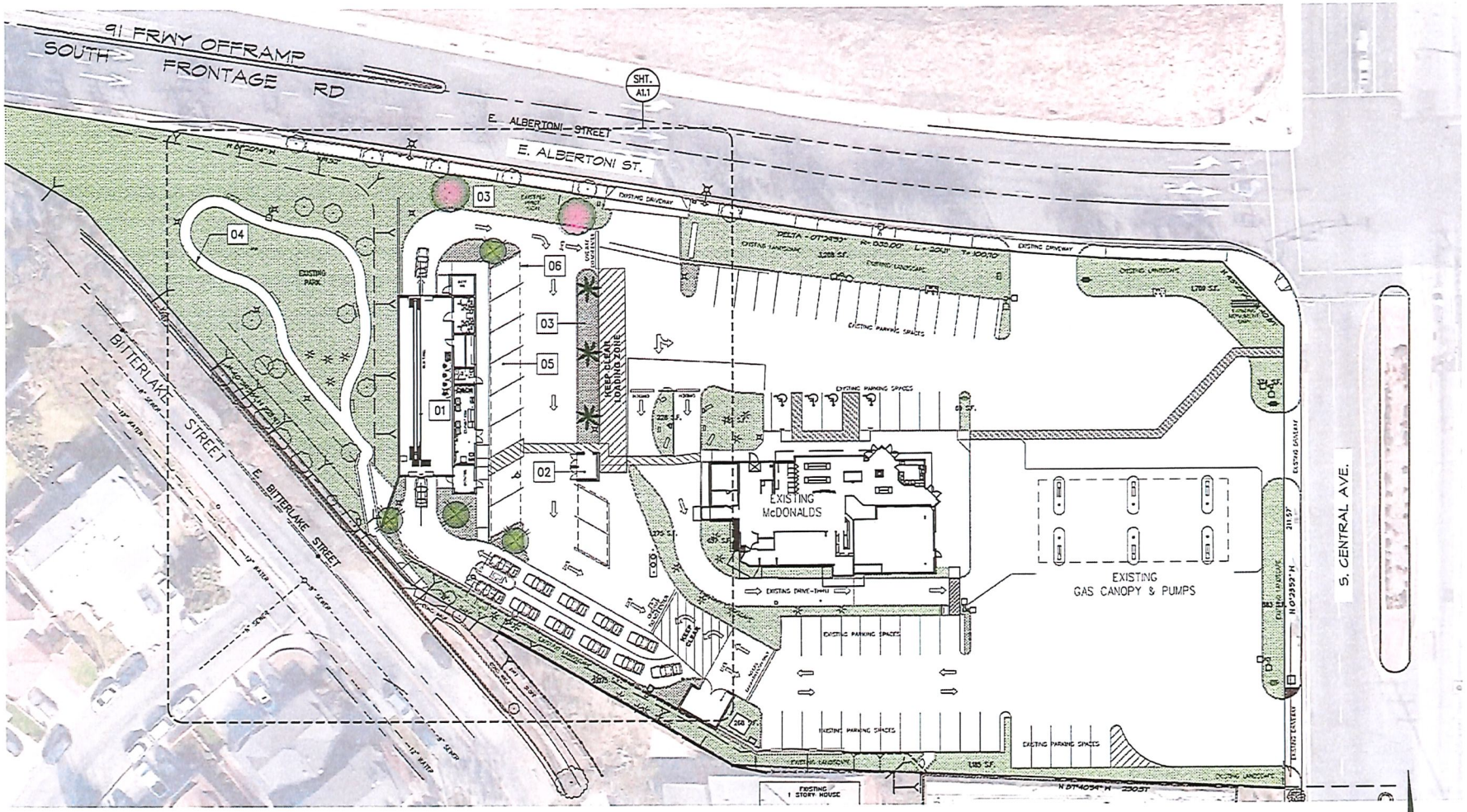
Given the size and location of the Project (net addition of 3,146 SF), it would be considered "local-serving" retail development that may be presumed to have a less than significant transportation impact based on the thresholds provided in the Technical Advisory (less than 50,000 SF). The location of the Project site will provide a convenient local-serving drive-through carwash facility for City of Carson residents and commuters that would divert traffic from Central Avenue and Albertoni Street currently traveling to the other drive-through carwash and gas station facilities. By improving destination proximity, the carwash Project will shorten trips and reduce VMT. It is also noted that a significant percentage of Project generated traffic (49% - 62%) would be "pass-by" in nature and thus is already travelling on the City's street system and not creating additional VMT. Thus, the Project would not generate significant CEQA impacts.

This concludes ATE's the trip generation, site access and circulation, Vehicle Miles Traveled (VMT) assumptions for the Carson Carwash Express. We appreciate the opportunity to assist you and the City with the Project.

Associated Transportation Engineers

By: Richard L. Pool, P.E.
Principal Engineer

attachments: Figure 1 - Project Site Plan
Figure 2 - Project Trip Distribution and Assignment
Figure 3 - Project Driveway Volumes

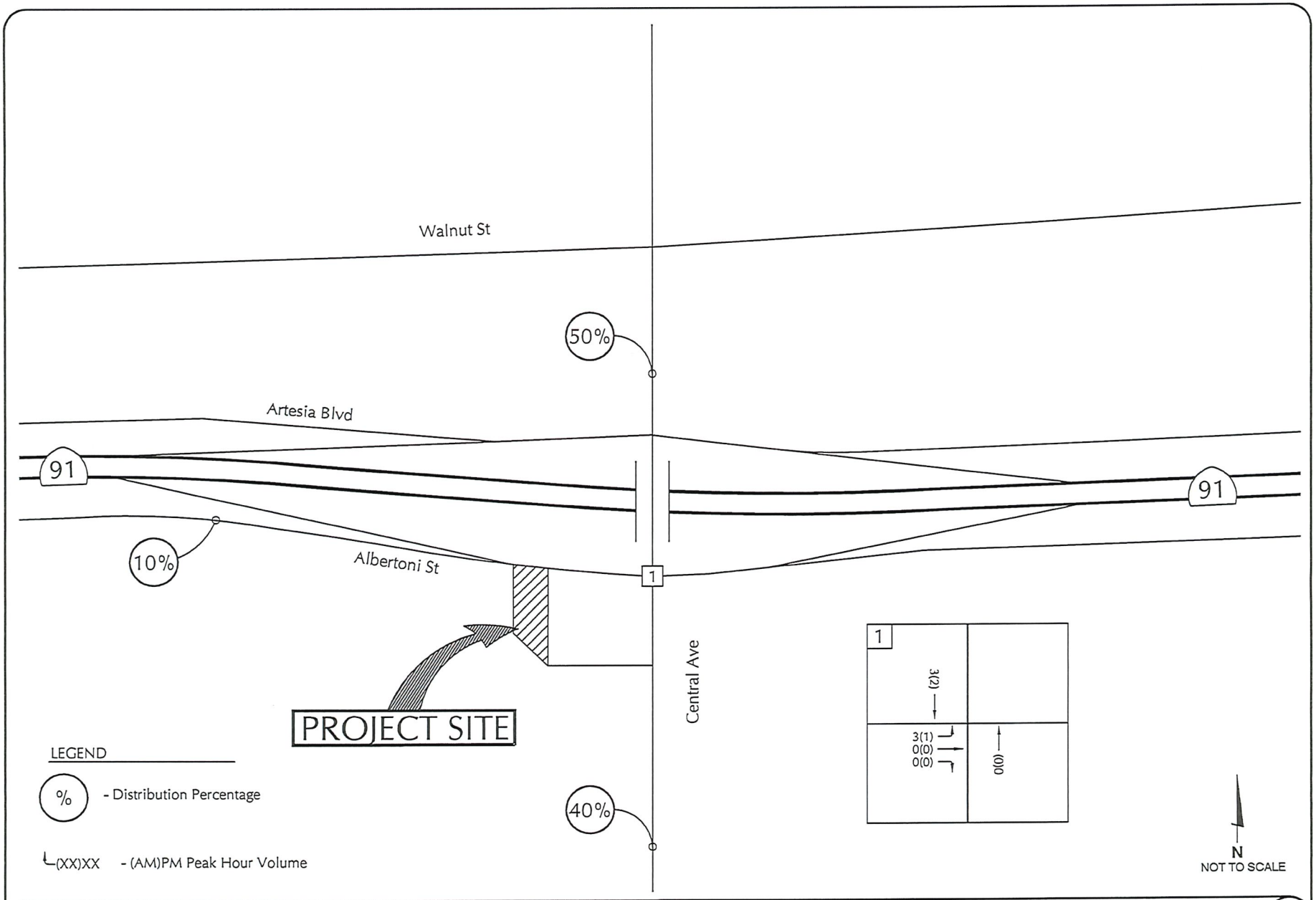


ASSOCIATED
TRANSPORTATION
ENGINEERS

PROJECT STIE PLAN

FIGURE 1

JH - ATE#24051

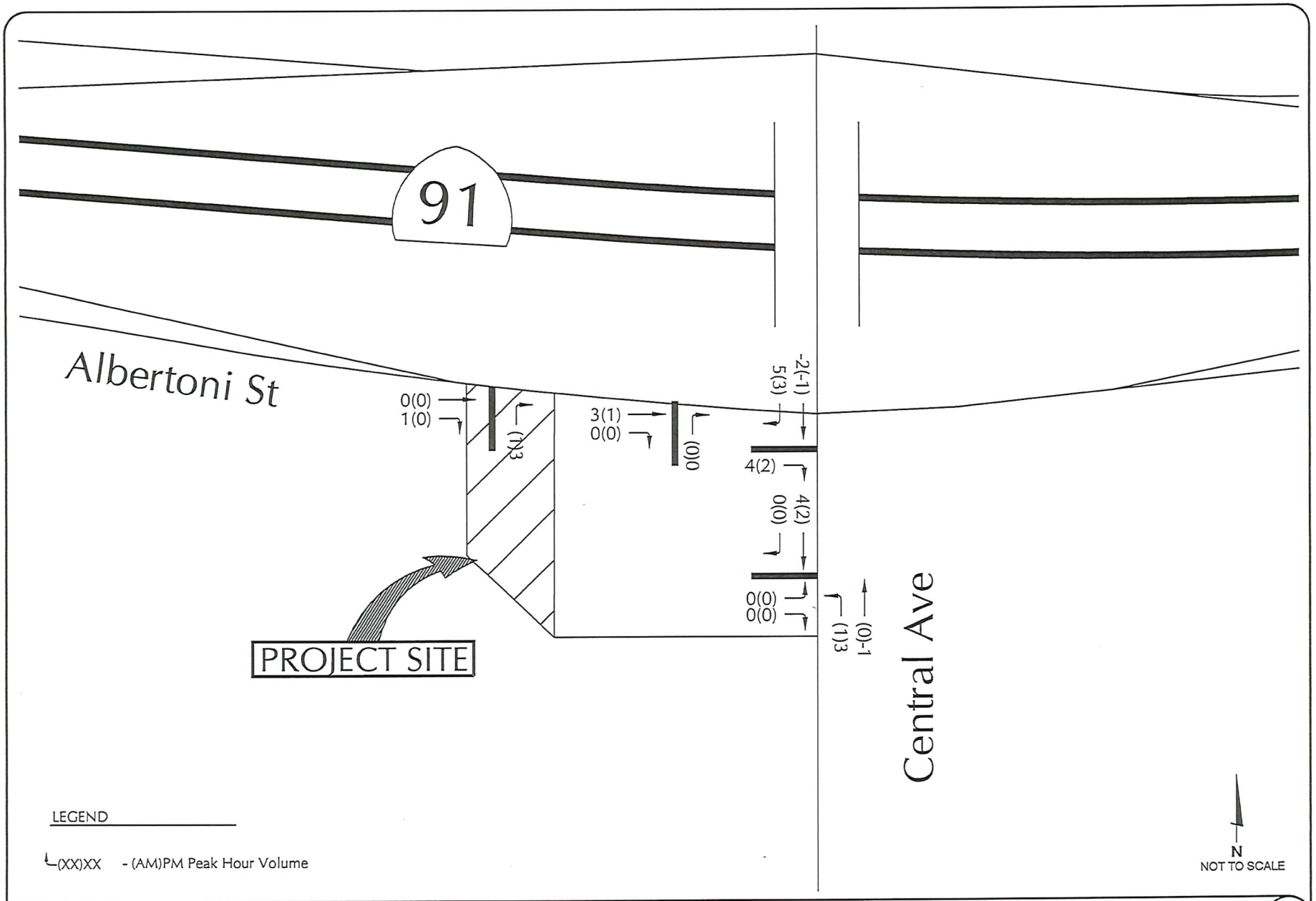


ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

FIGURE 2

JH - ATE#24051



ASSOCIATED TRANSPORTATION ENGINEERS

PROJECT DRIVEWAY VOLUMES

FIGURE 3

JH - ATE#24051

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

"Levels of Service" (LOS) A through F are used to rate roadway and intersection operating conditions, with LOS A indicating very good operations and LOS F indicating poor operations. More complete level of service definitions are:

LOS	Definition
A	Low volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within traffic stream. Drivers can maintain their desired speeds with little or no delay.
B	Stable flow with potential for some restriction of operating speeds due to traffic conditions. Maneuvering is only slightly restricted. Stopped delays are not bothersome and drivers are not subject to appreciable tension.
C	Stable operations, however the ability to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail but adverse signal coordination or longer queues cause delays.
D	Approaching unstable traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in their ability to maneuver and their selection of travel speeds. Comfort and convenience are low but tolerable.
E	Operations characterized by significant approach delays and average travel speeds of one-half to one-third of free flow speed. Flow is unstable and potential for stoppages of brief duration. High signal density, extensive queuing, or signal progression/timing are the typical causes of delays.
F	Forced flow operations with high approach delays at critical signalized intersections. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of downstream congestion.

Signalized Intersection Level of Service Definitions

LOS	Delay[a]	V/C Ratio	Definition
A	< 10.0	< 0.60	Progression is extremely favorable. Most vehicles arrive during the green phase. Many vehicles do not stop at all.
B	10.1 - 20.0	0.61 - 0.70	Good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
C	20.1 - 35.0	0.71 - 0.80	Only fair progression, longer cycle lengths, or both, result in higher cycle lengths. Cycle lengths may fail to serve queued vehicles, and overflow occurs. Number of vehicles stopped is significant, though many still pass through intersection without stopping.
D	35.1 - 55.0	0.81 - 0.90	Congestion becomes more noticeable. Unfavorable progression, long cycle lengths and high v/c ratios result in longer delays. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	55.1 - 80.0	0.91 - 1.00	High delay values indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent
F	> 80.0	> 1.00	Considered unacceptable for most drivers, this level occurs when arrival flow rates exceed the capacity of lane groups, resulting in many individual cycle failures. Poor progression and long cycle lengths may also contribute to high delay levels.

[a] Average control delay per vehicle in seconds.

Unsignalized Intersection Level of Service Definitions

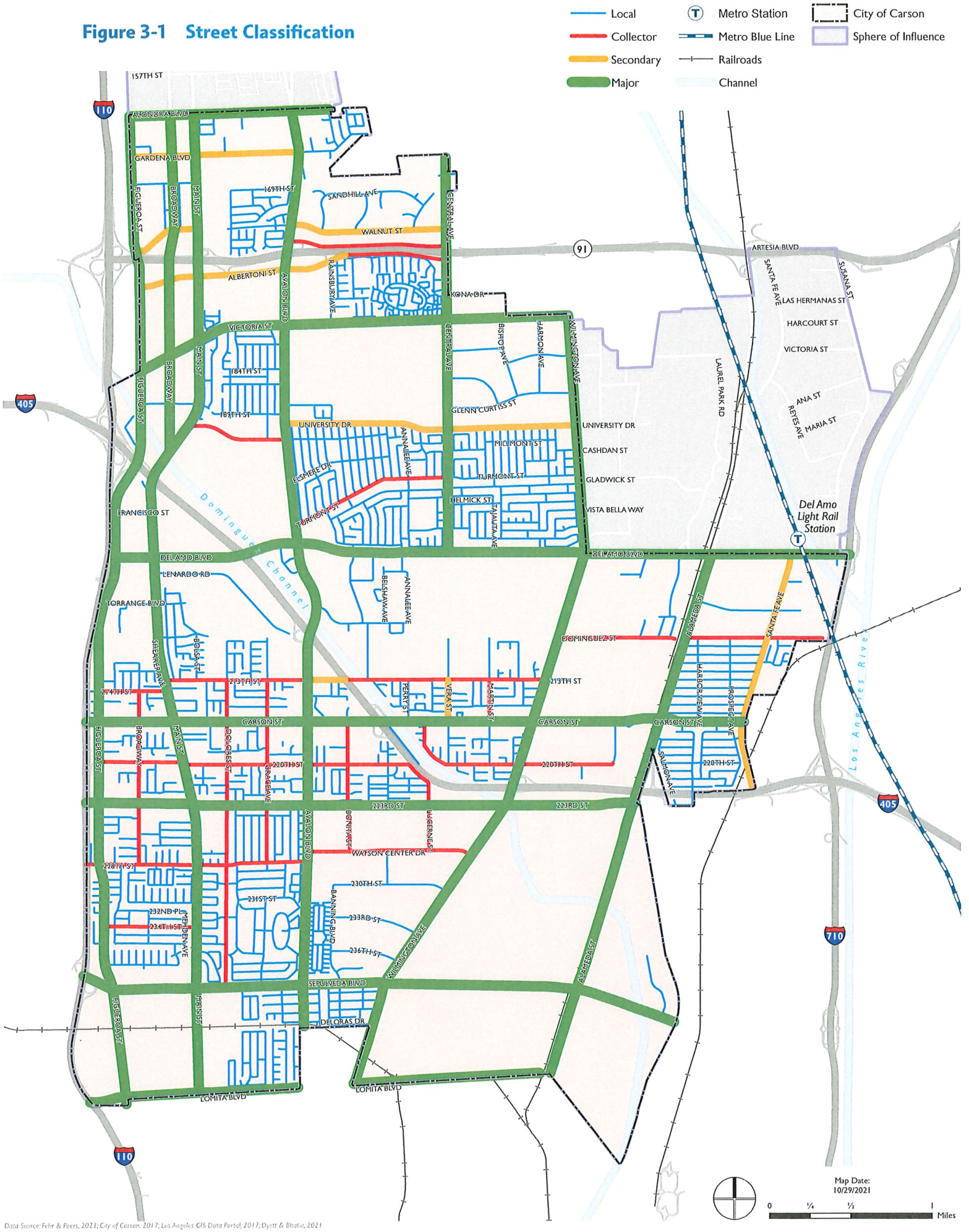
The HCM[1] uses *control delay* to determine the level of service at unsignalized intersections. Control delay is the difference between the travel time actually experienced at the control device and the travel time that would occur in the absence of the traffic control device. Control delay includes deceleration from free flow speed, queue move-up time, stopped delay and acceleration back to free flow speed.

LOS	Control Delay Seconds per Vehicle
A	< 10.0
B	10.1 - 15.0
C	15.1 - 25.0
D	25.1 - 35.0
E	35.1 - 50.0
F	> 50.0

[1] Highway Capacity Manual, National Research Board, 2000

GENERAL PLAN CIRCULATION PLAN ROADWAY CLASSIFICATIONS

Figure 3-1 Street Classification



Map Date: 10/29/2021

0 ¼ ½ 1 Miles

Data Source: Fehr & Peers, 2021; City of Carson, 2017; Los Angeles GIS Data Portal, 2017; Dyett & Bhatia, 2021

TRAFFIC COUNT DATA

Prepared by National Data & Surveying Services

S Central Ave & SR 91/Gardena Fwy WB Ramps/E-W Artesia Blvd

Peak Hour Turning Movement Count

ID: 24-020362-003
City: Carson

Day: Thursday
Date: 10/10/2024

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	NONE
PM	04:30 PM - 05:30 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	NONE
PM	4:00 PM - 06:00 PM

SOUTHBOUND — S Central Ave

AM	216	900	0	0	960	AM
NOON	0	0	0	0	0	NOON
PM	180	759	0	0	1171	PM

EASTBOUND — SR 91/Gardena Fwy WB Ramps/E-W Artesia Blvd

AM	NOON	PM	
525	0	548	⇦
0	0	0	↶ 0
0	0	0	↱ 0
0	0	0	→ 0
0	0	0	↷ 0
AM	NOON	PM	

WESTBOUND — SR 91/Gardena Fwy WB Ramps/E-W Artesia Blvd

PM	NOON	AM	
363	0	358	0 ↶
81	0	137	0 ←
391	0	589	0 ↰
0	0	0	0 ↱
0	0	0	⇨
PM	NOON	AM	

CONTROL

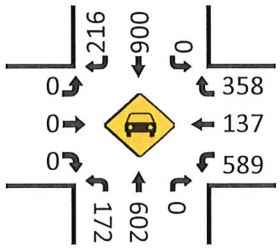
Signalized

TEV	2975	0	2870
	AM	NOON	PM
PHF	0.96		0.94

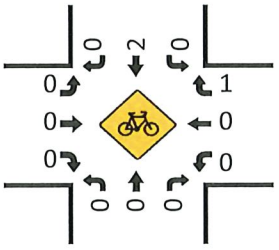
NORTHBOUND — S Central Ave

PM	1151	1	287	808	0	PM
NOON	0	0	0	0	0	NOON
AM	1490	1	172	602	0	AM

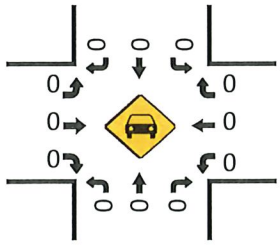
Totals (AM)



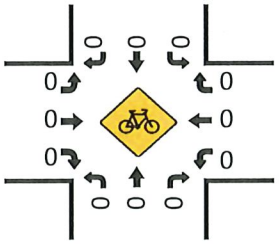
Total Bikes (AM)



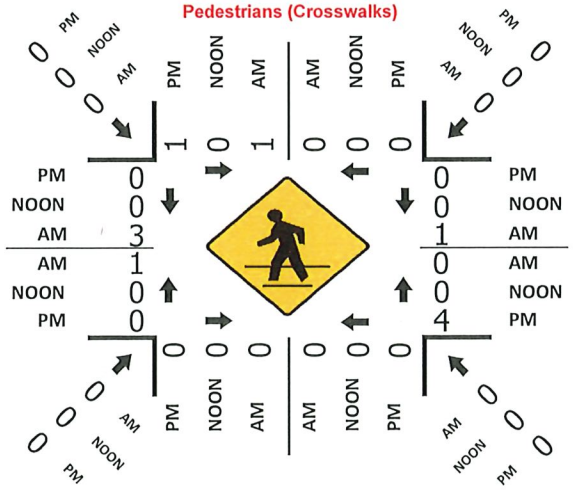
Totals (NOON)



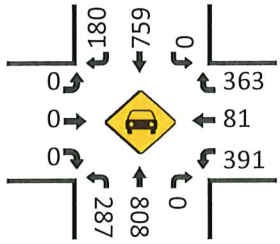
Total Bikes (NOON)



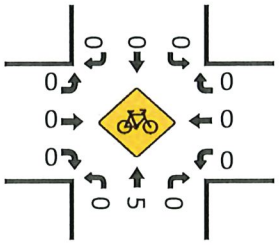
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by National Data & Surveying Services

S Central Ave & SR 91/Gardena Fwy EB Ramps/E Albertoni St/W Artesia Blvd

Peak Hour Turning Movement Count

ID: 24-020362-002
City: Carson

Day: Thursday
Date: 10/10/2024

PEAK HOURS
07:45 AM - 08:45 AM
NONE
04:45 PM - 05:45 PM

COUNT PERIODS
7:00 AM - 09:00 AM
NONE
4:00 PM - 06:00 PM

SOUTHBOUND — S Central Ave

AM	0	1033	465	0	774	AM
NOON	0	0	0	0	0	NOON
PM	0	814	344	1	1076	PM

EASTBOUND — SR 91/Gardena Fwy EB Ramps/E Albertoni St/W Artesia Blvd

AM	NOON	PM
0	0	0
0	0	0
257	0	303
105	0	788
393	0	182

WESTBOUND — SR 91/Gardena Fwy EB Ramps/E Albertoni St/W Artesia Blvd

PM	NOON	AM
0	0	0
0	0	0
0	0	0
0	0	0
1587	0	883

CONTROL

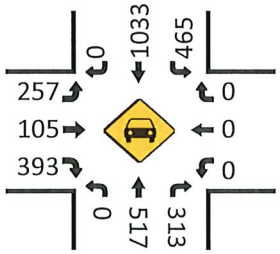
Signalized

TEV	3083 AM	0 NOON	3659 PM
PHF	0.96		0.96

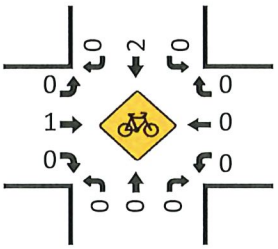
NORTHBOUND — S Central Ave

PM	996	0	0	772	455	PM
NOON	0	0	0	0	0	NOON
AM	1426	0	0	517	313	AM

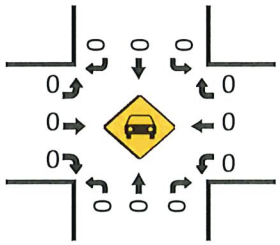
Totals (AM)



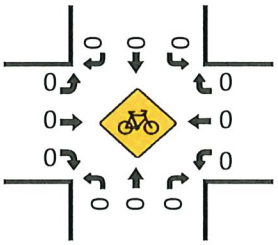
Total Bikes (AM)



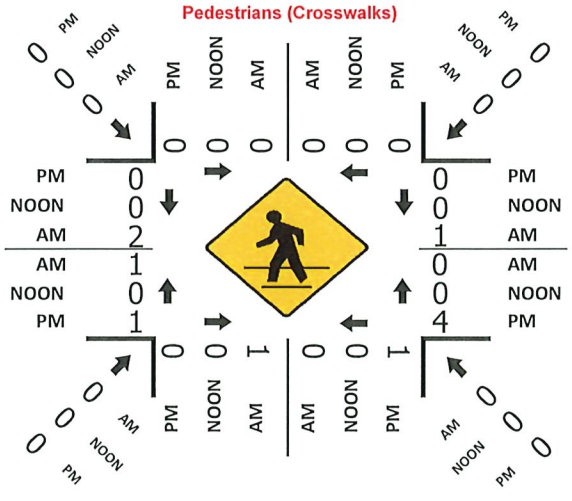
Totals (NOON)



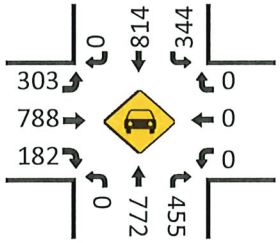
Total Bikes (NOON)



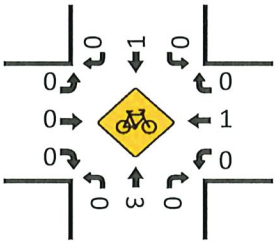
Pedestrians (Crosswalks)



Totals (PM)



Total Bikes (PM)



Prepared by National Data & Surveying Services

S Central Ave & E Victoria St

Peak Hour Turning Movement Count

ID: 24-020362-001
City: Carson

Day: Thursday
Date: 10/10/2024

Period	Peak Hours	Count Periods
AM	07:45 AM - 08:45 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	4:00 PM - 06:00 PM

CONTROL: Signalized

	AM	NOON	PM
TEV	2620	0	3290
PHF	0.90		0.96

SOUTHBOUND (S Central Ave)

	Right	Through	Left	U-Turn	Northbound departure
AM	487	745	158	2	705
NOON	0	0	0	0	0
PM	236	619	121	2	1129
Bikes/Peds	0	0	0	0	

EASTBOUND (E Victoria St)

	AM	NOON	PM	Bikes/Peds
Westbound departure	721	0	558	
U-Turn	3	0	0	0
Left	154	0	445	0
Through	147	0	687	0
Right	106	0	142	0

WESTBOUND (E Victoria St)

	PM	NOON	AM	Bikes/Peds
Right	138	0	86	0
Through	217	0	167	0
Left	16	0	14	0
U-Turn	0	0	0	0
Eastbound departure	826	0	329	

NORTHBOUND (S Central Ave)

	Southbound departure	U-Turn	Left	Through	Right
Bikes/Peds		0	0	0	0
PM	777	0	105	544	18
NOON	0	0	0	0	0
AM	865	0	64	463	24

Totals (AM)

Approach	Left	Through	Right
Southbound	158	745	487
Eastbound	154	147	106
Westbound	14	167	86
Northbound	64	463	24

Totals (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Totals (PM)

Approach	Left	Through	Right
Southbound	121	619	236
Eastbound	445	687	142
Westbound	16	217	138
Northbound	105	544	18

Total Bikes (AM)

Approach	Left	Through	Right
Southbound	0	1	0
Eastbound	0	1	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (NOON)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Total Bikes (PM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	1	0	0
Westbound	0	1	1
Northbound	1	4	0

Pedestrians (Crosswalks)

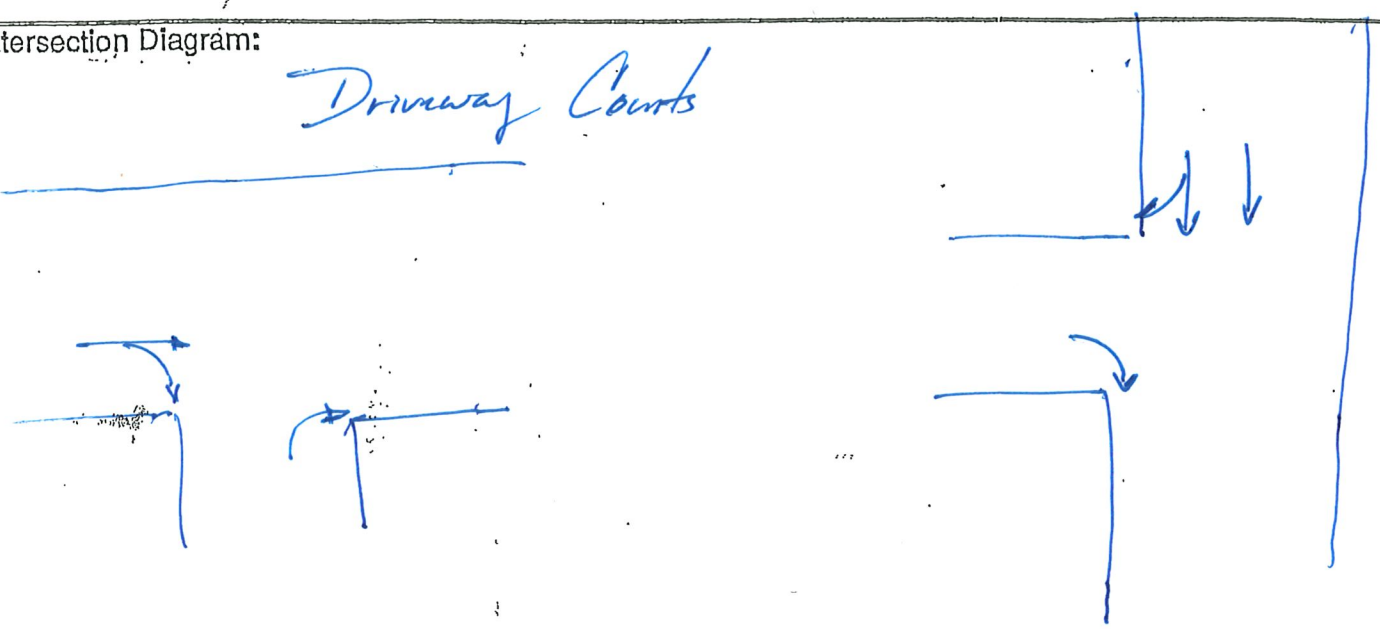
Crosswalk	Direction	AM	NOON	PM
North	Eastbound	5	0	1
North	Westbound	1	0	1
West	Southbound	9	0	3
West	Northbound	2	0	1
East	Southbound	1	0	0
East	Northbound	0	0	0
South	Eastbound	0	0	0
South	Westbound	0	0	0
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Counted By: _____ Date: October 24, 2024 Day: _____

Checked By: _____ Weather Conditions: _____

Intersection Diagram:

Driveway Counts



Unusual Occurances During Count Period: _____

MOVEMENT	Alberton Street						Central Avenue						
	West Dwy			East Dwy			North Dwy			South Dwy			
TIME ENDING	↘	↗		↘	↗		↘	↘		↗	↘	↘	↓
:15 A/P	III	III		I	IIII		IIII IIII	IIII		IIII IIII	IIII I	III IIII	III
:30	IIII	IIII		I	IIII		III IIII	I IIII		IIII IIII	IIII	IIII II	III
:45	IIII	II		II	III		II IIII	IIII		IIII II	IIII	IIII	II
:00	III	IIII		I	IIII		IIII IIII	IIII		IIII	IIII I	III IIII	II
:15	14	13		5	16		30	19		39	20	38	10
:30													
:45													
:00													
:15													
:30													
:45													
:00													
:15	II	I		II	III		IIII IIII	I IIII		IIII II IIII	IIII	IIII IIII	II
:30	IIII	II		0	IIII		IIII II IIII	IIII		IIII I IIII	II IIII	IIII IIII	III
:45	IIII I	II		III	IIII		IIII II IIII	IIII		IIII IIII	I IIII	IIII IIII III	IIII
:00	III	0		I	IIII		II IIII	IIII		IIII I	IIII	IIII II	III
:15	16	5		6	17		32	22		44	22	45	12

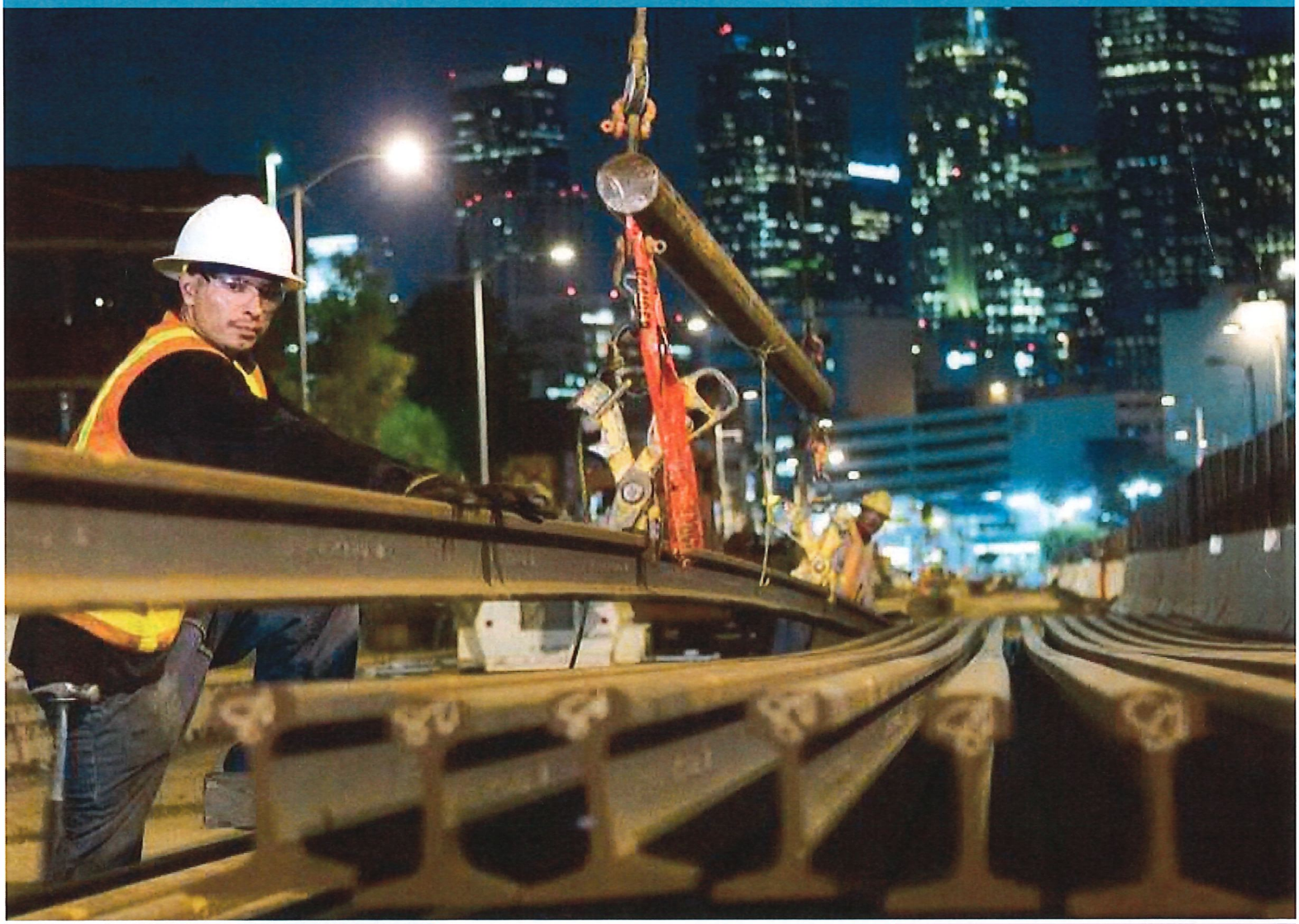
AM

PM

LOS ANGELES COUNTY 2010 CMP (EXHIBIT D-1)

Los Angeles County
Metropolitan Transportation Authority

2010 CONGESTION MANAGEMENT PROGRAM



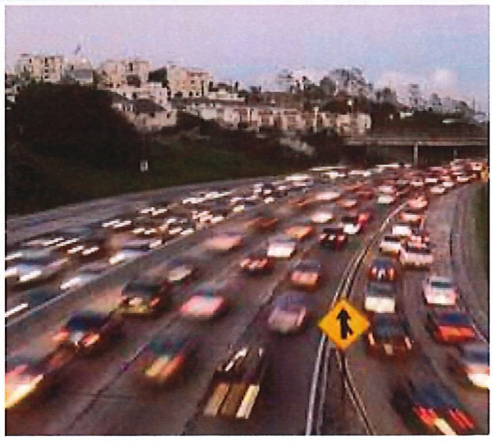


Exhibit D-1

GENERAL TRAFFIC VOLUME GROWTH FACTORS

RSA	Representative City/Place	2010	2015	2020	2025	2030	2035
7	Agoura Hills	1.000	1.020	1.041	1.052	1.063	1.075
8	Santa Clarita	1.000	1.145	1.291	1.348	1.405	1.461
9	Lancaster	1.000	1.214	1.427	1.676	1.924	2.172
10	Palmdale	1.000	1.134	1.267	1.363	1.458	1.553
11	Angeles Forest	1.000	1.151	1.301	1.394	1.487	1.580
12	West S.F. Valley	1.000	1.027	1.054	1.068	1.083	1.097
13	Burbank	1.000	1.024	1.049	1.063	1.077	1.092
14	Sylmar	1.000	1.024	1.049	1.071	1.093	1.114
15	Malibu	1.000	1.027	1.054	1.075	1.096	1.117
16	Santa Monica	1.000	1.014	1.028	1.038	1.049	1.059
17	West/Central L.A.	1.000	1.007	1.014	1.024	1.034	1.044
18	South Bay/LAX	1.000	1.013	1.026	1.035	1.044	1.053
19	Palos Verdes	1.000	1.025	1.051	1.061	1.071	1.081
20	Long Beach	1.000	1.076	1.152	1.160	1.168	1.177
21	Vernon	1.000	1.073	1.146	1.158	1.170	1.182
22	Downey	1.000	1.052	1.104	1.116	1.127	1.139
23	Downtown L.A.	1.000	1.009	1.018	1.030	1.042	1.054
24	Glendale	1.000	1.014	1.027	1.041	1.055	1.068
25	Pasadena	1.000	1.041	1.082	1.098	1.115	1.131
26	West Covina	1.000	1.023	1.046	1.066	1.086	1.106
27	Pomona	1.000	1.081	1.161	1.190	1.219	1.248

Table 2 - Traffic Volume Growth Factors

Representative City/Place	2010	Compound Annual Growth (%)	2015	Compound Annual Growth (%)	2020	Compound Annual Growth (%)	2025	Compound Annual Growth (%)	2030	Compound Annual Growth (%)	2035
Agoura Hills	1.000	0.40	1.020	0.41	1.041	0.21	1.052	0.21	1.063	0.22	1.075
Santa Clarita	1.000	2.75	1.145	2.43	1.291	0.87	1.348	0.83	1.405	0.78	1.461
Lancaster	1.000	3.95	1.214	3.29	1.427	3.27	1.676	2.80	1.924	2.45	2.172
Palmdale	1.000	2.55	1.134	2.24	1.267	1.47	1.363	1.36	1.458	1.27	1.553
Angeles Forest	1.000	2.85	1.151	2.48	1.301	1.39	1.394	1.30	1.487	1.22	1.580
West S.F. Valley	1.000	0.53	1.027	0.52	1.054	0.26	1.068	0.28	1.083	0.26	1.097
Burbank	1.000	0.48	1.024	0.48	1.049	0.27	1.063	0.26	1.077	0.28	1.092
Sylmar	1.000	0.48	1.024	0.48	1.049	0.42	1.071	0.41	1.093	0.38	1.114
Malibu	1.000	0.53	1.027	0.52	1.054	0.40	1.075	0.39	1.096	0.38	1.117
Santa Monica	1.000	0.28	1.014	0.27	1.028	0.19	1.038	0.21	1.049	0.19	1.059
West/Central L.A.	1.000	0.14	1.007	0.14	1.014	0.20	1.024	0.19	1.034	0.19	1.044
South Bay/LAX	1.000	0.26	1.013	0.26	1.026	0.17	1.035	0.17	1.044	0.17	1.053
Palos Verdes	1.000	0.50	1.025	0.50	1.051	0.19	1.061	0.19	1.071	0.19	1.081
Long Beach	1.000	1.48	1.076	1.37	1.152	0.14	1.160	0.14	1.168	0.15	1.177
Vernon	1.000	1.42	1.073	1.33	1.146	0.21	1.158	0.21	1.170	0.20	1.182
Downey	1.000	1.02	1.052	0.97	1.104	0.22	1.116	0.20	1.127	0.21	1.139
Downtown L.A.	1.000	0.18	1.009	0.18	1.018	0.23	1.030	0.23	1.042	0.23	1.054
Glendale	1.000	0.28	1.014	0.26	1.027	0.27	1.041	0.27	1.055	0.25	1.068
Pasadena	1.000	0.81	1.041	0.78	1.082	0.29	1.098	0.31	1.115	0.29	1.131
West Covina	1.000	0.46	1.023	0.45	1.046	0.38	1.066	0.37	1.086	0.37	1.106
Pomona	1.000	1.57	1.081	1.44	1.161	0.49	1.190	0.48	1.219	0.47	1.248

CARWASH TRIP GENERATION SURVEY DATA

Prepared by National Data & Surveying Services

Trip Generation

Location: Sun Day Carwash, 5128 N Figueroa St
City: Highland Park, CA

Time	Trip Generation (# of Vehicles)		
	10/10/2024		
	IN	OUT	TOTAL
7:00 AM	1	2	3
7:15 AM	2	2	4
7:30 AM	4	2	6
7:45 AM	7	4	11
8:00 AM	4	4	8
8:15 AM	8	9	17
8:30 AM	10	9	19
8:45 AM	6	6	12
9:00 AM	9	5	14
9:15 AM	12	9	21
9:30 AM	17	18	35
9:45 AM	12	12	24
10:00 AM	9	12	21
10:15 AM	15	9	24
10:30 AM	12	17	29
10:45 AM	13	11	24
11:00 AM	9	11	20
11:15 AM	8	13	21
11:30 AM	16	10	26
11:45 AM	11	11	22
12:00 PM	8	12	20
12:15 PM	7	10	17
12:30 PM	6	7	13
12:45 PM	9	9	18
1:00 PM	15	6	21
1:15 PM	12	14	26
1:30 PM	12	12	24
1:45 PM	10	11	21
2:00 PM	11	12	23
2:15 PM	12	10	22
2:30 PM	15	8	23
2:45 PM	15	14	29
3:00 PM	10	17	27
3:15 PM	6	12	18
3:30 PM	9	9	18
3:45 PM	17	12	29
4:00 PM	7	11	18
4:15 PM	7	9	16
4:30 PM	12	11	23
4:45 PM	11	9	20
5:00 PM	4	9	13
5:15 PM	11	3	14
5:30 PM	15	15	30
5:45 PM	12	13	25
6:00 PM	6	8	14
6:15 PM	13	15	28
6:30 PM	13	7	20
6:45 PM	6	12	18
7:00 PM	2	6	8
7:15 PM	1	3	4
7:30 PM	2	3	5
7:45 PM	0	1	1
Totals	481	486	967

AM Peak Hour	Trip Generation (# of Vehicles)		
	10/10/2024		
	IN	OUT	TOTAL
7:00 AM	1	2	3
7:15 AM	2	2	4
7:30 AM	4	2	6
7:45 AM	7	4	11
8:00 AM	4	4	8
8:15 AM	8	9	17
8:30 AM	10	9	19
8:45 AM	6	6	12
8:00-9:00 AM	28	28	56

PM Peak Hour	Trip Generation (# of Vehicles)		
	10/10/2024		
	IN	OUT	TOTAL
4:00 PM	7	11	18
4:15 PM	7	9	16
4:30 PM	12	11	23
4:45 PM	11	9	20
5:00 PM	4	9	13
5:15 PM	11	3	14
5:30 PM	15	15	30
5:45 PM	12	13	25
5:00-6:00 PM	42	40	82

Peak Hour	Trip Generation (# of Vehicles)		
	10/10/2024		
	IN	OUT	TOTAL
9:30 AM	17	18	35
9:45 AM	12	12	24
10:00 AM	9	12	21
10:15 AM	15	9	24
9:30-10:30 AM	53	51	104

Prepared by National Data & Surveying Services

Trip Generation

Location: Sun Day Carwash, 5128 N Figueroa St
City: Highland Park, CA

Time	Trip Generation (# of Vehicles)		
	10/11/2024		
	IN	OUT	TOTAL
7:00 AM	4	0	4
7:15 AM	3	2	5
7:30 AM	6	6	12
7:45 AM	7	2	9
8:00 AM	9	8	17
8:15 AM	15	12	27
8:30 AM	17	8	25
8:45 AM	11	17	28
9:00 AM	11	13	24
9:15 AM	13	13	26
9:30 AM	13	10	23
9:45 AM	9	20	29
10:00 AM	20	8	28
10:15 AM	17	15	32
10:30 AM	13	20	33
10:45 AM	15	12	27
11:00 AM	12	15	27
11:15 AM	14	14	28
11:30 AM	20	15	35
11:45 AM	11	18	29
12:00 PM	10	14	24
12:15 PM	14	7	21
12:30 PM	12	14	26
12:45 PM	11	14	25
1:00 PM	10	13	23
1:15 PM	19	12	31
1:30 PM	17	15	32
1:45 PM	13	20	33
2:00 PM	12	13	25
2:15 PM	11	12	23
2:30 PM	8	8	16
2:45 PM	7	9	16
3:00 PM	18	6	24
3:15 PM	13	16	29
3:30 PM	17	12	29
3:45 PM	12	15	27
4:00 PM	16	18	34
4:15 PM	15	17	32
4:30 PM	7	11	18
4:45 PM	16	10	26
5:00 PM	12	13	25
5:15 PM	11	12	23
5:30 PM	10	16	26
5:45 PM	12	8	20
6:00 PM	5	9	14
6:15 PM	9	8	17
6:30 PM	7	9	16
6:45 PM	1	6	7
7:00 PM	1	0	1
7:15 PM	0	2	2
7:30 PM	0	1	1
7:45 PM	0	0	0
Totals	566	568	1134

AM Peak Hour	Trip Generation (# of Vehicles)		
	10/11/2024		
	IN	OUT	TOTAL
7:00 AM	4	0	4
7:15 AM	3	2	5
7:30 AM	6	6	12
7:45 AM	7	2	9
8:00 AM	9	8	17
8:15 AM	15	12	27
8:30 AM	17	8	25
8:45 AM	11	17	28
8:00-9:00 AM	52	45	97

PM Peak Hour	Trip Generation (# of Vehicles)		
	10/11/2024		
	IN	OUT	TOTAL
4:00 PM	16	18	34
4:15 PM	15	17	32
4:30 PM	7	11	18
4:45 PM	16	10	26
5:00 PM	12	13	25
5:15 PM	11	12	23
5:30 PM	10	16	26
5:45 PM	12	8	20
4:00-5:00 PM	54	56	110

Peak Hour	Trip Generation (# of Vehicles)		
	10/11/2024		
	IN	OUT	TOTAL
9:45 AM	9	20	29
10:00 AM	20	8	28
10:15 AM	17	15	32
10:30 AM	13	20	33
9:45-10:45 AM	59	63	122

CARWASH QUEUE SURVEY DATA

Prepared by National Data & Surveying Services

Snapshot Queue

Location: Sun Day Carwash, 5128 N Figueroa St
City: Highland Park, CA
Date: 10/10/2024

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
7:00 AM	2
7:05 AM	0
7:10 AM	0
7:15 AM	0
7:20 AM	0
7:25 AM	0
7:30 AM	1
7:35 AM	0
7:40 AM	1
7:45 AM	0
7:50 AM	1
7:55 AM	0
8:00 AM	1
8:05 AM	0
8:10 AM	0
8:15 AM	0
8:20 AM	0
8:25 AM	2
8:30 AM	0
8:35 AM	1
8:40 AM	1
8:45 AM	1
8:50 AM	1
8:55 AM	0
9:00 AM	0
9:05 AM	0
9:10 AM	1
9:15 AM	1
9:20 AM	1
9:25 AM	2
9:30 AM	1
9:35 AM	1
9:40 AM	0
9:45 AM	3
9:50 AM	3
9:55 AM	3

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
10:00 AM	0
10:05 AM	0
10:10 AM	0
10:15 AM	1
10:20 AM	0
10:25 AM	3
10:30 AM	2
10:35 AM	1
10:40 AM	3
10:45 AM	0
10:50 AM	2
10:55 AM	0
11:00 AM	3
11:05 AM	0
11:10 AM	0
11:15 AM	0
11:20 AM	1
11:25 AM	0
11:30 AM	1
11:35 AM	0
11:40 AM	3
11:45 AM	3
11:50 AM	1
11:55 AM	1
12:00 PM	1
12:05 PM	0
12:10 PM	0
12:15 PM	0
12:20 PM	2
12:25 PM	0
12:30 PM	1
12:35 PM	2
12:40 PM	1
12:45 PM	1
12:50 PM	1
12:55 PM	0

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
1:00 PM	1
1:05 PM	0
1:10 PM	6
1:15 PM	3
1:20 PM	2
1:25 PM	3
1:30 PM	1
1:35 PM	2
1:40 PM	1
1:45 PM	0
1:50 PM	0
1:55 PM	0
2:00 PM	2
2:05 PM	4
2:10 PM	4
2:15 PM	1
2:20 PM	0
2:25 PM	2
2:30 PM	8
2:35 PM	5
2:40 PM	4
2:45 PM	3
2:50 PM	2
2:55 PM	3
3:00 PM	4
3:05 PM	0
3:10 PM	2
3:15 PM	1
3:20 PM	0
3:25 PM	0
3:30 PM	0
3:35 PM	1
3:40 PM	0
3:45 PM	0
3:50 PM	2
3:55 PM	1

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
4:00 PM	1
4:05 PM	1
4:10 PM	1
4:15 PM	0
4:20 PM	1
4:25 PM	0
4:30 PM	1
4:35 PM	1
4:40 PM	0
4:45 PM	3
4:50 PM	4
4:55 PM	0
5:00 PM	0
5:05 PM	0
5:10 PM	1
5:15 PM	1
5:20 PM	0
5:25 PM	1
5:30 PM	1
5:35 PM	5
5:40 PM	3
5:45 PM	0
5:50 PM	2
5:55 PM	0
6:00 PM	1
6:05 PM	0
6:10 PM	1
6:15 PM	1
6:20 PM	0
6:25 PM	0
6:30 PM	1
6:35 PM	0
6:40 PM	0
6:45 PM	2
6:50 PM	0
6:55 PM	0

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
7:00 PM	0
7:05 PM	0
7:10 PM	0
7:15 PM	1
7:20 PM	0
7:25 PM	0
7:30 PM	0
7:35 PM	1
7:40 PM	0
7:45 PM	0
7:50 PM	0
7:55 PM	0
8:00 PM	0
Totals	165

Average	1
Maximum	8
85th	2
95th	4

Prepared by National Data & Surveying Services

Snapshot Queue

Location: Sun Day Carwash, 5128 N Figueroa St
City: Highland Park, CA
Date: 10/10/2024

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
7:00 AM	2
7:05 AM	0
7:10 AM	0
7:15 AM	0
7:20 AM	0
7:25 AM	0
7:30 AM	1
7:35 AM	0
7:40 AM	1
7:45 AM	0
7:50 AM	1
7:55 AM	0
8:00 AM	1
8:05 AM	0
8:10 AM	0
8:15 AM	0
8:20 AM	0
8:25 AM	2
8:30 AM	0
8:35 AM	1
8:40 AM	1
8:45 AM	1
8:50 AM	1
8:55 AM	0

AM Peak Hour: 7:50 AM - 8:50 AM

Average	1
Maximum	2
85th	1
95th	1

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
4:00 PM	1
4:05 PM	1
4:10 PM	1
4:15 PM	0
4:20 PM	1
4:25 PM	0
4:30 PM	1
4:35 PM	1
4:40 PM	0
4:45 PM	3
4:50 PM	4
4:55 PM	0
5:00 PM	0
5:05 PM	0
5:10 PM	1
5:15 PM	1
5:20 PM	0
5:25 PM	1
5:30 PM	1
5:35 PM	5
5:40 PM	3
5:45 PM	0
5:50 PM	2
5:55 PM	0

PM Peak Hour: 4:45 PM - 5:45 PM

Average	2
Maximum	5
85th	3
95th	4

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
2:05 PM	4
2:10 PM	4
2:15 PM	1
2:20 PM	0
2:25 PM	2
2:30 PM	8
2:35 PM	5
2:40 PM	4
2:45 PM	3
2:50 PM	2
2:55 PM	3
3:00 PM	4

Overall Peak Hour: 2:05 PM - 3:05 PM

Average	3
Maximum	8
85th	4
95th	6

Prepared by National Data & Surveying Services

Snapshot Queue

Location: Sun Day Carwash, 5128 N Figueroa St
City: Highland Park, CA
Date: 10/11/2024

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
7:00 AM	0
7:05 AM	0
7:10 AM	0
7:15 AM	2
7:20 AM	0
7:25 AM	0
7:30 AM	0
7:35 AM	1
7:40 AM	1
7:45 AM	0
7:50 AM	0
7:55 AM	1
8:00 AM	0
8:05 AM	0
8:10 AM	0
8:15 AM	1
8:20 AM	2
8:25 AM	3
8:30 AM	5
8:35 AM	6
8:40 AM	4
8:45 AM	4
8:50 AM	6
8:55 AM	4
9:00 AM	5
9:05 AM	2
9:10 AM	1
9:15 AM	3
9:20 AM	4
9:25 AM	5
9:30 AM	5
9:35 AM	1
9:40 AM	3
9:45 AM	4
9:50 AM	1
9:55 AM	0

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
10:00 AM	1
10:05 AM	5
10:10 AM	7
10:15 AM	4
10:20 AM	4
10:25 AM	2
10:30 AM	6
10:35 AM	4
10:40 AM	0
10:45 AM	1
10:50 AM	1
10:55 AM	3
11:00 AM	4
11:05 AM	4
11:10 AM	8
11:15 AM	7
11:20 AM	2
11:25 AM	1
11:30 AM	1
11:35 AM	7
11:40 AM	3
11:45 AM	1
11:50 AM	0
11:55 AM	0
12:00 PM	0
12:05 PM	0
12:10 PM	0
12:15 PM	2
12:20 PM	4
12:25 PM	10
12:30 PM	7
12:35 PM	2
12:40 PM	0
12:45 PM	2
12:50 PM	0
12:55 PM	0

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
1:00 PM	2
1:05 PM	0
1:10 PM	2
1:15 PM	0
1:20 PM	5
1:25 PM	3
1:30 PM	3
1:35 PM	3
1:40 PM	1
1:45 PM	1
1:50 PM	6
1:55 PM	5
2:00 PM	2
2:05 PM	0
2:10 PM	3
2:15 PM	0
2:20 PM	2
2:25 PM	1
2:30 PM	0
2:35 PM	0
2:40 PM	0
2:45 PM	0
2:50 PM	0
2:55 PM	1
3:00 PM	1
3:05 PM	4
3:10 PM	2
3:15 PM	3
3:20 PM	4
3:25 PM	1
3:30 PM	1
3:35 PM	3
3:40 PM	1
3:45 PM	3
3:50 PM	1
3:55 PM	2

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
4:00 PM	2
4:05 PM	1
4:10 PM	2
4:15 PM	2
4:20 PM	0
4:25 PM	0
4:30 PM	1
4:35 PM	0
4:40 PM	1
4:45 PM	0
4:50 PM	2
4:55 PM	4
5:00 PM	3
5:05 PM	1
5:10 PM	5
5:15 PM	2
5:20 PM	1
5:25 PM	1
5:30 PM	1
5:35 PM	1
5:40 PM	2
5:45 PM	2
5:50 PM	0
5:55 PM	1
6:00 PM	0
6:05 PM	1
6:10 PM	0
6:15 PM	1
6:20 PM	2
6:25 PM	0
6:30 PM	1
6:35 PM	1
6:40 PM	0
6:45 PM	0
6:50 PM	0
6:55 PM	0

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
7:00 PM	0
7:05 PM	0
7:10 PM	0
7:15 PM	0
7:20 PM	0
7:25 PM	0
7:30 PM	0
7:35 PM	0
7:40 PM	0
7:45 PM	0
7:50 PM	0
7:55 PM	0
8:00 PM	0
Totals	284

Average	2
Maximum	10
85th	4
95th	6

Prepared by National Data & Surveying Services

Snapshot Queue

Location: Sun Day Carwash, 5128 N Figueroa St
City: Highland Park, CA
Date: 10/11/2024

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
7:00 AM	2
7:05 AM	0
7:10 AM	0
7:15 AM	0
7:20 AM	0
7:25 AM	0
7:30 AM	1
7:35 AM	0
7:40 AM	1
7:45 AM	0
7:50 AM	1
7:55 AM	0
8:00 AM	1
8:05 AM	0
8:10 AM	0
8:15 AM	0
8:20 AM	0
8:25 AM	2
8:30 AM	0
8:35 AM	1
8:40 AM	1
8:45 AM	1
8:50 AM	1
8:55 AM	0

AM Peak Hour: 7:50 AM - 8:50 AM

Average	1
Maximum	2
85th	1
95th	1

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
4:00 PM	1
4:05 PM	1
4:10 PM	1
4:15 PM	0
4:20 PM	1
4:25 PM	0
4:30 PM	1
4:35 PM	1
4:40 PM	0
4:45 PM	3
4:50 PM	4
4:55 PM	0
5:00 PM	0
5:05 PM	0
5:10 PM	1
5:15 PM	1
5:20 PM	0
5:25 PM	1
5:30 PM	1
5:35 PM	5
5:40 PM	3
5:45 PM	0
5:50 PM	2
5:55 PM	0

PM Peak Hour: 4:45 PM - 5:45 PM

Average	2
Maximum	5
85th	3
95th	4

Time	Snapshot Queue Length (# of Vehicles)
	QUEUE
8:30 AM	5
8:35 AM	6
8:40 AM	4
8:45 AM	4
8:50 AM	6
8:55 AM	4
9:00 AM	5
9:05 AM	2
9:10 AM	1
9:15 AM	3
9:20 AM	4
9:25 AM	5

Overall Peak Hour: 8:30 AM - 9:30 AM

Average	4
Maximum	6
85th	5
95th	6

APPROVED/PENDING PROJECTS TRIP GENERATION WORKSHEET

Associated Transportation Engineers
Trip Generation Worksheet

CARSON EXPRESS CARWASH - CUMULATIVE PROJECTS

Map Number	Project #	Land Use / ITE Code		Size		PassBy & Internal	ADT		AM PEAK HOUR						PM PEAK HOUR					
							Rate	Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
1	18101 Avalon Boulevard	Condo	220	30	DU	1.00	9.44	283	0.74	22	25%	6	75%	16	0.99	30	63%	19	37%	11
2	Carson Landing	Multi-Family	220	175	DU	1.00	NA	1,281	NA	81	NA	19	NA	62	NA	98	NA	62	NA	36
3	Carson Upton	Multi-Family	220	38	DU	1.00	NA	278	NA	17	NA	4	NA	13	NA	21	NA	13	NA	8
	Totals							1,842		120		29		91		149		94		55

(a) TGen from traffic study prepared by Fehr and Peers.
(b) TGen from traffic study prepared by Ganddni.

INTERSECTION LOS CALCULATION WORKSHEETS

Reference 1 - Central Avenue/Artesia Boulevard
Reference 2 - Central Avenue/Albertoni Street
Reference 3 - Central Avenue/Victoria Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	589	137	358	173	602	0	0	900	216
Future Volume (veh/h)	0	0	0	589	137	358	173	602	0	0	900	216
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				709	53	389	188	654	0	0	978	235
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				1105	60	441	338	2096	0	0	1244	555
Arrive On Green				0.31	0.31	0.31	0.06	0.19	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3563	194	1421	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				709	0	442	188	654	0	0	978	235
Grp Sat Flow(s),veh/h/ln				1781	0	1615	1781	1777	0	0	1777	1585
Q Serve(g_s), s				15.4	0.0	23.4	9.2	14.2	0.0	0.0	22.2	10.2
Cycle Q Clear(g_c), s				15.4	0.0	23.4	9.2	14.2	0.0	0.0	22.2	10.2
Prop In Lane				1.00		0.88	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1105	0	501	338	2096	0	0	1244	555
V/C Ratio(X)				0.64	0.00	0.88	0.56	0.31	0.00	0.00	0.79	0.42
Avail Cap(c_a), veh/h				1207	0	547	338	2096	0	0	1244	555
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.88	0.88	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.7	0.0	29.5	38.5	20.6	0.0	0.0	26.2	22.3
Incr Delay (d2), s/veh				1.0	0.0	14.8	1.8	0.3	0.0	0.0	5.1	2.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.2	0.0	10.4	4.4	6.7	0.0	0.0	9.6	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				27.8	0.0	44.3	40.3	20.9	0.0	0.0	31.3	24.7
LnGrp LOS				C		D	D	C			C	C
Approach Vol, veh/h					1151			842			1213	
Approach Delay, s/veh					34.1			25.2			30.0	
Approach LOS					C			C			C	

Timer - Assigned Phs	2		5	6		8
Phs Duration (G+Y+Rc), s	57.6		21.6	36.0		32.4
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5
Max Green Setting (Gmax), s	50.5		14.5	31.5		30.5
Max Q Clear Time (g_c+I1), s	16.2		11.2	24.2		25.4
Green Ext Time (p_c), s	4.6		0.1	4.0		2.5

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	30.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	391	81	363	288	808	0	0	759	180
Future Volume (veh/h)	0	0	0	391	81	363	288	808	0	0	759	180
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				303	259	395	313	878	0	0	825	196
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				487	512	434	463	2226	0	0	1125	502
Arrive On Green				0.27	0.27	0.27	0.52	1.00	0.00	0.00	0.32	0.32
Sat Flow, veh/h				1781	1870	1585	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				303	259	395	313	878	0	0	825	196
Grp Sat Flow(s),veh/h/ln				1781	1870	1585	1781	1777	0	0	1777	1585
Q Serve(g_s), s				13.4	10.5	21.7	11.7	0.0	0.0	0.0	18.6	8.7
Cycle Q Clear(g_c), s				13.4	10.5	21.7	11.7	0.0	0.0	0.0	18.6	8.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				487	512	434	463	2226	0	0	1125	502
V/C Ratio(X)				0.62	0.51	0.91	0.68	0.39	0.00	0.00	0.73	0.39
Avail Cap(c_a), veh/h				505	530	449	463	2226	0	0	1125	502
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.71	0.71	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.6	27.6	31.6	18.8	0.0	0.0	0.0	27.4	24.0
Incr Delay (d2), s/veh				2.2	0.8	22.2	2.8	0.4	0.0	0.0	4.2	2.3
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	4.5	10.3	3.8	0.1	0.0	0.0	8.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				30.9	28.3	53.8	21.6	0.4	0.0	0.0	31.6	26.3
LnGrp LOS				C	C	D	C	A			C	C
Approach Vol, veh/h					957			1191			1021	
Approach Delay, s/veh					39.7			6.0			30.6	
Approach LOS					D			A			C	

Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	60.9		27.9	33.0		29.1						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	55.5		22.5	28.5		25.5						
Max Q Clear Time (g_c+I1), s	2.0		13.7	20.6		23.7						
Green Ext Time (p_c), s	7.0		0.6	3.6		0.9						

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	24.1	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	589	137	358	173	612	0	0	911	216
Future Volume (veh/h)	0	0	0	589	137	358	173	612	0	0	911	216
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				709	53	389	188	665	0	0	990	235
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				1105	60	441	338	2096	0	0	1244	555
Arrive On Green				0.31	0.31	0.31	0.06	0.19	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3563	194	1421	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				709	0	442	188	665	0	0	990	235
Grp Sat Flow(s),veh/h/ln				1781	0	1615	1781	1777	0	0	1777	1585
Q Serve(g_s), s				15.4	0.0	23.4	9.2	14.5	0.0	0.0	22.6	10.2
Cycle Q Clear(g_c), s				15.4	0.0	23.4	9.2	14.5	0.0	0.0	22.6	10.2
Prop In Lane				1.00		0.88	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1105	0	501	338	2096	0	0	1244	555
V/C Ratio(X)				0.64	0.00	0.88	0.56	0.32	0.00	0.00	0.80	0.42
Avail Cap(c_a), veh/h				1207	0	547	338	2096	0	0	1244	555
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.88	0.88	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.7	0.0	29.5	38.5	20.7	0.0	0.0	26.4	22.3
Incr Delay (d2), s/veh				1.0	0.0	14.8	1.8	0.4	0.0	0.0	5.3	2.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.2	0.0	10.4	4.4	6.9	0.0	0.0	9.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				27.8	0.0	44.3	40.3	21.0	0.0	0.0	31.7	24.7
LnGrp LOS				C		D	D	C			C	C
Approach Vol, veh/h					1151			853			1225	
Approach Delay, s/veh					34.1			25.3			30.3	
Approach LOS					C			C			C	

Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	57.6		21.6	36.0		32.4						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	50.5		14.5	31.5		30.5						
Max Q Clear Time (g_c+I1), s	16.5		11.2	24.6		25.4						
Green Ext Time (p_c), s	4.7		0.1	3.9		2.5						

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	30.3	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	391	81	363	288	821	0	0	772	180
Future Volume (veh/h)	0	0	0	391	81	363	288	821	0	0	772	180
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				303	259	395	313	892	0	0	839	196
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				487	512	434	463	2226	0	0	1125	502
Arrive On Green				0.27	0.27	0.27	0.52	1.00	0.00	0.00	0.32	0.32
Sat Flow, veh/h				1781	1870	1585	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				303	259	395	313	892	0	0	839	196
Grp Sat Flow(s),veh/h/ln				1781	1870	1585	1781	1777	0	0	1777	1585
Q Serve(g_s), s				13.4	10.5	21.7	11.7	0.0	0.0	0.0	19.0	8.7
Cycle Q Clear(g_c), s				13.4	10.5	21.7	11.7	0.0	0.0	0.0	19.0	8.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				487	512	434	463	2226	0	0	1125	502
V/C Ratio(X)				0.62	0.51	0.91	0.68	0.40	0.00	0.00	0.75	0.39
Avail Cap(c_a), veh/h				505	530	449	463	2226	0	0	1125	502
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.69	0.69	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.6	27.6	31.6	18.8	0.0	0.0	0.0	27.5	24.0
Incr Delay (d2), s/veh				2.2	0.8	22.2	2.7	0.4	0.0	0.0	4.5	2.3
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.6	4.5	10.3	3.8	0.1	0.0	0.0	8.2	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				30.9	28.3	53.8	21.5	0.4	0.0	0.0	32.0	26.3
LnGrp LOS				C	C	D	C	A			C	C
Approach Vol, veh/h					957			1205			1035	
Approach Delay, s/veh					39.7			5.9			30.9	
Approach LOS					D			A			C	

Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	60.9		27.9	33.0		29.1						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	55.5		22.5	28.5		25.5						
Max Q Clear Time (g_c+I1), s	2.0		13.7	21.0		23.7						
Green Ext Time (p_c), s	7.2		0.6	3.6		0.9						

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	24.1	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	640	138	360	233	654	0	0	950	217
Future Volume (veh/h)	0	0	0	640	138	360	233	654	0	0	950	217
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				740	88	391	253	711	0	0	1033	236
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				1116	94	417	332	2085	0	0	1244	555
Arrive On Green				0.31	0.31	0.31	0.13	0.39	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3563	300	1331	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				740	0	479	253	711	0	0	1033	236
Grp Sat Flow(s),veh/h/ln				1781	0	1631	1781	1777	0	0	1777	1585
Q Serve(g_s), s				16.2	0.0	25.7	12.4	12.6	0.0	0.0	24.0	10.2
Cycle Q Clear(g_c), s				16.2	0.0	25.7	12.4	12.6	0.0	0.0	24.0	10.2
Prop In Lane				1.00		0.82	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1116	0	511	332	2085	0	0	1244	555
V/C Ratio(X)				0.66	0.00	0.94	0.76	0.34	0.00	0.00	0.83	0.43
Avail Cap(c_a), veh/h				1128	0	516	332	2085	0	0	1244	555
HCM Platoon Ratio				1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.84	0.84	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.8	0.0	30.0	37.4	15.1	0.0	0.0	26.8	22.3
Incr Delay (d2), s/veh				1.4	0.0	24.8	8.4	0.4	0.0	0.0	6.5	2.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	12.7	6.2	5.3	0.0	0.0	10.5	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				28.2	0.0	54.9	45.8	15.5	0.0	0.0	33.3	24.7
LnGrp LOS				C		D	D	B			C	C
Approach Vol, veh/h					1219			964			1269	
Approach Delay, s/veh					38.7			23.5			31.7	
Approach LOS					D			C			C	

Timer - Assigned Phs	2		5	6		8				
Phs Duration (G+Y+Rc), s	57.3		21.3	36.0		32.7				
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5				
Max Green Setting (Gmax), s	52.5		16.5	31.5		28.5				
Max Q Clear Time (g_c+I1), s	14.6		14.4	26.0		27.7				
Green Ext Time (p_c), s	5.2		0.2	3.4		0.5				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		31.9
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	450	81	365	348	861	0	0	815	181
Future Volume (veh/h)	0	0	0	450	81	365	348	861	0	0	815	181
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				325	318	397	378	936	0	0	886	197
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				480	504	428	489	2240	0	0	1086	484
Arrive On Green				0.27	0.27	0.27	0.55	1.00	0.00	0.00	0.31	0.31
Sat Flow, veh/h				1781	1870	1585	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				325	318	397	378	936	0	0	886	197
Grp Sat Flow(s),veh/h/ln				1781	1870	1585	1781	1777	0	0	1777	1585
Q Serve(g_s), s				14.7	13.5	22.0	14.9	0.0	0.0	0.0	20.8	8.9
Cycle Q Clear(g_c), s				14.7	13.5	22.0	14.9	0.0	0.0	0.0	20.8	8.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				480	504	428	489	2240	0	0	1086	484
V/C Ratio(X)				0.68	0.63	0.93	0.77	0.42	0.00	0.00	0.82	0.41
Avail Cap(c_a), veh/h				485	509	431	489	2240	0	0	1086	484
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.60	0.60	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.4	28.9	32.0	18.1	0.0	0.0	0.0	28.9	24.8
Incr Delay (d2), s/veh				3.7	2.5	26.3	4.6	0.3	0.0	0.0	6.8	2.5
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.3	6.0	10.9	4.6	0.1	0.0	0.0	9.3	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				33.0	31.4	58.3	22.7	0.3	0.0	0.0	35.7	27.3
LnGrp LOS				C	C	E	C	A			D	C
Approach Vol, veh/h					1040			1314			1083	
Approach Delay, s/veh					42.2			6.8			34.2	
Approach LOS					D			A			C	

Timer - Assigned Phs	2		5	6		8
Phs Duration (G+Y+Rc), s	61.2		29.2	32.0		28.8
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5
Max Green Setting (Gmax), s	56.5		24.5	27.5		24.5
Max Q Clear Time (g_c+I1), s	2.0		16.9	22.8		24.0
Green Ext Time (p_c), s	7.7		0.7	2.6		0.3

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	26.1	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	640	138	360	233	664	0	0	828	181
Future Volume (veh/h)	0	0	0	640	138	360	233	664	0	0	828	181
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				740	88	391	253	722	0	0	900	197
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				1119	94	418	328	2081	0	0	1249	557
Arrive On Green				0.31	0.31	0.31	0.18	0.59	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3563	300	1331	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				740	0	479	253	722	0	0	900	197
Grp Sat Flow(s),veh/h/ln				1781	0	1631	1781	1777	0	0	1777	1585
Q Serve(g_s), s				16.1	0.0	25.6	12.1	9.5	0.0	0.0	19.7	8.3
Cycle Q Clear(g_c), s				16.1	0.0	25.6	12.1	9.5	0.0	0.0	19.7	8.3
Prop In Lane				1.00		0.82	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1119	0	512	328	2081	0	0	1249	557
V/C Ratio(X)				0.66	0.00	0.94	0.77	0.35	0.00	0.00	0.72	0.35
Avail Cap(c_a), veh/h				1132	0	518	328	2081	0	0	1249	557
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.6	0.0	29.9	34.8	9.7	0.0	0.0	25.3	21.5
Incr Delay (d2), s/veh				1.4	0.0	24.4	10.8	0.5	0.0	0.0	3.6	1.8
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.5	0.0	12.6	6.0	3.3	0.0	0.0	8.3	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				28.0	0.0	54.2	45.6	10.1	0.0	0.0	28.9	23.3
LnGrp LOS				C		D	D	B			C	C
Approach Vol, veh/h					1219			975			1097	
Approach Delay, s/veh					38.3			19.3			27.9	
Approach LOS					D			B			C	

Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	57.0		21.0	36.0		32.7						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	52.5		16.5	31.5		28.5						
Max Q Clear Time (g_c+I1), s	11.5		14.1	21.7		27.6						
Green Ext Time (p_c), s	5.3		0.2	4.5		0.6						

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		29.2
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	450	81	365	348	874	0	0	828	181
Future Volume (veh/h)	0	0	0	450	81	365	348	874	0	0	828	181
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				325	318	397	378	950	0	0	900	197
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				475	499	423	485	2251	0	0	1106	493
Arrive On Green				0.27	0.27	0.27	0.54	1.00	0.00	0.00	0.31	0.31
Sat Flow, veh/h				1781	1870	1585	1781	3647	0	0	3647	1585
Grp Volume(v), veh/h				325	318	397	378	950	0	0	900	197
Grp Sat Flow(s),veh/h/ln				1781	1870	1585	1781	1777	0	0	1777	1585
Q Serve(g_s), s				14.7	13.5	22.1	15.1	0.0	0.0	0.0	21.0	8.8
Cycle Q Clear(g_c), s				14.7	13.5	22.1	15.1	0.0	0.0	0.0	21.0	8.8
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				475	499	423	485	2251	0	0	1106	493
V/C Ratio(X)				0.68	0.64	0.94	0.78	0.42	0.00	0.00	0.81	0.40
Avail Cap(c_a), veh/h				475	499	423	485	2251	0	0	1106	493
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.62	0.62	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.6	29.2	32.3	18.4	0.0	0.0	0.0	28.6	24.4
Incr Delay (d2), s/veh				4.0	2.7	28.9	5.1	0.4	0.0	0.0	6.6	2.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.4	6.0	11.2	4.7	0.1	0.0	0.0	9.4	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				33.6	31.9	61.2	23.4	0.4	0.0	0.0	35.2	26.8
LnGrp LOS				C	C	E	C	A			D	C
Approach Vol, veh/h					1040			1328			1097	
Approach Delay, s/veh					43.6			6.9			33.7	
Approach LOS					D			A			C	

Timer - Assigned Phs	2		5	6		8				
Phs Duration (G+Y+Rc), s	61.5		29.0	32.5		28.5				
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5				
Max Green Setting (Gmax), s	57.0		24.5	28.0		24.0				
Max Q Clear Time (g_c+I1), s	2.0		17.1	23.0		24.1				
Green Ext Time (p_c), s	7.9		0.7	2.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh	26.4	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	257	105	393	0	0	0	0	517	313	465	1033	0
Future Volume (veh/h)	257	105	393	0	0	0	0	517	313	465	1033	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	273	122	427				0	562	340	505	1123	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	522	548	464				0	1368	1074	595	2157	0
Arrive On Green	0.29	0.29	0.29				0.00	0.38	0.38	0.34	1.00	0.00
Sat Flow, veh/h	1781	1870	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	273	122	427				0	562	340	505	1123	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	11.5	4.4	23.5				0.0	10.4	7.7	12.2	0.0	0.0
Cycle Q Clear(g_c), s	11.5	4.4	23.5				0.0	10.4	7.7	12.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	522	548	464				0	1368	1074	595	2157	0
V/C Ratio(X)	0.52	0.22	0.92				0.00	0.41	0.32	0.85	0.52	0.00
Avail Cap(c_a), veh/h	544	571	484				0	1368	1074	902	2157	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.94	0.94	0.58	0.58	0.00
Uniform Delay (d), s/veh	26.6	24.1	30.8				0.0	20.2	19.4	28.4	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.2	22.3				0.0	0.9	0.7	2.9	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	1.9	11.1				0.0	4.2	2.4	4.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.4	24.3	53.1				0.0	21.1	20.1	31.4	0.5	0.0
LnGrp LOS	C	C	D					C	C	C	A	
Approach Vol, veh/h		822						902			1628	
Approach Delay, s/veh		40.3						20.7			10.1	
Approach LOS		D						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.0	39.1		30.9		59.1
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	23.5	25.5		27.5		53.5
Max Q Clear Time (g_c+I1), s	14.2	12.4		25.5		2.0
Green Ext Time (p_c), s	1.3	4.1		0.9		10.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	20.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	788	182	0	0	0	0	772	455	345	814	0
Future Volume (veh/h)	303	788	182	0	0	0	0	772	455	345	814	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	329	857	198				0	839	495	375	885	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	610	1007	233				0	1346	1057	445	1981	0
Arrive On Green	0.34	0.34	0.34				0.00	0.38	0.38	0.26	1.00	0.00
Sat Flow, veh/h	1781	2940	679				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	329	545	510				0	839	495	375	885	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1748				0	1777	1395	1728	1777	0
Q Serve(g_s), s	13.4	24.3	24.4				0.0	17.3	12.1	9.3	0.0	0.0
Cycle Q Clear(g_c), s	13.4	24.3	24.4				0.0	17.3	12.1	9.3	0.0	0.0
Prop In Lane	1.00		0.39				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	610	640	599				0	1346	1057	445	1981	0
V/C Ratio(X)	0.54	0.85	0.85				0.00	0.62	0.47	0.84	0.45	0.00
Avail Cap(c_a), veh/h	683	717	670				0	1346	1057	518	1981	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.77	0.77	0.65	0.65	0.00
Uniform Delay (d), s/veh	23.9	27.5	27.5				0.0	22.7	21.1	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.7	8.9	9.4				0.0	1.7	1.1	7.3	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	11.5	10.8				0.0	7.0	3.8	3.7	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.6	36.3	36.9				0.0	24.4	22.3	39.8	0.5	0.0
LnGrp LOS	C	D	D					C	C	D	A	
Approach Vol, veh/h		1384						1334			1260	
Approach Delay, s/veh		33.8						23.6			12.2	
Approach LOS		C						C			B	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.1	38.6		35.3		54.7						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	13.5	28.5		34.5		46.5						
Max Q Clear Time (g_c+I1), s	11.3	19.3		26.4		2.0						
Green Ext Time (p_c), s	0.3	4.9		4.5		7.0						

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	257	105	393	0	0	0	0	527	313	465	1044	0
Future Volume (veh/h)	257	105	393	0	0	0	0	527	313	465	1044	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	273	122	427				0	573	340	505	1135	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	522	548	464				0	1368	1074	595	2157	0
Arrive On Green	0.29	0.29	0.29				0.00	0.38	0.38	0.34	1.00	0.00
Sat Flow, veh/h	1781	1870	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	273	122	427				0	573	340	505	1135	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	11.5	4.4	23.5				0.0	10.6	7.7	12.2	0.0	0.0
Cycle Q Clear(g_c), s	11.5	4.4	23.5				0.0	10.6	7.7	12.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	522	548	464				0	1368	1074	595	2157	0
V/C Ratio(X)	0.52	0.22	0.92				0.00	0.42	0.32	0.85	0.53	0.00
Avail Cap(c_a), veh/h	544	571	484				0	1368	1074	902	2157	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.94	0.94	0.57	0.57	0.00
Uniform Delay (d), s/veh	26.6	24.1	30.8				0.0	20.3	19.4	28.4	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.2	22.3				0.0	0.9	0.7	2.9	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	1.9	11.1				0.0	4.3	2.4	4.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.4	24.3	53.1				0.0	21.2	20.1	31.3	0.5	0.0
LnGrp LOS	C	C	D					C	C	C	A	
Approach Vol, veh/h		822						913			1640	
Approach Delay, s/veh		40.3						20.8			10.0	
Approach LOS		D						C			B	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	20.0	39.1	30.9	59.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.5	25.5	27.5	53.5
Max Q Clear Time (g_c+I1), s	14.2	12.6	25.5	2.0
Green Ext Time (p_c), s	1.3	4.1	0.9	10.3

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	20.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	788	182	0	0	0	0	785	455	345	827	0
Future Volume (veh/h)	303	788	182	0	0	0	0	785	455	345	827	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	329	857	198				0	853	495	375	899	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	610	1007	233				0	1346	1057	445	1981	0
Arrive On Green	0.34	0.34	0.34				0.00	0.38	0.38	0.26	1.00	0.00
Sat Flow, veh/h	1781	2940	679				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	329	545	510				0	853	495	375	899	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1748				0	1777	1395	1728	1777	0
Q Serve(g_s), s	13.4	24.3	24.4				0.0	17.7	12.1	9.3	0.0	0.0
Cycle Q Clear(g_c), s	13.4	24.3	24.4				0.0	17.7	12.1	9.3	0.0	0.0
Prop In Lane	1.00		0.39				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	610	640	599				0	1346	1057	445	1981	0
V/C Ratio(X)	0.54	0.85	0.85				0.00	0.63	0.47	0.84	0.45	0.00
Avail Cap(c_a), veh/h	683	717	670				0	1346	1057	518	1981	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.77	0.77	0.64	0.64	0.00
Uniform Delay (d), s/veh	23.9	27.5	27.5				0.0	22.8	21.1	32.6	0.0	0.0
Incr Delay (d2), s/veh	0.7	8.9	9.4				0.0	1.8	1.1	7.2	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	11.5	10.8				0.0	7.2	3.8	3.7	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.6	36.3	36.9				0.0	24.6	22.3	39.7	0.5	0.0
LnGrp LOS	C	D	D					C	C	D	A	
Approach Vol, veh/h		1384						1348			1274	
Approach Delay, s/veh		33.8						23.7			12.0	
Approach LOS		C						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	16.1	38.6		35.3		54.7
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	13.5	28.5		34.5		46.5
Max Q Clear Time (g_c+I1), s	11.3	19.7		26.4		2.0
Green Ext Time (p_c), s	0.3	4.9		4.5		7.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	23.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	106	446	0	0	0	0	627	375	467	1132	0
Future Volume (veh/h)	258	106	446	0	0	0	0	627	375	467	1132	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	280	115	485				0	682	408	508	1230	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	524	551	467				0	1364	1071	593	2152	0
Arrive On Green	0.29	0.29	0.29				0.00	0.38	0.38	0.34	1.00	0.00
Sat Flow, veh/h	1781	1870	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	280	115	485				0	682	408	508	1230	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	11.8	4.2	26.5				0.0	13.2	9.5	12.3	0.0	0.0
Cycle Q Clear(g_c), s	11.8	4.2	26.5				0.0	13.2	9.5	12.3	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	524	551	467				0	1364	1071	593	2152	0
V/C Ratio(X)	0.53	0.21	1.04				0.00	0.50	0.38	0.86	0.57	0.00
Avail Cap(c_a), veh/h	524	551	467				0	1364	1071	826	2152	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.91	0.91	0.46	0.46	0.00
Uniform Delay (d), s/veh	26.6	23.9	31.8				0.0	21.1	20.0	28.5	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.2	52.2				0.0	1.2	0.9	3.2	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	1.8	16.1				0.0	5.3	3.0	4.2	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.6	24.1	83.9				0.0	22.3	20.9	31.7	0.5	0.0
LnGrp LOS	C	C	F					C	C	C	A	
Approach Vol, veh/h		880						1090			1738	
Approach Delay, s/veh		58.2						21.8			9.6	
Approach LOS		E						C			A	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.9	39.1		31.0		59.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	21.5	28.5		26.5		54.5
Max Q Clear Time (g_c+I1), s	11.3	15.2		28.5		2.0
Green Ext Time (p_c), s	1.1	5.1		0.0		11.7

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	24.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	792	250	0	0	0	0	883	519	347	928	0
Future Volume (veh/h)	304	792	250	0	0	0	0	883	519	347	928	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	330	861	272				0	960	564	377	1009	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	640	979	309				0	1165	914	563	1921	0
Arrive On Green	0.36	0.36	0.36				0.00	0.33	0.33	0.33	1.00	0.00
Sat Flow, veh/h	1781	2726	860				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	330	590	543				0	960	564	377	1009	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1716				0	1777	1395	1728	1777	0
Q Serve(g_s), s	13.1	26.6	26.7				0.0	22.4	15.3	8.5	0.0	0.0
Cycle Q Clear(g_c), s	13.1	26.6	26.7				0.0	22.4	15.3	8.5	0.0	0.0
Prop In Lane	1.00		0.50				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	640	672	616				0	1165	914	563	1921	0
V/C Ratio(X)	0.52	0.88	0.88				0.00	0.82	0.62	0.67	0.53	0.00
Avail Cap(c_a), veh/h	683	717	658				0	1165	914	563	1921	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.69	0.69	0.52	0.52	0.00
Uniform Delay (d), s/veh	22.7	27.0	27.0				0.0	27.9	25.5	28.2	0.0	0.0
Incr Delay (d2), s/veh	0.6	11.6	12.6				0.0	4.7	2.2	1.6	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	12.9	12.1				0.0	9.6	5.0	3.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.3	38.5	39.7				0.0	32.6	27.6	29.9	0.5	0.0
LnGrp LOS	C	D	D					C	C	C	A	
Approach Vol, veh/h		1463						1524			1386	
Approach Delay, s/veh		35.5						30.8			8.5	
Approach LOS		D						C			A	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	19.2	34.0	36.8	53.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	29.5	34.5	46.5
Max Q Clear Time (g_c+I1), s	10.5	24.4	28.7	2.0
Green Ext Time (p_c), s	0.3	3.5	3.7	8.4

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	25.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	106	446	0	0	0	0	627	373	467	1143	0
Future Volume (veh/h)	258	106	446	0	0	0	0	627	373	467	1143	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	280	115	485				0	682	405	508	1242	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	524	551	467				0	1348	1058	609	2152	0
Arrive On Green	0.29	0.29	0.29				0.00	0.38	0.38	0.18	0.61	0.00
Sat Flow, veh/h	1781	1870	1585				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	280	115	485				0	682	405	508	1242	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				0	1777	1395	1728	1777	0
Q Serve(g_s), s	11.8	4.2	26.5				0.0	13.3	9.5	12.8	19.1	0.0
Cycle Q Clear(g_c), s	11.8	4.2	26.5				0.0	13.3	9.5	12.8	19.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	524	551	467				0	1348	1058	609	2152	0
V/C Ratio(X)	0.53	0.21	1.04				0.00	0.51	0.38	0.83	0.58	0.00
Avail Cap(c_a), veh/h	524	551	467				0	1348	1058	826	2152	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.91	0.91	0.56	0.56	0.00
Uniform Delay (d), s/veh	26.6	23.9	31.8				0.0	21.5	20.3	35.8	10.8	0.0
Incr Delay (d2), s/veh	1.1	0.2	52.2				0.0	1.2	1.0	3.2	0.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	1.8	16.1				0.0	5.4	3.0	5.4	6.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.6	24.1	83.9				0.0	22.7	21.2	39.0	11.4	0.0
LnGrp LOS	C	C	F					C	C	D	B	
Approach Vol, veh/h		880						1087			1750	
Approach Delay, s/veh		58.2						22.2			19.4	
Approach LOS		E						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.4	38.6		31.0		59.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	21.5	28.5		26.5		54.5
Max Q Clear Time (g_c+I1), s	14.8	15.3		28.5		21.1
Green Ext Time (p_c), s	1.1	5.0		0.0		10.8

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	29.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	792	250	0	0	0	0	883	519	347	941	0
Future Volume (veh/h)	304	792	250	0	0	0	0	883	519	347	941	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	330	861	272				0	960	564	377	1023	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	640	979	309				0	1293	1015	439	1921	0
Arrive On Green	0.36	0.36	0.36				0.00	0.12	0.12	0.25	1.00	0.00
Sat Flow, veh/h	1781	2726	860				0	3647	2790	3456	3647	0
Grp Volume(v), veh/h	330	590	543				0	960	564	377	1023	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1716				0	1777	1395	1728	1777	0
Q Serve(g_s), s	13.1	26.6	26.7				0.0	23.5	17.2	9.4	0.0	0.0
Cycle Q Clear(g_c), s	13.1	26.6	26.7				0.0	23.5	17.2	9.4	0.0	0.0
Prop In Lane	1.00		0.50				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	640	672	616				0	1293	1015	439	1921	0
V/C Ratio(X)	0.52	0.88	0.88				0.00	0.74	0.56	0.86	0.53	0.00
Avail Cap(c_a), veh/h	683	717	658				0	1293	1015	449	1921	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	0.72	0.72	0.51	0.51	0.00
Uniform Delay (d), s/veh	22.7	27.0	27.0				0.0	35.5	32.7	32.8	0.0	0.0
Incr Delay (d2), s/veh	0.6	11.6	12.6				0.0	2.8	1.6	8.4	0.5	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	12.9	12.1				0.0	11.5	6.5	3.8	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.3	38.5	39.7				0.0	38.4	34.3	41.3	0.5	0.0
LnGrp LOS	C	D	D					D	C	D	A	
Approach Vol, veh/h		1463						1524			1400	
Approach Delay, s/veh		35.5						36.9			11.5	
Approach LOS		D						D			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.9	37.2		36.8		53.2
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	11.4	30.3		34.5		46.5
Max Q Clear Time (g_c+I1), s	11.4	25.5		28.7		2.0
Green Ext Time (p_c), s	0.1	3.3		3.7		8.6

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	28.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	147	106	14	167	86	64	463	24	160	745	487
Future Volume (veh/h)	157	147	106	14	167	86	64	463	24	160	745	487
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	171	160	115	15	182	93	70	503	26	174	810	529
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	360	243	32	277	136	93	1711	763	264	1798	802
Arrive On Green	0.08	0.18	0.18	0.02	0.12	0.12	0.05	0.48	0.48	0.08	0.51	0.51
Sat Flow, veh/h	3456	2029	1371	1781	2313	1131	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	171	139	136	15	138	137	70	503	26	174	810	529
Grp Sat Flow(s),veh/h/ln	1728	1777	1623	1781	1777	1667	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	3.5	5.1	5.5	0.6	5.4	5.7	2.8	6.2	0.6	3.6	10.6	18.0
Cycle Q Clear(g_c), s	3.5	5.1	5.5	0.6	5.4	5.7	2.8	6.2	0.6	3.6	10.6	18.0
Prop In Lane	1.00		0.84	1.00		0.68	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	315	288	32	213	200	93	1711	763	264	1798	802
V/C Ratio(X)	0.66	0.44	0.47	0.47	0.65	0.69	0.76	0.29	0.03	0.66	0.45	0.66
Avail Cap(c_a), veh/h	422	543	497	125	451	423	232	1711	763	450	1798	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	26.8	26.9	35.5	30.6	30.8	34.1	11.4	10.0	32.7	11.5	13.4
Incr Delay (d2), s/veh	2.8	1.0	1.2	10.3	3.3	4.1	11.8	0.4	0.1	2.8	0.8	4.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	2.1	2.0	0.3	2.3	2.4	1.5	2.2	0.2	1.5	3.7	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.6	27.7	28.1	45.7	33.9	34.9	45.9	11.9	10.1	35.5	12.3	17.6
LnGrp LOS	D	C	C	D	C	C	D	B	B	D	B	B
Approach Vol, veh/h		446			290			599			1513	
Approach Delay, s/veh		30.9			35.0			15.8			16.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	39.6	5.8	17.4	8.3	41.4	10.0	13.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	35.1	5.1	22.3	9.5	35.1	8.9	18.5
Max Q Clear Time (g_c+I1), s	5.6	8.2	2.6	7.5	4.8	20.0	5.5	7.7
Green Ext Time (p_c), s	0.2	3.4	0.0	1.2	0.0	6.5	0.2	1.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	20.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	445	687	142	16	217	138	105	544	18	123	619	236
Future Volume (veh/h)	445	687	142	16	217	138	105	544	18	123	619	236
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	484	747	154	17	236	150	114	591	20	134	673	257
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	600	922	190	35	340	208	146	1309	584	213	1237	552
Arrive On Green	0.17	0.31	0.31	0.02	0.16	0.16	0.08	0.37	0.37	0.06	0.35	0.35
Sat Flow, veh/h	3456	2934	605	1781	2119	1295	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	484	452	449	17	196	190	114	591	20	134	673	257
Grp Sat Flow(s),veh/h/ln	1728	1777	1762	1781	1777	1637	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	10.3	17.9	17.9	0.7	8.0	8.4	4.8	9.6	0.6	2.9	11.6	9.6
Cycle Q Clear(g_c), s	10.3	17.9	17.9	0.7	8.0	8.4	4.8	9.6	0.6	2.9	11.6	9.6
Prop In Lane	1.00		0.34	1.00		0.79	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	600	558	553	35	285	263	146	1309	584	213	1237	552
V/C Ratio(X)	0.81	0.81	0.81	0.48	0.69	0.72	0.78	0.45	0.03	0.63	0.54	0.47
Avail Cap(c_a), veh/h	838	734	727	117	419	386	245	1309	584	335	1237	552
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	24.1	24.1	37.0	30.2	30.4	34.3	18.3	15.4	34.9	20.0	19.3
Incr Delay (d2), s/veh	4.1	5.2	5.2	9.8	3.0	3.7	8.7	1.1	0.1	3.0	1.7	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	7.5	7.4	0.4	3.4	3.3	2.3	3.8	0.2	1.2	4.6	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.4	29.3	29.3	46.8	33.2	34.1	43.1	19.4	15.5	38.0	21.7	22.2
LnGrp LOS	C	C	C	D	C	C	D	B	B	D	C	C
Approach Vol, veh/h		1385			403			725			1064	
Approach Delay, s/veh		31.1			34.2			23.0			23.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	32.6	6.0	28.5	10.8	31.1	17.7	16.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.7	28.1	5.0	31.5	10.5	25.0	18.5	18.0
Max Q Clear Time (g_c+I1), s	4.9	11.6	2.7	19.9	6.8	13.6	12.3	10.4
Green Ext Time (p_c), s	0.1	3.5	0.0	4.1	0.1	4.0	1.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	27.6
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	147	106	14	167	87	64	467	24	161	749	489
Future Volume (veh/h)	159	147	106	14	167	87	64	467	24	161	749	489
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	173	160	115	15	182	95	70	508	26	175	814	532
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	362	245	32	277	138	92	1707	761	265	1796	801
Arrive On Green	0.08	0.18	0.18	0.02	0.12	0.12	0.05	0.48	0.48	0.08	0.51	0.51
Sat Flow, veh/h	3456	2029	1371	1781	2295	1146	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	173	139	136	15	139	138	70	508	26	175	814	532
Grp Sat Flow(s),veh/h/ln	1728	1777	1623	1781	1777	1664	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	3.6	5.1	5.5	0.6	5.5	5.8	2.8	6.3	0.6	3.6	10.7	18.3
Cycle Q Clear(g_c), s	3.6	5.1	5.5	0.6	5.5	5.8	2.8	6.3	0.6	3.6	10.7	18.3
Prop In Lane	1.00		0.84	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	317	290	32	214	201	92	1707	761	265	1796	801
V/C Ratio(X)	0.66	0.44	0.47	0.47	0.65	0.69	0.76	0.30	0.03	0.66	0.45	0.66
Avail Cap(c_a), veh/h	421	542	496	124	450	421	232	1707	761	449	1796	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	26.7	26.9	35.5	30.6	30.8	34.2	11.5	10.0	32.8	11.6	13.5
Incr Delay (d2), s/veh	2.8	1.0	1.2	10.3	3.3	4.1	11.8	0.4	0.1	2.8	0.8	4.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	2.1	2.0	0.3	2.3	2.4	1.5	2.2	0.2	1.5	3.7	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.7	27.7	28.1	45.8	33.9	34.9	46.0	12.0	10.1	35.6	12.4	17.8
LnGrp LOS	D	C	C	D	C	C	D	B	B	D	B	B
Approach Vol, veh/h		448			292			604			1521	
Approach Delay, s/veh		30.9			35.0			15.8			17.0	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	39.6	5.8	17.5	8.3	41.4	10.0	13.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	35.1	5.1	22.3	9.5	35.1	8.9	18.5
Max Q Clear Time (g_c+I1), s	5.6	8.3	2.6	7.5	4.8	20.3	5.6	7.8
Green Ext Time (p_c), s	0.2	3.4	0.0	1.2	0.0	6.5	0.2	1.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	20.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	448	687	142	16	217	139	105	549	18	124	624	239
Future Volume (veh/h)	448	687	142	16	217	139	105	549	18	124	624	239
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	487	747	154	17	236	151	114	597	20	135	678	260
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	602	922	190	35	337	208	146	1309	584	214	1237	552
Arrive On Green	0.17	0.31	0.31	0.02	0.16	0.16	0.08	0.37	0.37	0.06	0.35	0.35
Sat Flow, veh/h	3456	2934	605	1781	2113	1300	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	487	452	449	17	197	190	114	597	20	135	678	260
Grp Sat Flow(s),veh/h/ln	1728	1777	1762	1781	1777	1636	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	10.3	17.9	17.9	0.7	8.0	8.4	4.8	9.7	0.6	2.9	11.7	9.8
Cycle Q Clear(g_c), s	10.3	17.9	17.9	0.7	8.0	8.4	4.8	9.7	0.6	2.9	11.7	9.8
Prop In Lane	1.00		0.34	1.00		0.79	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	602	558	553	35	284	261	146	1309	584	214	1237	552
V/C Ratio(X)	0.81	0.81	0.81	0.48	0.69	0.73	0.78	0.46	0.03	0.63	0.55	0.47
Avail Cap(c_a), veh/h	838	734	727	117	419	386	245	1309	584	335	1237	552
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	24.1	24.1	37.0	30.3	30.5	34.3	18.3	15.4	34.9	20.0	19.4
Incr Delay (d2), s/veh	4.1	5.2	5.2	9.8	3.1	3.9	8.7	1.1	0.1	3.1	1.7	2.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	7.5	7.4	0.4	3.4	3.3	2.3	3.8	0.2	1.3	4.7	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	34.4	29.3	29.3	46.8	33.4	34.3	43.1	19.4	15.5	38.0	21.8	22.3
LnGrp LOS	C	C	C	D	C	C	D	B	B	D	C	C
Approach Vol, veh/h		1388			404			731			1073	
Approach Delay, s/veh		31.1			34.4			23.0			23.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	32.6	6.0	28.5	10.8	31.1	17.8	16.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.7	28.1	5.0	31.5	10.5	25.0	18.5	18.0
Max Q Clear Time (g_c+I1), s	4.9	11.7	2.7	19.9	6.8	13.7	12.3	10.4
Green Ext Time (p_c), s	0.1	3.5	0.0	4.1	0.1	4.0	1.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	27.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	152	107	21	188	103	65	509	24	164	796	519
Future Volume (veh/h)	195	152	107	21	188	103	65	509	24	164	796	519
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	212	165	116	23	204	112	71	553	26	178	865	564
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	397	263	45	296	156	91	1651	737	266	1743	777
Arrive On Green	0.09	0.19	0.19	0.03	0.13	0.13	0.05	0.46	0.46	0.08	0.49	0.49
Sat Flow, veh/h	3456	2047	1356	1781	2250	1184	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	212	142	139	23	159	157	71	553	26	178	865	564
Grp Sat Flow(s),veh/h/ln	1728	1777	1626	1781	1777	1657	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	4.5	5.3	5.7	1.0	6.4	6.8	3.0	7.4	0.7	3.8	12.3	21.2
Cycle Q Clear(g_c), s	4.5	5.3	5.7	1.0	6.4	6.8	3.0	7.4	0.7	3.8	12.3	21.2
Prop In Lane	1.00		0.83	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	303	344	315	45	234	218	91	1651	737	266	1743	777
V/C Ratio(X)	0.70	0.41	0.44	0.51	0.68	0.72	0.78	0.33	0.04	0.67	0.50	0.73
Avail Cap(c_a), veh/h	436	519	475	130	425	396	201	1651	737	436	1743	777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	26.6	26.8	36.2	31.2	31.4	35.3	12.8	11.0	33.8	12.9	15.2
Incr Delay (d2), s/veh	2.9	0.8	1.0	8.6	3.5	4.4	13.0	0.5	0.1	2.9	1.0	5.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.1	2.1	0.5	2.8	2.8	1.6	2.7	0.2	1.6	4.4	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	36.3	27.4	27.7	44.8	34.7	35.8	48.3	13.3	11.1	36.7	13.9	21.0
LnGrp LOS	D	C	C	D	C	D	D	B	B	D	B	C
Approach Vol, veh/h		493			339			650			1607	
Approach Delay, s/veh		31.3			35.9			17.1			18.9	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	39.5	6.4	19.1	8.4	41.4	11.1	14.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	35.0	5.5	22.0	8.5	36.0	9.5	18.0
Max Q Clear Time (g_c+I1), s	5.8	9.4	3.0	7.7	5.0	23.2	6.5	8.8
Green Ext Time (p_c), s	0.2	3.7	0.0	1.2	0.0	6.4	0.2	1.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	22.4
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	494	692	148	20	234	157	111	625	18	127	688	263
Future Volume (veh/h)	494	692	148	20	234	157	111	625	18	127	688	263
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	537	752	161	22	254	171	121	679	20	138	748	286
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	647	952	204	43	339	220	154	1259	561	217	1174	524
Arrive On Green	0.19	0.33	0.33	0.02	0.16	0.16	0.09	0.35	0.35	0.06	0.33	0.33
Sat Flow, veh/h	3456	2912	623	1781	2065	1341	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	537	459	454	22	217	208	121	679	20	138	748	286
Grp Sat Flow(s),veh/h/ln	1728	1777	1758	1781	1777	1629	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	11.6	18.2	18.2	0.9	9.0	9.5	5.2	11.8	0.6	3.0	13.9	11.4
Cycle Q Clear(g_c), s	11.6	18.2	18.2	0.9	9.0	9.5	5.2	11.8	0.6	3.0	13.9	11.4
Prop In Lane	1.00		0.35	1.00		0.82	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	647	581	575	43	291	267	154	1259	561	217	1174	524
V/C Ratio(X)	0.83	0.79	0.79	0.51	0.75	0.78	0.79	0.54	0.04	0.64	0.64	0.55
Avail Cap(c_a), veh/h	824	719	711	117	412	378	241	1259	561	356	1174	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	23.7	23.7	37.4	30.9	31.1	34.8	20.0	16.4	35.5	22.0	21.2
Incr Delay (d2), s/veh	5.7	4.8	4.9	8.9	4.5	6.5	8.6	1.7	0.1	3.1	2.6	4.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	7.5	7.5	0.5	3.9	3.9	2.5	4.7	0.2	1.3	5.7	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	36.1	28.5	28.6	46.3	35.4	37.6	43.4	21.7	16.5	38.6	24.7	25.3
LnGrp LOS	D	C	C	D	D	D	D	C	B	D	C	C
Approach Vol, veh/h		1450			447			820			1172	
Approach Delay, s/veh		31.3			37.0			24.7			26.5	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	32.0	6.4	29.9	11.2	30.2	19.0	17.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.0	27.5	5.1	31.4	10.5	25.0	18.5	18.0
Max Q Clear Time (g_c+I1), s	5.0	13.8	2.9	20.2	7.2	15.9	13.6	11.5
Green Ext Time (p_c), s	0.1	3.7	0.0	4.1	0.1	3.9	0.9	1.2

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	29.1
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	152	107	21	188	104	65	513	24	165	800	521
Future Volume (veh/h)	197	152	107	21	188	104	65	513	24	165	800	521
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	214	165	116	23	204	113	71	558	26	179	870	566
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	305	398	264	45	296	157	92	1649	735	267	1741	777
Arrive On Green	0.09	0.19	0.19	0.03	0.13	0.13	0.05	0.46	0.46	0.08	0.49	0.49
Sat Flow, veh/h	3456	2047	1356	1781	2242	1191	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	214	142	139	23	160	157	71	558	26	179	870	566
Grp Sat Flow(s),veh/h/ln	1728	1777	1626	1781	1777	1656	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	4.5	5.3	5.7	1.0	6.5	6.9	3.0	7.5	0.7	3.8	12.5	21.4
Cycle Q Clear(g_c), s	4.5	5.3	5.7	1.0	6.5	6.9	3.0	7.5	0.7	3.8	12.5	21.4
Prop In Lane	1.00		0.83	1.00		0.72	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	346	317	45	234	218	92	1649	735	267	1741	777
V/C Ratio(X)	0.70	0.41	0.44	0.51	0.68	0.72	0.78	0.34	0.04	0.67	0.50	0.73
Avail Cap(c_a), veh/h	435	518	474	130	424	395	201	1649	735	435	1741	777
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	26.6	26.7	36.3	31.2	31.4	35.4	12.9	11.0	33.9	13.0	15.3
Incr Delay (d2), s/veh	2.9	0.8	1.0	8.6	3.5	4.4	13.0	0.6	0.1	2.9	1.0	5.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.1	2.1	0.5	2.8	2.8	1.6	2.7	0.2	1.6	4.5	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	36.4	27.4	27.7	44.9	34.7	35.8	48.4	13.4	11.1	36.7	14.0	21.2
LnGrp LOS	D	C	C	D	C	D	D	B	B	D	B	C
Approach Vol, veh/h		495			340			655			1615	
Approach Delay, s/veh		31.4			35.9			17.1			19.1	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	39.5	6.4	19.2	8.4	41.5	11.2	14.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	35.0	5.5	22.0	8.5	36.0	9.5	18.0
Max Q Clear Time (g_c+I1), s	5.8	9.5	3.0	7.7	5.0	23.4	6.5	8.9
Green Ext Time (p_c), s	0.2	3.7	0.0	1.2	0.0	6.4	0.2	1.1

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	22.5
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	497	692	148	20	234	158	111	630	18	128	693	266
Future Volume (veh/h)	497	692	148	20	234	158	111	630	18	128	693	266
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	540	752	161	22	254	172	121	685	20	139	753	289
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	625	875	187	66	323	211	309	1432	639	205	1027	458
Arrive On Green	0.18	0.30	0.30	0.04	0.16	0.16	0.17	0.40	0.40	0.12	0.58	0.58
Sat Flow, veh/h	3456	2912	623	1781	2060	1345	1781	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	540	459	454	22	218	208	121	685	20	139	753	289
Grp Sat Flow(s),veh/h/ln	1728	1777	1758	1781	1777	1628	1781	1777	1585	1728	1777	1585
Q Serve(g_s), s	13.7	21.9	21.9	1.1	10.6	11.1	5.4	12.8	0.5	3.5	14.0	6.6
Cycle Q Clear(g_c), s	13.7	21.9	21.9	1.1	10.6	11.1	5.4	12.8	0.5	3.5	14.0	6.6
Prop In Lane	1.00		0.35	1.00		0.83	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	625	534	529	66	279	256	309	1432	639	205	1027	458
V/C Ratio(X)	0.86	0.86	0.86	0.33	0.78	0.81	0.39	0.48	0.03	0.68	0.73	0.63
Avail Cap(c_a), veh/h	710	620	613	101	355	326	309	1432	639	250	1027	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	35.8	29.7	29.7	42.2	36.5	36.7	33.0	19.9	9.6	38.8	16.5	5.8
Incr Delay (d2), s/veh	9.9	10.4	10.6	2.9	8.3	11.8	0.8	1.1	0.1	4.4	3.8	5.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	10.2	10.1	0.5	5.0	5.0	2.3	5.1	0.2	1.5	4.2	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.7	40.1	40.2	45.2	44.8	48.4	33.8	21.0	9.7	43.3	20.2	11.1
LnGrp LOS	D	D	D	D	D	D	C	C	A	D	C	B
Approach Vol, veh/h		1453			448			826			1181	
Approach Delay, s/veh		42.2			46.5			22.6			20.7	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	40.8	7.8	31.6	20.1	30.5	20.8	18.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	29.0	5.1	31.4	9.5	26.0	18.5	18.0
Max Q Clear Time (g_c+I1), s	5.5	14.8	3.1	23.9	7.4	16.0	15.7	13.1
Green Ext Time (p_c), s	0.0	3.8	0.0	3.1	0.1	4.2	0.6	1.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	32.1
HCM 6th LOS	C

DRIVEWAY LEVEL OF SERVICE WORKSHEETS

HCS 2010 Two-Way Stop Control Summary Report

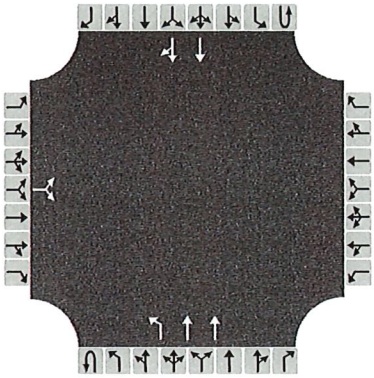
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	10/28/2024
Analysis Year	2027
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Carson Express Carwash

Site Information

Intersection	Central Avenue
Jurisdiction	City of Carson
East/West Street	Driveway
North/South Street	Central Avenue
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	2	0	0	0	2	0
Configuration			LR							L	T				T	TR
Volume (veh/h)		39		27						51	961				1549	23
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			71							55						
Capacity			125							363						
v/c Ratio			0.57							0.15						
95% Queue Length			2.8							0.5						
Control Delay (s/veh)			66.6							16.7						
Level of Service (LOS)			F							C						
Approach Delay (s/veh)	66.6								0.8							
Approach LOS	F															

HCS 2010 Two-Way Stop Control Summary Report

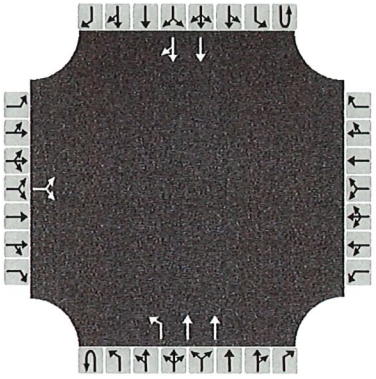
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	10/28/2024
Analysis Year	2027
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Carson Express Carwash

Site Information

Intersection	Central Avenue
Jurisdiction	City of Carson
East/West Street	Driveway
North/South Street	Central Avenue
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	2	0	0	0	2	0
Configuration			LR							L	T				T	TR
Volume (veh/h)		44		32						59	1358				1147	27
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			83							64						
Capacity			179							535						
v/c Ratio			0.46							0.12						
95% Queue Length			2.2							0.4						
Control Delay (s/veh)			41.3							12.6						
Level of Service (LOS)			E							B						
Approach Delay (s/veh)	41.3								0.5							
Approach LOS	E															

HCS 2010 Two-Way Stop Control Summary Report

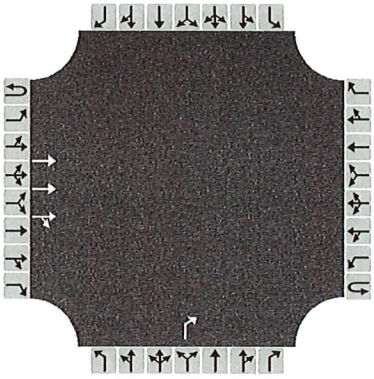
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	10/28/2024
Analysis Year	2027
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	Carson Express Carwash

Site Information

Intersection	Albertoni Street/Project Driveway
Jurisdiction	City of Carson
East/West Street	Albertoni Street
North/South Street	Project Driveway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	0	0	0	0	0		0	0	1		0	0	0
Configuration			T	TR								R				
Volume (veh/h)			783	16								16				
Percent Heavy Vehicles												3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)												17				
Capacity												485				
v/c Ratio												0.04				
95% Queue Length												0.1				
Control Delay (s/veh)												12.7				
Level of Service (LOS)												B				
Approach Delay (s/veh)									12.7							
Approach LOS									B							

HCS 2010 Two-Way Stop Control Summary Report

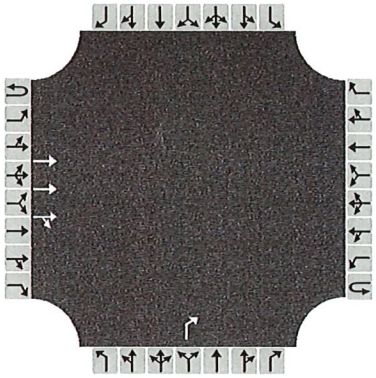
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	10/28/2024
Analysis Year	2027
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	Carson Express Carwash

Site Information

Intersection	Albertoni Street/Project Driveway
Jurisdiction	City of Carson
East/West Street	Albertoni Street
North/South Street	Project Driveway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	3	0	0	0	0	0		0	0	1		0	0	0
Configuration			T	TR								R				
Volume (veh/h)			1313	20								22				
Percent Heavy Vehicles												3				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)												24				
Capacity												314				
v/c Ratio												0.08				
95% Queue Length												0.2				
Control Delay (s/veh)												17.4				
Level of Service (LOS)												C				
Approach Delay (s/veh)									17.4							
Approach LOS									C							