LINSCOTT LAW & GREENSPAN engineers

TRANSPORTATION IMPACT STUDY

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

City of Monrovia, California
March 17, 2021

Prepared for:

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LLG Ref. 1-20-4393-1

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TRANSPORTATION IMPACT STUDY

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1.0 INTRODUCTION

1.1 Transportation Study Overview

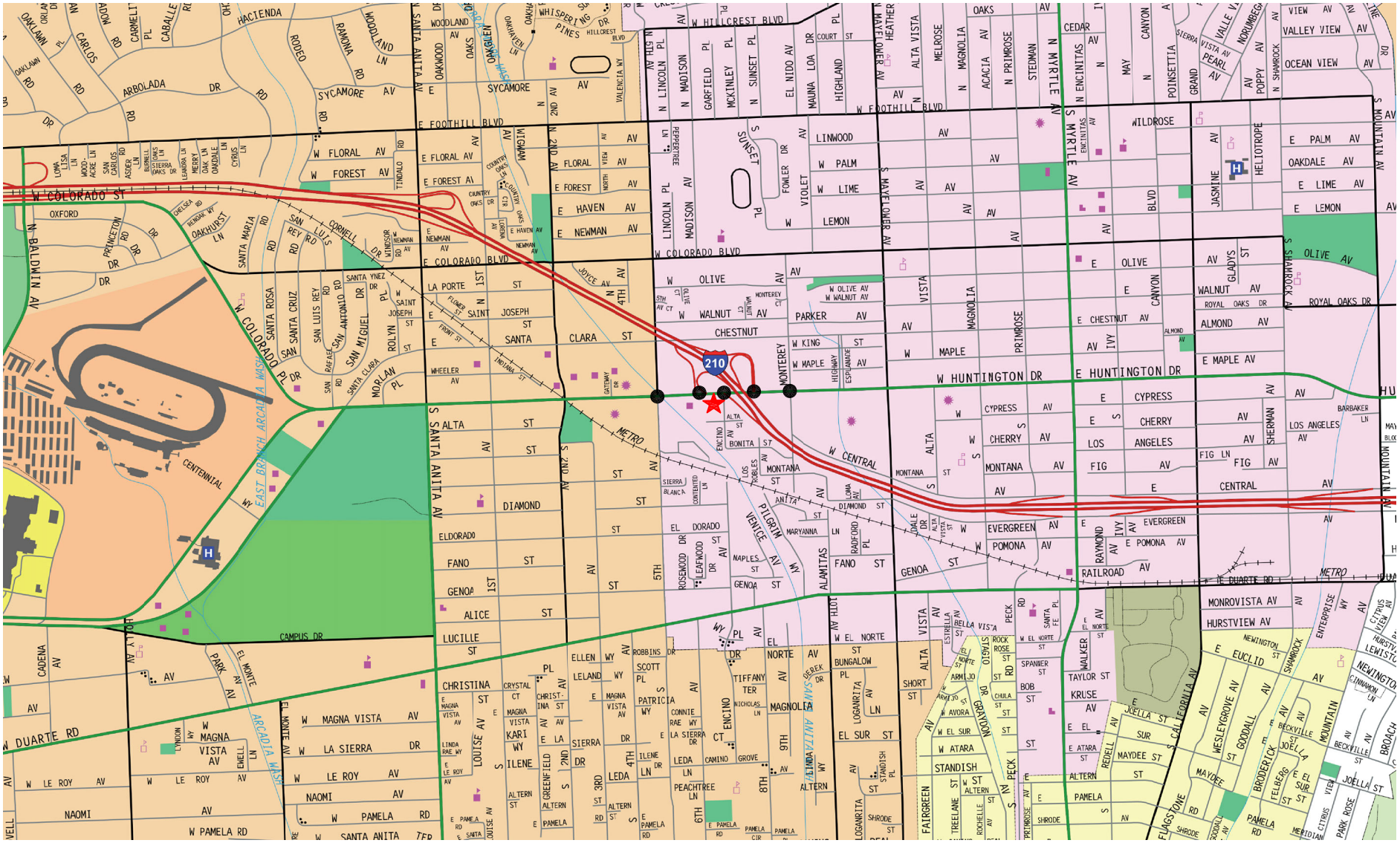
This transportation impact study has been conducted to identify and evaluate the potential transportation impacts of the proposed Chick-fil-A/Starbucks Monrovia project ("proposed project"). The proposed project site is located on the southwest corner of the Encino Avenue/Huntington Drive intersection in the City of Monrovia, California. The proposed project site is generally bounded by Huntington Drive to the north, Encino Avenue to the east, Alta Street to the south, and the existing Double Tree hotel to the west. The project site and general vicinity are shown in ***Figure 1-1***.

The transportation assessment follows the requirements set forth in the City of Monrovia's current *Transportation Study Guidelines*[1]. In compliance with the California Environmental Quality Act (CEQA) Sections 15064.3 and 15064.7, the City of Monrovia has adopted Vehicle Miles Traveled (VMT) for the purpose of analyzing transportation impacts under CEQA. In addition, the City maintains vehicle Level of Service (LOS) standards for local transportation infrastructure. Therefore, the Guidelines identify both CEQA based analysis requirements and non-CEQA based analysis requirements for analyzing the potential transportation impacts of proposed development projects.

This study evaluates potential project-related VMT impacts pursuant to the screening criteria, analysis tools, and thresholds adopted and approved for use by the City of Monrovia. The study also evaluates potential project-related effects on LOS at five (5) key intersections in the vicinity of the project site. The study intersections were determined in consultation with City of Monrovia staff. The Intersection Capacity Utilization (ICU) method was used to determine LOS for the four (4) signalized intersections, and the Highway Capacity Manual (HCM) method was used to determine LOS for the one (1) unsignalized intersection. In addition, the I-210 Freeway ramp intersections under Caltrans' jurisdiction were also evaluated based on HCM operational analysis methodologies.

This report (i) presents the proposed project's existing transportation network context, (ii) presents existing traffic volumes, (iii) forecasts cumulative baseline conditions, (iv) forecasts project-generated traffic, (v) assesses the potential for project-related transportation impacts consistent with the CEQA based and non-CEQA based metrics set forth by the City of Monrovia, and (vi) recommends transportation mitigation and/or improvement measures, where necessary.

[1] *City of Monrovia Transportation Study Guidelines for Vehicle Miles Traveled and Level of Service Assessment*, September 2020.



MAP SOURCE: RAND MCNALLY & COMPANY

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★ PROJECT SITE

● STUDY INTERSECTION

FIGURE 1-1
VICINITY MAP

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CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

1.2 Study Methodology

The CEQA and non-CEQA analysis criteria for this transportation assessment were identified in consultation with City of Monrovia staff. The analysis criteria were determined based on the City's Guidelines, the proposed project description and location, and the characteristics of the surrounding transportation system. As the Lead Agency under CEQA, the City of Monrovia confirmed the appropriateness of the analysis criteria when it approved the transportation assessment Scope of Work Memorandum of Understanding (MOU). The approved MOU is attached to this report in ***Appendix A***.

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743 (Steinberg, 2013). Among other things, SB 743 created a process to change the methodology to analyze transportation impacts under CEQA (Public Resources Code Section 21000 and following) in order to promote 1) the reduction of greenhouse gas emissions, 2) the development of multimodal transportation networks, and 3) a diversity of land uses. On December 30, 2013, the State of California Governor's Office of Planning and Research (OPR) released a preliminary evaluation of alternative methods of transportation analysis, which included analysis based on project VMT rather than impacts to intersection Level of Service. OPR issued other draft discussion documents in March 2015 and January 2016, suggesting some new revisions to the state CEQA Guidelines. In November 2017, OPR submitted the proposed amendments to the CEQA Guidelines to the State's Natural Resources Agency (that include a proposed new Guidelines Section 15064.3 which governs how analyses of potential traffic impacts should be conducted). On January 26, 2018, the Natural Resources Agency published a Notice of Rulemaking, commencing the formal rulemaking process for the amendments to the CEQA Guidelines. On December 28, 2018, the California Office of Administrative Law adopted the proposed amendments, formally implementing the use of VMT as the metric for transportation analysis under CEQA and providing a grace period allowing local agencies to opt-in to the new metrics. State-wide implementation of the new metric was required by July 1, 2020.

In anticipation of the mandated change to VMT, the San Gabriel Valley Council of Governments (SGVCOG), of which the City of Monrovia is a participating agency, undertook the SGVCOG SB 743 Implementation Study to assist with answering important implementation questions about the methodology, thresholds, and mitigation approaches for VMT impact analysis in the member agencies. The City of Monrovia utilized the information produced through the Implementation Study to adopt a methodology and significance thresholds for use in CEQA compliant transportation analyses. The new metric and thresholds of significance were formally adopted through City Council Resolution No. 2020-52[2] on July 7, 2020. In September 2020, the City released new Transportation Study Guidelines[3] which set forth the study methodology, thresholds, and potential mitigation strategies for VMT impact analysis within the City of Monrovia. In alignment with the goals of SB

[2] Resolution No. 2020-52, "A Resolution of the City Council of the City of Monrovia Adopting "Vehicle Miles Traveled" Baseline and Thresholds of Significance for Purposes of Analyzing Transportation Impacts Under the California Environmental Quality Act", adopted on July 7, 2020.

[3] "City of Monrovia Transportation Study Guidelines for Vehicle Miles Traveled and Level of Service Assessment", September 2020.

743, the City also requires an evaluation of a project's impact on the multi-modal pedestrian, bicycle, and transit network.

The City's Guidelines further note that SB 743 does not prevent agencies from continuing to analyze delay or LOS outside of CEQA review for other transportation planning or analysis purposes (i.e., general plans, impact fee programs, corridor studies, congestion reduction, or ongoing network monitoring). The City has LOS standards which local transportation infrastructure should strive to maintain. The LOS standards apply to discretionary approvals of new land use development projects. Therefore, the City's Guidelines also include requirements for non-CEQA analyses. Specifically, the City requires utilization of the Intersection Capacity Utilization (ICU) methodology to evaluate LOS at signalized intersections, and utilization of the latest version of the Highway Capacity Manual (HCM) methodology to evaluate LOS at unsignalized intersections.

The California State Department of Transportation (Caltrans) has also formally adopted VMT as the metric for evaluating the transportation impacts of local development projects on the State Highway System. Caltrans' *Transportation Impact Study Guide*[4] (TISG) references the December 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA*[5] prepared by the Governor's Office of Planning and Research (OPR) as the basis for its guidance on VMT assessment. For the purpose of this transportation assessment, it is understood that the City of Monrovia's adopted VMT methodology and criteria are substantially consistent with the recommendations provided by OPR in the *Technical Advisory* and thus satisfy Caltrans' VMT analysis requirements as well. Therefore, no separate VMT analysis has been prepared for Caltrans' review of the proposed project.

Caltrans' TISG states, "Additional future guidance will include the basis for requesting transportation impact analysis that is not based on VMT. This guidance will include a simplified safety analysis approach that reduces risks to all road users and that focuses on multi-modal conflict analysis as well as access management issues." While the final guidance is still being developed, Caltrans has released the "Interim Land Development and Intergovernmental Review (LDIGR) Safety Review Practitioners Guidance"[6]. The proposed project does not take direct access to/from a State facility; however, it is situated in the immediate vicinity of the I-210 Freeway eastbound and westbound ramps at Huntington Drive and is expected to generate net new project trips at the ramp intersections. Therefore, the interim safety guidance was reviewed and analyses relevant to the proposed land use development project were identified for inclusion in the transportation assessment.

The proposed project's CEQA transportation impacts have been evaluated based on the City of Monrovia's adopted VMT screening criteria, methodology, and thresholds. In order to evaluate the proposed project's effect on local transportation infrastructure, a non-CEQA analysis of five (5) study intersections has been conducted for the weekday AM and PM peak hours, utilizing the ICU

[4] "Vehicle Miles Traveled-Focused Transportation Impact Study Guide", Caltrans, May 20, 2020.
[5] "Technical Advisory on Evaluating Transportation Impacts in CEQA", Governor's Office of Planning and Research, December 2018.
[6] "Interim Land Development and Intergovernmental Practitioners Guidance", Caltrans, July 2020.

and HCM analysis methodologies for signalized and unsignalized intersections, respectively. Further, the I-210 Freeway ramp intersections under Caltrans' jurisdiction were also evaluated based on HCM operational analysis methodologies.

1.3 Los Angeles County Congestion Management Program Status

The Los Angeles County Congestion Management Program (CMP) was previously a state-mandated program that was enacted by the California State Legislature with the passage of Proposition 111 in 1990 that primarily utilized a level of service (LOS) performance metric. Pursuant to California Government Code §65088.3, local jurisdictions may opt out of the CMP requirement without penalty if a majority of the local jurisdictions representing a majority of the County's population formally adopt resolutions requesting to opt out of the program. As stated in a letter from the Los Angeles County Metropolitan Transportation Authority (Metro)[7], by August 28, 2019 fifty-seven local jurisdictions, which in total represent 8.5 million in population, had adopted resolutions electing to be exempt from the CMP. With the Los Angeles County region having reached the statutorily required threshold, the provisions of the CMP are no longer applicable to any of the 89 local jurisdictions within Los Angeles County, regardless of whether or not a jurisdiction adopted an opt-out resolution. Therefore, CMP Traffic Impact Analysis is no longer required in Environmental Impact Reports.

[7] Kalieh Honish, Los Angeles County Metropolitan Transportation Authority, to Seleta Reynolds, City of Los Angeles Department of Transportation, "Re: Dissolution of the Congestion Management Program in Los Angeles County", August 28, 2019.

2.0 PROJECT DESCRIPTION

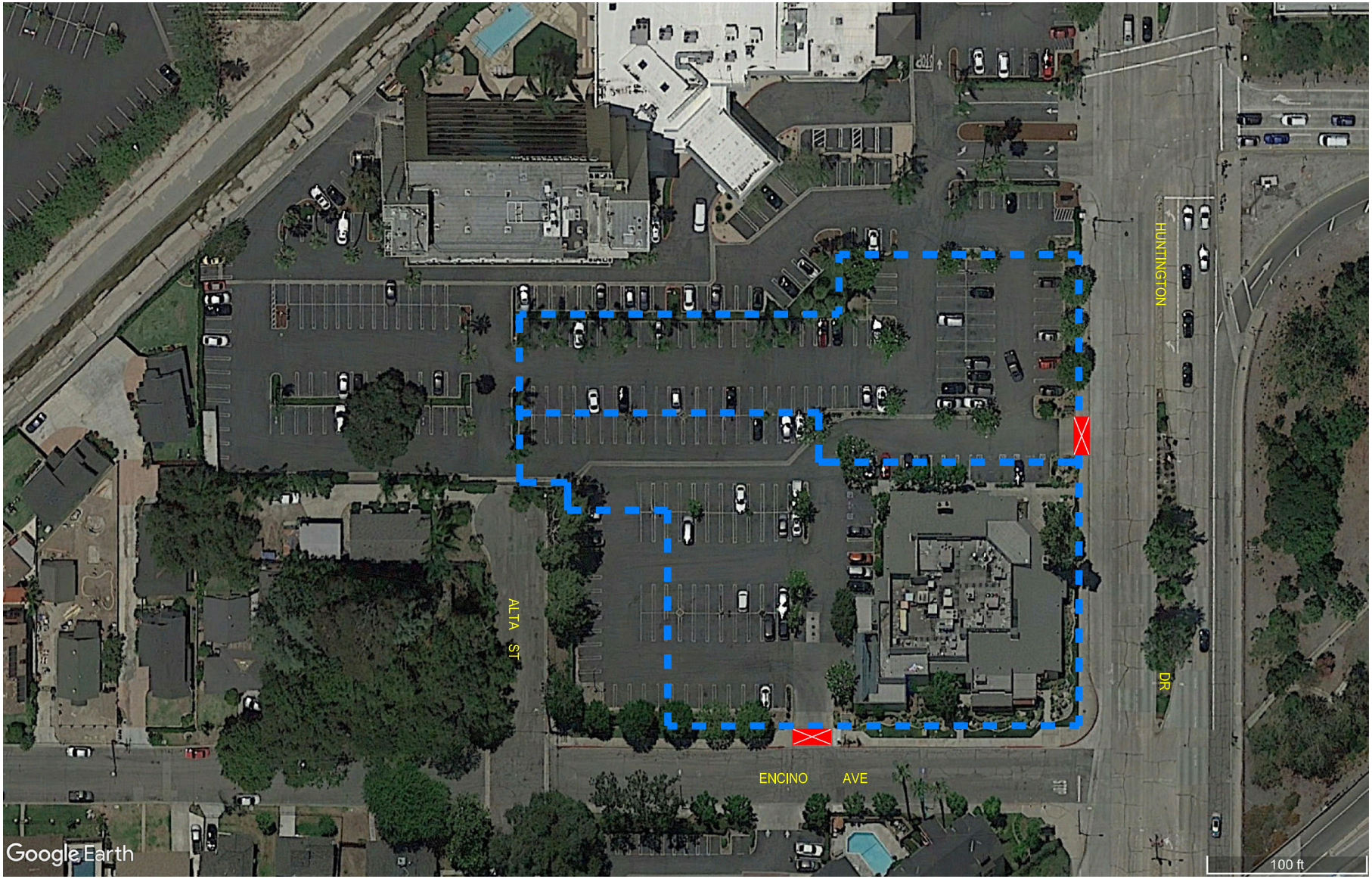
2.1 Existing Project Site

The proposed project site is located on the southwest corner of the Encino Avenue/Huntington Drive intersection located in the City of Monrovia, California. The proposed project site is generally bounded by Huntington Drive to the north, Encino Avenue to the east, Alta Street to the south, and the existing Double Tree hotel to the west. The proposed project site and general vicinity are shown in *Figure 1-1*. The project site is currently occupied by an existing Claim Jumper restaurant and existing surface parking areas along the east side of the Double Tree hotel between Huntington Drive and Alta Street. The existing surface parking areas interconnect with the existing surface parking and drive-aisles associated with the Double Tree hotel and other existing commercial development. The existing restaurant will be demolished to accommodate development of the proposed project. An aerial photograph of the existing project site is presented in ***Figure 2-1***.

2.2 Proposed Project Description

The proposed project consists of the development of two free-standing drive-through restaurants on the project site. A 4,562 square-foot Chick-fil-A restaurant is planned to be constructed in the northeast corner of the project site, in place of the demolished Claim Jumper restaurant. The Chick-fil-A restaurant will provide both indoor and patio seating as well as a drive-through service lane which is planned to accommodate up to 30 vehicles in queue. The proposed Chick-fil-A restaurant is planned to be open to the public Monday through Saturday between the hours of 6:30 AM and 10:00 PM, with employees at the site from 5:00 AM to 11:00 PM for opening and closing activities. Deliveries for the proposed Chick-fil-A may occur anytime within the hours of operation, but are likely to occur between the hours of 5:00 and 6:30 AM. A 2,200 square-foot Starbucks restaurant is planned to be constructed in the northwest corner of the project site, adjacent to the existing signalized driveway providing access to the Double Tree hotel and the existing commercial development at the site. The Starbucks restaurant will also provide interior service and a drive-through service lane which is planned to accommodate up to 13 vehicles in queue. The proposed Starbucks restaurant is planned to provide 24-hour operations seven days a week at the site. Deliveries for the proposed Starbucks are planned to occur between the hours of 7:00 and 9:00 AM daily, and up to two times a week, deliveries may occur between the hours of midnight and 4:00 AM. Construction and occupancy of both the Chick-fil-A and Starbucks restaurants is anticipated to be completed by the year 2023. The site plan for the proposed project is illustrated in ***Figure 2-2***.

The proposed project also includes dedication of approximately 8,600 square feet (0.2 acres) of land at the southeast corner of the project site to the City of Monrovia. It is understood that the City intends to develop this land in the future for use as a neighborhood "pocket park". The City's General Plan Open Space Element defines "pocket parks" as small parks that provide limited opportunities for active play and passive recreation. They are generally less than 0.5 acres in size and provide modest recreational amenities to residents within a 0.25-mile walking distance. It is understood that development of the pocket park will require a separate review and approval by the City.



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MAP SOURCE: GOODLE EARTH

PROJECT SITE

EXISTING DRIVEWAY

FIGURE 2-1
AERIAL PHOTOGRAPH OF EXISTING PROJECT SITE

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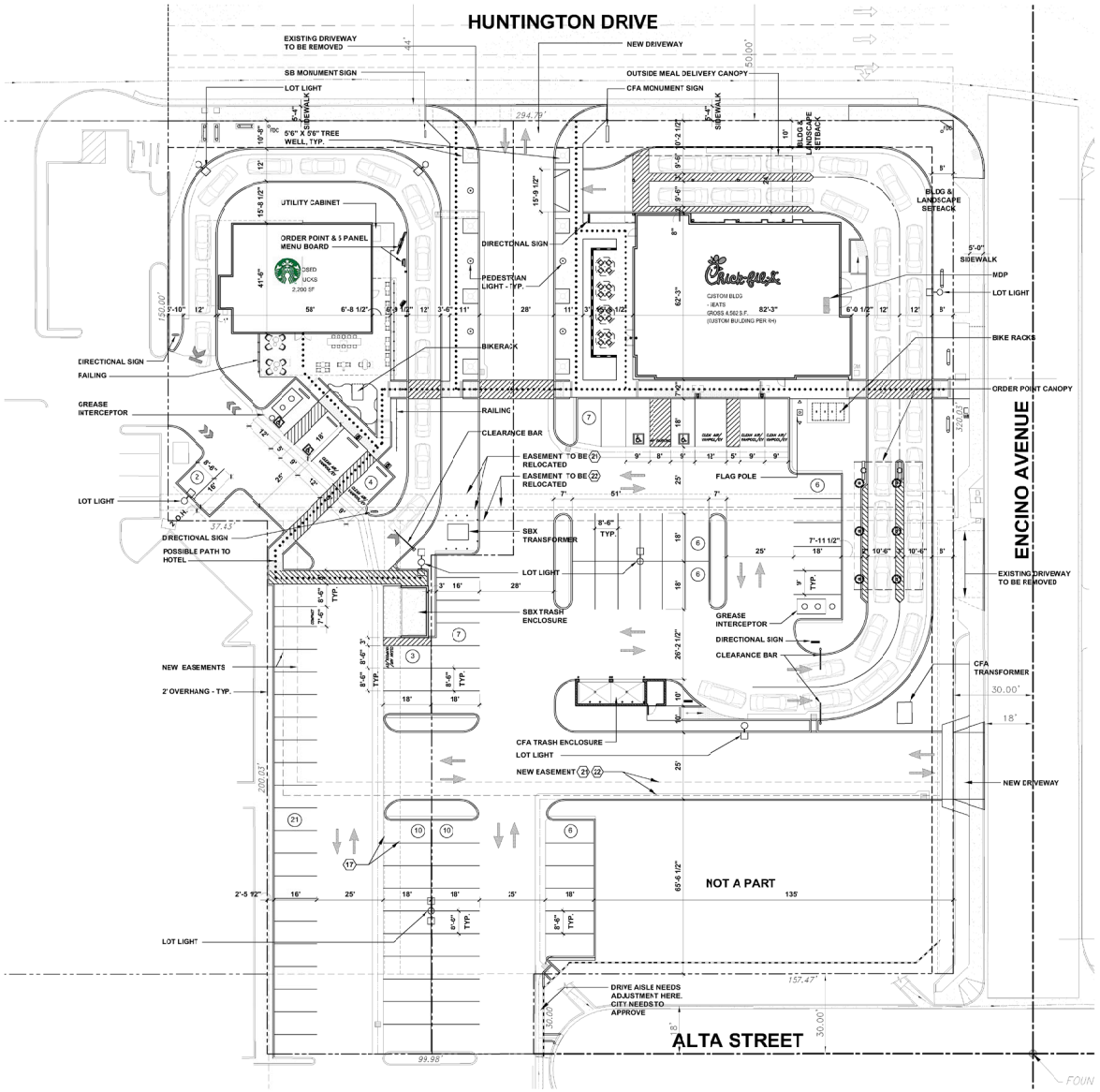
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT



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SOURCE: CRHO ARCHITECTS

FIGURE 2-2
SITE PLAN

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2.3 Project Site Access

2.3.1 *Vehicular Site Access*

Direct vehicular access to the proposed project site is currently accommodated by two existing driveways: one driveway on Huntington Drive, and one driveway on Encino Avenue. In addition, access to the project site is accommodated by the existing signalized intersection north of the Double Tree hotel (Study Intersection No. 2) via surface parking areas and drive-aisles which interconnect with the project site. As shown in *Figure 2-2*, access to the proposed project will remain substantially the same. A description of each proposed project site access point is provided in further detail below:

- Huntington Drive Driveway
  The driveway along Huntington Drive will be provided in approximately the same location as the existing driveway. This driveway will provide access to the central project site drive-aisle. Due to the presence of a raised median island along Huntington Drive, the driveway will accommodate only right-turning inbound and outbound movements to and from the eastbound travel lanes on Huntington Drive.

- Encino Avenue Driveway
  The existing Encino Avenue driveway, which currently accommodates full access (i.e., right and left-turning inbound and outbound movements), will be closed and replaced with a public sidewalk. A new, full access driveway will be constructed adjacent to the southerly property line of the proposed project. Both the sidewalk and driveway will be constructed to City of Monrovia design standards.

- Signalized Double Tree Driveway
  As previously noted, vehicular access to the project site is also presently accommodated by the signalized intersection north of the Double Tree hotel (Study Intersection. No. 2), which is comprised of the I-210 Freeway eastbound ramps, the existing Double Tree hotel driveway, and Huntington Drive. Direct access to the site from the signal is accommodated by the main drive-aisle/s associated with the Double Tree hotel which interconnect with the existing surface parking areas and the project site. It is envisioned that access to the proposed project will continue to be accommodated by the signalized intersection and existing drive-aisles. The signalized intersection accommodates full access into and out of the existing driveway.

Within the project site, vehicle circulation will be accommodated by drive-aisles which provide access to the surface parking areas and the drive-through service window queue storage lanes. As shown in *Figure 2*-2, the proposed Chick-fil-A drive-through storage lane will be accessible from the central project site drive-aisle adjacent to the throat of the Encino Avenue driveway. The service lane is planned to wrap counter-clockwise around the proposed Chick-fil-A restaurant adjacent to the property line along Encino Avenue and Huntington Drive. The central project site drive aisle will accommodate egress from the Chick-fil-A drive-through service lane. Access to the proposed

Starbucks drive-through service-window queue storage lane will be accommodated by the westerly project site drive-aisle. The service lane is planned to wrap counter-clockwise around the proposed Starbucks restaurant adjacent to the central project site drive-aisle and Huntington Drive. Egress from the Starbucks drive-through service lane is planned to occur near the westerly project site boundary, near the existing signalized Double Tree driveway.

In recognition of the proximity of the Chick-fil-A drive-through service lane exit to the Huntington Drive project driveway, the City of Monrovia reserves the right to restrict the project driveway to inbound right-turns only, should a post-opening operational review indicate that outbound vehicles waiting to turn right onto Huntington Drive block the service lane exit. A detailed operational review of this alternate site access scheme in which the Huntington Drive project driveway is restricted to right-turning inbound movements only is presented in *Section 5.7*, herein.

2.3.2 *Non-Vehicular Site Access*

The project site is planned to accommodate non-vehicular access to the proposed restaurants as well. Pedestrian access within the project site will be accommodated by Americans with Disabilities Act (ADA) compliant walkways along either side of the central project site drive-aisle, as shown in *Figure 2-2*. An additional walkway will be provided from Encino Avenue which will interconnect with the central drive-aisle walkways. These walkways will provide exclusive pedestrian and bicycle access from the public sidewalks to both the Chick-fil-A and Starbucks restaurants. A striped pedestrian walkway which extends towards the Double Tree hotel entrance will also be provided, which may be connected to the hotel entrance area. The walkways thus minimize the extent of pedestrian and bicycle interaction with vehicles at the site and provide a comfortable, convenient, and safe environment for pedestrians and bicyclists accessing the proposed restaurants from outside the project site.

2.4 Project Parking

The proposed Chick-fil-A and Starbucks restaurants are planned to provide a total of 88 parking spaces. The parking spaces will be provided in surface parking areas which interconnect with the existing surface parking areas and drive aisles serving the Double Tree hotel and other commercial development along the south side of Huntington Drive. A total of four (4) handicap accessible spaces will be provided, and six (6) spaces will be reserved for clean air, vanpool, or electric vehicles. In addition, the project site will provide public bicycle parking racks adjacent to both the proposed Chick-fil-A and Starbucks restaurants.

A calculation of the project's parking requirements was prepared based on the parking ratios provided in the City of Monrovia Municipal Code Section 17.24.060, "Number of Spaces Required – Nonresidential Uses". According to the Code, the required parking ratio for a fast-food or drive-through restaurant is 1.5 spaces for every table, or a minimum of 10 spaces, whichever is greater. The proposed Chick-fil-A restaurant will accommodate up to 32 tables, including 28 indoor dining tables and four (4) outdoor/patio dining tables. Based on information provided by the project Applicant, it is understood that the proposed Starbucks restaurant will accommodate a maximum of

26 tables, including 12 indoor tables and 14 outdoor tables. It is further understood from direction provided by City staff that the parking ratio is to be applied to indoor tables only. Therefore, application of the Municipal Code parking ratios to the proposed restaurants results in an on-site parking requirement of 60 spaces, as shown below:

Chick-fil-A Restaurant	28 indoor tables	x	1.5 spaces/table	=	42 spaces
Starbucks Restaurant	12 indoor tables	x	1.5 spaces/table	=	18 spaces
			Total Required Project Parking	=	60 spaces

The proposed project's planned on-site parking supply of 88 spaces therefore exceeds the Municipal Code parking requirement of 60 spaces, resulting in a surplus of 28 spaces.

2.5 Project Trip Generation and Distribution

2.5.1 *Project Trip Generation Forecast*

Traffic trip generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. The traffic volumes anticipated to be generated by the proposed project were forecast for the typical weekday AM and PM peak commute hours as well as over a 24-hour period (i.e., daily). Trip generation rate information provided in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 10th Edition[8] and *Trip Generation Handbook,* 3rd Edition[9] was utilized to prepare the trip generation forecast. Specifically, trip generation average rates for Land Use 937: Donut-Coffee Shop with Drive-Through Window were utilized to forecast the trips generated by the proposed Starbucks restaurant. However, in recognition of the unique trip generation characteristics of Chick-fil-A restaurants, an empirically derived trip generation rate was utilized to forecast the trips generated by the proposed Chick-fil-A restaurant. A description of the empirically derived trip rates is provided below.

Empirical Chick-fil-A Trip Generation Rates

Vehicle trip counts were conducted at three existing Chick-fil-A restaurants in the Southern California region in order to more accurately forecast the vehicle trips expected to be generated by the proposed Chick-fil-A restaurant. The following locations were observed for purposes of deriving site-specific trip generation rates:

- 12190 Foothill Boulevard, Rancho Cucamonga, California 91739
- 1949 N. Campus Avenue, Upland, California 91784
- 1700 E. Colorado Boulevard, Pasadena, California 91106

Observations were conducted at each site during the morning (7:00 to 9:00 AM) and afternoon (4:00 to 6:00 PM) peak hours for two consecutive mid-week days. Observations at the locations in the Cities of Rancho Cucamonga and Upland were conducted in August and September 2018, respectively, while observations at the location in the City of Pasadena

[8] Institute of Transportation Engineers *Trip Generation Manual*, 10th Edition, Washington D.C., 2017.
[9] Institute of Transportation Engineers *Trip Generation Handbook*, 3rd Edition, Washington, D.C., revised 2017.

were conducted in September 2019. Empirical trip rates per thousand square feet of building area were calculated for each site individually. The two-day trip generation averages for each observation site, as well as for all three sites in aggregate, are presented in ***Appendix Table B-1***. Summaries of the observation data and the empirical trip rate calculations for each observation site are presented in ***Appendix Tables B-2*** through ***B-4***. As shown in *Appendix Table B-1*, the aggregate two-day trip generation rate for Chick-fil-A restaurants based on observation of existing sites was also compared to the trip generation rates published in the *Trip Generation Manual* for Land Use 934: Fast-Food Restaurant with Drive-Through. It is noted that the daily trip rate based on the peak hour observations of the existing sites is approximately equal to the published ITE daily trip rate for fast-food restaurants. However, the observed AM peak hour trip rate was approximately 18 percent (18%) lower and the observed PM peak hour trip rate was approximately 98 percent (98%) higher than the published rate for the same time period. Therefore, it is determined that the empirical trip generation rates derived from observation of other existing Chick-fil-A restaurants will provide a more accurate trip generation forecast for the proposed project. The aggregate trip rates for all three observation sites were utilized to prepare the trip generation forecast during the weekday AM and PM peak hours, as well as over a 24-hour period.

A forecast was also made of likely pass-by trips that could be anticipated at the site for the proposed project. Pass-by trips are intermediate stops made on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the site. The *Trip Generation Handbook* presents the national database of pass-by trip rates for 25 land uses, including Land Use 934: Fast-Food Restaurant with Drive-Through Window. Pursuant to the data presented in the *Handbook*, a 50% pass-by adjustment has been applied to the weekday AM and PM peak hour vehicle trip generation forecasts, as well as to the daily vehicle trip generation forecast for the proposed Chick-fil-A restaurant. It is noted that the *Handbook* provides limited data for Land Use 937: Donut-Coffee Shop with Drive-Through Window. The data which is presented suggests that pass-by rates of up to 80% may occur for this land use. However, due to the small sample size of this data, the pass-by rate of 50% provided for fast-food restaurants was applied to the proposed Starbucks restaurant as well. Utilization of the better established, lower pass-by rates for the Starbucks component results in a more conservative trip generation forecast for the proposed project.

Based on direction from City staff, an estimate of trips expected to be generated by the approximately 8,600 square-foot future pocket park was also included in the project trip generation forecast. Trip generation average rates for Land Use 411: Public Park were utilized to forecast the typical weekday AM and PM peak hour trips as well as trips over a 24-hour period. The *Trip Generation Manual* provides trip generation rates for Land Use 411 per acre, however due to the small size of the future park, these trip rates were found to result in a nominal trip generation forecast. Instead, trip generation rates per employee were utilized in order to provide a more conservative estimate of trips. Although the number of park employees expected at the site is not currently known, based on the small size of the park an employment level of one (1) employee was assumed for trip generation forecasting purposes. The pocket park is intended to be neighborhood

serving in nature, therefore a walk-in patronage adjustment of 50% has been assumed in order to account for the anticipated use of the park by the local neighborhood residents as well as patrons and guests of the nearby commercial developments.

In addition to the proposed project trip generation forecasts described above, forecasts were also prepared for the existing site use. Trip generation average rates for Land Use 932: High-Turnover (Sit-Down) Restaurant were utilized to forecast the current vehicle trips generated by the existing Claim Jumper restaurant, which was assumed to be open and operating normally at the time most of the existing baseline traffic volumes were collected (discussed in greater detail in *Section 3.4*, herein). As Claim Jumper Restaurants are typically not open for breakfast, it is assumed that the existing restaurant generates only a nominal number of trips during the AM peak hour. Consistent with the trip generation forecasts prepared for the proposed project, a pass-by adjustment was also applied to the existing restaurant. Pursuant to the data provided for Land Use 932 in the *Trip Generation Handbook*, a pass-by adjustment of 45% was applied to the PM peak hour vehicle trip generation forecasts. As no pass-by data is available for other anticipated peak periods (such as the lunch time peak), a lower pass-by rate of 25% has been assumed for the daily trip generation forecast in order to provide a conservative daily trip estimate.

The trip generation forecast for the proposed project is summarized in ***Table 2-1***. As presented in *Table 2-1*, the proposed project is forecast to result in a net increase of 175 vehicle trips (91 net new inbound trips and 84 net new outbound trips) during the AM peak hour and a net increase of 131 vehicle trips (56 net new inbound trips and 75 net new outbound trips) during the PM peak hour. Over a 24-hour period, the proposed project is forecast to result in a net increase of 1,019 daily trip ends (roughly 510 net new inbound trips and 510 net new outbound trips) over a 24-hour period on a typical weekday.

2.5.2 *Project Trip Distribution and Assignment*

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

- The site's proximity to major traffic corridors (i.e., Huntington Drive, 5th Street, the I-210 Freeway, etc.);
- Expected localized traffic flow patterns based on adjacent roadway channelization and presence of traffic signals;
- Existing intersection traffic volumes;
- Existing site parcel access ingress/egress schemes;
- Ingress/egress scheme planned for the proposed project;
- Nearby population and employment centers; and
- Input from City of Monrovia staff.

Table 2-1
PROJECT TRIP GENERATION FORECAST

TRIP GENERATION RATES [1]									
	ITE LAND USE		WEEKDAY	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
ITE LAND USE CATEGORY	CODE	VARIABLE	DAILY	IN (%)	OUT (%)	TOTAL	IN (%)	OUT (%)	TOTAL
Chick-fil-A Restaurants	[2]	Per 1,000 SF	488.63	53%	47%	32.89	49%	51%	64.83
Public Park	411	Per Employee	59.53	65%	35%	4.59	45%	55%	7.41
High-Turnover (Sit-Down) Restaurant	932	Per 1,000 SF	112.18	55%	45%	9.94	62%	38%	9.77
Donut/Coffee Shop with Drive-Through Window	937	Per 1,000 SF	820.38	51%	49%	88.99	50%	50%	43.38

PROJECT TRIP GENERATION FORECAST									
	ITE LAND USE		DAILY TRIP ENDS [3]	AM PEAK HOUR VOLUMES [3]			PM PEAK HOUR VOLUMES [3]		
LAND USE	CODE	SIZE	VOLUMES	IN	OUT	TOTAL	IN	OUT	TOTAL
Proposed Project									
Chick-fil-A Restaurant	[2]	4,562 GSF	2,229	80	70	150	145	151	296
- Less Pass-by (50%) [4],[5]			(1,115)	(40)	(35)	(75)	(73)	(76)	(149)
Starbucks Restaurant	937	2,200 GSF	1,805	100	96	196	48	47	95
- Less Pass-by (50%) [4],[5]			(903)	(50)	(48)	(98)	(24)	(24)	(48)
Pocket Park	411	1 Emp.	60	3	2	5	3	4	7
- Less Walk-in Patronage (50%) [6]			(30)	(2)	(1)	(3)	(2)	(2)	(4)
Subtotal Proposed Project			***2,046***	***91***	***84***	***175***	***97***	***100***	***197***
Existing Uses									
Claim Jumper Restaurant	932	(12,216) GSF	(1,370)	Nom.	Nom.	Nom.	(74)	(45)	(119)
- Less Pass-by (45%) [4],[7]			343	0	0	0	33	20	53
Subtotal Existing Uses			***(1,027)***	***0***	***0***	***0***	***(41)***	***(25)***	***(66)***
NET NEW PROJECT TRIPS			***1,019***	***91***	***84***	***175***	***56***	***75***	***131***

[1] Source: ITE "Trip Generation Manual", 10th Edition, 2017, or as otherwise noted.

[2] Trip generation rates based on rates derived from site specific surveys conducted at existing Chick-fil-A restaurants located in the Cities of Rancho Cucamonga, Upland, and Pasadena, California. Trip generation rate represents the aggregate two-day average trip rates at the existing Chick-fil-A locations. Refer to *Appendix B* for derivation of the trip rates.

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

[4] Sources: ITE "Trip Generation Manual", 10th Edition, 2017 and ITE "Trip Generation Handbook", 3rd Edition, revised 2017. Pass-by trips are made as intermediate stops on the way from an origin to a primary destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the site.

[5] A pass-by adjustment of 50% has been applied to both the AM and PM peak hour trip generation forecasts, based on information provided for ITE Land Use 934 (Fast-Food Restaurant with Drive-Through Window). It is noted that the limited pass-by data provided for ITE Land Use 937 (Donut-Coffee Shop with Drive-Through) indicates a pass-by rate of up to 80% may occur for this land use; however, in order to provide a conservative forecast, a 50% pass-by adjustment was applied to the proposed Starbucks restaurant as well.

[6] The approximately 8,600 square-foot pocket park is intended to be neighborhood serving in nature. While ITE Land Use Code 411 (Public Park) provides trip generation rates based on park acreage, employing such rates would have resulted in a nominal vehicle trip forecast. Given the small size of the park, an employment level of one (1) employee was assumed for trip generation forecasting purposes instead. A walk-in patronage adjustment of 50% has been applied in order to account for the anticipated use of the park by the local neighborhood as well as patrons and guests of nearby commercial developments.

[7] A pass-by adjustment of 45% has been applied to the PM peak hour trip generation forecasts, based on information provided for ITE Land Use 932 (High-Turnover [Sit-Down] Restaurant). A pass-by adjustment of 25% has been assumed for the daily trip generation forecasts.

The general, directional traffic distribution patterns for the proposed project are presented in ***Figure 2-3***. The forecast net new weekday AM and PM peak hour project traffic volumes at the study intersections associated with the proposed project are presented in ***Figures 2-4*** and ***2-5***, respectively. The traffic volume assignments presented in *Figures 2-4* and *2-5* reflect the traffic distribution characteristics shown in *Figure 2-3* and the project trip generation forecasts presented in *Table 2-1*.

2.6 Project Service-Window Queuing

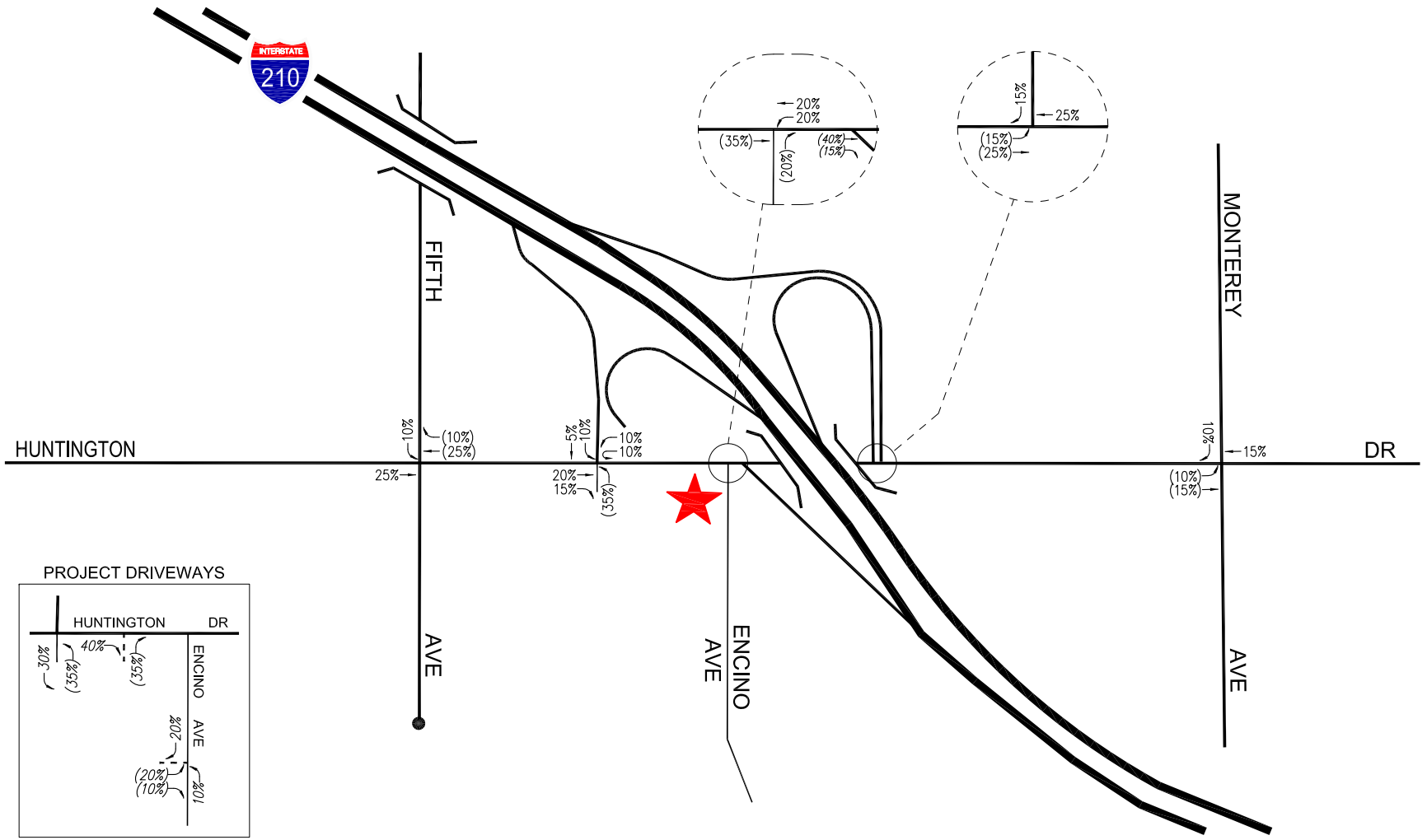
A review of the expected maximum drive-through service-window vehicle queue lengths was conducted to determine the adequacy of the proposed service-lane queue storage areas. A queuing analysis for each proposed drive-through service lane is provided below.

2.6.1 *Proposed Chick-fil-A Restaurant*

In recognition of the unique vehicle queuing characteristics of Chick-fil-A restaurants, vehicle queuing at existing restaurant locations in the Southern California region was reviewed in order to more appropriately forecast the expected vehicle queue at the proposed project. As part of this review, LLG received and reviewed the previous queuing analyses conducted by TJW Engineering on behalf of Chick-fil-A (i.e., as summarized in their memorandum, dated December 18, 2017, contained in ***Appendix C***). Two (2) of the four (4) sites reviewed as part of TJW Engineering's analysis were also surveyed by LLG personnel as part of the empirical trip generation surveys described in *Section 2.5.1*; namely, the existing restaurants located in the Cities of Rancho Cucamonga and Upland. As reported by TJW Engineers, the maximum observed queue at the Rancho Cucamonga site was 19 vehicles and the maximum observed queue at the Upland site was 26 vehicles. It is noted that the TJW Engineering memorandum highlights the Upland location for its unusual characteristics with respect to peak hour arrival rates and vehicle queues. As Chick-fil-A restaurants tend to actively manage the drive-through queues to maintain acceptable levels, TJW Engineering concluded that the parking lot layout for the Upland site functions as an extension of the drive-through lane, allowing the existing restaurant to operate with longer queues without impacting the adjacent public right-of-way.

LLG staff observed the service-lane queuing which occurred at existing restaurants in the Cities of Pasadena and Santa Clarita. The Pasadena location, which was also surveyed and included in the calculation of the empirical trip generation rates, was observed to have a maximum queue of 25 vehicles at the site. The Pasadena location is directly adjacent to Pasadena City College, and likely experiences a higher than typical demand due to the proximity of the College, which may also account for the longer queues observed at this location. A maximum queue of 22 vehicles was observed at the Santa Clarita location, which is situated in the Westfield Valencia Town Center regional shopping mall. The queuing observations for the Pasadena and Santa Clarita locations are also included in *Appendix C.* It is important to note that all survey sites are similar in size and function (i.e., providing indoor dining and a drive-through service lane) to the proposed project.

A summary of the location, size, and maximum observed vehicle queue for each observation site is presented in ***Table 2-2***, along with a forecast of the maximum queue at the proposed project site based on each site's ratio of maximum queue to gross square feet. A calculation of the forecast



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NOT TO SCALE

PROJECT SITE

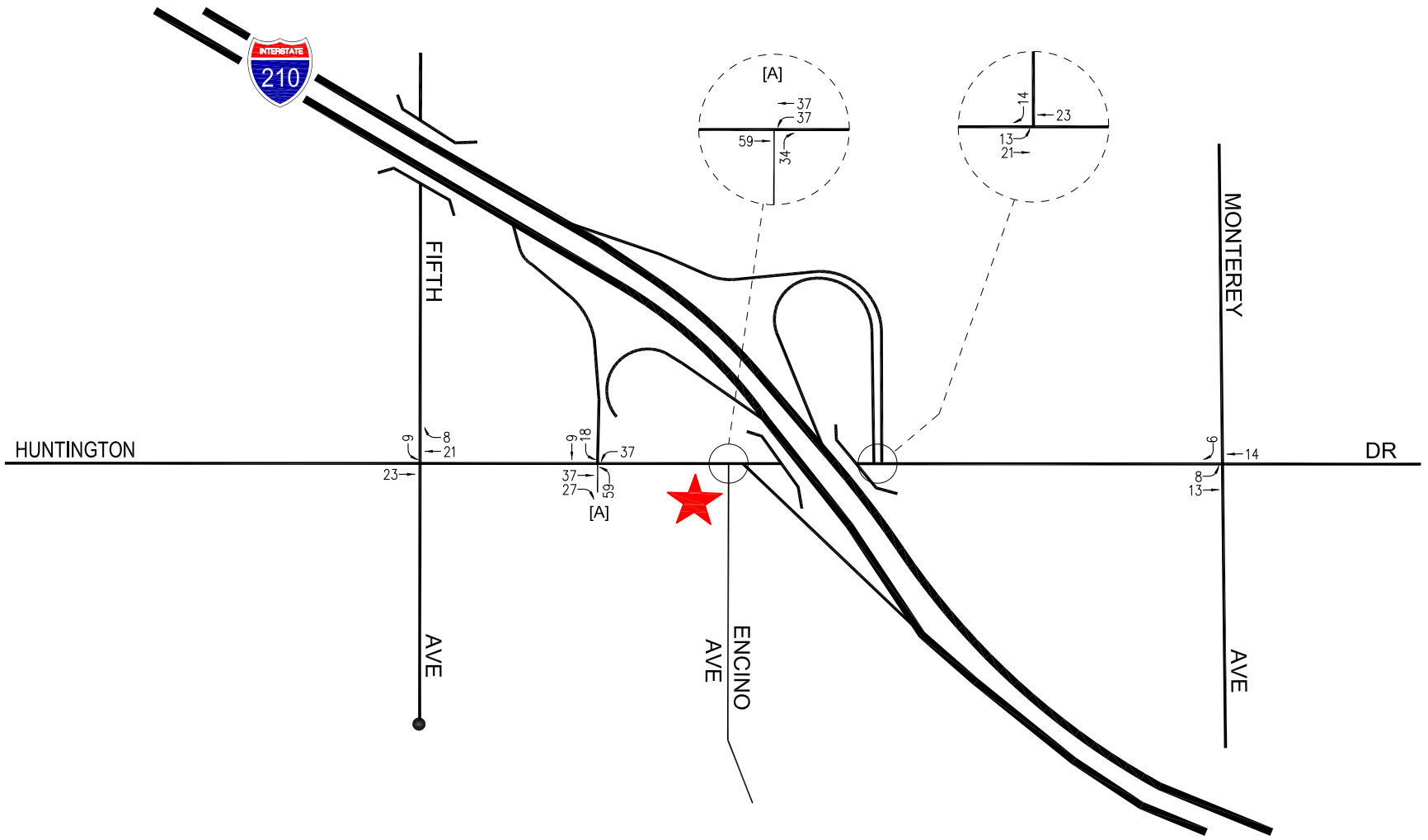
XX = INBOUND PERCENTAGES

(XX) = OUTBOUND PERCENTAGES

FIGURE 2-3
PROJECT TRIP DISTRIBUTION

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT



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NOT TO SCALE

★ PROJECT SITE

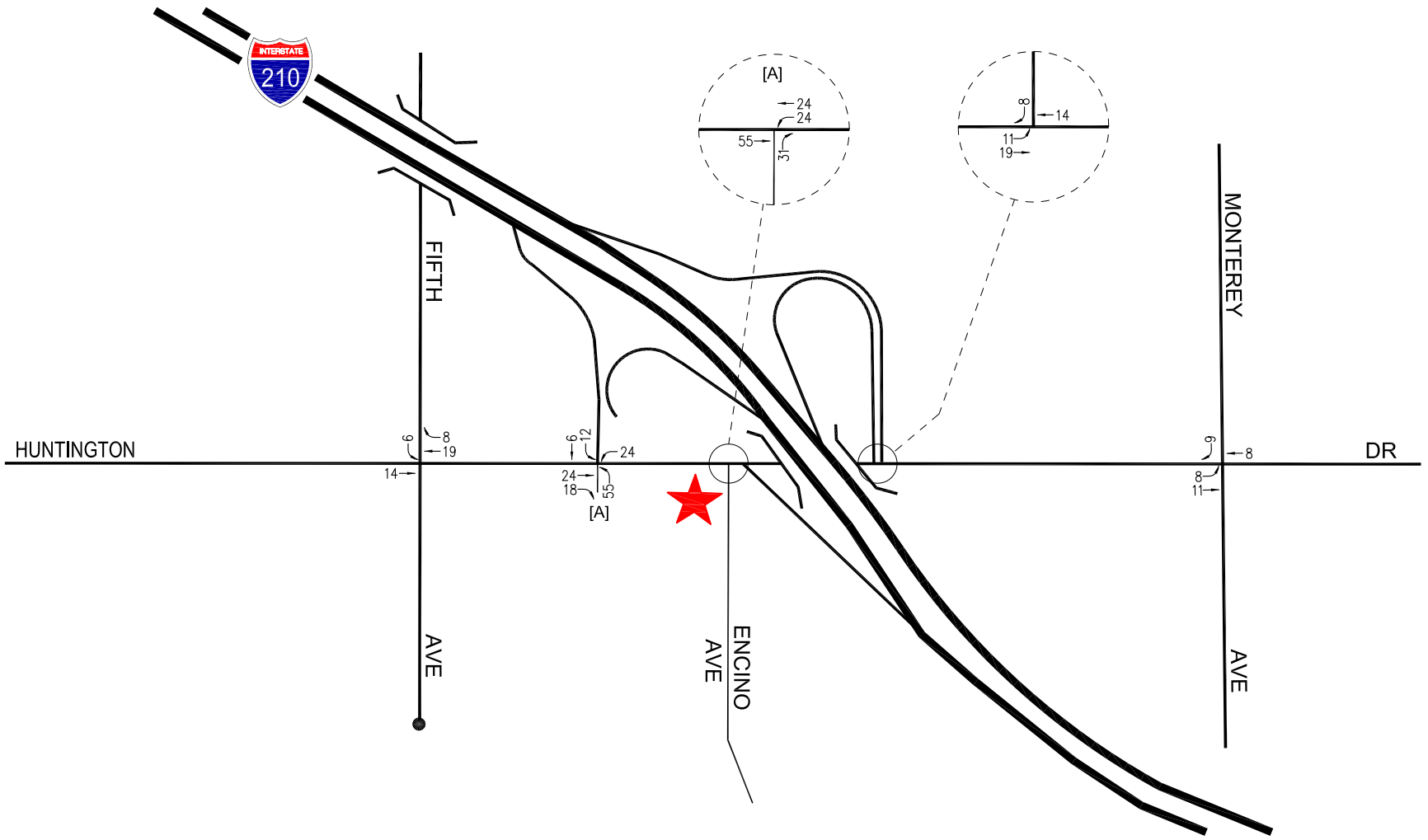
[A] PASS-BY TRIP REDUCTIONS ARE NOT APPLIED TO INTERSECTIONS ADJACENT TO THE PROJECT SITE.

FIGURE 2-4
PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers



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★ PROJECT SITE

[A] PASS-BY TRIP REDUCTIONS ARE NOT APPLIED TO INTERSECTIONS ADJACENT TO THE PROJECT SITE.

FIGURE 2-5
PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

Table 2-2
SUMMARY OF DRIVE-THROUGH SERVICE-LANE VEHICLE QUEUING OBSERVATIONS AT EXISTING CHICK-FIL-A RESTAURANTS [1]

LOCATION	SIZE (SF) [2]	MAX OBSERVED QUEUE (VEH.) [3]	QUEUE RATIO (VEH./1,000 SF)	FORECAST PROJECT QUEUE (VEH.) [4]
12190 Foothill Boulevard, Rancho Cucamonga	4,856	19	3.91	18
1949 N. Campus Avenue, Upland	4,625	26	5.62	26
1700 E. Colorado Boulevard, Pasadena	4,595	25	5.44	25
24180 Magic Mountain Parkway, Santa Clarita	4,496	22	4.89	22
Aggregate of All Observation Sites	18,572	92	4.95	23

[1] Based on observations at existing Chick-fil-A restaurants located in the Cities of Rancho Cucamonga, Upland, Pasadena, and Santa Clarita.
[2] Based on information provided by Chick-fil-A, Inc.
[3] Refer to the queuing data summaries provided in *Appendix C.*
[4] The proposed Chick-fil-A is planned to provide 4,562 square feet. The forecast maximum project vehicle queue is the product of the size of the proposed project and the queue ratio based on empirical observations.

maximum queue based on the aggregate of all four sites is also presented in *Table 2-2*. The comparative queuing assessment using the aggregate of all four existing sites results in a forecast maximum drive-through service-lane queue for this project of 23 vehicles. Utilization of the aggregate queue ratio minimizes the variations in queuing due to the unique characteristics of each observed site and provides a broader sample on which to base the maximum forecast vehicle queue for the proposed project. The proposed project site is not expected to experience atypical queue management or high demand from a unique source, therefore the forecast maximum queue of 23 vehicles as derived from observations of these unique locations represents a reasonable estimate.

As shown in the site plan illustrated in *Figure 2-2,* the proposed project is planned to accommodate up to 30 vehicles in a dual-loaded drive-through service lane. Therefore, it is anticipated that the proposed service-lane vehicle queue storage area will adequately accommodate the forecast maximum vehicle queue based on the aggregate queue ratio, as well as the theoretical maximum queues based on application of individual existing site queue ratios. In addition, similar to other existing Chick-fil-A restaurants, it is expected that Chick-fil-A employees/order takers will be deployed during peak hours, if necessary, to conduct remote ordering with tablets in order to expedite drive-through operations. It is recommended that clear signage directing vehicles to the drive-through service lane be installed on the project site to minimize unnecessary circulation within the site. Should the vehicle queue exceed the available storage space, it is recommended that the project Applicant implement a policy similar to that of other restaurants in which a staff member will be present to direct the additional vehicle(s) to a parking or waiting area to ensure that potential queues do not interfere with on-site circulation or spill back onto adjacent public right-of-way.

2.6.2 *Proposed Starbucks Restaurant*

The drive-through service-lane queuing analysis for the proposed Starbucks restaurant was based on the average number of vehicles expected to use the drive-through window during the peak hour and the average time to service each vehicle. The average number of vehicles expected to utilize the proposed drive-through lane was determined based on a percentage of the forecast peak hour inbound trip generation.

The proposed Starbucks restaurant is forecast to generate 100 inbound trips during the weekday AM peak hour and 48 inbound trips during the weekday PM peak hour, as shown in *Table 2-1*. It should be noted that the pass-by trip adjustments are not applied when evaluating drive-through service-lane queuing, as all trips must be within the project site in order to access the proposed drive-through lane and are no longer considered to be on a primary route without diversion. Since the proposed project is forecast to generate far greater inbound vehicular traffic during the weekday AM peak hour than during the weekday PM peak hour, this queuing evaluation has been prepared focusing on the weekday AM peak hour conditions for worst case analysis purposes.

The proportion of service lane utilization as a percentage of inbound trips was derived from empirical data which was collected as part of a study prepared for a proposed Starbucks in the City of Whittier. The number of drive-through versus walk-in trips at a free-standing Starbucks located at the southwest corner of the Colima Road/Whittier Boulevard intersection were collected during the

weekday AM and PM peak hours for two consecutive days. The average service lane utilization during the weekday AM peak hour was 57 percent (57%) of all inbound vehicular trips, while the average service lane utilization during the weekday PM peak hour was 60 percent (60%) of all inbound vehicular trips. Therefore, the average proportion of inbound trips expected to utilize the proposed service lane during the weekday AM peak hour was conservatively estimated to be 65 percent (65%). The average arrival rate at the drive-through service lane is therefore anticipated to be 65 vehicles per hour. The queuing observation data worksheets are provided in ***Appendix D***.

The average service rate for the drive-through service window was assumed to be 40 seconds (or 0.67 minutes) per vehicle or 90 vehicles per hour (i.e., 60 minutes ÷ 0.67 minutes per vehicle = 90 vehicles). This service rate is derived from empirical data which was collected as part of a queuing study prepared by Stantec Consulting Services Inc. for a proposed Starbucks coffee shop in the City of Pomona. The number of drive-through transactions at an existing, free-standing Starbucks adjacent to the I-10 Freeway in Pomona were collected during the weekday AM peak operations (i.e., for a two-hour period) for seven consecutive days. The average peak drive-through transactions per half hour was 45 vehicles, which corresponds to a service rate of 40 seconds (or 0.67 minutes) per vehicle. The queuing study memorandum is included in *Appendix D*.

The maximum queue length worksheet for the proposed Starbucks restaurant is presented in ***Table 2-3***. The calculations utilize a confidence level of 95 percent. As shown in *Table 2-3,* the maximum queue length associated with the proposed Starbucks drive-through service lane is estimated to be eight (8) vehicles and the corresponding required storage length is approximately 200 feet. As mentioned previously, the proposed Starbucks drive-through service lane is planned to accommodate a queue of up to 13 vehicles. Thus, based on the queuing analysis, the planned drive-through service lane is expected to accommodate the calculated maximum vehicle queue lengths based on the forecast demand.

Based on information provided by the project Applicant, it is understood that the parking stalls located in front of the restaurant will be reserved for mobile order pick-up and curb-side delivery service, which is expected to alleviate additional queuing associated with the drive-through service lane. It is recommended that clear signage directing vehicles to the Starbucks drive-through service lane be installed on the project site to minimize unnecessary circulation within the site. It is also noted that should the on-site drive-through queue exceed the planned available storage, it is recommended that the project Applicant implement a policy similar to that of other restaurant chains in which a staff member will be present to direct the additional vehicle(s) to a parking or waiting area. This practice will ensure that potential queues will not interfere with on-site circulation. It is recommended that the project Applicant prepare queue management plans in advance of beginning operations at the site, outlining how any potential queue overflow will be handled in order to prevent interference with on-site circulation along the drive aisles. Specifically, the queue management plan should address how the inbound drive aisles connecting to the signalized Double Tree driveway will be kept clear in the event that the drive-through storage is fully occupied, in order to prevent operational disruptions at the intersection.

Table 2-3
DRIVE-THROUGH SERVICE WINDOW QUEUING ANALYSIS [1]

The maximum queue length for a drive-through window at a service facility (i.e., such as a fast-food restaurant, pharmacy, car wash, or bank) may be estimated using this worksheet. The maximum queue length is based on two factors, the vehicle arrival rate and the vehicle service rate.

For traffic flow calculations, the vehicle arrival rate is the average number of vehicles arriving in an hour (the peak hour is typically utilized). The vehicle service rate is the average amount of time to complete a service interaction. The service rate is typically expressed in minutes and then converted to an hourly basis.

To estimate the maximum queue length, the utilization factor is calculated and the confidence level is determined. The utilization factor is the average arrival rate divided by the average service time. The confidence level is expressed as a percent. If the confidence level is 95 percent, then 95 percent of the time the maximum queue length will be less than or equal to the calculated number of vehicles. For this calculation, it is assumed that the vehicles are serviced in the order of arrival through one service window (i.e., first in-first out or FIFO).

Inbound Peak Hour Volume =	100	vehicles per hour
Vehicles using Drive-Thru =	65	percent
Average Arrival Rate (Drive-Thru Volume) =	65	vehicles per hour
Average Service Time per Vehicle [2] =	0.67	minute(s)
Average Service Rate =	90	vehicles per hour
Utilization Factor =	0.722	
Confidence Level =	95	percent
Maximum Queue Length =	**8**	**vehicles**
Average Vehicle Length [3] =	25	feet
Required Storage Length =	**200**	**feet**

[1] Source: "Traffic Flow Theory," A Monograph, Special Report 165, TRB, 1975.

[2] Source: "Queue Length Analysis - Starbucks Drive Through at 1010 Garey Avenue", Memorandum From Daryl Zerfass, PE, PTP, Stantec, To Anthony J. Karber, Garey Partners, LTD. May 30, 2014.

[3] Assumes 20 feet per vehicle and a five-foot separation between vehicles.

3.0 PROJECT SITE CONTEXT

The project site is located within a well-established multi-modal transportation network maintained by the City of Monrovia. The following sections will provide an overview of the transportation infrastructure in the vicinity of the proposed project, including infrastructure which supports both motorized and non-motorized transportation modes.

3.1 Non-Vehicle Network

Non-vehicular transportation generally encompasses walking, biking, and other active transportation modes. Distinct facilities are often provided for these non-vehicular modes. Most prominently, paved sidewalks are typically provided to facilitate pedestrian travel outside of the roadway. In some cases, bicycle facilities such as painted bike lanes or separated bike paths are provided within the roadway in order to separate bike traffic from vehicular traffic. Roadways which are designed to prioritize non-vehicular transportation modes utilize complimentary non-vehicular infrastructure in order to promote comfortable, safe travel for both pedestrians and bicyclists. A review of the pedestrian and bicycle infrastructure provided in the vicinity of the project site is provided below.

3.1.1 *Pedestrian System*

Pedestrian infrastructure consists of facilities such as sidewalks, crosswalks, pedestrian signals, curb access ramps, Americans with Disabilities Act (ADA) compliant tactile warning strips, and curb extensions, among other things. These facilities are widely provided within the study area. Sidewalks are provided along the major corridors within the City, including Fifth Avenue, Monterey Avenue, and Huntington Drive. Marked crosswalks, pedestrian signals, and curb ramps are provided at the study intersections. Tactile warning strips consisting of yellow truncated dome pads are provided for the curb ramps at the intersections of Fifth Avenue/Huntington Drive and Monterey Avenue/Huntington Drive, while textured concrete paving is provided at the study intersections under Caltrans jurisdiction and the intersection of Encino Avenue/Huntington Dive. In addition, curb bulb-outs are provided at the on the north- and southwest corners of the Fifth Avenue/Huntington Drive intersection. The bulb-outs shorten the pedestrian crossing distance across Huntington Drive, reducing the exposure to conflict with vehicles and promoting pedestrian safety. Paved pedestrian sidewalks and curb ramps are also provided along Encino Avenue between Huntington Drive and Alta Street, however public sidewalks are generally not provided in the existing residential neighborhood south of the project site which is bound by the barriers of the Santa Anita Wash, the Metro “L” (Gold) Line light rail right-of-way, and the I-210 Freeway.

3.1.2 *Bicycle System*

Bicycle infrastructure consists of both facilities within the roadway as well as public bicycle parking spaces. The Federal and State transportation systems recognize three primary bikeway facilities: Bicycle Paths (Class I), Bicycle Lanes (Class II), and Bicycle Routes (Class III). Bicycle Paths (Class I) are exclusive car free facilities that are typically not located within a roadway area. Bicycle Lanes (Class II) are part of the street design that is dedicated only for bicycles and identified by a

striped lane separating vehicle lanes from bicycle lanes. Bicycle Routes (Class III) are preferably located on collector and lower volume arterial streets.

The City of Monrovia's current Circulation Element[10] of the General Plan indicates that a total of 4.7 miles of existing bicycle facilities are provided within the City, including an east-west bike lane along Colorado Boulevard and Olive Avenue, east-west bike routes along Olive Avenue and Greystone Avenue, and north-south bike routes along Magnolia Avenue and Shamrock Avenue (north of Olive Avenue). Additional bike routes are planned for Magnolia Avenue and Shamrock Avenue south of Olive Avenue, and additional east-west bike routes are planned for sections of Central Avenue, Evergreen Avenue, and Duarte Road. The City of Monrovia Bicycle Master Plan[11], indicates that a total of 36.7 miles of additional bicycle facilities are proposed, including bicycle routes on Fifth Avenue and Monterey Avenue. The Plan further indicates that Huntington Drive should be studied for the feasibility of providing a separated bikeway facility from the westerly City boundary to the easterly City boundary. The existing and proposed bicycle facilities in the City of Monrovia is illustrated in ***Figure 3-1***.

3.2 Transit Network

Public bus and light rail transit services are provided within the project study area. Public bus service in the City of Monrovia by the Los Angeles Metropolitan Transportation Authority (Metro) and Foothill Transit. The Metro "L" (Gold) Line light rail also serves the City of Monrovia, with the Monrovia station located approximately one mile away at 1675 Primrose Avenue and the Arcadia station located approximately 0.67 miles away at 200 First Avenue. The existing public transit routes in the vicinity of the project site are illustrated in ***Figure 3-2***. A summary of the existing transit service in the vicinity of the project site is presented in ***Table 3-1***.

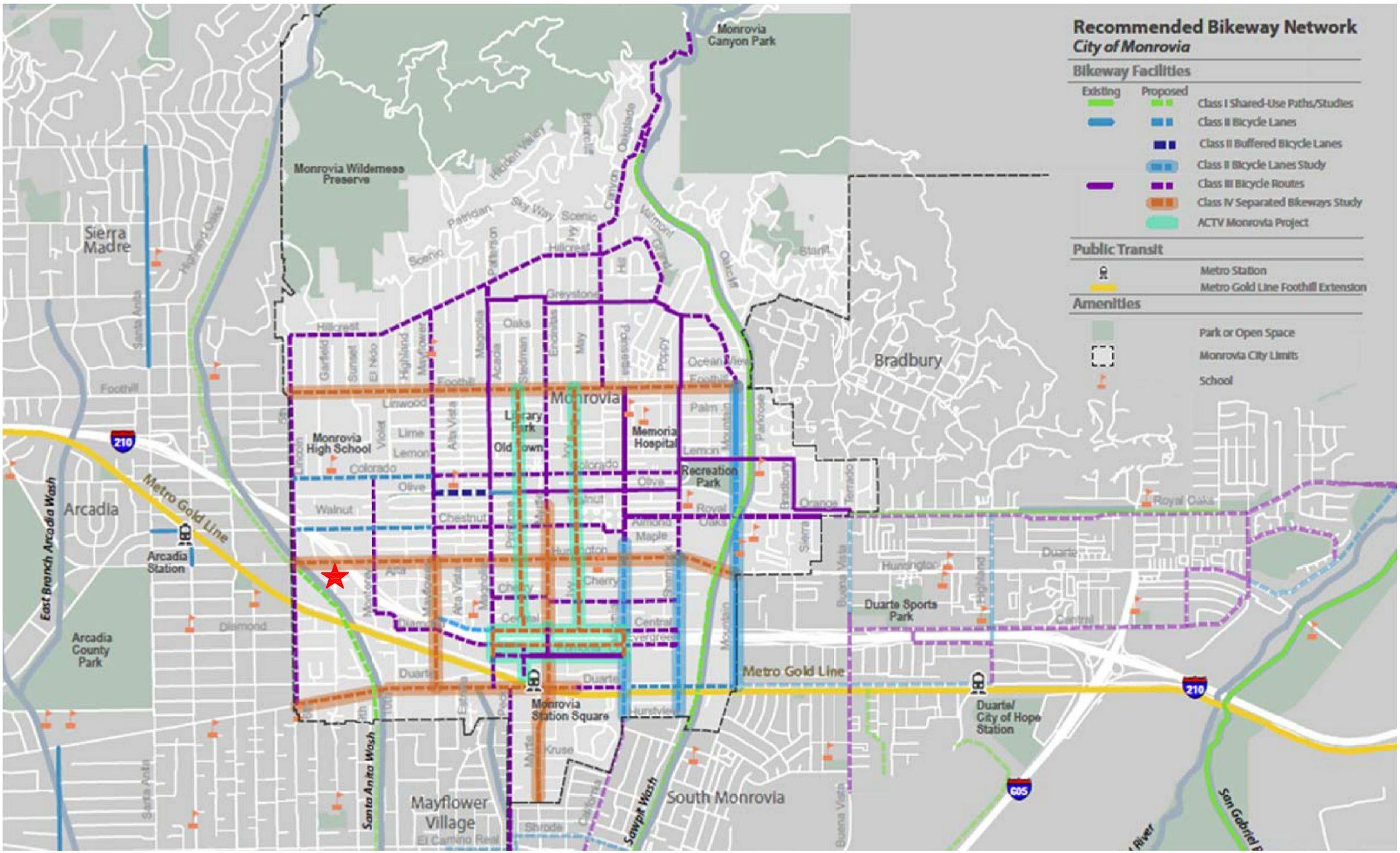
As shown in *Figure 3-2*, public transit access to the project site is provided by Foothill Transit Line 187, which runs along Huntington Drive at a frequency of 20 minutes or better during weekday service. Stops on Line 187 are provided in the east- and westbound directions at the intersection of Fifth Avenue/Huntington Drive. A public bench and trash can are provided in the vicinity of the westbound stop. Bus stops with bus shelters, benches, and trash cans are also provided in the east- and westbound directions at the intersection of Monterey Avenue/Huntington Drive. All four adjacent bus stops are located within approximately 1,000 feet or less from the project site.

3.3 Vehicle Network

3.3.1 *Roadway Classifications*

The City of Monrovia utilizes the roadway categories recognized by regional, state and federal transportation agencies. There are four categories in the roadway hierarchy, ranging from freeways

[10] City of Monrovia Circulation Element of the Monrovia General Plan, adopted January 15, 2008 and amended November 6, 2012.
[11] "City of Monrovia Bicycle Master Plan", prepared by Alta Planning + Design, June 2018.



SOURCE: CITY OF MONROVIA BICYCLE MASTER PLAN

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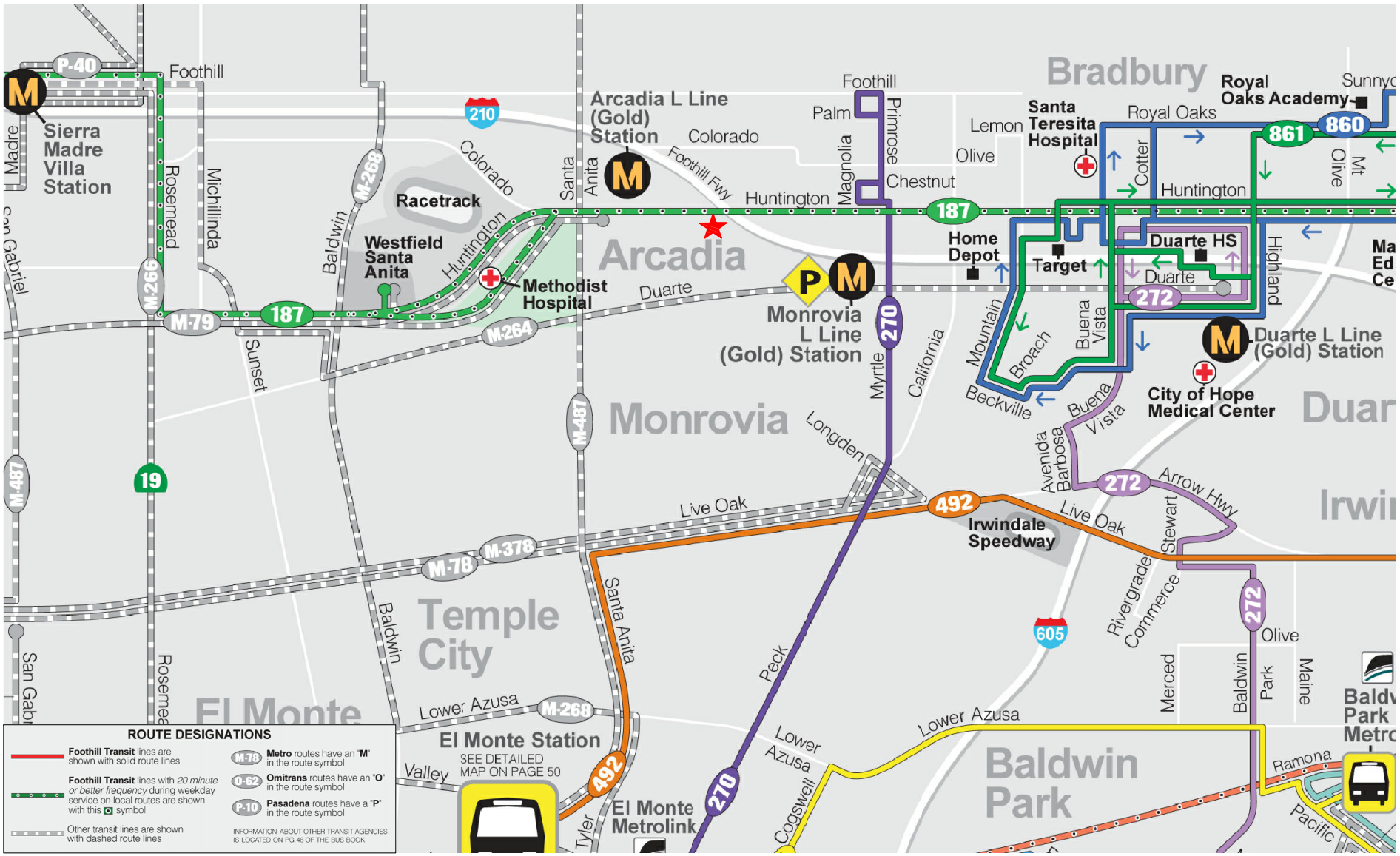
NOT TO SCALE

★ PROJECT SITE

FIGURE 3-1
EXISTING BIKEWAYS

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT



SOURCE: FOOTHILL TRANSIT

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PROJECT SITE

FIGURE 3-2
EXISTING TRANSIT ROUTES

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

Table 3-1
EXISTING TRANSIT ROUTES [1]

ROUTE	DESTINATIONS	ROADWAY(S) NEAR SITE	NO. OF BUSES/TRAINS DURING PEAK HOUR		
			DIR	AM	PM
Foothill Transit 187	Azusa to Pasadena via Duarte, Monrovia, Arcadia and Sierra Madre	Fifth Avenue, Monterey Avenue, Huntington Drive	EB WB	4 4	4 4
Foothill Transit 270	El Monte to Monrovia via Irwindale	Myrtle Avenue, Huntington Drive	NB SB	1 1	1 1
Metro 487	El Monte to Downtown Los Angeles via Arcadia, Pasadena, San Marino, Temple City, San Gabriel and East Los Angeles	Santa Anita Avenue	EB WB	1 2	2 1
Metro Gold Line	East Los Angeles to Azusa via Downtown Los Angeles, Los Angeles, South Pasadena, Pasadena, Arcadia, Monrovia, Duarte and Irwindale	Arcadia Station, Monrovia Station	NB SB	7 7	7 7
TOTAL				**27**	**27**

[1] Sources: Foothill Transit and Los Angeles County Metropolitan Transportation Authority (Metro) websites, 2020.

with the highest capacity to two-lane undivided roadways with the lowest capacity. The roadway categories are summarized as follows:

- *Freeways* are limited-access and high speed travel ways included in the state and federal highway systems. Their purpose is to carry regional through-traffic. Access is provided by interchanges with typical spacing of one mile or greater. No local access is provided to adjacent land uses.

- *Arterial* roadways are major streets that primarily serve through-traffic and provide access to abutting properties as a secondary function. Arterials are generally designed with two to six travel lanes and their major intersections are signalized. In the City of Monrovia, this roadway type is divided into two categories: Primary and Secondary arterials.

    - Primary arterials connect to Secondary arterials and collector streets via signalized intersections. Primary arterials are typically four-or-more lane roadways and provide exclusive turn lanes at major intersections. Directional traffic is generally separated by a raised center median island. On-street parking may be accommodated, depending on the number of through lanes and roadway width. Signalized intersections are generally controlled by a coordinated signal progression system. The right-of-way varies from 100 to 120 feet, while the roadway width varies from 70 to 84 feet. Speed limits on collector streets typically vary between 35 and 40 miles per hour.

    - Secondary arterials supplement the primary arterials to provide regional access, and provide alternative routes to parallel primary arterials. Secondary arterials are typically two-to-four lane and provide exclusive left-turn lanes at major intersections. Directional traffic is generally separated by a two-way left-turn lane. On-street parking is accommodated wherever possible. The right-of-way varies from 80 to 96 feet, while the roadway width varies from 60 to 76 feet. Speed limits on collector streets typically vary between 35 and 40 miles per hour.

- *Collector* roadways are streets that provide access and traffic circulation within residential and non-residential (e.g., commercial and industrial) areas. Collector roadways connect local streets to arterials via controlled intersections and are typically designed with two through travel lanes (i.e., one through travel lane in each direction) plus an on-street parking lane. Separate left-turn lanes may be provided at major intersections. They may also provide access to abutting properties. The right-of-way varies from 60 to 84 feet, while the roadway width varies from 40 to 64 feet. Speed limits on collector streets typically vary between 25 and 35 miles per hour.

- *Local* roadways distribute traffic within a neighborhood, or similar adjacent neighborhoods, and are not intended for use as a through-street or a link between higher capacity facilities such as collector or arterial roadways. Local streets are fronted by residential uses and do not

typically serve commercial uses. Generally, travel lanes are not striped, and parking may be accommodated on one or both sides of the roadway. The right-of-way varies from 40 to 56 feet, while the roadway width varies from 24 to 40 feet. The Speed limits on local roadways may not be posted, but are presumed to be 25 miles per hour or less.

3.3.2 *Regional Highway System*

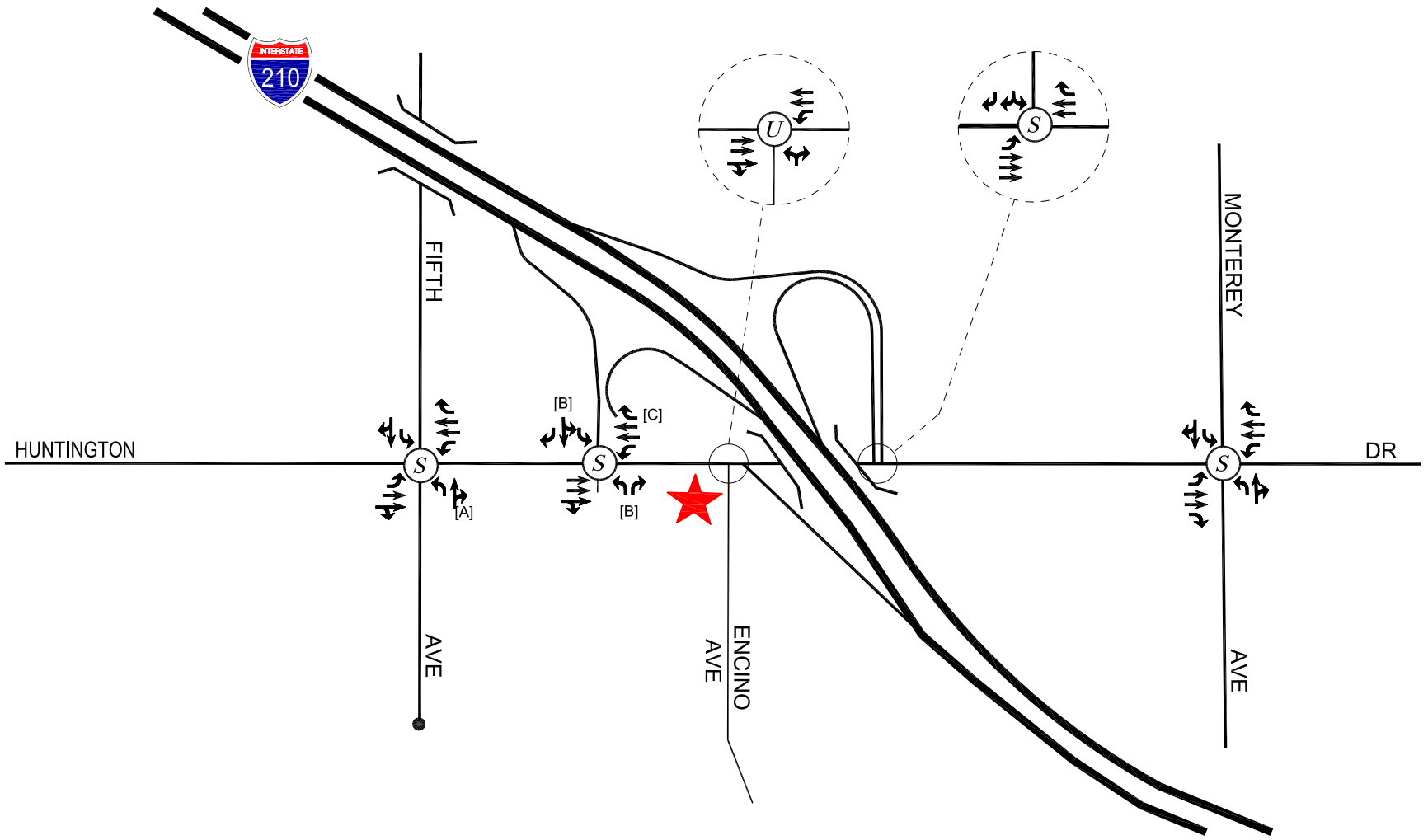
Primary regional access is provided by the I-210 Freeway as shown in *Figure 1-1*. The *Foothill (I-210) Freeway* is a major east-west freeway located just north and east of the project site. The I-210 Freeway connects the foothill communities from the westerly terminus in Sylmar to the easterly terminus in Redlands. In the project vicinity, four mixed-flow mainline lanes and one High Occupancy Vehicle lane are provided in each direction on the I-210 Freeway. Full access interchanges (i.e., eastbound and westbound on- and off-ramps) are provided at Huntington Drive.

3.3.3 *Roadway Descriptions*

The current lane configurations and traffic control measures at each study intersection is presented in ***Figure 3-3***. Descriptions of the roadways which make up the study area are provided in ***Table 3-2***, including the roadway classification, number of lanes, median types, and speed limits designated by the City of Monrovia.

3.4 Traffic Count Data

Manual counts of vehicular, pedestrian, and bicycle volumes were conducted at each of the five study intersections during the weekday morning (AM) and afternoon (PM) commuter periods to determine the peak hour traffic volumes. The manual counts utilized in the transportation assessment were conducted in 2016, 2018, and 2020 by various independent traffic count subconsultants at the study intersections from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM to determine the AM and PM peak commute hours, respectively. Traffic counts conducted in years 2016 and 2018 for four (4) of the five (5) study intersections were increased by an annual ambient traffic growth rate of one percent (1.0%) per year to reflect existing year 2020 conditions. Historic traffic counts for the remaining one (1) study intersection were not identified through a search of LLG records and data on file with the City. Therefore, manual counts were conducted in September 2020 for the Encino Avenue/Huntington Drive intersection. It should be noted that the new traffic count was collected in the midst of the COVID-19 pandemic, at a time when the Los Angeles County Public Health Department's "Safer at Home" orders were in effect and area schools were out of normal session, and thus represent atypical conditions. A comparison of the historic volumes after being adjusted to year 2020 conditions and the current atypical roadway segment volumes along Huntington Drive was conducted, and manual volume adjustments were applied to increase the eastbound and westbound through volumes at the Encino Avenue/Huntington Drive intersection. The turning movements into and out of Encino Avenue were also increased through application of an upwards adjustment factor derived from the previously described roadway segment volume comparison. A factor of 82.0% was applied to the AM peak hour volumes, while a factor of 33.0% was applied to the PM peak hour volumes.



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S SIGNALIZED INTERSECTION

U UNSIGNALIZED INTERSECTION

[A] NO RIGHT-TURN ON RED

[B] SPLIT-PHASE OPERATION

[C] FREE-FLOW MOVEMENT

FIGURE 3-3
EXISTING LANE CONFIGURATIONS

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

Table 3-2
EXISTING ROADWAY DESCRIPTIONS

ROADWAY	CLASSIFICATION [1]	TRAVEL LANES		MEDIAN TYPES [4]	SPEED LIMIT
		DIRECTION [2]	NO. LANES [3]		
5th Avenue	Collector Street	NB-SB	2 [5]	N/A	35 to 25
Encino Avenue	Local Street	NB-SB	2	N/A	25
Monterey Avenue	Local Street	NB-SB	2 [5]	N/A	30
Huntington Drive -East of City boundary -West of City boundary [6]	 Primary Arterial Principle Travel Corridor	 EB-WB EB-WB	 4 to 6 4 [6]	 RMI RMI	 35 35

[1] Roadway classifications obtained from the *City of Monrovia Circulation Element of the General Plan,* amended November 6, 2012, and *City of Arcadia General Plan Circulation and Infrastructure Plan,* adopted November 2010.
[2] Direction of roadways in the project area: NB-SB = northbound and southbound; and EB-WB = eastbound and westbound.
[3] Number of lanes in both directions on the roadway.
[4] Median type of the road: RMI = Raised Median Island; 2WLT = 2-Way Left-Turn Lane; and N/A = Not Applicable.
[5] Class III Bike Route
[6] City of Arcadia

The weekday AM and PM peak hour manual counts of vehicle movements at the five study intersections are summarized in ***Table 3-3***. The existing traffic volumes at the study intersections during the weekday AM and PM peak hours are shown in ***Figures 3-4*** and ***3-5***, respectively. For each study intersection, the highest one-hour total traffic volumes (i.e., four consecutive 15-minute time intervals) traversing through the intersection during the 7:00 to 9:00 AM and 4:00 to 6:00 PM time periods were selected so as to determine the respective weekday AM and PM peak hour traffic volumes for each study intersection. For purposes of the traffic impact analysis, this common traffic engineering practice ensures that a more conservative (i.e., worst case) assessment of existing operating conditions be attained for each study intersection. Therefore, the traffic volumes shown in *Figures 3-4* and *3-5* for the study intersections do not necessarily reflect the same exact one-hour time period during the morning and/or afternoon peak commuter conditions (i.e., one intersection's peak hour may have occurred between 7:30 and 8:30 AM, while another intersection's peak hour may have occurred between 7:45 and 8:45 AM). Summary data worksheets of the manual traffic counts at the study intersections are contained in ***Appendix E***.

3.5 Cumulative Development Projects

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

> "(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the [lead] agency, or
>
> (B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency."

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

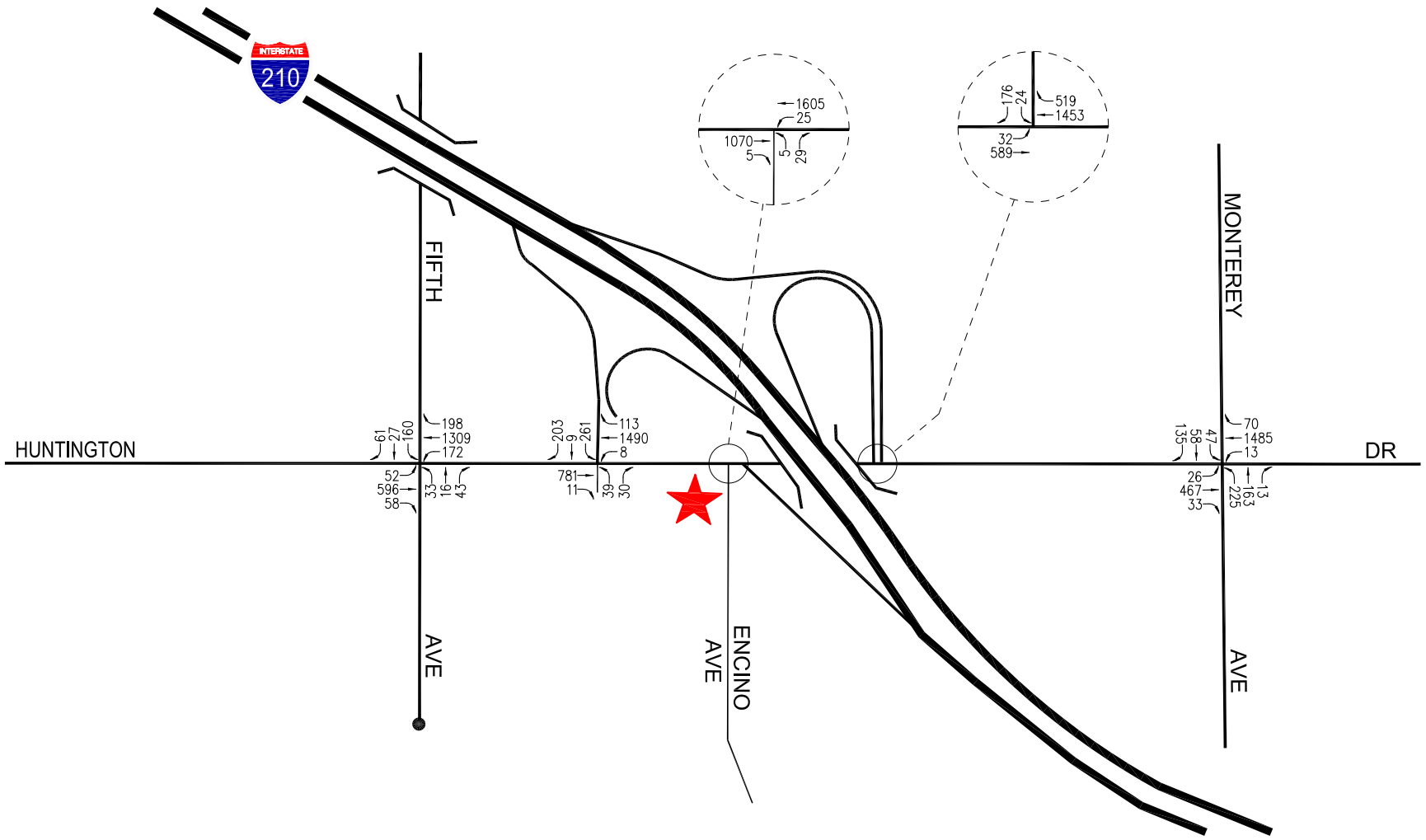
3.5.1 *Related Projects*

A forecast of on-street traffic conditions prior to occupancy of the proposed project was prepared by incorporating the potential trips associated with other known development projects (related projects) in the area (i.e., within an approximate 1.0-mile radius from the project site). With this information,

Table 3-3
EXISTING TRAFFIC VOLUMES [1]
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	DATE CONDUCTED	DIR	AM PEAK HOUR		PM PEAK HOUR	
				BEGAN	VOLUME	BEGAN	VOLUME
1	Fifth Avenue/ Huntington Drive	09/18/2018	NB SB EB WB	8:00 AM	92 248 706 1,679	4:45 PM	326 274 1,560 980
2	I-210 Freeway Eastbound Ramps- Private Driveway/ Huntington Drive	09/20/2016	NB SB EB WB	7:30 AM	69 473 792 1,611	5:00 PM	40 442 1,587 1,144
3	Encino Avenue/ Huntington Drive	09/30/2020	NB SB EB WB	7:45 AM	34 1,093 1,075 1,630	5:00 PM	36 1,954 1,977 1,160
4	I-210 Freeway Westbound Ramps/ Huntington Drive	09/20/2016	NB SB EB WB	7:30 AM	0 200 621 1,972	5:00 PM	0 479 1,376 1,287
5	Monterey Avenue/ Huntington Drive	09/18/2018	NB SB EB WB	7:15 AM	401 240 526 1,568	4:45 PM	196 275 1,495 962

[1] Counts conducted by National Data & Surveying Services (2016), City Count, LLC (2018), and City Traffic Counters (2020).



PROJECT SITE

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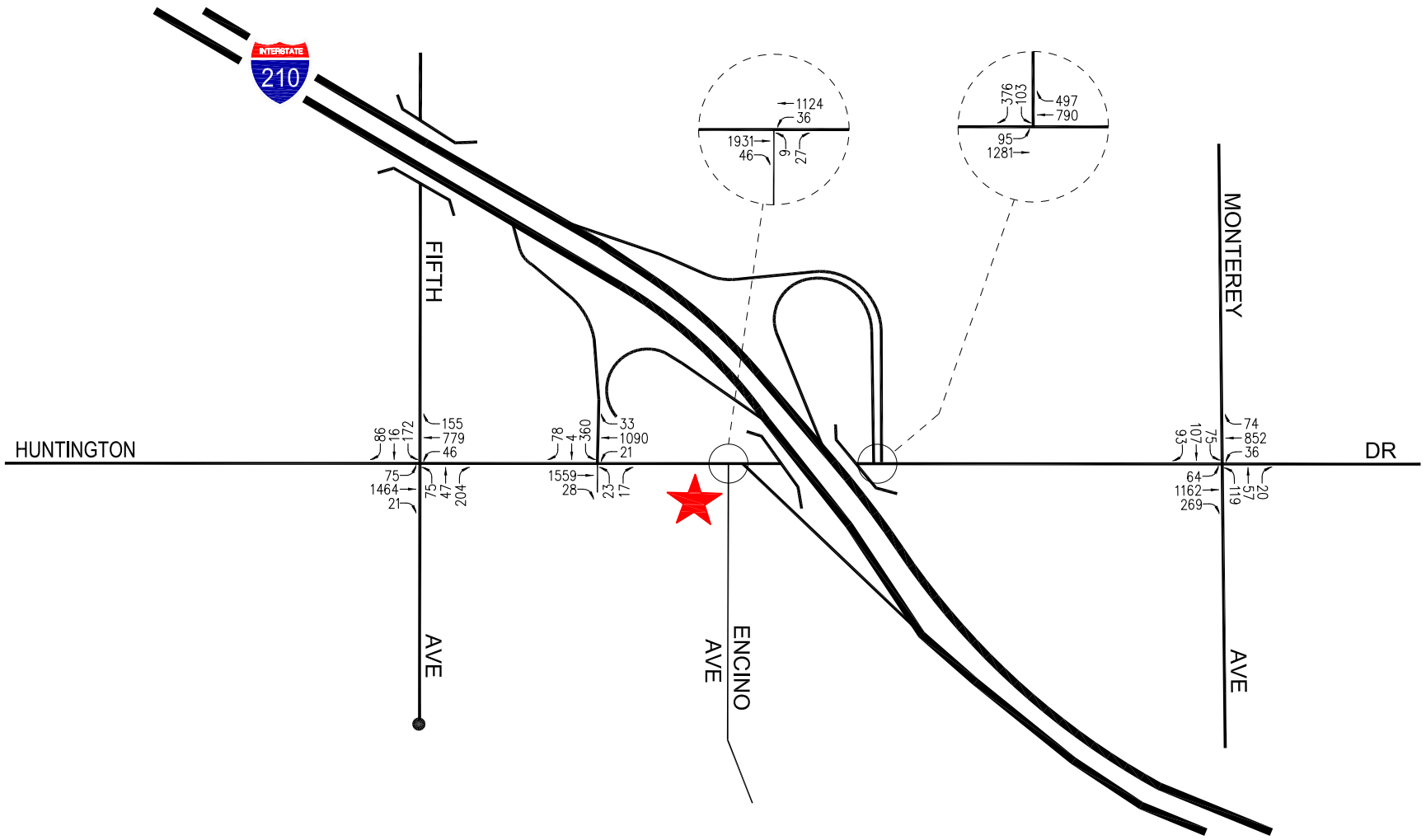
NOT TO SCALE

FIGURE 3-4
EXISTING TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers



PROJECT SITE

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NOT TO SCALE

LINSCOTT, LAW & GREENSPAN, engineers

FIGURE 3-5
EXISTING TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

the potential impact of the proposed project can be evaluated within the context of the cumulative impacts of all ongoing development. The related projects research was based on information on file with the City of Monrovia, the City of Arcadia, and the County of Los Angeles. The list of related projects in the project site area is presented in ***Table 3-4***. The location of the related projects is shown in ***Figure 3-6***.

Traffic volumes expected to be generated by the related projects were calculated using rates provided in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*[12], or they were obtained from other traffic studies as noted. The related projects' respective traffic generation for the weekday AM and PM peak hours, as well as on a daily basis for a typical weekday, is summarized in *Table 3-4*. The related projects traffic volumes were distributed and assigned to the street system based on the projects' locations in relation to the study intersections, their proximity to major traffic corridors, proposed land uses, nearby population and employment centers, etc. The distribution of the related projects traffic volumes to the study intersections during the weekday AM and PM peak hours are displayed in ***Figures 3-7*** and ***3-8***, respectively.

3.5.2 *Ambient Traffic Growth Factor*

Horizon year background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown related projects in the study area as well as account for typical growth in traffic volumes due to the development of projects outside the study area. An annual growth rate of one percent (1.0%) per year was selected for this analysis in consultation with City of Monrovia staff during the scoping process.

Therefore, application of this one percent (1.0%) ambient growth factor in addition to the forecast traffic generated by the related projects allows for a very conservative forecast of future traffic volumes in the project study area as incorporation of both (i.e., an ambient traffic growth rate and a detailed list of cumulative development projects) is expected to overstate potential future traffic volumes. As described in *Section 3.5* herein, CEQA only requires that one of these two approaches be employed in developing the future traffic volume forecasts, however, this cumulative analysis conservatively analyzes both growth projections and related projects.

[12] Institute of Transportation Engineers *Trip Generation Manual*, 10th Edition, Washington, D.C., 2017.

Table 3-4
RELATED PROJECTS LIST AND TRIP GENERATION [1]

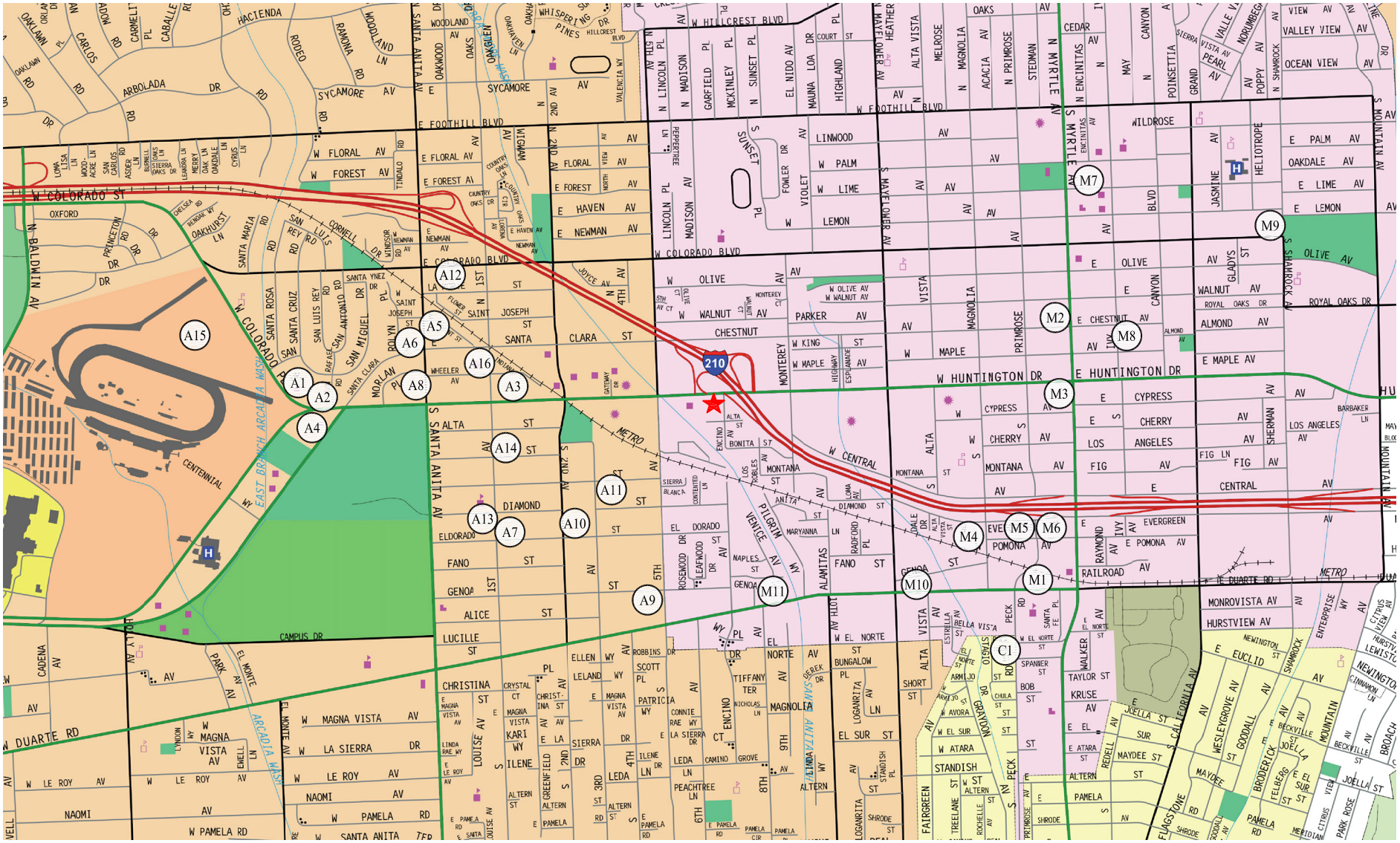
MAP NO.	PROJECT STATUS	PROJECT NAME/NUMBER ADDRESS/LOCATION	LAND USE DATA		PROJECT DATA SOURCE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			LAND-USE	SIZE			IN	OUT	TOTAL	IN	OUT	TOTAL
City of Monrovia												
M1	Approved	Station Square South Specific Plan 205-225 W. Duarte Road & 1725 Peck Road	Multi-family Residential	296 DU	[3]	925	(10)	80	70	66	7	73
M2	Under Construction	Avalon Monrovia 825 S. Myrtle Avenue	Multi-family Residential Retail	154 DU 3,900 GLSF	[4]	721	(11)	38	27	44	8	52
M3	Approved	TownePlace Suites by Marriott 102-140 W. Huntington Drive	Hotel	109 Rooms	[5]	891	34	24	58	34	31	65
M4	Approved	Alexan Foothills 1625 S. Magnolia Avenue	Apartment Live/Work Unit	432 DU 4 DU	[6]	1,938	12	131	143	132	62	194
M5	Approved	Arroyo at Monrovia Station 202-238 W. Evergreen Avenue, 1551 S. Primrose Avenue & 1610 S. Magnolia Avenue	Apartment Retail	302 DU 7,080 GLSF	[7]	1,107	(5)	55	50	60	20	80
M6	Approved	127 Pomona Mixed-Use 123-145 W. Pomona Avenue & 1528-1532 S. Primrose Avenue	Apartment Retail	310 DU 10,000 GLSF	[8]	1,390	11	62	73	71	40	111
M7	Approved	Lime Avenue Self Storage & Commercial Facility 115-127 E. Lime Avenue	Self-Storage Small Office Less Existing Office	86,730 GSF 5,520 GSF (92,250) GSF	[9]	131 89 (1,038)	5 9 (153)	4 2 (19)	9 11 (172)	7 4 (25)	8 10 (145)	15 14 (170)
M8	Approved	910 S. Ivy Avenue	Townhome	6 DU	[10]	44	1	2	3	2	1	3
M9	Approved	525 S. Shamrock Avenue	Museum Less Existing Restaurant	5,036 GSF (5,036) GSF	[11] [12]	10 (565)	1 (28)	0 (22)	1 (50)	0 (30)	1 (19)	1 (49)
M10	Approved	425 W. Duarte Road	Townhome	6 DU	[10]	44	1	2	3	2	1	3
M11	Approved	717-721 W. Duarte Road	Townhome	12 DU	[10]	88	1	5	6	4	3	7
City of Arcadia												
A1	Approved	Hotel Indigo 125 W. Huntington Drive & 161 Colorado Place	Hotel Restaurant Coffee Shop	165 Rooms 4,146 GSF 1,568 GSF	[13]	2,442	73	105	178	104	43	147
A2	Existing	125 W. Huntington Drive	Office	67,123 GSF	[13],[14]	654	67	11	78	12	65	77
A3	Approved	Huntington Plaza Mixed-Use 117-129 E. Huntington Drive & 124-134 E. Wheeler Avenue	Apartment Retail	139 DU 11,150 GLSF	[15]	856	2	33	35	42	23	65

Table 3-4 (Continued)
RELATED PROJECTS LIST AND TRIP GENERATION [1]

MAP NO.	PROJECT STATUS	PROJECT NAME/NUMBER ADDRESS/LOCATION	LAND USE DATA		PROJECT DATA SOURCE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			LAND-USE	SIZE			IN	OUT	TOTAL	IN	OUT	TOTAL
A4	Approved	Seabiscuit Pacific Specific Plan 130 W. Huntington Drive	Hotel Condominium Retail	227 Rooms 96 DU 3,196 GLSF	[16]	2,774	65	64	129	114	109	223
A5	Under Construction	288 N. Santa Anita Avenue	Medical Office Retail	23,300 GSF 7,050 GLSF	[17] [18]	811 266	51 4	14 3	65 7	23 13	58 14	81 27
A6	Proposed	205 N. Santa Anita Avenue	Residential Commercial	25 DU 1,800 GLSF	[10] [18]	183 68	3 1	9 1	12 2	9 3	5 4	14 7
A7	Proposed	420 S. First Avenue	Residential Commercial	10 DU 1,200 GLSF	[10] [18]	73 45	1 1	4 0	5 1	4 2	2 3	6 5
A8	Proposed	25 N. Santa Anita Avenue	Residential Commercial	160 DU 18,000 GLSF	[10] [18]	1,171 680	17 11	57 6	74 17	57 33	33 36	90 69
A9	Approved	416-428 Genoa Street	Condominium	8 DU	[10]	59	1	3	4	3	1	4
A10	Approved	414 Second Street	Condominium	6 DU	[10]	44	1	2	3	2	1	3
A11	Under Construction	314 California Street	Condominium	5 DU	[10]	37	0	2	2	2	1	3
A12	Completed	22-26 E. Colorado Avenue	Condominium	8 DU	[10]	59	1	3	4	3	1	4
A13	Proposed	405 S. First Avenue	Condominium Commercial	4 DU 585 GLSF	[10] [18]	29 22	0 1	2 0	2 1	1 1	1 1	2 2
A14	Under Construction	130 S. First Avenue	Office	5,600 GSF	[19]	55	5	1	6	1	5	6
A15	Proposed	Santa Anita Park North Barn Project 285 W. Huntington Drive	Barn/Stables Expansion Dormitories Canteen	816 Stalls 104 Units 3,391 GSF	[20]	1,729	64	22	86	41	119	160
A16	Completed	57 Wheeler Avenue	Apartment Retail Office	38 DU 10,730 GLSF 7,120 GSF	[21]	618	15	19	34	30	29	59
Los Angeles County												
C1	Approved	1901-1909 Peck Road	Condominium	10 DU	[10]	73	1	4	5	4	2	6
TOTAL						18,523	253	729	982	875	584	1,459

Table 3-4 (Continued)
RELATED PROJECTS LIST AND TRIP GENERATION [1]

[1] Source: City of Monrovia Planning Department, City of Arcadia Planning Department, and Los Angeles County Department of Regional Planning. Unless otherwise noted, the traffic volumes were forecast by applying trip rates as provided in the ITE Trip Generation Manual, 10th Edition, 2017.
[2] Trips are one-way traffic movements, entering or leaving.
[3] Source: "Draft Station Square South Specific Plan Initial Study/Mitigated Negative Declaration," prepared by MIG, Inc., April 2018.
[4] Source: "Avalon Monrovia Traffic Impact Analysis", prepared by LSA, March 2018.
[5] Source: "Monrovia Hotel Project Traffic Impact Analysis", prepared by LSA, May 2018.
[6] Source: "1625 Magnolia Avenue Traffic Impact Analysis", prepared by LSA, May 2018.
[7] Source: "The Arroyo at Monrovia Station Project Transportation Impact Study", prepared by Linscott, Law & Greenspan, Engineers, March 2019.
[8] Source: "123 W. Pomona Project Transportation Impact Study", prepared by Linscott, Law & Greenspan, Engineers, March 2019.
[9] Source: "Monrovia Self-Storage Trip Generation Study", prepared by Fehr & Peers, August 2019. Inbound and outbound splits are based on the distributions provided in the *Trip Generation Manual* for the cited ITE land uses.
[10] ITE Land Use Code 220 (Multifamily Housing [Low-Rise]) trip generation average rates.
[11] ITE Land Use 580 (Museum) trip generation average rates. The peak hour trip generation is assumed to represent 10% of the daily trips.
[12] ITE Land Use 932 (High-Turnover [Sit-Down] Restaurant) trip generation average rates.
[13] Source: "125 W. Huntington Drive, Buildings C & D Transportation Impact Analysis", prepared by Linscott, Law & Greenspan, Engineers, December 2019.
[14] Accounts for the re-occupancy of the former office building located at 125 W. Huntington Drive. Refer to the report cited in footnote [13] for additional details.
[15] Source: "Huntington Plaza Traffic Impact Study", prepared by Psomas, September 2019.
[16] Source: "Traffic Impact Study for Santa Anita Inn Redevelopment Project", prepared by Kimley Horn, dated April 2018. Based on information provided by City staff, the proposed project has since been updated to consist of a 233-room hotel, 96-unit condominium, and 10,600 square feet of retail space.
[17] ITE Land Use Code 720 (Medical/Dental Office Building) trip generation average rates.
[18] ITE Land Use Code 820 (Shopping Center) trip generation average rates.
[19] ITE Land Use Code 710 (General Office Building) trip generation average rates.
[20] Source: "Draft Santa Anita Park North Barn Transportation Impact Analysis", prepared by Fehr & Peers, February 2019.
[21] Source: "Wheeler Mixed-Use Project Traffic Impact Study", prepared by Linscott, Law & Greenspan, Engineers, May 2015.



MAP SOURCE: RAND MCNALLY & COMPANY

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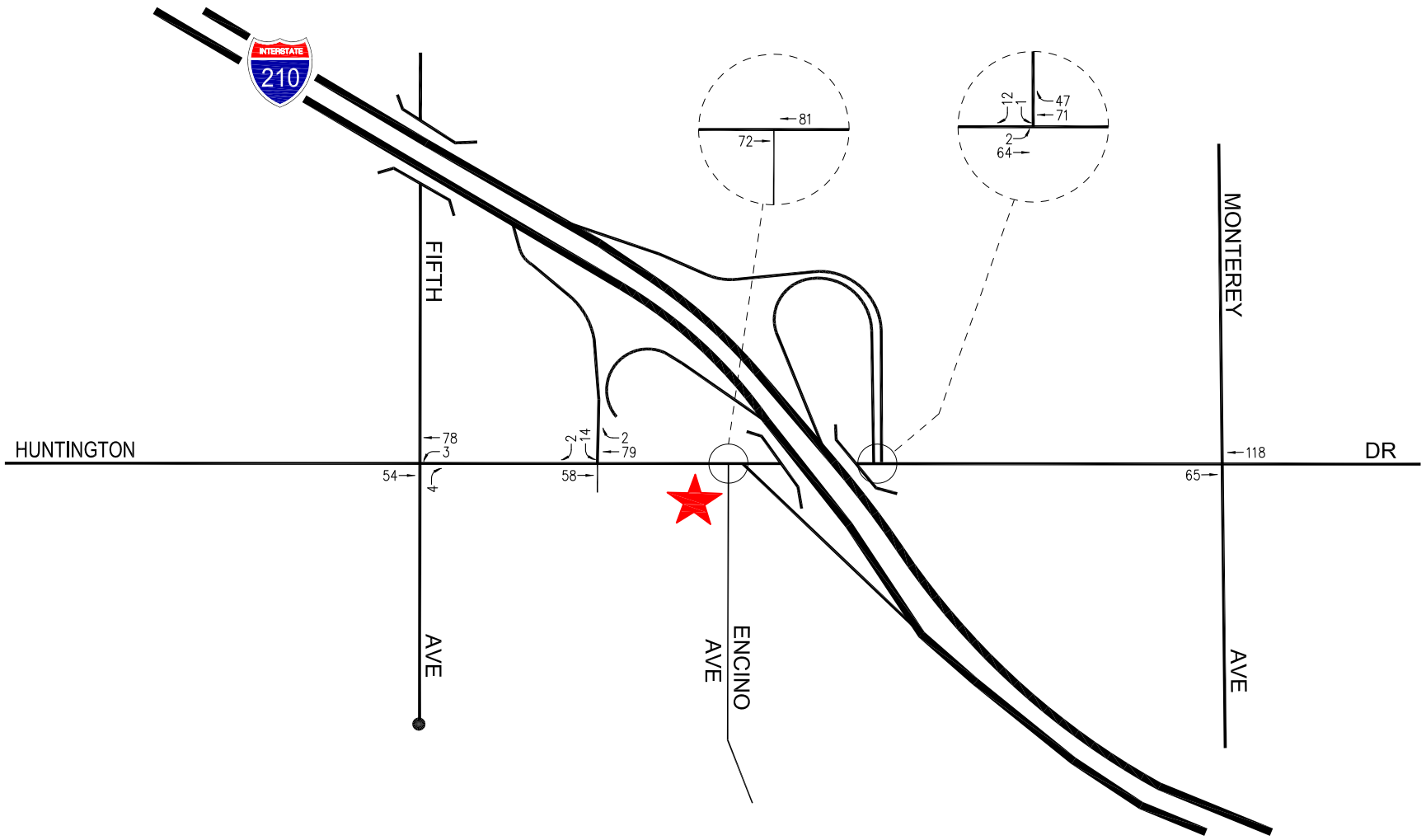
NOT TO SCALE

- PROJECT SITE
- (M1) CITY OF MONROVIA RELATED PROJECT
- (A1) CITY OF ARCADIA RELATED PROJECT
- (C1) COUNTY OF LOS ANGELES RELATED PROJECT

FIGURE 3-6
LOCATION OF RELATED PROJECTS

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT



PROJECT SITE

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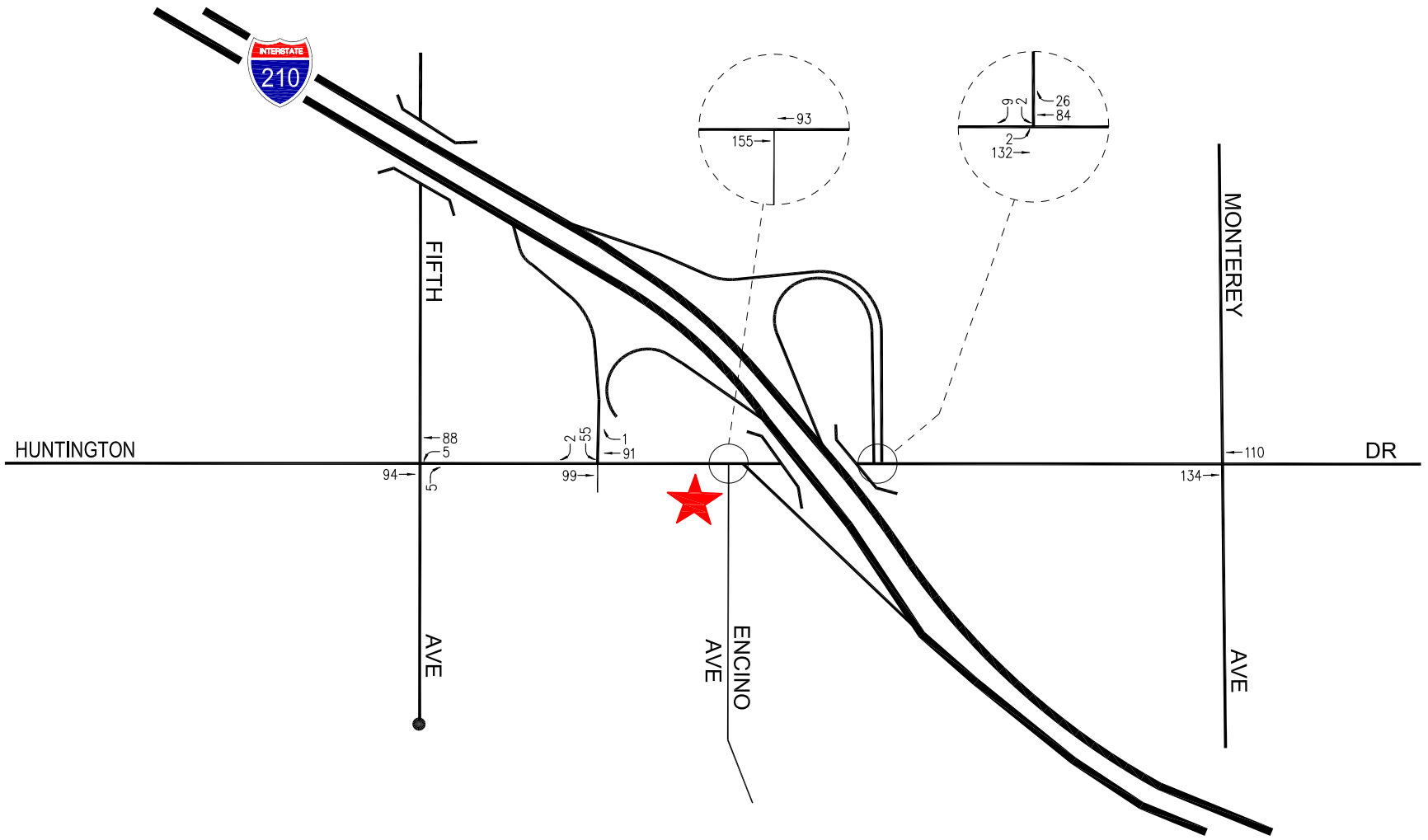
FIGURE 3-7
RELATED PROJECTS TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers



PROJECT SITE

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FIGURE 3-8
RELATED PROJECTS TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

4.0 CEQA TRANSPORTATION ANALYSIS

The State of California Governor's Office of Planning and Research (OPR) issued proposed updates to the CEQA guidelines in November 2017 that amends the Appendix G question for transportation impacts to delete reference to vehicle delay and level of service and instead refer to Section 15064.3, subdivision (b)(1) of the CEQA Guidelines asking if the project will result in a substantial increase in vehicle miles traveled (VMT). The California Natural Resources Agency certified and adopted the revisions to the CEQA Guidelines in December of 2018, and as of July 1, 2020 the provisions of the new section are in effect statewide. Concurrently, OPR developed the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018), which provides non-binding recommendations on the implementation of VMT methodology which has significantly informed the way VMT analyses are conducted in the State. Accordingly, for the purpose of environmental review under CEQA, the City of Monrovia has adopted significance criteria for transportation impacts based on VMT for land use projects and plans which is generally consistent with the recommendations provided by OPR in the *Technical Advisory*.

4.1 Vehicle Miles Traveled (VMT) Project Screening

Traditionally, public agencies have set certain thresholds to determine whether a project requires detailed transportation analysis or if it could be assumed to have less than significant environmental impacts without additional study. The City of Monrovia has adopted three screening criteria which may be applied to screen proposed projects out of detailed VMT analysis. Proposed projects are not required to satisfy all of the screening criteria in order to screen out of further VMT analysis; satisfaction of one criterion is sufficient for screening purposes. The following sections provide a detailed explanation of each screening criteria as it relates to the proposed project.

4.1.1 *Transit Priority Area Screening*

CEQA Guidelines Section 15064.3(b)(1) states in part: "Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact." In keeping with the statutory presumption of less than significant impacts due to nearby high-quality transit, the City of Monrovia has adopted a transit priority area[13] (TPA) screening criterion. Projects which are located with in a TPA are presumed to have a less than significant impact, absent substantial evidence to the contrary. This presumption may not be appropriate if:

- The project has a floor area ratio (FAR) of less than 0.75.
- The project includes more parking for use by residents, customers, or employees of the project than required by the City. If a project has more parking than required by Code that is intended for design feasibility (such as completing a full floor in an above- or below-grade parking structure), this exception would not apply.

[13] Public Resources Code Section 21099(a)(7): ""Transit priority area" means an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program or applicable regional transportation plan."

- The project is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Southern California Association of Governments [SCAG]).
- The project replaces affordable residential units with a smaller number of moderate- or high-income residential units.

The San Gabriel Valley COG Vehicle Miles Traveled Evaluation Tool ("VMT Evaluation Tool"), which was developed by Fehr & Peers as part of the SB 743 VMT Implementation Study effort, is recommended for use to conduct TPA screening in the City of Monrovia.

As described in *Section 3.2*, public transit service is provided in the vicinity of the proposed project. The Metro "L" (Gold) Line Arcadia Station and Monrovia Station qualify as major transit stops[14], however they are located more than 0.5 mile away from the proposed project site. Foothill Transit Line 187, which provides service in the immediate vicinity of the project site, does not meet the criteria for a high-quality transit corridor[15]. Based on a review of the existing transit service in the vicinity, the proposed project is not expected to screen out of VMT due to being located within a TPA. The VMT Evaluation Tool likewise concludes that the project fails the TPA screening criterion. Screening worksheets generated by the tool for the proposed project are included in ***Appendix F***.

4.1.2 *Low VMT Area Screening*

It is assumed that projects which will be located within areas which currently exhibit low VMT, and that incorporate similar features pertaining to density, land use mix, and transit availability, will tend to exhibit similarly low VMT. In areas where the existing VMT generation already falls below the applicable thresholds, and where projects are likely to generate similar levels of VMT, projects may be screened out of preparing detailed VMT analysis. OPR notes that such screening is appropriate for residential and office projects.

The City of Monrovia has adopted a low VMT area screening criterion which may apply to residential, office, or other employment-related and mixed-use land use types. The SCAG Travel Demand Forecasting Model was used to establish VMT performance for individual Traffic Analysis Zones (TAZ). The VMT values for each TAZ are then compared to the applicable City thresholds (i.e., VMT per captia, per employee, or per service population) to determine if the TAZ can be considered a low VMT area. Locations within the City of Monrovia which qualify for the low VMT area screening are to be identified through the VMT Evaluation Tool.

[14] Public Resources Code Section 21064.3: ""Major transit stop" means a site containing any of the following: (a) An existing rail or bus rapid transit station. (b) A ferry terminal served by either a bus or rail transit service. (c) The intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods."

[15] Public Resources Code Section 21155(b): "For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours."

As reported in the screening worksheets provided in *Appendix F*, the project is situated within TAZ 2240300, which currently exhibits 17.8 home-based work VMT per employee. The threshold for commercial project types is noted as 16.47 home-based work VMT per employee. Therefore, the TAZ does not currently exhibit VMT below the applicable thresholds, and cannot be considered a low VMT area. The proposed project site therefore fails the low VMT area screening criterion.

4.1.3 *Project Type Screening*

The City of Monrovia has identified a list of land use types which may be presumed to have a less than significant impact. Absent substantial evidence to the contrary, the listed land uses are assumed to be local serving in their nature and therefore would not generate new demand; rather, projects of these types would meet existing demand, shortening the distance that residents, employees, customers, or visitors would need to travel. For example, the City's Guidelines identify local serving schools, public parks, day care centers, places of worship, public libraries, and more, as examples of local serving land uses.

OPR states that local serving retail may also be presumed to cause less than significant impacts. By adding retail opportunities into the urban fabric and improving retail destination proximity, local serving retail developments tend to shorten trips and reduce VMT. OPR suggests that the threshold for local serving versus regional serving retail (which may lead to substitution of longer regional trips instead of shorter local ones) is 50,000 square feet. Consistent with the presumption of less than significant impacts for local serving retail presented by OPR, the City of Monrovia also screens out local serving retail projects of less than 50,000 square feet, including retail projects such as gas stations, banks, restaurants, and shopping centers.

The proposed project consists of the development of two free-standing buildings which together will provide a total of 6,762 square feet of restaurant space (i.e., the proposed Chick-fil-A will provide 4,562 square feet while the proposed Starbucks will provide 2,220 square feet). The proposed land use type is identified by the City of Monrovia as a local serving retail use, and the size of the project is well below 50,000 square feet. Therefore, the proposed project satisfies the criteria to be considered a local serving use and is screened out of further VMT analysis as it is presumed to cause less than significant transportation impacts.

4.1.4 *Summary of Screening Conclusions*

The City of Monrovia has adopted three screening criteria which may be applied to screen proposed projects out of detailed VMT analysis. The project does not meet the criteria to be screened out of VMT analysis based on location within a TPA or based on location within a low VMT area. The project does satisfy the criteria for a local serving retail project of less than 50,000 square feet. Therefore, the project is screened out of further VMT analysis.

4.2 VMT Impact Conclusions

As described in *Section 4.1.4*, the project meets the criteria for a local serving retail use and is screened out of further VMT analysis. The screening criterion is based on the presumption that local

serving retail uses will cause less than significant impacts. Therefore, through satisfaction of the screening criterion, the project is determined to have a less that significant transportation impact.

4.3 Active Transportation and Public Transit Analysis

Pursuant to the City of Monrovia Transportation Study Guidelines, a significant impact may also occur "if the project conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities". The following section provides a brief review of the City's adopted policies, plans, and programs pertaining to active transportation and public transit analysis.

4.3.1 *Adopted Policies, Plans, or Programs*

The City's current Circulation Element of the General Plan sets forth goals and policies pertaining to accident and traffic safety, transit and public transportation, and bicycle routes and pedestrian facilities, among other things. Relevant adopted policies include:

- Policy 3.6: Provide continuity to the sidewalk system, including wheelchair ramps, when new development occurs, to minimize pedestrian/vehicle conflicts.

- Policy 3.7: Expand bicycle routes where opportunities arise and demand warrants to minimize conflicts between cyclists and motorists.

- Policy 4.5: Require new development along arterial streets to provide transit facilities, such as bus shelters and turn-outs designed to established standards and specifications, where deemed necessary.

- Policy 6.1: Provide for the safety of pedestrians and bicycles by adhering to state and national standards and uniform practices.

- Policy 6.5: Encourage the provision of an accessible and secure area for bicycle storage at all new and existing developments.

The City of Monrovia Bicycle Master Plan also sets forth a number of objectives and goals to promote and encourage bicycling. The Bicycle Master Plan includes objectives pertaining to programs that support bicycling, including programs that introduce and promote education, encouragement, and outreach, facilitate non-motorized travel to transit stations and stops, and encourage non-motorized travel to shops and restaurants. The Bicycle Master Plan also provides specific recommendations for promoting bicycling activities within the City, such as provision of bicycle detection at traffic signals, a bicycle wayfinding program, and bicycle parking on public and private property. As shown in *Figure 3-1*, additional bicycle facilities are proposed in the vicinity of the Chick-fil-A/Starbucks Monrovia project site, and a feasibility study for providing separated bikeways along Huntington Drive is recommended.

4.3.2 *Qualitative Impact Conclusions*

The proposed Chick-fil-A/Starbucks Monrovia project is not expected to have a significant impact on active transportation or public transit in the vicinity of the project site. As described in *Section 2.3.2* herein, the project site is planned to accommodate pedestrian and bicycle access via exclusive walkways which connect the proposed Chick-fil-A and Starbucks restaurants to the public sidewalks. The walkways minimize the extent of pedestrian and bicycle interaction with vehicles at the site and provide a comfortable, convenient, and safe environment which in turn can encourage use of active transportation modes. The project site is further planned to provide bicycle parking facilities for use by employees and the public. The proposed project is therefore found to be in alignment with the City's General Plan Circulation Element and Bicycle Master Plan goals to promote pedestrian and bicycle safety and provide appropriate and supportive active transportation infrastructure.

The proposed project is located adjacent to Huntington Drive, which is currently served by public bus transit service provided by Foothill Transit Line 187. As noted in *Section 3.2*, the project site is within easy walking distance from existing bus stops located near Fifth Avenue and Monterey Avenue. The proposed project is not expected to affect access or safety at the existing bus stops, nor is it expected to hinder public transit service along Huntington Drive. Further, the Bicycle Master Plan recommends studying the feasibility of providing a separated bikeway along Huntington Drive. The proposed project is not expected to preclude the City from constructing bicycle facilities or pursuing bicycle network improvements along local roadways within the study area. Development of the proposed project will not prevent the City from completing any proposed transit, bicycle, or pedestrian facilities.

Since the proposed project is not found to result in conflicts with adopted policies, plans, or programs, nor is it expected to negatively affect the performance or safety of existing or planned pedestrian, bicycle, or transit facilities, it is determined that the proposed project will have a less than significant impact on active transportation and public transit in the vicinity of the project site.

5.0 NON-CEQA ANALYSIS

The City of Monrovia's Transportation Study Guidelines notes that the City has vehicle Level of Service (LOS) standards which local infrastructure will strive to maintain. The LOS standards apply to discretionary approvals of new land use projects. The following section presents the operational (i.e., Level of Service) analysis prepared for the proposed Chick-fil-A/Starbucks Monrovia project pursuant to this requirement.

5.1 Analysis Methodology

In order to estimate the proposed project's effect on intersection operations, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic volumes on a peak hour and daily basis. The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic volumes. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area. The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area. The proposed project's forecast trip generation, distribution, and assignment is presented in *Section 2.5* herein. With the forecasting process complete and project traffic assignments developed, the effect of the proposed project is isolated by comparing operational conditions at the selected study intersections using existing and expected future traffic volumes without and with forecast project traffic.

Signalized study intersections are evaluated using the Intersection Capacity Utilization (ICU) method of analysis. The ICU method determines the Volume-to-Capacity (*v/c*) ratios on a critical lane basis (i.e., based on the individual *v/c* ratios for key conflicting traffic movements). The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing. The overall intersection *v/c* ratio is subsequently assigned a Level of Service (LOS) value to describe intersection operations. Level of Service varies from LOS A (free flow conditions) to LOS F (jammed condition). A detailed description of the ICU method and corresponding Levels of Service is provided in ***Appendix G***. Consistent with the City's Transportation Study Guidelines, the ICU analysis prepared for the signalized intersections assumes a minimum clearance interval of 0.10, a lane capacity of 1,600 vehicles per hour for through and turn lanes, and a lane capacity of 2,880 vehicles per hour for dual turn lanes.

Unsignalized intersections such as two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections are analyzed using the Highway Capacity Manual (HCM) method of analysis. The HCM methodology determines the average control delay (expressed in seconds per vehicle) at the intersection. Average control delay for any particular movement is a function of the capacity of the approach and the degree of saturation. The average control delay includes delay due to

deceleration to a stop at the back of the queue from free-flow speed, move-up time within the queue, stopped delay at the front of the queue, and delay due to acceleration back to free-flow speed. It should be noted that the TWSC methodology estimates the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns and determines the LOS for each constrained movement. A detailed description of the HCM method and corresponding Level of Service is also provided in *Appendix G*. Consistent with the City's Transportation Study Guidelines, the HCM analysis prepared for the unsignalized intersections assumes a peak hour factor (PHF) of 0.95 for the forecast future conditions. As noted previously, existing traffic volumes were determined based historic and current intersection traffic counts collected by a variety of traffic count subconsultants. As the observed PHF under existing conditions could not be obtained for all study intersections, a PHF of 0.95 was utilized for existing conditions as well in order to provide a consistent analysis.

5.2 Criteria for Non-CEQA Analysis

The relative effect of the added project traffic volumes to be generated by the proposed project during the weekday AM and PM peak hours was evaluated based on analysis of existing and future operating conditions at the study intersections, without and with the proposed project. The previously discussed capacity analysis procedures were utilized to evaluate the future *v/c* or delay relationships and service level characteristics at each study intersection. The effect of project-generated traffic at each study intersection was compared to the City of Monrovia's intersection LOS standards as presented below. The acceptable operating condition for intersections in the City is LOS D or better as established in the City's General Plan. Any intersection which is operating at LOS E or F is considered deficient.

Signalized intersections will require improvement if one of the following conditions is met:

- The addition of project traffic results in the intersections to change from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F).

- The project-related increase in volume-to-capacity (V/C) is equal to or greater than 0.020 at an intersection that is projected to operate at LOS E with addition of project traffic.

- The project related increase in V/C is equal to or greater than 0.010 at an intersection that is projected to operate at LOS F with addition of project traffic.

Intersection improvements at signalized intersections will require the intersection to return to the baseline V/C ratio if the baseline V/C ratio is greater than 0.900 (i.e., corresponding to LOS E or F).

Unsignalized intersections will require improvements if both of the following conditions are met:

- The addition of project traffic to an intersection results in the degradation of overall intersection operations from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F), and

- The intersection meets peak hour signal warrants either caused by project volumes, or the project volumes are added at an intersection that meets peak hour signal warrants in the baseline scenario(s). Peak hour signal warrants should be determined based on the latest California Manual on Uniform Traffic Control Devices (CA MUTCD).

5.3 Analysis Scenarios

Pursuant to the City's Transportation Study Guidelines and in coordination with City staff, LOS calculations have been prepared for the following scenarios:

[a] Existing conditions.

[b] Existing with project conditions.

[c] Condition [b] with implementation of intersection improvement measures, if necessary.

[d] Condition [a] plus one percent (1.0%) per year annual ambient traffic growth through year 2023 and with completion and occupancy of the related projects (i.e., future without project conditions).

[e] Condition [d] with completion and occupancy of the proposed project.

[f] Condition [e] with implementation of intersection improvement measures, if necessary.

The weekday AM and PM peak hour LOS analysis prepared for the study intersections using the ICU and HCM methodology is summarized in ***Table 5-1***. The ICU and HCM data worksheets for the analyzed intersections are provided in *Appendix G*.

5.4 Existing Conditions

5.4.1 *Existing Conditions*

As indicated in column [1] of *Table 5-1*, all five study intersections are presently operating at LOS D or better during the weekday AM and PM peak hours under existing conditions. The existing traffic volumes at the study intersections during the weekday AM and PM peak hours are displayed in *Figures 2-4* and *2-5*, respectively.

5.4.2 *Existing With Project Conditions*

As shown in column [2] of *Table 5-1,* all five intersections are expected to continue operating at LOS D or better during the weekday AM and PM peak hours under the existing with project conditions. The *v/c* ratios and delays at all of the study intersections incrementally increase with the addition of project-generated traffic. The proposed project is not expected to cause any of the study intersections to operate at a deficient LOS, therefore no project-specific intersection improvements or project-specific transportation demand management measures are proposed or required. Figures

Table 5-1
SUMMARY OF VOLUME TO CAPACITY RATIOS, DELAYS, AND LEVELS OF SERVICE
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	PEAK HOUR	[1] YEAR 2020 EXISTING V/C or DELAY	[1] LOS [a]	[2] YEAR 2020 EXISTING W/ PROJECT V/C or Delay	[2] LOS [a]	[2] CHANGE V/C or DELAY [(2)-(1)]	[2] IMPROVE-MENTS REQUIRED [b]	[3] YEAR 2023 FUTURE PRE-PROJECT V/C or DELAY	[3] LOS [a]	[4] YEAR 2023 FUTURE W/ PROJECT V/C or DELAY	[4] LOS [a]	[4] CHANGE V/C or DELAY [(5)-(4)]	[4] IMPROVE-MENTS REQUIRED [b]
1	Fifth Avenue/	AM	0.678	B	0.691	B	0.013	No	0.723	C	0.735	C	0.012	No
	Huntington Drive	PM	0.857	D	0.865	D	0.008	No	0.915	E	0.923	E	0.008	No
2	I-210 Freeway EB Ramps-Private Driveway/	AM	0.717	C	0.754	C	0.037	No	0.761	C	0.798	C	0.037	No
	Huntington Drive	PM	0.585	A	0.649	B	0.064	No	0.644	B	0.704	C	0.060	No
3	Encino Avenue/	AM	13.1	B	13.1	B	0.0	No	14.4	B	14.4	B	0.0	No
	Huntington Drive	PM	15.4	C	15.9	C	0.5	No	17.4	C	17.7	C	0.3	No
4	I-210 Freeway WB Ramps/	AM	0.644	B	0.664	B	0.020	No	0.688	B	0.708	C	0.020	No
	Huntington Drive	PM	0.636	B	0.646	B	0.010	No	0.674	B	0.683	B	0.009	No
5	Monterey Avenue/	AM	0.842	D	0.857	D	0.015	No	0.901	E	0.916	E	0.015	No
	Huntington Drive	PM	0.685	B	0.692	B	0.007	No	0.745	C	0.752	C	0.007	No

[a] Level of Service (LOS) is based on the reported *v/c* ratio for signalized intersections and the delay value for unsignalized intersections. LOS is thus defined as follows:

V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
0.000-0.600	0-15	A	>0.800-0.900	>25-35	D
>0.600-0.700	>10-15	B	>0.900-1.000	>35-50	E
>0.700-0.800	>15-25	C	>1.000	>50	F

[b] According to the City of Monrovia's *Transportation Study Guidelines,* an intersection will require improvement if the following conditions are met.

For signalized intersections:

- the addition of project traffic results in the intersections to change from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F); or
- the project-related increase in volume-to-capacity (v/c) is equal to or greater than 0.020 at an intersection that is projected to operate at LOS E with addition of project traffic; or
- the project-related increase in v/c is equal to or greater than 0.010 at an intersection that is projected to operate at LOS F with addition of project traffic.

For unsignalized intersections:

- the addition of project traffic to an intersection results in the degradation of overall intersection operations from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F); and
- the intersection meets peak hour signal warrants either caused by project volumes, or the project volumes are added at an intersection that meets peak hour signal warrants in the baseline scenario(s).

illustrating the existing with project traffic volumes at the study intersections during the weekday AM and PM peak hours are presented in *Appendix G*.

5.5 Future Year 2023 Cumulative Conditions

5.5.1 *Future Year 2023 Cumulative Without Project Conditions*

The future cumulative baseline conditions were forecast based on the addition of traffic generated by the completion and occupancy of the related projects, as well as the growth in traffic due to the combined effects of continuing development, intensification of existing developments and other factors (i.e., ambient growth). The *v/c* ratios and delay at all of the study intersections are incrementally increased with the addition of ambient traffic and traffic generated by the related projects listed in *Table 3-4*. As presented in column [3] of *Table 5-1*, three of the five study intersections are expected to operate at LOS D or better during the weekday AM and PM peak hours with the addition of growth in ambient traffic and related projects traffic under the future without project conditions. The following two remaining study intersections are anticipated to operate at LOS E for the peak hour shown below with the addition of related projects traffic and ambient traffic:

- Int. No. 1: Fifth Avenue/Huntington Drive PM Peak Hour: *v/c* = 0.915, LOS E
- Int. No. 5: Monterey Avenue/Huntington Drive AM Peak Hour: *v/c* = 0.901, LOS E

Figures illustrating the future without project (existing, ambient growth and related projects) traffic volumes at the study intersections during the weekday AM and PM peak hours are presented in *Appendix G*.

5.5.2 *Future Year 2023 Cumulative With Project Conditions*

As shown in column [4] of *Table 5-1,* three of the five study intersections are expected to continue operating at LOS D or better under the future with project conditions, while the following two intersections are expected to continue operating at LOS E for the peak hours shown below:

- Int. No. 1: Fifth Avenue/Huntington Drive PM Peak Hour: *v/c* = 0.923, LOS E
- Int. No. 5: Monterey Avenue/Huntington Drive AM Peak Hour: *v/c* = 0.916, LOS E

The *v/c* ratios and delays at all of the study intersections incrementally increase with the addition of project-generated traffic. The incremental increases in *v/c* ratio at the two study intersections forecast to operate at LOS E do not exceed the City's criteria, therefore no project-specific intersection improvements or project-specific transportation demand management measures are proposed or required. Figures illustrating the future with project (existing, ambient growth, related projects and project) traffic volumes at the study intersections during the weekday AM and PM peak hours are presented in *Appendix G*.

5.6 Traffic Impact Fee

The City of Monrovia has adopted a Traffic Impact Fee (TIF) for new development projects located within the City south of Huntington Drive. The purpose of the fee is to finance specific traffic and intersection improvements needed to address the cumulative effects of new developments proposed in the City and those that may be constructed under the General Plan. The impact fee area, the necessary improvements, and the resulting fee were identified in the "Traffic Impact Fee Study for the City of Monrovia South of Huntington", prepared by Gibson Transportation Consulting in April 2019, and adopted by City Council Resolution No. 2019-43 on September 17, 2019. The Traffic Impact Fee Study establishes the nexus between the anticipated impacts of new development within the City, specific traffic improvements needed to maintain acceptable levels of service, and the corresponding fees necessary to cover the improvement costs. The study establishes a fee of $2,095.00 per net new afternoon peak hour trip.

The proposed project is located within the fee area, which is generally bounded by Huntington Drive to the north, Fifth Avenue to the west, Live Oak Avenue to the south, and Mountain Avenue to the east. The proposed project also meets the criteria for new development within the City. It is therefore expected that the proposed project will be required to pay a Traffic Impact Fee in the amount of $274,445.00, as calculated below:

Net New PM Peak Hour Trips:		131 trips
Fee Per Net New PM Peak Hour Trip:	x	$2,095.00/trip
Total Fee:		$274,445.00

It is noted that the following two capacity-enhancing intersection improvements are identified among the traffic improvements which are to be financed via the City's TIF:

- Fifth Avenue/Huntington Drive – "Add a third eastbound through lane that starts approximately 150 feet west of the intersection. This lane would then continue until it meets the existing right-turn lane at the I-210 eastbound on-ramp."

- Monterey Avenue/Huntington Drive – "Convert the westbound right-turn lane into a shared through/right lane that continues until it meets the existing right-turn lane at the I-210 westbound on-ramp. Add a third eastbound through lane that starts approximately 150 feet west of the intersection that continues until it meets the existing right-turn lane at the intersection of Huntington Drive & Highway Esplanade."

While the incremental degradation of intersection LOS caused by project-generated traffic does not exceed the City's criteria for project-specific traffic improvements, the proposed Chick-fil-A/Starbucks Monrovia project is expected to contribute toward cumulative effects on intersections which are already operating at unacceptable LOS. Therefore, payment of the TIF represents the project's fair-share contribution towards the improvements required to bring adjacent intersections to an acceptable LOS.

5.7 Alternate Site Access Scheme Assessment

As previously discussed in *Section 2.3.1*, the City of Monrovia reserves the right to restrict the Huntington Drive project driveway to inbound right-turns only. The City may choose to impose this restriction should a post-opening operational review indicate that outbound vehicles waiting to turn right onto Huntington Drive block the Chick-fil-A drive-through service lane exit and interfere with the drive-through service lane operations.

The service lane exit is approximately 18 feet south of the property line and approximately 23 feet south of the project driveway's edge of traveled way, as shown in *Figure 2-1*. The project driveway can therefore likely accommodate one average-sized passenger vehicle waiting to turn right onto Huntington Drive without blocking the service lane exit. A queuing assessment was prepared for the project driveway utilizing the City-approved Highway Capacity Manual (HCM) methodology for the Future with Project conditions at the project driveway. The driveway queuing worksheets are contained in ***Appendix H***. As shown in the worksheets in *Appendix H*, the average delay for vehicles making the right-turn onto Huntington Drive is calculated to be approximately 11 seconds during the AM peak hour and approximately 15 seconds during the PM peak hour. The corresponding 95th percentile queue for the northbound right-turn movement, which represents the maximum back of vehicle queue at 95th percentile traffic volumes, is less than one (1) vehicle during both the AM and PM peak hours, indicating that no more than one vehicle at a time is expected to be waiting to turn right onto Huntington Drive, even near peak traffic volume conditions. Based on the results of the driveway queuing assessment, it is anticipated that vehicles waiting to turn right onto Huntington Drive generally will not block the Chick-fil-A drive-through service lane exit. Any potential blockage of the exit is expected to be transient in nature, and is not expected to negatively impact the efficiency of the drive-through service lane operations. In order to further reduce the potential for other patrons of the project site to block the service lane exit, it is recommended that "Keep Clear" pavement markings be installed along the central drive-aisle in front of the service lane exit.

Although it is not anticipated that the drive-through service lane exit will be blocked by vehicles waiting to turn right onto Huntington Drive, the City reserves the right to restrict the project driveway to inbound right-turning movements only. In order to fully evaluate the potential effects of the proposed project under this potential alternate site access scheme, a supplemental analysis of the operational LOS at the study intersections was conducted assuming the Huntington Drive project driveway accommodates inbound right-turning traffic only. The LOS analysis of this alternate site access scheme is provided in *Appendix H*. The project traffic distribution pattern under the alternate site access scheme is presented in ***Appendix Figure H-1***, while ***Appendix Figures H-2*** and ***H-3*** present the forecast net new weekday AM and PM peak hour traffic volumes assigned to each study intersection under the alternate site access scheme. The traffic volume assignments presented in *Appendix Figures H-2* and *H-3* reflect the traffic distribution characteristics shown in *Appendix Figure H-1* and the project trip generation forecasts presented in *Table 2-1*. The resulting weekday AM and PM peak hour LOS analysis prepared for the study intersections under the alternate site access scheme is summarized in ***Appendix Table H-1***. The ICU and HCM data worksheets are also provided in *Appendix H*.

As presented in *Appendix Table H-1*, under the alternate site access scheme which assumes the Huntington Drive project driveway is restricted to inbound right-turning movements only, the addition of project traffic results in incremental increases in *v/c* ratios and delays at the study intersections, but does not exceed the City's operational criteria to require project-specific intersection improvements or project-specific transportation demand management measures. Therefore, no intersection improvements or transportation demand management measures are anticipated to be required should the City choose to restrict the Huntington Drive project driveway to inbound right-turn movements only.

6.0 CALIFORNIA DEPARTMENT OF TRANSPORTATION ANALYSIS

Consistent with the previously described statutory changes to the CEQA Guidelines, the California Department of Transportation (Caltrans) has also formally adopted VMT as the metric for reviewing the transportation impacts of a land use development project. As described in *Section 1*.2 herein, Caltrans has released the *Transportation Impact Study Guide* (TISG) and the "Interim LD-IGR Safety Review Practitioners Guidance" in order to provide guidance on Caltrans' review of land use projects.

6.1 Vehicle Miles Traveled Analysis

Caltrans' TISG references the December 2018 *Technical Advisory* prepared by OPR as the basis for its guidance on VMT assessment. For the purpose of this transportation assessment, it is understood that the City of Monrovia's adopted VMT methodology and screening criteria are substantially consistent with the recommendations provided in the *Technical Advisory* and thus satisfy Caltrans' VMT analysis requirements as well. Therefore, no separate VMT analysis has been prepared for Caltrans' review of the proposed project.

6.2 Off-Ramp Vehicle Queuing Analysis

The "Interim LD-IGR Safety Review Practitioners Guidance" provides direction on a simplified safety analysis approach that reduces the risk to all road users and that focuses on multi-modal conflict analysis as well as access management issues. District traffic safety staff are encouraged to consider the proposed project's potential influence on safety on state roadways, including the following factors:

- Increased presence of pedestrians and bicyclists
- Degradation of the walking and bicycling environment and experience
- New pedestrian and bicyclist connection desires
- Multimodal conflict points, especially at intersections and project access locations
- Change in traffic mix such as an increase in bicyclists or pedestrians where features such as shoulders or sidewalks may not exist or are inconsistent with facility design (sidewalks, bike and multi-user paths, multimodal roadways, etc.)
- Increased vehicular speeds
- Transition between free flow and metered flow
- Increased traffic volumes

- Queuing at off-ramps resulting in slow or stopped traffic on the mainline or speed differentials between adjacent lanes

- Queuing exceeding turn pocket length that impedes through-traffic

The proposed Chick-fil-A/Starbucks Monrovia project does not take direct access from a State facility; therefore, the project has not been reviewed for factors pertaining to site access or local roadways. However, the proposed project is expected to generate net new project trips at the following two study intersections: Study Intersection No. 2: I-210 Freeway Eastbound Ramps/ Huntington Drive; and Study Intersection No. 3: I-210 Freeway Westbound Ramps/Huntington Drive. Therefore, an analysis of the project's effect on off-ramp queuing was prepared in order to determine if the project would cause, or contribute towards, slowing or stopped traffic on mainline travel lanes resulting in unsafe speed differentials between adjacent lanes.

Pursuant to prior direction from Caltrans staff, off-ramp queueing was analyzed using the current Highway Capacity Manual (HCM) method for signalized intersections. The off-ramp queuing calculations were prepared using the *Synchro 11* software package which implements the HCM operational methodology. A *Synchro* network was created based on existing conditions field reviews at the above two (2) ramp intersections. In addition, specifics such as traffic volume data, lane configurations, available vehicle storage lengths, crosswalk locations, posted speed limits, traffic signal timing and phasing, etc., were coded to complete the existing network. The corresponding weekday AM peak hour and PM peak hour peak hour HCM worksheets for purposes of determining the 95th percentile vehicle queues are contained in ***Appendix I***.

The queuing analysis was prepared for the existing, existing with project, future without project and future cumulative with project conditions. Each of the two freeway off-ramp intersection approaches were reviewed in terms of expected maximum vehicle queues (i.e., 95th percentile queues) which represent the maximum back of vehicle queues with 95th percentile traffic volumes. The corresponding maximum vehicle queue lengths were then compared with 85% of the ramp storage lengths (i.e., the available storage length as measured from the applicable freeway/frontage road gore areas to the respective off-ramp approach limit lines/merge points). The total queuing for each off-ramp was determined based on the sum of the maximum vehicle queues for each off-ramp lane. The total ramp storage lengths were determined based on 85% of the sum of the striped storage for all lanes provided at the off-ramp location.

As presented in ***Table 6-1***, adequate storage areas are provided to accommodate the forecast 95th percentile queues under existing, existing with project, future without project and future cumulative with project conditions. The proposed project is not expected to cause or contribute towards vehicle queuing which extends back into the I-210 Freeway mainline travel lanes resulting in unsafe speed differentials between adjacent lanes. Therefore, the proposed project is not anticipated to negatively influence safety on the State Highway System.

Table 6-1
SUMMARY OF OFF-RAMP VEHICLE QUEUING ANALYSIS [1]
WEEKDAY AM AND PM PEAK HOURS

NO.	INTERSECTION	PEAK HOUR	85th PERCENTILE AVAILABLE OFF-RAMP STORAGE [2] (FEET)	EXISTING YEAR 2020		EXISTING YEAR 2020 WITH PROJECT		FUTURE YEAR 2023 WITHOUT PROJECT		FUTURE YEAR 2023 WITH PROJECT	
				95th %-ILE QUEUE [3] (FEET)	EXCEEDS 85th %-ILE STORAGE? (YES/NO)	95th %-ILE QUEUE [3] (FEET)	EXCEEDS 85th %-ILE STORAGE? (YES/NO)	95th %-ILE QUEUE [3] (FEET)	EXCEEDS 85th %-ILE STORAGE? (YES/NO)	95th %-ILE QUEUE [3] (FEET)	EXCEEDS 85th %-ILE STORAGE? (YES/NO)
2	I-210 Freeway EB Off-Ramp-Private Driveway/ Huntington Drive	AM	1,640	608	No	643	No	645	No	675	No
		PM	1,640	573	No	590	No	645	No	658	No
4	I-210 Freeway WB Off-Ramp/ Huntington Drive	AM	1,480	250	No	270	No	275	No	295	No
		PM	1,480	660	No	670	No	690	No	700	No

[1] Refer to calculation worksheets in *Appendix I.*

[2] Available storage represents 85 percent (85%) of total storage space, as measured via Google Earth (2020) aerial imagery. The total storage represents the sum of all formally striped lanes on the off-ramp.

[3] The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. The reported queue represents the sum of the 95th percentile vehicle queues for all lanes of the off-ramp (refer to Appendix Table I-1). An average vehicle length of 25 feet (including vehicle separation) was assumed for analysis purposes.

7.0 SUMMARY AND CONCLUSIONS

- ***Project Description*** – The proposed project site is located on the southwest corner of the Encino Avenue/Huntington Drive intersection located in the City of Monrovia, California. The proposed project site is generally bounded by Huntington Drive to the north, Encino Avenue to the east, Alta Street to the south, and the existing Double Tree hotel to the west. The proposed project consists of the development of two free-standing restaurants: a 4,562 square-foot Chick-fil-A restaurant providing a drive-through service lane which is planned to accommodate up to 30 vehicles in queue; and a 2,200 square-foot Starbucks restaurant providing a drive-through service lane which is planned to accommodate up to 13 vehicles in queue. The existing Claim Jumper restaurant currently located at the project site will be demolished to accommodate development of the proposed project. Completion and occupancy of Chick-fil-A/Starbucks Monrovia project is expected by the year 2023. The project also includes dedication of approximately 8,600 square feet (0.2 acres) of land at the southeast corner of the site to the City of Monrovia. This land is planned to be developed into a neighborhood "pocket park". Development of the pocket park will require a separate review and approval by the City, although it has been assessed for trip generation and associated impact purposes here within.

- ***Project Site Access*** – Vehicular access to the project site will be accommodated by two project driveways: one driveway on Huntington Drive which will provide right-turn in/right-turn access only due to the presence of a raised median island, and one driveway on Encino Avenue which will provide full access. Additionally, access to the project site will also be accommodated via the signalized intersection of the I-210 Freeway eastbound ramps, the Double Tree Hotel driveway, and Huntington Drive. Pedestrian and bicycle access to the project site will be accommodated via exclusive walkways which connect from the public sidewalks to both the Chick-fil-A and Starbucks restaurants.

- ***Project Parking –*** The proposed project is planned to provide a total of 88 parking spaces. Application of the parking ratios provided in the City of Monrovia Municipal Code Section 17.24.060 to the proposed results in a parking requirement of 60 parking spaces. The planned parking supply therefore exceeds the Municipal Code parking requirement, resulting in a surplus of 28 spaces.

- ***Project Trip Generation*** – The proposed project is expected to generate 175 net new vehicle trips (91 inbound trips and 84 outbound trips) during the AM peak hour. During the PM peak hour, the proposed project development is expected to generate 131 net new vehicle trips (56 inbound trips and 75 outbound trips). Over a 24-hour period, the proposed project development is forecast to generate an increase of approximately 1,019 net new daily trips during a typical weekday.

- ***Project Service-Window Queuing*** – The proposed Chick-fil-A restaurant is planned to accommodate up to 30 vehicles in a dual-loaded drive-through service lane. Based on empirical observations at existing Chick-fil-A restaurants located in the Cities of Rancho Cucamonga,

Upland, Pasadena, and Santa Clarita, a maximum queue of 23 vehicles is forecast for the proposed restaurant. Therefore, it is expected that the proposed Chick-fil-A service-lane queue storage area will adequately accommodate the forecast maximum vehicle queue. The proposed Starbucks restaurant is planned to accommodate up to 13 vehicles in the drive-through service lane. Utilizing empirical drive-through utilization and service rate data collected at existing Starbucks in the Cities of Whittier and Pomona, a maximum queue of eight (8) vehicles is forecast for the proposed restaurant. Therefore, it is expected that the proposed Starbucks service-lane queue storage area will adequately accommodate the forecast maximum vehicle queue.

- ***CEQA Vehicle Miles Traveled Assessment*** – Consistent with the requirements of CEQA Guidelines Section 15064.3, the City of Monrovia has adopted significance criteria for transportation impacts based on vehicle miles traveled for land used development projects. The City has also adopted three criteria for screening projects out of detailed VMT analysis. The proposed Chick-fil-A/Starbucks Monrovia project meets the criteria to be screened out of VMT analysis as a local serving retail project of less than 50,000 square feet. This screening criterion is based on the presumption that by adding retail opportunities into the urban fabric and improving retail destination proximity, local serving retail developments tend to shorten trips and reduce VMT. Therefore, through satisfaction of the screening criterion, the proposed project is determined to have a less that significant transportation impact.

- ***CEQA Active Transportation and Public Transit Assessment*** – The City of Monrovia Transportation Study Guidelines state that a significant impact may also occur "if the project conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities". The proposed project is found to be in alignment with the City's General Plan Circulation Element and Bicycle Master Plan goals to promote pedestrian and bicycle safety and provide appropriate and supportive active transportation infrastructure. Further, development of the proposed project will not prevent the City from completing any proposed transit, bicycle, or pedestrian facilities. It is therefore determined that the proposed project will have a less than significant impact on active transportation and public transit in the vicinity of the project site.

- ***Non-CEQA Analysis*** – Five study intersections were reviewed for consistency with the City of Monrovia's adopted Level of Service (LOS) standards. The study intersections were evaluated using the City-approved Intersection Capacity Utilization (ICU) and Highway Capacity Manual (HCM) methodologies to determine the Level of Service under existing, existing with project, and future without and with project conditions. Based on application of the City's LOS standards, the proposed project is not required to identify or construct intersection improvements at any of the study intersections.

  A supplemental review was prepared to assess the effect of project traffic on the study intersections should the City choose to restrict the Huntington Drive project driveway to inbound right-turning movements only. Under this alternate site access scheme, the incremental increases in

v/c ratio or delay at the study intersections caused by the proposed project does not exceed the City's operational criteria. Therefore, it is not anticipated that the project will be required to identify or construct intersection improvements at any of the study intersections should the City choose to restrict the Huntington Drive project driveway to inbound right-turning movements only.

- ***Traffic Impact Fee –*** The City of Monrovia has adopted a Traffic Impact Fee (TIF) of $2,095.00 per net new afternoon peak hour trip. The project is forecast to generate 131 net new PM peak hour trips; therefore, is expected that the project will be required to pay a fee in the amount of $274,445.00.

- ***Caltrans Analysis*** – It is understood that the City of Monrovia's adopted VMT methodology and screening criteria are substantially consistent with the recommendations provided in the *Technical Advisory* prepared by OPR and thus satisfy Caltrans' VMT analysis requirements as well. Therefore, no separate VMT analysis has been prepared for Caltrans' review of the proposed project. Pursuant to the direction provided in the "Interim LD-IGR Safety Review Practitioners Guidance", an analysis of the project's effect on off-ramp queuing determined that the proposed project is not expected to cause or contribute towards vehicle queuing which extends back into the I-210 Freeway mainline travel lanes resulting in unsafe speed differentials between adjacent lanes.

APPENDIX A

TRANSPORTATION IMPACT STUDY SCOPE OF WORK MEMORANDUM OF UNDERSTANDING

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MEMORANDUM

To:	Pat Gibson Richard Gibson City of Monrovia	Date:	October 23, 2020
From:	Clare M. Look-Jaeger, P.E. Grace Turney, EIT LLG Engineers	LLG Ref:	1-20-4393-1
Subject:	Chick-fil-A/Starbucks Monrovia Project – Transportation Impact Study Scope of Work		

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following Transportation Impact Study Scope of Work for the Chick-fil-A Monrovia project for your review and approval.

Transportation Study Scope of Work

The Transportation Impact Analysis Report for the proposed Chick-fil-A Monrovia project will be prepared according to the currently adopted City of Monrovia analysis and significance criteria.

A. Project Location: The project site is located on the southwest corner of the Encino Avenue/Huntington Drive intersection in the City of Monrovia, California. The site is generally bounded by Huntington Drive to the north, Encino Drive to the east, Alta Street to the south, and the existing Double Tree hotel to the west. The project site is currently occupied by the existing Claim Jumper restaurant as well as existing surface parking areas. Vehicular access to the existing site is accommodated via the signalized driveway north of the Double Tree hotel, one unsignalized right-in/right-out driveway on Huntington Drive, and one unsignalized full access driveway on Encino Avenue. The existing project site surface parking areas interconnect with the surface parking areas and drive aisles associated with the Double Tree hotel and other existing commercial development. See attached ***Figure 1 – Vicinity Map***.

B. Project Description: The project consists of the development of two free-standing drive-through restaurants on the project site: a 4,689 square-foot Chick-fil-A restaurant, providing both indoor service as well as a dual-loaded drive-through service lane expected to accommodate up to 30 vehicles in queue; and a 2,200 square-foot Starbucks restaurant, which will also provide a drive-through service lane expected to accommodate up to 14 vehicles in queue. The Chick-fil-A restaurant will be situated in the upper northeast corner of the project site, while the Starbucks restaurant will be situated adjacent to the existing signalized driveway. The existing Claim Jumper restaurant will be demolished in order to accommodate the proposed project. Vehicular access to the proposed restaurants would continue to be provided via the existing signalized driveway and the existing unsignalized right-in/right-out driveway on Huntington Drive. The

existing full access driveway on Encino Avenue is planned to be closed, and a new full access driveway on Encino Avenue is planned to be constructed at the southerly project boundary. Pedestrian access from both Huntington Drive and Encino Avenue will also be provided. A total of 88 parking spaces are planned to be provided at the project site. The project build-out and occupancy of both the proposed Chick-fil-A and Starbucks restaurants is anticipated to occur by year 2023. For the purposed of this assessment, the See attached ***Figure 2 – Site Plan***.

CEQA Transportation Assessment

C. Vehicle Miles Traveled (VMT) Analysis: In compliance with current CEQA Guidelines, the City of Monrovia has formally adopted VMT as the metric for evaluating a project's transportation impacts for environmental review purposes. Resolution No. 2020-52 sets forth VMT baselines and thresholds of significance for various project types as well as the City's adopted screening criteria., which are also presented in the "City of Monrovia Transportation Study Guidelines for Vehicle Miles Traveled and Level of Service Assessment" (September 2020). Pursuant to the City's Guidelines, certain local-serving project types may be presumed to have a less than significant impact absent substantial evidence to the contrary. Local-serving retail projects (less than 50,000 square feet) generally improve the convenience of shopping close to home and has the effect of reducing vehicle travel, therefore these projects may be screened out of detailed VMT analysis. The City of Monrovia identifies local-serving retail uses which are less than 50,000 square feet, including gas station, bank, restaurant, and shopping center land uses, as land uses which can be presumed to have a less than significant impact (absent substantial evidence to the contrary).

The proposed project consists of the development of a total of 6,889 square-feet of restaurant space, which falls well below the screening threshold of 50,000 square-feet of local serving retail/restaurant space. Therefore, based on the City of Monrovia's adopted screening criteria, the proposed project is presumed to have a less than significant transportation impact for the purposes of environmental review.

D. Active Transportation and Public Transit Analysis:

A qualitative review will be conducted to evaluate whether the project is consistent with the City's adopted policies, plans, and programs regarding public transit, bicycle, and pedestrian facilities. This review will focus on the City's current General Plan Circulation Element (adopted in 2008 and amended in 2012).

Non-CEQA Transportation Assessment

E. Project Study Area: The following five (5) key study intersections have been identified for non-CEQA operational level of service analyses. The purpose of this analysis is to confirm General Plan consistency and compliance with the City's traffic impact fee program. See attached *Figure 1 –Vicinity Map.*

Study Intersections

1. Fifth Avenue/Huntington Drive (signalized)
2. I-210 Freeway EB Ramps-Project Driveway/Huntington Drive (signalized)
3. Encino Avenue/Huntington Drive (stop-sign controlled)
4. I-210 Freeway WB Ramps/Huntington Drive (signalized)
5. Monterey Avenue/Huntington Drive (signalized)

F. Traffic Counts: LLG has obtained historic intersection turning movement counts for four of the five study intersections listed above. These historic counts will be adjusted to year 2020 conditions by applying an ambient growth rate of 1.0% per year to each turning movement volume. Historic traffic counts were not located for the unsignalized intersection of Encino Avenue/Huntington Drive; therefore, new manual intersection turning movement counts will be conducted for the weekday morning (7:00-9:00 AM) and afternoon (4:00-6:00 PM) peak commute periods at this location. Since the new manual counts are anticipated to reflect the disrupted travel patterns caused by the on-going COVID-19 pandemic and local health department "Safer at Home" orders, the major street volumes obtained from the new counts will be manually adjusted and an appropriate growth factor determined through comparison with the historic counts at the adjacent intersections will be applied to the minor street volumes.

G. Project Traffic Generation: The trip generation potential of the proposed project will be estimated using empirical trip rates derived from site-specific observations of existing Chick-fil-A restaurants as well as the average trip rates provided in the 10th Edition of the *Trip Generation Manual* (2017), published by the Institute of Transportation Engineers (ITE), for ITE Land Use 937: Coffee/Donut Shop with Drive-Through Window. The empirical Chick-fil-A trip rates were found to be comparable to the weekday daily and AM peak hour trip generation rates for ITE Land Use 934: Fast-Food Restaurant with Drive-Through Window, but are significantly higher than the ITE rates during the PM peak hour. Based on information provided in the ITE *Trip Generation Handbook*, 3rd Edition (2017) for the ITE Land Use 934, the project trip forecast was adjusted to account for a 50% pass-by rate during the AM and PM peak hours.

The project trip generation forecast has also been adjusted to account for the trips currently generated by the existing land use at the project site. The trips currently generated by the existing Claim Jumper restaurant have been forecast using trip rates for ITE Land Use 932: High-Turnover (Sit-Down) Restaurant. Similar to the pass-by adjustment applied to the proposed project forecast, the existing use forecast was also adjusted by 45% during the PM peak hour based on information provided in the *Handbook* for ITE Land Use 932.

As indicated in the project description, the proposed project is forecast to generate 1,375 net new daily trips, with 67 net new vehicle trips (32 inbound, 35 outbound) during the AM peak hour and 140 net new vehicle trips (62 inbound, 78 outbound) during the PM peak hour on a typical weekday. See attached ***Table 1 – Project Trip Generation Forecast***. The derivation of the empirical Chick-fil-A trip generation rates and comparison to the ITE Land Use 934: Fast-Food Restaurant with Drive-Through Window trip generation rates is provided in the attached ***Table 2 – Chick-fil-A Empirical Trip Rates***.

H. Project Trip Distribution Pattern: See attached ***Figure 3 – Project Trip Distribution***

I. Year 2023 Cumulative Traffic:

- Ambient Growth Rate: 1.0% per year.
- Cumulative Projects: See attached ***Table 3, Related Projects List and Trip Generation*** and ***Figure 4, Location of Related Projects***

J. Analysis Scenarios: The following analysis scenarios will be prepared for the weekday AM and weekday PM peak hour conditions in order to assess potential traffic impacts associated with the proposed project:

(a) Existing Traffic Conditions;
(b) Existing Plus Project Traffic Conditions;
(c) Scenario (b) with Mitigation, if necessary;
(d) Future Year 2023 Cumulative Pre-Project Traffic Conditions;
(e) Future Year 2023 Cumulative Plus Project Traffic Conditions;
(f) Scenario (e) with Mitigation, if necessary;

The LOS calculations will be prepared using the Intersection Capacity Utilization (ICU) methodology for signalized intersections and the Highway Capacity Manual (HCM) methodology for unsignalized intersections.

K. Thresholds of Significance

The acceptable LOS for intersections in the City is D or better as established in the City's General Plan. Any intersections operating at a LOS of E or F is considered deficient. Signalized intersections will require improvement if one of the following conditions is met:

- The addition of project traffic results in the intersections to change from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F).
- The project-related increase in volume-to-capacity (V/C) is equal to or greater than 0.020 at an intersection that is projected to operate at LOS E with addition of project traffic.
- The project related increase in V/C is equal to or greater than 0.010 at an intersection that is projected to operate at LOS F with addition of project traffic.

Intersection improvements at signalized intersections will require the intersection to return to the baseline V/C ratio if the baseline V/C ratio is greater than 0.900.

Unsignalized intersections will require improvements if both of the following conditions are met:

- The addition of project traffic to an intersection results in the degradation of overall intersection operations from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F), and
- The intersection meets peak hour signal warrants either caused by project volumes, or the project volumes are added at an intersection that meets peak hour signal warrants in the baseline scenario(s). Peak hour signal warrants should be determined based on the latest California Manual on Uniform Traffic Control Devices (CA MUTCD).

L. Other Issues/Items:

- Drive-Through Service-Window Vehicle Queuing: The vehicle queuing associated with the drive-through service lanes proposed as part of the Chick-fil-A and Starbucks restaurants will be evaluated to confirm the adequacy of the proposed vehicle queue storage area. The drive-through vehicle queuing forecast for the proposed Chick-fil-A restaurant will be based on empirical peak hour queue length observations LLG has conducted at three existing

Chick-fil-A restaurant locations in the Southern California region. While LLG does not possess similar empirical queue length observations for existing Starbucks restaurants, the drive-through vehicle queuing forecast for the proposed Starbucks restaurant will be prepared utilizing other Starbucks-specific empirical data such as the percent of patrons utilizing the drive-through window during peak hours and the average service time.

- Caltrans Facilities Analysis: In compliance with State law, Caltrans also now requires VMT-based analysis of development projects. Caltrans' *Vehicle Miles Traveled-Focused Transportation Impact Study Guidelines* (dated May 20, 2020) states that Caltrans will review and comment on impact determinations which are consistent with OPR's Technical Advisory and State greenhouse gas (GHG) emissions goals. LLG believes that the VMT analysis requirements set forth by the City of Monrovia are consistent with the Technical Advisory and State GHG goals, and therefore no separate VMT analysis will be prepared for Caltrans. However, Caltrans has also released the *Interim Land Development and Intergovernmental Review (LD-IGR) Safety Review Practitioner's Guide* (dated July 2020), which requires a detailed safety review for projects which are expected to affect the State Highway System. Therefore, based on the project site location and proximity to the I-210 Freeway, existing and future year analyses will be prepared for the Huntington Drive ramp intersections in order to address any potential concerns Caltrans may have in accordance with the *Interim LD-IGR Safety Review Practitioner's Guide*.

Pending your review of the above information, we will proceed with the transportation analysis. Please feel free to contact us at 626.796.2322 if you have any questions, comments, or suggested revisions regarding the above. Thank you.

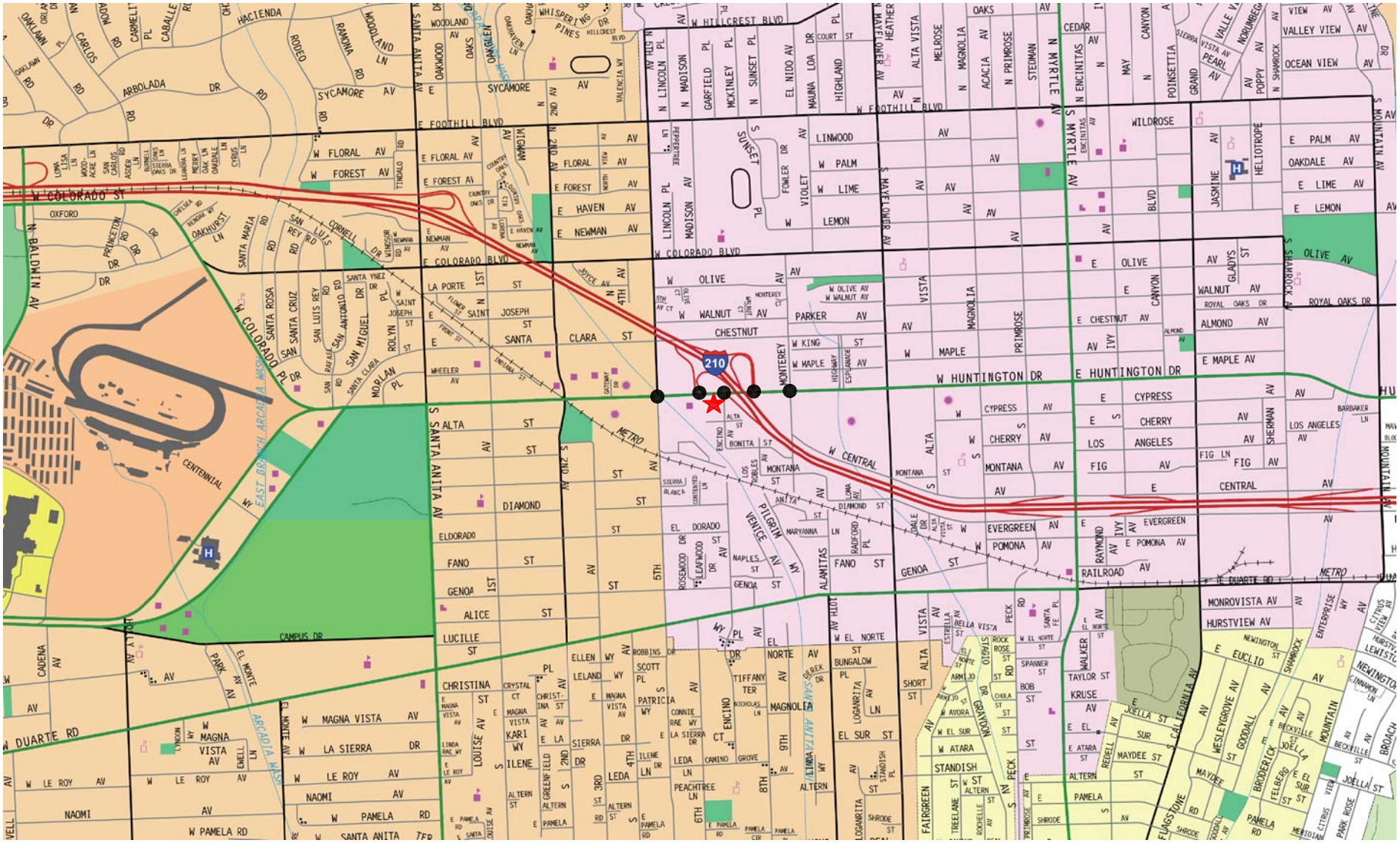
Approved by:

_____ _____

City of Monrovia Date

Attachments

c: File



MAP SOURCE: RAND MCNALLY & COMPANY

NOT TO SCALE

PROJECT SITE

STUDY INTERSECTION

FIGURE 1
VICINITY MAP

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

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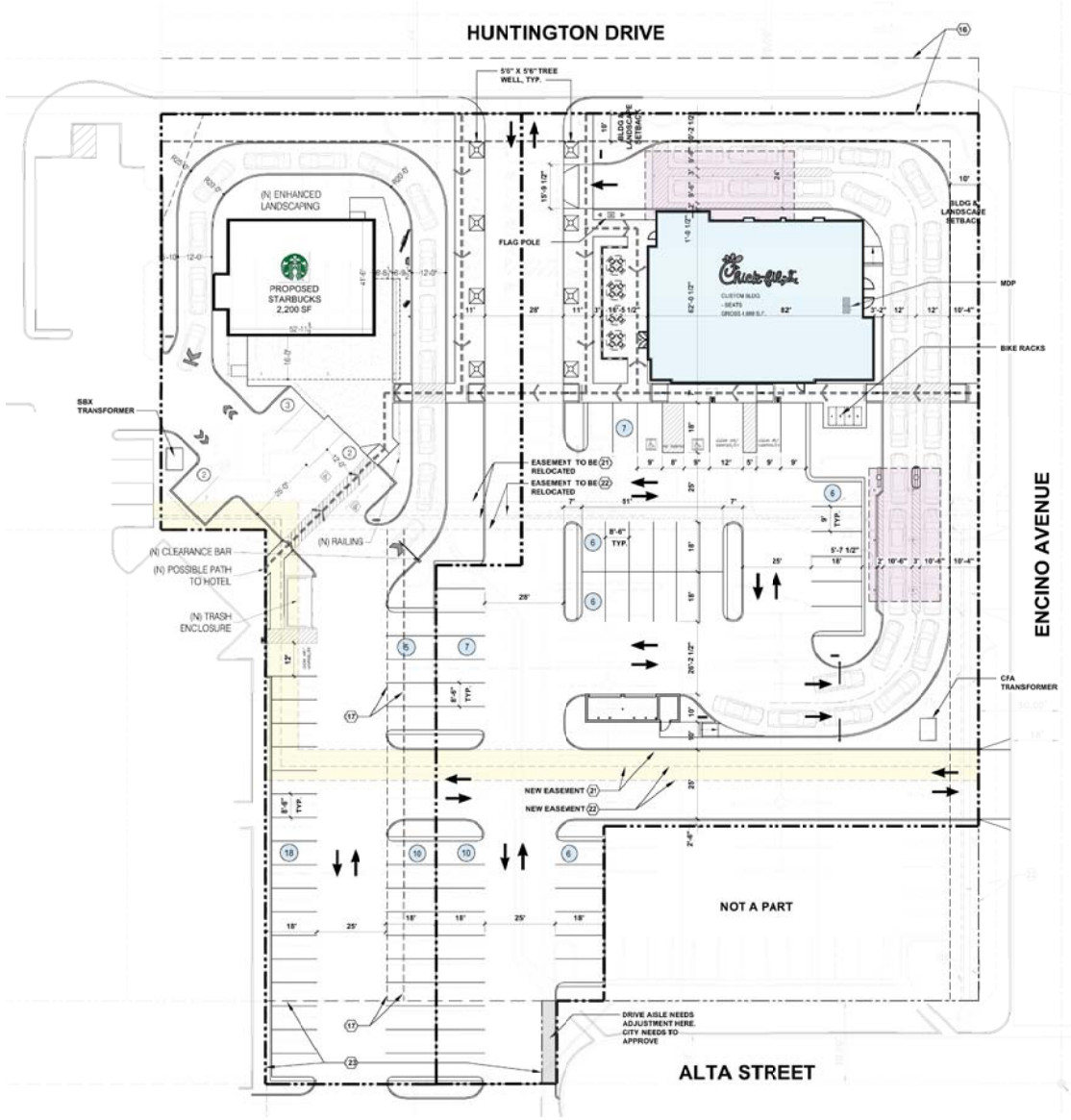

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SOURCE: CRHO ARCHITECTS

FIGURE 2
SITE PLAN

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

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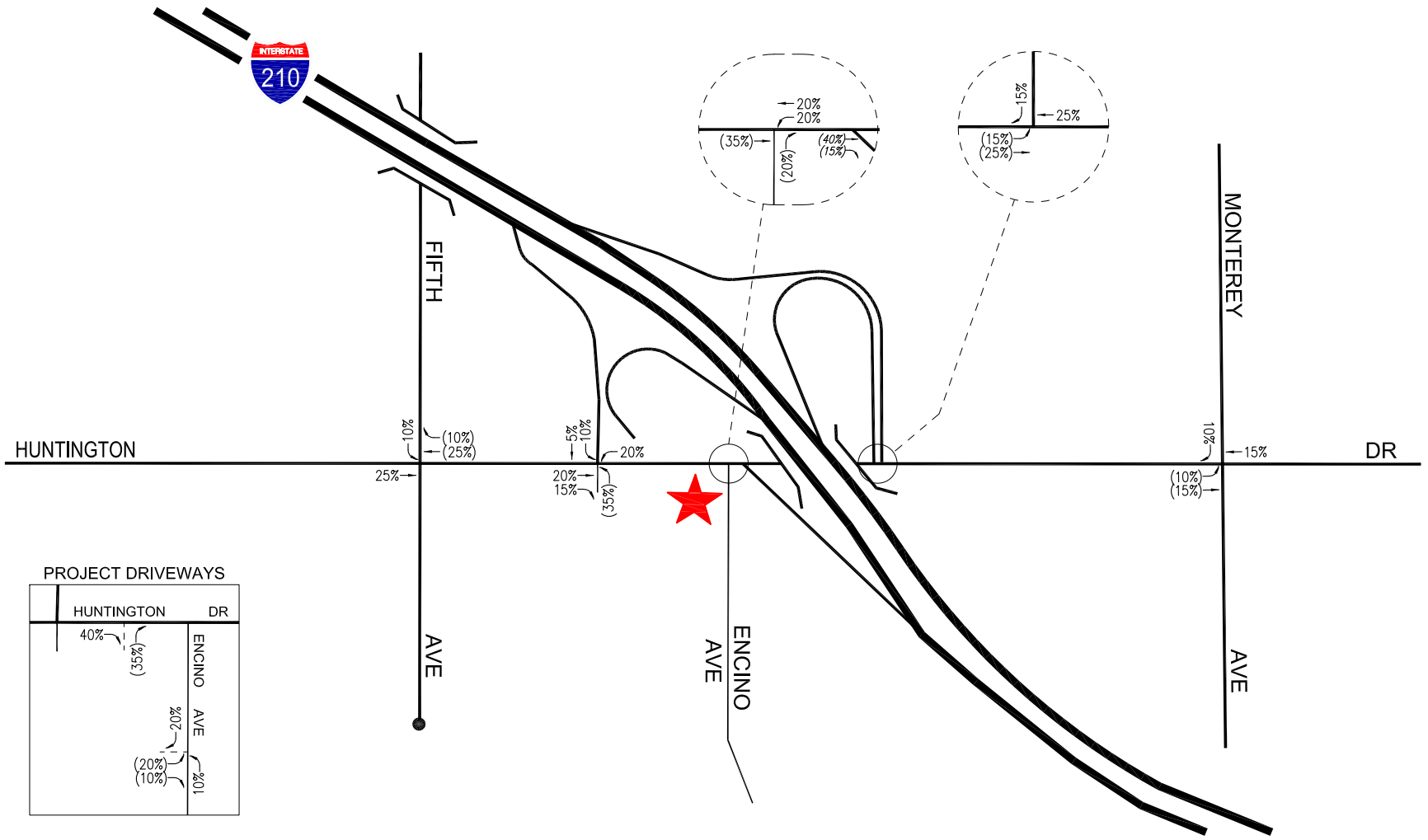

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NOT TO SCALE

PROJECT SITE

XX = INBOUND PERCENTAGES

(XX) = OUTBOUND PERCENTAGES

FIGURE 3
PROJECT TRIP DISTRIBUTION

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

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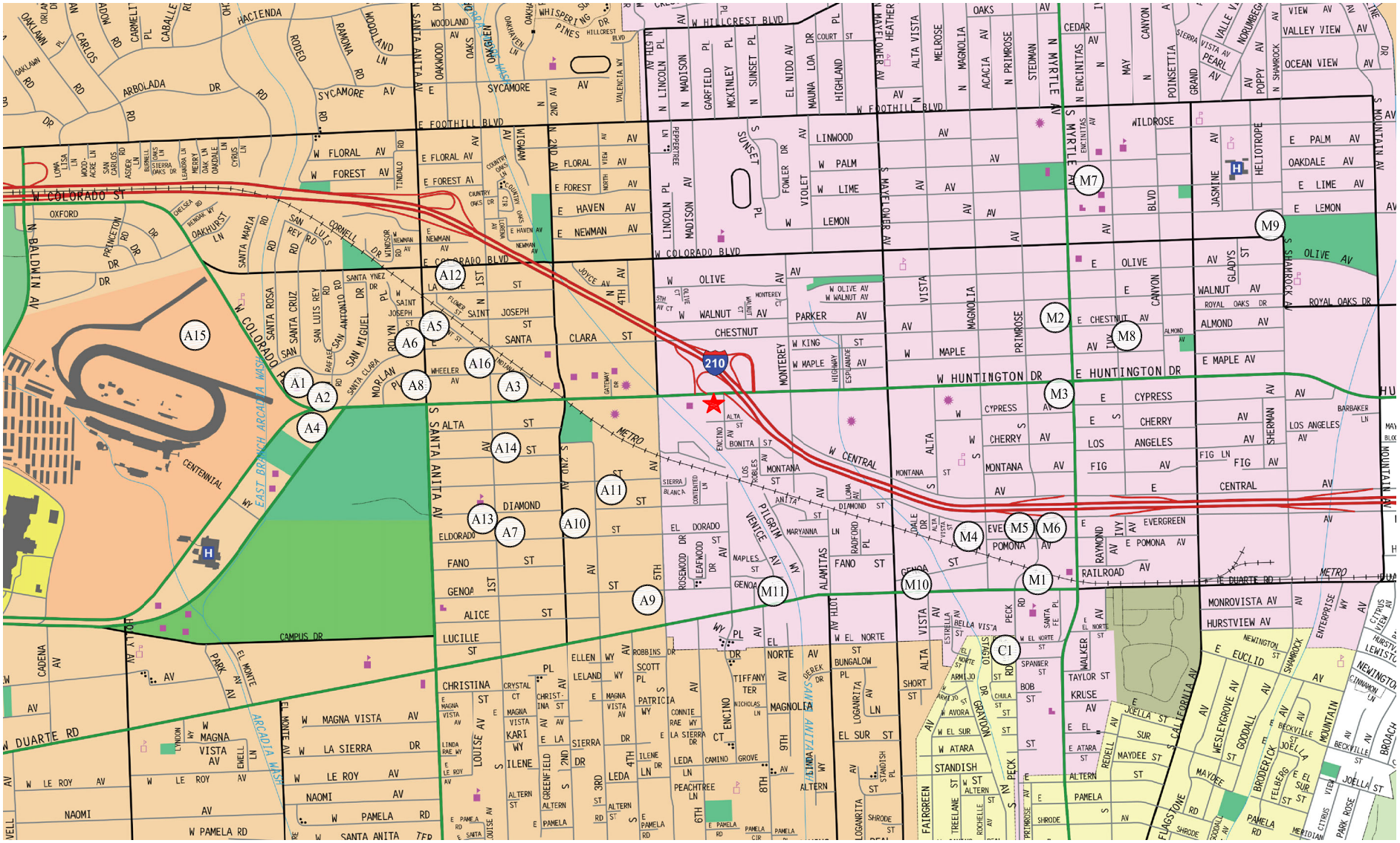

MAP SOURCE: RAND MCNALLY & COMPANY

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NOT TO SCALE

★ PROJECT SITE

(M1) CITY OF MONROVIA RELATED PROJECT

(A1) CITY OF ARCADIA RELATED PROJECT

(C1) COUNTY OF LOS ANGELES RELATED PROJECT

FIGURE 4
LOCATION OF RELATED PROJECTS

LINSCOTT, LAW & GREENSPAN, engineers

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

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Table 1
PROJECT TRIP GENERATION FORECAST

TRIP GENERATION RATES [1]									
	ITE			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
ITE LAND USE CATEGORY	LAND USE CODE	VARIABLE	WEEKDAY DAILY	IN (%)	OUT (%)	TOTAL	IN (%)	OUT (%)	TOTAL
Chick-fil-A Restaurants	[2]	Per 1,000 SF	488.63	53%	47%	32.89	49%	51%	64.83
High-Turnover (Sit-Down) Restaurant	932	Per 1,000 SF	112.18	55%	45%	9.94	62%	38%	9.77
Donut/Coffee Shop with Drive-Through Window	937	Per 1,000 SF	820.38	51%	49%	88.99	50%	50%	43.38

PROJECT TRIP GENERATION FORECAST									
	ITE		DAILY TRIP ENDS [3]	AM PEAK HOUR VOLUMES [3]			PM PEAK HOUR VOLUMES [3]		
LAND USE	LAND USE CODE	SIZE	VOLUMES	IN	OUT	TOTAL	IN	OUT	TOTAL
Proposed Project									
Chick-fil-A Restaurant	[2]	4,689 GSF	2,291	82	72	154	149	155	304
- Less Pass-by (50%) [4],[5]			(1,146)	(41)	(36)	(77)	(75)	(78)	(153)
Starbucks Restaurant	937	2,200 GSF	1,805	100	96	196	48	47	95
- Less Pass-by (50%) [4],[5]			(903)	(50)	(48)	(98)	(24)	(24)	(48)
Subtotal Proposed Project			***2,047***	***91***	***84***	***175***	***98***	***100***	***198***
Existing Uses									
Claim Jumper Restaurant	932	(10,887) GSF	(1,221)	(59)	(49)	(108)	(66)	(40)	(106)
- Less Pass-by (45%) [4],[6]			549	0	0	0	30	18	48
Subtotal Existing Uses			***(672)***	***(59)***	***(49)***	***(108)***	***(36)***	***(22)***	***(58)***
NET NEW PROJECT TRIPS			***1,375***	***32***	***35***	***67***	***62***	***78***	***140***

[1] Source: ITE "Trip Generation Manual", 10th Edition, 2017.

[2] Trip generation rates based on rates derived from site specific surveys conducted at existing Chick-fil-A restaurants located in the Cities of Rancho Cucamonga, Upland, and Pasadena, California. Trip generation rate represents the aggregate two-day average trip rates at the existing Chick-fil-A locations. Refer to Table 2 for derivation of the trip rates.

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

[4] Sources: ITE "Trip Generation Manual", 10th Edition, 2017 and ITE "Trip Generation Handbook", 3rd Edition, 2014. Pass-by trips are made as intermediate stops on the way from an origin to a primary destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the site.

[5] A pass-by adjustment of 50% has been applied to both the AM and PM peak hour trip generation forecasts, based on information provided for ITE Land Use 934 (Fast-Food Restaurant with Drive-Through Window). It is noted that the limited pass-by data provided for ITE Land Use 937 (Donut-Coffee Shop with Drive-Through) indicates a pass-by rate of up to 80% may occur for this land use; however, in order to provide a conservative forecast, a 50% pass-by adjustment was applied to the proposed Starbucks restaurant as well.

[6] A pass-by adjustment of 45% has been applied to the PM peak hour trip generation forecasts, based on information provided for ITE Land Use 932 (High-Turnover [Sit-Down] Restaurant).

Table 2
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
Aggregate of Rancho Cucamonga, Upland, and Pasadena Survey Locations

LOCATION OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [6]	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [6]			PM PEAK HOUR TRIP RATES [6]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Rancho Cucamonga Two-Day Average [2]	4,856 GSF	2,200	76.5	75.5	152	143	145	288	453.048	15.754	15.548	31.302	29.448	29.860	59.308
Distribution Split		50% In/50% Out	50%	50%	100%	50%	50%	100%	50% In/50% Out	50%	50%	100%	50%	50%	100%
Upland Two-Day Average [3]	4,625 GSF	2,263	82	74	156	147	149.5	296.5	489.189	17.730	16.000	33.730	31.784	32.324	64.108
Distribution Split		50% In/50% Out	53%	47%	100%	50%	50%	100%	50% In/50% Out	53%	47%	100%	50%	50%	100%
Pasadena Two-Day Average [4]	4,595 GSF	2,415	86	69	155	158.5	169.5	328	525.571	18.716	15.016	33.732	34.494	36.888	71.382
Distribution Split		50% In/50% Out	55%	45%	100%	48%	52%	100%	50% In/50% Out	55%	45%	100%	48%	52%	100%
Aggregate of All Survey Sites [5]	14,076 GSF	6,878	244.5	218.5	463	448.5	464	912.5	488.633	17.370	15.523	32.893	31.863	32.964	64.827
Distribution Split		50% In/50% Out	53%	47%	100%	49%	51%	100%	50% In/50% Out	53%	47%	100%	49%	51%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	14,076 GSF	6,629	289	277	566	239	221	460	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Aggregate Rate versus ITE		+249	-45	-59	-103	+210	+243	+453	+17.683	-3.127	-4.170	-7.297	+14.875	+17.282	+32.157
Percent Difference		+3.8%			-18.2%			+98.4%	+3.8%			-18.2%			+98.4%

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

[2] The two-day average at the 12190 Foothill Boulevard, Rancho Cucamonga, California 91739 survey location was determined by averaging the peak hour trips identified on August 22, 2018 and August 23, 2018, respectively, for the AM and PM peak hours. Refer to Table 2A.

[3] The two-day average at the 1949 N. Campus Avenue, Upland, California 91784 survey location was determined by averaging the peak hour trips identified on September 5, 2018 and September 6, 2018, respectively, for the AM and PM peak hours. Refer to Table 2B.

[4] The two-day average at the 1700 E. Colorado Boulevard, Pasadena, California 91106 survey location was determined by averaging the peak hour trips identified on September 24, 2019 and September 25, 2019, respectively, for the AM and PM peak hours. Refer to Table 2C.

[5] The aggregate trips were determined by summing the two-day average peak hour trips identified at the Rancho Cucamonga, Upland, and Pasadena survey locations for the AM and PM peak hours, respectively.

[6] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.

[7] Trip rates per 1,000 gross square feet.

[8] ITE *Trip Generation Manual,* 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Table 2A
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
12190 Foothill Boulevard, Rancho Cucamonga, CA 91739

DATE OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES [6]			PM PEAK HOUR VOLUMES [6]			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Wednesday, August 22, 2018 [2]	4,856 GSF	2,210	81	81	162	153	127	280	455.107	16.680	16.680	33.360	31.507	26.153	57.660
Distribution Split		50% In/50% Out	50%	50%	100%	55%	45%	100%	50% In/50% Out	50%	50%	100%	55%	45%	100%
Thursday, August 23, 2018 [3]	4,856 GSF	2,190	72	70	142	133	163	296	450.988	14.827	14.415	29.242	27.389	33.567	60.956
Distribution Split		50% In/50% Out	51%	49%	100%	45%	55%	100%	50% In/50% Out	51%	49%	100%	45%	55%	100%
Two-Day Average [4]	4,856 GSF	2,200	76.5	75.5	152	143	145	288	453.048	15.754	15.548	31.302	29.448	29.860	59.308
Distribution Split		50% In/50% Out	50%	50%	100%	50%	50%	100%	50% In/50% Out	50%	50%	100%	50%	50%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	4,856 GSF	2,287	99	96	195	83	76	159	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Two-Day Average Rate versus ITE		-87	-23	-21	-43	+60	+69	+129	-17.902	-4.743	-4.145	-8.888	+12.460	+14.178	+26.638
Percent Difference		-3.8%			-22.1%			+81.1%	-3.8%			-22.1%			+81.5%

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

[2] Based on actual site observations, on Wednesday, August 22, 2018, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.

[3] Based on actual site observations, on Thursday, August 23, 2018, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 4:15 PM to 5:15 PM.

[4] The two-day average was determined by averaging the peak hour trips identified on August 22, 2018 and August 23, 2018, respectively, for the AM and PM peak hours.

[5] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.

[6] Actual site observations were conducted during the morning and evening peak hours at the existing Rancho Cucamonga site. The volumes shown represent the peak hourly trips (i.e., the peak sum of inbound and outbound trips).

[7] Trip rates per 1,000 gross square feet. Based on information provided by the project Applicant, the existing Rancho Cucamonga site is 4,856 square feet.

[8] ITE *Trip Generation Manual*, 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Table 2B
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
1949 N. Campus Avenue, Upland, CA 91784

DATE OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES [6]			PM PEAK HOUR VOLUMES [6]			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Wednesday, September 5, 2018 [2]	4,625 GSF	2,185	82	73	155	143	139	282	472.432	17.730	15.784	33.514	30.919	30.054	60.973
Distribution Split		50% In/50% Out	53%	47%	100%	51%	49%	100%	50% In/50% Out	53%	47%	100%	51%	49%	100%
Thursday, September 6, 2018 [3]	4,625 GSF	2,340	82	75	157	151	160	311	505.946	17.730	16.216	33.946	32.649	34.595	67.244
Distribution Split		50% In/50% Out	52%	48%	100%	49%	51%	100%	50% In/50% Out	52%	48%	100%	49%	51%	100%
Two-Day Average [4]	4,625 GSF	2,263	82	74	156	147	149.5	296.5	489.189	17.730	16.000	33.730	31.784	32.324	64.108
Distribution Split		50% In/50% Out	53%	47%	100%	50%	50%	100%	50% In/50% Out	53%	47%	100%	50%	50%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	4,625 GSF	2,178	95	91	186	79	72	151	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Two-Day Average Rate versus ITE		+85	-13	-17	-30	+68	+78	+146	+18.239	-2.767	-3.693	-6.460	+14.796	+16.642	+31.438
Percent Difference		+3.9%			-16.1%			+96.4%	+3.9%			-16.1%			+96.2%

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

[2] Based on actual site observations, on Wednesday, September 5, 2018, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.

[3] Based on actual site observations, on Thursday, September 6, 2018, the AM peak hour occurred from 7:15 AM to 8:15 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.

[4] The two-day average was determined by averaging the peak hour trips identified on September 5, 2018 and September 6, 2018, respectively, for the AM and PM peak hours.

[5] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.

[6] Actual site observations were conducted during the morning and evening peak hours at the existing Upland site. The volumes shown represent the peak hourly trips (i.e., the peak sum of inbound and outbound trips).

[7] Trip rates per 1,000 gross square feet. Based on information provided by the project Applicant, the existing Upland site is 4,625 square feet.

[8] ITE *Trip Generation Manual*, 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Table 2C
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
1700 E. Colorado Boulevard, Pasadena, CA 91106

DATE OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES [6]			PM PEAK HOUR VOLUMES [6]			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Tuesday, September 24, 2019 [2]	4,595 GSF	2,470	80	70	150	165	179	344	537.541	17.410	15.234	32.644	35.909	38.955	74.864
Distribution Split		50% In/50% Out	53%	47%	100%	48%	52%	100%	50% In/50% Out	53%	47%	100%	48%	52%	100%
Wednesday, September 25, 2019 [3]	4,595 GSF	2,360	92	68	160	152	160	312	513.602	20.022	14.799	34.821	33.079	34.820	67.899
Distribution Split		50% In/50% Out	58%	43%	100%	49%	51%	100%	50% In/50% Out	57%	43%	100%	49%	51%	100%
Two-Day Average [4]	4,595 GSF	2,415	86	69	155	158.5	169.5	328	525.571	18.716	15.016	33.732	34.494	36.888	71.382
Distribution Split		50% In/50% Out	55%	45%	100%	48%	52%	100%	50% In/50% Out	55%	45%	100%	48%	52%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	4,595 GSF	2,164	94	91	185	78	72	150	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Two-Day Average Rate versus ITE		+251	-8	-22	-30	+81	+98	+178	+54.621	-1.781	-4.677	-6.458	+17.506	+21.206	+38.712
Percent Difference		+11.6%			-16.2%			+118.7%	+11.6%			-16.1%			+118.5%

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

[2] Based on actual site observations, on Tuesday, September 24, 2019, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.

[3] Based on actual site observations, on Wednesday, September 25, 2019, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 4:00 PM to 5:00 PM.

[4] The two-day average was determined by averaging the peak hour trips identified on September 24, 2019 and September 25, 2019, respectively, for the AM and PM peak hours.

[5] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.

[6] Actual site observations were conducted during the morning and evening peak hours at the existing Pasadena site. The volumes shown represent the peak hourly trips (i.e., the peak sum of inbound and outbound trips).

[7] Trip rates per 1,000 gross square feet. Based on information provided by the project Applicant, the existing Pasadena site is 4,595 square feet.

[8] ITE *Trip Generation Manual,* 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Table 3
RELATED PROJECTS LIST AND TRIP GENERATION [1]

MAP NO.	PROJECT STATUS	PROJECT NAME/NUMBER ADDRESS/LOCATION	LAND USE DATA		PROJECT DATA SOURCE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			LAND-USE	SIZE			IN	OUT	TOTAL	IN	OUT	TOTAL
City of Monrovia												
M1	Approved	Station Square South Specific Plan 205-225 W. Duarte Road & 1725 Peck Road	Multi-family Residential	296 DU	[3]	925	(10)	80	70	66	7	73
M2	Under Construction	Avalon Monrovia 825 S. Myrtle Avenue	Multi-family Residential Retail	154 DU 3,900 GLSF	[4]	721	(11)	38	27	44	8	52
M3	Approved	TownePlace Suites by Marriott 102-140 W. Huntington Drive	Hotel	109 Rooms	[5]	891	34	24	58	34	31	65
M4	Approved	Alexan Foothills 1625 S. Magnolia Avenue	Apartment Live/Work Unit	432 DU 4 DU	[6]	1,938	12	131	143	132	62	194
M5	Approved	Arroyo at Monrovia Station 202-238 W. Evergreen Avenue, 1551 S. Primrose Avenue & 1610 S. Magnolia Avenue	Apartment Retail	302 DU 7,080 GLSF	[7]	1,107	(5)	55	50	60	20	80
M6	Approved	127 Pomona Mixed-Use 123-145 W. Pomona Avenue & 1528-1532 S. Primrose Avenue	Apartment Retail	310 DU 10,000 GLSF	[8]	1,390	11	62	73	71	40	111
M7	Approved	Lime Avenue Self Storage & Commercial Facility 115-127 E. Lime Avenue	Self-Storage Small Office Less Existing Office	86,730 GSF 5,520 GSF (92,250) GSF	[9]	131 89 (1,038)	5 9 (153)	4 2 (19)	9 11 (172)	7 4 (25)	8 10 (145)	15 14 (170)
M8	Approved	910 S. Ivy Avenue	Townhome	6 DU	[10]	44	1	2	3	2	1	3
M9	Approved	525 S. Shamrock Avenue	Museum Less Existing Restaurant	5,036 GSF (5,036) GSF	[11] [12]	10 (565)	1 (28)	0 (22)	1 (50)	0 (30)	1 (19)	1 (49)
M10	Approved	425 W. Duarte Road	Townhome	6 DU	[10]	44	1	2	3	2	1	3
M11	Approved	717-721 W. Duarte Road	Townhome	12 DU	[10]	88	1	5	6	4	3	7
City of Arcadia												
A1	Approved	Hotel Indigo 125 W. Huntington Drive & 161 Colorado Place	Hotel Restaurant Coffee Shop	165 Rooms 4,146 GSF 1,568 GSF	[13]	2,442	73	105	178	104	43	147
A2	Existing	125 W. Huntington Drive	Office	67,123 GSF	[13],[14]	654	67	11	78	12	65	77
A3	Approved	Huntington Plaza Mixed-Use 117-129 E. Huntington Drive & 124-134 E. Wheeler Avenue	Apartment Retail	139 DU 11,150 GLSF	[15]	856	2	33	35	42	23	65

Table 3 (Continued)
RELATED PROJECTS LIST AND TRIP GENERATION [1]

MAP NO.	PROJECT STATUS	PROJECT NAME/NUMBER ADDRESS/LOCATION	LAND USE DATA		PROJECT DATA SOURCE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			LAND-USE	SIZE			IN	OUT	TOTAL	IN	OUT	TOTAL
A4	Approved	Seabiscuit Pacific Specific Plan 130 W. Huntington Drive	Hotel Condominium Retail	227 Rooms 96 DU 3,196 GLSF	[16]	2,774	65	64	129	114	109	223
A5	Under Construction	288 N. Santa Anita Avenue	Medical Office Retail	23,300 GSF 7,050 GLSF	[17] [18]	811 266	51 4	14 3	65 7	23 13	58 14	81 27
A6	Proposed	205 N. Santa Anita Avenue	Residential Commercial	25 DU 1,800 GLSF	[10] [18]	183 68	3 1	9 1	12 2	9 3	5 4	14 7
A7	Proposed	420 S. First Avenue	Residential Commercial	10 DU 1,200 GLSF	[10] [18]	73 45	1 1	4 0	5 1	4 2	2 3	6 5
A8	Proposed	25 N. Santa Anita Avenue	Residential Commercial	160 DU 18,000 GLSF	[10] [18]	1,171 680	17 11	57 6	74 17	57 33	33 36	90 69
A9	Approved	416-428 Genoa Street	Condominium	8 DU	[10]	59	1	3	4	3	1	4
A10	Approved	414 Second Street	Condominium	6 DU	[10]	44	1	2	3	2	1	3
A11	Under Construction	314 California Street	Condominium	5 DU	[10]	37	0	2	2	2	1	3
A12	Completed	22-26 E. Colorado Avenue	Condominium	8 DU	[10]	59	1	3	4	3	1	4
A13	Proposed	405 S. First Avenue	Condominium Commercial	4 DU 585 GLSF	[10] [18]	29 22	0 1	2 0	2 1	1 1	1 1	2 2
A14	Under Construction	130 S. First Avenue	Office	5,600 GSF	[19]	55	5	1	6	1	5	6
A15	Proposed	Santa Anita Park North Barn Project 285 W. Huntington Drive	Barn/Stables Expansion Dormitories Canteen	816 Stalls 104 Units 3,391 GSF	[20]	1,729	64	22	86	41	119	160
A16	Completed	57 Wheeler Avenue	Apartment Retail Office	38 DU 10,730 GLSF 7,120 GSF	[21]	618	15	19	34	30	29	59
Los Angeles County												
C1	Approved	1901-1909 Peck Road	Condominium	10 DU	[10]	73	1	4	5	4	2	6
TOTAL						18,523	253	729	982	875	584	1,459

Table 3 (Continued)
RELATED PROJECTS LIST AND TRIP GENERATION [1]

[1] Source: City of Monrovia Planning Department and City of Arcadia Planning Department. Unless otherwise noted, the traffic volumes were forecast by applying trip rates as provided in the ITE *Trip Generation Manual*, 10th Edition, 201
[2] Trips are one-way traffic movements, entering or leaving.
[3] Source: "Draft Station Square South Specific Plan Initial Study/Mitigated Negative Declaration," prepared by MIG, Inc., April 2018.
[4] Source: "Avalon Monrovia Traffic Impact Analysis", prepared by LSA, March 2018.
[5] Source: "Monrovia Hotel Project Traffic Impact Analysis", prepared by LSA, May 2018.
[6] Source: "1625 Magnolia Avenue Traffic Impact Analysis", prepared by LSA, May 2018.
[7] Source: "The Arroyo at Monrovia Station Project Transportation Impact Study", prepared by Linscott, Law & Greenspan, Engineers, March 2019.
[8] Source: "123 W. Pomona Project Transportation Impact Study", prepared by Linscott, Law & Greenspan, Engineers, March 2019.
[9] Source: "Monrovia Self-Storage Trip Generation Study", prepared by Fehr & Peers, August 2019. Inbound and outbound splits are based on the distributions provided in the *Trip Generation Manual* for the cited ITE land uses.
[10] ITE Land Use Code 220 (Multifamily Housing [Low-Rise]) trip generation average rates.
[11] ITE Land Use 580 (Museum) trip generation average rates. The peak hour trip generation is assumed to represent 10% of the daily trips.
[12] ITE Land Use 932 (High-Turnover [Sit-Down] Restaurant) trip generation average rates.
[13] Source: "125 W. Huntington Drive, Buildings C & D Transportation Impact Analysis", prepared by Linscott, Law & Greenspan, Engineers, December 2019.
[14] Accounts for the re-occupancy of the former office building located at 125 W. Huntington Drive. Refer to the report cited in footnote [13] for additional details.
[15] Source: "Huntington Plaza Traffic Impact Study", prepared by Psomas, September 2019.
[16] Source: "Traffic Impact Study for Santa Anita Inn Redevelopment Project", prepared by Kimley Horn, dated April 2018. Based on information provided by City staff, the proposed project has since been updated to consist of a 233-room hotel, 96-unit condominium, and 10,600 square feet of retail space.
[17] ITE Land Use Code 720 (Medical/Dental Office Building) trip generation average rates.
[18] ITE Land Use Code 820 (Shopping Center) trip generation average rates.
[19] ITE Land Use Code 710 (General Office Building) trip generation average rates.
[20] Source: "Draft Santa Anita Park North Barn Transportation Impact Analysis", prepared by Fehr & Peers, February 2019.
[21] Source: "Wheeler Mixed-Use Project Traffic Impact Study", prepared by Linscott, Law & Greenspan, Engineers, May 2015.

APPENDIX B

CHICK-FIL-A TRIP GENERATION DATA

Appendix Table B-1
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
Aggregate of Rancho Cucamonga, Upland, and Pasadena Survey Locations

LOCATION OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [6]	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Rancho Cucamonga Two-Day Average [2]	4,856 GSF	2,200	76.5	75.5	152	143	145	288	453.048	15.754	15.548	31.302	29.448	29.860	59.308
Distribution Split		50% In/50% Out	50%	50%	100%	50%	50%	100%	50% In/50% Out	50%	50%	100%	50%	50%	100%
Upland Two-Day Average [3]	4,625 GSF	2,263	82	74	156	147	149.5	296.5	489.189	17.730	16.000	33.730	31.784	32.324	64.108
Distribution Split		50% In/50% Out	53%	47%	100%	50%	50%	100%	50% In/50% Out	53%	47%	100%	50%	50%	100%
Pasadena Two-Day Average [4]	4,595 GSF	2,415	86	69	155	158.5	169.5	328	525.571	18.716	15.016	33.732	34.494	36.888	71.382
Distribution Split		50% In/50% Out	55%	45%	100%	48%	52%	100%	50% In/50% Out	55%	45%	100%	48%	52%	100%
Aggregate of All Survey Sites [5]	14,076 GSF	6,878	244.5	218.5	463	448.5	464	912.5	488.633	17.370	15.523	32.893	31.863	32.964	64.827
Distribution Split		50% In/50% Out	53%	47%	100%	49%	51%	100%	50% In/50% Out	53%	47%	100%	49%	51%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	14,076 GSF	6,629	289	277	566	239	221	460	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Aggregate Rate versus ITE		+249	-45	-59	-103	+210	+243	+453	+17.683	-3.127	-4.170	-7.297	+14.875	+17.282	+32.157
Percent Difference		+3.8%			-18.2%			+98.4%	+3.8%			-18.2%			+98.4%

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

[2] The two-day average at the 12190 Foothill Boulevard, Rancho Cucamonga, California 91739 survey location was determined by averaging the peak hour trips identified on August 22, 2018 and August 23, 2018, respectively, for the AM and PM peak hours. Refer to Appendix Table B-2.

[3] The two-day average at the 1949 N. Campus Avenue, Upland, California 91784 survey location was determined by averaging the peak hour trips identified on September 5, 2018 and September 6, 2018, respectively, for the AM and PM peak hours. Refer to Appendix Table B-3.

[4] The two-day average at the 1700 E. Colorado Boulevard, Pasadena, California 91106 survey location was determined by averaging the peak hour trips identified on September 24, 2019 and September 25, 2019, respectively, for the AM and PM peak hours. Refer to Appendix Table B-4.

[5] The aggregate trips were determined by summing the two-day average peak hour trips identified at the Rancho Cucamonga, Upland, and Pasadena survey locations for the AM and PM peak hours, respectively.

[6] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.

[7] Trip rates per 1,000 gross square feet.

[8] ITE *Trip Generation Manual,* 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Appendix Table B-2
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
12190 Foothill Boulevard, Rancho Cucamonga, CA 91739

DATE OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES [6] IN	AM PEAK HOUR VOLUMES [6] OUT	AM PEAK HOUR VOLUMES [6] TOTAL	PM PEAK HOUR VOLUMES [6] IN	PM PEAK HOUR VOLUMES [6] OUT	PM PEAK HOUR VOLUMES [6] TOTAL	DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7] IN	AM PEAK HOUR TRIP RATES [7] OUT	AM PEAK HOUR TRIP RATES [7] TOTAL	PM PEAK HOUR TRIP RATES [7] IN	PM PEAK HOUR TRIP RATES [7] OUT	PM PEAK HOUR TRIP RATES [7] TOTAL
Wednesday, August 22, 2018 [2]	4,856 GSF	2,210	81	81	162	153	127	280	455.107	16.680	16.680	33.360	31.507	26.153	57.660
Distribution Split		50% In/50% Out	50%	50%	100%	55%	45%	100%	50% In/50% Out	50%	50%	100%	55%	45%	100%
Thursday, August 23, 2018 [3]	4,856 GSF	2,190	72	70	142	133	163	296	450.988	14.827	14.415	29.242	27.389	33.567	60.956
Distribution Split		50% In/50% Out	51%	49%	100%	45%	55%	100%	50% In/50% Out	51%	49%	100%	45%	55%	100%
Two-Day Average [4]	4,856 GSF	2,200	76.5	75.5	152	143	145	288	453.048	15.754	15.548	31.302	29.448	29.860	59.308
Distribution Split		50% In/50% Out	50%	50%	100%	50%	50%	100%	50% In/50% Out	50%	50%	100%	50%	50%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES IN	AM PEAK HOUR VOLUMES OUT	AM PEAK HOUR VOLUMES TOTAL	PM PEAK HOUR VOLUMES IN	PM PEAK HOUR VOLUMES OUT	PM PEAK HOUR VOLUMES TOTAL	DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7] IN	AM PEAK HOUR TRIP RATES [7] OUT	AM PEAK HOUR TRIP RATES [7] TOTAL	PM PEAK HOUR TRIP RATES [7] IN	PM PEAK HOUR TRIP RATES [7] OUT	PM PEAK HOUR TRIP RATES [7] TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	4,856 GSF	2,287	99	96	195	83	76	159	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Two-Day Average Rate versus ITE		-87	-23	-21	-43	+60	+69	+129	-17.902	-4.743	-4.145	-8.888	+12.460	+14.178	+26.638
Percent Difference		-3.8%			-22.1%			+81.1%	-3.8%			-22.1%			+81.5%

[1] Trips are one-way traffic movements, entering or leaving.
[2] Based on actual site observations, on Wednesday, August 22, 2018, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.
[3] Based on actual site observations, on Thursday, August 23, 2018, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 4:15 PM to 5:15 PM.
[4] The two-day average was determined by averaging the peak hour trips identified on August 22, 2018 and August 23, 2018, respectively, for the AM and PM peak hours.
[5] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.
[6] Actual site observations were conducted during the morning and evening peak hours at the existing Rancho Cucamonga site. The volumes shown represent the peak hourly trips (i.e., the peak sum of inbound and outbound trips).
[7] Trip rates per 1,000 gross square feet. Based on information provided by the project Applicant, the existing Rancho Cucamonga site is 4,856 square feet.
[8] ITE *Trip Generation Manual*, 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Appendix Table B-3
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
1949 N. Campus Avenue, Upland, CA 91784

DATE OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES [6]			PM PEAK HOUR VOLUMES [6]			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Wednesday, September 5, 2018 [2]	4,625 GSF	2,185	82	73	155	143	139	282	472.432	17.730	15.784	33.514	30.919	30.054	60.973
Distribution Split		50% In/50% Out	53%	47%	100%	51%	49%	100%	50% In/50% Out	53%	47%	100%	51%	49%	100%
Thursday, September 6, 2018 [3]	4,625 GSF	2,340	82	75	157	151	160	311	505.946	17.730	16.216	33.946	32.649	34.595	67.244
Distribution Split		50% In/50% Out	52%	48%	100%	49%	51%	100%	50% In/50% Out	52%	48%	100%	49%	51%	100%
Two-Day Average [4]	4,625 GSF	2,263	82	74	156	147	149.5	296.5	489.189	17.730	16.000	33.730	31.784	32.324	64.108
Distribution Split		50% In/50% Out	53%	47%	100%	50%	50%	100%	50% In/50% Out	53%	47%	100%	50%	50%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES			PM PEAK HOUR VOLUMES			DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7]			PM PEAK HOUR TRIP RATES [7]		
			IN	OUT	TOTAL	IN	OUT	TOTAL		IN	OUT	TOTAL	IN	OUT	TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	4,625 GSF	2,178	95	91	186	79	72	151	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Two-Day Average Rate versus ITE		+85	-13	-17	-30	+68	+78	+146	+18.239	-2.767	-3.693	-6.460	+14.796	+16.642	+31.438
Percent Difference		+3.9%			-16.1%			+96.4%	+3.9%			-16.1%			+96.2%

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

[2] Based on actual site observations, on Wednesday, September 5, 2018, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.

[3] Based on actual site observations, on Thursday, September 6, 2018, the AM peak hour occurred from 7:15 AM to 8:15 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.

[4] The two-day average was determined by averaging the peak hour trips identified on September 5, 2018 and September 6, 2018, respectively, for the AM and PM peak hours.

[5] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.

[6] Actual site observations were conducted during the morning and evening peak hours at the existing Upland site. The volumes shown represent the peak hourly trips (i.e., the peak sum of inbound and outbound trips).

[7] Trip rates per 1,000 gross square feet. Based on information provided by the project Applicant, the existing Upland site is 4,625 square feet.

[8] ITE *Trip Generation Manual*, 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

Appendix Table B-4
CHICK-FIL-A EMPIRICAL TRIP RATES [1]
1700 E. Colorado Boulevard, Pasadena, CA 91106

DATE OF SURVEY	SIZE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES [6] IN	AM PEAK HOUR VOLUMES [6] OUT	AM PEAK HOUR VOLUMES [6] TOTAL	PM PEAK HOUR VOLUMES [6] IN	PM PEAK HOUR VOLUMES [6] OUT	PM PEAK HOUR VOLUMES [6] TOTAL	DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7] IN	AM PEAK HOUR TRIP RATES [7] OUT	AM PEAK HOUR TRIP RATES [7] TOTAL	PM PEAK HOUR TRIP RATES [7] IN	PM PEAK HOUR TRIP RATES [7] OUT	PM PEAK HOUR TRIP RATES [7] TOTAL
Tuesday, September 24, 2019 [2]	4,595 GSF	2,470	80	70	150	165	179	344	537.541	17.410	15.234	32.644	35.909	38.955	74.864
Distribution Split		50% In/50% Out	53%	47%	100%	48%	52%	100%	50% In/50% Out	53%	47%	100%	48%	52%	100%
Wednesday, September 25, 2019 [3]	4,595 GSF	2,360	92	68	160	152	160	312	513.602	20.022	14.799	34.821	33.079	34.820	67.899
Distribution Split		50% In/50% Out	58%	43%	100%	49%	51%	100%	50% In/50% Out	57%	43%	100%	49%	51%	100%
Two-Day Average [4]	4,595 GSF	2,415	86	69	155	158.5	169.5	328	525.571	18.716	15.016	33.732	34.494	36.888	71.382
Distribution Split		50% In/50% Out	55%	45%	100%	48%	52%	100%	50% In/50% Out	55%	45%	100%	48%	52%	100%

Comparison to Published ITE Trip Rates

LAND USE	RATE	DAILY TRIP ENDS VOLUMES [5]	AM PEAK HOUR VOLUMES IN	AM PEAK HOUR VOLUMES OUT	AM PEAK HOUR VOLUMES TOTAL	PM PEAK HOUR VOLUMES IN	PM PEAK HOUR VOLUMES OUT	PM PEAK HOUR VOLUMES TOTAL	DAILY TRIP RATES [7]	AM PEAK HOUR TRIP RATES [7] IN	AM PEAK HOUR TRIP RATES [7] OUT	AM PEAK HOUR TRIP RATES [7] TOTAL	PM PEAK HOUR TRIP RATES [7] IN	PM PEAK HOUR TRIP RATES [7] OUT	PM PEAK HOUR TRIP RATES [7] TOTAL
Fast-Food Restaurant with Drive-Through Window [8]	4,595 GSF	2,164	94	91	185	78	72	150	470.950	20.497	19.693	40.190	16.988	15.682	32.670
Distribution Split									50% In/50% Out	51%	49%	100%	52%	48%	100%
Comparison															
Two-Day Average Rate versus ITE		+251	-8	-22	-30	+81	+98	+178	+54.621	-1.781	-4.677	-6.458	+17.506	+21.206	+38.712
Percent Difference		+11.6%			-16.2%			+118.7%	+11.6%			-16.1%			+118.5%

[1] Trips are one-way traffic movements, entering or leaving.
[2] Based on actual site observations, on Tuesday, September 24, 2019, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 5:00 PM to 6:00 PM.
[3] Based on actual site observations, on Wednesday, September 25, 2019, the AM peak hour occurred from 8:00 AM to 9:00 AM, and the PM peak hour occurred from 4:00 PM to 5:00 PM.
[4] The two-day average was determined by averaging the peak hour trips identified on September 24, 2019 and September 25, 2019, respectively, for the AM and PM peak hours.
[5] Daily trip ends were estimated based on the assumption that the average peak hour trips (i.e., the average of the AM and PM peak hour trips) represent ten percent (10%) of the total daily trip ends.
[6] Actual site observations were conducted during the morning and evening peak hours at the existing Pasadena site. The volumes shown represent the peak hourly trips (i.e., the peak sum of inbound and outbound trips).
[7] Trip rates per 1,000 gross square feet. Based on information provided by the project Applicant, the existing Pasadena site is 4,595 square feet.
[8] ITE *Trip Generation Manual,* 10th Edition, Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) trip generation average rates.

APPENDIX C

CHICK-FIL-A DRIVE-THROUGH SERVICE-LANE QUEUING DATA

December 18, 2017

Ms. Jennifer Daw
Development Manager, Restaurant Development
CHICK-FIL-A, INC.
15635 Alton Parkway, Suite 350
Irvine CA 92618

Report: Queuing Analysis - Proposed West Covina Chick-fil-A (200 Vincent Avenue)

Dear Ms. Daw:

TJW ENGINEERING, INC. (TJW) is pleased to submit this drive-through queue analysis for the proposed Chick-fil-A restaurant at 200 Vincent Avenue in the City of West Covina. This report summarizes the results of drive-through queue observations conducted at four Chick-fil-A locations in Southern California and has been updated to include analysis of three additional days of data collection at each of the four comparative sites.

Appendix A contains the proposed 200 Vincent Avenue Chick-fil-A site plan.

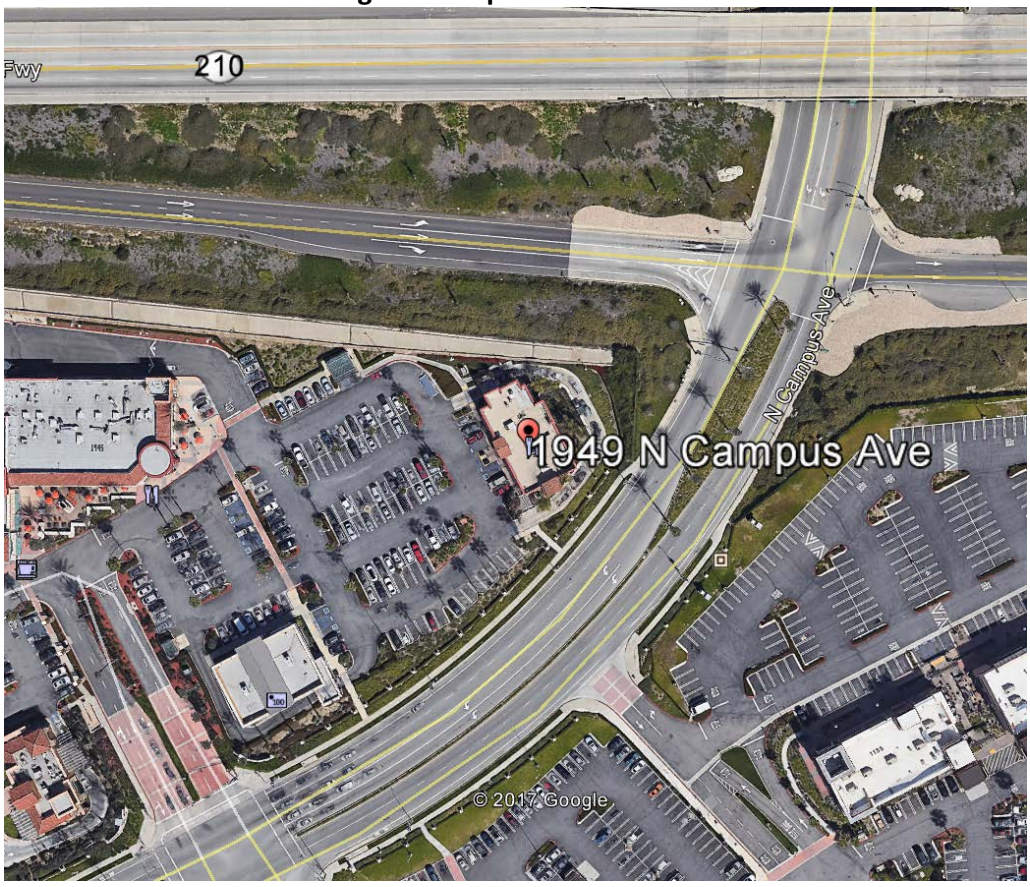
Comparative Sites

Comparable sites for drive-through queue analysis were determined by the City of West Covina. Drive-through queue and operational information was collected at the following four Chick-fil-A sites:

- ***Upland Chick-fil-A*** located at 1949 N Campus Ave, Upland, CA 91784
- ***Corona Chick-fil-A*** located at 3555 Grand Oaks, Corona, CA 92881
- ***Laguna Hills Chick-fil-A*** located at 24011 El Toro Rd, Laguna Hills, CA 92653
- ***Rancho Cucamonga Chick-fil-A*** located at 12190 Foothill Blvd, Rancho Cucamonga, CA 91739

The ***Upland Chick-fil-A*** comparable site is an approximately 4,600 square foot Chick-fil-A with a drive-through window located at 1949 N Campus Ave, Upland, CA 91784.

Figure 1 – Upland Chick-fil-A



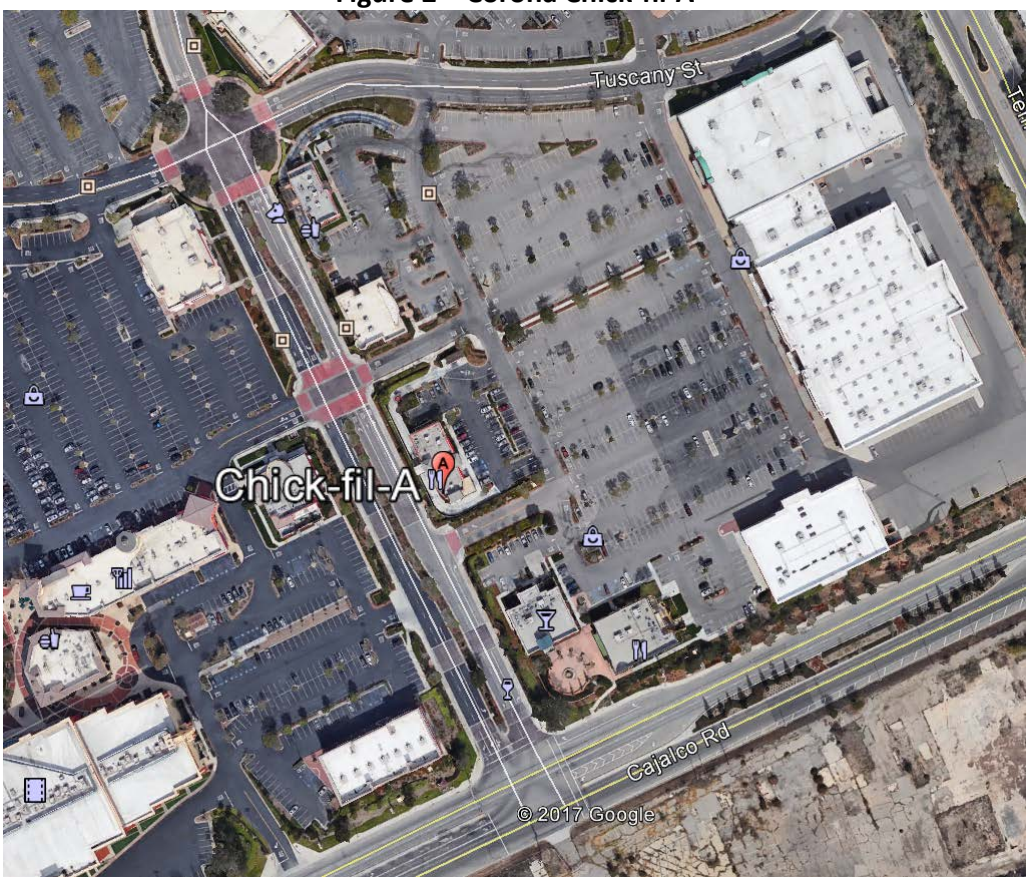
Data was collected at the Upland Chick-fil-A on the following dates:

- Wednesday January 18, 2017
- Saturday January 21, 2017
- Friday November 17, 2017
- Saturday November 18, 2017
- Monday November 20, 2017

Appendix B contains the Upland Chick-fil-A site plan.

The ***Corona Chick-fil-A*** comparable site is an approximately 4,500 square foot Chick-fil-A with a drive-through window located at 3555 Grand Oaks, Corona CA 92881.

Figure 2 – Corona Chick-fil-A



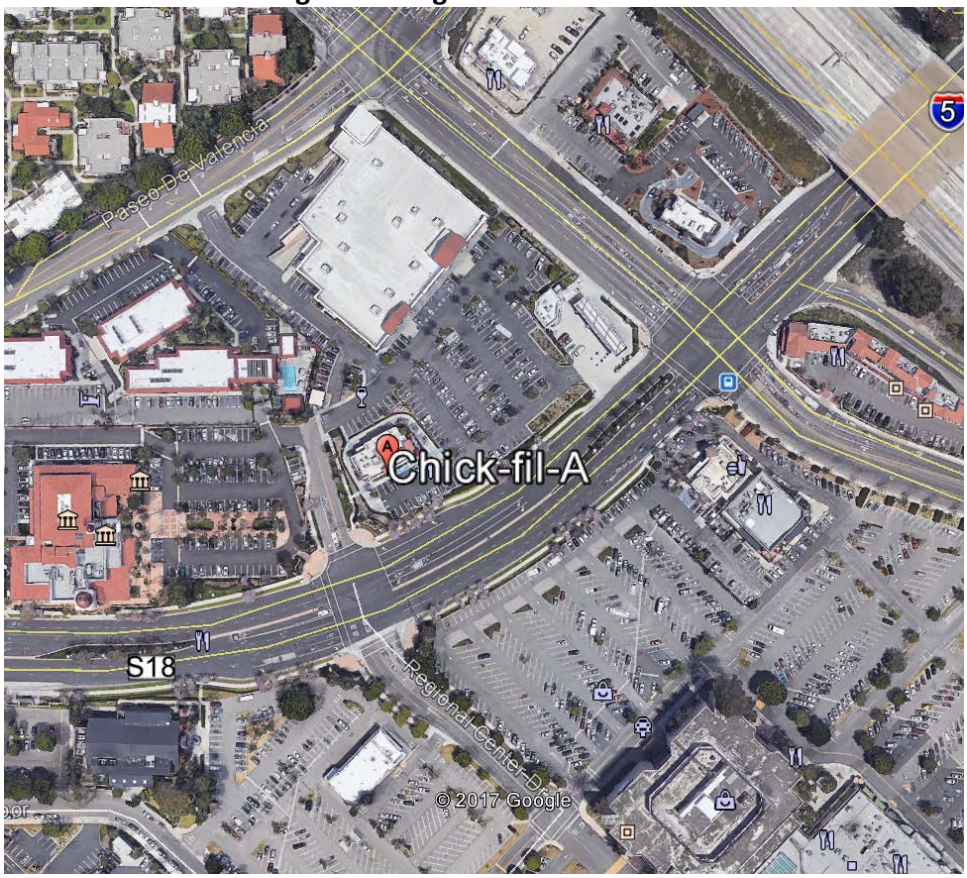
Data was collected at the Corona Chick-fil-A on the following dates:

- Saturday January 21, 2017
- Thursday January 26, 2017
- Friday November 17, 2017
- Saturday November 18, 2017
- Monday November 20, 2017

Appendix B contains the Corona Chick-fil-A site plan.

The ***Laguna Hills Chick-fil-A*** comparable site is an approximately 4,000 square foot Chick-fil-A with a drive-through window located at 24011 El Toro Rd, Laguna Hills, CA 92653.

Figure 3 – Laguna Hills Chick-fil-A



Data was collected at the Laguna Hills Chick-fil-A on the following dates:

- Saturday January 21, 2017
- Tuesday January 31, 2017
- Friday November 17, 2017
- Saturday November 18, 2017
- Monday November 20, 2017

Appendix B contains the Laguna Hills Chick-fil-A site plan.

The ***Rancho Cucamonga Chick-fil-A*** comparable site is an approximately 4,600 square foot Chick-fil-A with a drive-through window located at 12190 Foothill Blvd, Rancho Cucamonga, CA 91739.

Figure 4 – Rancho Cucamonga Chick-fil-A

Data was collected at the Laguna Hills Chick-fil-A on the following dates:

- Wednesday May 3, 2017
- Saturday May 6, 2017
- Friday November 17, 2017
- Saturday November 18, 2017
- Monday November 20, 2017

Appendix B contains the Rancho Cucamonga Chick-fil-A site plan.

The drive-through queue was observed and recorded at each of the survey sites during the following time periods, which correspond with typical peak periods of demand at Chick-fil-A restaurants:

- Monday morning from 7:00 AM to 9:00 AM;
- Monday mid-day from 11:00 AM to 2:00 PM;
- Monday evening from 4:00 PM to 7:00 PM;
- Tues, Weds, or Thurs morning from 7:00 AM to 9:00 AM;
- Tues, Weds, or Thurs mid-day from 11:00 AM to 2:00 PM;
- Tues, Weds, or Thurs evening from 4:00 PM to 7:00 PM;
- Friday morning from 7:00 AM to 9:00 AM;
- Friday mid-day from 11:00 AM to 2:00 PM;
- Friday evening from 4:00 PM to 10:00 PM;
- Saturday mid-day from 11:30 AM to 2:30 PM; and
- Saturday evening from 4:00 PM to 10:00 PM

The queue was recorded in fifteen-minute increments, such that there were a total of 108 weekday data points and 36 Saturday data points per site, for a total of 144 observations points per site, and 576 observation points overall. For each 15-minute interval, the highest queue observed within the interval was recorded.

Drive-Through Queue Observation Results

Based on the collected data, ***Table 1*** shows the frequency of each observed queue length, from zero vehicles up to the maximum observed queue (twenty-seven vehicles), the cumulative frequency, and the probability of the queue not exceeding a certain length based on the observed data.

Table 1 summarizes the results of the queue observations and frequency calculations. Data for the entirety of the observations periods is provided in ***Appendix C***.

Table 1
Summary of Drive-Through Queue Observations and Analysis

Drive-Through Queue			
Number of Vehicles in Queue (N)	Number of Occurences	Cumulative Frequency	Probabilityof Queue Length not Exceeding N
0	0	0	0.0%
1	1	1	0.2%
2	8	9	1.6%
3	8	17	3.0%
4	29	46	8.0%
5	23	69	12.0%
6	33	102	17.7%
7	39	141	24.5%
8	30	171	29.7%
9	48	219	38.0%
10	50	269	46.7%
11	41	310	53.8%
12	66	376	65.3%
13	56	432	75.0%
14	34	466	80.9%
15	32	498	86.5%
16	31	529	91.8%
17	18	547	95.0%
18	12	559	97.0%
19	7	566	98.3%
20	5	571	99.1%
21	0	571	99.1%
22	1	572	99.3%
23	2	574	99.7%
24	1	575	99.8%
25	0	575	99.8%
26	1	576	100.0%

A typical rule of thumb when designing drive-through queue storage is that the 85th percentile queue should be chosen and that the drive-through should be designed to accommodate these queues. Based on this rule of thumb, the observed 85th percentile queue length at the four comparable Chick-fil-As is 15 vehicles, and the appropriate drive-through design would accommodate at least this many vehicles.

As shown in the site plan in ***Appendix A***, the proposed ***West Covina Chick-fil-A*** will construct a two-lane drive-through with two order boxes and a single pick-up window with room for approximately 7 vehicles between the pick-up window and the order boards, and room for 7 vehicles from each order board back (14 vehicles total) before it would spill into the nearest drive aisle, for a total of 21 vehicles of stacking capacity, exceeding the 85th percentile queue observed at the comparable sites. As designed, the proposed Chick-fil-A would accommodate the 99th percentile queue observed at the comparable sites.

Table 2 summarizes the results of the drive through queue observations at the four comparative sites. Chick-fil-A sites typically employ order takers and handheld ordering during peak periods of drive-through activity, in-lieu of using the order boards, for greater throughput.

Table 2
Summary of Drive-Through Queue Observations – All Sites

Time Period	Maximum Vehicles Observed in Drive-Through[1]			
	Upland	Corona	Laguna Hills	Rancho Cucamonga
Morning				
Monday-Thurs 7:00-9:00 AM	9	8	7	12
Friday 7:00-9:00 AM	12	11	10	14
Mid-day				
Monday-Thurs 11:00-2:00 PM	24	15	17	19
Friday 11:00-2:00 PM	26	16	16	17
Saturday 11:30-2:30 PM	18	13	14	15
Late Afternoon/Evening				
Monday-Thursday 4:00-7:00 PM	20	13	14	16
Friday 4:00-10:00 PM	20	16	11	18
Saturday 4:00-10:00 PM	17	15	9	18

Note: 1 = Number of vehicles between pick up window and order board + number of vehicles from order board back

At each of the four sites, the weekday AM (breakfast) period experienced the shortest queues, due to lower demand. Vehicle queues tended to be longest during either the weekday mid-day (lunchtime) period or the weekday PM (dinner) period. The Upland Chick-fil-A consistently had the longest observed queues during the mid-day and afternoon/evening periods. The sites were observed utilizing order takers and iPad ordering during peak periods of drive-through demand to assist in queue management.

The proposed 21 vehicle stacking capacity in the drive-through at the proposed ***West Covina Chick-fil-A*****,** exceeds the maximum observed queue at the Corona, Laguna Hills and Rancho Cucamonga Chick-fil-A locations. There were 5 observations of queues greater than 21 vehicles at the Upland Chick-fil-A, which occurred during the Monday lunchtime and Friday lunchtime observation periods.

While the Upland Chick-fil-A experienced the longest queues, it was not the busiest comparable location, as shown in ***Table 3***.

Table 3
Arrival Rates and Maximum Observed Queues- Monday and Friday Lunchtime

Time Period	Upland				Rancho Cucamonga			
	Total Arrivals	Arrivals / Hour	Peak 15 Min Arrival Rate	Maximum Vehicles Observed in Drive-Through[1]	Total Arrivals	Arrivals / Hour	Peak 15 Min Arrival Rate	Maximum Vehicles Observed in Drive-Through[1]
Monday 11:00-2:00 PM	248	82.66	25	24	237	79	30	19
Friday 11:00-2:00 PM	249	83	24	26	284	94.66	31	17
Time Period	**Laguna Hills**				**Corona**			
	Total Arrivals	**Arrivals / Hour**	**Peak 15 Min Arrival Rate**	**Maximum Vehicles Observed in Drive-Through[1]**	**Total Arrivals**	**Arrivals / Hour**	**Peak 15 Min Arrival Rate**	**Maximum Vehicles Observed in Drive-Through[1]**
Monday 11:00-2:00 PM	241	80.33	26	17	272	90.66	30	13
Friday 11:00-2:00 PM	244	81.33	25	16	256	85.33	29	16

As shown in ***Table 3***, during the observed Monday and Friday lunch periods, the Upland Chick-fil-A was the second or third busiest of the comparable locations, and experienced the lowest peak 15 minute arrival rates of the four locations. However,it experienced the longest queues.

It is our experience, having collected queue data at over a dozen Chick-fil-A sites in the past three years, that Chick-fil-A franchisees tend to actively manage their queues and manage them to acceptable levels for the location they are in. At the Upland site, as shown previously in Figure 1, Chick-fil-A is sited on the eastern fringe of a large shopping Center, next to the least convenient parking (for the rest of the center) that is likely utilized by employees and potentially seasonal overflow parking during the holidays. The parking aisle on the southern edge of the site adjacent to Chick-fil-A functions as an extension of the drive-through queue capacity because it does not spill back into other driveways or uses, which is the likely reason that the Upland site operates with longer queues – because it can.

Drive-Through Queuing: Conclusions

The proposed ***West Covina Chick-fil-A*** will construct a two-lane drive-through with two order boxes and a single pick-up window with room for approximately 7 vehicles between the pick-up window and the order boards, and room for 7 vehicles from each order boards back (14 vehicles total) before it would spill into the nearest drive aisle, for a total of 21 vehicles of stacking capacity, exceeding the 85th percentile queue observed at the comparable sites. As designed, the proposed Chick-fil-A would accommodate the 99th percentile queue observed at the comparable sites, and is more than adequate to handle anticipated queues.

Additionally, the location of the drive-through entrance on the southern edge of the site provides the ability for some stacking in the drive aisles in the extremely rare event that the drive-through queue is longer than 21 vehicles; an event observed at only 1 of the 4 comparable sites. The two busiest comparable sites were observed to have queues of 19 vehicles or less for all observation periods. The extra stacking provided by the drive aisles would allow a total of approximately 27 vehicles in the drive-through queue without queue spillback onto City streets.

Based on the observed queuing at the comparable Chick-fil-A sites, the drive-through at the proposed ***West Covina Chick-fil-A*** site should be aggressively managed with multiple order takers utilizing iPad ordering and payment during peak periods, similar to what was observed at the Corona and Rancho Cucamonga comparable locations.

Please feel free to call us at (949) 878-3509 if you have any questions regarding this analysis.

Sincerely,

Thomas Wheat, PE, TE
Principal
TJW Engineering, Inc.

Registered Civil Engineer *#69467*
Registered Traffic Engineer *#2565*

Jeffrey Weckstein
Transportation Planner
TJW Engineering, Inc.

Appendix Table C-1
SUMMARY OF CHICK-FIL-A DRIVE-THROUGH LANE VEHICLE QUEUING OBSERVATIONS [1]
1700 E. Colorado Boulevard, Pasadena, CA 91106

Tuesday, September 24, 2019				Wednesday, September 25, 2019			
TIME	OBSERVED QUEUE	TIME	OBSERVED QUEUE	TIME	OBSERVED QUEUE	TIME	OBSERVED QUEUE
8:10 AM	7	4:06 PM	22	8:36 AM	11	4:15 PM	9
8:13 AM	13	4:17 PM	17	8:41 AM	17	4:48 PM	11
8:15 AM	10	4:25 PM	15			5:07 PM	24
8:28 AM	14	4:36 PM	13			5:40 PM	24
8:44 AM	17	4:56 PM	25				
MAXIMUM	17		25	**MAXIMUM**	17		24

[1] Observations conducted by LLG staff. Queues were documented when substantial peaks in the vehicle queue were observed, as compared to the general level of vehicle queuing during the time period.

Appendix Table C-2
SUMMARY OF CHICK-FIL-A DRIVE-THROUGH LANE VEHICLE QUEUING OBSERVATIONS [1]
24180 Magic Mountain Parkway, Santa Clarita, CA 91355

Tuesday, October 22, 2019				Wednesday, October 23, 2019			
TIME	MAX OBSERVED QUEUE	TIME	MAX OBSERVED QUEUE	TIME	MAX OBSERVED QUEUE	TIME	MAX OBSERVED QUEUE
7:00 AM	3	4:00 PM	7	7:00 AM	1	4:00 PM	18
7:05 AM	6	4:05 PM	9	7:05 AM	2	4:05 PM	7
7:10 AM	5	4:10 PM	13	7:10 AM	4	4:10 PM	15
7:15 AM	4	4:15 PM	14	7:15 AM	5	4:15 PM	15
7:20 AM	3	4:20 PM	13	7:20 AM	8	4:20 PM	18
7:25 AM	2	4:25 PM	8	7:25 AM	4	4:25 PM	17
7:30 AM	2	4:30 PM	14	7:30 AM	4	4:30 PM	16
7:35 AM	4	4:35 PM	16	7:35 AM	3	4:35 PM	13
7:40 AM	5	4:40 PM	13	7:40 AM	5	4:40 PM	17
7:45 AM	7	4:45 PM	11	7:45 AM	3	4:45 PM	14
7:50 AM	7	4:50 PM	18	7:50 AM	3	4:50 PM	16
7:55 AM	6	4:55 PM	18	7:55 AM	1	4:55 PM	12
8:00 AM	5	5:00 PM	18	8:00 AM	8	5:00 PM	9
8:05 AM	5	5:05 PM	20	8:05 AM	5	5:05 PM	10
8:10 AM	6	5:10 PM	21	8:10 AM	6	5:10 PM	14
8:15 AM	5	5:15 PM	21	8:15 AM	6	5:15 PM	17
8:20 AM	6	5:20 PM	22	8:20 AM	5	5:20 PM	20
8:25 AM	6	5:25 PM	18	8:25 AM	8	5:25 PM	17
8:30 AM	4	5:30 PM	15	8:30 AM	8	5:30 PM	15
8:35 AM	2	5:35 PM	14	8:35 AM	7	5:35 PM	17
8:40 AM	3	5:40 PM	19	8:40 AM	7	5:40 PM	17
8:45 AM	3	5:45 PM	20	8:45 AM	9	5:45 PM	17
8:50 AM	1	5:50 PM	18	8:50 AM	5	5:50 PM	18
8:55 AM	4	5:55 PM	18	8:55 AM	3	5:55 PM	22
9:00 AM	-	6:00 PM	18	9:00 AM	5	6:00 PM	20
AVERAGE	5		16	**AVERAGE**	5		16
85TH %-ILE	6		20	**85TH %-ILE**	8		18
95TH %-ILE	7		21	**95TH %-ILE**	8		20
MAXIMUM	7		22	**MAXIMUM**	9		22

[1] Observations conducted by LLG staff. The maximum observed queue in five minute increments is reported.

APPENDIX D

STARBUCKS DRIVE-THROUGH SERVICE-LANE QUEUING DATA

OBSERVATIONAL SURVEY - RESULTS

CLIENT: LLG - PASADENA

PROJECT: STARBUCKS - 14940 WHITTIER BOULEVARD

DATE: WEDNESDAY, JANUARY 14, 2015

PERIOD: 07:00 AM TO 09:00 AM

FILE: 1_AMWED-OB

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
15-MIN	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0700-0715	3	5	8	1	2	5	7	5
0715-0730	4	6	9	0	5	6	8	5
0730-0745	5	4	8	1	5	5	9	5
0745-0800	5	1	7	1	7	5	8	5
0800-0815	4	4	9	2	6	3	8	7
0815-0830	4	2	11	1	8	5	9	7
0830-0845	7	5	10	2	7	4	11	8
0845-0900	6	6	9	2	8	3	9	8

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
1-HR	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0700-0800	17	16	32	3	19	21	32	20
0715-0815	18	15	33	4	23	19	33	22
0730-0830	18	11	35	5	26	18	34	24
0745-0845	20	12	37	6	28	17	36	27
0800-0900	21	17	39	7	29	15	37	30

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

OBSERVATIONAL SURVEY - RESULTS

CLIENT: LLG - PASADENA

PROJECT: STARBUCKS - 14940 WHITTIER BOULEVARD

DATE: WEDNESDAY, JANUARY 14, 2015

PERIOD: 04:00 PM TO 06:00 PM

FILE: 1_PMWED-OB

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
15-MIN	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0400-0415	7	8	10	1	3	5	13	5
0415-0430	7	3	8	1	5	8	9	7
0430-0445	7	7	10	2	5	7	10	9
0445-0500	4	6	11	2	4	9	11	6
0500-0515	8	4	9	1	2	8	10	8
0515-0530	4	5	6	2	3	7	6	6
0530-0545	5	4	9	2	3	7	9	7
0545-0600	5	5	8	0	3	3	8	5

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
1-HR	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0400-0500	25	24	39	6	17	29	43	27
0415-0515	26	20	38	6	16	32	40	30
0430-0530	23	22	36	7	14	31	37	29
0445-0545	21	19	35	7	12	31	36	27
0500-0600	22	18	32	5	11	25	33	26

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

OBSERVATIONAL SURVEY - RESULTS

CLIENT: LLG - PASADENA

PROJECT: STARBUCKS - 14940 WHITTIER BOULEVARD

DATE: THURSDAY, JANUARY 15, 2015

PERIOD: 07:00 AM TO 09:00 AM

FILE: 2_AMTHUR-OB

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
15-MIN	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0700-0715	7	7	10	3	7	5	11	9
0715-0730	4	3	12	2	5	10	9	9
0730-0745	4	5	12	1	8	4	8	9
0745-0800	5	1	8	1	7	8	9	5
0800-0815	5	0	13	2	10	9	12	8
0815-0830	7	3	10	2	5	7	10	9
0830-0845	2	5	9	1	5	2	7	5
0845-0900	6	3	9	1	9	5	9	7

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
1-HR	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0700-0800	20	16	42	7	27	27	37	32
0715-0815	18	9	45	6	30	31	38	31
0730-0830	21	9	43	6	30	28	39	31
0745-0845	19	9	40	6	27	26	38	27
0800-0900	20	11	41	6	29	23	38	29

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

OBSERVATIONAL SURVEY - RESULTS

CLIENT: LLG - PASADENA

PROJECT: STARBUCKS - 14940 WHITTIER BOULEVARD

DATE: THURSDAY, JANUARY 15, 2015

PERIOD: 04:00 PM TO 06:00 PM

FILE: 2_PMTHUR-OB

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
15-MIN	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0400-0415	5	0	5	2	4	9	8	4
0415-0430	3	1	5	0	2	5	5	3
0430-0445	4	5	7	2	2	6	7	6
0445-0500	5	4	9	3	3	8	11	6
0500-0515	1	1	10	3	5	4	10	4
0515-0530	2	6	9	2	4	6	8	5
0530-0545	6	12	8	2	3	4	9	7
0545-0600	6	5	11	1	3	6	9	9

	WHITTIER BLVD		ALLEY WAY				VEHICLES TRIPS	
1-HR	INBOUND	OUTBOUND	INBOUND		OUTBOUND		INBOUND	
PERIOD	EBRT	NBRT	WBRT	EBLT	SBRT	SBLT	DRIVE THRU	WALK IN
0400-0500	17	10	26	7	11	28	31	19
0415-0515	13	11	31	8	12	23	33	19
0430-0530	12	16	35	10	14	24	36	21
0445-0545	14	23	36	10	15	22	38	22
0500-0600	15	24	38	8	15	20	36	25

THE TRAFFIC SOLUTION
329 DIAMOND STREET
ARCADIA, CALIFORNIA 91006
626.446.7978 PHONE

Stantec

Memo

To:	Garey Partners, LTD. c/o Anthony J. Karber	From:	Daryl Zerfass, PE, PTP Stantec
File:	273008660	Date:	May 30, 2014

Reference: Queue Length Analysis – Starbucks Drive Through at 1010 North Garey Avenue

Stantec Consulting Services Inc. (Stantec) has prepared an on-site drive through queuing analysis for the proposed Starbucks located at 1010 North Garey Avenue in the City of Pomona. Following is a summary of the analysis that has been prepared in accordance with the scope of work approved by the City's Department of Public Works (attached). The work effort consists of a queuing analysis of the project's proposed drive-through lane based on actual measured data acquired from the drive-through of a similar Starbucks in the City of Pomona.

Project Description

The proposed project consists of a freestanding Starbucks building with a drive through lane (the proposed site-plan is attached for reference). The project site is located on the northeast corner of North Garey Avenue and East Alvarado Street. Access to the site is via a proposed driveway on East Alvarado Street, and from North Garey Avenue via an existing alleyway.

Analysis

To estimate the peak drive through queue lengths, data for drive through transactions was obtained from the freestanding Starbucks located on Fairplex Drive adjacent to the I-10 freeway and used to estimate the average peak queue length. Data was provided for seven consecutive days in early April, 2014 for the store's peak two-hour period.

Summarized below is the drive through transaction data for the Fairplex Starbucks. As shown, the peak period typically begins around 7:00 or 7:30 in the morning, with the exception of Sunday when the peak period began at 10:30 AM.

Table 1 Peak Drive Through Transactions

Day	Peak Period	Ave. Peak Transactions (per Half Hour)
Monday (3/31/2014)	7:30 AM – 9:30 AM	37
Tuesday (4/1/2014)	7:00 AM – 9:00 AM	43
Wednesday (4/2/2014)	7:00 AM – 9:00 AM	44
Thursday (4/3/2014)	7:00 AM – 9:00 AM	46
Friday (4/4/2014)	7:00 AM – 9:00 AM	56
Saturday (4/5/2014)	7:30 AM – 9:30 AM	37
Sunday (4/6/2014)	10:30 AM – 12:30 PM	34
Average of 5 Highest Days		**45**
Data Source: Starbucks (Fairplex/I-10 Location)		

Reference: Queue Length Analysis – Starbucks Drive Through at 1010 North Garey Avenue

As shown in the above table, the highest measured volume of drive through traffic at the Fairplex Starbucks was 56 transactions per half hour, which equates to 1.9 transactions per minute, on average, or 32 seconds per transaction. The peak drive-through volume based on the five highest days of the week equates to 45 transactions per half hour, or 90 vehicles per hour, on average. Given the measured peak service rate of 32 seconds per transaction and a 90 vehicle per hour random arrival rate, the 85th percentile[1] queue length is eight vehicles, or 160 feet. Attached for reference is the queue length calculation worksheet.

The proposed project site plan indicates that approximately 200 feet of on-site storage is available for vehicles in the drive through queue without extending onto East Alvarado Street or blocking the sidewalk. As such, the proposed site plan is expected to accommodate the peak hour queues of the proposed Starbucks without traffic spilling over onto the adjacent public roadways.

As shown in the attached site plan exhibit, customers can access the drive-through from either North Garey Avenue (via the alley) or from East Alvarado Street. At peak times when the queue extends into the parking lot drive aisle, vehicles may be approaching the drive-through lane from each direction. When that occurs, the drivers are expected to alternate (take turns) entering the drive-through lane. Alternatively, signs could be posted to require drivers to enter from one direction only, however there are two primary drawbacks to that approach. First, there is no feasible enforcement method, resulting in low compliance, and second, it unnecessarily limits access during the majority of the day when queues are short. Therefore, an attempt to regulate the direction of entering vehicles is not recommended.

Drivers leaving the pick-up window will have the option to turn left through the parking lot to exit to North Garey Avenue, or to turn right to exit to East Alvarado Street. At peak times when there is a queue of vehicles extending into the parking lot drive aisle, drivers leaving the pick-up window will naturally chose to make a right-turn to exit the parking lot, rather than be delayed by trying to turn left. During non-peak times, it is not recommended to artificially restrict left-turns from the drive through, as that would require all vehicles to exit onto East Alvarado Street and motorists would lose the benefit of having exits onto two separate roadways. Since the drive through aisle is wide enough (25') to allow cars to pass by a drive through queue, a gridlock situation should not occur. As such, an attempt to regulate the direction of exiting vehicles is not recommended.

At peak times when the queue extends into the parking lot drive aisle, the adjacent parking stalls will be temporarily impacted. The drive aisle is wide enough (25') to allow entering or exiting cars to

[1] The 85th percentile is a commonly used threshold for design purposes, and it means that there is only a 15 percent probability that the queue will be longer than the estimated eight vehicles when the drive-through demand is greatest. Important to note is that this does not mean that the queue will exceed 8 vehicles 15 percent of the time, rather it means that the peak queue, which happens for a short period each day, only has a 15 percent probability that it would exceed eight vehicles during that peak time. Important to note is that a maximum queue for a drive through such as this cannot be accurately determined from a formula since drivers will alter their behavior based on their individual tolerance for waiting. In other words, the longer the queue gets, the more likely it is that drivers will choose to not enter the drive through and will instead chose another location. A maximum queue calculation using a formula will indicate a near infinite queue length, which is not a reasonable expectation under real world conditions.

Reference: Queue Length Analysis – Starbucks Drive Through at 1010 North Garey Avenue

pass by cars waiting in the drive through queue; however, the ability to enter or exit a parking stall may be temporarily delayed until a gap opens in the queue. This situation would only occur during times of peak drive through demand. The 25' aisle width meets the typical standard aisle width of 24' to 25' for 90 degree parking, and therefore is acceptable for two-way operation.

Drive-through queues for uses such as a coffee shop are partially self-regulating. Since there are typically many local options for coffee shops, potential customers can avoid an excessively long drive-through queue by utilizing another location. In this specific case, there is another Starbucks (without drive through), less than a mile south on Garey Avenue, and two other nearby Starbucks with drive-throughs that are each less than three miles from the project site.

In conclusion, our review of the proposed site plan indicates that it is expected to accommodate the peak drive-through queues without traffic spilling over onto the adjacent public roadways.

Thank you for requesting our assistance with your project. If you have any questions on the analysis presented here, please feel free to contact either Charlie Ho at (949) 932-6063 or myself.

STANTEC CONSULTING SERVICES INC.

Daryl Zerfass, PE, PTP
Principal, Transportation Planning and Traffic Engineering
Phone: (949) 923-6058
Daryl.Zerfass@stantec.com

Attachment: Scope of Work – Approved 4/21/2014
Site Plan – Starbucks 1010 N. Garey Ave., Pomona
Queue Calculation Worksheet

c. Charlie Ho, Stantec

Exhibit B

TRAFFIC IMPACT STUDY SCOPE

CITY OF POMONA

Project Name:	Starbucks
Project Address:	1010 N. Garey Ave, Pomona
Project Description:	New Freestanding Starbucks with Drive-Through

	Consultant	Developer
Name:	Daryl Zerfass, PE, PTP Stantec	GAREY PARTNERS, LTD. c/o Anthony J. Karber
Address:	38 Technology Dr, Suite 100 Irvine, CA 92618	2024 N. Broadway, Suite 203 Santa Ana, CA 92706
Telephone: E-mail:	(949) 923-6058 daryl.zerfass@stantec.com	(714) 550-9100 ajk@galleriacenters.com

A. Trip Generation

Existing Land Use	n/a	Proposed Land Use	n/a
Existing Zoning	n/a	Proposed Zoning	n/a

	In	Out	Total
AM Peak Hour	n/a	n/a	n/a
PM Peak Hour	n/a	n/a	n/a

B. Trip Distribution

Attach graphical representation n/a

C. Background Traffic

Project Opening year:	n/a	Growth Rate:	n/a

D. Study Intersections

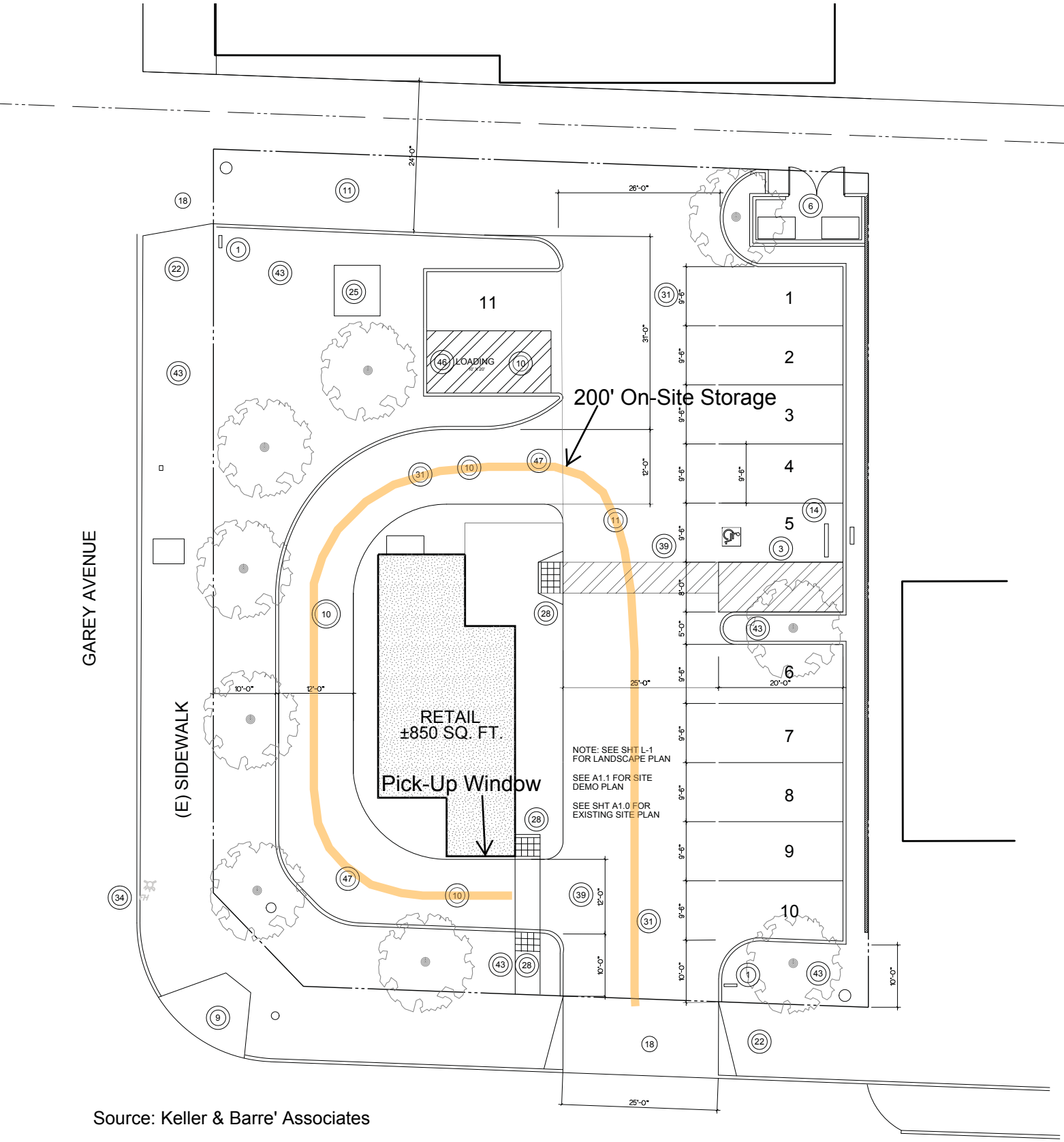
n/a	

E. Specific issues to be addressed in the Study

Peak queue lengths in drive-through lane.	
Queue analysis will be prepared using transaction data to be provide by Starbucks.	

Approved By:

City of Pomona Traffic Engineering:	
Date:	4/21/14



Source: Keller & Barre' Associates

Site Plan

QUEUEING WORKSHEET

Location: Starbucks Drive-Thru Lane (1 service position)
Description: Peak Two-Hour Condition for Five-Day Average

Xth Percentile (e.g., 95th percentile = .95)		0.85
probablility of a queue exceeding a length of M vehicles	*P(x > M) =*	0.15
number of parallel service positions	N =	1
maximum 5 minute arrival rate (veh/5 minutes)		7.5
mean average arrival rate of vehicles into the system (veh/hr)	q =	90
average service time (sec/veh/position)		32
mean average service rate per service position (veh/hr/position)	Q =	112.5
coefficient of utilization $\rho = \frac{q}{NQ}$	ρ =	0.8
Qm (lookup from table below)	*Qm =*	0.8
Number of vehicles in queue waiting to be served	*M =*	6.5018

where:

$$M = \left[\frac{\ln P(x > M) - \ln Q_M}{\ln \rho}\right] - 1$$

Queue Storage Required per lane	***(veh)***	***M+1 =***	**8**
	(feet)		**160**

Table of Qm Values

ρ	N = 1	2	3	4	5	6	7	8	9	10
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.05	0.0500	0.0091	0.0019	0.0004	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
0.10	0.1000	0.0182	0.0037	0.0008	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
0.15	0.1500	0.0421	0.0142	0.0052	0.0030	0.0008	0.0004	0.0001	0.0001	0.0000
0.20	0.2000	0.0660	0.0247	0.0096	0.0056	0.0015	0.0009	0.0002	0.0001	0.0000
0.25	0.2500	0.1023	0.0474	0.0233	0.0148	0.0063	0.0041	0.0019	0.0012	0.0006
0.30	0.3000	0.1385	0.0700	0.0370	0.0241	0.0111	0.0074	0.0036	0.0024	0.0011
0.35	0.3500	0.1836	0.1056	0.0639	0.0447	0.0256	0.0183	0.0111	0.0080	0.0050
0.40	0.4000	0.2286	0.1411	0.0907	0.0654	0.0400	0.0293	0.0185	0.0137	0.0088
0.45	0.4500	0.2810	0.1890	0.1323	0.1009	0.0696	0.0542	0.0388	0.0306	0.0224
0.50	0.5000	0.3333	0.2368	0.1739	0.1365	0.0991	0.0791	0.0591	0.0476	0.0360
0.55	0.5500	0.3917	0.2958	0.2305	0.1891	0.1478	0.1236	0.0993	0.0840	0.0687
0.60	0.6000	0.4501	0.3548	0.2870	0.2418	0.1965	0.1680	0.1395	0.1204	0.1013
0.65	0.6500	0.5134	0.4236	0.3578	0.3120	0.2662	0.2356	0.2051	0.1833	0.1616
0.70	0.7000	0.5766	0.4923	0.4286	0.3823	0.3359	0.3033	0.2706	0.2462	0.2218
0.75	0.7500	0.6439	0.5698	0.5125	0.4697	0.4269	0.3955	0.3641	0.3398	0.3156
0.80	0.8000	0.7111	0.6472	0.5964	0.5571	0.5178	0.4877	0.4576	0.4335	0.4093
0.85	0.8500	0.7819	0.7322	0.6921	0.6606	0.6290	0.6043	0.5795	0.5593	0.5390
0.90	0.9000	0.8526	0.8172	0.7878	0.7640	0.7402	0.7208	0.7014	0.6851	0.6687
0.95	0.9500	0.9263	0.9086	0.8939	0.8820	0.8701	0.8604	0.8507	0.8425	0.8344
1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

source: Table 8-11 (Transportation and Land Development, ITE, 1988)

APPENDIX E

TRAFFIC, PEDESTRIAN, AND BICYCLE COUNT DATA

Turning Movement Count Report AM

Location ID: 1
North/South: 5th Avenue
East/West: Huntington Drive

Date: 09/18/18
City: Monrovia, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
7:00	16	2	35	20	293	18	7	0	3	2	66	5	467
7:15	18	5	37	29	347	26	8	3	4	4	94	7	582
7:30	14	6	60	32	299	39	1	1	9	6	121	4	592
7:45	11	6	64	56	297	54	9	2	4	9	156	11	679
8:00	11	6	49	64	345	50	8	5	4	19	154	8	723
8:15	20	6	26	43	291	35	8	6	6	12	143	9	605
8:30	18	8	38	43	311	39	14	4	14	11	138	14	652
8:45	11	6	44	44	336	45	12	1	8	15	149	20	691
Total Volume:	119	45	353	331	2519	306	67	22	52	78	1021	78	4991
Approach %	23%	9%	68%	10%	80%	10%	48%	16%	37%	7%	87%	7%	
Peak Hr Begin:	8:00												
PHV	60	26	157	194	1283	169	42	16	32	57	584	51	2671
PHF	0.920			0.897			0.703			0.940			0.924

Turning Movement Count Report PM

Location ID: 1
North/South: 5th Avenue
East/West: Huntington Drive

Date: 09/18/18
City: Monrovia, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	20	4	55	42	135	17	18	5	13	12	330	20	671
16:15	16	7	55	31	201	9	23	5	15	5	341	13	721
16:30	22	5	55	22	174	10	52	8	21	3	326	20	718
16:45	27	4	41	37	178	12	37	5	18	10	390	18	777
17:00	24	5	36	37	176	12	82	22	24	3	355	26	802
17:15	18	4	53	37	213	14	48	12	14	2	338	11	764
17:30	15	3	39	41	197	7	33	7	18	6	352	19	737
17:45	18	3	33	42	216	6	28	3	10	2	387	23	771
Total Volume:	160	35	367	289	1490	87	321	67	133	43	2819	150	5961
Approach %	28%	6%	65%	15%	80%	5%	62%	13%	26%	1%	94%	5%	
Peak Hr Begin:	16:45												
PHV	84	16	169	152	764	45	200	46	74	21	1435	74	3080
PHF	0.897			0.910			0.625			0.915			0.960

Pedestrian/Bicycle Count Report

Location ID: 1
North/South: 5th Avenue
East/West: Huntington Drive

Date: 09/18/18
City: Monrovia, CA

	North		East		South		West	
Leg:	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*
7:00	0	0	0	0	1	0	0	0
7:15	0	0	0	0	1	0	1	0
7:30	1	0	6	0	5	1	2	0
7:45	0	0	4	0	0	0	1	0
8:00	0	1	1	0	1	0	3	0
8:15	0	0	0	0	0	0	0	0
8:30	4	0	1	0	3	0	1	0
8:45	0	0	3	0	0	0	0	0

	North		East		South		West	
Leg:	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*
16:00	0	0	7	0	4	0	0	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	3	0	2	0	2	0
16:45	0	0	0	0	0	0	2	0
17:00	0	0	2	0	2	0	0	0
17:15	0	0	0	0	2	0	1	0
17:30	0	0	2	0	4	1	2	0
17:45	0	0	1	1	0	0	0	0

ITM Peak Hour Summary

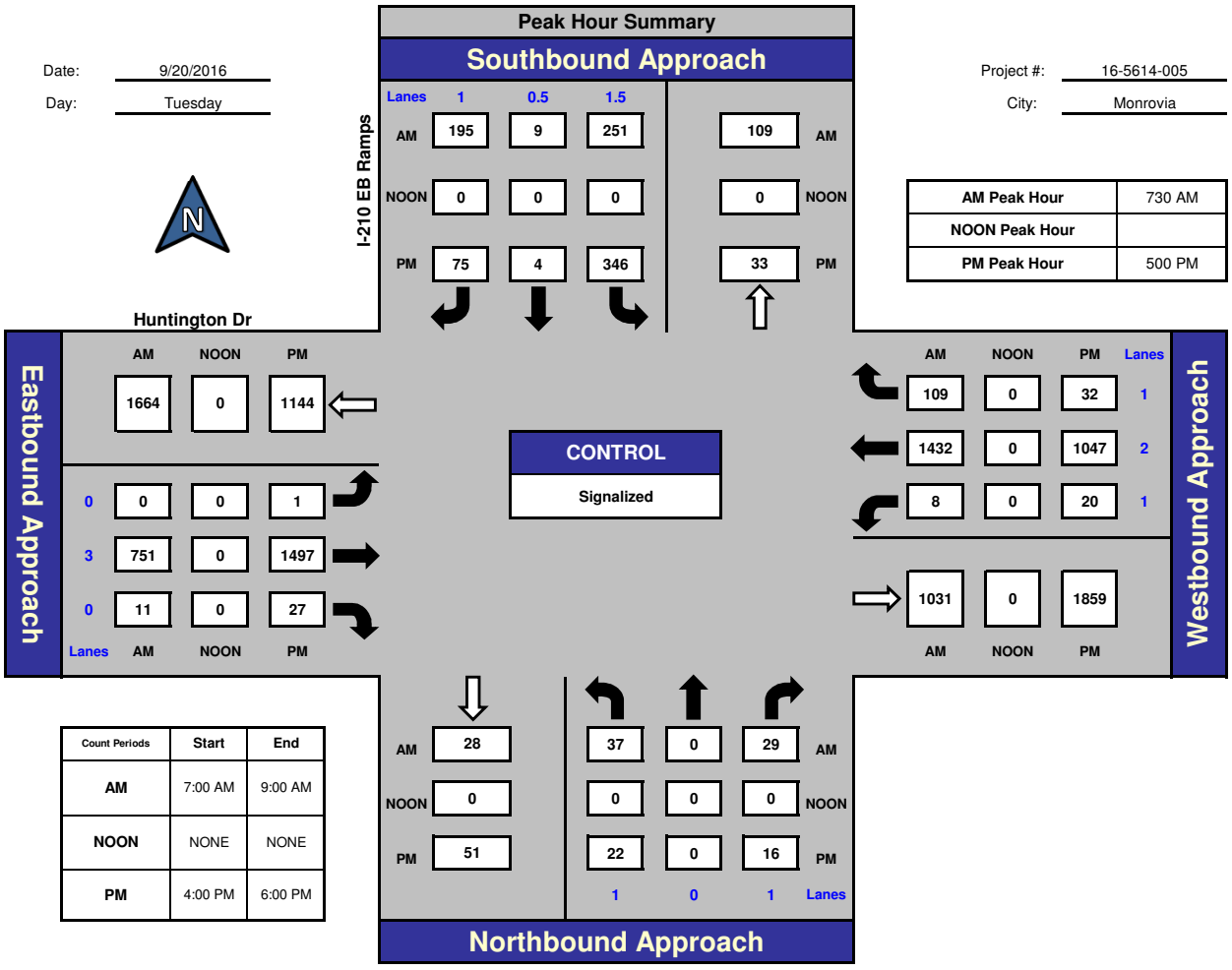
Prepared by:

National Data & Surveying Services

I-210 EB Ramps and Huntington Dr , Monrovia

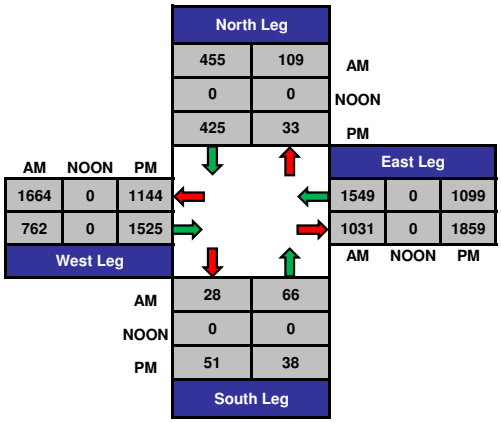
Date: 9/20/2016
Day: Tuesday
Project #: 16-5614-005
City: Monrovia

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

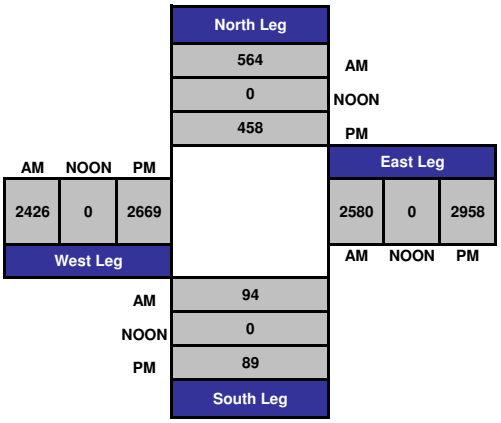


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



CITY TRAFFIC COUNTERS

WWW.CTCOUNTERS.COM

File Name : EncinoAve-I-210FrwyEBOn-Ramp_Huntington
Site Code : 00000000
Start Date : 9/30/2020
Page No : 1

Groups Printed- Vehicles

	Southbound			Huntington Drive Westbound			Encino Avenue - I-210 Frwy EB ON-Ramp Northbound			Huntington Drive Eastbound			
Start Time	Left	Thru	Right	Left To Encino Ave	U-Turn to I-210 Frwy EB On-Ramp	Thru	Left From Encino Ave	Thru	Right From Encino Ave	Thru	Right To I-210 Frwy EB On-Ramp	Right To Encino Ave	Int. Total
07:00 AM	0	0	0	4	1	130	1	0	7	54	47	0	244
07:15 AM	0	0	0	1	3	177	0	0	8	60	65	3	317
07:30 AM	0	0	0	1	2	159	2	0	6	97	66	0	333
07:45 AM	0	0	0	3	2	222	0	0	4	110	75	2	418
Total	0	0	0	9	8	688	3	0	25	321	253	5	1312
08:00 AM	0	0	0	1	2	217	1	0	1	116	52	0	390
08:15 AM	0	0	0	2	1	210	0	0	4	106	64	0	387
08:30 AM	0	0	0	1	2	216	2	0	7	112	85	1	426
08:45 AM	0	0	0	1	1	199	0	0	2	121	61	3	388
Total	0	0	0	5	6	842	3	0	14	455	262	4	1591
04:00 PM	0	0	0	2	2	197	0	0	4	227	157	4	593
04:15 PM	0	0	0	1	3	145	1	0	5	237	117	4	513
04:30 PM	0	0	0	2	0	206	0	0	2	274	149	8	641
04:45 PM	0	0	0	6	3	183	3	0	4	268	125	1	593
Total	0	0	0	11	8	731	4	0	15	1006	548	17	2340
05:00 PM	0	0	0	3	2	207	1	0	6	299	177	5	700
05:15 PM	0	0	0	3	5	212	0	0	2	268	164	7	661
05:30 PM	0	0	0	1	0	236	2	0	3	243	162	8	655
05:45 PM	0	0	0	5	1	249	2	0	4	238	110	5	614
Total	0	0	0	12	8	904	5	0	15	1048	613	25	2630
Grand Total	0	0	0	37	30	3165	15	0	69	2830	1676	51	7873
Apprch %	0	0	0	1.1	0.9	97.9	17.9	0	82.1	62.1	36.8	1.1	
Total %	0	0	0	0.5	0.4	40.2	0.2	0	0.9	35.9	21.3	0.6	

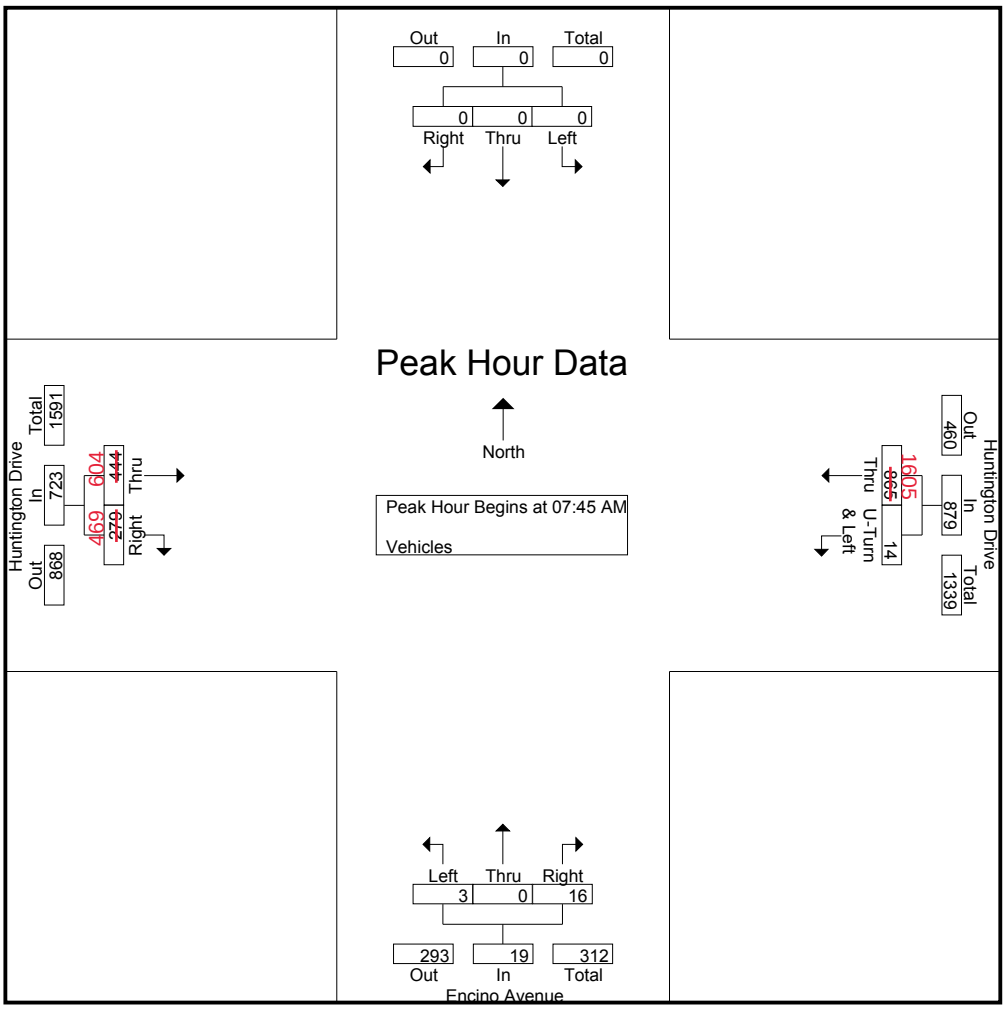
CITY TRAFFIC COUNTERS

WWW.CTCOUNTERS.COM

File Name : EncinoAve-I-210FrwyEBOn-Ramp_Huntington
Site Code : 00000000
Start Date : 9/30/2020
Page No : 2

	Southbound				Huntington Drive Westbound				Encino Avenue Northbound				Huntington Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	U-Turn	Thru	App. Total	Left	Thru	Right	App. Total	Thru	Right to I-210	Right to Encino	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	**3**	**2**	**222**	**227**	0	0	4	4	110	75	**2**	187	418
08:00 AM	0	0	0	0	1	2	217	220	1	0	1	2	**116**	52	0	168	390
08:15 AM	0	0	0	0	2	1	210	213	0	0	4	4	106	64	0	170	387
08:30 AM	0	0	0	0	1	2	216	219	**2**	0	**7**	**9**	112	**85**	1	**198**	**426**
Total Volume	0	0	0	0	7	7	865	879	3	0	16	19	444	276	3	723	1621
% App. Total	0	0	0		0.8	0.8	98.4		15.8	0	84.2		61.4	38.2	0.4		
PHF	.000	.000	.000	.000	.583	.875	.974	.968	.375	.000	.571	.528	.957	.812	.375	.913	.951

+740 +160 +190



CITY TRAFFIC COUNTERS

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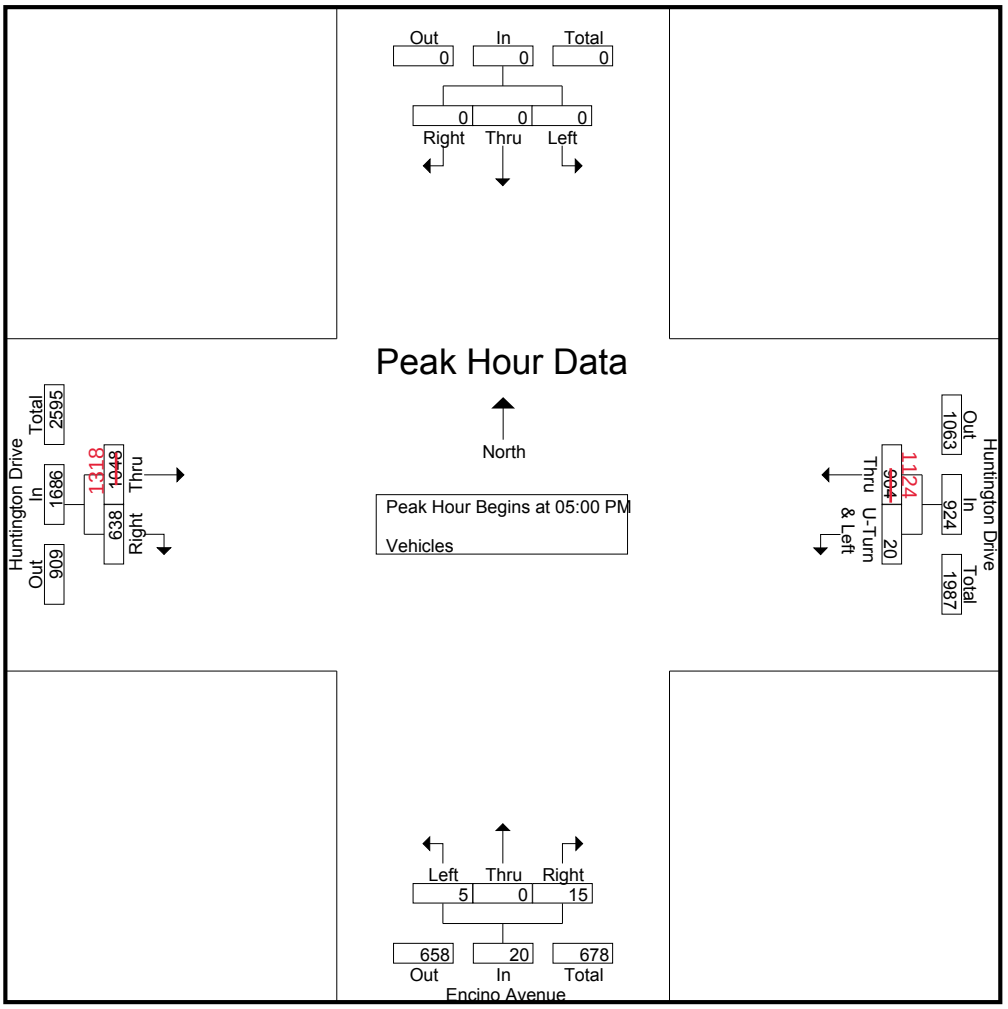
File Name : EncinoAve-I-210FrwyEBOn-Ramp_Huntington
Site Code : 00000000
Start Date : 9/30/2020
Page No : 3

	Southbound				Huntington Drive Westbound				Encino Avenue Northbound				Huntington Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	U-Turn	Thru	App. Total	Left	Thru	Right	App. Total	Thru	Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1														to I-210	to Encino		
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	3	2	207	212	1	0	**6**	**7**	**299**	**177**	5	**481**	**700**
05:15 PM	0	0	0	0	3	**5**	212	220	0	0	2	2	268	164	7	439	661
05:30 PM	0	0	0	0	1	0	236	237	**2**	0	3	5	243	162	**8**	413	655
05:45 PM	0	0	0	0	**5**	1	**249**	**255**	2	0	4	6	238	110	5	353	614
Total Volume	0	0	0	0	12	8	904	924	5	0	15	20	1048	613	25	1686	2630
% App. Total	0	0	0		1.3	0.9	97.8		25	0	75		62.2	36.4	1.5		
PHF	.000	.000	.000	.000	.600	.400	.908	.906	.625	.000	.625	.714	.876	.866	.781	.876	.939
							+220							+270			



CITY TRAFFIC COUNTERS

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File Name : EncinoAve-I-210FrwyEBOn-Ramp_Huntington_BP
Site Code : 00000000
Start Date : 9/30/2020
Page No : 1

Groups Printed- Bikes & Peds

	Southbound		Huntington Drive Westbound		Encino Avenue - I-210 Frwy EB ON-Ramp Northbound		Huntington Drive Eastbound		
Start Time	Bikes	Peds	Bikes	Peds	Bikes	Peds	Bikes	Peds	Int. Total
07:30 AM	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	1	0	0	0	1
08:00 AM	0	0	0	0	0	1	0	0	1
08:15 AM	0	0	0	0	1	2	0	0	3
08:45 AM	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	1	4	0	0	5
04:00 PM	0	0	0	0	0	1	0	0	1
04:15 PM	0	0	0	0	1	0	0	0	1
04:45 PM	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	1	2	0	0	3
05:00 PM	0	0	0	0	1	3	0	0	4
05:15 PM	0	0	0	0	2	2	0	0	4
05:30 PM	0	0	0	0	1	1	0	0	2
05:45 PM	0	0	0	0	2	2	0	0	4
Total	0	0	0	0	6	8	0	0	14
Grand Total	0	0	0	0	9	14	0	0	23
Apprch %	0	0	0	0	39.1	60.9	0	0	
Total %	0	0	0	0	39.1	60.9	0	0	

CITY TRAFFIC COUNTERS
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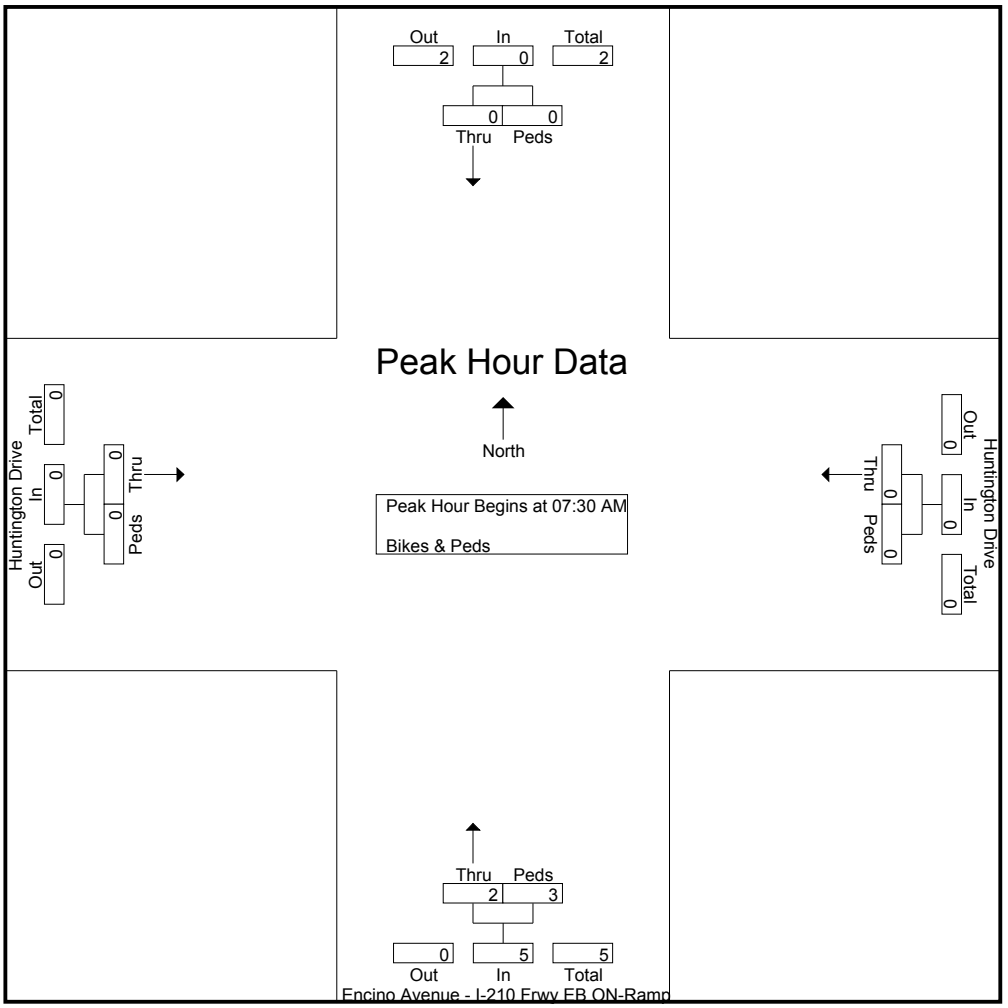
File Name : EncinoAve-I-210FrwyEBOn-Ramp_Huntington_BP
Site Code : 00000000
Start Date : 9/30/2020
Page No : 2

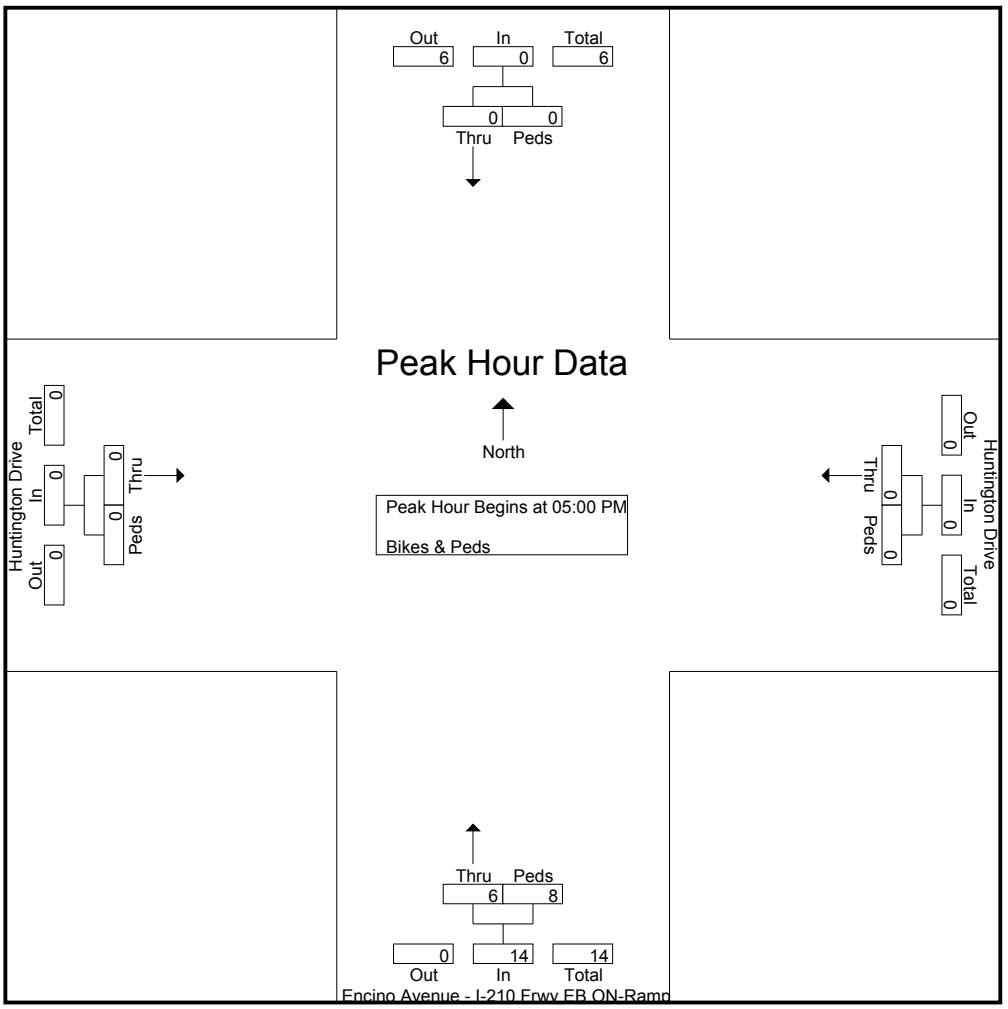
	Southbound			Huntington Drive Westbound			Encino Avenue - I-210 Frwy EB ON-Ramp Northbound			Huntington Drive Eastbound			
Start Time	Bikes	Peds	App. Total	Bikes	Peds	App. Total	Bikes	Peds	App. Total	Bikes	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	**1**	0	1	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	1	1	0	0	0	1
08:15 AM	0	0	0	0	0	0	1	**2**	**3**	0	0	0	**3**
Total Volume	0	0	0	0	0	0	2	3	5	0	0	0	5
% App. Total	0	0		0	0		40	60		0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.375	.417	.000	.000	.000	.417



CITY TRAFFIC COUNTERS
WWW.CTCOUNTERS.COM

File Name : EncinoAve-I-210FrwyEBOn-Ramp_Huntington_BP
Site Code : 00000000
Start Date : 9/30/2020
Page No : 3

	Southbound			Huntington Drive Westbound			Encino Avenue - I-210 Frwy EB ON-Ramp Northbound			Huntington Drive Eastbound			
Start Time	Bikes	Peds	App. Total	Bikes	Peds	App. Total	Bikes	Peds	App. Total	Bikes	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	1	**3**	**4**	0	0	0	**4**
05:15 PM	0	0	0	0	0	0	**2**	2	4	0	0	0	4
05:30 PM	0	0	0	0	0	0	1	1	2	0	0	0	2
05:45 PM	0	0	0	0	0	0	2	2	4	0	0	0	4
Total Volume	0	0	0	0	0	0	6	8	14	0	0	0	14
% App. Total	0	0		0	0		42.9	57.1		0	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.667	.875	.000	.000	.000	.875



ITM Peak Hour Summary

Prepared by:

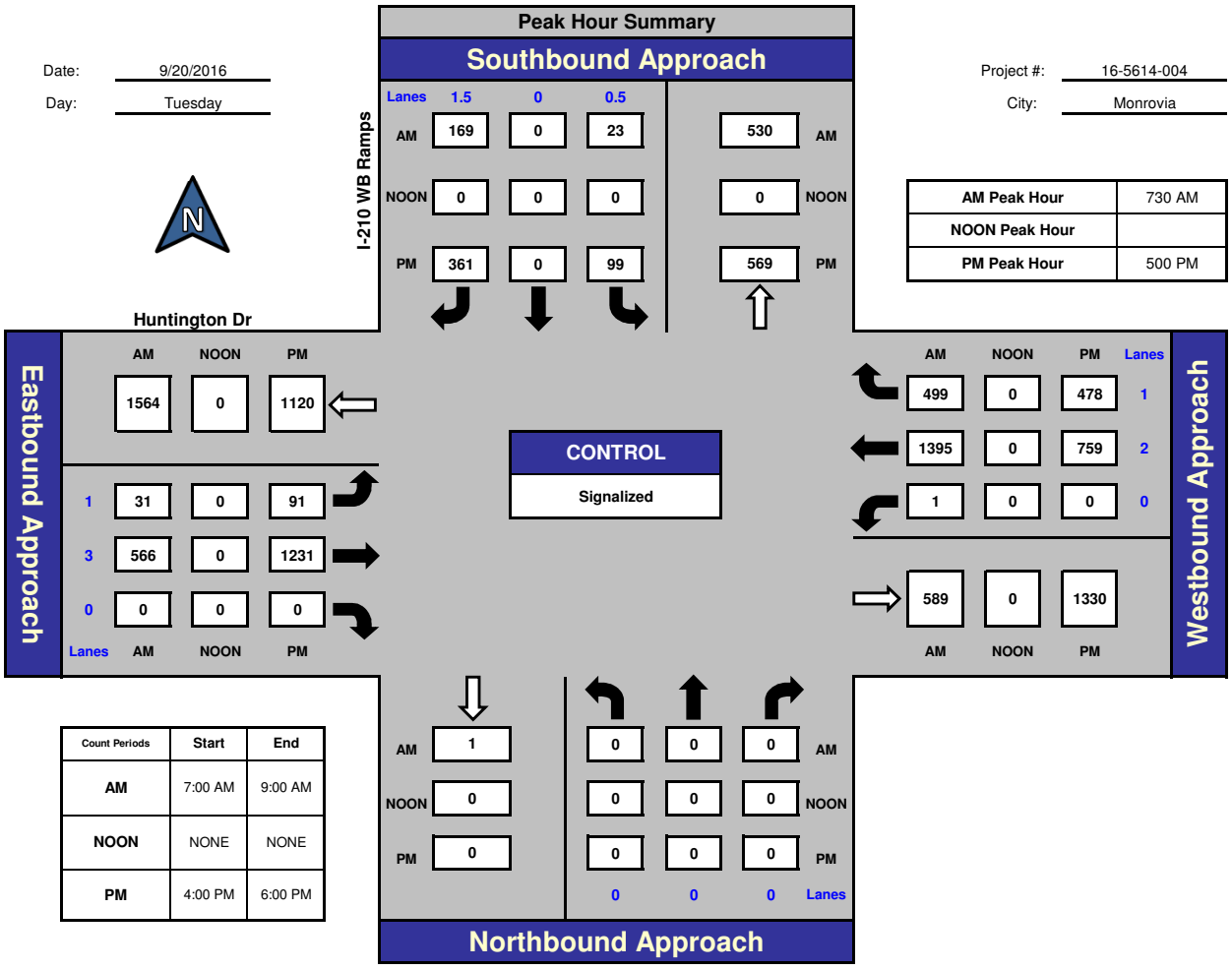
National Data & Surveying Services

I-210 WB Ramps and Huntington Dr , Monrovia

Date: 9/20/2016
Day: Tuesday

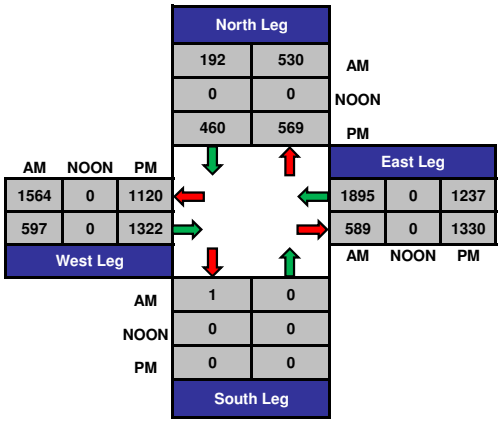
Project #: 16-5614-004
City: Monrovia

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

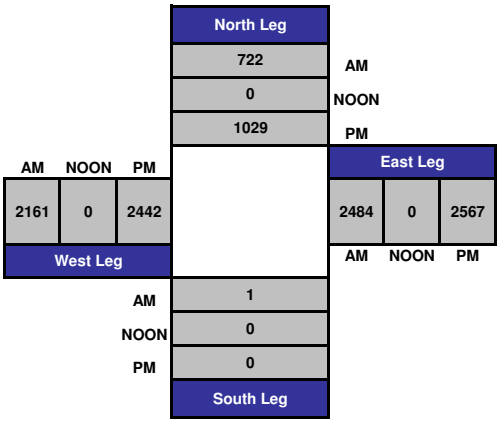


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Turning Movement Count Report AM

Location ID: 2
North/South: Monterey Avenue
East/West: Huntington Drive

Date: 09/18/18
City: Monrovia, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
7:00	39	6	3	12	397	8	0	12	43	4	56	6	586
7:15	40	7	10	17	418	4	2	23	44	7	87	5	664
7:30	33	20	11	14	370	3	4	54	65	7	110	7	698
7:45	26	17	13	21	348	4	2	58	53	8	156	9	715
8:00	33	13	12	17	320	2	5	25	59	10	105	4	605
8:15	35	7	10	13	362	4	1	5	23	9	120	6	595
8:30	39	5	10	15	357	5	2	16	40	13	112	7	621
8:45	33	9	15	23	345	2	3	9	24	7	120	8	598
Total Volume:	278	84	84	132	2917	32	19	202	351	65	866	52	5082
Approach %	62%	19%	19%	4%	95%	1%	3%	35%	61%	7%	88%	5%	
Peak Hr Begin:	7:15												
PHV	132	57	46	69	1456	13	13	160	221	32	458	25	2682
PHF	0.918			0.876			0.801			0.744			0.938

Turning Movement Count Report PM

Location ID: 2
North/South: Monterey Avenue
East/West: Huntington Drive

Date: 09/18/18
City: Monrovia, CA

	Southbound			*Westbound*			*Northbound*			*Eastbound*			
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	Totals:
Movements:	R	T	L	R	T	L	R	T	L	R	T	L	
16:00	22	17	20	16	174	5	0	15	22	37	320	12	660
16:15	32	21	26	10	207	12	4	23	36	33	280	9	693
16:30	25	22	20	22	184	19	2	9	26	38	293	14	674
16:45	20	24	24	21	200	10	9	15	30	63	269	19	704
17:00	21	21	16	20	230	7	4	9	38	58	311	17	752
17:15	30	24	15	23	168	6	3	22	27	74	275	16	683
17:30	20	36	19	9	237	12	4	10	22	69	284	11	733
17:45	12	28	17	16	168	10	4	14	40	57	297	15	678
Total Volume:	182	193	157	137	1568	81	30	117	241	429	2329	113	5577
Approach %	34%	36%	30%	8%	88%	5%	8%	30%	62%	15%	81%	4%	
Peak Hr Begin:	16:45												
PHV	91	105	74	73	835	35	20	56	117	264	1139	63	2872
PHF	0.900			0.914			0.894			0.949			0.955

Pedestrian/Bicycle Count Report

Location ID: 2
North/South: Monterey Avenue
East/West: Huntington Drive

Date: 09/18/18
City: Monrovia, CA

	North		East		South		West	
Leg:	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*
7:00	0	0	0	0	2	0	0	0
7:15	1	0	1	0	1	0	1	0
7:30	0	0	0	0	1	0	0	0
7:45	1	0	2	0	4	0	0	0
8:00	0	0	0	0	0	0	0	0
8:15	0	0	2	0	2	0	0	0
8:30	0	0	2	0	1	0	1	0
8:45	1	0	2	0	0	0	1	0

	North		East		South		West	
Leg:	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*	*Peds*	*Bicycle*
16:00	0	0	0	0	5	1	0	1
16:15	1	0	1	1	0	0	0	0
16:30	0	0	0	0	2	0	2	2
16:45	0	0	2	0	7	2	2	1
17:00	2	0	4	0	5	0	0	0
17:15	1	0	6	0	3	1	0	0
17:30	0	0	4	0	2	0	1	0
17:45	0	0	5	0	1	0	1	0

APPENDIX F

SAN GABRIEL VALLEY COG VEHICLE MILES TRAVELED EVALUATION TOOL SCREENING WORKSHEETS

SGVCOG VMT Evaluation Tool Report

Project Details

Timestamp of Analysis: October 01, 2020, 05:17:27 PM

Project Name: Chick-fil-A/Starbucks Monrovia Project/LLG Ref. 1-20-4393-1

Project Description: Chick-fil-A/Starbucks Monrovia Project

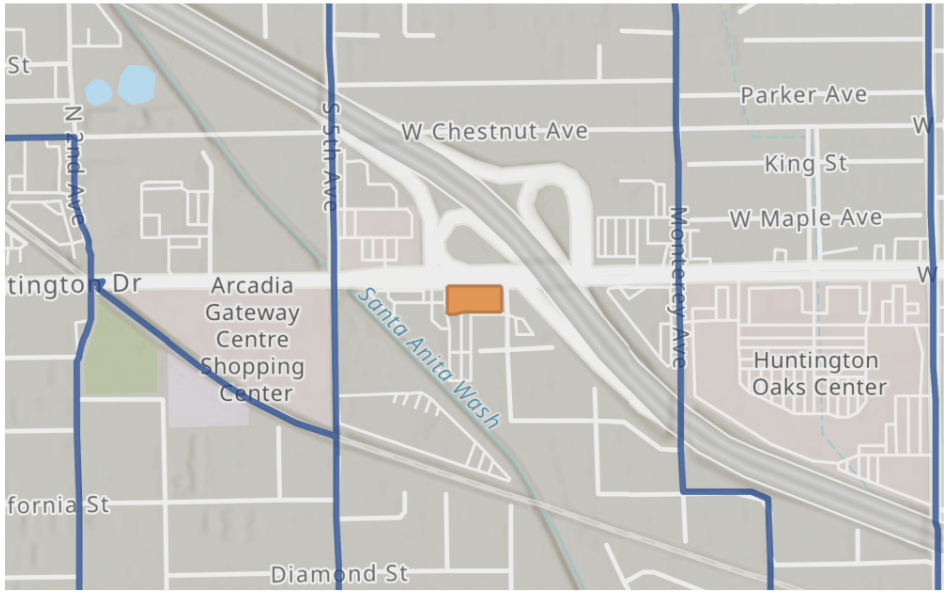
Project Location

Jurisdiction: Monrovia

APN	TAZ
8507-008-035	22240300

Inside a TPA?

No (Fail)



Analysis Details

Data Version: SCAG Regional Travel Demand Model 2016 RTP Base Year 2012

Analysis Methodology: TAZ

Baseline Year: 2020

Project Land Use

Residential:

Single Family DU:

Multifamily DU:

Total DUs: 0

Non-Residential:

Office KSF:

Local Serving Retail KSF:

Industrial KSF:

Residential Affordability (percent of all units):

Extremely Low Income: 0 %

Very Low Income: 0 %

Low Income: 0 %

Parking:

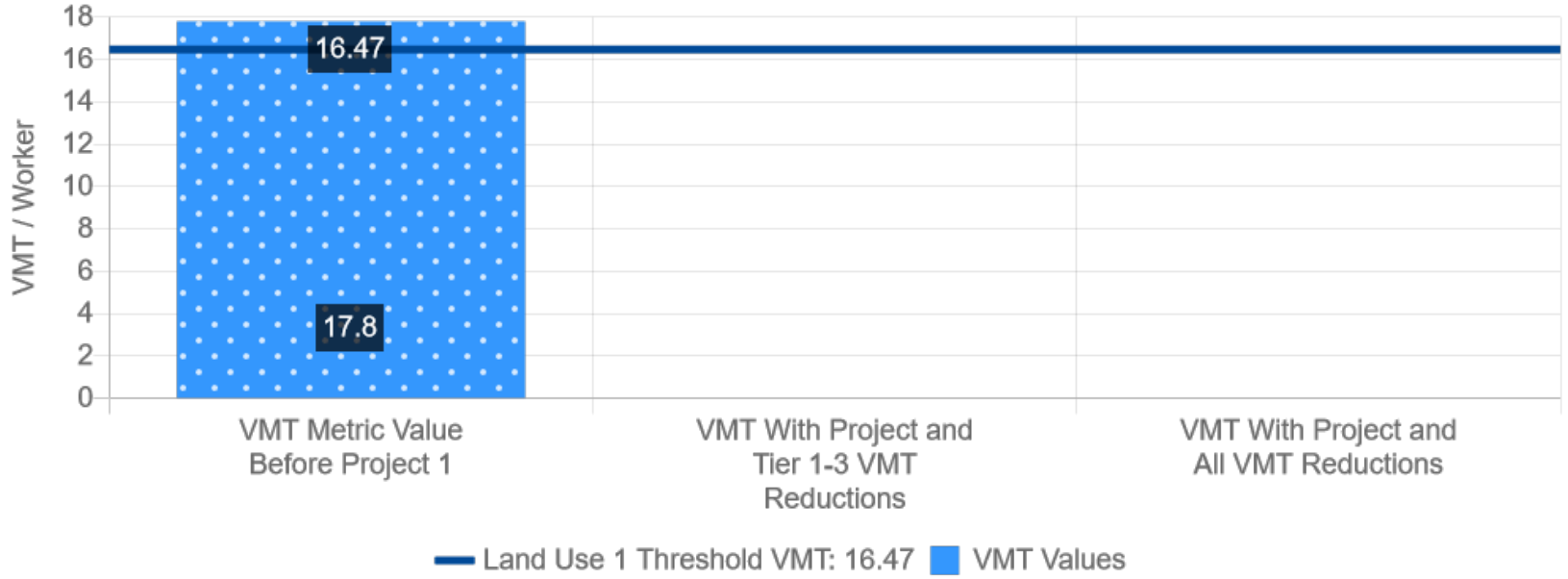
Motor Vehicle Parking:

Bicycle Parking:

Commercial Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Commercial
VMT Without Project 1:	Home-based Work VMT per Worker
VMT Baseline Description 1:	Subarea Average
VMT Baseline Value 1:	19.38
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	17.8	null	null
Low VMT Screening Analysis	No (Fail)	null	null



APPENDIX G

ICU/HCM AND LEVELS OF SERVICE EXPLANATION
EXISTING WITH PROJECT, FUTURE WITHOUT PROJECT, AND FUTURE WITH PROJECT VOLUME FIGURES
ICU AND HCM DATA WORKSHEETS – WEEKDAY AM AND PM PEAK HOURS

INTERSECTION CAPACITY UTILIZATION (ICU) DESCRIPTION

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

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

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

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

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

Intersection Capacity Utilization Characteristics

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

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

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

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

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

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

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

LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

In the *Highway Capacity Manual (HCM)*, published by the Transportation Research Board, level of service for unsignalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, in the absence of incidents, control, traffic, or geometric delay. Only the portion of total delay attributed to the traffic control measures, either traffic signals or stop signs, is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Level of Service criteria for unsignalized intersections are stated in terms of the average control delay per vehicle. The level of service is determined by the computed or measured control delay and is defined for each minor movement. Average control delay for any particular minor movement is a function of the service time for the approach and the degree of utilization. (Level of service is not defined for the intersection as a whole for two-way stop controlled intersections.)

Level of Service Criteria for TWSC/AWSC Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Level of Service (LOS) values are used to describe intersection operations with service levels varying from LOS A (free flow) to LOS F (jammed condition). The following descriptions summarize *HCM* criteria for each level of service:

LOS A describes operations with very low control delay, up to 10 seconds per vehicle.

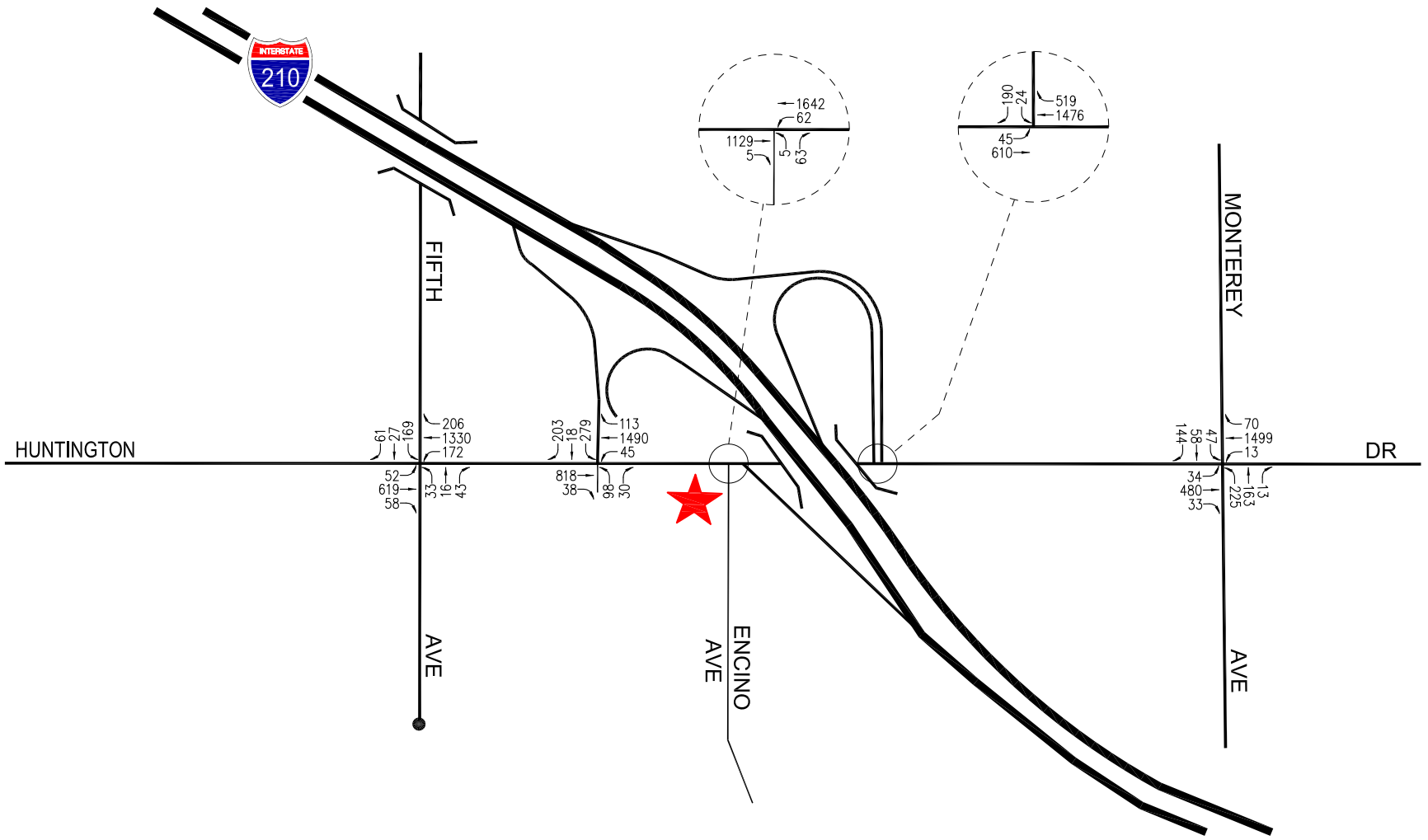
LOS B describes operations with control delay greater than 10 and up to 15 seconds per vehicle.

LOS C describes operations with control delay greater than 15 and up to 25 seconds per vehicle.

LOS D describes operations with control delay greater than 25 and up to 35 seconds per vehicle.

LOS E describes operations with control delay greater than 35 and up to 50 seconds per vehicle.

LOS F describes operations with control delay in excess of 50 seconds per vehicle. For two-way stop controlled intersections, LOS F exists when there are insufficient gaps of suitable size to allow side-street demand to safely cross through a major-street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches.



N

NOT TO SCALE

PROJECT SITE

APPENDIX FIGURE G-1
EXISTING WITH PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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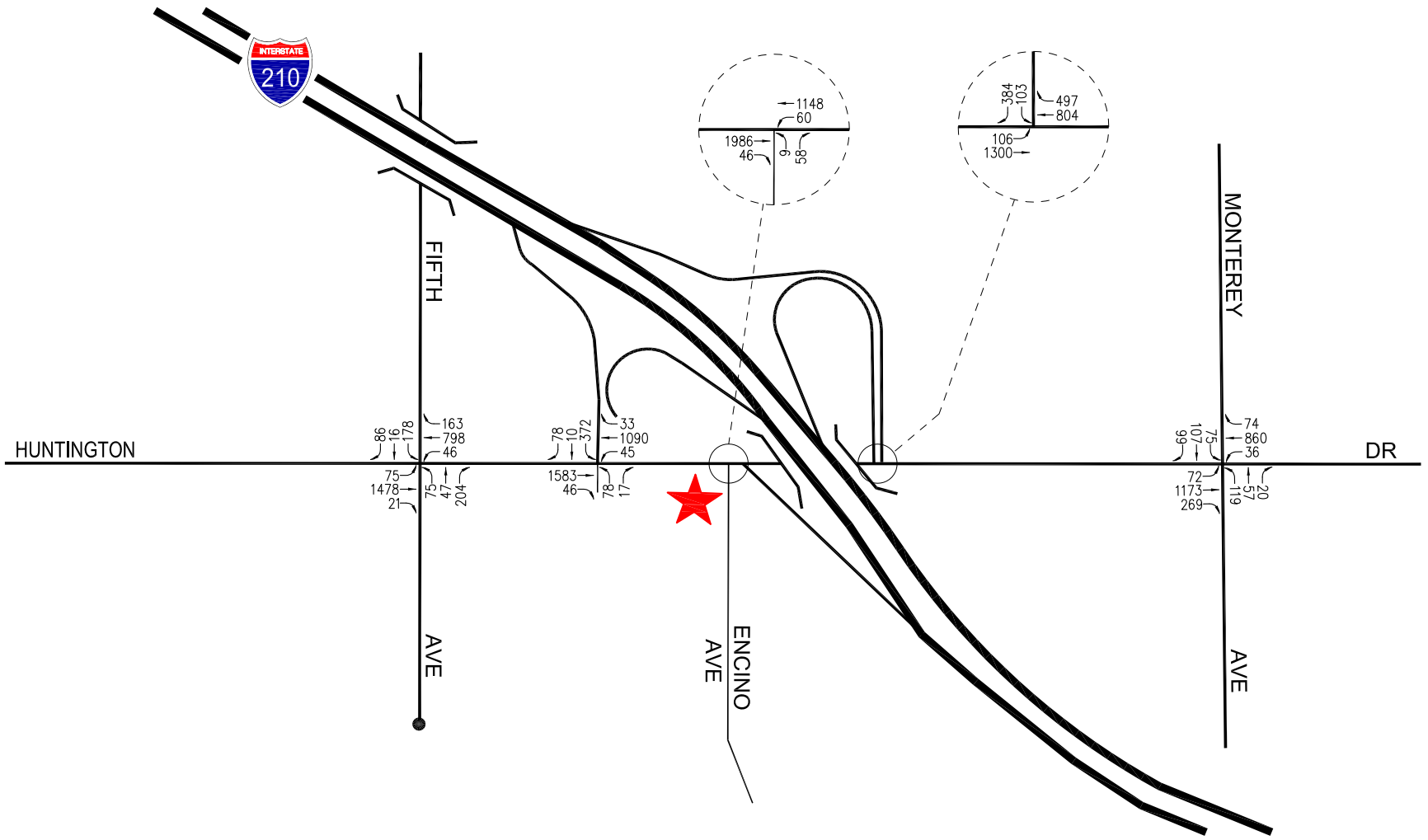

N

NOT TO SCALE

PROJECT SITE

APPENDIX FIGURE G-2
EXISTING WITH PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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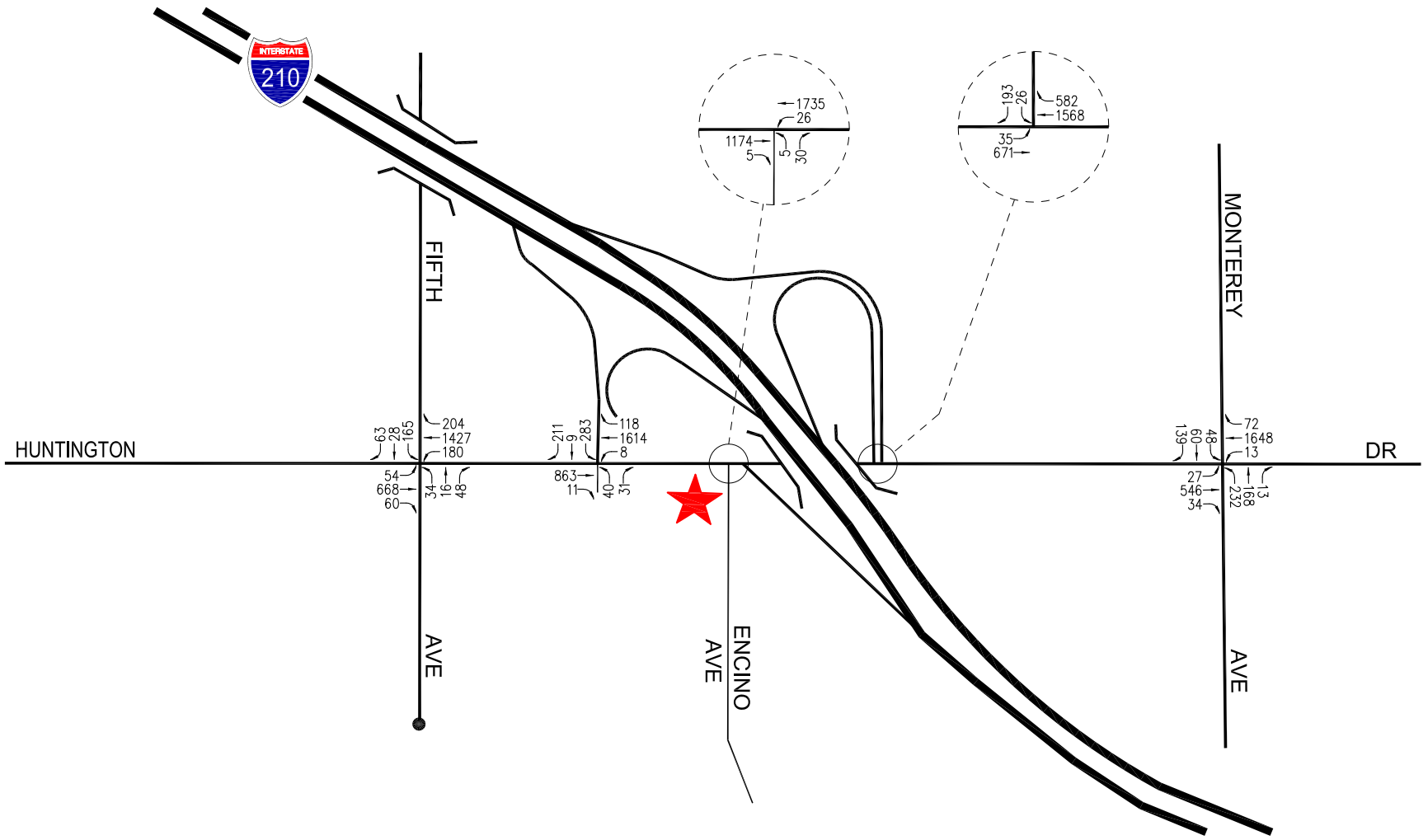

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE G-3
FUTURE WITHOUT PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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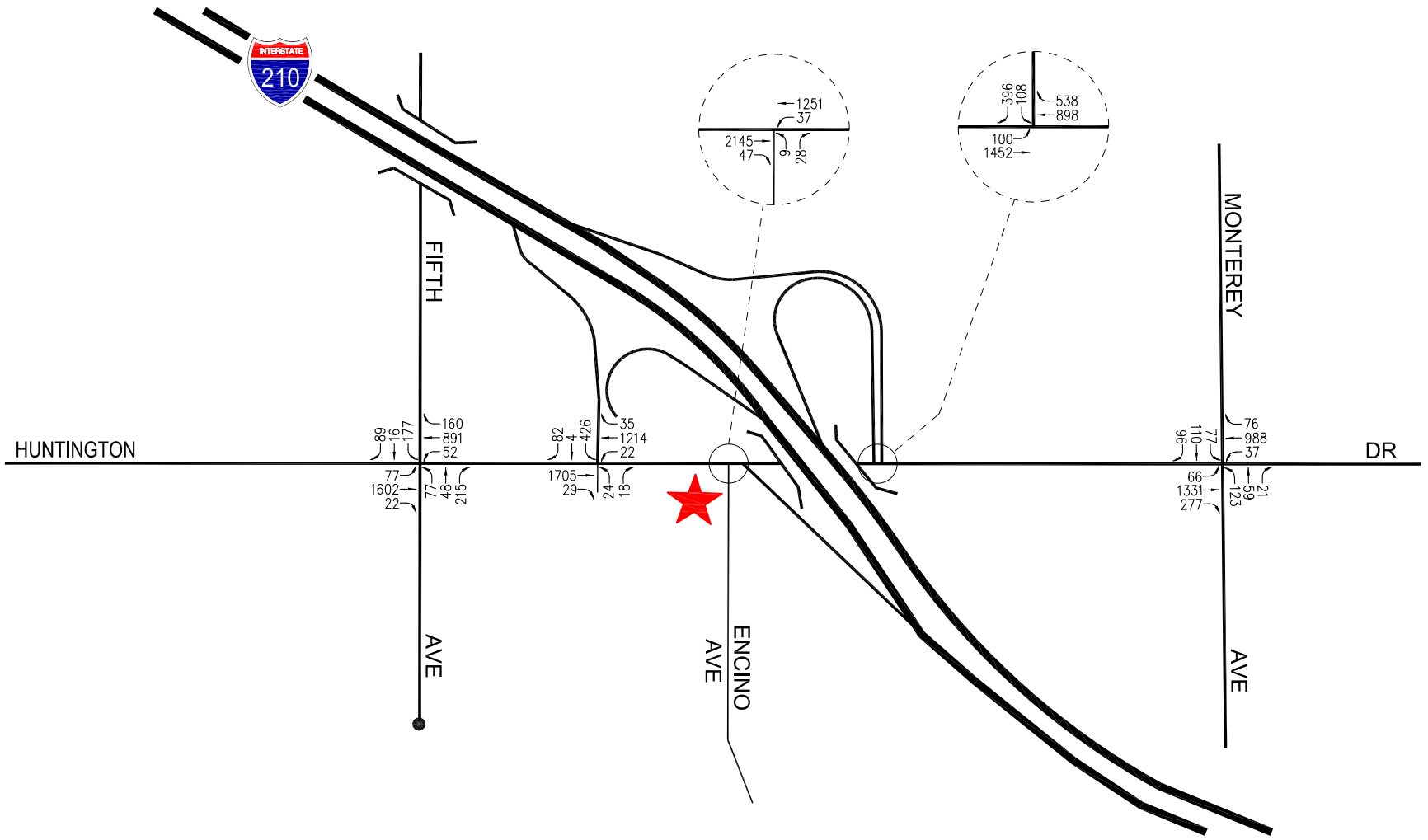

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE G-4
FUTURE WITHOUT PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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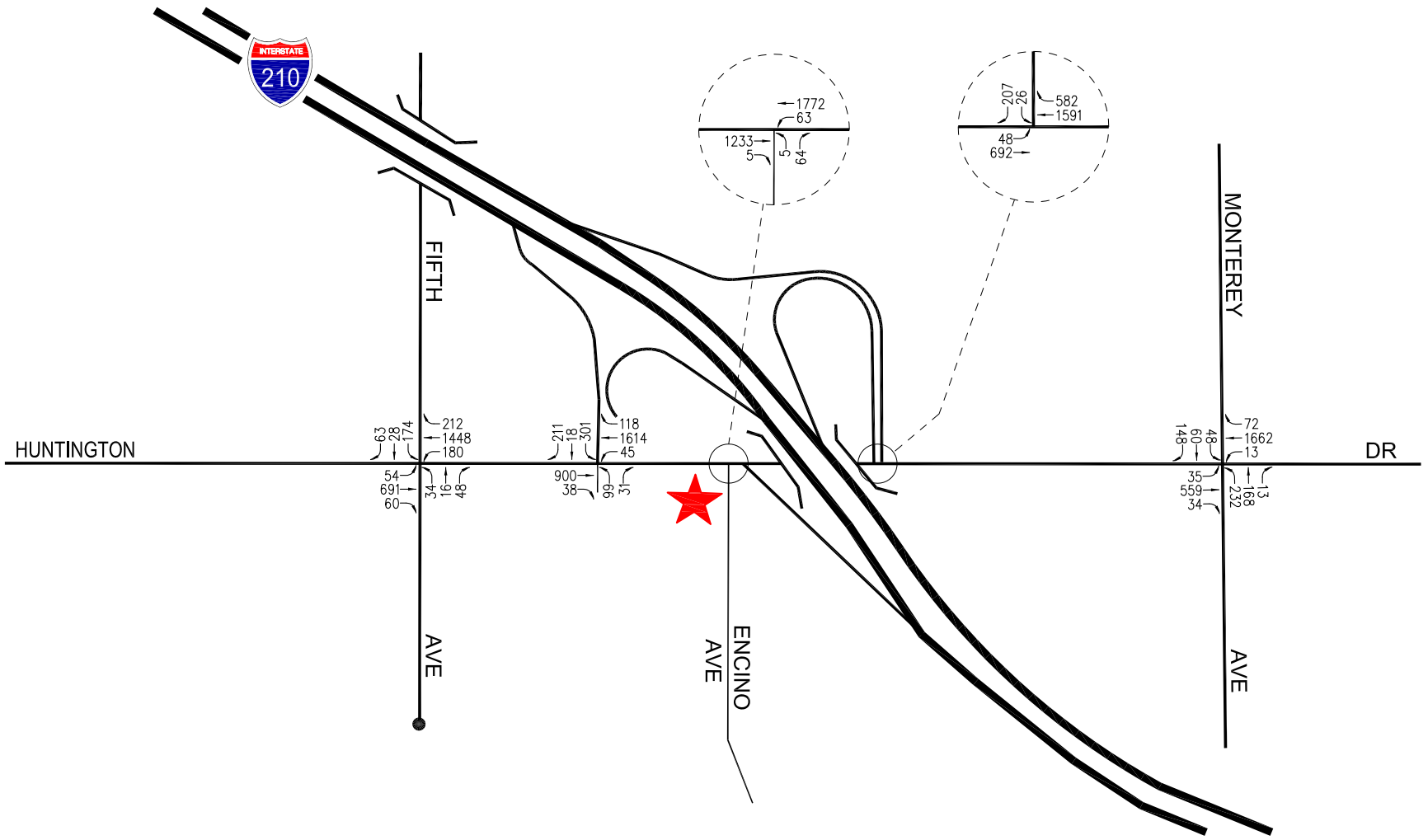

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE G-5
FUTURE WITH PROJECT TRAFFIC VOLUMES

WEEKDAY AM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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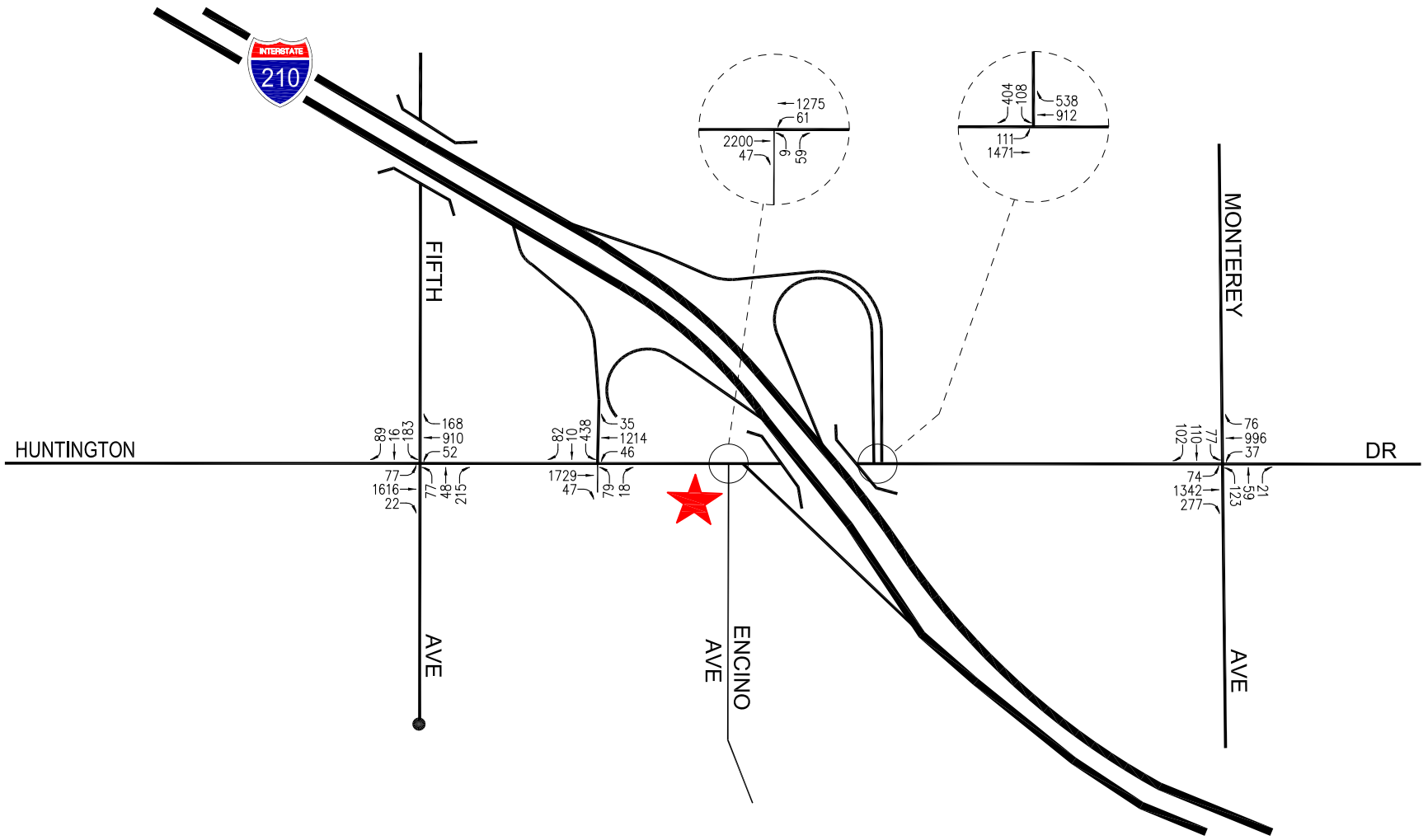

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE G-6
FUTURE WITH PROJECT TRAFFIC VOLUMES

WEEKDAY PM PEAK HOUR

CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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INTERSECTION CAPACITY UTILIZATION

Fifth Avenue @ Huntington Drive

N-S St: Fifth Avenue
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU1

Peak hr: AM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	33	1600	0.021	0	33	1600	0.021	1	0	34	1600	0.021	0	34	1600	0.021
NB Thru	16	1600	0.037 *	0	16	1600	0.037 *	0	0	16	1600	0.040 *	0	16	1600	0.040 *
NB Right [3]	43	0	0.000	0	43	0	0.000	1	4	48	0	0.000	0	48	0	0.000
SB Left	160	1600	0.100 *	9	169	1600	0.106 *	5	0	165	1600	0.103 *	9	174	1600	0.109 *
SB Thru	27	1600	0.055	0	27	1600	0.055	1	0	28	1600	0.057	0	28	1600	0.057
SB Right	61	0	0.000	0	61	0	0.000	2	0	63	0	0.000	0	63	0	0.000
EB Left	52	1600	0.033 *	0	52	1600	0.033 *	2	0	54	1600	0.034 *	0	54	1600	0.034 *
EB Thru	596	3200	0.204	23	619	3200	0.212	18	54	668	3200	0.228	23	691	3200	0.235
EB Right	58	0	0.000	0	58	0	0.000	2	0	60	0	0.000	0	60	0	0.000
WB Left	172	1600	0.108	0	172	1600	0.108	5	3	180	1600	0.113	0	180	1600	0.113
WB Thru	1309	3200	0.409 *	21	1330	3200	0.416 *	40	78	1427	3200	0.446 *	21	1448	3200	0.453 *
WB Right	198	1600	0.124	8	206	1600	0.129	6	0	204	1600	0.128	8	212	1600	0.133
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.678				0.691					0.723				0.735
LOS			B				B					C				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: City Count, LLC
2 Capacity expressed in veh/hour of green
3 No Right-Turn on Red

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INTERSECTION CAPACITY UTILIZATION

Fifth Avenue @ Huntington Drive

N-S St: Fifth Avenue
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU1

Peak hr: PM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	75	1600	0.047	0	75	1600	0.047	2	0	77	1600	0.048	0	77	1600	0.048
NB Thru	47	1600	0.157 *	0	47	1600	0.157 *	1	0	48	1600	0.164 *	0	48	1600	0.164 *
NB Right [3]	204	0	0.000	0	204	0	0.000	6	5	215	0	0.000	0	215	0	0.000
SB Left	172	1600	0.108 *	6	178	1600	0.111 *	5	0	177	1600	0.111 *	6	183	1600	0.114 *
SB Thru	16	1600	0.064	0	16	1600	0.064	0	0	16	1600	0.066	0	16	1600	0.066
SB Right	86	0	0.000	0	86	0	0.000	3	0	89	0	0.000	0	89	0	0.000
EB Left	75	1600	0.047	0	75	1600	0.047	2	0	77	1600	0.048	0	77	1600	0.048
EB Thru	1464	3200	0.464 *	14	1478	3200	0.468 *	44	94	1602	3200	0.508 *	14	1616	3200	0.512 *
EB Right	21	0	0.000	0	21	0	0.000	1	0	22	0	0.000	0	22	0	0.000
WB Left	46	1600	0.029 *	0	46	1600	0.029 *	1	5	52	1600	0.033 *	0	52	1600	0.033 *
WB Thru	779	3200	0.243	19	798	3200	0.249	24	88	891	3200	0.278	19	910	3200	0.284
WB Right	155	1600	0.097	8	163	1600	0.102	5	0	160	1600	0.100	8	168	1600	0.105
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.857				0.865					0.915				0.923
LOS			D				D					E				E

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: City Count, LLC
2 Capacity expressed in veh/hour of green
3 No Right-Turn on Red

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway EB Ramps-Private Driveway @ Huntington Drive

N-S St:	I-210 Freeway EB Ramps-Private Driveway	Peak hr: AM	Date: 3/10/2021
E-W St:	Huntington Drive	Annual Growth: 1.00%	Existing Year: 2020
Project:	Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1		Projection Year: 2023
File:	ICU2		

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left [3]	39	1600	0.024 *	59	98	1600	0.061 *	1	0	40	1600	0.025 *	59	99	1600	0.062 *
NB Thru [3]	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right [3]	30	1600	0.019	0	30	1600	0.019	1	0	31	1600	0.019	0	31	1600	0.019
SB Left [3]	261	0	0.091	18	279	0	0.097	8	14	283	0	0.098	18	301	0	0.105
SB Thru [3]	9	2880	0.094	9	18	2880	0.103	0	0	9	2880	0.101	9	18	2880	0.111
SB Right [3]	203	1600	0.127 *	0	203	1600	0.127 *	6	2	211	1600	0.132 *	0	211	1600	0.132 *
EB Left	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0	0.000 *	0	0	0	0.000 *
EB Thru	781	4800	0.165	37	818	4800	0.178	24	58	863	4800	0.182	37	900	4800	0.195
EB Right	11	0	0.000	27	38	0	0.000	0	0	11	0	0.000	27	38	0	0.000
WB Left	8	1600	0.005	37	45	1600	0.028	0	0	8	1600	0.005	37	45	1600	0.028
WB Thru	1490	3200	0.466 *	0	1490	3200	0.466 *	45	79	1614	3200	0.504 *	0	1614	3200	0.504 *
WB Right [4]	113	1600	0.000	0	113	1600	0.000	3	2	118	1600	0.000	0	118	1600	0.000
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.717				0.754					0.761				0.798
LOS			C				C					C				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green
3 Split-phase operation.
4 Free Flow movement

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway EB Ramps-Private Driveway @ Huntington Drive

N-S St:	I-210 Freeway EB Ramps-Private Driveway	Peak hr: PM	Date: 3/10/2021
E-W St:	Huntington Drive	Annual Growth: 1.00%	Existing Year: 2020
Project:	Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1		Projection Year: 2023
File:	ICU2		

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left [3]	23	1600	0.014 *	55	78	1600	0.049 *	1	0	24	1600	0.015 *	55	79	1600	0.049 *
NB Thru [3]	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right [3]	17	1600	0.011	0	17	1600	0.011	1	0	18	1600	0.011	0	18	1600	0.011
SB Left [3]	360	0	0.125	12	372	0	0.129	11	55	426	0	0.148	12	438	0	0.152
SB Thru [3]	4	2880	0.126 *	6	10	2880	0.133 *	0	0	4	2880	0.149 *	6	10	2880	0.156 *
SB Right [3]	78	1600	0.049	0	78	1600	0.049	2	2	82	1600	0.051	0	82	1600	0.051
EB Left	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000 *	0	0	0	0.000
EB Thru	1559	4800	0.331 *	24	1583	4800	0.339 *	47	99	1705	4800	0.361	24	1729	4800	0.370 *
EB Right	28	0	0.000	18	46	0	0.000	1	0	29	0	0.000	18	47	0	0.000
WB Left	21	1600	0.013 *	24	45	1600	0.028 *	1	0	22	1600	0.014	24	46	1600	0.029 *
WB Thru	1090	3200	0.341	0	1090	3200	0.341	33	91	1214	3200	0.379 *	0	1214	3200	0.379
WB Right [4]	33	1600	0.000	0	33	1600	0.000	1	1	35	1600	0.000	0	35	1600	0.000
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.585				0.649					0.644				0.704
LOS			A				B					B				C

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green
3 Split-phase operation.
4 Free Flow movement

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1070	5	25	1605	5	29
Future Vol, veh/h	1070	5	25	1605	5	29
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1126	5	26	1689	5	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1141	0	2036	576
Stage 1	-	-	-	-	1139	-
Stage 2	-	-	-	-	897	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*846	-	*190	*673
Stage 1	-	-	-	-	*719	-
Stage 2	-	-	-	-	*371	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*835	-	*182	*664
Mov Cap-2 Maneuver	-	-	-	-	*182	-
Stage 1	-	-	-	-	*710	-
Stage 2	-	-	-	-	*359	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	478	-	-	* 835	-
HCM Lane V/C Ratio	0.075	-	-	0.032	-
HCM Control Delay (s)	13.1	-	-	9.5	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1931	46	36	1124	9	27
Future Vol, veh/h	1931	46	36	1124	9	27
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2033	48	38	1183	9	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2091	0	2735	1051
Stage 1	-	-	-	-	2067	-
Stage 2	-	-	-	-	668	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*600	-	*270	*477
Stage 1	-	-	-	-	*510	-
Stage 2	-	-	-	-	*557	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*593	-	*249	*471
Mov Cap-2 Maneuver	-	-	-	-	*249	-
Stage 1	-	-	-	-	*504	-
Stage 2	-	-	-	-	*521	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	385	-	-	* 593	-
HCM Lane V/C Ratio	0.098	-	-	0.064	-
HCM Control Delay (s)	15.4	-	-	11.5	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1129	5	62	1642	5	63
Future Vol, veh/h	1129	5	62	1642	5	63
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1188	5	65	1728	5	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1203	0	2195	607
Stage 1	-	-	-	-	1201	-
Stage 2	-	-	-	-	994	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*819	-	*190	*651
Stage 1	-	-	-	-	*696	-
Stage 2	-	-	-	-	*371	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*808	-	*173	*643
Mov Cap-2 Maneuver	-	-	-	-	*173	-
Stage 1	-	-	-	-	*687	-
Stage 2	-	-	-	-	*341	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	536	-	-	* 808	-
HCM Lane V/C Ratio	0.134	-	-	0.081	-
HCM Control Delay (s)	12.7	-	-	9.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1986	46	60	1148	9	58
Future Vol, veh/h	1986	46	60	1148	9	58
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2091	48	63	1208	9	61

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2149	0	2855	1080
Stage 1	-	-	-	-	2125	-
Stage 2	-	-	-	-	730	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*573	-	*270	*456
Stage 1	-	-	-	-	*487	-
Stage 2	-	-	-	-	*557	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*566	-	*237	*450
Mov Cap-2 Maneuver	-	-	-	-	*237	-
Stage 1	-	-	-	-	*481	-
Stage 2	-	-	-	-	*495	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	402	-	-	* 566	-
HCM Lane V/C Ratio	0.175	-	-	0.112	-
HCM Control Delay (s)	15.9	-	-	12.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.6	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1174	5	26	1735	5	30
Future Vol, veh/h	1174	5	26	1735	5	30
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1236	5	27	1826	5	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1251	0	2216	631
Stage 1	-	-	-	-	1249	-
Stage 2	-	-	-	-	967	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*819	-	*144	*651
Stage 1	-	-	-	-	*696	-
Stage 2	-	-	-	-	*325	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*808	-	*137	*643
Mov Cap-2 Maneuver	-	-	-	-	*137	-
Stage 1	-	-	-	-	*687	-
Stage 2	-	-	-	-	*314	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	421	-	-	* 808	-
HCM Lane V/C Ratio	0.088	-	-	0.034	-
HCM Control Delay (s)	14.4	-	-	9.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2145	47	37	1251	9	28
Future Vol, veh/h	2145	47	37	1251	9	28
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2258	49	39	1317	9	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2317	0	3030	1164
Stage 1	-	-	-	-	2293	-
Stage 2	-	-	-	-	737	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*518	-	*223	*412
Stage 1	-	-	-	-	*441	-
Stage 2	-	-	-	-	*510	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*512	-	*204	*407
Mov Cap-2 Maneuver	-	-	-	-	*204	-
Stage 1	-	-	-	-	*435	-
Stage 2	-	-	-	-	*471	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	328	-	-	* 512	-
HCM Lane V/C Ratio	0.119	-	-	0.076	-
HCM Control Delay (s)	17.4	-	-	12.6	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1233	5	63	1772	5	64
Future Vol, veh/h	1233	5	63	1772	5	64
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1298	5	66	1865	5	67

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1313	0	2376	662
Stage 1	-	-	-	-	1311	-
Stage 2	-	-	-	-	1065	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*791	-	*121	*629
Stage 1	-	-	-	-	*673	-
Stage 2	-	-	-	-	*301	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*781	-	*109	*621
Mov Cap-2 Maneuver	-	-	-	-	*109	-
Stage 1	-	-	-	-	*664	-
Stage 2	-	-	-	-	*276	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	463	-	-	* 781	-
HCM Lane V/C Ratio	0.157	-	-	0.085	-
HCM Control Delay (s)	14.2	-	-	10	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2200	47	61	1275	9	59
Future Vol, veh/h	2200	47	61	1275	9	59
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2316	49	64	1342	9	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2375	0	3150	1193
Stage 1	-	-	-	-	2351	-
Stage 2	-	-	-	-	799	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*518	-	*223	*412
Stage 1	-	-	-	-	*441	-
Stage 2	-	-	-	-	*510	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*512	-	*193	*407
Mov Cap-2 Maneuver	-	-	-	-	*193	-
Stage 1	-	-	-	-	*435	-
Stage 2	-	-	-	-	*446	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	355	-	-	* 512	-
HCM Lane V/C Ratio	0.202	-	-	0.125	-
HCM Control Delay (s)	17.7	-	-	13	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.7	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway WB Ramps @ Huntington Drive

N-S St: I-210 Freeway WB Ramps
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU4

Peak hr: AM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0	0.000 *	0	0	0	0.000 *
NB Thru	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
SB Left	24	0	0.008	0	24	0	0.008	1	1	26	0	0.009	0	26	0	0.009
SB Thru	0	2880	0.069 *	0	0	2880	0.074 *	0	0	0	2880	0.076 *	0	0	2880	0.081 *
SB Right	176	0	0.000	14	190	0	0.000	5	12	193	0	0.000	14	207	0	0.000
EB Left	32	1600	0.020 *	13	45	1600	0.028 *	1	2	35	1600	0.022 *	13	48	1600	0.030 *
EB Thru	589	4800	0.123	21	610	4800	0.127	18	64	671	4800	0.140	21	692	4800	0.144
EB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Left	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Thru	1453	3200	0.454 *	23	1476	3200	0.461 *	44	71	1568	3200	0.490 *	23	1591	3200	0.497 *
WB Right	519	1600	0.324	0	519	1600	0.324	16	47	582	1600	0.364	0	582	1600	0.364
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.644				0.664					0.688				0.708
LOS			B				B					B				C

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway WB Ramps @ Huntington Drive

N-S St: I-210 Freeway WB Ramps
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU4

Peak hr: PM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0	0.000 *	0	0	0	0.000 *
NB Thru	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
SB Left	103	0	0.036	0	103	0	0.036	3	2	108	0	0.038	0	108	0	0.038
SB Thru	0	2880	0.166 *	0	0	2880	0.169 *	0	0	0	2880	0.175 *	0	0	2880	0.178 *
SB Right	376	0	0.000	8	384	0	0.000	11	9	396	0	0.000	8	404	0	0.000
EB Left	95	1600	0.059 *	11	106	1600	0.066 *	3	2	100	1600	0.063 *	11	111	1600	0.069 *
EB Thru	1281	4800	0.267	19	1300	4800	0.271	39	132	1452	4800	0.303	19	1471	4800	0.306
EB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Left	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Thru	790	3200	0.247	14	804	3200	0.251	24	84	898	3200	0.281	14	912	3200	0.285
WB Right	497	1600	0.311 *	0	497	1600	0.311 *	15	26	538	1600	0.336 *	0	538	1600	0.336 *
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.636				0.646					0.674				0.683
LOS			B				B					B				B

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
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INTERSECTION CAPACITY UTILIZATION

Monterey Avenue @ Huntington Drive

N-S St: Monterey Avenue
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU5

Peak hr: AM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	225	1600	0.141 *	0	225	1600	0.141 *	7	0	232	1600	0.145 *	0	232	1600	0.145 *
NB Thru	163	1600	0.110	0	163	1600	0.110	5	0	168	1600	0.113	0	168	1600	0.113
NB Right	13	0	0.000	0	13	0	0.000	0	0	13	0	0.000	0	13	0	0.000
SB Left	47	1600	0.029	0	47	1600	0.029	1	0	48	1600	0.030	0	48	1600	0.030
SB Thru	58	1600	0.121 *	0	58	1600	0.126 *	2	0	60	1600	0.124 *	0	60	1600	0.130 *
SB Right	135	0	0.000	9	144	0	0.000	4	0	139	0	0.000	9	148	0	0.000
EB Left	26	1600	0.016 *	8	34	1600	0.021 *	1	0	27	1600	0.017 *	8	35	1600	0.022 *
EB Thru	467	3200	0.146	13	480	3200	0.150	14	65	546	3200	0.171	13	559	3200	0.175
EB Right	33	1600	0.021	0	33	1600	0.021	1	0	34	1600	0.021	0	34	1600	0.021
WB Left	13	1600	0.008	0	13	1600	0.008	0	0	13	1600	0.008	0	13	1600	0.008
WB Thru	1485	3200	0.464 *	14	1499	3200	0.468 *	45	118	1648	3200	0.515 *	14	1662	3200	0.519 *
WB Right	70	1600	0.044	0	70	1600	0.044	2	0	72	1600	0.045	0	72	1600	0.045
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.842				0.857					0.901				0.916
LOS			D				D					E				E

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

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INTERSECTION CAPACITY UTILIZATION

Monterey Avenue @ Huntington Drive

N-S St: Monterey Avenue
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU5

Peak hr: PM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	119	1600	0.074 *	0	119	1600	0.074 *	4	0	123	1600	0.077 *	0	123	1600	0.077 *
NB Thru	57	1600	0.048	0	57	1600	0.048	2	0	59	1600	0.050	0	59	1600	0.050
NB Right	20	0	0.000	0	20	0	0.000	1	0	21	0	0.000	0	21	0	0.000
SB Left	75	1600	0.047	0	75	1600	0.047	2	0	77	1600	0.048	0	77	1600	0.048
SB Thru	107	1600	0.125 *	0	107	1600	0.129 *	3	0	110	1600	0.129 *	0	110	1600	0.133 *
SB Right	93	0	0.000	6	99	0	0.000	3	0	96	0	0.000	6	102	0	0.000
EB Left	64	1600	0.040	8	72	1600	0.045	2	0	66	1600	0.041	8	74	1600	0.046
EB Thru	1162	3200	0.363 *	11	1173	3200	0.367 *	35	134	1331	3200	0.416 *	11	1342	3200	0.419 *
EB Right	269	1600	0.168	0	269	1600	0.168	8	0	277	1600	0.173	0	277	1600	0.173
WB Left	36	1600	0.023 *	0	36	1600	0.023 *	1	0	37	1600	0.023 *	0	37	1600	0.023 *
WB Thru	852	3200	0.266	8	860	3200	0.269	26	110	988	3200	0.309	8	996	3200	0.311
WB Right	74	1600	0.046	0	74	1600	0.046	2	0	76	1600	0.048	0	76	1600	0.048
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.685				0.692					0.745				0.752
LOS			B				B					C				C

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

APPENDIX H

HUNTINGTON DRIVE PROJECT DRIVEWAY QUEUING ASSESSMENT
ALTERNATE SITE ACCESS SCHEME ASSESSMENT

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1176	73	0	1777	0	59
Future Vol, veh/h	1176	73	0	1777	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1238	77	0	1871	0	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	658
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	*646
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*646
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	646	-	-	-
HCM Lane V/C Ratio	0.096	-	-	-
HCM Control Delay (s)	11.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

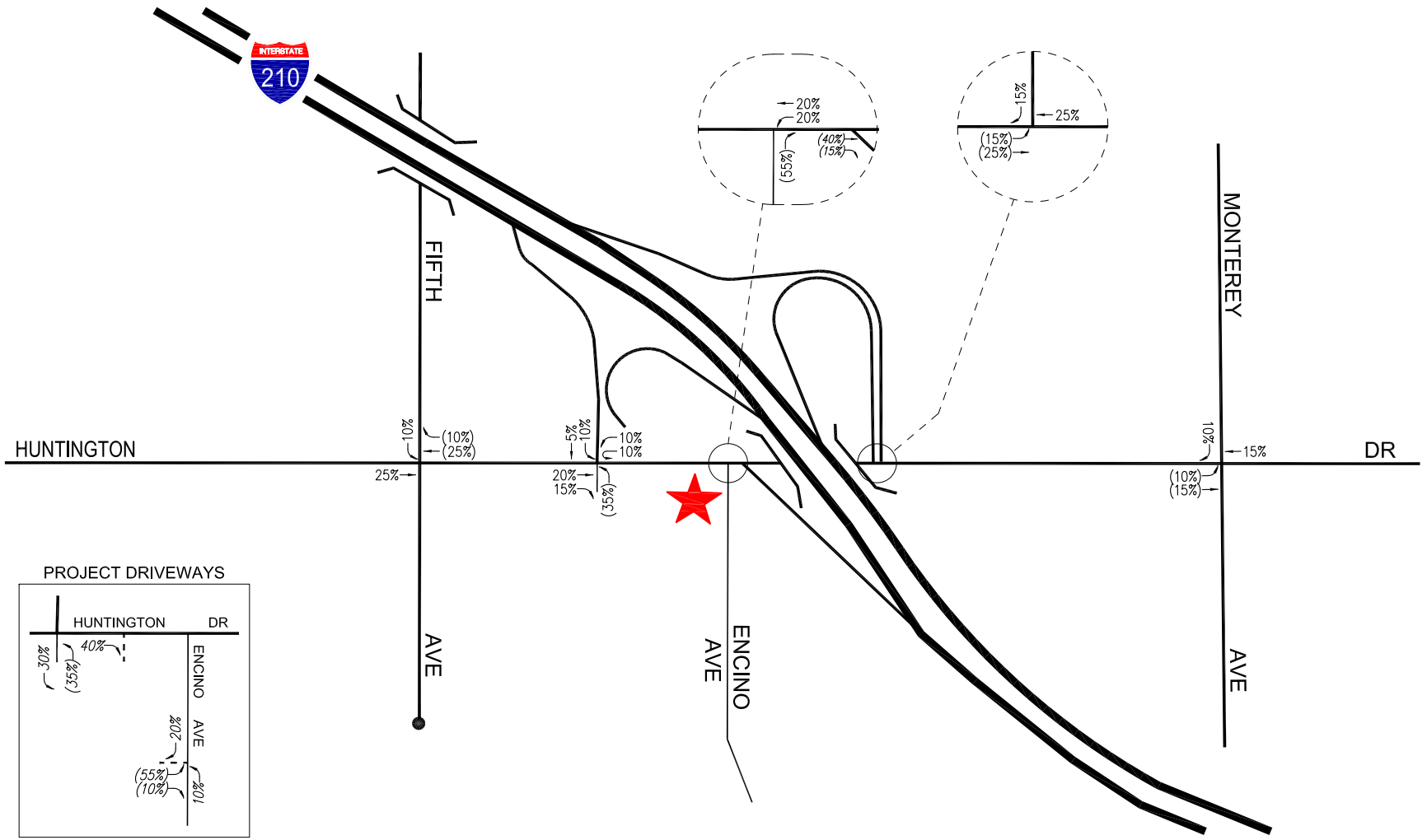
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2149	49	0	1284	0	55
Future Vol, veh/h	2149	49	0	1284	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2262	52	0	1352	0	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1157
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	-	-	0	-	0	*412
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*412
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	412	-	-	-
HCM Lane V/C Ratio	0.141	-	-	-
HCM Control Delay (s)	15.2	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.5	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



PROJECT DRIVEWAYS

NOT TO SCALE

PROJECT SITE
XX = INBOUND PERCENTAGES
(XX) = OUTBOUND PERCENTAGES

APPENDIX FIGURE H-1
PROJECT TRIP DISTRIBUTION

ALTERNATE SITE ACCESS SCHEME
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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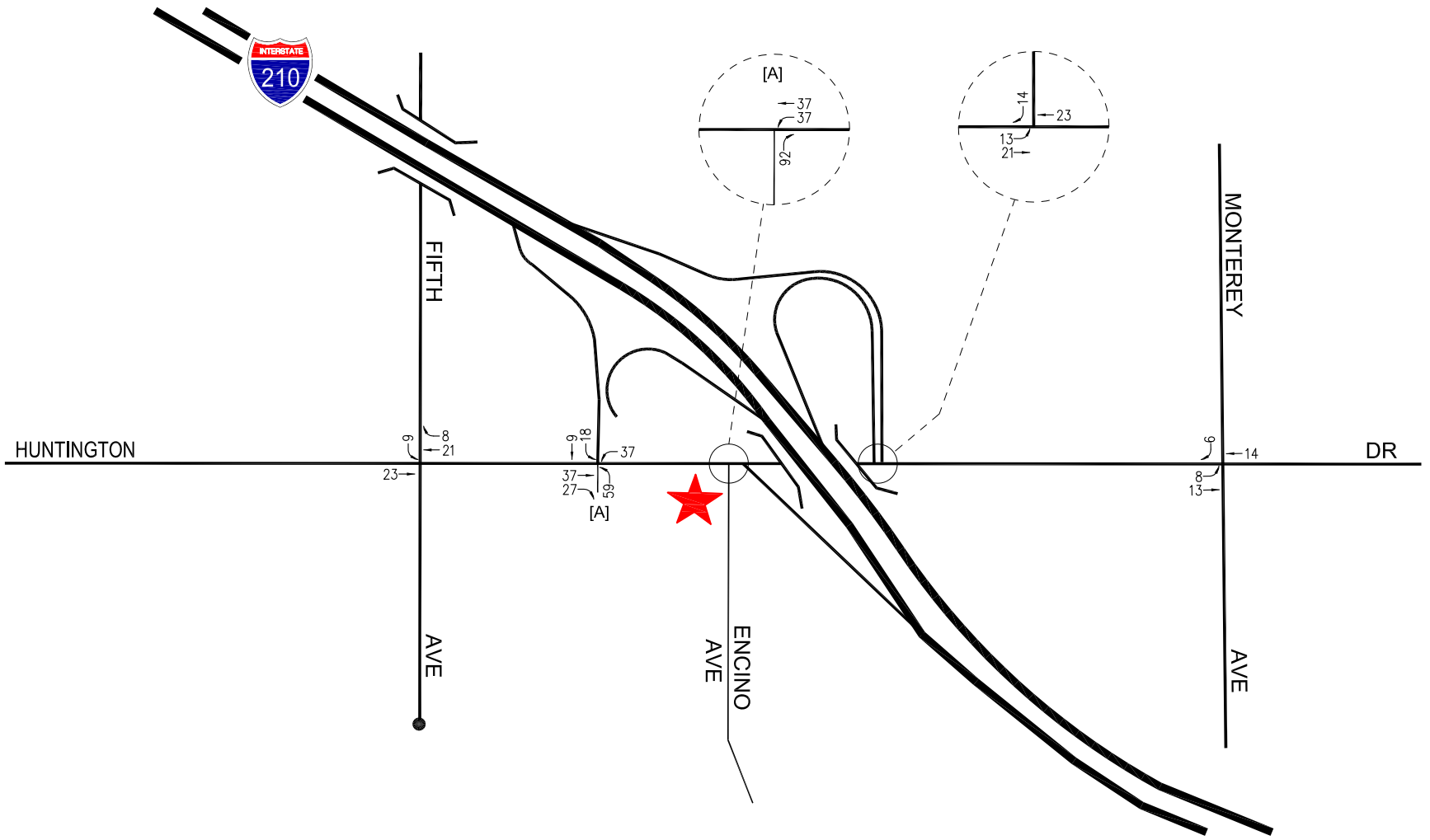

N

NOT TO SCALE

★ PROJECT SITE

[A] PASS-BY TRIP REDUCTIONS ARE NOT APPLIED TO INTERSECTIONS ADJACENT TO THE PROJECT SITE.

LINSCOTT, LAW & GREENSPAN, engineers

APPENDIX FIGURE H-2
PROJECT TRAFFIC VOLUMES
ALTERNATE SITE ACCESS SCHEME
WEEKDAY AM PEAK HOUR
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

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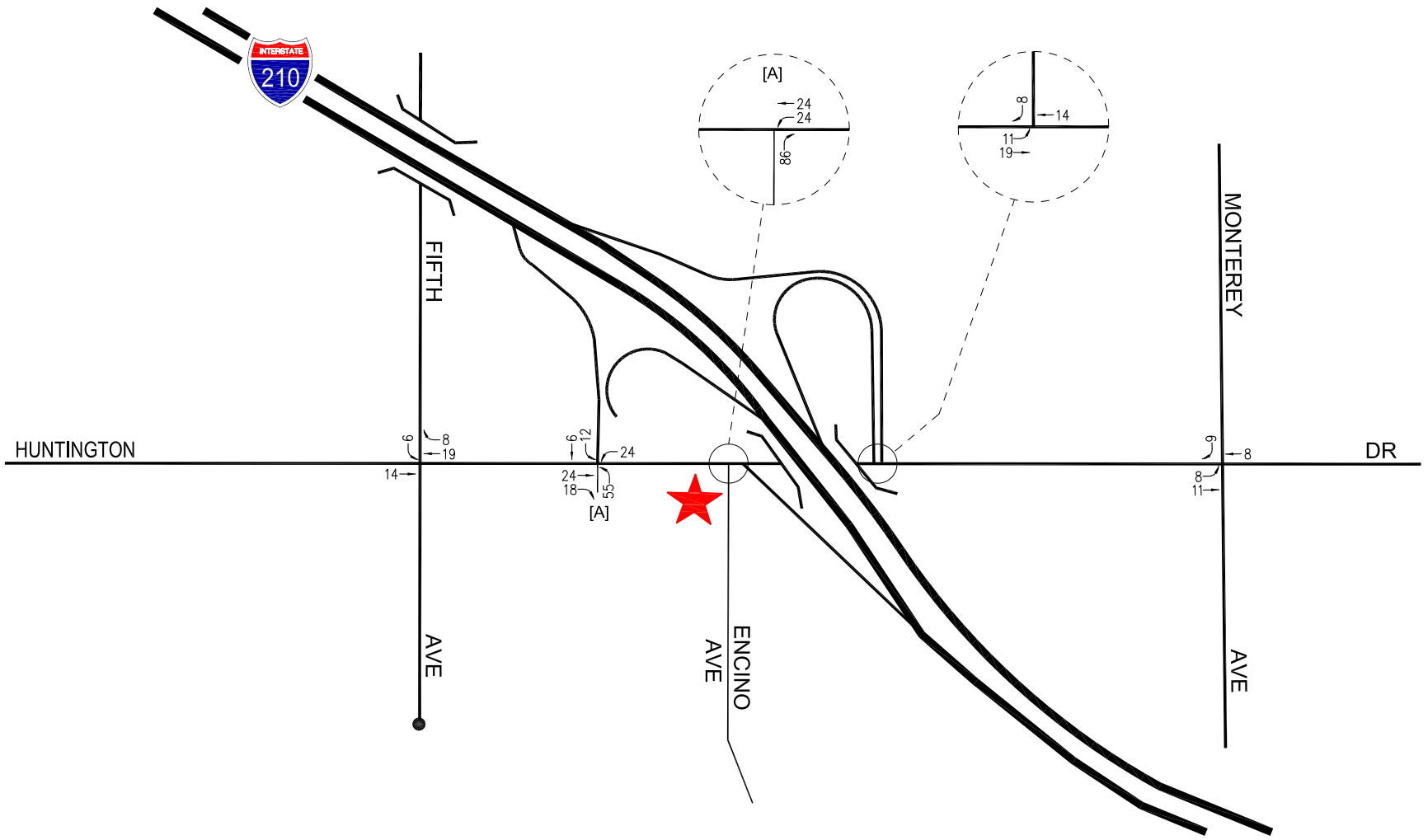

N

NOT TO SCALE

★ PROJECT SITE

[A] PASS-BY TRIP REDUCTIONS ARE NOT APPLIED TO INTERSECTIONS ADJACENT TO THE PROJECT SITE.

APPENDIX FIGURE H-3
PROJECT TRAFFIC VOLUMES
ALTERNATE SITE ACCESS SCHEME
WEEKDAY PM PEAK HOUR
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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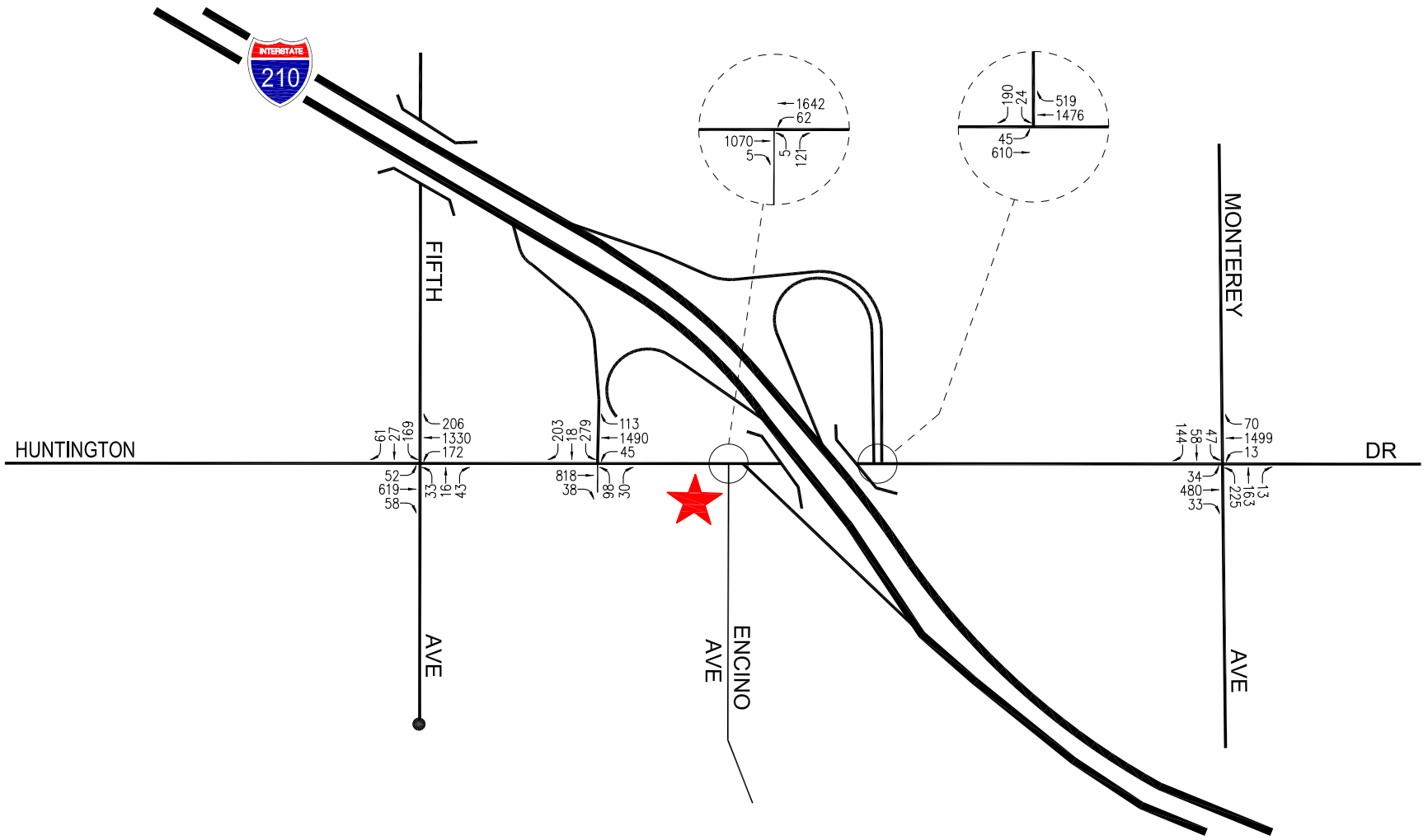

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE H-4
EXISTING WITH PROJECT TRAFFIC VOLUMES

ALTERNATE SITE ACCESS SCHEME
WEEKDAY AM PEAK HOUR
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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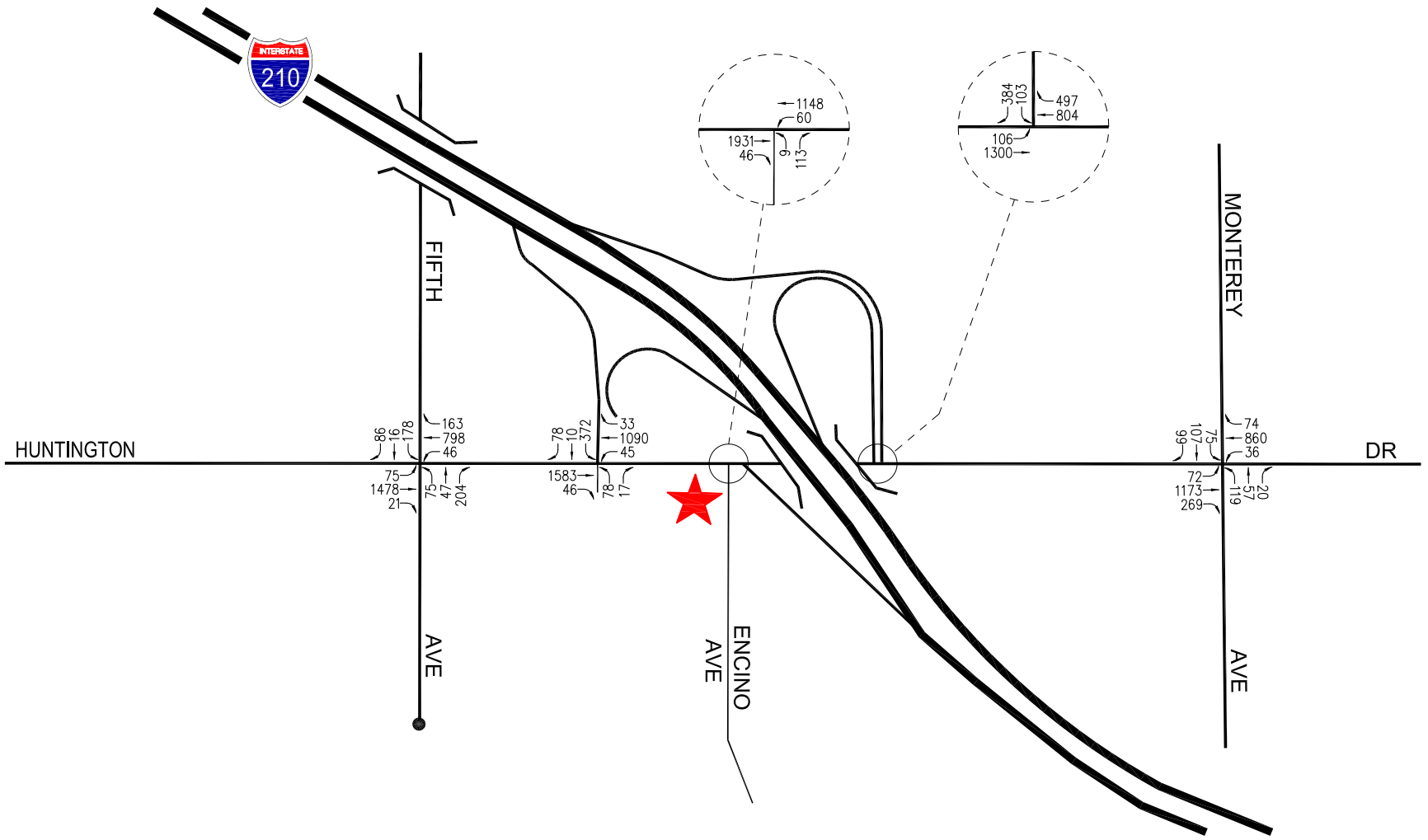

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE H-5
EXISTING WITH PROJECT TRAFFIC VOLUMES

ALTERNATE SITE ACCESS SCHEME
WEEKDAY PM PEAK HOUR
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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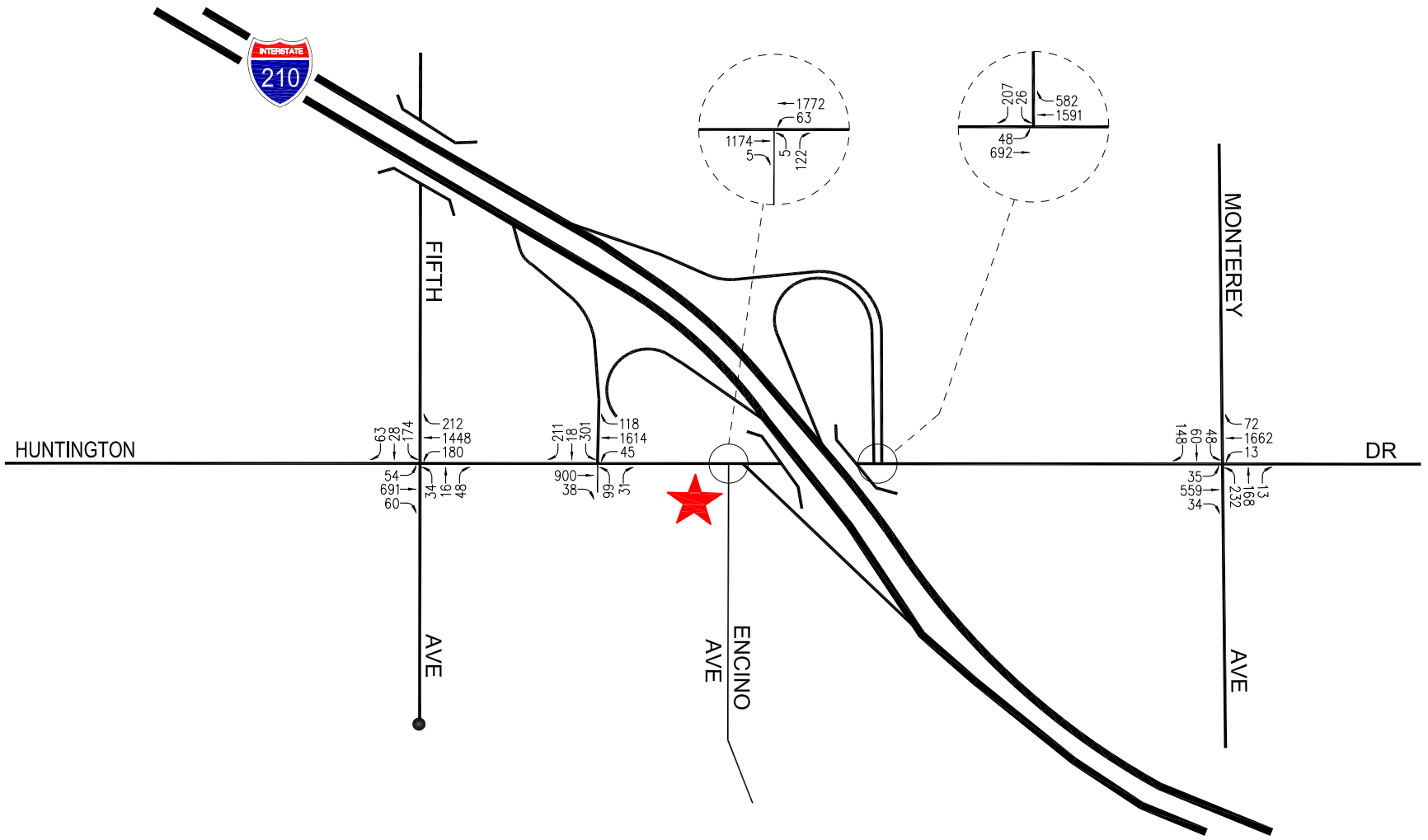

PROJECT SITE

NOT TO SCALE

APPENDIX FIGURE H-6
FUTURE WITH PROJECT TRAFFIC VOLUMES

ALTERNATE SITE ACCESS SCHEME
WEEKDAY AM PEAK HOUR
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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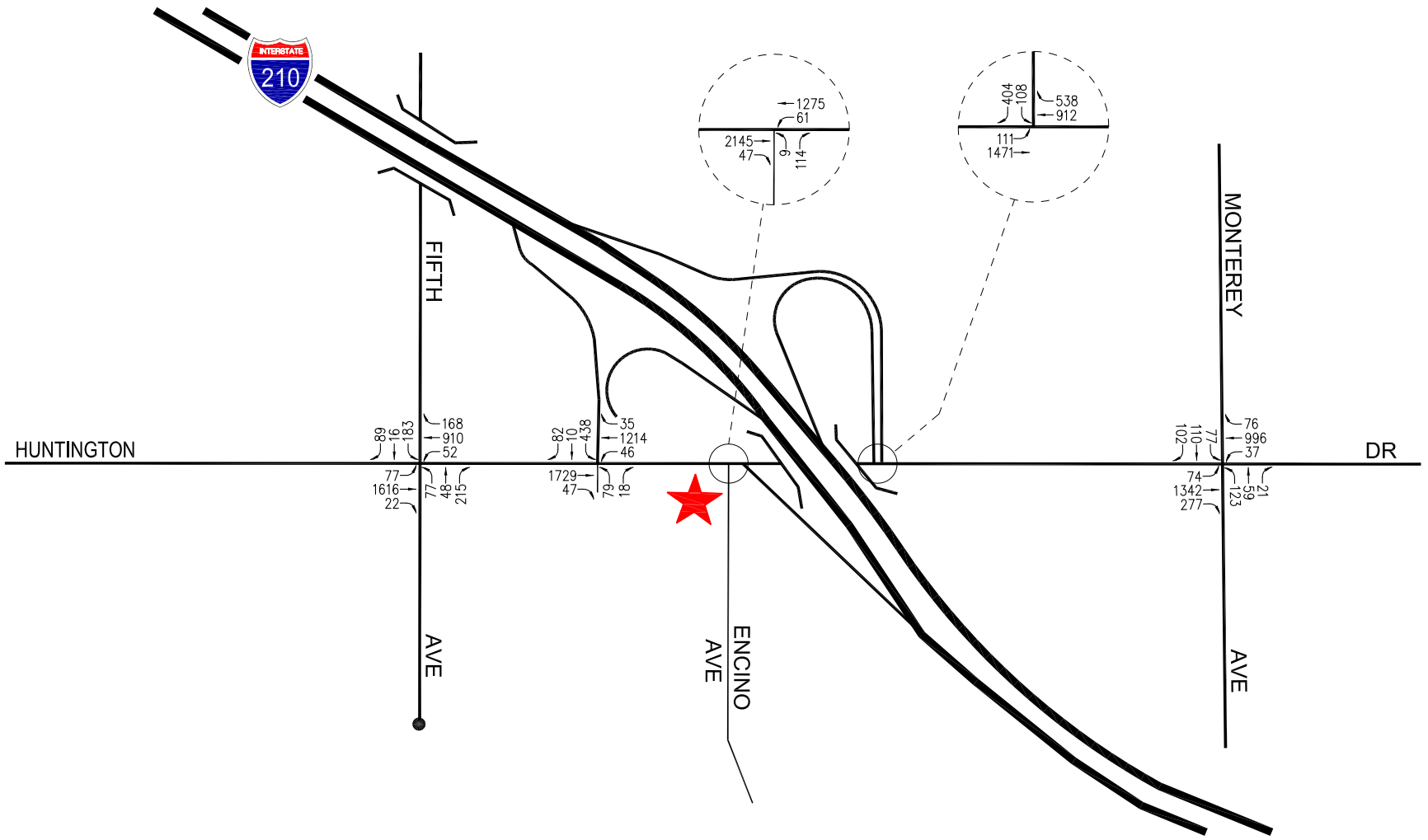

PROJECT SITE

N

NOT TO SCALE

APPENDIX FIGURE H-7
FUTURE WITH PROJECT TRAFFIC VOLUMES

ALTERNATE SITE ACCESS SCHEME
WEEKDAY PM PEAK HOUR
CHICK-FIL-A/STARBUCKS MONROVIA PROJECT

LINSCOTT, LAW & GREENSPAN, engineers

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Appendix Table H-1
SUMMARY OF VOLUME TO CAPACITY RATIOS, DELAYS, AND LEVELS OF SERVICE
WEEKDAY AM AND PM PEAK HOURS
Alternate Site Access Scheme

			[1]		[2]				[3]		[4]			
NO.	INTERSECTION	PEAK HOUR	YEAR 2020 EXISTING V/C or DELAY	LOS [a]	YEAR 2020 EXISTING W/ PROJECT V/C or Delay	LOS [a]	CHANGE V/C or DELAY [(2)-(1)]	IMPROVE-MENTS REQUIRED [b]	YEAR 2023 FUTURE PRE-PROJECT V/C or DELAY	LOS [a]	YEAR 2023 FUTURE W/ PROJECT V/C or DELAY	LOS [a]	CHANGE V/C or DELAY [(5)-(4)]	IMPROVE-MENTS REQUIRED [b]
1	Fifth Avenue/	AM	0.678	B	0.691	B	0.013	No	0.723	C	0.735	C	0.012	No
	Huntington Drive	PM	0.857	D	0.865	D	0.008	No	0.915	E	0.923	E	0.008	No
2	I-210 Freeway EB Ramps-Private Driveway/	AM	0.717	C	0.754	C	0.037	No	0.761	C	0.798	C	0.037	No
	Huntington Drive	PM	0.585	A	0.649	B	0.064	No	0.644	B	0.704	C	0.060	No
3	Encino Avenue/	AM	13.1	B	13.1	B	0.0	No	14.4	B	14.4	B	0.0	No
	Huntington Drive	PM	15.4	C	16.6	C	1.2	No	17.4	C	19.5	C	2.1	No
4	I-210 Freeway WB Ramps/	AM	0.644	B	0.664	B	0.020	No	0.688	B	0.708	C	0.020	No
	Huntington Drive	PM	0.636	B	0.646	B	0.010	No	0.674	B	0.683	B	0.009	No
5	Monterey Avenue/	AM	0.842	D	0.857	D	0.015	No	0.901	E	0.916	E	0.015	No
	Huntington Drive	PM	0.685	B	0.692	B	0.007	No	0.745	C	0.752	C	0.007	No

[a] Level of Service (LOS) is based on the reported *v/c* ratio for signalized intersections and the delay value for unsignalized intersections. LOS is thus defined as follows:

V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
0.000-0.600	0-15	A	>0.800-0.900	>25-35	D
>0.600-0.700	>10-15	B	>0.900-1.000	>35-50	E
>0.700-0.800	>15-25	C	>1.000	>50	F

[b] According to the City of Monrovia's *Transportation Study Guidelines,* an intersection will require improvement if the following conditions are met.

For signalized intersections:

- the addition of project traffic results in the intersections to change from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F); or
- the project-related increase in volume-to-capacity (v/c) is equal to or greater than 0.020 at an intersection that is projected to operate at LOS E with addition of project traffic; or
- the project-related increase in v/c is equal to or greater than 0.010 at an intersection that is projected to operate at LOS F with addition of project traffic.

For unsignalized intersections:

- the addition of project traffic to an intersection results in the degradation of overall intersection operations from acceptable operations (LOS D or better) to unacceptable operations (LOS E or F); and
- the intersection meets peak hour signal warrants either caused by project volumes, or the project volumes are added at an intersection that meets peak hour signal warrants in the baseline scenario(s).

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INTERSECTION CAPACITY UTILIZATION

Fifth Avenue @ Huntington Drive

N-S St: Fifth Avenue
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU1

Peak hr: AM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

Alternate Site Access Scheme

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	33	1600	0.021	0	33	1600	0.021	1	0	34	1600	0.021	0	34	1600	0.021
NB Thru	16	1600	0.037 *	0	16	1600	0.037 *	0	0	16	1600	0.040 *	0	16	1600	0.040 *
NB Right [3]	43	0	0.000	0	43	0	0.000	1	4	48	0	0.000	0	48	0	0.000
SB Left	160	1600	0.100 *	9	169	1600	0.106 *	5	0	165	1600	0.103 *	9	174	1600	0.109 *
SB Thru	27	1600	0.055	0	27	1600	0.055	1	0	28	1600	0.057	0	28	1600	0.057
SB Right	61	0	0.000	0	61	0	0.000	2	0	63	0	0.000	0	63	0	0.000
EB Left	52	1600	0.033 *	0	52	1600	0.033 *	2	0	54	1600	0.034 *	0	54	1600	0.034 *
EB Thru	596	3200	0.204	23	619	3200	0.212	18	54	668	3200	0.228	23	691	3200	0.235
EB Right	58	0	0.000	0	58	0	0.000	2	0	60	0	0.000	0	60	0	0.000
WB Left	172	1600	0.108	0	172	1600	0.108	5	3	180	1600	0.113	0	180	1600	0.113
WB Thru	1309	3200	0.409 *	21	1330	3200	0.416 *	40	78	1427	3200	0.446 *	21	1448	3200	0.453 *
WB Right	198	1600	0.124	8	206	1600	0.129	6	0	204	1600	0.128	8	212	1600	0.133
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.678				0.691					0.723				0.735
LOS			B				B					C				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: City Count, LLC
2 Capacity expressed in veh/hour of green
3 No Right-Turn on Red

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INTERSECTION CAPACITY UTILIZATION

Fifth Avenue @ Huntington Drive

N-S St: Fifth Avenue
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU1

Peak hr: PM
Annual Growth: 1.00%

Alternate Site Access Scheme

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	75	1600	0.047	0	75	1600	0.047	2	0	77	1600	0.048	0	77	1600	0.048
NB Thru	47	1600	0.157 *	0	47	1600	0.157 *	1	0	48	1600	0.164 *	0	48	1600	0.164 *
NB Right [3]	204	0	0.000	0	204	0	0.000	6	5	215	0	0.000	0	215	0	0.000
SB Left	172	1600	0.108 *	6	178	1600	0.111 *	5	0	177	1600	0.111 *	6	183	1600	0.114 *
SB Thru	16	1600	0.064	0	16	1600	0.064	0	0	16	1600	0.066	0	16	1600	0.066
SB Right	86	0	0.000	0	86	0	0.000	3	0	89	0	0.000	0	89	0	0.000
EB Left	75	1600	0.047	0	75	1600	0.047	2	0	77	1600	0.048	0	77	1600	0.048
EB Thru	1464	3200	0.464 *	14	1478	3200	0.468 *	44	94	1602	3200	0.508 *	14	1616	3200	0.512 *
EB Right	21	0	0.000	0	21	0	0.000	1	0	22	0	0.000	0	22	0	0.000
WB Left	46	1600	0.029 *	0	46	1600	0.029 *	1	5	52	1600	0.033 *	0	52	1600	0.033 *
WB Thru	779	3200	0.243	19	798	3200	0.249	24	88	891	3200	0.278	19	910	3200	0.284
WB Right	155	1600	0.097	8	163	1600	0.102	5	0	160	1600	0.100	8	168	1600	0.105
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.857				0.865					0.915				0.923
LOS			D				D					E				E

* *Key conflicting movement as a part of ICU*
1 Counts conducted by: City Count, LLC
2 Capacity expressed in veh/hour of green
3 No Right-Turn on Red

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway EB Ramps-Private Driveway @ Huntington Drive

N-S St:	I-210 Freeway EB Ramps-Private Driveway	Peak hr: AM	Date: 3/10/2021
E-W St:	Huntington Drive	Annual Growth: 1.00%	Existing Year: 2020
Project:	Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1		Projection Year: 2023
File:	ICU2	***Alternate Site Access Scheme***	

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left [3]	39	1600	0.024 *	59	98	1600	0.061 *	1	0	40	1600	0.025 *	59	99	1600	0.062 *
NB Thru [3]	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right [3]	30	1600	0.019	0	30	1600	0.019	1	0	31	1600	0.019	0	31	1600	0.019
SB Left [3]	261	0	0.091	18	279	0	0.097	8	14	283	0	0.098	18	301	0	0.105
SB Thru [3]	9	2880	0.094	9	18	2880	0.103	0	0	9	2880	0.101	9	18	2880	0.111
SB Right [3]	203	1600	0.127 *	0	203	1600	0.127 *	6	2	211	1600	0.132 *	0	211	1600	0.132 *
EB Left	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0	0.000 *	0	0	0	0.000 *
EB Thru	781	4800	0.165	37	818	4800	0.178	24	58	863	4800	0.182	37	900	4800	0.195
EB Right	11	0	0.000	27	38	0	0.000	0	0	11	0	0.000	27	38	0	0.000
WB Left	8	1600	0.005	37	45	1600	0.028	0	0	8	1600	0.005	37	45	1600	0.028
WB Thru	1490	3200	0.466 *	0	1490	3200	0.466 *	45	79	1614	3200	0.504 *	0	1614	3200	0.504 *
WB Right [4]	113	1600	0.000	0	113	1600	0.000	3	2	118	1600	0.000	0	118	1600	0.000
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.717				0.754					0.761				0.798
LOS			C				C					C				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green
3 Split-phase operation.
4 Free Flow movement

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway EB Ramps-Private Driveway @ Huntington Drive

N-S St:	I-210 Freeway EB Ramps-Private Driveway	Peak hr: PM	Date: 3/10/2021
E-W St:	Huntington Drive	Annual Growth: 1.00%	Existing Year: 2020
Project:	Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1		Projection Year: 2023
File:	ICU2	***Alternate Site Access Scheme***	

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left [3]	23	1600	0.014 *	55	78	1600	0.049 *	1	0	24	1600	0.015 *	55	79	1600	0.049 *
NB Thru [3]	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right [3]	17	1600	0.011	0	17	1600	0.011	1	0	18	1600	0.011	0	18	1600	0.011
SB Left [3]	360	0	0.125	12	372	0	0.129	11	55	426	0	0.148	12	438	0	0.152
SB Thru [3]	4	2880	0.126 *	6	10	2880	0.133 *	0	0	4	2880	0.149 *	6	10	2880	0.156 *
SB Right [3]	78	1600	0.049	0	78	1600	0.049	2	2	82	1600	0.051	0	82	1600	0.051
EB Left	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000 *	0	0	0	0.000
EB Thru	1559	4800	0.331 *	24	1583	4800	0.339 *	47	99	1705	4800	0.361	24	1729	4800	0.370 *
EB Right	28	0	0.000	18	46	0	0.000	1	0	29	0	0.000	18	47	0	0.000
WB Left	21	1600	0.013 *	24	45	1600	0.028 *	1	0	22	1600	0.014	24	46	1600	0.029 *
WB Thru	1090	3200	0.341	0	1090	3200	0.341	33	91	1214	3200	0.379 *	0	1214	3200	0.379
WB Right [4]	33	1600	0.000	0	33	1600	0.000	1	1	35	1600	0.000	0	35	1600	0.000
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.585				0.649					0.644				0.704
LOS			A				B					B				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green
3 Split-phase operation.
4 Free Flow movement

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1070	5	62	1642	5	121
Future Vol, veh/h	1070	5	62	1642	5	121
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1126	5	65	1728	5	127

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1141	0	2133	576
Stage 1	-	-	-	-	1139	-
Stage 2	-	-	-	-	994	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*846	-	*190	*673
Stage 1	-	-	-	-	*719	-
Stage 2	-	-	-	-	*371	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*835	-	*173	*664
Mov Cap-2 Maneuver	-	-	-	-	*173	-
Stage 1	-	-	-	-	*710	-
Stage 2	-	-	-	-	*342	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	597	-	-	* 835	-
HCM Lane V/C Ratio	0.222	-	-	0.078	-
HCM Control Delay (s)	12.7	-	-	9.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1931	46	60	1148	9	113
Future Vol, veh/h	1931	46	60	1148	9	113
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2033	48	63	1208	9	119

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2091	0	2797	1051
Stage 1	-	-	-	-	2067	-
Stage 2	-	-	-	-	730	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*600	-	*270	*477
Stage 1	-	-	-	-	*510	-
Stage 2	-	-	-	-	*557	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*593	-	*238	*471
Mov Cap-2 Maneuver	-	-	-	-	*238	-
Stage 1	-	-	-	-	*504	-
Stage 2	-	-	-	-	*498	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	439	-	-	* 593	-
HCM Lane V/C Ratio	0.293	-	-	0.107	-
HCM Control Delay (s)	16.6	-	-	11.8	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.2	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1174	5	63	1772	5	122
Future Vol, veh/h	1174	5	63	1772	5	122
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1236	5	66	1865	5	128

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1251	0	2314	631
Stage 1	-	-	-	-	1249	-
Stage 2	-	-	-	-	1065	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*819	-	*121	*651
Stage 1	-	-	-	-	*696	-
Stage 2	-	-	-	-	*301	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*808	-	*109	*643
Mov Cap-2 Maneuver	-	-	-	-	*109	-
Stage 1	-	-	-	-	*687	-
Stage 2	-	-	-	-	*277	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	539	-	-	* 808	-
HCM Lane V/C Ratio	0.248	-	-	0.082	-
HCM Control Delay (s)	13.9	-	-	9.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2145	47	61	1275	9	114
Future Vol, veh/h	2145	47	61	1275	9	114
Conflicting Peds, #/hr	0	10	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	73	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2258	49	64	1342	9	120

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2317	0	3092	1164
Stage 1	-	-	-	-	2293	-
Stage 2	-	-	-	-	799	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	*518	-	*223	*412
Stage 1	-	-	-	-	*441	-
Stage 2	-	-	-	-	*510	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	*512	-	*193	*407
Mov Cap-2 Maneuver	-	-	-	-	*193	-
Stage 1	-	-	-	-	*435	-
Stage 2	-	-	-	-	*446	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	376	-	-	* 512	-
HCM Lane V/C Ratio	0.344	-	-	0.125	-
HCM Control Delay (s)	19.5	-	-	13	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.5	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway WB Ramps @ Huntington Drive

N-S St: I-210 Freeway WB Ramps
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU4

Peak hr: AM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

Alternate Site Access Scheme

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0	0.000 *	0	0	0	0.000 *
NB Thru	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
SB Left	24	0	0.008	0	24	0	0.008	1	1	26	0	0.009	0	26	0	0.009
SB Thru	0	2880	0.069 *	0	0	2880	0.074 *	0	0	0	2880	0.076 *	0	0	2880	0.081 *
SB Right	176	0	0.000	14	190	0	0.000	5	12	193	0	0.000	14	207	0	0.000
EB Left	32	1600	0.020 *	13	45	1600	0.028 *	1	2	35	1600	0.022 *	13	48	1600	0.030 *
EB Thru	589	4800	0.123	21	610	4800	0.127	18	64	671	4800	0.140	21	692	4800	0.144
EB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Left	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Thru	1453	3200	0.454 *	23	1476	3200	0.461 *	44	71	1568	3200	0.490 *	23	1591	3200	0.497 *
WB Right	519	1600	0.324	0	519	1600	0.324	16	47	582	1600	0.364	0	582	1600	0.364
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.644				0.664					0.688				0.708
LOS			B				B					B				C

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
2 Capacity expressed in veh/hour of green

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INTERSECTION CAPACITY UTILIZATION

I-210 Freeway WB Ramps @ Huntington Drive

N-S St: I-210 Freeway WB Ramps
E-W St: Huntington Drive
Project: Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1
File: ICU4

Peak hr: PM
Annual Growth: 1.00%

Date: 3/10/2021
Existing Year: 2020
Projection Year: 2023

Alternate Site Access Scheme

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	0	0	0.000 *	0	0	0	0.000 *	0	0	0	0	0.000 *	0	0	0	0.000 *
NB Thru	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
NB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
SB Left	103	0	0.036	0	103	0	0.036	3	2	108	0	0.038	0	108	0	0.038
SB Thru	0	2880	0.166 *	0	0	2880	0.169 *	0	0	0	2880	0.175 *	0	0	2880	0.178 *
SB Right	376	0	0.000	8	384	0	0.000	11	9	396	0	0.000	8	404	0	0.000
EB Left	95	1600	0.059 *	11	106	1600	0.066 *	3	2	100	1600	0.063 *	11	111	1600	0.069 *
EB Thru	1281	4800	0.267	19	1300	4800	0.271	39	132	1452	4800	0.303	19	1471	4800	0.306
EB Right	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Left	0	0	0.000	0	0	0	0.000	0	0	0	0	0.000	0	0	0	0.000
WB Thru	790	3200	0.247	14	804	3200	0.251	24	84	898	3200	0.281	14	912	3200	0.285
WB Right	497	1600	0.311 *	0	497	1600	0.311 *	15	26	538	1600	0.336 *	0	538	1600	0.336 *
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.636				0.646					0.674				0.683
LOS			B				B					B				B

** Key conflicting movement as a part of ICU*
1 Counts conducted by: National Data & Surveying Services
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INTERSECTION CAPACITY UTILIZATION

Monterey Avenue @ Huntington Drive

N-S St:	Monterey Avenue	Peak hr:	AM
E-W St:	Huntington Drive	Annual Growth:	1.00%
Project:	Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1		
File:	ICU5		

Date:	3/10/2021
Existing Year:	2020
Projection Year:	2023

Alternate Site Access Scheme

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	225	1600	0.141 *	0	225	1600	0.141 *	7	0	232	1600	0.145 *	0	232	1600	0.145 *
NB Thru	163	1600	0.110	0	163	1600	0.110	5	0	168	1600	0.113	0	168	1600	0.113
NB Right	13	0	0.000	0	13	0	0.000	0	0	13	0	0.000	0	13	0	0.000
SB Left	47	1600	0.029	0	47	1600	0.029	1	0	48	1600	0.030	0	48	1600	0.030
SB Thru	58	1600	0.121 *	0	58	1600	0.126 *	2	0	60	1600	0.124 *	0	60	1600	0.130 *
SB Right	135	0	0.000	9	144	0	0.000	4	0	139	0	0.000	9	148	0	0.000
EB Left	26	1600	0.016 *	8	34	1600	0.021 *	1	0	27	1600	0.017 *	8	35	1600	0.022 *
EB Thru	467	3200	0.146	13	480	3200	0.150	14	65	546	3200	0.171	13	559	3200	0.175
EB Right	33	1600	0.021	0	33	1600	0.021	1	0	34	1600	0.021	0	34	1600	0.021
WB Left	13	1600	0.008	0	13	1600	0.008	0	0	13	1600	0.008	0	13	1600	0.008
WB Thru	1485	3200	0.464 *	14	1499	3200	0.468 *	45	118	1648	3200	0.515 *	14	1662	3200	0.519 *
WB Right	70	1600	0.044	0	70	1600	0.044	2	0	72	1600	0.045	0	72	1600	0.045
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.842				0.857					0.901				0.916
LOS			D				D					E				E

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

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INTERSECTION CAPACITY UTILIZATION

Monterey Avenue @ Huntington Drive

N-S St:	Monterey Avenue	Peak hr: PM	Date: 3/10/2021
E-W St:	Huntington Drive	Annual Growth: 1.00%	Existing Year: 2020
Project:	Chick-fil-A/Starbucks Monrovia Project/1-20-4393-1		Projection Year: 2023
File:	ICU5	***Alternate Site Access Scheme***	

	2020 EXISTING TRAFFIC			2020 EXISTING WITH PROJECT				2023 FUTURE PRE-PROJECT					2023 FUTURE WITH PROJECT			
Movement	1 Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio	Added Amb. Grow. Volume	Added Rel. Proj. Volume	Total Volume	2 Capacity	V/C Ratio	Added Volume	Total Volume	2 Capacity	V/C Ratio
NB Left	119	1600	0.074 *	0	119	1600	0.074 *	4	0	123	1600	0.077 *	0	123	1600	0.077 *
NB Thru	57	1600	0.048	0	57	1600	0.048	2	0	59	1600	0.050	0	59	1600	0.050
NB Right	20	0	0.000	0	20	0	0.000	1	0	21	0	0.000	0	21	0	0.000
SB Left	75	1600	0.047	0	75	1600	0.047	2	0	77	1600	0.048	0	77	1600	0.048
SB Thru	107	1600	0.125 *	0	107	1600	0.129 *	3	0	110	1600	0.129 *	0	110	1600	0.133 *
SB Right	93	0	0.000	6	99	0	0.000	3	0	96	0	0.000	6	102	0	0.000
EB Left	64	1600	0.040	8	72	1600	0.045	2	0	66	1600	0.041	8	74	1600	0.046
EB Thru	1162	3200	0.363 *	11	1173	3200	0.367 *	35	134	1331	3200	0.416 *	11	1342	3200	0.419 *
EB Right	269	1600	0.168	0	269	1600	0.168	8	0	277	1600	0.173	0	277	1600	0.173
WB Left	36	1600	0.023 *	0	36	1600	0.023 *	1	0	37	1600	0.023 *	0	37	1600	0.023 *
WB Thru	852	3200	0.266	8	860	3200	0.269	26	110	988	3200	0.309	8	996	3200	0.311
WB Right	74	1600	0.046	0	74	1600	0.046	2	0	76	1600	0.048	0	76	1600	0.048
Yellow Allowance			0.100 *				0.100 *					0.100 *				0.100 *
ICU			0.685				0.692					0.745				0.752
LOS			B				B					C				C

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

APPENDIX I

CALTRANS HCM OFF-RAMP QUEUING WORKSHEETS

LEVEL OF SERVICE FOR UNSIGNALIZED INTERSECTIONS

In the *Highway Capacity Manual (HCM)*, published by the Transportation Research Board, level of service for unsignalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, in the absence of incidents, control, traffic, or geometric delay. Only the portion of total delay attributed to the traffic control measures, either traffic signals or stop signs, is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Level of Service criteria for unsignalized intersections are stated in terms of the average control delay per vehicle. The level of service is determined by the computed or measured control delay and is defined for each minor movement. Average control delay for any particular minor movement is a function of the service time for the approach and the degree of utilization. (Level of service is not defined for the intersection as a whole for two-way stop controlled intersections.)

Level of Service Criteria for TWSC/AWSC Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Level of Service (LOS) values are used to describe intersection operations with service levels varying from LOS A (free flow) to LOS F (jammed condition). The following descriptions summarize *HCM* criteria for each level of service:

LOS A describes operations with very low control delay, up to 10 seconds per vehicle.

LOS B describes operations with control delay greater than 10 and up to 15 seconds per vehicle.

LOS C describes operations with control delay greater than 15 and up to 25 seconds per vehicle.

LOS D describes operations with control delay greater than 25 and up to 35 seconds per vehicle.

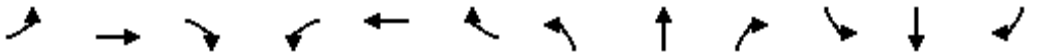
LOS E describes operations with control delay greater than 35 and up to 50 seconds per vehicle.

LOS F describes operations with control delay in excess of 50 seconds per vehicle. For two-way stop controlled intersections, LOS F exists when there are insufficient gaps of suitable size to allow side-street demand to safely cross through a major-street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches.

Appendix Table I-1
TABULATION OF OFF-RAMP VEHICLE QUEUING [1]
WEEKDAY AM AND PM PEAK HOURS

INT. NO.	OFF-RAMP LOCATION	PEAK HOUR	LANE GROUP MOVEMENT [2]	NO. OF LANES [2]	EXISTING YEAR 2020		EXISTING YEAR 2020 WITH PROJECT		FUTURE YEAR 2023 WITHOUT PROJECT		FUTURE YEAR 2023 WITH PROJECT	
					MAXIMUM BACK OF QUEUE [3] (Veh.)	MAXIMUM TOTAL QUEUE [4] (Veh.)	MAXIMUM BACK OF QUEUE [3] (Veh.)	MAXIMUM TOTAL QUEUE [4] (Veh.)	MAXIMUM BACK OF QUEUE [3] (Veh.)	MAXIMUM TOTAL QUEUE [4] (Veh.)	MAXIMUM BACK OF QUEUE [3] (Veh.)	MAXIMUM TOTAL QUEUE [4] (Veh.)
2	I-210 Freeway EB Off-Ramp-Private Driveway/ Huntington Drive	AM	SB Left	2	6.8	13.6	7.5	15.0	7.4	14.8	8.0	16.0
			SB Right	1	10.7	10.7	10.7	10.7	11.0	11.0	11.0	11.0
			Total AM Queuing			24.3		25.7		25.8		27.0
		PM	SB Left	2	9.4	18.8	9.8	19.6	10.8	21.6	11.1	22.2
			SB Right	1	4.1	4.1	4.0	4.0	4.2	4.2	4.1	4.1
			Total PM Queuing			22.9		23.6		25.8		26.3
4	I-210 Freeway WB Off-Ramp/ Huntington Drive	AM	SB Right	2	5.0	10.0	5.4	10.8	5.5	11.0	5.9	11.8
			Total AM Queuing			10.0		10.8		11.0		11.8
		PM	SB Left	1	14.8	14.8	15.1	15.1	15.5	15.5	15.8	15.8
			SB Right	1	11.6	11.6	11.7	11.7	12.1	12.1	12.2	12.2
			Total PM Queuing			26.4		26.8		27.6		28.0

[1] Queues calculated herein are utilized in the off-ramp queuing analysis presented in Table 6-1.
[2] Off-ramp movements and lane geometry assumptions based on the results of the shared-lane volume balancing procedure provided by the Synchro 11 software.
[3] The 95th percentile queue (in vehicles) as reported by the HCM methodology reflects the maximum back of queue for the lane with the highest queue in the lane group. Refer to the analysis worksheets contained in *Appendix I.*
[4] The 95th percentile maximum queue was obtained by multiplying the reported queue by the number of lanes in the lane group. The total peak hour queue was obtained by summing all lane group queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	781	11	8	1490	113	39	0	30	261	9	203
Future Volume (veh/h)	0	781	11	8	1490	113	39	0	30	261	9	203
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	822	12	8	1568	0	41	0	32	281	0	214
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3172	46	414	2174		135	0	120	622	0	272
Arrive On Green	0.00	0.61	0.61	1.00	1.00	0.00	0.08	0.00	0.08	0.17	0.00	0.17
Sat Flow, veh/h	0	5353	76	658	3554	1648	1781	0	1585	3563	0	1558
Grp Volume(v), veh/h	0	539	295	8	1568	0	41	0	32	281	0	214
Grp Sat Flow(s),veh/h/ln	0	1702	1856	658	1777	1648	1781	0	1585	1781	0	1558
Q Serve(g_s), s	0.0	8.8	8.8	0.2	0.0	0.0	2.6	0.0	2.3	8.5	0.0	15.8
Cycle Q Clear(g_c), s	0.0	8.8	8.8	9.0	0.0	0.0	2.6	0.0	2.3	8.5	0.0	15.8
Prop In Lane	0.00		0.04	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2083	1136	414	2174		135	0	120	622	0	272
V/C Ratio(X)	0.00	0.26	0.26	0.02	0.72		0.30	0.00	0.27	0.45	0.00	0.79
Avail Cap(c_a), veh/h	0	2083	1136	414	2174		238	0	211	1054	0	461
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.7	10.7	0.5	0.0	0.0	52.4	0.0	52.3	44.4	0.0	47.4
Incr Delay (d2), s/veh	0.0	0.3	0.6	0.1	2.1	0.0	1.2	0.0	1.2	0.7	0.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	5.8	6.5	0.0	1.1	0.0	2.2	0.0	1.7	6.8	0.0	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.0	11.3	0.6	2.1	0.0	53.7	0.0	53.4	45.0	0.0	53.8
LnGrp LOS	A	B	B	A	A		D	A	D	D	A	D
Approach Vol, veh/h		834			1576	A		73			495	
Approach Delay, s/veh		11.1			2.1			53.6			48.8	
Approach LOS		B			A			D			D	

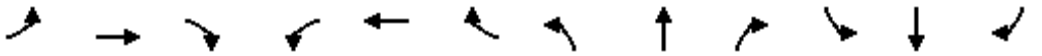
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	79.4	26.5	79.4	14.1
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	52.0	35.5	52.0	16.0
Max Q Clear Time (g_c+I1), s	10.8	17.8	11.0	4.6
Green Ext Time (p_c), s	9.1	2.2	24.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1559	28	21	1090	33	23	0	17	360	4	78
Future Volume (veh/h)	0	1559	28	21	1090	33	23	0	17	360	4	78
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	1641	29	22	1147	0	24	0	18	382	0	82
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3353	59	204	2306		112	0	100	537	0	234
Arrive On Green	0.00	0.65	0.65	1.00	1.00	0.00	0.06	0.00	0.06	0.15	0.00	0.15
Sat Flow, veh/h	0	5335	91	297	3554	1648	1781	0	1585	3563	0	1553
Grp Volume(v), veh/h	0	1081	589	22	1147	0	24	0	18	382	0	82
Grp Sat Flow(s),veh/h/ln	0	1702	1853	297	1777	1648	1781	0	1585	1781	0	1553
Q Serve(g_s), s	0.0	19.6	19.6	2.5	0.0	0.0	1.5	0.0	1.3	12.2	0.0	5.7
Cycle Q Clear(g_c), s	0.0	19.6	19.6	22.1	0.0	0.0	1.5	0.0	1.3	12.2	0.0	5.7
Prop In Lane	0.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2209	1203	204	2306		112	0	100	537	0	234
V/C Ratio(X)	0.00	0.49	0.49	0.11	0.50		0.21	0.00	0.18	0.71	0.00	0.35
Avail Cap(c_a), veh/h	0	2209	1203	204	2306		238	0	211	1351	0	589
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.8	10.8	2.8	0.0	0.0	53.4	0.0	53.3	48.5	0.0	45.7
Incr Delay (d2), s/veh	0.0	0.8	1.4	1.1	0.8	0.0	0.9	0.0	0.9	2.3	0.0	1.2
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(95%),veh/ln	0.0	11.4	12.5	0.3	0.4	0.0	1.3	0.0	1.0	9.4	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.6	12.3	3.8	0.8	0.0	54.4	0.0	54.2	50.7	0.0	46.8
LnGrp LOS	A	B	B	A	A		D	A	D	D	A	D
Approach Vol, veh/h		1670			1169	A		42			464	
Approach Delay, s/veh		11.8			0.8			54.3			50.1	
Approach LOS		B			A			D			D	

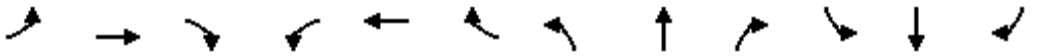
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	83.9	23.6	83.9	12.5
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	42.0	45.5	42.0	16.0
Max Q Clear Time (g_c+I1), s	21.6	14.2	24.1	3.5
Green Ext Time (p_c), s	14.6	2.4	10.5	0.1

Intersection Summary	
HCM 6th Ctrl Delay	13.8
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	818	38	45	1490	113	98	0	30	279	18	203
Future Volume (veh/h)	0	818	38	45	1490	113	98	0	30	279	18	203
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	861	40	47	1568	0	103	0	32	308	0	214
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3023	140	383	2149		147	0	131	625	0	273
Arrive On Green	0.00	0.60	0.60	1.00	1.00	0.00	0.08	0.00	0.08	0.18	0.00	0.18
Sat Flow, veh/h	0	5168	232	618	3554	1648	1781	0	1585	3563	0	1558
Grp Volume(v), veh/h	0	586	315	47	1568	0	103	0	32	308	0	214
Grp Sat Flow(s),veh/h/ln	0	1702	1827	618	1777	1648	1781	0	1585	1781	0	1558
Q Serve(g_s), s	0.0	9.9	9.9	1.4	0.0	0.0	6.8	0.0	2.3	9.4	0.0	15.8
Cycle Q Clear(g_c), s	0.0	9.9	9.9	11.3	0.0	0.0	6.8	0.0	2.3	9.4	0.0	15.8
Prop In Lane	0.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2058	1105	383	2149		147	0	131	625	0	273
V/C Ratio(X)	0.00	0.28	0.29	0.12	0.73		0.70	0.00	0.24	0.49	0.00	0.78
Avail Cap(c_a), veh/h	0	2058	1105	383	2149		238	0	211	1054	0	461
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.3	11.3	0.8	0.0	0.0	53.6	0.0	51.6	44.7	0.0	47.3
Incr Delay (d2), s/veh	0.0	0.3	0.6	0.7	2.2	0.0	6.0	0.0	1.0	0.8	0.0	6.2
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(95%),veh/ln	0.0	6.6	7.3	0.1	1.2	0.0	5.9	0.0	1.7	7.5	0.0	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.7	12.0	1.4	2.2	0.0	59.6	0.0	52.5	45.4	0.0	53.5
LnGrp LOS	A	B	B	A	A		E	A	D	D	A	D
Approach Vol, veh/h		901			1615	A		135			522	
Approach Delay, s/veh		11.8			2.2			57.9			48.7	
Approach LOS		B			A			E			D	

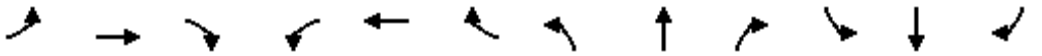
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.6	26.6	78.6	14.9
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	52.0	35.5	52.0	16.0
Max Q Clear Time (g_c+I1), s	11.9	17.8	13.3	8.8
Green Ext Time (p_c), s	10.1	2.4	23.9	0.3

Intersection Summary	
HCM 6th Ctrl Delay	14.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1583	46	45	1090	33	78	0	17	372	10	78
Future Volume (veh/h)	0	1583	46	45	1090	33	78	0	17	372	10	78
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	1666	48	47	1147	0	82	0	18	400	0	82
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3196	92	187	2227		143	0	127	554	0	242
Arrive On Green	0.00	0.63	0.63	1.00	1.00	0.00	0.08	0.00	0.08	0.16	0.00	0.16
Sat Flow, veh/h	0	5269	147	285	3554	1648	1781	0	1585	3563	0	1554
Grp Volume(v), veh/h	0	1112	602	47	1147	0	82	0	18	400	0	82
Grp Sat Flow(s),veh/h/ln	0	1702	1843	285	1777	1648	1781	0	1585	1781	0	1554
Q Serve(g_s), s	0.0	21.7	21.7	7.8	0.0	0.0	5.3	0.0	1.3	12.8	0.0	5.6
Cycle Q Clear(g_c), s	0.0	21.7	21.7	29.5	0.0	0.0	5.3	0.0	1.3	12.8	0.0	5.6
Prop In Lane	0.00		0.08	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2133	1155	187	2227		143	0	127	554	0	242
V/C Ratio(X)	0.00	0.52	0.52	0.25	0.52		0.57	0.00	0.14	0.72	0.00	0.34
Avail Cap(c_a), veh/h	0	2133	1155	187	2227		238	0	211	1351	0	589
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.4	12.4	4.3	0.0	0.0	53.2	0.0	51.3	48.2	0.0	45.2
Incr Delay (d2), s/veh	0.0	0.9	1.7	3.2	0.9	0.0	3.6	0.0	0.5	2.3	0.0	1.1
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(95%),veh/ln	0.0	12.6	13.8	0.8	0.5	0.0	4.6	0.0	0.9	9.8	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.3	14.1	7.5	0.9	0.0	56.8	0.0	51.8	50.5	0.0	46.2
LnGrp LOS	A	B	B	A	A		E	A	D	D	A	D
Approach Vol, veh/h		1714			1194	A		100			482	
Approach Delay, s/veh		13.6			1.1			55.9			49.8	
Approach LOS		B			A			E			D	

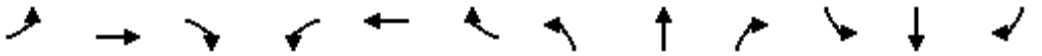
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	81.2	24.2	81.2	14.6
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	42.0	45.5	42.0	16.0
Max Q Clear Time (g_c+I1), s	23.7	14.8	31.5	7.3
Green Ext Time (p_c), s	13.7	2.5	7.3	0.2

Intersection Summary	
HCM 6th Ctrl Delay	15.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	863	11	8	1614	118	40	0	31	283	9	211
Future Volume (veh/h)	0	863	11	8	1614	118	40	0	31	283	9	211
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	908	12	8	1699	0	42	0	33	304	0	222
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3149	42	377	2155		136	0	121	640	0	280
Arrive On Green	0.00	0.61	0.61	1.00	1.00	0.00	0.08	0.00	0.08	0.18	0.00	0.18
Sat Flow, veh/h	0	5361	69	607	3554	1648	1781	0	1585	3563	0	1559
Grp Volume(v), veh/h	0	595	325	8	1699	0	42	0	33	304	0	222
Grp Sat Flow(s),veh/h/ln	0	1702	1858	607	1777	1648	1781	0	1585	1781	0	1559
Q Serve(g_s), s	0.0	10.0	10.0	0.2	0.0	0.0	2.7	0.0	2.4	9.2	0.0	16.4
Cycle Q Clear(g_c), s	0.0	10.0	10.0	10.2	0.0	0.0	2.7	0.0	2.4	9.2	0.0	16.4
Prop In Lane	0.00		0.04	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2064	1126	377	2155		136	0	121	640	0	280
V/C Ratio(X)	0.00	0.29	0.29	0.02	0.79		0.31	0.00	0.27	0.48	0.00	0.79
Avail Cap(c_a), veh/h	0	2064	1126	377	2155		238	0	211	1054	0	461
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.3	11.3	0.7	0.0	0.0	52.4	0.0	52.3	44.1	0.0	47.1
Incr Delay (d2), s/veh	0.0	0.4	0.6	0.1	3.0	0.0	1.3	0.0	1.2	0.7	0.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	6.7	7.5	0.0	1.6	0.0	2.3	0.0	1.8	7.4	0.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.6	11.9	0.8	3.0	0.0	53.7	0.0	53.5	44.9	0.0	53.5
LnGrp LOS	A	B	B	A	A		D	A	D	D	A	D
Approach Vol, veh/h		920			1707	A		75			526	
Approach Delay, s/veh		11.7			3.0			53.6			48.5	
Approach LOS		B			A			D			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	78.8	27.1	78.8	14.2
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	52.0	35.5	52.0	16.0
Max Q Clear Time (g_c+I1), s	12.0	18.4	12.2	4.7
Green Ext Time (p_c), s	10.3	2.4	26.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	14.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1705	29	22	1214	35	24	0	18	426	4	82
Future Volume (veh/h)	0	1705	29	22	1214	35	24	0	18	426	4	82
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	1795	31	23	1278	0	25	0	19	451	0	86
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3253	56	170	2236		114	0	102	602	0	263
Arrive On Green	0.00	0.63	0.63	1.00	1.00	0.00	0.06	0.00	0.06	0.17	0.00	0.17
Sat Flow, veh/h	0	5337	89	255	3554	1648	1781	0	1585	3563	0	1557
Grp Volume(v), veh/h	0	1182	644	23	1278	0	25	0	19	451	0	86
Grp Sat Flow(s),veh/h/ln	0	1702	1854	255	1777	1648	1781	0	1585	1781	0	1557
Q Serve(g_s), s	0.0	23.7	23.7	4.0	0.0	0.0	1.6	0.0	1.4	14.5	0.0	5.8
Cycle Q Clear(g_c), s	0.0	23.7	23.7	27.6	0.0	0.0	1.6	0.0	1.4	14.5	0.0	5.8
Prop In Lane	0.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2142	1167	170	2236		114	0	102	602	0	263
V/C Ratio(X)	0.00	0.55	0.55	0.14	0.57		0.22	0.00	0.19	0.75	0.00	0.33
Avail Cap(c_a), veh/h	0	2142	1167	170	2236		238	0	211	1351	0	590
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.6	12.6	4.3	0.0	0.0	53.3	0.0	53.2	47.4	0.0	43.8
Incr Delay (d2), s/veh	0.0	1.0	1.9	1.6	1.1	0.0	1.0	0.0	0.9	2.4	0.0	0.9
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(95%),veh/ln	0.0	13.5	14.9	0.4	0.6	0.0	1.4	0.0	1.0	10.8	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	13.7	14.5	6.0	1.1	0.0	54.3	0.0	54.1	49.9	0.0	44.8
LnGrp LOS	A	B	B	A	A		D	A	D	D	A	D
Approach Vol, veh/h		1826			1301	A		44			537	
Approach Delay, s/veh		14.0			1.2			54.2			49.0	
Approach LOS		B			A			D			D	

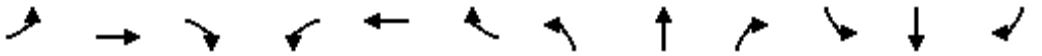
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	81.5	25.8	81.5	12.7
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	42.0	45.5	42.0	16.0
Max Q Clear Time (g_c+I1), s	25.7	16.5	29.6	3.6
Green Ext Time (p_c), s	13.1	2.8	8.8	0.1

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	900	38	45	1614	118	99	0	31	301	18	211
Future Volume (veh/h)	0	900	38	45	1614	118	99	0	31	301	18	211
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	947	40	47	1699	0	104	0	33	331	0	222
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3012	127	349	2131		147	0	131	643	0	281
Arrive On Green	0.00	0.60	0.60	1.00	1.00	0.00	0.08	0.00	0.08	0.18	0.00	0.18
Sat Flow, veh/h	0	5192	212	570	3554	1648	1781	0	1585	3563	0	1559
Grp Volume(v), veh/h	0	641	346	47	1699	0	104	0	33	331	0	222
Grp Sat Flow(s),veh/h/ln	0	1702	1831	570	1777	1648	1781	0	1585	1781	0	1559
Q Serve(g_s), s	0.0	11.2	11.2	1.8	0.0	0.0	6.8	0.0	2.3	10.1	0.0	16.3
Cycle Q Clear(g_c), s	0.0	11.2	11.2	13.0	0.0	0.0	6.8	0.0	2.3	10.1	0.0	16.3
Prop In Lane	0.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2041	1098	349	2131		147	0	131	643	0	281
V/C Ratio(X)	0.00	0.31	0.31	0.13	0.80		0.71	0.00	0.25	0.51	0.00	0.79
Avail Cap(c_a), veh/h	0	2041	1098	349	2131		238	0	211	1054	0	461
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.9	11.9	1.0	0.0	0.0	53.6	0.0	51.6	44.4	0.0	47.0
Incr Delay (d2), s/veh	0.0	0.4	0.8	0.8	3.2	0.0	6.1	0.0	1.0	0.8	0.0	6.3
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(95%),veh/ln	0.0	7.5	8.1	0.1	1.7	0.0	6.0	0.0	1.8	8.0	0.0	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.3	12.6	1.8	3.2	0.0	59.8	0.0	52.6	45.3	0.0	53.3
LnGrp LOS	A	B	B	A	A		E	A	D	D	A	D
Approach Vol, veh/h		987			1746	A		137			553	
Approach Delay, s/veh		12.4			3.2			58.0			48.5	
Approach LOS		B			A			E			D	

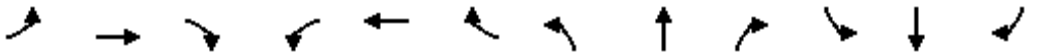
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	77.9	27.2	77.9	14.9
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	52.0	35.5	52.0	16.0
Max Q Clear Time (g_c+I1), s	13.2	18.3	15.0	8.8
Green Ext Time (p_c), s	11.3	2.5	25.5	0.3

Intersection Summary	
HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1729	47	46	1214	35	79	0	18	438	10	82
Future Volume (veh/h)	0	1729	47	46	1214	35	79	0	18	438	10	82
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		0.98
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	0	1870	1945	1870	1870	1945	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	1820	49	48	1278	0	83	0	19	469	0	86
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	3108	84	156	2161		143	0	128	619	0	271
Arrive On Green	0.00	0.61	0.61	0.81	0.81	0.00	0.08	0.00	0.08	0.17	0.00	0.17
Sat Flow, veh/h	0	5280	138	245	3554	1648	1781	0	1585	3563	0	1558
Grp Volume(v), veh/h	0	1212	657	48	1278	0	83	0	19	469	0	86
Grp Sat Flow(s),veh/h/ln	0	1702	1845	245	1777	1648	1781	0	1585	1781	0	1558
Q Serve(g_s), s	0.0	26.0	26.0	15.3	15.8	0.0	5.4	0.0	1.3	15.0	0.0	5.8
Cycle Q Clear(g_c), s	0.0	26.0	26.0	41.3	15.8	0.0	5.4	0.0	1.3	15.0	0.0	5.8
Prop In Lane	0.00		0.07	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	2070	1122	156	2161		143	0	128	619	0	271
V/C Ratio(X)	0.00	0.59	0.59	0.31	0.59		0.58	0.00	0.15	0.76	0.00	0.32
Avail Cap(c_a), veh/h	0	2070	1122	156	2161		238	0	211	1351	0	591
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.3	14.3	16.9	6.0	0.0	53.2	0.0	51.3	47.2	0.0	43.3
Incr Delay (d2), s/veh	0.0	1.2	2.2	5.1	1.2	0.0	3.6	0.0	0.5	2.5	0.0	0.9
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(95%),veh/ln	0.0	14.8	16.3	1.8	7.4	0.0	4.6	0.0	1.0	11.1	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	15.5	16.6	22.0	7.2	0.0	56.9	0.0	51.9	49.6	0.0	44.2
LnGrp LOS	A	B	B	C	A		E	A	D	D	A	D
Approach Vol, veh/h		1869			1326	A		102			555	
Approach Delay, s/veh		15.9			7.7			55.9			48.8	
Approach LOS		B			A			E			D	

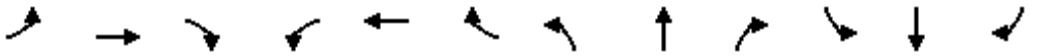
Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	79.0	26.4	79.0	14.7
Change Period (Y+Rc), s	6.0	5.5	6.0	5.0
Max Green Setting (Gmax), s	42.0	45.5	42.0	16.0
Max Q Clear Time (g_c+I1), s	28.0	17.0	43.3	7.4
Green Ext Time (p_c), s	11.6	2.9	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Note: Exclusive Northbound Left lane assumed as a shared Left-Through lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	589	0	0	1453	519	0	0	0	24	0	176
Future Volume (veh/h)	32	589	0	0	1453	519	0	0	0	24	0	176
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.97
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	34	620	0	0	1529	546				0	0	212
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	164	3855	0	0	2580	1143				0	333	571
Arrive On Green	1.00	1.00	0.00	0.00	0.73	0.73				0.00	0.00	0.18
Sat Flow, veh/h	200	5485	0	0	3647	1574				0	1870	3204
Grp Volume(v), veh/h	34	620	0	0	1529	546				0	0	212
Grp Sat Flow(s),veh/h/ln	200	1770	0	0	1777	1574				0	1870	1602
Q Serve(g_s), s	7.6	0.0	0.0	0.0	24.8	17.5				0.0	0.0	7.0
Cycle Q Clear(g_c), s	32.4	0.0	0.0	0.0	24.8	17.5				0.0	0.0	7.0
Prop In Lane	1.00		0.00	0.00		1.00				0.00		1.00
Lane Grp Cap(c), veh/h	164	3855	0	0	2580	1143				0	333	571
V/C Ratio(X)	0.21	0.16	0.00	0.00	0.59	0.48				0.00	0.00	0.37
Avail Cap(c_a), veh/h	164	3855	0	0	2580	1143				0	631	1081
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				0.00	0.00	1.00
Uniform Delay (d), s/veh	4.6	0.0	0.0	0.0	7.9	6.9				0.0	0.0	43.4
Incr Delay (d2), s/veh	2.9	0.1	0.0	0.0	1.0	1.4				0.0	0.0	0.5
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(95%),veh/ln	0.7	0.1	0.0	0.0	13.2	9.3				0.0	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	0.1	0.0	0.0	8.9	8.3				0.0	0.0	43.9
LnGrp LOS	A	A	A	A	A	A				A	A	D
Approach Vol, veh/h		654			2075						212	
Approach Delay, s/veh		0.5			8.8						43.9	
Approach LOS		A			A						D	

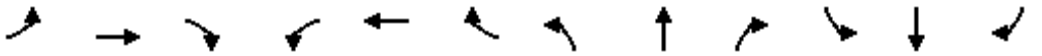
Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	93.1	26.9	93.1
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	34.4	9.0	26.8
Green Ext Time (p_c), s	8.4	1.1	28.6

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	1281	0	0	790	497	0	0	0	103	0	376
Future Volume (veh/h)	95	1281	0	0	790	497	0	0	0	103	0	376
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.99
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	100	1348	0	0	832	523				108	216	252
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	298	3654	0	0	2446	1083				132	265	351
Arrive On Green	0.92	0.92	0.00	0.00	0.69	0.69				0.22	0.22	0.22
Sat Flow, veh/h	402	5485	0	0	3647	1574				613	1226	1626
Grp Volume(v), veh/h	100	1348	0	0	832	523				324	0	252
Grp Sat Flow(s),veh/h/ln	402	1770	0	0	1777	1574				1840	0	1626
Q Serve(g_s), s	9.4	3.9	0.0	0.0	11.4	18.6				20.1	0.0	17.3
Cycle Q Clear(g_c), s	20.9	3.9	0.0	0.0	11.4	18.6				20.1	0.0	17.3
Prop In Lane	1.00		0.00	0.00		1.00				0.33		1.00
Lane Grp Cap(c), veh/h	298	3654	0	0	2446	1083				397	0	351
V/C Ratio(X)	0.34	0.37	0.00	0.00	0.34	0.48				0.82	0.00	0.72
Avail Cap(c_a), veh/h	298	3654	0	0	2446	1083				621	0	549
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	4.3	1.7	0.0	0.0	7.6	8.7				44.8	0.0	43.6
Incr Delay (d2), s/veh	3.0	0.3	0.0	0.0	0.4	1.5				5.5	0.0	3.3
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(95%),veh/ln	1.2	1.9	0.0	0.0	7.4	10.2				14.8	0.0	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.3	2.0	0.0	0.0	8.0	10.3				50.3	0.0	47.0
LnGrp LOS	A	A	A	A	A	B				D	A	D
Approach Vol, veh/h		1448			1355						576	
Approach Delay, s/veh		2.4			8.9						48.8	
Approach LOS		A			A						D	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	88.6	31.4	88.6
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	22.9	22.1	20.6
Green Ext Time (p_c), s	22.7	3.2	15.8

Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	610	0	0	1476	519	0	0	0	24	0	190
Future Volume (veh/h)	45	610	0	0	1476	519	0	0	0	24	0	190
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.97
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	47	642	0	0	1554	546				0	0	227
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	160	3854	0	0	2579	1143				0	334	571
Arrive On Green	1.00	1.00	0.00	0.00	0.73	0.73				0.00	0.00	0.18
Sat Flow, veh/h	195	5485	0	0	3647	1574				0	1870	3204
Grp Volume(v), veh/h	47	642	0	0	1554	546				0	0	227
Grp Sat Flow(s),veh/h/ln	195	1770	0	0	1777	1574				0	1870	1602
Q Serve(g_s), s	12.7	0.0	0.0	0.0	25.6	17.5				0.0	0.0	7.5
Cycle Q Clear(g_c), s	38.3	0.0	0.0	0.0	25.6	17.5				0.0	0.0	7.5
Prop In Lane	1.00		0.00	0.00		1.00				0.00		1.00
Lane Grp Cap(c), veh/h	160	3854	0	0	2579	1143				0	334	571
V/C Ratio(X)	0.29	0.17	0.00	0.00	0.60	0.48				0.00	0.00	0.40
Avail Cap(c_a), veh/h	160	3854	0	0	2579	1143				0	631	1082
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				0.00	0.00	1.00
Uniform Delay (d), s/veh	5.6	0.0	0.0	0.0	8.0	6.9				0.0	0.0	43.6
Incr Delay (d2), s/veh	4.6	0.1	0.0	0.0	1.1	1.4				0.0	0.0	0.5
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(95%),veh/ln	1.1	0.1	0.0	0.0	13.5	9.3				0.0	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	0.1	0.0	0.0	9.1	8.3				0.0	0.0	44.1
LnGrp LOS	B	A	A	A	A	A				A	A	D
Approach Vol, veh/h		689			2100						227	
Approach Delay, s/veh		0.8			8.9						44.1	
Approach LOS		A			A						D	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	93.1	26.9	93.1
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	40.3	9.5	27.6
Green Ext Time (p_c), s	8.9	1.1	28.7

Intersection Summary	
HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	1300	0	0	804	497	0	0	0	103	0	384
Future Volume (veh/h)	106	1300	0	0	804	497	0	0	0	103	0	384
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.99
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	112	1368	0	0	846	523				108	222	256
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	293	3639	0	0	2435	1078				132	271	356
Arrive On Green	0.91	0.91	0.00	0.00	0.69	0.69				0.22	0.22	0.22
Sat Flow, veh/h	397	5485	0	0	3647	1573				602	1238	1626
Grp Volume(v), veh/h	112	1368	0	0	846	523				330	0	256
Grp Sat Flow(s),veh/h/ln	397	1770	0	0	1777	1573				1840	0	1626
Q Serve(g_s), s	11.9	4.2	0.0	0.0	11.8	18.8				20.5	0.0	17.5
Cycle Q Clear(g_c), s	23.7	4.2	0.0	0.0	11.8	18.8				20.5	0.0	17.5
Prop In Lane	1.00		0.00	0.00		1.00				0.33		1.00
Lane Grp Cap(c), veh/h	293	3639	0	0	2435	1078				403	0	356
V/C Ratio(X)	0.38	0.38	0.00	0.00	0.35	0.49				0.82	0.00	0.72
Avail Cap(c_a), veh/h	293	3639	0	0	2435	1078				621	0	549
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	4.8	1.9	0.0	0.0	7.8	8.9				44.6	0.0	43.4
Incr Delay (d2), s/veh	3.8	0.3	0.0	0.0	0.4	1.6				5.8	0.0	3.3
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(95%),veh/ln	1.6	2.0	0.0	0.0	7.6	10.3				15.0	0.0	11.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.6	2.2	0.0	0.0	8.2	10.5				50.4	0.0	46.7
LnGrp LOS	A	A	A	A	A	B				D	A	D
Approach Vol, veh/h		1480			1369						586	
Approach Delay, s/veh		2.6			9.1						48.8	
Approach LOS		A			A						D	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		88.2		31.8		88.2						
Change Period (Y+Rc), s		6.0		5.5		6.0						
Max Green Setting (Gmax), s		68.0		40.5		68.0						
Max Q Clear Time (g_c+I1), s		25.7		22.5		20.8						
Green Ext Time (p_c), s		22.8		3.3		16.1						

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	671	0	0	1568	582	0	0	0	26	0	193
Future Volume (veh/h)	35	671	0	0	1568	582	0	0	0	26	0	193
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.97
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	37	706	0	0	1651	613				0	0	232
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	141	3854	0	0	2579	1143				0	334	571
Arrive On Green	1.00	1.00	0.00	0.00	0.73	0.73				0.00	0.00	0.18
Sat Flow, veh/h	166	5485	0	0	3647	1574				0	1870	3204
Grp Volume(v), veh/h	37	706	0	0	1651	613				0	0	232
Grp Sat Flow(s),veh/h/ln	166	1770	0	0	1777	1574				0	1870	1602
Q Serve(g_s), s	12.7	0.0	0.0	0.0	28.5	21.0				0.0	0.0	7.7
Cycle Q Clear(g_c), s	41.2	0.0	0.0	0.0	28.5	21.0				0.0	0.0	7.7
Prop In Lane	1.00		0.00	0.00		1.00				0.00		1.00
Lane Grp Cap(c), veh/h	141	3854	0	0	2579	1143				0	334	571
V/C Ratio(X)	0.26	0.18	0.00	0.00	0.64	0.54				0.00	0.00	0.41
Avail Cap(c_a), veh/h	141	3854	0	0	2579	1143				0	631	1082
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				0.00	0.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	0.0	0.0	8.4	7.4				0.0	0.0	43.7
Incr Delay (d2), s/veh	4.5	0.1	0.0	0.0	1.2	1.8				0.0	0.0	0.6
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(95%),veh/ln	1.0	0.1	0.0	0.0	14.8	10.8				0.0	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.2	0.1	0.0	0.0	9.7	9.2				0.0	0.0	44.2
LnGrp LOS	B	A	A	A	A	A				A	A	D
Approach Vol, veh/h		743			2264						232	
Approach Delay, s/veh		0.7			9.5						44.2	
Approach LOS		A			A						D	

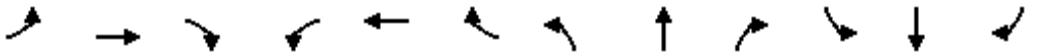
Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	93.1	26.9	93.1
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	43.2	9.7	30.5
Green Ext Time (p_c), s	9.0	1.2	29.1

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	1452	0	0	898	538	0	0	0	108	0	396
Future Volume (veh/h)	100	1452	0	0	898	538	0	0	0	108	0	396
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.99
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	105	1528	0	0	945	566				114	227	266
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	255	3610	0	0	2416	1070				138	275	365
Arrive On Green	0.90	0.90	0.00	0.00	0.68	0.68				0.22	0.22	0.22
Sat Flow, veh/h	346	5485	0	0	3647	1573				615	1225	1626
Grp Volume(v), veh/h	105	1528	0	0	945	566				341	0	266
Grp Sat Flow(s),veh/h/ln	346	1770	0	0	1777	1573				1840	0	1626
Q Serve(g_s), s	15.3	5.4	0.0	0.0	13.9	21.6				21.2	0.0	18.2
Cycle Q Clear(g_c), s	29.2	5.4	0.0	0.0	13.9	21.6				21.2	0.0	18.2
Prop In Lane	1.00		0.00	0.00		1.00				0.33		1.00
Lane Grp Cap(c), veh/h	255	3610	0	0	2416	1070				413	0	365
V/C Ratio(X)	0.41	0.42	0.00	0.00	0.39	0.53				0.83	0.00	0.73
Avail Cap(c_a), veh/h	255	3610	0	0	2416	1070				621	0	549
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	6.2	2.1	0.0	0.0	8.4	9.6				44.3	0.0	43.2
Incr Delay (d2), s/veh	4.8	0.4	0.0	0.0	0.5	1.9				6.4	0.0	3.4
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(95%),veh/ln	1.9	2.5	0.0	0.0	8.7	11.7				15.5	0.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	2.5	0.0	0.0	8.9	11.5				50.7	0.0	46.5
LnGrp LOS	B	A	A	A	A	B				D	A	D
Approach Vol, veh/h		1633			1511						607	
Approach Delay, s/veh		3.0			9.8						48.9	
Approach LOS		A			A						D	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	87.6	32.4	87.6
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	31.2	23.2	23.6
Green Ext Time (p_c), s	23.7	3.4	18.4

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	692	0	0	1591	582	0	0	0	26	0	207
Future Volume (veh/h)	48	692	0	0	1591	582	0	0	0	26	0	207
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.97
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	51	728	0	0	1675	613				0	0	247
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	138	3854	0	0	2579	1143				0	334	572
Arrive On Green	1.00	1.00	0.00	0.00	0.73	0.73				0.00	0.00	0.18
Sat Flow, veh/h	162	5485	0	0	3647	1574				0	1870	3204
Grp Volume(v), veh/h	51	728	0	0	1675	613				0	0	247
Grp Sat Flow(s),veh/h/ln	162	1770	0	0	1777	1574				0	1870	1602
Q Serve(g_s), s	22.5	0.0	0.0	0.0	29.3	21.0				0.0	0.0	8.2
Cycle Q Clear(g_c), s	51.8	0.0	0.0	0.0	29.3	21.0				0.0	0.0	8.2
Prop In Lane	1.00		0.00	0.00		1.00				0.00		1.00
Lane Grp Cap(c), veh/h	138	3854	0	0	2579	1143				0	334	572
V/C Ratio(X)	0.37	0.19	0.00	0.00	0.65	0.54				0.00	0.00	0.43
Avail Cap(c_a), veh/h	138	3854	0	0	2579	1143				0	631	1082
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				0.00	0.00	1.00
Uniform Delay (d), s/veh	8.7	0.0	0.0	0.0	8.5	7.4				0.0	0.0	43.9
Incr Delay (d2), s/veh	7.4	0.1	0.0	0.0	1.3	1.8				0.0	0.0	0.6
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(95%),veh/ln	1.6	0.1	0.0	0.0	15.2	10.9				0.0	0.0	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	0.1	0.0	0.0	9.8	9.2				0.0	0.0	44.5
LnGrp LOS	B	A	A	A	A	A				A	A	D
Approach Vol, veh/h		779			2288						247	
Approach Delay, s/veh		1.2			9.6						44.5	
Approach LOS		A			A						D	

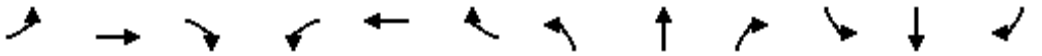
Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	93.1	26.9	93.1
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	53.8	10.2	31.3
Green Ext Time (p_c), s	7.2	1.3	28.9

Intersection Summary	
HCM 6th Ctrl Delay	10.3
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	1471	0	0	912	538	0	0	0	108	0	404
Future Volume (veh/h)	111	1471	0	0	912	538	0	0	0	108	0	404
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99				1.00		0.99
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	1945	0	0	1870	1870				1945	1870	1945
Adj Flow Rate, veh/h	117	1548	0	0	960	566				114	233	270
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	2	2	0	0	2	2				2	2	2
Cap, veh/h	250	3595	0	0	2405	1065				137	281	370
Arrive On Green	0.90	0.90	0.00	0.00	0.68	0.68				0.23	0.23	0.23
Sat Flow, veh/h	341	5485	0	0	3647	1573				605	1236	1627
Grp Volume(v), veh/h	117	1548	0	0	960	566				347	0	270
Grp Sat Flow(s),veh/h/ln	341	1770	0	0	1777	1573				1840	0	1627
Q Serve(g_s), s	19.6	5.7	0.0	0.0	14.4	21.8				21.5	0.0	18.5
Cycle Q Clear(g_c), s	33.9	5.7	0.0	0.0	14.4	21.8				21.5	0.0	18.5
Prop In Lane	1.00		0.00	0.00		1.00				0.33		1.00
Lane Grp Cap(c), veh/h	250	3595	0	0	2405	1065				418	0	370
V/C Ratio(X)	0.47	0.43	0.00	0.00	0.40	0.53				0.83	0.00	0.73
Avail Cap(c_a), veh/h	250	3595	0	0	2405	1065				621	0	549
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	2.2	0.0	0.0	8.6	9.8				44.2	0.0	43.0
Incr Delay (d2), s/veh	6.2	0.4	0.0	0.0	0.5	1.9				6.7	0.0	3.3
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(95%),veh/ln	2.5	2.6	0.0	0.0	8.9	11.8				15.8	0.0	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	2.6	0.0	0.0	9.1	11.7				50.9	0.0	46.3
LnGrp LOS	B	A	A	A	A	B				D	A	D
Approach Vol, veh/h		1665			1526						617	
Approach Delay, s/veh		3.3			10.0						48.9	
Approach LOS		A			B						D	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	87.2	32.8	87.2
Change Period (Y+Rc), s	6.0	5.5	6.0
Max Green Setting (Gmax), s	68.0	40.5	68.0
Max Q Clear Time (g_c+I1), s	35.9	23.5	23.8
Green Ext Time (p_c), s	22.2	3.4	18.7

Intersection Summary	
HCM 6th Ctrl Delay	13.4
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Note: Shared Southbound Left-Right lane assumed as shared Left-Through-Right lane in order to correctly calculate the intersection delays and queues.