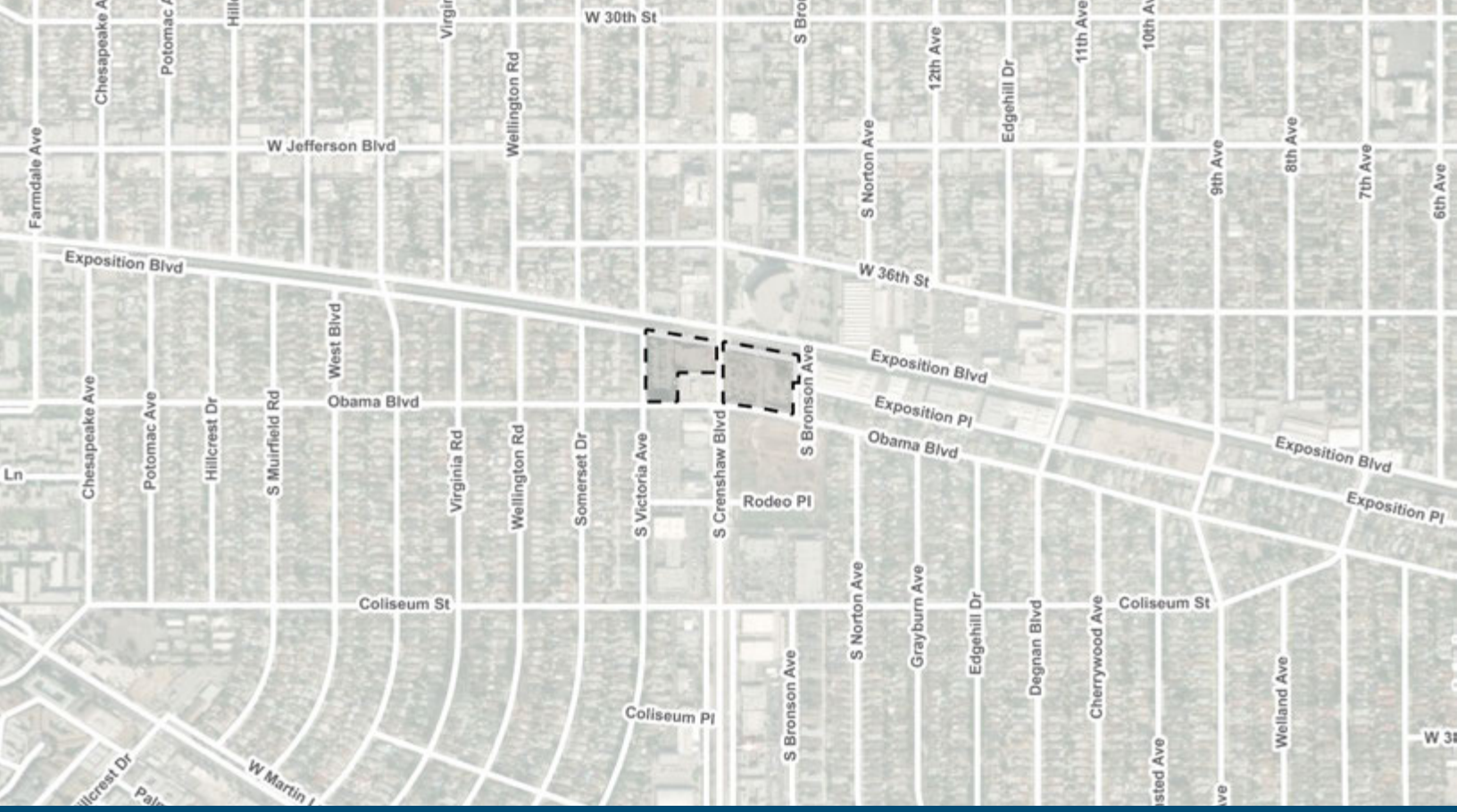
APPENDIX J.1

Transportation Assessment Study



3630 Crenshaw Blvd

Transportation Assessment Study

April 2020

CPC-2019-5425-DB-MCUP-SPP-ZAI-SPR

VTT-82282

ENV-2019-5426-EAF

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Executive Summary

Source: NN Engineering

This Transportation Assessment Study (TAS) was prepared to examine current and future transportation conditions in and around the proposed Crenshaw Crossing Mixed-Use Residential Development ("Project"). The Project is being developed as part of the Los Angeles County Metropolitan Transportation Authority's ("Metro") and the County of Los Angeles' (the "County") Joint Development Program for the Expo/Crenshaw Metro Station. The purpose of this TAS is twofold. It provides decision-makers and the public with information pertaining to the potential transportation impacts to the existing and future transportation network with implementation of the Project. Also, it identifies feasible measures or corrective conditions to offset any impacts or deficiencies.

The TAS was prepared in accordance with Los Angeles Department of Transportation (LADOT) Transportation Assessment Guidelines (TAG), Southern California Association of Governments (SCAG), as well as California Department of Transportation (Caltrans) District 7 standards and requirements. The City review process as defined in the TAG advances the City's vision of developing a safe, accessible, well-maintained, and well-connected multimodal transportation network. The TAS includes a detailed description of the existing and future (planned) transportation network, including traffic and roadway operations and transit, bicycle, and pedestrian facilities.

The TAS analyzes the Project that consists of 401 dwelling units (320 market-rate, 81 affordable), 15,527 s.f. retail/restaurant, 22,277 s.f. supermarket, 2,650 s.f. of community space, and 542 s.f. of Los Angeles County Metropolitan Transportation Authority (Metro) secured bicycle parking that will be available to the public via Metro's Bike Parking program. The Project site encompasses six parcels on the west (Site A) and east (Site B) sides of Crenshaw Blvd, between the Expo Line and Obama Blvd, and adjacent to the under-construction Crenshaw/LAX Line stop (the "Project Site"). The Project Site also includes portions of public right-of-way along Lower Exposition Blvd on both sides of Crenshaw Blvd and a portion of Bronson Ave, that are to be merged through the Project's vesting tentative tract map ("Merger Areas").

The TAS includes an in-depth analysis of traffic and roadway operations with the projected travel demand associated with the Project, including new weekday morning and evening peak-hour vehicle trips at area intersections and roadways. A qualitative review of potential effects to public transit, bicycle, and pedestrian facilities, as well as users of such facilities is also included. Three analysis scenarios are included in the report: Existing (no project) conditions, Future (2023) No Project conditions, and Future (2023) Plus Project conditions.

To analyze the CEQA Transportation Impacts per the TAG, a project applicability analysis (Threshold T-1), detailed Vehicle Miles Traveled (VMT) analysis (Threshold T-2.1 and T-2.2), and potential geometric hazard analysis (Threshold T-3) are included in the study.

CEQA analysis findings for each threshold are listed below:

- Threshold T-1 – The Project would not create significant impacts to transportation user needs as defined by the City's transportation policy framework.
- Threshold T-2.1 –household rates Utilizing the LADOT's VMT Calculator Tool (Version 1.2) and proposed additional reduction factors attributed to future transit access, VMT rates would not exceed applicable thresholds for the South Area Planning Commission.
- Threshold T-2.2 - Analysis is not required for this threshold, which only applies to transportation projects, since the Project is not a transportation project.
- Threshold T-3 – Due to the Project's clear separation of bike and pedestrian desire lines (preferred and intuitive pedestrian pathways) and access points and vehicular driveways, there are no increased hazards due to geometric design of the site.

Further, non-CEQA analysis is included in this report in adherence with Section 3 of the TAG.

Non-CEQA analysis findings are listed below:

- Pedestrian, bicycle and transit activity is expected to increase with the operation of the Project, however improvements for these transportation users are included in the Project to enhance the user experience and increase safety. As a result, the Project will not result in the degradation of facilities for pedestrians, bicyclists, and transit users.
- The Project is not expected to significantly degrade access, safety, or circulation in the study area. Analysis of Future (2023) Plus Project conditions on the side street approaches at S. Victoria Ave and Obama Blvd result in some increases in delay for the PM peak hour, but not to a significant extent. Additionally, queue lengths for Future (2023) Plus Project conditions do not significantly exceed Future (2023) No Project conditions.
- Project construction will not require in-street construction and therefore will not negatively affect existing pedestrian, bicycle, transit, or vehicle circulation.
- The Project does not require residential street cut-through analysis and is not expected to adversely affect the character and function of nearby streets.

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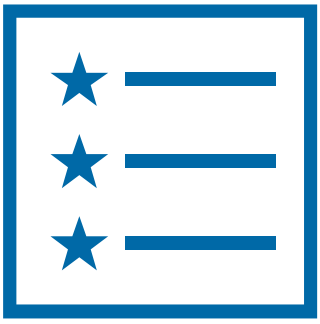
1 Introduction

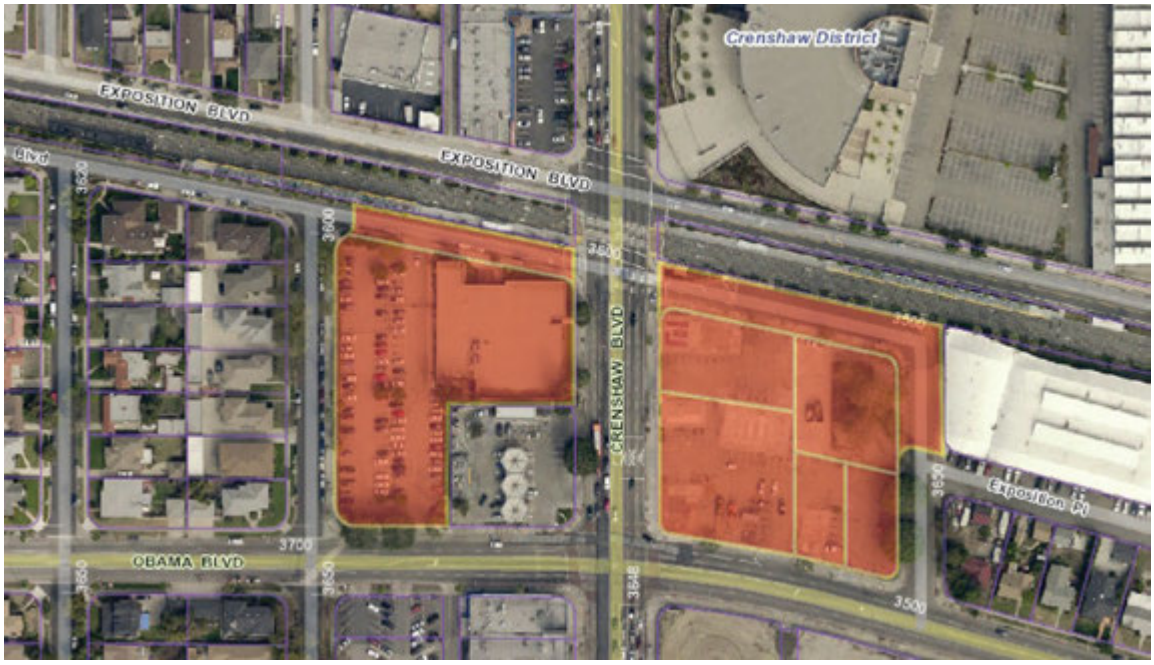
PROJECT DESCRIPTION AND STUDY PURPOSE

The purpose of this Transportation Assessment Study (TAS) is to provide a comprehensive evaluation of the proposed Crenshaw Crossing Transit Oriented Development (herein referred to as the "Project") and to examine the extent to which the Project would affect the surrounding circulation network.



The Project Site is in the southwestern portion of Los Angeles, in the Crenshaw neighborhood. The Project is within the Crenshaw Corridor Specific Plan area and would comprise six parcels divided into two sites as seen in and outlined in **Figure 1**and **Table 1-1**. Currently, a portion of the lot on the east side of Crenshaw Blvd is being developed by Metro as a portal entrance to the subterranean station on the new Metro Crenshaw/LAX Line. Both sites would feature residential uses totaling 401 dwelling units (320 market-rate, 81 affordable), 15,527 s.f. retail/restaurant, 22,277 s.f. supermarket, 2,650 s.f. of community space and between the two sites, a total of 542 s.f. of Los Angeles County Metropolitan Transportation Authority (Metro) secured bicycle parking that will be available to the public via Metro's Bike Parking program. The Project is located on Crenshaw Blvd which is identified as a part of the City's High Injury Network (HIN). Being that this development is a Transit Oriented Development (TOD), including being located within the Crenshaw Corridor Specific Plan's TOD Subarea, it should be noted that there is expected to be an increase of pedestrian and bicycle activity to and from the Project Site. Notably, as mentioned previously, the Project Site will have an entrance to the subterranean Metro Station of the Crenshaw/LAX Line on-site of the east development (Site B). This Metro Rail light rail line will serve as a major local and regional connector to on-site amenities such as the grocery store, retail, and restaurant uses.

Figure 1 Project parcels



Source: LA City GIS

Table 1-1 Property Addresses and Assessor Parcel Number

	Accessor Parcel Number	Address
Site A	5046-022-900	3606 W. Exposition Blvd 3633 W. Obama Blvd
	NA	Portion of Lower Exposition Blvd between Victoria Ave and Crenshaw Blvd to be merged into Project Site as part of Project.
Site B	5044-002-901	3630 S. Crenshaw Blvd
	5044-002-902	3502 & 3510 W. Exposition Blvd 3631 & 3633 S. Bronson Ave
	5044-002-903 (previously 5044-002-006)	3515 & 3519 W. Obama Blvd 3642-3646 S. Crenshaw Blvd
	5044-002-904 (previously 5044-002-008)	3505 W. Obama Blvd
	5044-002-905 (previously 5044-002-009)	3635, 3639, & 3645 S. Bronson Ave 3501 W. Obama Blvd
	NA	Portion of Lower Exposition Blvd between Crenshaw Blvd and Bronson Ave; and portion of Bronson Ave between Exposition Blvd and Exposition Pl to be merged into Project Site as part of Project.

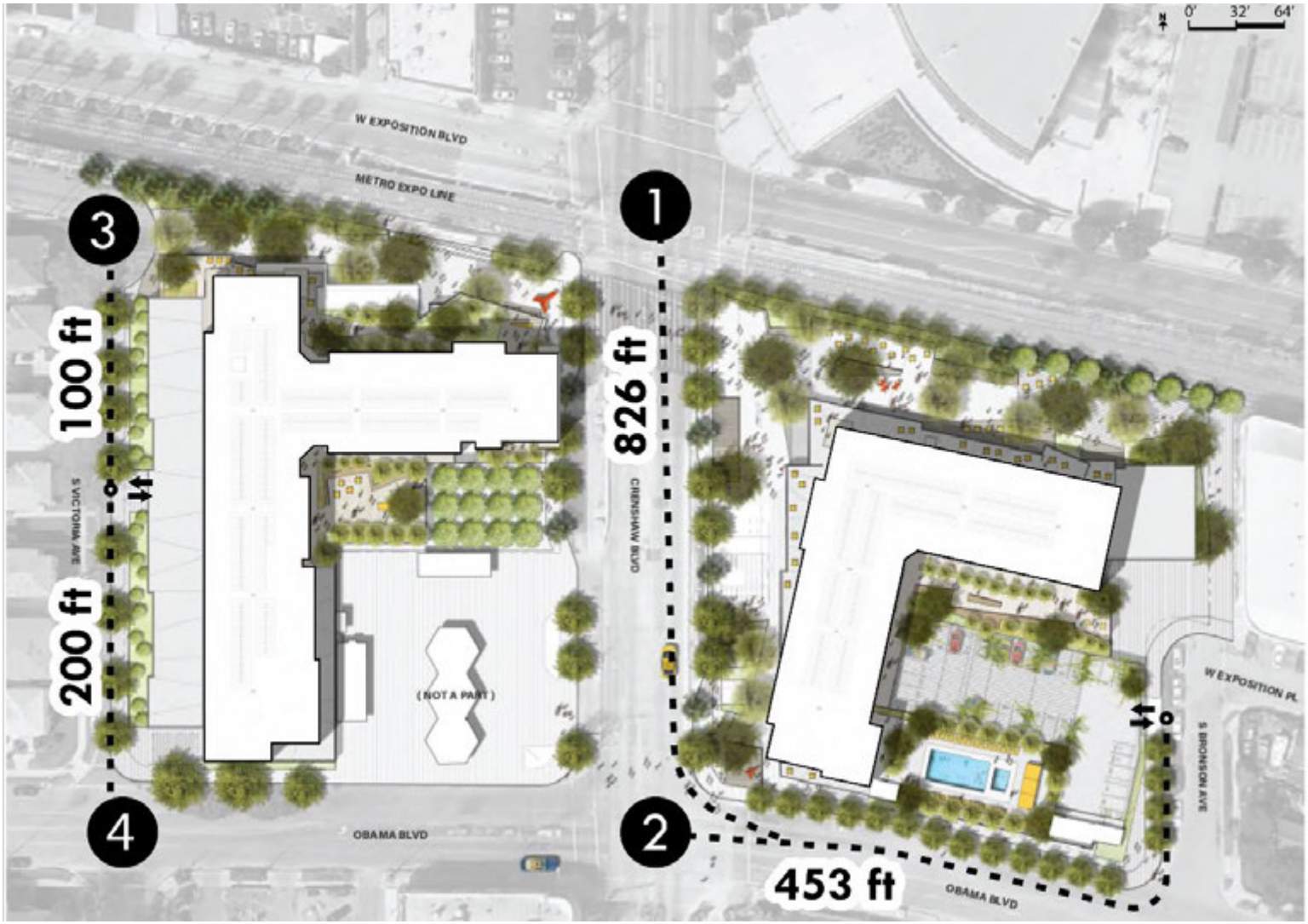
The Project's west site (Site A), between Crenshaw Blvd and Victoria Ave, would be comprised of an off-street above-grade parking garage wrapped by ground-level restaurant, retail and community uses along with low-rise residential units primarily situated along Victoria Ave. Additional residential units would be located on the floors above.

The Project's east site (Site B) would be comprised of an off-street (below- and above-grade) parking garage surrounded by a supermarket and retail/restaurant space at ground-level. Above the ground floor would be comprised of residential uses to the north and west, common areas to the south and west, and community space available for use by retailers, restaurants, or residents to the east. Vehicular access to the parking garage would be gained via a two-way driveway along Bronson Ave, south of West Exposition Pl. The east site would additionally include an entrance to the subterranean Metro Crenshaw/LAX Line station along Crenshaw Blvd.

The Project would not introduce any new external streets but would include new and redeveloped, sidewalks adjacent to the development and access to open space areas as well as linkage to the new Metro Crenshaw/LAX Line Station on the eastern site (Site B). As previously noted, segments of Exposition Blvd (between Victoria Ave and Crenshaw Blvd, and between Crenshaw Blvd and Bronson Ave) and Bronson Ave(between Exposition Blvd and Exposition Pl) would be merged into the Project Site through the Project's vesting tentative tract map to create a publicly accessible open space plaza and pedestrian promenade. The merging of these ROW portions would eliminate a street crossing across Lower Exposition Blvd and create a more direct pedestrian access between the Expo Line, the future Crenshaw/LAX Line, and various bus lines serviced at those stops along Crenshaw Blvd, thus improving transit connections and pedestrian safety.

The Project would eliminate existing curb cuts (driveways) along the north sides of the developments, facing Lower W. Exposition Blvd, as those portions of the public ROW would be merged into the Project Site as part of the Project, allowing for a continuous pedestrian promenade on both sites. The removal of these curb-cuts will be in conjunction with the closure of Lower W. Exposition Blvd and a portion of S. Bronson Ave from Victoria Ave to the intersection of S. Bronson Ave and W. Exposition Pl. Similarly, existing curb cuts along the north side of Obama Blvd on the Project Site will be removed. Existing on-street parking on the east side of Victoria Ave would be impacted by the new entrance to the west development; the curb cut could permanently remove up to four (4) on-street spaces. Additionally, existing on-street parking on the west side of S. Bronson Ave would be impacted by the new entrance to the eastern development; the curb cut could permanently remove up to four (4) on-street spaces. An additional thirteen (13) on-street spaces are lost with the merger of Lower W. Exposition Blvd and the Project Site. Study intersections and proximity to Project driveways are shown in **Figure 2**.

Figure 2 Study Intersections and distance to Project driveways.



Source: Watt Investment Partners, 2019

As previously stated, the Project would be comprised of 401 dwelling units (320 market-rate, 81 affordable), 15,527 s.f. retail/restaurant, 22,277 s.f. supermarket, and 2,650 s.f. of community space. The Project would encompass six parcels within two sites on west and east sides of Crenshaw Blvd, between the Expo Line and Obama Blvd, and adjacent to the under-construction Crenshaw/LAX Line stop. Property addresses and their associated assessor parcel numbers are shown in **Table 1-1**. The scope of work for this TAS was approved by LADOT in an August 8, 2019 Memorandum of Understanding (MOU) as seen in **Appendix D** and includes an analysis of potential transportation impacts per the LADOT Transportation Analysis Guidelines (TAG).

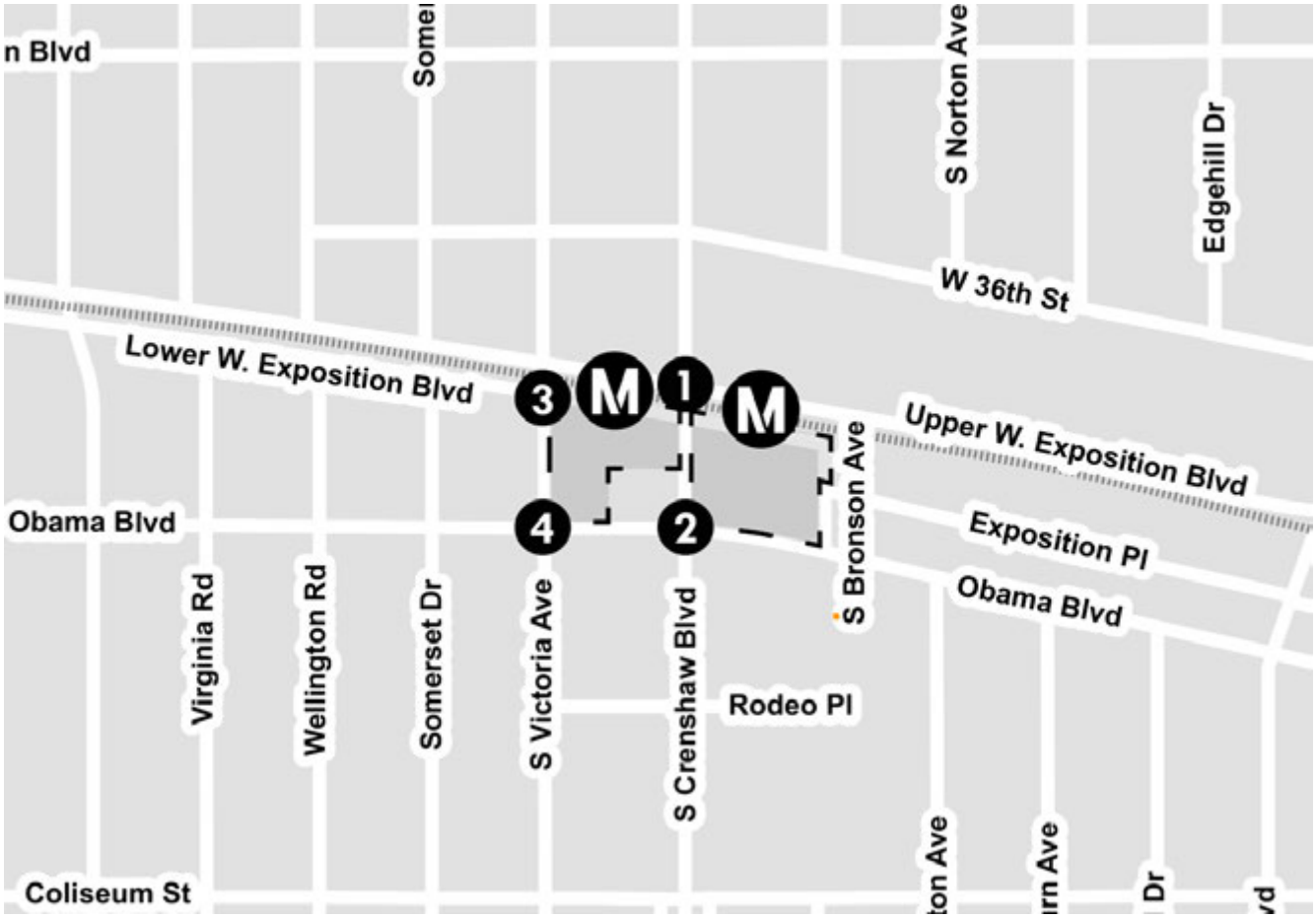
For purposes of assessing traffic and circulation conditions within the Project environs, vehicle trips were estimated based on trip generation rates from the *Institute of Transportation Engineers Trip Generation Manual*, 10th Edition (ITE, 2017) for commercial uses as well as the LADOT TAG rates for residential uses. Further adjustments were applied to account for the context of the Project Site and proposed multimodal environs, in accordance with LADOT guidelines and approval. NN Engineering collected existing roadway volumes and intersection turning movement counts (auto, bicycle and pedestrian) on Tuesday-Wednesday, April 17-18, 2018 during the typical weekday commute peak period (i.e., 7:00 a.m. to 10:00 a.m. and 3:00 p.m. to 6:00 p.m.). It is noted that intersection and roadway data were collected when all public and private schools were in session and weather conditions included clear skies and moderate temperatures.

In coordination with LADOT staff, four study intersections have been identified to be evaluated based on review of TAG non-CEQA operational evaluation criteria:

- All primary Project driveways
- Intersections at either end of the block(s) on which the Project is located or up to 600 feet from primary Project driveway(s), whichever is closer
- Unsignalized intersections adjacent to the Project
- Signalized intersections within close proximity to the Project to where 100 or more net new peak hour trips will be added by the Project.

The four intersections were examined during weekday AM and PM peak hours, calculated as the highest peak hour of each the AM and PM data collection periods aggregated for all intersections. The four intersections identified are as follows: (1) Crenshaw Blvd / Upper W. Exposition Blvd, and; (2) Crenshaw Blvd / Obama Blvd and; (3) S. Victoria Ave / Lower W. Exposition Blvd, and; (4) S. Victoria Ave / Obama Blvd **Figure 3** displays the approximate locations of the study intersections.

Figure 3 Study Intersections 1-4

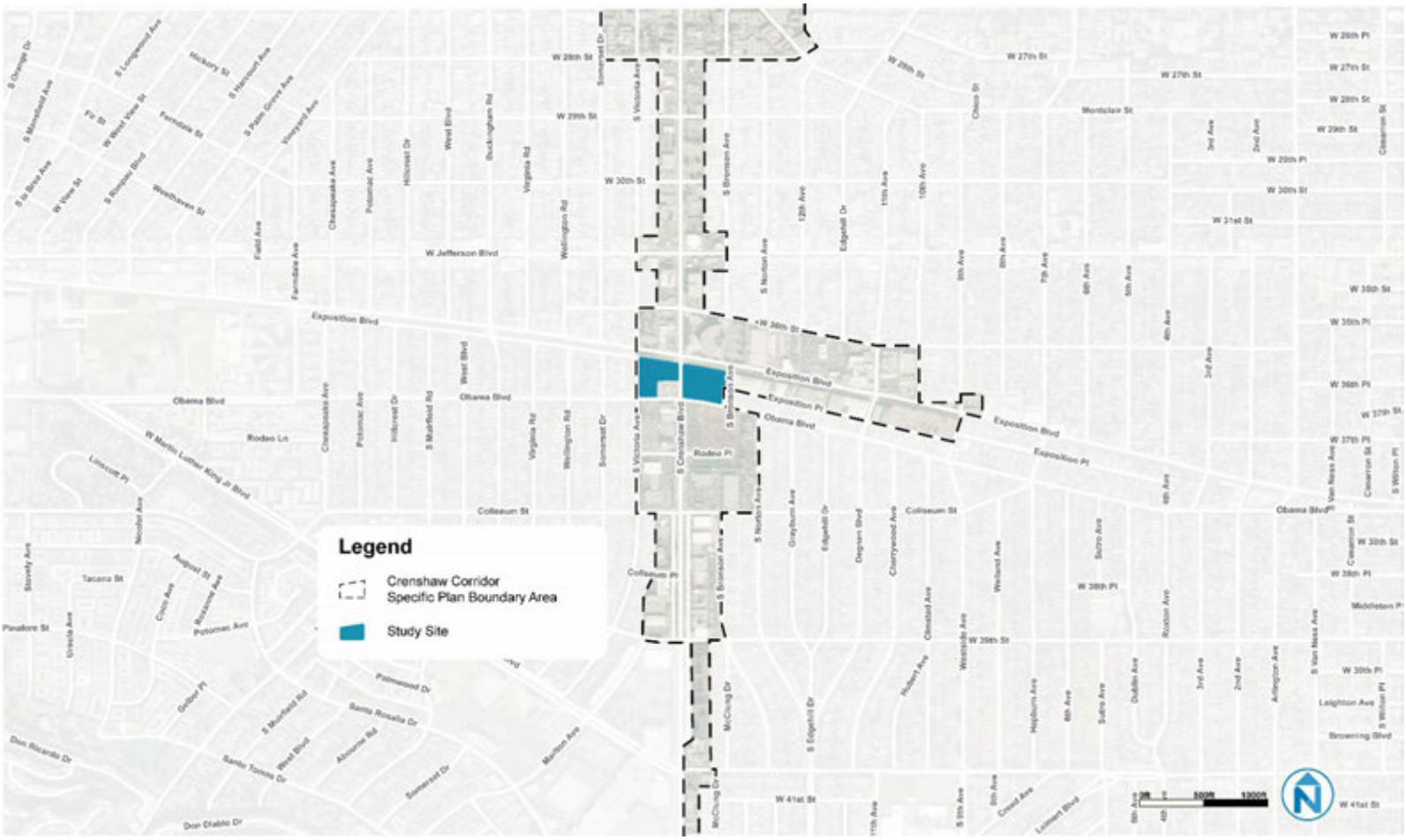


PROJECT CONTEXT AND STUDY AREA

The Project Site is located on the southwest portion of the City of Los Angeles, specifically made up of six parcels and portions of existing public ROW, bounded by the at-grade Expo Line to north, Obama Blvd (formerly Rodeo Rd.) to the south, and Crenshaw Blvd running between them. The Project Site will be served by the Expo Line with station access on the eastside of the intersection of Crenshaw and Upper Exposition Blvds and the future Crenshaw/LAX Line with an underground station on Crenshaw Blvd within the Project Site. The Project Site, in its entirety encompasses approximately 4.18 acres that are currently occupied by a vacant one-story government office building and parking lot, and a worksite for the under-construction Crenshaw/LAX line station. The Project Site is in the Crenshaw Corridor Specific Plan area. Crenshaw Blvd is a major commercial corridor with access to a variety of transit options. In general, the land-use context surrounding the corridor is single family and low-density residential with small lot sizes and short setbacks.

The roadway network in and around the Project Site is in a grid pattern comprised of multi-lane avenues and local streets. Light rail operating within a dedicated transitway running east-west borders the Project Site to the north. The intersection of the Expo line at Crenshaw Blvd and Upper Exposition Blvd is street level with at-grade vehicle, bicycle and pedestrian crossings.

Figure 4 Project Context



ANALYSIS SCENARIOS

The following scenarios were defined in consultation with LADOT (as approved in the MOU) to determine the extent to which the Project may affect the surrounding transportation environment during weekday morning (AM) and evening (PM) peak periods:

- ***Existing Conditions*** – This scenario represents current multimodal conditions and the existing roadway network. Roadway segment and intersection traffic volumes are based on existing intersection turning movement counts collected by NN Engineering.
- ***Future No Project*** – 2023 conditions if no project is built. The traffic network under this scenario assumes no changes to the roadway network. This scenario includes background traffic growth and related developments that will contribute to increased regional traffic.
- ***Future*** + ***Project*** – 2023 conditions plus projected traffic generated by the Project; the traffic network under this scenario represents projected conditions and including permanent road closures due to the merging of these public ROWs into the Project Site (Lower W. Exposition Blvd between S. Victoria Ave and S. Bronson Ave; and Bronson Ave between Exposition Blvd and Exposition Pl) new intersections and access driveways proposed by the Project. This scenario includes background traffic growth and related developments that will contribute to increased regional traffic.

2 Regulatory Setting

STATE REGULATIONS

California Department of Transportation

Caltrans is responsible for the planning, design, construction, and maintenance of all state highways. Caltrans' jurisdiction includes improvements to the interchange ramps serving area freeways. The *Guide for the Preparation of Traffic Impact Studies* provides consistent guidance for Caltrans staff who review local development and land use change proposals[1]. The Guide also informs local agencies about the information needed for Caltrans to analyze the traffic impacts to state highway facilities, including freeway segments, on- or off-ramps, and signalized intersections. Caltrans facilities in the surroundings of the Project Site include Interstate 10, as well as the on- and off-ramps from those state facilities. The Caltrans *Guide for the Preparation of Traffic Impact Studies* reads:

> *"Caltrans endeavors to maintain a target level of service (LOS) at the transition between LOS C and LOS D on State highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing Measure of Effectiveness (MOE) should be maintained."*

REGIONAL REGULATIONS

Los Angeles County Metropolitan Transportation Authority (Metro)

The Los Angeles County Metropolitan Transportation Authority (Metro) serves as the Congestion Management Agency (CMA) of Los Angeles County. As required by state law, Metro must prepare a Congestion Management Program (CMP) or an equivalent comprehensive plan that outlines strategies for managing the regional transportation network[2]. As of July 2019, the County of Los Angeles adopted a Transportation Core Service Area Congestion Management Program Opt-Out under the justification that the CMP is outdated and not in line with regional, State, and Federal transportation planning requirements[3]. Opting out relieves the County from "having a single measure LOS to determine roadway deficiencies" allowing for emphasis on VMT impacts in place of LOS.

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[1] Caltrans, *Guide for the Preparation of Traffic Impact Studies*, 2002.

[2] Los Angeles County Metropolitan Transportation Authority Congestion Management Program 2010 (published and adopted October 28, 2010).

[3] http://file.lacounty.gov/SDSInter/bos/supdocs/137953.pdf

Southern California Association of Governments (SCAG)

SCAG authored the current Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) known as *2016-2040 RTP/SCS,* adopted on April 7, 2016. *2016-2040 RTP/SCS* specifies a detailed set of investments and strategies throughout the region from 2016 through 2040 to maintain, manage, and improve the surface transportation system, specifying how anticipated federal, state, and local transportation funds will be spent[4]. The projects included in the 2035 plan that may affect the Project Site and/or future users of the project are:

- Metro Crenshaw Northern Extension
- Metro Crenshaw/LAX transit corridor (under construction, opening 2020) - the Crenshaw/LAX Transit Corridor Project is an 8.5-mile light rail transit (LRT) line extending from the intersection of Crenshaw and Exposition Blvds allowing for transfer to the Metro Expo line to a connection with the Metro Green Line at the Aviation/LAX Station
- Metro Expo Line Station streetscape project-east Crenshaw Blvd to Jefferson Blvd Design & construction of pedestrian related streetscape improvements within 1/4 mile from each of three light rail stations along Exposition Blvd between Crenshaw Blvd & Jefferson Blvd
- Stocker/MLK Crenshaw access to Metro Expo LRT station. This project will design/construct capital improvements at the bus hub intersections of Stocker St/Crenshaw Blvd and Martin Luther King Jr Blvd/Crenshaw Blvd in the City of Los Angeles. Project elements to include sidewalk improvements, street furniture, safety lighting, and wayfinding signage
- Slauson Light Rail: Crenshaw Corridor to Metro Blue Line-Slauson Station (Metro)
- Crenshaw Exposition Light Rail Station TOD Accessibility: Installation of pedestrian/transit connectivity improvements from Coliseum St to 30th St (Metro)
- Crenshaw Blvd Corridor northern extension (beyond segment funded by Measure R) all the way to West Hollywood/Hollywood (Metro)

[4] Full list of projects are available online at: http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS_ProjectList.pdf

LOCAL REGULATIONS

City of Los Angeles General Plan

The City of Los Angeles Mobility Plan 2035[5] contains guiding and implementing policies that are relevant to transportation and circulation in the study area. These guiding and implementing policies are presented below in **Table 2-1.**

Table 2-1 City of Los Angeles Mobility Plan 2035 – Guiding Policies and Objectives

Objective/Policy	Description
Policy 1.1	Design, plan, and operate streets to prioritize the safety of the most vulnerable roadway user.
Policy 1.2	Implement a balanced transportation system on all streets, tunnels, and bridges using complete streets principles to ensure the safety and mobility of all users.
Policy 1.4	Design streets to Targeted Operating Speeds as defined in the Complete Streets Design Guide.
Objective 1.6	Increase pedestrian safety improvements in the design and implementation of complete streets projects within the top 25% SB565[6] disadvantaged communities located in the City of Los Angeles or as subsequently identified through tools utilized by the City
Policy 1.5	Reduce conflicts and improve safety at railroad crossings through design, planning, and operation.
Policy 1.6	Design detour facilities to provide safe passage for all modes of travel during times of construction.
Policy 1.7	Enhance roadway safety by maintaining the street, alley, tunnel, and bridge system in good to excellent condition.
Policy 2.3	Recognize walking as a component of every trip, and ensure high-quality pedestrian access in all site planning and public right-of-way modifications to provide a safe and comfortable walking environment
Policy 2.6	Provide safe, convenient, and comfortable local and regional bicycling facilities for people of all types and abilities.
Policy 2.9	Consider the role of each enhanced network when designing a street that includes multiple modes.
Objective 3.7	Install pedestrian access curb ramps at 100% of all intersections by 2035.
Policy 3.2	Accommodate the needs of people with disabilities when modifying or installing infrastructure in the public right-of-way.
Policy 3.3	Promote equitable land use decisions that result in fewer vehicle trips by providing greater proximity and access to jobs, destinations, and other neighborhood services.
Policy 3.8	Provide bicyclists with convenient, secure and well-maintained bicycle parking facilities.
Policy 4.8	Encourage greater utilization of Transportation Demand Management (TDM) strategies to reduce dependence on single-occupancy vehicles.
Policy 4.13	Balance on-street and off-street parking supply with other transportation and land use objectives.

[5] City of Los Angeles, Mobility Plan 2035, An Element of the General Plan, adopted September 7, 2016.

[6] While the Mobility Plan references SB 565, the correct bill number regarding disadvantaged communities is SB 535.

Objective/Policy	Description
Objective 5.1	Decrease VMT per capita by 5% every five years, to 20% by 2035.

Source: City of Los Angeles Mobility Plan 2035 (April 2016).

It is important to note that the Crenshaw Corridor Specific Plan provides a detailed vision, guiding plan area principles (purposes), guidelines and policies for the corridor. Because the Project would be located within this Plan Area, all regulations and policies set forth in the Specific Plan would be applicable. Transportation related goals and policies are presented below in **Table 2-2**.

Table 2-2 City of Los Angeles – Crenshaw Corridor Specific Plan

Purpose	Description
Purpose-E	To promote a high level of pedestrian activity in areas identified as Pedestrian-Oriented Areas and TOD Areas by promoting neighborhood serving uses, which encourage pedestrian activity and promote reduced traffic generation.
Purpose-F	To promote an attractive pedestrian environment in the areas designated as Pedestrian-Oriented Areas and TOD Areas by regulating the design and placement of buildings and structures which accommodate outdoor dining and other ground level retail activity.
Purpose-H	To encourage the creation of pedestrian-friendly TOD Areas consistent with the goals and policies of the Community Plan that promote health and sustainability by encouraging a mix of uses providing jobs, housing, goods and services, as well as access to open space, all within walking distance of the Mid City/Exposition and Crenshaw/LAX Light Rail Transit Corridor stations.

Source: City of Los Angeles Crenshaw Corridor Specific Plan (Amended 2017)

Los Angeles Department of Transportation TAG

The TAG, approved in July 2019, provide step-by step guidance for assessing impacts and preparing Transportation Assessment Studies. The TAG was developed to identify land use development and transportation projects that may impact the transportation system; to ensure proposed land use development projects achieve site access design requirements and on-site circulation best practices; and to define whether off-site improvements are needed. The TAG includes CEQA and non-CEQA guidelines to be contained in Transportation Assessment Studies.

CEQA Analysis

The TAG outlines guidelines to analyze impacts in line with CEQA. These thresholds include:

- **Threshold T-1** Conflicting with Plans, Programs, Ordinances, or Policies

  Analyze projects to identify any conflicts with City plans and policies. If there are conflicts, prioritize improvements for people walking, bicycling, and riding transit.

- **Threshold T-2.1** Causing Substantial VMT

  Analyze VMT impacts as a result of the project and determine if the results are in line with the Los Angeles Mobility Plan 2035 goal to decrease VMT per capita by 5% every five years [from 2015 baseline conditions], to 20% by 2035.

- **Threshold T-2.2** Substantially Inducing Additional Automobile Travel

This threshold analyzes whether a project increases vehicular capacity and leads to additional VMT on the roadway network, and applies only to transportation projects.

- **Threshold T-3** Substantially Increasing Hazards Due to a Geometric design or Feature or Incompatible Use

  Evaluate site access points for possible hazards for vehicle/bicycle/pedestrian interactions.

Non-CEQA Analysis

The TAG also includes non-CEQA analysis to align with City of Los Angeles regulations.

Pedestrian, Bicycle, and Transit Access Assessment

The TAG describes policies necessary to ensure that pedestrian and bicycle facilities are safe and effective for City residents. Significant impacts to these facilities would occur if a project or an element of a project:

- Creates a hazardous condition that currently does not exist for pedestrians and bicyclists, or otherwise interferes with pedestrian accessibility to the study area and adjoining areas; or
- Conflicts with an existing or planned pedestrian or bicycle facility; or
- Conflicts with policies related to bicycle and pedestrian activity adopted by the City of Los Angeles. Generally, a project causes a significant impact to transit facilities and services if an element of it conflicts with existing or planned transit services. The TAG states the evaluation of transit facilities shall consider if:
  - A project creates demand for public transit services above the capacity which is provided or planned;
  - A project or project-related mitigation disrupts existing transit services or facilities[7]; or
  - A project or project-related mitigation conflicts with existing or planned transit facility.

Project Access, Safety and Circulation Evaluation

The TAG requires the project be analyzed for vehicular/vehicular, vehicular/bicycle, or vehicular/pedestrian constraints related to safety and capacity constraints, as well as potential operational delays.

Project Construction

The TAG requires assessment of the project construction activities and any in-street construction for infrastructure projects that may result in temporary infrastructure constraints, loss of access, or loss/rerouting of bus lines.

Residential Street Cut-Through Analysis

The TAG requires analysis of possible increase to average daily traffic (ADT) along side streets caused by the project. Specifically, this guideline analyzes impacts to streets classified as a Local Street in the City's General Plan, with residential land-use frontage.

[7] This includes disruptions caused by proposed project streets or driveways on transit streets and impacts to transit stops/shelters; and impacts to transit operations from roadway changes proposed or resulting from a project.

3 Project Context

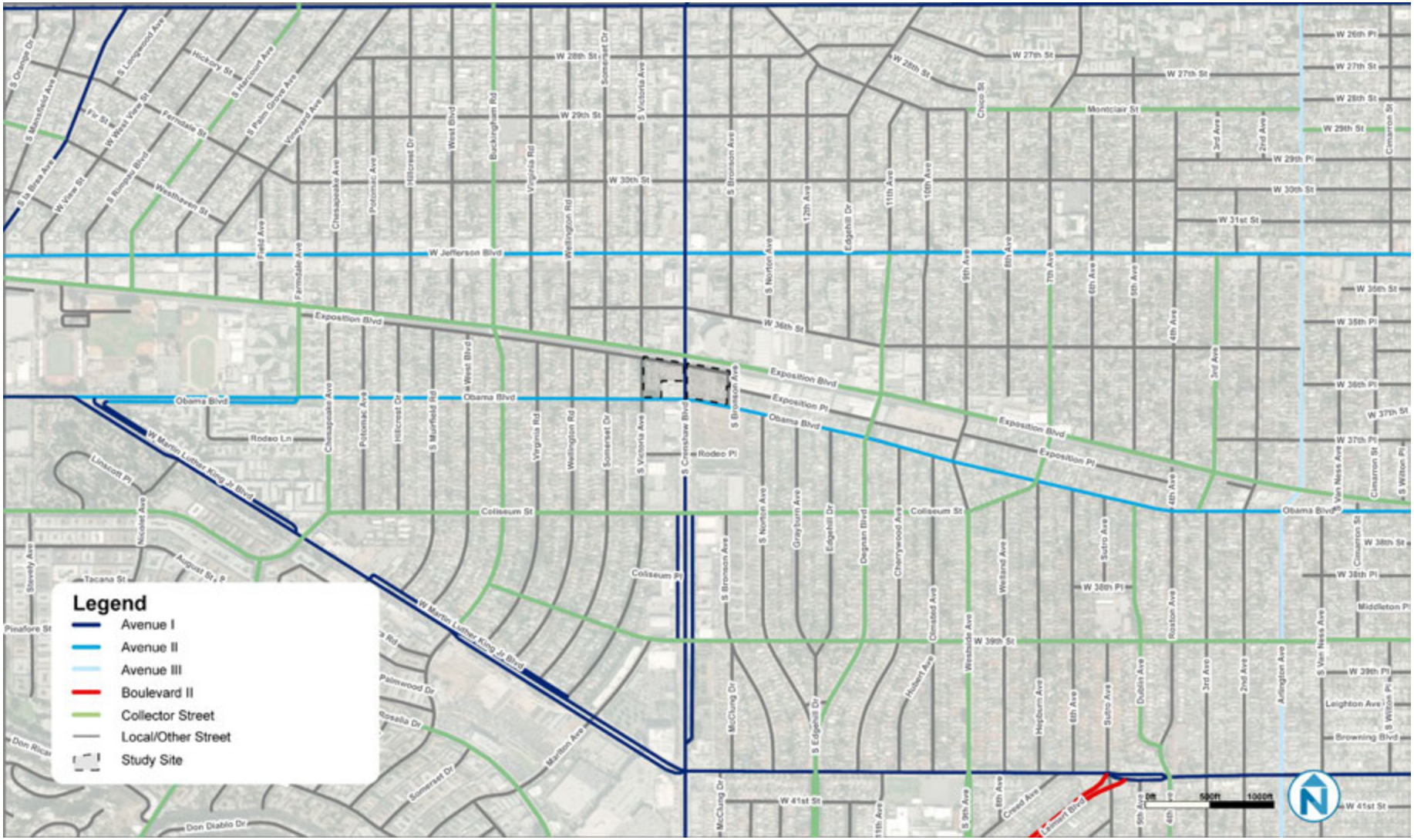
The existing transportation-related context of the Project is described below, beginning with a description of the street network that serves the Project Site and surroundings. Existing transit service, and bicycle and pedestrian facilities near the Project are also described. Intersection and roadway segment levels of service are then defined, and current conditions for roadways and intersections in the Project vicinity are summarized.

ROADWAY NETWORK

The Project Site is in the southwestern region of the City of Los Angeles and bounded by the Expo Line to north, Obama Blvd to the south, Bronson Ave to the east, and S. Victoria Ave to the west. Between the six parcels that comprise the Project runs Crenshaw Blvd. Interstate 10, Interstate 110, Western Ave and a series of local-serving streets provide regional access to the Project Site. A full description of regional and local roadways in the context of the Project vicinity is provided below. **Figure 5** illustrates the street network and classification based on the City of Los Angeles *Mobility Plan 2035*[8].

[8] City of Los Angeles General Plan – Mobility Element, Mobility Plan 2035; available online at: https://planning.lacity.org/documents/policy/mobilityplnmemo.pdf

Figure 5 Street Network



Source: City of Los Angeles Mobility Plan 2035 (2016).

Regional Roadways

Interstate 10 (I-10/Santa Monica Freeway) is an east-west freeway that connects the City of Los Angeles with Santa Monica to the west and Riverside as well as San Bernardino Counties to the east. Within the study area, I-10 is five travel lanes and one auxiliary lane between access ramps in each direction. Three full-access interchanges north of the Project Site, at Arlington Ave, Crenshaw Blvd, and S. La Brea Ave, provide access from I-10 to South Los Angeles. The most recent data published by Caltrans indicates that the annual average daily traffic (AADT) volume on I-10 ranges from 294,000-325,000 vehicles with 22,100-23,100 peak-hour vehicles near the Project Site[9]. The freeway is a designated roadway in the Metro C*ongestion Management Program* (CMP) transportation system[10]. The freeway is a designated truck route in the *Mobility Plan 2035*.

Local Roadways

Local roadways that serve the Project include Exposition Blvd, Crenshaw Blvd, Obama Blvd and Jefferson Blvd, which also provide additional connections to other local and regional streets. These and other local streets are described below.

Upper Exposition Blvd is an east-west roadway located directly north of the Metro Expo Line right of way. The road originates at the University of Southern California, spanning the length of much of Los Angeles before changing designation to Jefferson Blvd at Bay Rd. Near the Project, the boulevard is primarily one 10' travel lane and a 5' bike lane (class II bike lane) in each direction with added 10' wide turn pockets at intersections. Between Gramercy Pl and S. Figueroa St, the roadway widens to two travel lanes in each direction separated by a central median. At Gramercy Pl, Exposition Blvd splits at a diverging intersection across an at-grade rail crossing to create Obama Blvd. Exposition Blvd continues west as a two-way road on the north side of the Expo Line tracks. The street is classified as a Collector Street and is also included in the Pedestrian Enhanced Districts network in the *Mobility Plan 2035*.

Lower Exposition Blvd is an east-west roadway located directly north of the Project. The road extends from Farmdale Ave in the west to Bronson Ave in the east. The street is classified as a Local Street in the *Mobility Plan 2035*. The Project Site and Lower Exposition Blvd segments directly adjacent to the Project Site are planned to be merged, creating publicly accessible pedestrian-priority access to Crenshaw Blvd as well as on-site and nearby public transportation amenities.

Crenshaw Blvd is a north-south roadway containing two 10' travel lanes with added 10' wide turn pockets at intersections in each direction. In the study area, the boulevard extends from 29th St in the north to Martin Luther King Jr. Blvd to the south. The street is classified as an Ave I in the *Mobility Plan 2035* and is also included in the Pedestrian Enhanced Districts Network. Metro has planned to incorporate bus turnouts along the corridor.

Obama Blvd is an east-west roadway with two 10' to 12' travel lanes in each direction with added 10' turn pockets at intersections. On-street parking exists on both sides of the street west of S. Victoria Ave, on the north side of the street east of Bronson Ave, and on the south side of the street east of Norton Ave. In the

[9] California Department of Transportation (Caltrans), Traffic Data Branch, 2017 All Traffic Volumes on CSHS; available online at: http://www.dot.ca.gov/trafficops/census/.

[10] Los Angeles Metropolitan Transportation Authority (Metro) Congestion Management Program (October 2010); available online at: http://media.metro.net/projects_studies/cmp/images/CMP_Final_2010.pdf.

study area, the street extends from Olmstead Ave to the east and S. Muirfield Rd (and becomes Higuera St in Culver City) to the west. The street is classified as an Ave II in the *Mobility Plan 2035*.

S. Victoria Ave is a north-south roadway with one travel lane in each direction. The street is approximately 35' from curb to curb with unrestricted parking aside from street sweeping hours on both sides. In the study area, the street extends from Lower W. Exposition Blvd in the north to Martin Luther King Jr. Blvd in the south. The street is classified as a Local Street in the *Mobility Plan 2035*.

S. Bronson Ave is a north-south roadway with one travel lane in each direction. The street is approximately 35' from curb to curb with unrestricted parking. In the study area, the street extends from Lower W. Exposition Blvd in the north to Obama Blvd in the south. The segment of S. Bronson Ave between Lower W. Exposition Blvd and Exposition Pl will be merged with the Project Site and produce publicly accessible, wide pedestrian access to Crenshaw Blvd and on-site Metro Rail stations. The street is classified as a Local Street in the *Mobility Plan 2035*.

TRANSIT SERVICE

Figure 6 presents the existing transit network in the study area.

Los Angeles Metropolitan Transportation Authority (Metro) operates heavy rail, light rail, and fixed-route bus transit service. Within the Project area, there are five bus routes that operate during weekdays (Monday through Friday) and limited service on weekends. Also, within the study area are two Metro operated light rail lines, the Metro Expo Line and the soon-to-be opened (2020) Metro Crenshaw/LAX Line. [11]

Rail

- **Metro Expo Line** operates weekday, weekend, and holiday service between the City of Santa Monica and Downtown Los Angeles. Weekday service operates from 3:36 AM to 2:32 AM with Friday night service being extended to 2:52 AM. Weekend and holiday service operates between 3:36 AM and 2:32 AM, with Saturday night service being extended to 2:52 AM. This Metro Light Rail Line operates at approximately 15-minute headways (the frequency, or interval of time between buses traveling in any given direction along a designated route). The nearest stops in proximity to the Project are at either side of Crenshaw Blvd the intersection of W. Exposition Blvd. The portion of the Expo Line within the study area operates at-grade.
- **Metro Crenshaw/LAX Line** Phase 1 is planned to open mid-2020. Phase 1 will link the Metro Expo Line from Exposition/Crenshaw Station to the Metro Green Line at Aviation/LAX Station. The line will connect to the LAX people mover at Aviation/Century Station. The line will serve the Crenshaw District, City of Inglewood, and Westchester. The portion of the Crenshaw/LAX Line within the study area operates below-grade.

Bus

- **Route 740** operates weekday and weekend service between Jefferson Park at the Expo/Crenshaw station to the north, and the South Bay Galleria to the south. Weekday service operates from 4:51 AM to 9:34 PM, and weekend service operates from 5:31 AM to 9:19 PM. This route does not have service on Sundays or during select holidays. During hours of operation, this Metro Rapid bus route operates at approximately 15-minute headways. The nearest stops in proximity to the Project are at the intersection of Upper W. Exposition Blvd and Crenshaw Blvd, north of the Expo Line Station.
- **Route 210** operates weekday and weekend services between the Hollywood/Vine Red Line Station and South Bay Galleria Transit Center in Hermosa Beach. Weekday service operatesfrom 4:21 AM to 2:39 AM, and weekend service operates from 4:15 AM to 2:36 AM. This local route operates both Saturday and Sunday service along the 210/710 route. During hours of operation, this fixed-route local bus route operates at approximately 10-15-minute headways during both weekday and weekend service. The nearest stops in proximity to the Project are at the intersection of W. Upper W. Exposition Blvd and Crenshaw Blvd, north of the Expo Line Station.
- **Route 710** operates weekday and weekend services between the Hollywood/Vine Red Line Station and South Bay Galleria Transit Center in Hermosa Beach. Weekday service operates from

[11]Los Angeles Metropolitan Transportation Authority (LA Metro) Timetables. Regular Bus and Rail Schedules effective June 23, 2019. https://www.metro.net/riding/maps/system-maps/

5:17 AM to 9:24 PM, and weekend service operates from 6:04 AM to 8:54 PM. This route does not have service on Sundays or during select holidays. During hours of operation, this fixed-route Metro bus route operates at approximately 15-minute headways during both weekday and weekend service. The nearest stops in proximity to the Project are at the intersection of Upper W. Exposition Blvd and Crenshaw Blvd, north of the Expo Line Station.

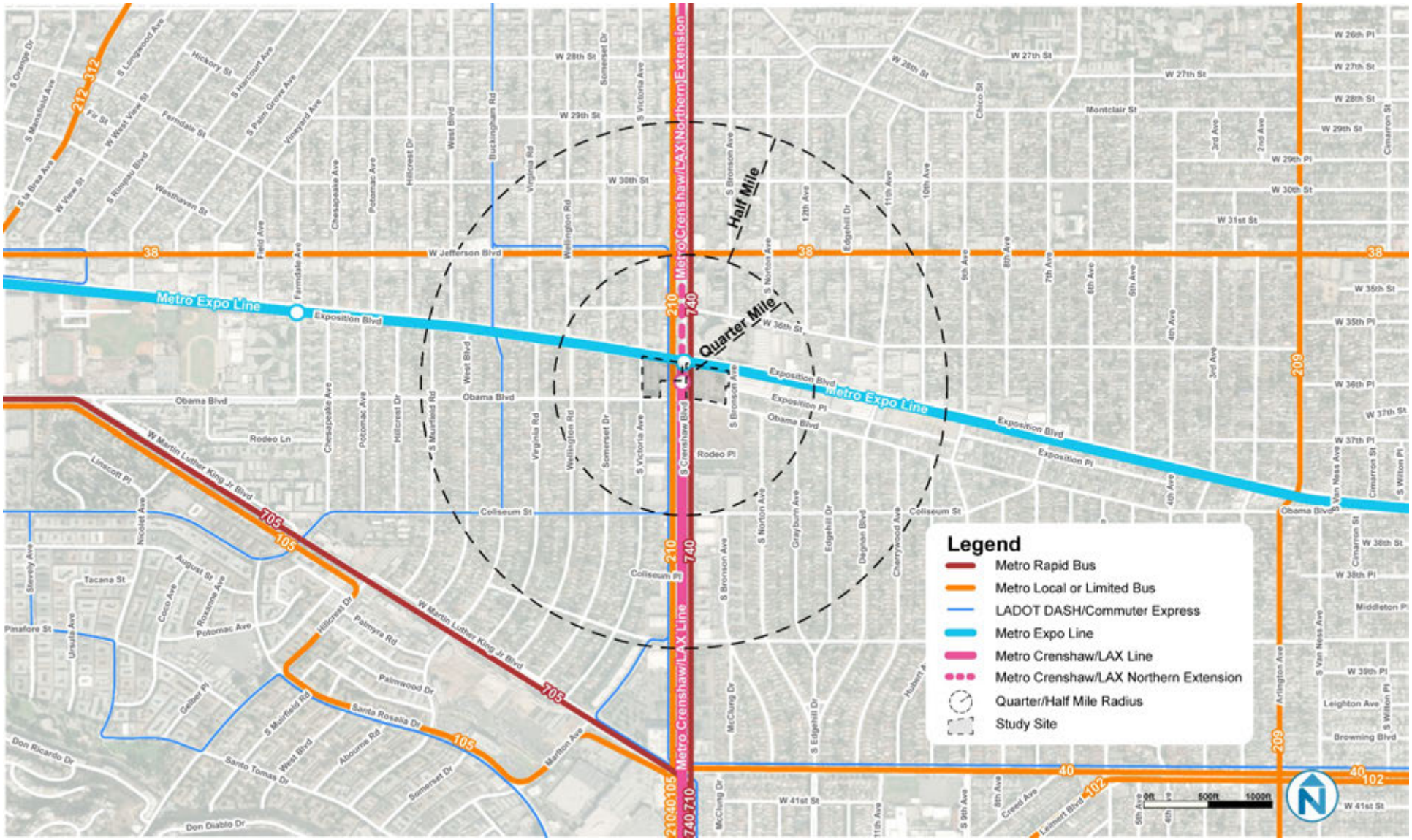
- **Route 705** operates weekday and weekend services between West Hollywood at the intersection of San Vicente Blvd and Santa Monica Blvd and the City of Vernon at the intersection of Pacific Blvd/E. Vernon Blvd and Santa Fe Ave. Weekday service operates from 5:00 AM to 9:19 PM. This line does not run service on weekends or select holidays. During hours of operation, this fixed-route Metro Rapid bus route operates at approximately 10-25-minute headways during weekday service. The nearest stop in proximity to the Project is at Martin Luther King, Jr Blvd and Crenshaw Blvd.
- **Route 38** operates between Broadway and Venice Ave west of the Fashion District of Los Angeles and Washington/Fairfax Transit Hub near Culver City between 4:05 AM and 1:03 AM on weekdays, with Westbound service terminating at 12:27 AM. On Saturdays, the bus route operates between 4:17 AM and 1:03 AM, with Westbound service terminating at 12:27 AM. During hours of operation, this fixed-route bus route operates at approximately 30-minute headways during weekday service. In the Project area, the bus route operates along Jefferson Blvd. The nearest bus stop is located at the intersection Jefferson Blvd & Crenshaw Blvd.

Los Angeles Department of Transportation (LADOT) operates fixed-route bus transit service. Within the Project area, there are three DASH routes operated by LADOT (Midtown, Leimert/Slauson, and Crenshaw Routes) that operate during weekdays (Monday through Friday) as well as weekends (Saturday and Sunday). None of the three lines provide holiday service. [12]

- **DASH Midtown Route** operates between Mid City and Crenshaw between 6:00 AM and 7:40 PM on weekdays, with Southbound service terminating at 7:48 PM. On Saturdays, the bus route operates between from 9:00 AM and 6:40 PM, with Southbound service terminating at 6:48 PM. In the Project area, the bus route makes a loop using Jefferson Blvd, Crenshaw Blvd, Coliseum St, and Buckingham Rd. The nearest bus stop is located on the same block of the study site west of Crenshaw Blvd.
- **DASH Leimert/Slauson Route** is operated as a bidirectional loop from Martin Luther King Blvd at Crenshaw Mall to the LA Memorial Coliseum to the east. The clockwise route operates between 6:05 AM and 7:44 PM on weekdays. The counterclockwise route operates between the same hours. Saturdays and Sundays, the bus route operates between 9:00 AM and 6:54 PM. In the Project area, the bus route operates along Crenshaw Blvd, Martin Luther King, Jr Blvd, and Marlton Ave. The nearest bus stop is located at the intersection of W. Martin Luther King Blvd and Crenshaw Blvd.
- **DASH Crenshaw Route** is operated as a bidirectional loop from Martin Luther King, Jr Blvd at Crenshaw Mall to the Rancho Cienega Recreation Center. The route operates between 6:00 AM and 7:35 PM on weekdays. The counterclockwise route operates between the same hours. On Saturdays, the bus route operates between from 9:00 AM and 6:35 PM, with Southbound service terminating at 6:48 PM. In the Project area, the bus route operates along Crenshaw Blvd, Coliseum St, W. 39th St, and Menalto Ave. The nearest bus stop is located on the same block of the study site west of Crenshaw Blvd.

[12] Los Angeles Department of Transportation (LADOT) Downtown Area Short Hop (DASH). https://www.ladottransit.com/index.html#mNavDash

Figure 6 **Transit Network**



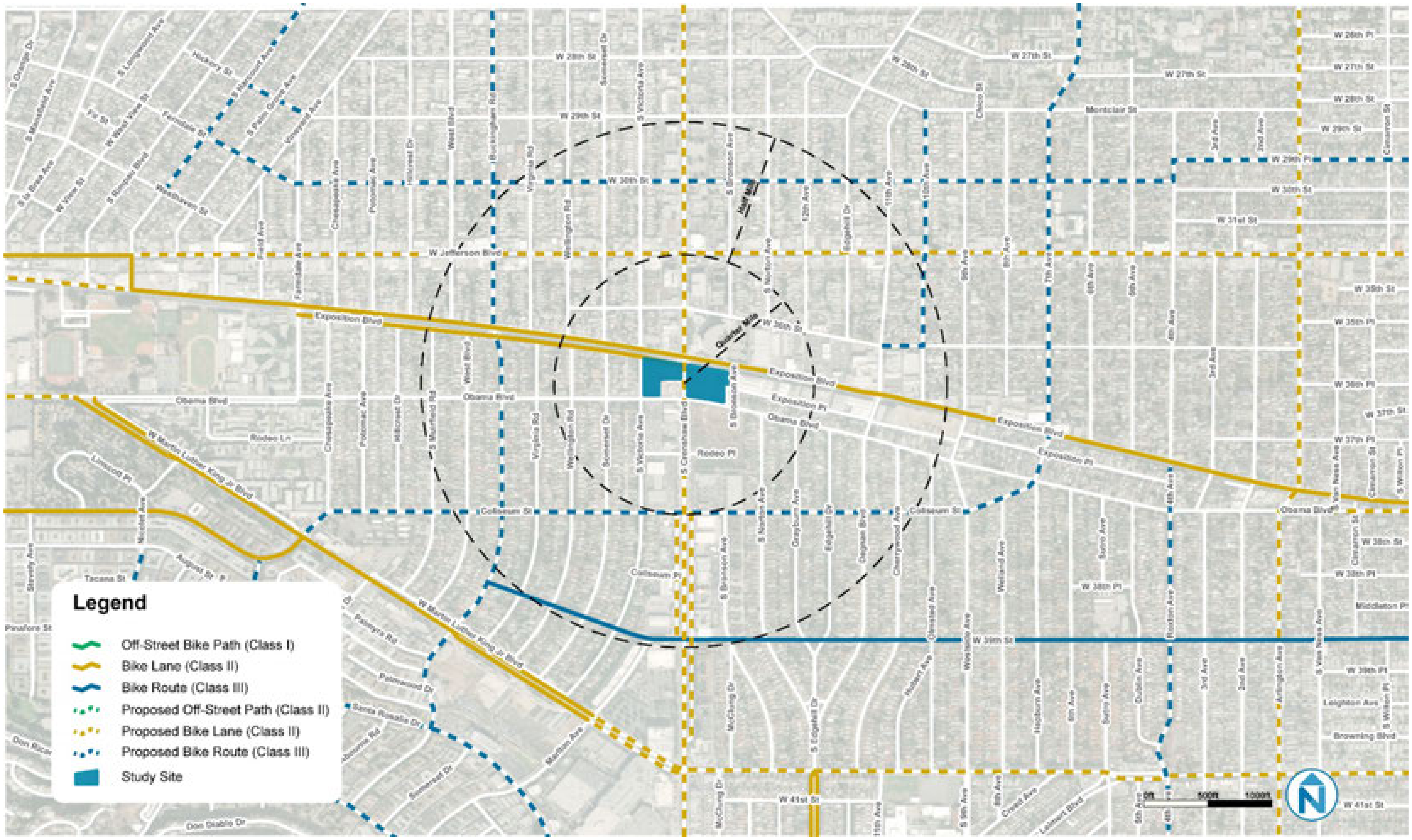
BICYCLE NETWORK

Figure 7 (next page) presents the existing bicycle network in the study area. According to the *Mobility Plan 2035*, bikeways are classified as Class I (bicycle paths separated from roads), Class II (striped bicycle lanes within the paved areas of roadways), or Class III (signed bike routes that allow cyclists to share streets with vehicles). Within the study area, there are Class II bike lanes situated along the entirety of Upper W. Exposition Blvd the bike lanes continue east to the University of Southern California. West, the Class II bike lane continues along Upper W. Exposition Blvd and jogs the north to the Jefferson Blvd alignment at the intersection of La Brea and Upper W. Exposition. A Class II bike lane also exists along W. Martin Luther King Jr Blvd to the south of the Project Site, from Obama Blvd to Marlton Ave. Also, in the study area is a Class III bike route that runs along W. 39th St from its western terminus at Buckingham Rd and to the east where it terminates at Exposition Park and the Los Angeles Memorial Coliseum.

There are several planned bike routes near the Project Site according to the County's 2012 Bike Master Plan, slated for implementation through 2032; all the routes near the study area are proposed by other planning authorities according to Metro data[13]. Notably, there are planned Class II bike lanes along Crenshaw Blvd, which will serve the Project Site directly. Other bicycle infrastructure planned for the study area include Class II bike lanes along W. Jefferson Blvd, Arlington Ave extension of the Martin Luther King Jr Blvd bike lanes to the south, Obama Blvd west of W. Martin Luther King Blvd as well as east of Arlington Ave, and extension of the W. Exposition Blvd bike lanes to the west. Class III bike routes are planned along the following roadways in the study area: Buckingham Rd, W. 30th St, 10th Ave, 7th Ave, Coliseum St, Roxton/4th Ave (south of W. Exposition), Santa Rosalia Dr, Santo Tomas Dr, Harcourt Ave and Hickory St.

[13] Source: LA County Bicycle Master Plan (2012) and LA City Bicycle Plan (2010) via dpw.lacounty.gov/pdd/bike/map.cfm.

Figure 7 **Bicycle Network**



Source: LA County Bicycle Master Plan (2012) and LA City Bicycle Plan (2010) via dpw.lacounty.gov/pdd/bike/map.cfm.

PEDESTRIAN NETWORK

Pedestrian facilities generally include sidewalks, crosswalks, curb ramps, pedestrian signals, and streetscape/landscape amenities (e.g., tree-lined buffers, planters, street lighting, etc.).

Most streets within the study area include continuous, raised, concrete sidewalks and curb cuts (ramps) at intersection corners. Most intersections do not have pedestrian crosswalks and such safety treatments are only located at major intersections, such as Crenshaw Blvd and Obama Blvd, and the intersection of Crenshaw Blvd and the Metro Expo Line Crossing. All major intersections along Crenshaw Blvd within the study area feature crosswalks. The presence of on-street parking, street trees, and parkways throughout much of the study area neighborhood streets allows for additional separation between moving vehicles and pedestrians. Intersection movements (autos, bicyclists and pedestrians) are generally controlled by STOP signs at unsignalized intersections, or a signal, which allow for safer pedestrian crossings; however, not all intersection approaches include STOP signs, therefore, requiring moving vehicles to yield to pedestrians making a crossing movement whether there is a marked crosswalk or not. Marked north-south pedestrian crossing along Obama Blvd are only facilitated at major intersections which can be up to a half-mile apart. **Table 3-1** below presents the Existing Sidewalk Inventory for streets in proximity to the Project Site.

Table 3-1 Existing Sidewalk Inventory

Street	Existing Sidewalk Inventory
Crenshaw Blvd	Sidewalks on both sides
Upper W. Exposition Blvd	Sidewalks on both sides
Lower W. Exposition Blvd	Sidewalks on the south side from Victoria Ave to Bronson Ave*
Obama Blvd	Sidewalks on both sides
Victoria Ave	Sidewalks on both sides
W 36th St	Sidewalks on both sides
Bronson Ave	Sidewalks on both sides**
Exposition Pl	No Sidewalks
Norton Ave	Sidewalks on both sides
Somerset Ave	Sidewalks on both sides

Source: Mobility Plan 2035, Figure 6-6 and site observations; NN Engineering, 2019.

** Segments directly adjacent to the Project Site will be merged and produce publicly accessible non-motorized access to Crenshaw Blvd and all Metro Rail stations.*

*** The segment of S. Bronson Ave between Lower W. Exposition Blvd and Exposition Pl will be merged with the Project Site and produce publicly accessible non-motorized access to Crenshaw Blvd and all Metro Rail stations.*

Pedestrian facilities are planned by Metro that include improved pedestrian crossings at the intersection of Crenshaw Blvd and Obama Blvd, a signalized midblock pedestrian crossing south of the Metro Expo Line connecting the East entrance to the new Crenshaw/LAX Line, bus turn-outs on both sides of Crenshaw Blvd, improved sidewalk facilities and shade trees along Crenshaw Blvd, and the merger of segments of Lower W. Exposition Blvd and S. Bronson Ave adjacent to the Project that will create publicly accessible non-motorized

access to Crenshaw Blvd and all Metro Rail stations. The Crenshaw Corridor Specific Plan emphasizes the importance of improving pedestrian safety in TOD Areas, of which this Project would be a part. Therefore, pedestrian lighting, reduced vehicular traffic generation, and neighborhood serving infrastructure and uses would be emphasized in both design and operations of the Project.

RELATED PROJECTS

The TAG states that "*related projects should include known development projects within one-quarter mile (1,320 foot) radius of the project site*" be considered in the volume calculations. [14] However, for this TAS, known projects within ½ mile of the Project were included per LADOT guidance and is memorialized in the MOU (**Appendix D**). There are five related projects in various phases of development that plan to have completed construction before the completion of the Project. The associated trip generation for each is assumed to be accurate and will be incorporated into future traffic volume projections. These projects are listed in **Table 3-2** below.

It should be noted, on November 19, 2019, the South Los Angeles Area Planning Commission rejected a plan for District Square located at 3670 Crenshaw Blvd. The future of this project is uncertain at time of writing; however, the project trips were included for Future (2023) No Project and Plus Project analysis scenarios. Trip generation for District Square was conducted using ITE *Trip Generation Manual* (10th Edition) based off land uses provided in the respective project's Project Description.

Table 3-2 Related Projects

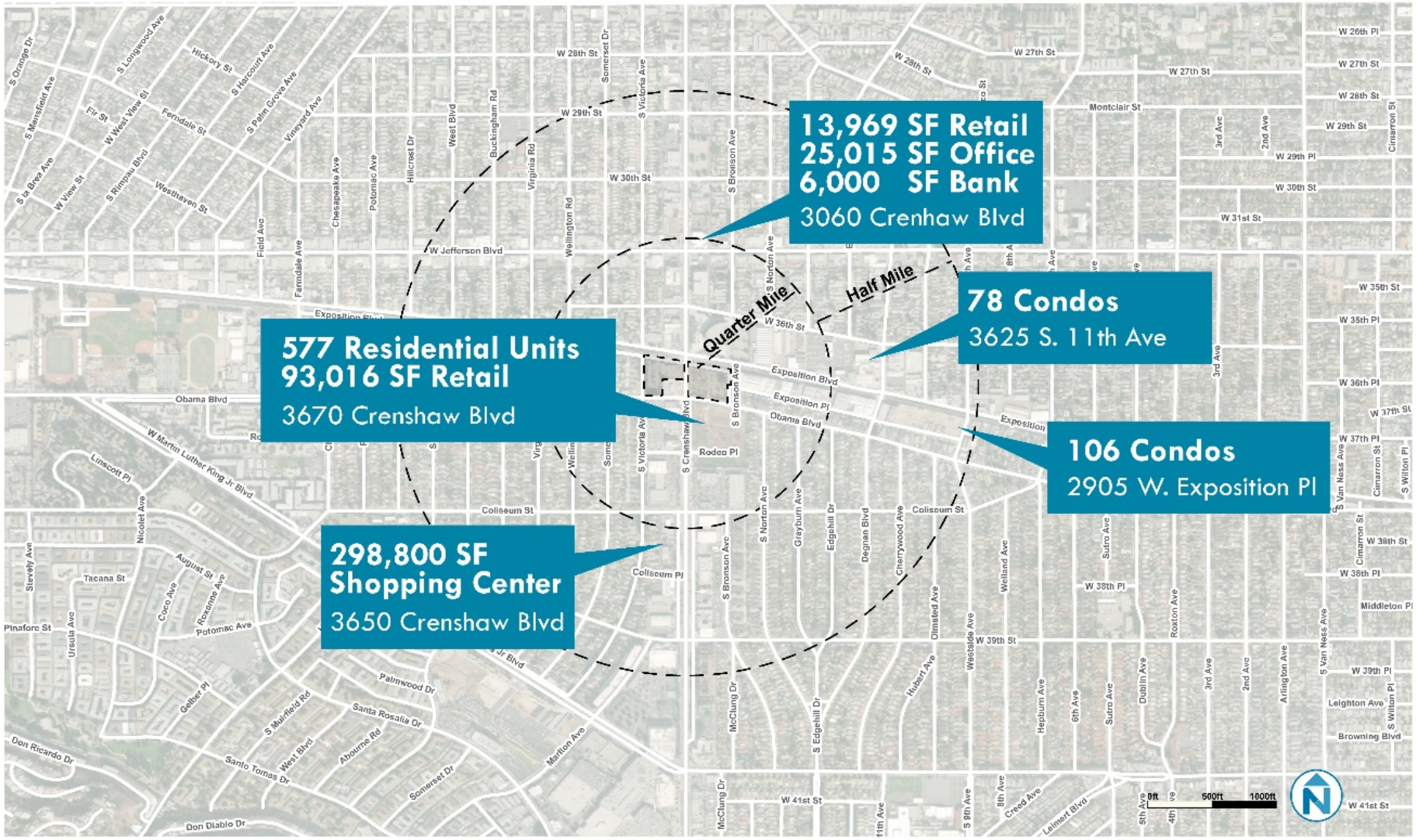
Project ID	Year	Title	Description	Address	Trip Generation			
					AM In	AM Out	PM In	PM Out
35093	2009	Shopping Center	298800 SF Shopping Center	3650 Crenshaw Blvd	62	40	214	232
33981	2007	Retail/ Office Building	13969 SF Retail, 25015 SF Office + 6000 SF Bank	3060 S. Crenshaw Blvd	36	11	34	50
45207	2016	2905 Exposition Pl Condos	78 Condos	2905 W. Exposition Pl	5	29	27	13
46431	2017	LA 10th & 11th Condos	106 Condos	3625 S. 11th Ave	-31	32	22	-10
N/A	N/A	District Square[1]	577 Residential Units 93,016 SF Retail	3670 Crenshaw Blvd	71	129	154	128

Source: Case Logging and Tracking System Report; LADOT February 4, 2019.

1: District Square not available in LADOT data provided; trip generation calculated manually using ITE 10th Edition methodology with 25% transit reduction and 0% TDM reduction.

[14] Source: LADOT TAG. Pg. 11. https://ladot.lacity.org/sites/g/files/wph266/f/TA_Guidelines_%2020190730.pdf.

Figure 8 Map of Related Projects included in future volume calculations



4 CEQA Analysis

The Office of Planning and Research proposed updates to CEQA guidelines establish VMT as the primary metric for evaluating a project's impacts on the environment and transportation system.[15] The CEQA Thresholds are listed in **Table 4-1**.

Table 4-1 CEQA Analysis Thresholds

Thresholds	Name	Description	Meets Threshold?
Threshold T-1	Conflicting with Plans, Programs, Ordinances, or Policies	Analyze projects to identify any conflicts with City plans and policies. If there are conflicts, prioritize improvements for non-vehicular users.	No. Based on the responses listed in **Table 4-2** (below), the Project is found to not conflict with the City of Los Angeles General Plan policies stated in **Table 2-1** and **Table 2-2**. Although the Project will modify public right-of-way, overall the Project improves facilities for pedestrians, bicyclists, motorists, and public transit riders. The transit-oriented focus of the Project encourages sustainable transportation and is in line with the long-term mobility needs identified in the Mobility Plan 2035.
Threshold T-2.1	Causing Substantial VMT	Analyze VMT impacts as a result of the project and determine if the results are in line with the Los Angeles Mobility Plan 2035.	No. The analysis below shows the Project without mitigation would result in a *significant transportation impact for household* VMT per capita. However, it should be noted that the LADOT VMT calculator **does not** account for the presence of the under-construction Crenshaw/LAX Line as well as bus pull-outs and other station amenities that will effectively transform the Project Site and Metro site into a transit hub for the area. With additional VMT reduction proposed in the section below, the final household per capita VMT for the Project is below the VMT impact

[15] Los Angeles Department of Transportation (LADOT) Transportation Assessment Guidelines. July 2019

			threshold and therefore results in *no significant impact to household VMT.*
Threshold T-2.2	Substantially Inducing Additional Automobile Travel	*The project is not a transportation project, and therefore this threshold does not apply.*	*The project is not a transportation project, and therefore this threshold does not apply.*
Threshold T-3	Substantially Increasing Hazards Due to a Geometric design or Feature or Incompatible Use	Evaluate site access points for possible hazards for vehicle/bicycle/pedestrian interactions.	No. As noted in the sections below, the site access clearly separates vehicular driveways and pedestrian and bicycle circulation, resulting in limited vehicle/pedestrian, vehicle/bicycle, and vehicle/vehicle conflicts.

CONFLICTING WITH PLANS, PROGRAMS, ORDINANCES, OR POLICIES (THRESHOLD T-1)

According to the TAG, if a project both requires discretionary action and either—generates a net increase in daily vehicle trips of 250 or more, OR; making voluntary or required modifications to the public right-of-way, OR; is on a lot that is greater than 0.5-acre in total gross area—then the screening criteria is met for this threshold. The Project is expected to generate more than 250 daily vehicle trips and is on a lot that is greater than 0.5 acres. As a result, further analysis is required to assess whether the Project will negatively affect existing pedestrian, bicycle, or transit facilities. The table below is included per the TAG to determine Project applicability to plans, policies, and programs. The Project is also analyzed for consistency with the City of Los Angeles Mobility Plan 2035 and Crenshaw Corridor Specific Plan objectives and policies as outlined in **Table 2-1** and **Table 2-2**, respectively.

Table 4-2 Questions to Determine Project Applicability to Plans, Policies, and Programs

#	Guiding Questions	Relevant Plans, Policies, and Programs	Supporting/ Complementary City Plans, Policies, and Programs to Consult	Project Applicability
Existing Plan Applicability				
1	Does the project include additions or new construction along a street designated as a Blvd I, and II, and/or Ave I, II, or III on property zoned for R3 or less restrictive zone? (screening question)	*LAMC Section 12.37*		Yes, Crenshaw Blvd is designated as Ave I and Obama Blvd is designated as Ave II.
2	Is Project Site along any network identified in the City's Mobility Plan?	*MP 2.3 through 2.7*		Yes, Crenshaw Blvd is identified in the City's Mobility Plan as a Pedestrian Enhanced District (PED) street and within the Bicycle Lane Network (as a Tier 2 Bicycle Lane). Of note, Crenshaw Blvd is also identified as a Comprehensive Transit Enhanced Street north of Exposition Blvd (immediately north of the project).
3	Are dedications or improvements needed to serve long-term mobility needs identified in the Mobility Plan 2035?	*MP - Street Classifications; MP – Street Designations and Standard Roadway Dimensions*	*MP - 2.17 Street Widenings*	No
4	Does the project require placement of transit furniture in accordance with City's Coordinated Street Furniture and Bus Bench Program?			No
5	Is Project Site in an identified Transit Oriented Community (TOC)?	*MP - TEN; MP - PED; MP - BEN; TOC Guidelines*		No
6	Is Project Site on a roadway identified in City's High Injury Network?	*Vision Zero*	*Mobility Plan 2035*	Yes, Crenshaw Blvd is identified in the City's High Injury Network.

7	Does project propose repurposing existing curb space? (Bike corral, car-sharing, parklet, electric vehicle charging, loading zone, curb extension, etc.)	*MP - 2.1 Adaptive Reuse of Streets; MP - 2.10 Loading Areas; MP - 3.5 Multi-Modal Features; MP - 3.8 Bicycle Parking; MP - 4.13 Parking and Land Use Management; MP - 5.4 Clean Fuels and Vehicles*	*MP - 2.3 Pedestrian Infrastructure; MP - 2.4 Neighborhood Enhanced Network; MP - 3.2 People with Disabilities; MP - 4.1 New Technologies; MP 5.1 Sustainable Transportation; MP - 5.5 Green Streets*	Yes. See the Project Site layout **Figure 20**
8	Does project propose narrowing or shifting existing sidewalk placement?	*MP 2.3 Pedestrian Infrastructure; MP 3.1 - Access for All; MP -PED; MP - ENG 19; MP 2.17 Street Widenings*	*Healthy LA; Vision Zero; Sustainability pLAn*	No
9	Does project propose paving, narrowing, shifting or removing an existing parkway?	*MP - 5.5 Green Streets; Sustainability pLAn*		No
10	Does project propose modifying, removing or otherwise affect existing bicycle infrastructure? (ex: driveway proposed along street with bicycle facility)	*MP - BEN; MP - 4.15 Public Hearing Process*	*Vision Zero*	No
11	Is Project Site adjacent to an alley? If yes, will project make use of, modify, or restrict alley access?	*MP - 3.9 Increased Network Access; MP - ENG.9; MP - PL.1; MP - PL.13; MP - PS.3*		No
12	Does project create a cul-de-sac or is Project Site located adjacent to existing cul-de-sac? If yes, is cul-de-sac consistent with design goal in Mobility Plan 2035 (maintain through bicycle and pedestrian access)?	*MP - 3.10 Cul-de-sacs*		No. However, the removal of lower Exposition Blvd's intersections with Victoria and Bronson Aves creates "elbows" that have some functionality similar to culs-de-sac, but still maintain turning traffic access as well as through bicycle and pedestrian access.
Access: Driveways and Loading				
13	Does Project Site introduce a new driveway or loading access along an arterial (Ave or Blvd)?	*MP - PL.1; MP - PK.10, CDG 4.1.02*	*Vision Zero*	No

14	If yes to 13, Is a non-arterial frontage or alley access available to serve the driveway or loading access needs?	*MP - PL.1; MPP 321*	*Vision Zero*	N/A
15	Does Project Site include a corner lot? (avoid driveways too close to intersections)	*CDG 4.1.01*		Yes. The Project Site is bordered by Crenshaw Blvd, Obama Blvd, Bronson Ave, and Victoria Ave. Driveways are located 143 feet and 200 feet from the Bronson Ave and Victoria Ave intersections with Obama Blvd, respectively.
16	Does project propose driveway width in excess of City standard?	*MPP Sec. 321*	*Vision Zero, Sustainability pLAn, MP - PED, MP - BEN CDG 4.1.04*	No
17	Does project propose more driveways than required by City maximum standard?	*MPP - Sec No. 321 Driveway Design*	*Vision Zero, MP, Healthy LA*	No
18	Are loading zones proposed as a part of the project?	*MP - 2.10 Loading Areas; MP - PK.1; MP - PK.7; MP - PK.8; MPP 321*		No
19	Does project include "drop-off" zones or areas? If yes, are such areas located to the side or rear of the building?	MP - 2.10 Loading Areas		Yes, Located within ROW elbows on (i) Bronson Ave at the rear/side of building & on (ii) Victoria Ave at the rear/side of building.
20	Does project propose modifying, limiting/restricting, or removing public access to a public right-of-way (e.g., vacating public right-of-way?)	*MP - 2.3 Pedestrian Infrastructure; MP - 3.9 Increased Network Access*		Yes – Lower Exposition Blvd between Victoria Ave and Bronson Ave, and segment of Bronson to Expo Pl will be vacated/merged through the tract map. Yes – Lower Exposition Blvd between Victoria Ave and Bronson Ave will be merged into the Project Site. The resulting street vacations will remain publicly accessed open spaces for bicycles and pedestrians.

A full consistency analysis to support CEQA Threshold T-1, including objectives and policies as part of the Los Angeles Mobility Plan 2035 and Crenshaw Corridor Specific Plan, can be found in **Appendix E.**

Based on the responses listed in **Table 4-2** and **Appendix E,** the Project is found to not conflict or include features that would preclude the City of Los Angeles Mobility Plan 2035 or Crenshaw Corridor Specific Plan policies stated in **Table 2-1** and **Table 2-2.** Although the Project will modify public right-of-way, overall the Project improves facilities for pedestrians, bicyclists, motorists, and public transit riders. The transit-oriented focus of the Project encourages sustainable transportation and is in line with the long-term mobility needs identified in the Mobility Plan 2035.

CAUSING SUBSTANTIAL VEHICLE MILES TRAVELED (THRESHOLD T-2.1)

Project vehicle miles traveled (VMT) analysis consists of determining whether there would be an increase or decrease in VMT per person on an Area Planning Commission level. Additionally, VMT analysis allows for mitigation of impacts using transportation demand management (TDM) programs to reduce vehicle trips.

VMT Methodology

The City of Los Angeles VMT analysis requires use of the City's VMT Calculator. The calculator uses land use type and area for inputs and provides the following outputs:

- Daily vehicle trips
- Daily VMT
- Household VMT per capita: this is the total home-based VMT productions divided by the population of the project
- Work VMT per employee: this is the total home-based work attractions divided by the employment of the project
- Household significance threshold: the household VMT per capita is measured against threshold for the area planning commission (APC) in which the project is located to determine if the project has a significant household impact
- Work significance threshold: the work VMT per employee is measured against the APC threshold to determine if the project has a significant work impact.[16]

The tool also allows entry of TDM strategies that result in a decrease of VMT beyond the baseline calculations. These calculations are conducted both for TDM strategies that are part of the proposed Project and those that have been added as part of a particular mitigation measure.

For development projects, the City defines a project as having a potential impact if:

- "For residential projects, the project would generate household VMT per capita exceeding 15% below the existing average household VMT per capita for the Area Planning Commission (APC) area in which the project is located. (see **Table 4-3**)

[16] LADOT Website. https://ladot.lacity.org/what-we-do/planning-development-review/transportation-planning-policy/modernizingtransportation-analysis

- For office projects, the project would generate work VMT per employee exceeding 15% below the existing average work VMT per employee for the APC in which the project is located. (see **Table 4-3**)
- For regional serving retail projects, the project would result in a net increase in VMT.
- For other land use types, measure VMT impacts for the work trip element using the criteria for office projects above. (see **Table 4-3**)"[17]

Table 4-3 Impact Criteria (15% Below APC Average)

Area Planning Commission	Daily Household VMT per Capita	Daily Work VMT per Employee
Central	6.0	7.6
East LA	7.2	12.7
Harbor	9.2	12.3
North Valley	9.2	15.0
South LA	**6.0**	**11.6**
South Valley	9.4	11.6
West LA	7.4	11.1

Source: LADOT Transportation Assessment Guidelines

As the Project is located within the South LA APC, the Project will be considered to have a significant impact to VMT if it exceeds the following thresholds:

- Daily Household VMT per capita of 6.0
- Daily Work VMT per employee of 11.6.

TDM Mitigation

Transportation demand management (TDM) strategies provide methods to reduce vehicular trips. Strategies have accompanying reduction rates based on the intensity of the method applied. Strategies are grouped into the following categories:

- Parking
- Transit
- Education & Encouragement
- Commute Trip Reductions
- Shared Mobility
- Bicycle Infrastructure
- Neighborhood Enhancement

Within the VMT Calculator, TDM strategies produce reduction rates can be applied to the model to produce two outputs: TDM measures incorporated as part of the "Proposed Project" (without mitigation strategies),

[17] LADOT Website. https://ladot.lacity.org/what-we-do/planning-development-review/transportation-planning-policy/modernizingtransportation-analysis

and TDM measures proposed as "With Mitigation." For this Project, all TDM measures fall under "**Proposed Project**," meaning they would be incorporated as a strategy without mitigation.

VMT Analysis Findings

The following provides an assessment of the results of the VMT Calculator analysis findings. Full VMT Calculator output and spreadsheet are included in **Appendix C**.

As stated per the TAG, a new development would have a less-than-significant transportation impact if the project were to achieve an average daily VMT per capita that is 15% less than the Area Planning Commission's average daily VMT per Capita. If a project were to result in VMT rates that exceed the 15%-reduction threshold, the project would be inconsistent with statewide and local environmental and transportation policies and therefore, would result in a significant transportation impact. Initial results from the LADOT VMT Calculator are shown in **Table 4-4**. The model utilized Site A's 3606 Exposition Blvd address for VMT calculations.

Table 4-4 Proposed Project Analysis Results (from VMT calculator tool)

Analysis Results	
Total Employees: 145 Total Population: 975	
3,881 Daily Vehicle Trips 25,495 Daily VMT	
7.2 Household VMT per Capita N/A VMT per Employee	
Significant VMT Impact?	
Household > 6.0	Yes
Work > 11.6	N/A

The analysis shows the Proposed Project would result in a ***significant transportation impact for household VMT*** per capita. However, it should be noted that the LADOT VMT Calculator does not account for the presence of the under-construction Metro Crenshaw/LAX Line (to be in operation in 2020) as well as bus pull-outs and other station amenities that will effectively transform the Project Site and Metro site into a multi-modal transit hub for the area.

Work VMT per Employee is not reported for projects in which the only commercial use is retail, since retail VMT impacts are not addressed by the VMT Calculator. The Project includes retail uses that do not exceed 50,000 square feet, and therefore meets the screening criteria and a ***no impact determination for VMT per employee*** can be made for the portion of the project that contains retail uses.

Additional Transit VMT Reductions

Version 1.2 of the City of Los Angeles VMT Calculator applies appropriate transit reductions based on the Project Site location's proximity to existing transit using a Mixed-Use Trip General Model (MXD) within the larger VMT Calculator tool. Per discussions with LADOT staff, it was determined that this version of the model, does not include reductions for any planned or future transit. The Project's location is unique for its proximity to both the existing Metro Expo Line as well as being directly above the Expo/Crenshaw station

currently under construction as part of the Crenshaw/LAX Line and includes direct access to the station within the Project Site. The transit construction directly adjacent to the Project Site will improve transit access in the area, and therefore an additional transit reduction is recommended to the VMT Calculator. This additional application will more accurately represent transit trips for the Project.

The *California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures, August 2010*[18] is a common resource for transportation practitioners to estimate a variety of VMT reduction credits. CAPCOA was used as a baseline to justify further reductions, and a total of **11.1%** additional transit reduction is proposed. This total comes from a variety of CAPCOA transportation measures and is summarized in **Table 4-5**. While there is no research identified that specifically looks at the quantitative impact of transit facility improvement as a standalone strategy, it can be reasonably assumed based on substantial evidence and our expert opinion that the future rail and bus network in the immediate Project vicinity and the Los Angeles region as a whole will be drastically altered as part of multiple Metro projects under construction or funded and in progress. This is particularly apparent directly at the Project Site, where the future Crenshaw/LAX Line (scheduled to open in 2020) will intersect the existing Expo Line. This key transit hub will allow for residents to viably commute via transit in all directions throughout Los Angeles County, connecting to future transit lines such as the Purple Line extension as well as Los Angeles International Airport.

Table 4-5 CAPCOA VMT Reduction Measures

Transit Improvement Measure	VMT Reduction
CAPCOA TST-1: Provide a Bus Rapid Transit System (CEQA# MS-G3)	**A = 3.2%**
CAPCOA TST-3: Expand Transit Network (CEQA# MS-G3)	**B = 8.2%**
Grouped Strategies – Increases effectiveness, no VMT reduction applied	
CAPCOA TST-2: Implement Transit Access Improvements (MP# LU-3.4.3) CAPCOA TST-5: Provide Bike Parking Near Transit (CEQA MP# TR-4.1.4)	(Grouped strategies with TST-3)
Combined Additional Reductions to MXD Model **X = 1 – (1-A) X (1-B)**	**X = 11.1376% (11.1% rounded in text)**

In the LADOT VMT Model, transit improvement strategies affect both home-based work (HBW) production and home based other (HBO) production trips and subsequent VMT calculations. The LADOT VMT Model's calculation methodology was carried forward in determining additional reduction factors due to the future transit conditions surrounding the Project Site. With the above referenced reductions factored into the VMT tool, a manual recalculation of HBW and HBO VMT was conducted and applied to the overall VMT analysis. The final adjusted per capita results with additional **11.1**% transit reduction credit is displayed in **Table 4-6** along with the VMT Calculator's MXD and TDM adjustments.

[18] *California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures, August 2010.* http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

Table 4-6 Additional transit reduction required to meet VMT threshold

MXD Trip Type	Unadjusted VMT[19]	MXD Adjustment[19]	Additional Proposed Transit MXD Reduction	Total MXD Adjustment	New MXD VMT	TDM Adjustment (Proposed Project)[19]	New Project VMT	New VMT Household per Capita (Population = 975)
Home Based Work Production	4,565	-29.2%	-11.1%	-40.4%	2,722	-19.7%	2,185	
Home Based Other Production	8,191	-32.8%	-11.1%	-43.9%	4,594	-19.7%	3,688	
Total	12,756				7,316		5,873	**6.0**

Note: Values may be rounded to match LADOT VMT Calculator output

Applying the additional proposed VMT reduction along with existing reductions for MXD and TDM strategies proposed with the Project, the final household per capita VMT for the Project falls below the VMT impact threshold, and therefore results in no significant impact to household VMT (*Threshold T-2.1* is **not met**).

SUBSTANTIALLY INDUCING ADDITIONAL AUTOMOBILE TRAVEL (THRESHOLD T-2.2)

The Project is not a transportation project, therefore Threshold T-2.2 is not applicable to the Project.

SUBSTANTIALLY INCREASING HAZARDS DUE TO A GEOMETRIC DESIGN FEATURE OR INCOMPATIBLE USE (THRESHOLD T-3)

The Project proposes new driveways from the public right-of-way. As a result, analysis of possible increased hazards due to the geometric design of the Project Site is required.

Site A

Site A includes 3606 W. Exposition Blvd & 3633 W. Obama Blvd. and the portion of Exposition Blvd between S. Victoria Ave and Crenshaw Blvd to be merged into Project Site as part of Project. Vehicular access for this site is along S. Victoria Ave for entering and existing the parking garage. S. Victoria Ave is a low volume, low speed neighborhood street which will result in limited vehicle-to-vehicle interactions at the driveway access for Site A. This driveway crosses a sidewalk, but not bike facilities. Pedestrian access to the retail and restaurant uses is on the east side of Site A along Crenshaw Blvd and the north side of Site A facing the Expo Line ROW. Tenant access for the proposed residences is along the north side of the site facing the Expo Line ROW and the south side of the site facing Obama Blvd. Transit connections from the Crenshaw/LAX Line and bus routes are along Crenshaw Blvd, the east side of Site A.

[19] VMT, MXD, and TDM adjustments as calculated within LADOT VMT Calculator. See Report 4: MXD Methodology in Appendix C.

The site access clearly separates vehicular driveways and pedestrian and bicycle circulation. Additionally, the character of S. Victoria Ave will minimize vehicle conflicts at the driveway access. As a result, the design of Site A creates limited vehicle/pedestrian, vehicle/bicycle, and vehicle/vehicle conflicts.

Site B

Site B includes 3630 S. Crenshaw Blvd, 3502 & 3510 W. Exposition Blvd, 3631 & 3633 S. Bronson Ave, 3515 & 3519 W. Obama Blvd, 3642-3646 S. Crenshaw Blvd, 3505 W. Obama Blvd, 3635, 3639, & 3645 S. Bronson Ave, 3501 W. Obama Blvd, and portion of Exposition Blvd between Crenshaw Blvd and Bronson Ave; and portion of Bronson Ave between Exposition Blvd and Exposition Pl to be merged into Project Site as part of Project. Vehicular access for Site B is along S. Bronson Ave for entering and exiting the parking garage. S. Bronson Ave is a low volume, low speed neighborhood street which will result in limited vehicle-to-vehicle interactions at the driveway access for Site B. This driveway crosses a sidewalk, but not bike facilities. Pedestrian access to the grocery, retail, and restaurant uses is on the north side of Site B, facing the Expo Line ROW and south side of Site B, facing Obama Blvd. Tenant access for the proposed residences is at the northeast corner facing the existing LADWP Equipment Yard and at the southwest corner facing Crenshaw Blvd.

Site B access clearly separates vehicular driveways and pedestrian and bicycle circulation. As a result, the design of Site B creates limited vehicle/pedestrian, vehicle/bicycle, and vehicle/vehicle conflicts.

Background Project Impacts

Along Obama Blvd across from access to Site B, the District Square development has proposed driveways on either side of S. Bronson Ave. Plans from the City of Los Angeles show the driveway closer to Crenshaw Blvd as a right-in-right-out access for the parking garage and the driveway further east for freight loading only. The access restrictions for the parking garage driveway should not conflict with access to the Site B parking garage on S. Bronson Ave. Access for the District Square freight loading is located east of the S. Bronson Ave. access point and therefore will not pose conflicts or incompatible uses. **Figure 9** details the site plan overview for the District Square project showing driveway access points to the south of Site B.

Figure 9 District Square Site Plan

Source: City of Los Angeles Department of City Planning, Appeal Recommendation Report Case No. DIR-2018-3204-SPR-SPP-1A. November 19,2019.

Project Impacts

The Project is located along Crenshaw Blvd which is included in the High Injury Network. No vehicular access points are proposed along Crenshaw Blvd as part of the Project. In addition, improved pedestrian and bicycle facilities will enhance the experience for non-vehicular users along Crenshaw Blvd. Due to the Project's clear separation of bike and pedestrian circulation and access points and vehicular driveways, *Threshold T-3: Increased hazards due to geometric design of the Project Site* is **not met.**

5 Non-CEQA Transportation Analyses

The Project was evaluated based on TAG requirements for Non-CEQA assessment categories. The methodology includes non-vehicular facility impacts; a project access, safety and circulation evaluation, project construction, and a residential street cut-through analysis.

PEDESTRIAN, BICYCLE, & TRANSIT ACCESS ASSESSMENT

Project impacts on bicycle, pedestrian and transit facilities and services were determined based on physical or demand-based impacts to facilities. To conduct this evaluation, the significance criteria for bicycle, pedestrian, and transit impacts established by the TAG were reviewed. Engineering judgment was then applied to determine the impacts of each scenario, given these significance criteria.

Review of the Project impacts to bicycle, pedestrian, and transit facilities are based on whether the Project proposes removal or degradation of these facilities.

Bicycle

The Project will support biking by providing various bike parking locations including short- and long-term bike parking for residents and commercial uses consistent with applicable City of Los Angeles requirements. The short-term bike parking will be in areas with high pedestrian traffic and pedestrian scale lighting for safety. They will be conveniently accessible to the commercial and residential entrances. Long-term bike parking would be located on multiple levels of the parking structure accessed via lobby elevators on the ground floor. Additionally, the Project would provide long-term bike storage for Metro transit riders near the ground floor commercial uses on the west site.

The Project will likely result in increased bicycle activity from the proposed development. However, the Project does not propose removing any existing bike infrastructure and provides enhanced bike access and storage for future residents, Metro transit riders, and patrons. For these reasons, the Project will not result in the degradation of bicycle facilities.

Pedestrian

The Project supports pedestrian activity for the neighborhood by providing amenities to make walking safer and more comfortable. Additional on-site landscaping will improve pedestrian comfort along the street and add visual relief. The sidewalks along the Project Site are currently undergoing improvements by Metro and will create pedestrian-friendly conditions along the Crenshaw Corridor – new sidewalks with street trees. Additionally, the segment of Lower Exposition Blvd between S. Victoria Ave and Crenshaw Blvd would be closed off to vehicles and incorporated into the Project and maintained as a pedestrian paseo to provide pedestrian connection between the surrounding neighborhood and transit facilities. The segment of Lower Exposition Blvd between Crenshaw Blvd and Bronson Ave, and segment of Bronson Ave between Exposition Blvd and Exposition Pl would also be closed off to vehicles, incorporated into the Project, and provide a publicly accessible landscaped plaza for additional pedestrian linkages into and throughout the Project. The merging of these ROW portions would eliminate a street crossing across Lower Exposition Blvd for transit users

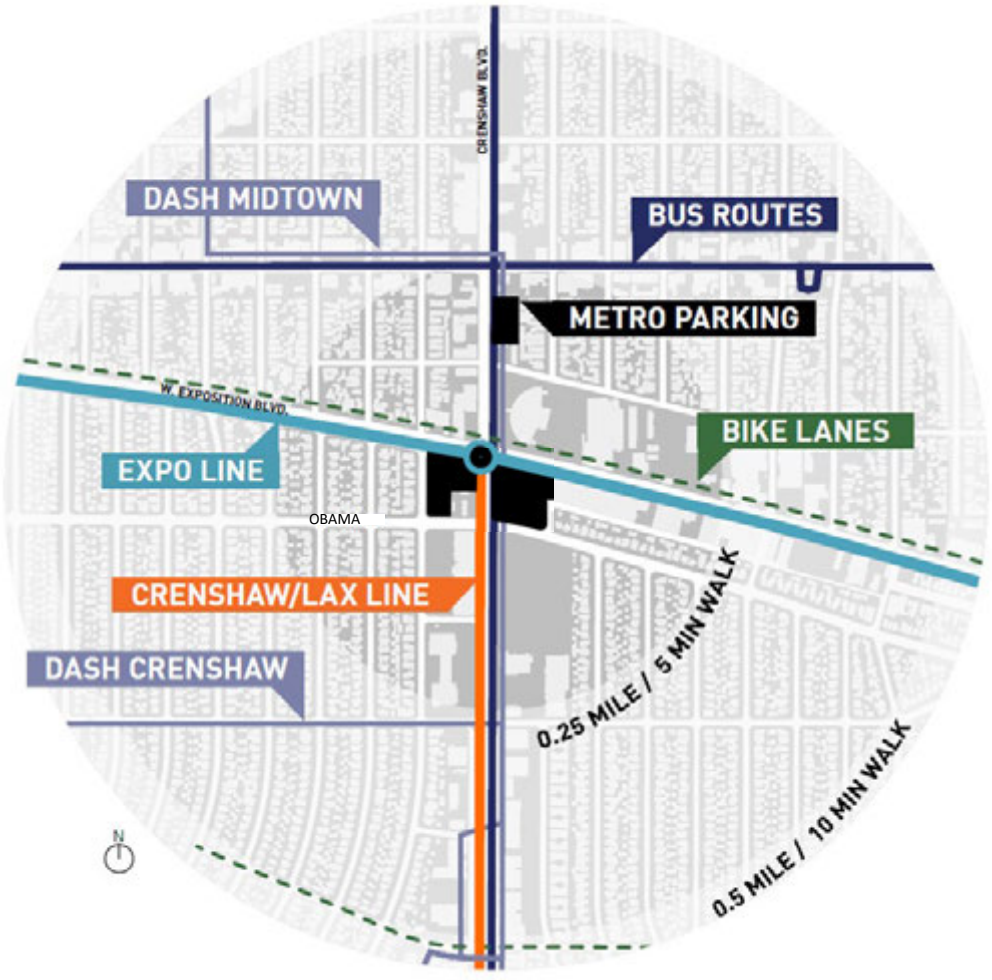
and create a more direct pedestrian access between the Expo Line and the future Crenshaw/LAX Line and various bus lines serviced at those stops along Crenshaw Blvd, thus improving transit connections and pedestrian safety.

The Project will have ground floor storefronts to provide pedestrian-oriented street frontages along with wide sidewalks and landscaping. Driveway access will be located along S. Victoria Ave and S. Bronson Ave, away from major commercial areas to minimize pedestrian/vehicular conflicts at driveways.

The Project will result in increased pedestrian activity from the proposed commercial and residential development. However, the Project does not propose removing or narrowing existing pedestrian facilities, but instead widening and enhancing them to accommodate the increased pedestrian volume and improve the pedestrian experience. For all these reasons, the Project will not result in the degradation of pedestrian facilities.

Transit

The Project is in a transit-rich area with access to the Metro Expo line and future access to the Metro Crenshaw/LAX Line along with numerous bus lines, including the Metro Rapid bus line and the City's DASH Midtown line. As a Metro and County Joint Development Program project, the Project provides additional vehicular and bike parking for Metro transit riders and will create a safer, more comfortable pedestrian experience for all transit riders. No bus stops relocations are proposed as part of the Project. As a result, the Project will not degrade transit facilities, but rather support the multi-modal transit hub.



PROJECT ACCESS, SAFETY, AND CIRCULATION EVALUATION

Existing Traffic Conditions

Existing weekday morning (AM) and evening (PM) roadway and intersection turning movement volumes at the study intersections are based on traffic counts collected on Tuesday-Thursday, April 17-19, 2018. Intersection movements were collected during the typical AM peak period (7:00 AM to 10:00 AM) and PM peak period (3:00 PM to 6:00 PM). It is noted that traffic counts were collected during an average weekday, when schools were in session and the weather was sunny and clear with mild temperatures. The location, weekday AM and PM peak-hour turning movements at the four (4) study intersections listed below. Roadway volumes are presented in **Figure 10** and **Figure 11.**

- Crenshaw Blvd / Upper W. Exposition Blvd
- Crenshaw Blvd / Obama Blvd
- S. Victoria Ave / Lower W. Exposition Blvd
- S. Victoria Ave / Obama Blvd

Figure 10 **Existing Study Intersection Vehicle Turning Movement Volumes (AM Peak Hour)**

Figure 11 **Existing Study Intersection Vehicle Turning Movement Volumes (PM Peak Hour)**

Existing Level of Service Analysis

Intersection and roadway operations were evaluated based on the Highway Capacity Manual 2000 methodology. The results were analyzed in accordance to regulations and performance standards established by the City of Los Angeles, Metropolitan Transportation Authority (LA Metro), SCAG, and Caltrans. All study intersections are located within the City of Los Angeles jurisdiction. The Highway Capacity Manual 2000 definitions for level of service are included in **Table 5-1**and

Table 5-2.

Table 5-1 Signalized Intersection Level of Service Definitions (HCM Method)

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable, and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally, occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

Table 5-2 Unsignalized Intersection Level of Service Definitions (HCM Method)

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤10.0	No delay for stop-controlled approaches.
B	10.0 and ≤15.0	Operations with minor delay.
C	>15.0 and ≤25.0	Operations with moderate delays.
D	>25.0 and ≤35.0	Operations with increasingly unacceptable delays.
E	>35.0 and ≤50.0	Operations with high delays, and long queues.
F	>50.0	Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.

Source: Transportation Research Board, Highway Capacity Manual, 2010.

The weekday AM and PM peak hour intersection levels of service under existing conditions are shown in **Table 5-3.** The results indicate that all four study intersections currently operate at acceptable level of service or better, (LOS A through D), during weekday peak hours. Intersections of Victoria Ave and Obama Blvd as well as Lower Exposition Blvd operate under excellent conditions (LOS A). LOS calculation sheets are provided in **Appendix A.**

Table 5-3 Existing Weekday Peak-Hour Intersection Level of Service

#	Intersection	Control Type[a]	AM Peak[b]		PM Peak[b]	
			Delay[c]	LOS	Delay	LOS
1	Crenshaw Blvd / Upper Exposition Blvd	Signal	28.3	C	29.9	C
2	Crenshaw Blvd / Obama Blvd	Signal	33.9	C	34.5	C
3	Victoria Ave / Lower Exposition Blvd	SSSC	8.9	A	9.0	A
4	Victoria Ave / Obama Blvd	SSSC	25.5	D	32.8	D

Notes:
a. Signal = Signalized intersection; AWSC = All-Way STOP-Controlled intersection; TWSC = Two-Way STOP-Controlled; and SSSC = Side-Street STOP-Controlled intersection.
b. LOS calculations performed using Synchro and Transportation Research Board HCM 2000.
c. Average vehicle delay (in seconds per vehicle) is reported for the intersection as a whole for signalized and AWSC intersections, and for worst STOP-controlled movement or approach only for TWSC and SSSC intersections.
BOLD indicates intersection operating at unacceptable LOS conditions.

Source: NN Engineering, 2019.

Existing Queue Analysis

Queues were analyzed based on the length of the lane capacity and the Highway Capacity Manual calculated length. Queues that exceed the lane capacity may block access to turn pockets or driveways resulting in unused green time.

The weekday AM and PM peak hour intersection queue lengths and capacities under existing conditions are shown in **Table 5-4**. During the existing weekday AM and PM peak hours, both signalized intersections operate at overall acceptable levels of service. However, in the existing AM and PM peak hour at Crenshaw Blvd/Upper Exposition Blvd, the northbound thru/right 95th percentile queue extends to the upstream intersection (Crenshaw Blvd/Obama Blvd). Additionally, in AM peak hour at Crenshaw Blvd/Obama Blvd, the westbound right and southbound thru/right lanes exceed the turn pocket capacities. In the PM peak hour at Crenshaw Blvd/Obama Blvd, the eastbound left, southbound left, and southbound thru/right all exceed their lane capacities.

Table 5-4 Existing Weekday Peak-Hour Signalized Intersection Queues

#	Intersection	Movement	Capacity[b]	AM Queues[a]		PM Queues[a]	
				50th	95th	50th	95th
1	Crenshaw Blvd / Upper Exposition Blvd	EB L	*130*	11	28	*7*	14
		EB T	*300*	45	81	221	246
		EB R	*100*	0	0	0	28
		WB L	*140*	21	46	51	97
		WB T/R	*1500*	294	394	93	156
		NB L	*100*	45	84	23	40
		NB T/R	*310*	203	**459**	145	**329**
		SB L	*150*	29	*57*	36	63
		SB T/R	*400*	215	287	246	294
2	Crenshaw Blvd / Obama Blvd	EB L	*180*	92	120	146	**208**
		EB T/R	*290*	139	135	235	247
		WB L	*170*	*54*	*72*	44	*70*
		WB T	*280*	208	204	120	122
		WB R	*160*	195	**261**	0	34
		NB L	*185*	22	*47*	48	64
		NB T/R	*500*	210	312	201	284
		SB L	*180*	60	110	93	**197**
		SB T/R	*310*	346	**384**	378	**461**

Notes:

a. Queue lengths are measured in feet. Queue shown is maximum after two cycles for the 50th and 95th percentiles.

b. Capacity is measured by internal link distance for thru lanes and turn bay length for right or left turn pockets.

BOLD 95th percentile queue lengths designate those that exceed either turn pocket storage capacity or extend to the upstream intersection.

Source: Synchro Studio 9, 2017.

Project Characteristics

This section summarizes the land use characteristics of the Project and describes the changes in motor vehicle trips that are projected to result from the Project. This section also describes the projected distribution of those motor vehicle trips, and how they were assigned to the roadway network. The changes in motor vehicle traffic associated with the Project were estimated using a three-step process:

1. **Travel Demand** – The *amount* of new vehicle, transit, pedestrian, and other traffic generated by the proposed development.
2. **Trip Distribution** – The *directions* that these trips would travel when approaching and departing the Project's land uses was projected.
3. **Trip Assignment** – These trips were then *assigned* to specific roadway segments and intersection turning movement

Project Travel Demand

This section estimates the travel demand potentially generated by the Project. "Travel demand" generally refers to the new vehicle, transit, pedestrian, and other traffic generated by the proposed development. For purposes of this analysis, the travel demand estimation focuses on the number of new vehicle trips generated by the Project. The Project would include planned residential and commercial uses development that would generate daily and weekday peak period vehicle traffic, both internal and external to the Project Site.

Traffic trip generation was estimated using the ITE *Trip Generation Manual* (10th Edition) and LADOT rates. The ITE manual provides guidance on estimating traffic generation for various land use developments based on observations conducted across the United States. Although the data generated by ITE are necessarily national in character, the Project Site is in a more urban area with better access to public transportation than those sampled by the ITE analyses. Accordingly, the ITE rates were adjusted using LADOT reductions, as approved by LADOT in the MOU.

Table 5-5 presents the adjusted vehicle trip generation estimate for the Project under all build scenarios for buildout year 2023. As shown, the Project would generate up to 5,137 daily trips; 67 inbound and 94 outbound weekday AM peak-hour trips, and 137 inbound and 108 outbound weekday PM peak-hour trips, respectively. Detailed trip generation calculations can be found in **Table 5-5**.

Table 5-5 Adjusted Project Trip Generation Estimation

ITE Land Use Code		Project	Project Trip Generation				
				AM		PM	
Use	ITE Code[1]	Units	Daily	In[2]	Out[2]	In[2]	Out[2]
Affordable Housing	LADOT	81 DU	167	10	17	8	5
Market Housing	LADOT	320 DU	1,176	15	50	30	16
Supermarket	850	22,277 sf	1,462	32	22	46	43
Retail[3]	820	10,685 sf	686	3	3	15	15
Restaurant	930	8,034 sf	1,646	7	3	37	29
Total Project Trips							
Total Project	--	--	5,137	67	94	135	108

Notes:
1. Trip generation rates were based on fitted curve equation per ITE Trip Generation, 10th Edition.
2. Inbound/Outbound trip distribution based on ITE Trip Generation, 10th Edition.
3. Retail trip generation calculations include community space, to provide a conservative estimate.

Trip Distribution and Assignment

The trip distribution and assignment of project-generated vehicle trips were developed based on the following:

- Existing (minus segments of Lower W. Exposition and S. Bronson Ave planned for closure) roadway network in proximity of the Project Site
- Location of the planned parking garage driveway
- Existing (minus segments of Lower W. Exposition and S. Bronson Ave planned for closure) vehicular demand along area roadways and intersections

In addition, vehicle trip distribution and assignment patterns were determined based on new access points, land-use distribution throughout the entire Project Site, and considering the placement of residential uses, non-residential uses, and key access locations uses that would be made by residents.

For typical residential land-use development projects, standard trip distribution of new person and vehicle trips are typically determined by applying the assumptions and methodologies as outlined in the LADOT TAG. Moreover, modal splits for all residential trips are based on the most recent available U.S. Census journey-to-work data for the census tract in which the Project would be located and distribution of residential trips is typically based on geographic destinations indicated in the relevant census tract data. Per the TAG, the distribution and assignment of residential trips are largely defined by areas of employment in Los Angeles, mostly in downtown, and elsewhere in the County (e.g., Venice Beach, Santa Monica, Hawthorne, Compton, etc.).

The vehicle trip distribution (inbound and outbound) for weekday peak hours is shown in **Figure 12**. All assumptions have been approved by LADOT through the MOU.

Figure 13 presents the project-generated vehicle trip distribution and assignment along study area roadways, intersections the Project Site during the weekday AM peak hour while **Figure 14** Weekday PM Peak Hour Project-Generated Vehicle Trips presents the PM distributions. Project-generated vehicle trip distribution and assignment patterns were determined on existing access points to the proposed residential units and proposed parking facilities (including new employees of retail, residential, and supermarket uses).

Figure 12 Trip distribution as approved by LADOT.

Figure 13 **Weekday AM Peak Hour Project-Generated Vehicle Trips**

Figure 14 **Weekday PM Peak Hour Project-Generated Vehicle Trips**

Parking Demand

The Project would provide a total of 502 off-street parking spaces (including 9 reserved as leasing spaces), which includes 9 ADA Metro Park and Ride spaces across the two parking facilities. These new parking spaces would be accessible for residents and commercial users. As a Metro and County Joint Development Program project for the Expo/Crenshaw Station, the Project is required to and complies with certain parking standards, in addition to complying with the maximum parking requirements of the Crenshaw Corridor Specific Plan, the City's Density Ordinance ("Density Bonus")(493 spaces), and the Exclusive Negotiation Agreement (ENA)(502 spaces). The ENA is a result of Metro and County's Joint Development Program to develop the Expo/Crenshaw Station. **Figure 15** provides a breakdown of parking recommendations by the ENA as well as recommendation from the City's Density Bonus Option 1. As such, the Project's provided parking complies with the aforementioned to accommodate residential and commercial users and employees who would otherwise drive to the site and park along neighboring streets. Essentially, the Project's parking program will provide enough parking to avoid an overflow of parking onto adjacent streets. Additionally, the presence of on-site transit will reduce the overall demand for parking in the area as users will be inclined to access the site without a car.

There are expected to be approximately 145 full- or part-time employees for the commercial uses on-site according to the VMT Calculator outputs (**Appendix C**). Not every employee would work every day or at the same time of day. That said, there would be potential for a slight increase in demand during those hours when residents who drive, were home.

Figure 15 Parking recommendations in Project Description.

	Spaces Recommended		
	a) Density Bonus Option 1	b) ENA	Spaces Proposed**
Site A Total	**299**	**234**	**232**
Residential	279	203	203
Commercial	20	31	29
Site B Total	**249**	**259**	**252**
Residential	188	158	159
Commercial	61	92	93
Site A and B Total	**548**	**484**	**484**
Residential	467	361	362
Commercial	81	123	122
Maximum Spaces Allowed per Specific Plan (90% of LAMC Required)	**493**	-	**484**
Metro ADA Spaces Required per ENA	-	9	9
Leasing Staff Spaces Required per ENA	-	9	9
		Total	**502**

a) Density Bonus Parking Option 1: Each residential unit shall provide 1 parking space for units with 0-1 bedrooms; and 2 spaces for units with 2-3 bedrooms; Los Angeles State Enterprise Zone 2 spaces per 1,000 sf of commercial floor area
b) 1 space per market-rate unit; 0.5 space per affordable unit; 1 space per 1,000 sf of commercial/community space
**** Project will request a Density Bonus Off-Menu Incentive to reduce residential parking requirement on Site A by 28% to 203 spaces and on Site B by 16% to 159 spaces.**

Source: Crenshaw Crossing Project Description, October 2010.

Future (2023) No Project Conditions

Under future conditions (year 2023) population and employment projections assuming 1% ambient growth per year, planned transportation system improvements contained in the latest City of Los Angeles Travel Demand Forecasting (TDF) Model and known projects within ½ mile from the Project Site are all included in the analysis.

Methodology

The following describes the methodology to calculate future (year 2023) intersection turning movements within the study area. A 1% growth rate compounded annually over five years was applied to the existing 2018 traffic volumes. The nearby related project volumes as outlined in **Table 3-2** were then distributed within the network and added to the respective intersections impacted by the new developments.

Planned Network Changes

Although there are several planned transportation network improvements throughout the City Los Angeles, there are no projects that would affect any specific study intersection or roadway.

Future (2023) Plus Project Conditions

The following section includes an evaluation of projected Year 2023 traffic conditions at study intersections with and without implementation of the Project.

Future Level of Service and Delay Analysis

Figure 16 through **Figure 19** present the future no project and future plus project intersection volumes. **Table 5-6** presents intersection LOS conditions and approach delays during the weekday AM and PM peak hours for all scenarios: Existing, Future (2023) No Project, and Future (2023) Plus Project.

The intersection of Crenshaw Blvd/Upper W. Exposition Blvd maintains an acceptable LOS under the future no project and future plus project conditions with no significant impacts to the approach delays.

The intersection of Crenshaw Blvd/Obama Blvd operates at LOS E in the 2023 Plus Project PM scenario. This is a result of increased volumes in the WB left and the SB left in the 2023 No Project and Plus Project scenarios. Many of these trips are a result of compounding volumes due to the large development known as District Square, which is on the corner of the intersection Crenshaw Blvd and Obama Blvd, at 3670 Crenshaw Blvd. The volumes for this development were estimated based on ITE trip generation rates with a 25% transit reduction and no TDM reduction, as background project information was not available as part of the Case Logging and Tracking System Report provided by LADOT with the MOU. Coordination with this development will be necessary to prevent unacceptable operations at Crenshaw Blvd/Obama Blvd.

The SB movement at S. Victoria Ave/Obama Blvd operates at a LOS E/F in the 2023 Plus Project scenario AM/PM, however this is in part due to the 24 AM/44 PM trips redirected as a result of the Lower W. Exposition Blvd closure between S. Victoria Ave and Crenshaw Blvd. These trips were assumed to redirect by turning right on S. Victoria Ave, left on Obama Blvd, and right continuing onto Crenshaw Blvd southbound. Depending on specific destinations of the existing users of Lower W. Exposition Blvd, the additional delay predicted with the road closure may result in these vehicles traveling through other intersections. Given the proximity of this intersection to the signalized Crenshaw Blvd/Obama Blvd intersection, signalization of this intersection would not be appropriate.

For the side-street stop-controlled intersection at S. Victoria Ave/Lower W. Exposition Blvd, the Future (2023) Plus project condition eliminates the eastbound leg and therefore, this intersection can no longer be evaluated for LOS as it is assumed to operate at free-flow (as an unsignalized elbow).

Figure 16 **Future (2023) No Project Turning Movements (AM Peak)**

Figure 17 **Future (2023) No Project Turning Movements (PM Peak)**

Figure 18 **Future (2023) Plus Project Intersection Turning Movements (AM Peak)**

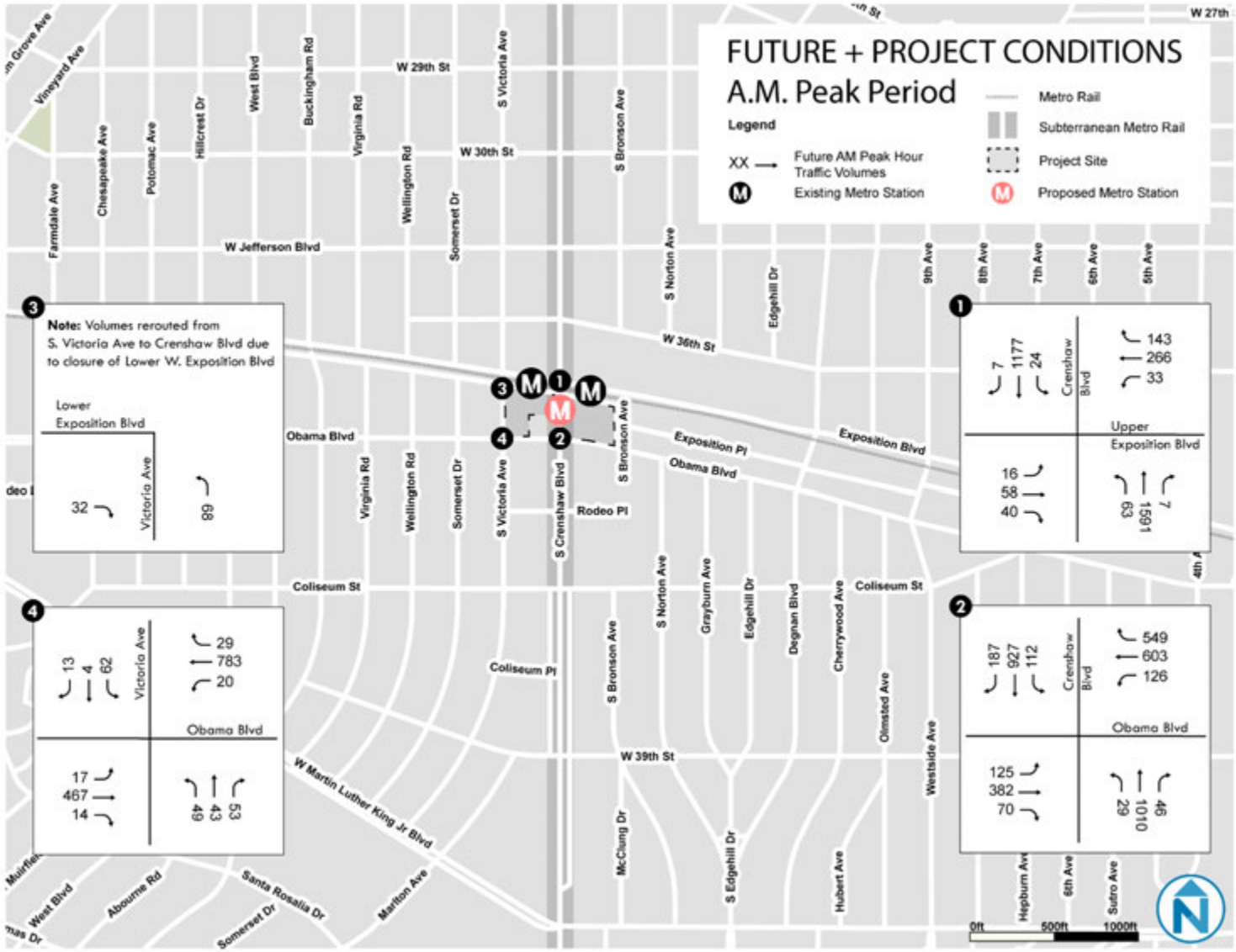


Figure 19 **Future (2023) Plus Project Intersection Turning Movements (PM Peak)**

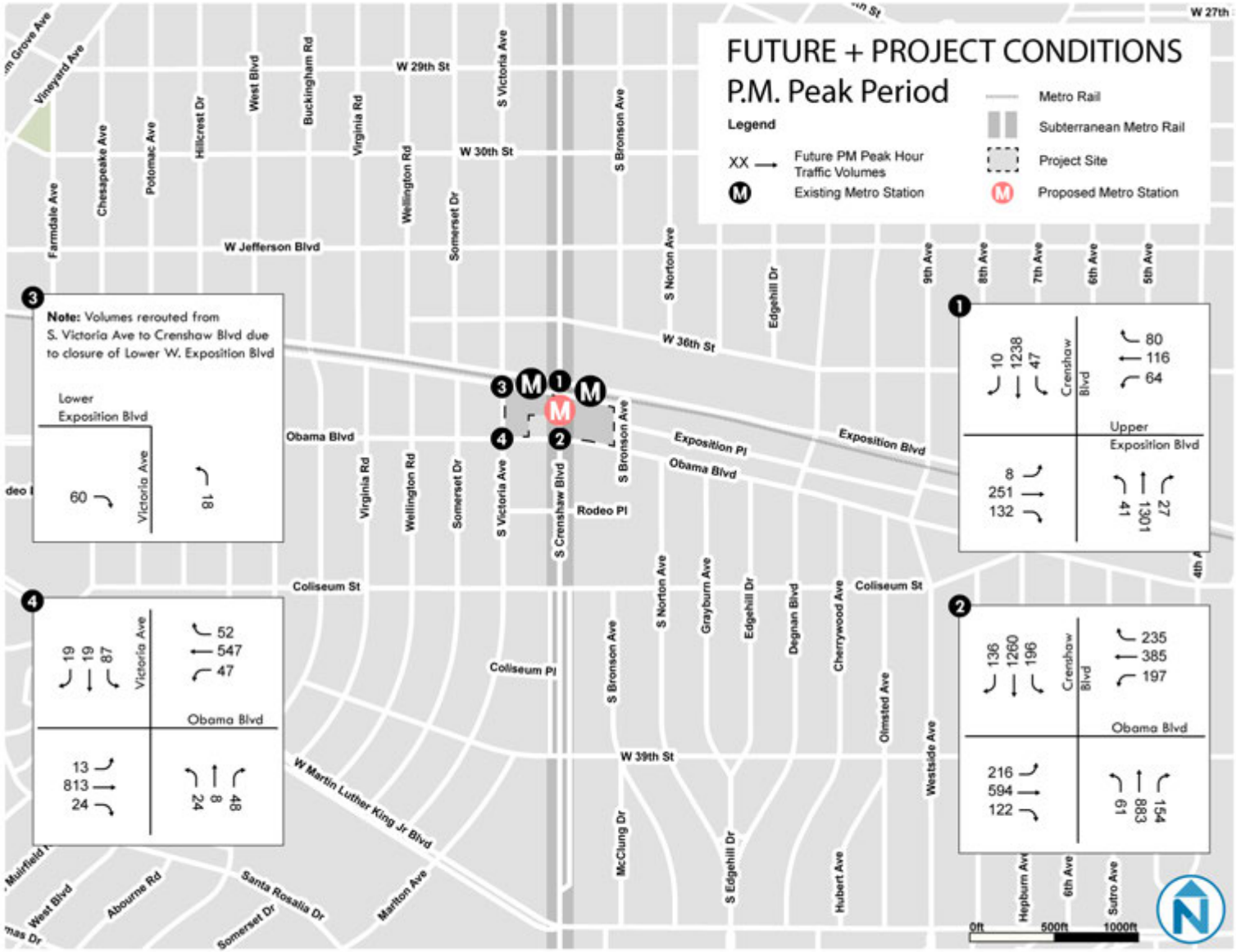


Table 5-6 All Scenarios LOS Summary and Approach Delay

#	Intersection	Control Type	Approach	Existing				2023 No Project				2023 Plus Project			
				AM Peak[b]		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				Delay[c]	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Crenshaw Blvd / Upper W. Exposition Blvd	Signal	Intersection	28.3	C	29.9	C	33.3	D	38.3	D	33.2	C	37.7	D
			EB	42.5		51.5		42.0		55.4		43.6		55.4	
			WB	48.2		40.5		49.3		43.7		51.6		43.7	
			NB	24.8		23.2		33.0		40.9		32.6		39.3	
			SB	24.2		27.0		26.3		28.3		25.7		28.7	
2	Crenshaw Blvd / Obama Blvd	Signal	Intersection	33.9	C	34.5	C	36.1	D	52.2	D	37.6	D	**65.2**	**E**
			EB	39.3		42.0		32.9		25.3		35.2		27.7	
			WB	38.0		32.7		35.8		38.2		36.2		74.8	
			NB	25.4		25.0		31.6		41.3		33.1		43.0	
			SB	35.3		38.1		41.8		80.9		44.3		98.5	
3	S Victoria Ave / Lower W. Exposition Blvd	SSSC	NB	8.9	A	9.0	A	8.9	A	9.0	A	N/A		N/A	
4	S Victoria Ave / Obama Blvd	SSSC	NB	25.5	D	25.0	C	**37.4**	**E**	**43.8**	**E**	**46.8**	**E**	**56.2**	**F**
			SB	22.2	C	32.8	D	28.0	D	**48.3**	**E**	**89.4**	**F**	**265.5**	**F**

Notes
a. Signal = Signalized intersection; AWSC = All-Way STOP-Controlled intersection; TWSC = Two-Way STOP-Controlled; and SSSC = Side-Street STOP-Controlled intersection.
b. LOS calculations performed using Synchro and Transportation Research Board HCM 2000.
c. Average vehicle delay (in seconds per vehicle) is reported for the intersection as a whole for signalized and AWSC intersections, and for worst STOP-controlled movement or approach only for TWSC and SSSC intersections.

BOLD indicates intersection would operate at unacceptable LOS conditions.
Shaded indicates a direct Project traffic impact to intersection.

Source: NN Engineering, 2019.

Future Queue Analysis

The weekday AM and PM peak hour intersection queue lengths and capacities under Existing, Future (2023) No Project and Future (2023) Plus Project scenarios are shown in **Table 5-7**. PM peak hour queues at the Crenshaw Blvd/Obama Blvd WB left approach increase from 70 ft Existing to 269 ft Future (2023) No Project, approximately 10 vehicle lengths, as a result of traffic volume growth and trips generated from related projects. In the Future (2023) No Project condition, this WB left queue exceeds capacity in the PM peak hour. Future (2023) Plus Project conditions increase this queue by approximately 4 vehicle lengths.

The queues at Crenshaw Blvd/Obama Blvd for the WB left turn movement can be accommodated with restriping along Obama Blvd to extend the turn pocket length and prevent thru lane blockages.

The Crenshaw Blvd/Upper Exposition Blvd intersection does not experience longer queues in the Future (2023) Plus Project scenario beyond what exists under current conditions.

Table 5-7 2023 Future Weekday Peak-Hour Signalized Intersection Queues

#	Intersection	Movement	Capacity[b]	Existing				2023 No Project				2023 Plus Project			
				AM Queues[a]		PM Queues[a]		AM Queues		PM Queues[a]		AM Queues[a]		PM Queues[a]	
				50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
1	Crenshaw Blvd / Upper Exposition Blvd	EB L	*130*	11	28	*7*	14	13	32	6	19	13	32	6	19
		EB T	*300*	*45*	81	221	246	43	80	213	**302**	43	80	213	302
		EB R	*100*	0	0	0	28	0	0	0	25	0	0	0	31
		WB L	*140*	21	46	51	97	30	59	61	101	31	60	61	101
		WB T/R	*1500*	294	394	93	156	321	442	109	177	321	442	109	177
		NB L	*100*	*45*	84	23	40	49	89	32	47	51	87	36	52
		NB T/R	*310*	203	**459**	145	**329**	358	514	357	416	395	526	364	419
		SB L	*150*	29	*57*	36	63	22	*47*	44	79	22	*47*	44	79
		SB T/R	*400*	215	287	246	294	251	319	278	335	257	325	290	348
2	Crenshaw Blvd / Obama Blvd	EB L	*180*	92	120	146	**208**	89	134	145	205	103	160	169	238
		EB T/R	*290*	139	135	235	247	134	147	213	247	146	165	248	283
		WB L	*170*	54	*72*	44	70	81	114	160	**269**	94	137	251	354
		WB T	*280*	208	204	120	122	204	228	102	135	204	235	110	145
		WB R	*160*	195	**261**	0	34	254	372	0	41	266	400	3	49
		NB L	*185*	22	*47*	48	64	23	49	41	74	27	54	58	97
		NB T/R	*500*	210	312	201	284	274	343	294	335	288	348	298	338
		SB L	*180*	60	110	93	**197**	87	**186**	177	327	102	221	247	409
		SB T/R	*310*	346	**384**	378	**461**	383	411	505	553	386	414	517	556

Notes:
a. Queue lengths are measured in feet. Queue shown is maximum after two cycles for the 50th and 95th percentiles.
b. Capacity is measured by internal link distance for thru lanes and turn bay length for right or left turn pockets.
BOLD 95th percentile queue lengths designate those that exceed either turn pocket storage capacity or extend to the upstream intersection.
Grayed out values designate 95th percentile queue lengths exceed either turn pocket storage capacity or extend to the upstream intersection in the existing condition and therefore are not evaluated in the no project or plus project scenarios.

Figure 20 Project Site Plan

Source: Watt Investment Partners, 2019

Passenger Loading Evaluation

A passenger pick-up/drop-off area are provided at the elbows near the pedestrian paseo at the northwest portion of Site A along Victoria Ave and adjacent to the Expo Line frontage. Passenger loading is not planned as part of the Project Site along Crenshaw Blvd. Transportation network company (TNC) usage will be emphasized in the northwest corner of Site A to limit conflicts of vehicles blocking traffic or access points along the other roadways. This location should minimize pedestrian and bicycle conflicts with passenger loading due to the closure of the paseo to vehicular uses.

PROJECT CONSTRUCTION

While some temporary construction closures may be required of pedestrian, bicycle, transit, or individual vehicular lanes may be required, the Project will not require major in-street construction and therefore will not have negative, long-term effects on existing pedestrian, bicycle, transit, or vehicle circulation. Construction of the Project will comply with all applicable standards and provisions of local and state regulations. The Project team will work with the City to mitigate potential temporary impacts to pedestrian, bicycle, transit, or vehicle circulation as a part of its construction transportation management plan. Hauling schedules as well as pedestrian and bicycle protection plans may be provided.

RESIDENTIAL STREET CUT-THROUGH ANALYSIS

Because no nearby neighborhood streets currently operate as congested, the additional Project Trips are not expected to divert routing through other neighborhood street routes in order to save on travel time. As a result, residential street cut-through analysis is not required as the Project will not adversely affect the character and function of nearby residential streets.

SUMMARY OF NON-CEQA IMPACTS

The Project's emphasis on mixed-uses and proximity to transit mitigate many of the potential transportation impacts. Although the project will attract increased pedestrian, bicycle, vehicular and transit activity to the Project Site, the design of the Project Site itself defines clear separation for user access which allows for minimal conflicts and no increased hazards. For the construction of the Project, the Project team will work with the City to develop a construction transportation management plan to mitigate any temporary impacts to pedestrian, bicycle, transit, or vehicle circulation.

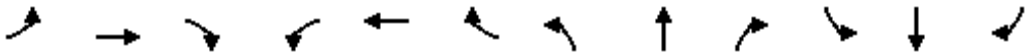
The additional vehicular traffic in the area as a result of the Project and related projects in proximity will cause minor increase in delays and queues at some intersections. The closure of Lower W. Exposition Blvd between S. Victoria Ave and Crenshaw Blvd may cause some vehicles to redirect and no longer travel on S. Victoria Ave. This may prevent any increased delays as a result of the Project on S. Victoria Ave southbound. Along Obama Blvd, restriping to extend turn pocket lengths will help prevent thru lane blockages at the signalized intersection at Obama Blvd/Crenshaw Blvd.

Appendices

Appendix A Intersection Level of Service (LOS) Calculations

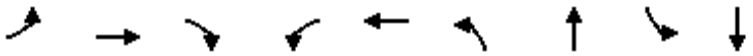
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	442	89	605	510	30	1115	72	1217
v/c Ratio	0.81	0.43	0.39	0.58	0.80	0.26	0.50	0.53	0.50
Control Delay	69.3	31.5	34.4	35.7	27.1	58.0	25.1	85.2	36.2
Queue Delay	6.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	1.0
Total Delay	75.3	31.5	34.4	35.7	29.4	58.0	25.1	85.2	37.2
Queue Length 50th (ft)	92	139	54	208	195	22	210	60	346
Queue Length 95th (ft)	120	135	72	204	261	47	312	110	384
Internal Link Dist (ft)		297		283			521		318
Turn Bay Length (ft)	180		170		160	185		180	
Base Capacity (vph)	228	1471	324	1486	803	137	2219	137	2442
Starvation Cap Reductn	0	0	0	0	0	0	0	0	889
Spillback Cap Reductn	58	0	0	0	171	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.30	0.27	0.41	0.81	0.22	0.50	0.53	0.78

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	334	35	71	532	454	24	950	18	65	865	167
Future Volume (vph)	102	334	35	71	532	454	24	950	18	65	865	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3254		1652	3303	1478	1652	4732		1652	4630	
Flt Permitted	0.29	1.00		0.41	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	508	3254		721	3303	1478	1652	4732		1652	4630	
Peak-hour factor, PHF	0.80	0.84	0.80	0.80	0.88	0.89	0.80	0.87	0.80	0.90	0.85	0.84
Adj. Flow (vph)	128	398	44	89	605	510	30	1092	22	72	1018	199
RTOR Reduction (vph)	0	9	0	0	0	173	0	2	0	0	18	0
Lane Group Flow (vph)	128	433	0	89	605	337	30	1113	0	72	1199	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	37.8	37.8		37.8	37.8	37.8	5.3	54.2		12.0	60.9	
Effective Green, g (s)	37.8	37.8		37.8	37.8	37.8	5.3	54.2		12.0	60.9	
Actuated g/C Ratio	0.31	0.31		0.31	0.31	0.31	0.04	0.45		0.10	0.51	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	160	1025		227	1040	465	72	2137		165	2349	
v/s Ratio Prot		0.13			0.18		0.02	c0.24		0.04	c0.26	
v/s Ratio Perm	c0.25			0.12		0.23						
v/c Ratio	0.80	0.42		0.39	0.58	0.73	0.42	0.52		0.44	0.51	
Uniform Delay, d1	37.6	32.5		32.1	34.5	36.5	55.8	23.6		50.8	19.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.36	1.66	
Incremental Delay, d2	24.1	0.3		1.1	0.8	5.6	3.9	0.9		1.7	0.7	
Delay (s)	61.8	32.8		33.2	35.3	42.1	59.7	24.5		70.6	33.2	
Level of Service	E	C		C	D	D	E	C		E	C	
Approach Delay (s)		39.3			38.0			25.4			35.3	
Approach LOS		D			D			C			D	

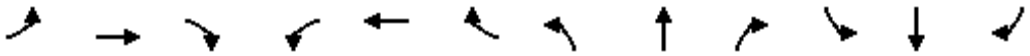
Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	68	38	28	429	69	1594	38	1131
v/c Ratio	0.13	0.18	0.13	0.24	0.87	0.52	0.62	0.32	0.47
Control Delay	41.5	39.9	1.0	57.5	55.3	64.8	22.6	59.9	21.8
Queue Delay	0.0	0.0	1.2	1.5	0.0	0.0	0.4	0.0	0.1
Total Delay	41.5	39.9	2.2	59.0	55.3	64.8	22.9	59.9	21.9
Queue Length 50th (ft)	11	45	0	21	294	45	203	29	215
Queue Length 95th (ft)	28	81	0	46	394	m84	459	57	287
Internal Link Dist (ft)		480			550		318		709
Turn Bay Length (ft)	130		100	140		100		150	
Base Capacity (vph)	130	397	290	140	599	137	2561	137	2415
Starvation Cap Reductn	0	0	0	0	0	0	400	0	0
Spillback Cap Reductn	0	0	153	46	0	0	0	0	397
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.17	0.28	0.30	0.72	0.50	0.74	0.28	0.56

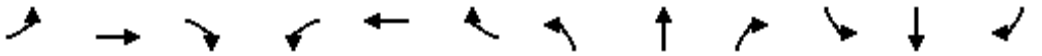
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	59	30	22	249	126	55	1421	12	30	1067	6
Future Volume (vph)	13	59	30	22	249	126	55	1421	12	30	1067	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	1739	1478	1652	1643		1652	4740		1652	4741	
Flt Permitted	0.33	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	571	1739	1478	1652	1643		1652	4740		1652	4741	
Peak-hour factor, PHF	0.80	0.87	0.80	0.80	0.92	0.80	0.80	0.90	0.80	0.80	0.95	0.80
Adj. Flow (vph)	16	68	38	28	271	158	69	1579	15	38	1123	8
RTOR Reduction (vph)	0	0	35	0	19	0	0	0	0	0	1	0
Lane Group Flow (vph)	16	68	3	28	410	0	69	1594	0	38	1130	0
Turn Type	Perm	NA	Over	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		6	3	5	2		3	8		7	4	
Permitted Phases	6											
Actuated Green, G (s)	26.0	26.0	9.2	5.3	37.1		9.2	60.1		5.5	56.4	
Effective Green, g (s)	26.0	26.0	9.2	5.3	37.1		9.2	60.1		5.5	56.4	
Actuated g/C Ratio	0.22	0.22	0.08	0.04	0.31		0.08	0.50		0.05	0.47	
Clearance Time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	123	376	113	72	507		126	2373		75	2228	
v/s Ratio Prot		0.04	0.00	0.02	c0.25		0.04	c0.34		0.02	c0.24	
v/s Ratio Perm	0.03											
v/c Ratio	0.13	0.18	0.03	0.39	0.81		0.55	0.67		0.51	0.51	
Uniform Delay, d1	37.9	38.3	51.3	55.8	38.2		53.4	22.5		55.9	22.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.99	0.98		1.00	1.00	
Incremental Delay, d2	0.5	0.2	0.1	3.5	9.3		4.1	1.3		5.3	0.8	
Delay (s)	38.4	38.6	51.3	59.2	47.4		56.7	23.4		61.2	23.0	
Level of Service	D	D	D	E	D		E	C		E	C	
Approach Delay (s)		42.5			48.2			24.8			24.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.1
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	419	13	15	701	15	47	41	50	7	4	5
Future Volume (Veh/h)	13	419	13	15	701	15	47	41	50	7	4	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.83	0.80	0.80	0.93	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	16	505	16	19	754	19	59	51	63	9	5	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					377							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	773			521			966	1356	260	1112	1354	386
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	399			521			623	1080	260	794	1078	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			80	72	91	95	97	99
cM capacity (veh/h)	990			1041			300	179	738	166	180	928

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	268	268	396	396	173	20
Volume Left	16	0	19	0	59	9
Volume Right	0	16	0	19	63	6
cSH	990	1700	1041	1700	345	244
Volume to Capacity	0.02	0.16	0.02	0.23	0.50	0.08
Queue Length 95th (ft)	1	0	1	0	67	7
Control Delay (s)	0.7	0.0	0.6	0.0	25.5	22.2
Lane LOS	A		A		D	C
Approach Delay (s)	0.3		0.3		25.5	22.2
Approach LOS					D	C

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	48.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	23	7	2	12	23	40
Future Volume (Veh/h)	23	7	2	12	23	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.88	0.80
Hourly flow rate (vph)	29	9	3	15	26	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			38		54	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		54	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1572		952	1040

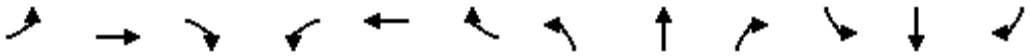
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	38	18	76
Volume Left	0	3	26
Volume Right	9	0	50
cSH	1700	1572	1008
Volume to Capacity	0.02	0.00	0.08
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	1.2	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	8.9
Approach LOS			A

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	13.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	204	678	68	377	108	64	1082	113	1377
v/c Ratio	0.81	0.67	0.53	0.37	0.20	0.46	0.48	0.82	0.59
Control Delay	61.0	37.4	46.6	32.0	5.0	62.4	24.1	105.9	37.6
Queue Delay	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3
Total Delay	61.8	37.4	46.6	32.0	5.0	62.4	24.1	105.9	39.9
Queue Length 50th (ft)	146	235	44	120	0	48	201	93	378
Queue Length 95th (ft)	208	247	70	122	34	64	284	#197	461
Internal Link Dist (ft)		294		296			521		318
Turn Bay Length (ft)	180		170		160	185		180	
Base Capacity (vph)	365	1467	187	1486	725	150	2242	137	2317
Starvation Cap Reductn	0	0	0	0	0	0	0	0	766
Spillback Cap Reductn	37	0	0	0	68	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.46	0.36	0.25	0.16	0.43	0.48	0.82	0.89

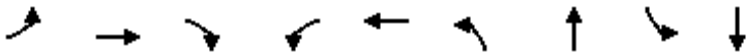
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



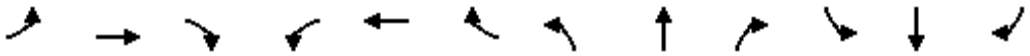
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	528	64	55	313	100	41	903	21	108	1180	107
Future Volume (vph)	184	528	64	55	313	100	41	903	21	108	1180	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3237		1652	3303	1478	1652	4725		1652	4676	
Flt Permitted	0.47	1.00		0.24	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	812	3237		417	3303	1478	1652	4725		1652	4676	
Peak-hour factor, PHF	0.90	0.90	0.70	0.81	0.83	0.93	0.64	0.86	0.66	0.96	0.95	0.79
Adj. Flow (vph)	204	587	91	68	377	108	64	1050	32	112	1242	135
RTOR Reduction (vph)	0	13	0	0	0	75	0	2	0	0	8	0
Lane Group Flow (vph)	204	665	0	68	377	33	64	1080	0	113	1369	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	37.1	37.1		37.1	37.1	37.1	8.6	55.9		11.0	58.3	
Effective Green, g (s)	37.1	37.1		37.1	37.1	37.1	8.6	55.9		11.0	58.3	
Actuated g/C Ratio	0.31	0.31		0.31	0.31	0.31	0.07	0.47		0.09	0.49	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	251	1000		128	1021	456	118	2201		151	2271	
v/s Ratio Prot		0.21			0.11		0.04	c0.23		c0.07	c0.29	
v/s Ratio Perm	c0.25			0.16		0.02						
v/c Ratio	0.81	0.66		0.53	0.37	0.07	0.54	0.49		0.75	0.60	
Uniform Delay, d1	38.2	36.0		34.3	32.3	29.3	53.8	22.2		53.2	22.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.27	1.48	
Incremental Delay, d2	17.9	1.7		4.2	0.2	0.1	5.0	0.8		16.7	1.1	
Delay (s)	56.1	37.7		38.5	32.6	29.4	58.8	23.0		84.2	34.3	
Level of Service	E	D		D	C	C	E	C		F	C	
Approach Delay (s)		42.0			32.7			25.0			38.1	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



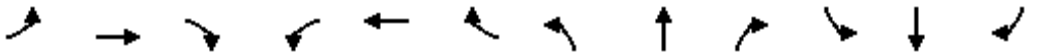
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	12	300	127	68	196	40	1286	48	1155
v/c Ratio	0.05	0.83	0.24	0.52	0.37	0.29	0.55	0.39	0.53
Control Delay	37.8	65.7	4.0	67.8	27.9	55.7	23.1	62.1	25.2
Queue Delay	0.0	0.0	0.4	10.0	0.0	0.0	0.1	0.0	0.6
Total Delay	37.8	65.7	4.4	77.7	27.9	55.7	23.2	62.1	25.8
Queue Length 50th (ft)	7	221	0	51	93	23	145	36	246
Queue Length 95th (ft)	14	276	28	97	156	40	329	63	294
Internal Link Dist (ft)		480			550		318		709
Turn Bay Length (ft)	130		100	140		100		150	
Base Capacity (vph)	243	384	531	140	598	137	2332	137	2187
Starvation Cap Reductn	0	0	0	0	0	0	253	0	0
Spillback Cap Reductn	0	0	153	46	0	0	0	0	601
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.78	0.34	0.72	0.33	0.29	0.62	0.35	0.73

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	237	112	59	110	74	25	1134	21	36	1074	7
Future Volume (vph)	6	237	112	59	110	74	25	1134	21	36	1074	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	1739	1478	1652	1637		1652	4724		1652	4739	
Flt Permitted	0.63	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1103	1739	1478	1652	1637		1652	4724		1652	4739	
Peak-hour factor, PHF	0.50	0.79	0.88	0.87	0.92	0.97	0.63	0.91	0.53	0.75	0.94	0.58
Adj. Flow (vph)	12	300	127	68	120	76	40	1246	40	48	1143	12
RTOR Reduction (vph)	0	0	89	0	20	0	0	3	0	0	1	0
Lane Group Flow (vph)	12	300	38	68	176	0	40	1283	0	48	1154	0
Turn Type	Perm	NA	pm+ov	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		6	3	5	2		3	8		7	4	
Permitted Phases	6		6									
Actuated Green, G (s)	24.8	24.8	36.0	7.8	38.4		11.2	56.9		7.4	53.1	
Effective Green, g (s)	24.8	24.8	36.0	7.8	38.4		11.2	56.9		7.4	53.1	
Actuated g/C Ratio	0.21	0.21	0.30	0.06	0.32		0.09	0.47		0.06	0.44	
Clearance Time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	227	359	443	107	523		154	2239		101	2097	
v/s Ratio Prot		c0.17	0.01	c0.04	0.11		0.02	c0.27		0.03	c0.24	
v/s Ratio Perm	0.01		0.02									
v/c Ratio	0.05	0.84	0.09	0.64	0.34		0.26	0.57		0.48	0.55	
Uniform Delay, d1	38.2	45.6	30.2	54.7	31.1		50.5	22.8		54.4	24.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.94		1.00	1.00	
Incremental Delay, d2	0.1	15.4	0.1	11.7	0.4		0.8	1.0		3.5	1.0	
Delay (s)	38.3	61.0	30.3	66.4	31.5		50.0	22.4		57.9	25.7	
Level of Service	D	E	C	E	C		D	C		E	C	
Approach Delay (s)		51.5			40.5			23.2			27.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.1
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	744	23	45	470	9	23	8	46	12	18	10
Future Volume (Veh/h)	3	744	23	45	470	9	23	8	46	12	18	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.89	0.80	0.80	0.90	0.80	0.89	0.80	0.80	0.80	0.80	0.92
Hourly flow rate (vph)	4	836	29	56	522	11	26	10	58	15	23	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					374							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	533			865			1248	1504	432	1070	1512	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	316			865			1094	1372	432	901	1381	26
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			79	92	90	91	81	99
cM capacity (veh/h)	1141			774			123	123	571	170	121	960

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	422	447	317	272	94	49
Volume Left	4	0	56	0	26	15
Volume Right	0	29	0	11	58	11
cSH	1141	1700	774	1700	322	181
Volume to Capacity	0.00	0.26	0.07	0.16	0.29	0.27
Queue Length 95th (ft)	0	0	6	0	30	26
Control Delay (s)	0.1	0.0	2.5	0.0	25.0	32.8
Lane LOS	A		A		C	D
Approach Delay (s)	0.1		1.3		25.0	32.8
Approach LOS					C	D

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	54.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	42	15	15	14	9	9
Future Volume (Veh/h)	42	15	15	14	9	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	53	19	19	18	11	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			72		118	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			72		118	62
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1528		866	1002

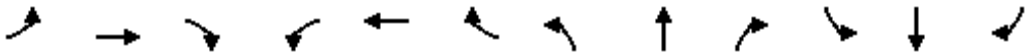
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	72	37	22
Volume Left	0	19	11
Volume Right	19	0	11
cSH	1700	1528	929
Volume to Capacity	0.04	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	3.8	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	3.8	9.0
Approach LOS			A

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization		18.2%	ICU Level of Service
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	138	481	140	668	597	31	1204	106	1306
v/c Ratio	0.76	0.40	0.54	0.55	0.85	0.26	0.61	0.77	0.59
Control Delay	56.9	27.2	35.7	30.9	31.1	58.2	31.0	101.4	41.3
Queue Delay	62.3	0.0	0.0	0.0	52.8	0.0	0.0	0.0	1.4
Total Delay	119.2	27.2	35.7	30.9	83.9	58.2	31.0	101.4	42.8
Queue Length 50th (ft)	89	134	81	204	254	23	274	87	383
Queue Length 95th (ft)	134	147	114	228	372	49	343	#186	411
Internal Link Dist (ft)		297		283			521		318
Turn Bay Length (ft)	180		170		160	185		180	
Base Capacity (vph)	223	1472	319	1486	802	137	1963	137	2197
Starvation Cap Reductn	0	0	0	0	0	0	0	0	643
Spillback Cap Reductn	95	0	0	0	298	0	15	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.33	0.44	0.45	1.18	0.23	0.62	0.77	0.84

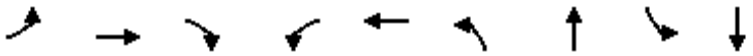
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	365	37	112	588	531	25	1010	34	95	927	181
Future Volume (vph)	110	365	37	112	588	531	25	1010	34	95	927	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3256		1652	3303	1478	1652	4721		1652	4629	
Flt Permitted	0.29	1.00		0.41	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	498	3256		710	3303	1478	1652	4721		1652	4629	
Peak-hour factor, PHF	0.80	0.84	0.80	0.80	0.88	0.89	0.80	0.87	0.80	0.90	0.85	0.84
Adj. Flow (vph)	138	435	46	140	668	597	31	1161	42	106	1091	215
RTOR Reduction (vph)	0	8	0	0	0	157	0	3	0	0	20	0
Lane Group Flow (vph)	138	473	0	140	668	440	31	1201	0	106	1286	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	44.2	44.2		44.2	44.2	44.2	5.4	47.7		12.1	54.4	
Effective Green, g (s)	44.2	44.2		44.2	44.2	44.2	5.4	47.7		12.1	54.4	
Actuated g/C Ratio	0.37	0.37		0.37	0.37	0.37	0.05	0.40		0.10	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	183	1199		261	1216	544	74	1876		166	2098	
v/s Ratio Prot		0.15			0.20		0.02	c0.25		0.06	c0.28	
v/s Ratio Perm	0.28			0.20		c0.30						
v/c Ratio	0.75	0.39		0.54	0.55	0.81	0.42	0.64		0.64	0.61	
Uniform Delay, d1	33.1	28.0		29.8	30.0	34.1	55.8	29.2		51.8	24.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.32	1.53	
Incremental Delay, d2	16.1	0.2		2.1	0.5	8.6	3.8	1.7		7.1	1.2	
Delay (s)	49.2	28.2		32.0	30.5	42.7	59.6	30.9		75.4	39.1	
Level of Service	D	C		C	C	D	E	C		E	D	
Approach Delay (s)		32.9			35.8			31.6			41.8	
Approach LOS		C			D			C			D	

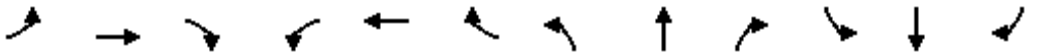
Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	67	46	40	468	79	1745	30	1228
v/c Ratio	0.17	0.17	0.16	0.33	0.89	0.60	0.70	0.26	0.53
Control Delay	42.2	38.7	1.2	60.0	56.7	73.4	29.9	58.0	23.9
Queue Delay	0.0	0.0	2.5	19.2	0.0	0.0	1.5	0.0	0.4
Total Delay	42.2	38.7	3.7	79.2	56.7	73.4	31.4	58.0	24.3
Queue Length 50th (ft)	13	43	0	30	321	49	358	22	251
Queue Length 95th (ft)	32	80	0	59	442	m89	514	47	319
Internal Link Dist (ft)		480			550		318		709
Turn Bay Length (ft)	130		100	140		100		150	
Base Capacity (vph)	119	410	290	140	599	137	2481	137	2329
Starvation Cap Reductn	0	0	0	0	0	0	511	0	0
Spillback Cap Reductn	0	0	171	84	0	0	0	0	562
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.16	0.39	0.71	0.78	0.58	0.89	0.22	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	58	37	32	266	143	63	1563	6	24	1158	7
Future Volume (vph)	16	58	37	32	266	143	63	1563	6	24	1158	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	1739	1478	1652	1639		1652	4743		1652	4741	
Flt Permitted	0.29	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	507	1739	1478	1652	1639		1652	4743		1652	4741	
Peak-hour factor, PHF	0.80	0.87	0.80	0.80	0.92	0.80	0.80	0.90	0.80	0.80	0.95	0.80
Adj. Flow (vph)	20	67	46	40	289	179	79	1737	8	30	1219	9
RTOR Reduction (vph)	0	0	42	0	20	0	0	1	0	0	1	0
Lane Group Flow (vph)	20	67	4	40	448	0	79	1744	0	30	1227	0
Turn Type	Perm	NA	Over	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		6	3	5	2		3	8		7	4	
Permitted Phases	6											
Actuated Green, G (s)	27.9	27.9	9.2	5.6	39.3		9.2	58.1		5.3	54.2	
Effective Green, g (s)	27.9	27.9	9.2	5.6	39.3		9.2	58.1		5.3	54.2	
Actuated g/C Ratio	0.23	0.23	0.08	0.05	0.33		0.08	0.48		0.04	0.45	
Clearance Time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	117	404	113	77	536		126	2296		72	2141	
v/s Ratio Prot		0.04	0.00	0.02	c0.27		0.05	c0.37		0.02	c0.26	
v/s Ratio Perm	0.04											
v/c Ratio	0.17	0.17	0.03	0.52	0.84		0.63	0.76		0.42	0.57	
Uniform Delay, d1	36.8	36.8	51.3	55.9	37.4		53.7	25.3		55.8	24.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.10	1.17		1.00	1.00	
Incremental Delay, d2	0.7	0.2	0.1	5.8	10.9		7.1	1.8		3.9	1.1	
Delay (s)	37.5	37.0	51.4	61.7	48.3		66.2	31.4		59.7	25.5	
Level of Service	D	D	D	E	D		E	C		E	C	
Approach Delay (s)		42.0			49.3			33.0			26.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.1
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	457	14	20	771	16	49	43	53	7	4	5
Future Volume (Veh/h)	14	457	14	20	771	16	49	43	53	7	4	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.83	0.80	0.80	0.93	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	18	551	18	25	829	20	61	54	66	9	5	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					377							
pX, platoon unblocked	0.85						0.85	0.85		0.85	0.85	0.85
vC, conflicting volume	849			569			1066	1495	284	1228	1494	424
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	465			569			721	1226	284	911	1225	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			76	62	91	93	97	99
cM capacity (veh/h)	927			999			250	144	712	121	144	920

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	294	294	440	434	181	20
Volume Left	18	0	25	0	61	9
Volume Right	0	18	0	20	66	6
cSH	927	1700	999	1700	284	185
Volume to Capacity	0.02	0.17	0.03	0.26	0.64	0.11
Queue Length 95th (ft)	1	0	2	0	100	9
Control Delay (s)	0.7	0.0	0.8	0.0	37.4	28.0
Lane LOS	A		A		E	D
Approach Delay (s)	0.4		0.4		37.4	28.0
Approach LOS					E	D

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	54.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	24	7	2	13	24	42
Future Volume (Veh/h)	24	7	2	13	24	42
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	30	9	3	16	30	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			39		56	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			39		56	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1571		949	1039

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	39	19	83
Volume Left	0	3	30
Volume Right	9	0	53
cSH	1700	1571	1004
Volume to Capacity	0.02	0.00	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	1.2	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	8.9
Approach LOS			A

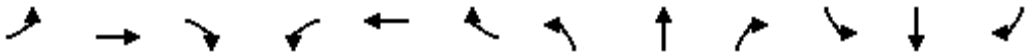
Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	246	761	213	409	202	54	1188	176	1637
v/c Ratio	0.65	0.52	0.99	0.28	0.26	0.44	0.76	1.28	0.96
Control Delay	35.5	24.8	92.4	21.4	3.5	63.9	38.8	219.6	63.2
Queue Delay	64.1	0.0	0.0	0.0	0.8	0.0	0.0	0.0	43.7
Total Delay	99.6	24.8	92.4	21.4	4.4	63.9	38.8	219.6	106.9
Queue Length 50th (ft)	145	213	160	102	0	41	294	~177	~505
Queue Length 95th (ft)	205	247	#269	135	41	74	335	#327	#553
Internal Link Dist (ft)		297		283			521		318
Turn Bay Length (ft)	180		170		160	185		180	
Base Capacity (vph)	378	1468	216	1486	776	137	1569	137	1708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	450
Spillback Cap Reductn	194	0	0	0	342	0	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.34	0.52	0.99	0.28	0.47	0.39	0.76	1.28	1.30

Intersection Summary

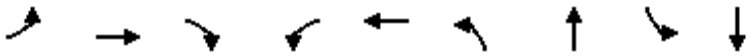
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	569	67	170	360	180	43	921	103	158	1271	119
Future Volume (vph)	197	569	67	170	360	180	43	921	103	158	1271	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3249		1652	3303	1478	1652	4669		1652	4685	
Flt Permitted	0.48	1.00		0.28	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	841	3249		481	3303	1478	1652	4669		1652	4685	
Peak-hour factor, PHF	0.80	0.84	0.80	0.80	0.88	0.89	0.80	0.87	0.80	0.90	0.85	0.84
Adj. Flow (vph)	246	677	84	212	409	202	54	1059	129	176	1495	142
RTOR Reduction (vph)	0	8	0	0	0	111	0	13	0	0	9	0
Lane Group Flow (vph)	246	753	0	213	409	91	54	1175	0	176	1628	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	54.0	54.0		54.0	54.0	54.0	7.5	39.0		11.0	42.5	
Effective Green, g (s)	54.0	54.0		54.0	54.0	54.0	7.5	39.0		11.0	42.5	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	0.45	0.06	0.32		0.09	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	378	1462		216	1486	665	103	1517		151	1659	
v/s Ratio Prot		0.23			0.12		0.03	c0.25		0.11	c0.35	
v/s Ratio Perm	0.29			c0.44		0.06						
v/c Ratio	0.65	0.52		0.99	0.28	0.14	0.52	0.77		1.17	0.98	
Uniform Delay, d1	25.7	23.6		32.6	20.7	19.3	54.5	36.5		54.5	38.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.24	1.37	
Incremental Delay, d2	4.0	0.3		56.8	0.1	0.1	4.7	3.9		120.7	16.9	
Delay (s)	29.6	23.9		89.4	20.8	19.4	59.3	40.5		188.6	69.3	
Level of Service	C	C		F	C	B	E	D		F	E	
Approach Delay (s)		25.3			38.2			41.3			80.9	
Approach LOS		C			D			D			F	

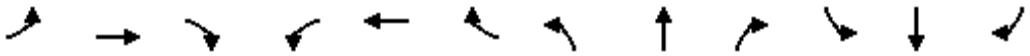
Intersection Summary			
HCM 2000 Control Delay	52.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	289	158	80	226	45	1461	59	1276
v/c Ratio	0.05	0.82	0.54	0.61	0.43	0.33	0.62	0.47	0.58
Control Delay	37.9	64.3	12.1	72.9	28.6	73.9	41.3	65.5	26.1
Queue Delay	0.0	0.0	77.9	670.0	0.0	0.0	1.1	0.0	18.9
Total Delay	37.9	64.3	90.0	742.9	28.6	73.9	42.4	65.5	45.1
Queue Length 50th (ft)	6	213	0	61	109	32	357	44	278
Queue Length 95th (ft)	19	#302	25	101	177	m47	416	79	335
Internal Link Dist (ft)		480			550		318		709
Turn Bay Length (ft)	130		100	140		100		150	
Base Capacity (vph)	236	384	290	140	599	137	2339	137	2196
Starvation Cap Reductn	0	0	0	0	0	0	577	0	0
Spillback Cap Reductn	0	0	195	140	0	0	0	0	945
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.75	1.66	80.00	0.38	0.33	0.83	0.43	1.02

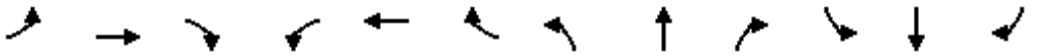
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	251	126	64	116	80	36	1284	27	47	1200	10
Future Volume (vph)	8	251	126	64	116	80	36	1284	27	47	1200	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	1739	1478	1652	1623		1652	4730		1652	4739	
Flt Permitted	0.62	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1073	1739	1478	1652	1623		1652	4730		1652	4739	
Peak-hour factor, PHF	0.80	0.87	0.80	0.80	0.92	0.80	0.80	0.90	0.80	0.80	0.95	0.80
Adj. Flow (vph)	10	289	158	80	126	100	45	1427	34	59	1263	12
RTOR Reduction (vph)	0	0	143	0	25	0	0	2	0	0	1	0
Lane Group Flow (vph)	10	289	15	80	201	0	45	1459	0	59	1275	0
Turn Type	Perm	NA	Over	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		6	3	5	2		3	8		7	4	
Permitted Phases	6											
Actuated Green, G (s)	24.5	24.5	11.2	8.0	38.3		11.2	56.9		7.5	53.2	
Effective Green, g (s)	24.5	24.5	11.2	8.0	38.3		11.2	56.9		7.5	53.2	
Actuated g/C Ratio	0.20	0.20	0.09	0.07	0.32		0.09	0.47		0.06	0.44	
Clearance Time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	355	137	110	518		154	2242		103	2100	
v/s Ratio Prot		c0.17	0.01	c0.05	0.12		0.03	c0.31		0.04	c0.27	
v/s Ratio Perm	0.01											
v/c Ratio	0.05	0.81	0.11	0.73	0.39		0.29	0.65		0.57	0.61	
Uniform Delay, d1	38.4	45.6	49.8	54.9	31.7		50.7	24.0		54.7	25.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.32	1.62		1.00	1.00	
Incremental Delay, d2	0.1	13.3	0.3	21.1	0.5		0.8	1.1		7.5	1.3	
Delay (s)	38.4	58.9	50.2	76.1	32.2		67.7	40.0		62.2	26.8	
Level of Service	D	E	D	E	C		E	D		E	C	
Approach Delay (s)		55.4			43.7			40.9			28.3	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.1
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	800	24	47	532	13	24	8	48	13	19	11
Future Volume (Veh/h)	3	800	24	47	532	13	24	8	48	13	19	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.83	0.80	0.80	0.93	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	4	964	30	59	572	16	30	10	60	16	24	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					377							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	588			994			1410	1693	497	1193	1700	294
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	408			994			1291	1595	497	1058	1603	92
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			63	89	88	87	73	98
cM capacity (veh/h)	1068			692			82	90	519	126	89	881

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	486	512	345	302	100	54
Volume Left	4	0	59	0	30	16
Volume Right	0	30	0	16	60	14
cSH	1068	1700	692	1700	189	135
Volume to Capacity	0.00	0.30	0.09	0.18	0.53	0.40
Queue Length 95th (ft)	0	0	7	0	68	43
Control Delay (s)	0.1	0.0	2.7	0.0	43.8	48.3
Lane LOS	A		A		E	E
Approach Delay (s)	0.1		1.5		43.8	48.3
Approach LOS					E	E

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	44	16	16	15	9	9
Future Volume (Veh/h)	44	16	16	15	9	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	55	20	20	19	11	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			75		124	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			75		124	65
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1524		860	999

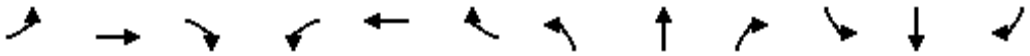
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	75	39	22
Volume Left	0	20	11
Volume Right	20	0	11
cSH	1700	1524	924
Volume to Capacity	0.04	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	3.8	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	3.8	9.0
Approach LOS			A

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization		18.3%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	156	543	158	685	617	36	1219	124	1314
v/c Ratio	0.84	0.44	0.65	0.55	0.86	0.30	0.64	0.91	0.61
Control Delay	68.0	26.6	42.1	30.0	32.2	59.4	32.2	120.8	42.3
Queue Delay	70.6	0.0	0.0	0.0	53.3	0.0	0.0	0.0	1.6
Total Delay	138.6	26.6	42.1	30.0	85.5	59.4	32.2	120.8	43.8
Queue Length 50th (ft)	103	146	94	204	266	27	288	102	386
Queue Length 95th (ft)	160	165	137	235	400	54	348	#221	414
Internal Link Dist (ft)		297		283			521		318
Turn Bay Length (ft)	180		170		160	185		180	
Base Capacity (vph)	220	1464	289	1486	802	137	1908	137	2144
Starvation Cap Reductn	0	0	0	0	0	0	0	0	601
Spillback Cap Reductn	108	0	0	0	341	0	14	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.39	0.37	0.55	0.46	1.34	0.26	0.64	0.91	0.85

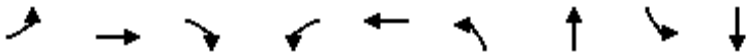
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	382	70	126	603	549	29	1010	46	112	927	187
Future Volume (vph)	125	382	70	126	603	549	29	1010	46	112	927	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3223		1652	3303	1478	1652	4712		1652	4625	
Flt Permitted	0.28	1.00		0.37	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	491	3223		643	3303	1478	1652	4712		1652	4625	
Peak-hour factor, PHF	0.80	0.84	0.80	0.80	0.88	0.89	0.80	0.87	0.80	0.90	0.85	0.84
Adj. Flow (vph)	156	455	88	158	685	617	36	1161	58	124	1091	223
RTOR Reduction (vph)	0	15	0	0	0	155	0	4	0	0	22	0
Lane Group Flow (vph)	156	528	0	158	685	462	36	1215	0	124	1292	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	45.5	45.5		45.5	45.5	45.5	5.4	46.5		12.0	53.1	
Effective Green, g (s)	45.5	45.5		45.5	45.5	45.5	5.4	46.5		12.0	53.1	
Actuated g/C Ratio	0.38	0.38		0.38	0.38	0.38	0.05	0.39		0.10	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	1222		243	1252	560	74	1825		165	2046	
v/s Ratio Prot		0.16			0.21		0.02	c0.26		0.08	c0.28	
v/s Ratio Perm	c0.32			0.25		0.31						
v/c Ratio	0.84	0.43		0.65	0.55	0.83	0.49	0.67		0.75	0.63	
Uniform Delay, d1	33.9	27.7		30.7	29.2	33.7	55.9	30.3		52.5	25.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.31	1.51	
Incremental Delay, d2	26.8	0.2		6.1	0.5	9.7	5.0	1.9		15.7	1.3	
Delay (s)	60.7	27.9		36.8	29.7	43.3	60.9	32.3		84.8	40.4	
Level of Service	E	C		D	C	D	E	C		F	D	
Approach Delay (s)		35.2			36.2			33.1			44.3	
Approach LOS		D			D			C			D	

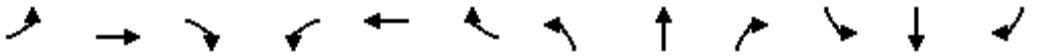
Intersection Summary			
HCM 2000 Control Delay	37.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	67	50	41	468	79	1777	30	1248
v/c Ratio	0.18	0.18	0.17	0.34	0.88	0.60	0.72	0.26	0.54
Control Delay	43.4	40.2	1.3	60.3	55.5	73.4	30.7	58.0	24.3
Queue Delay	0.0	0.0	3.1	108.8	0.0	0.0	2.7	0.0	0.5
Total Delay	43.4	40.2	4.4	169.2	55.5	73.4	33.3	58.0	24.8
Queue Length 50th (ft)	13	43	0	31	321	51	395	22	257
Queue Length 95th (ft)	32	80	0	60	442	m87	526	47	325
Internal Link Dist (ft)		480			550		318		709
Turn Bay Length (ft)	130		100	140		100		150	
Base Capacity (vph)	114	388	290	140	599	137	2468	137	2316
Starvation Cap Reductn	0	0	0	0	0	0	549	0	0
Spillback Cap Reductn	0	0	174	103	0	0	0	0	566
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.17	0.43	1.11	0.78	0.58	0.93	0.22	0.71

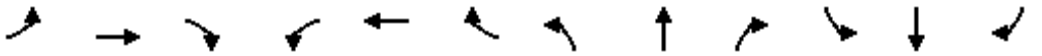
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	58	40	33	266	143	63	1591	7	24	1177	7
Future Volume (vph)	16	58	40	33	266	143	63	1591	7	24	1177	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	1739	1478	1652	1639		1652	4743		1652	4741	
Flt Permitted	0.30	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	516	1739	1478	1652	1639		1652	4743		1652	4741	
Peak-hour factor, PHF	0.80	0.87	0.80	0.80	0.92	0.80	0.80	0.90	0.80	0.80	0.95	0.80
Adj. Flow (vph)	20	67	50	41	289	179	79	1768	9	30	1239	9
RTOR Reduction (vph)	0	0	46	0	20	0	0	1	0	0	1	0
Lane Group Flow (vph)	20	67	4	41	448	0	79	1776	0	30	1247	0
Turn Type	Perm	NA	Over	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		6	3	5	2		3	8		7	4	
Permitted Phases	6											
Actuated Green, G (s)	25.4	25.4	9.2	7.2	38.4		9.2	59.0		5.3	55.1	
Effective Green, g (s)	25.4	25.4	9.2	7.2	38.4		9.2	59.0		5.3	55.1	
Actuated g/C Ratio	0.21	0.21	0.08	0.06	0.32		0.08	0.49		0.04	0.46	
Clearance Time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	109	368	113	99	524		126	2331		72	2176	
v/s Ratio Prot		0.04	0.00	0.02	c0.27		0.05	c0.37		0.02	c0.26	
v/s Ratio Perm	0.04											
v/c Ratio	0.18	0.18	0.03	0.41	0.86		0.63	0.76		0.42	0.57	
Uniform Delay, d1	38.8	38.8	51.3	54.4	38.2		53.7	24.8		55.8	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.11	1.18		1.00	1.00	
Incremental Delay, d2	0.8	0.2	0.1	2.8	12.9		6.8	1.7		3.9	1.1	
Delay (s)	39.6	39.0	51.4	57.2	51.1		66.5	31.1		59.7	24.9	
Level of Service	D	D	D	E	D		E	C		E	C	
Approach Delay (s)		43.6			51.6			32.6			25.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.1
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	467	14	20	783	29	49	43	53	62	4	13
Future Volume (Veh/h)	17	467	14	20	783	29	49	43	53	62	4	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.83	0.80	0.80	0.93	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	21	563	18	25	842	36	61	54	66	78	5	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					377							
pX, platoon unblocked	0.85						0.85	0.85		0.85	0.85	0.85
vC, conflicting volume	878			581			1096	1542	290	1260	1533	439
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	492			581			749	1277	290	944	1266	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			74	59	91	29	96	98
cM capacity (veh/h)	903			989			234	133	706	110	135	918

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	302	300	446	457	181	99
Volume Left	21	0	25	0	61	78
Volume Right	0	18	0	36	66	16
cSH	903	1700	989	1700	257	131
Volume to Capacity	0.02	0.18	0.03	0.27	0.71	0.76
Queue Length 95th (ft)	2	0	2	0	119	111
Control Delay (s)	0.9	0.0	0.8	0.0	46.8	89.4
Lane LOS	A		A		E	F
Approach Delay (s)	0.4		0.4		46.8	89.4
Approach LOS					E	F

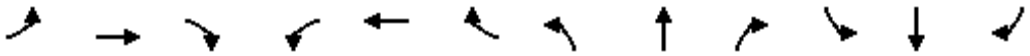
Intersection Summary				
Average Delay	10.0			
Intersection Capacity Utilization	55.3%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	270	860	246	438	264	76	1208	218	1644
v/c Ratio	0.74	0.59	1.37	0.29	0.33	0.59	0.77	1.59	0.97
Control Delay	42.0	25.8	226.0	21.6	3.9	72.0	38.8	335.2	65.4
Queue Delay	62.1	0.0	0.0	0.0	1.0	0.0	0.0	0.0	42.3
Total Delay	104.0	25.8	226.0	21.6	4.8	72.0	38.8	335.2	107.6
Queue Length 50th (ft)	169	248	~251	110	3	58	298	~247	~517
Queue Length 95th (ft)	238	283	#354	145	49	97	338	#409	#556
Internal Link Dist (ft)		297		283			521		318
Turn Bay Length (ft)	180		170		160	185		180	
Base Capacity (vph)	363	1461	180	1486	805	137	1567	137	1692
Starvation Cap Reductn	0	0	0	0	0	0	0	0	433
Spillback Cap Reductn	173	0	0	0	318	0	7	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.42	0.59	1.37	0.29	0.54	0.55	0.77	1.59	1.31

Intersection Summary

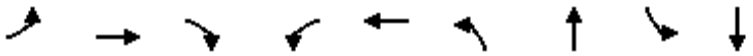
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	594	122	197	385	235	61	883	154	196	1260	136
Future Volume (vph)	216	594	122	197	385	235	61	883	154	196	1260	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3215		1652	3303	1478	1652	4633		1652	4676	
Flt Permitted	0.46	1.00		0.23	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	806	3215		401	3303	1478	1652	4633		1652	4676	
Peak-hour factor, PHF	0.80	0.84	0.80	0.80	0.88	0.89	0.80	0.87	0.80	0.90	0.85	0.84
Adj. Flow (vph)	270	707	152	246	438	264	76	1015	192	218	1482	162
RTOR Reduction (vph)	0	15	0	0	0	141	0	24	0	0	11	0
Lane Group Flow (vph)	270	845	0	246	438	123	76	1184	0	218	1633	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4		4						
Actuated Green, G (s)	54.0	54.0		54.0	54.0	54.0	7.8	39.0		11.0	42.2	
Effective Green, g (s)	54.0	54.0		54.0	54.0	54.0	7.8	39.0		11.0	42.2	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	0.45	0.06	0.32		0.09	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	1446		180	1486	665	107	1505		151	1644	
v/s Ratio Prot		0.26			0.13		0.05	c0.26		c0.13	c0.35	
v/s Ratio Perm	0.33			c0.61		0.08						
v/c Ratio	0.75	0.58		1.37	0.29	0.19	0.71	0.79		1.44	0.99	
Uniform Delay, d1	27.3	24.6		33.0	20.9	19.8	55.0	36.7		54.5	38.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.25	1.36	
Incremental Delay, d2	8.1	0.6		196.3	0.1	0.1	19.8	4.2		229.5	19.3	
Delay (s)	35.4	25.2		229.3	21.0	19.9	74.8	41.0		297.6	72.1	
Level of Service	D	C		F	C	B	E	D		F	E	
Approach Delay (s)		27.7			74.8			43.0			98.5	
Approach LOS		C			E			D			F	

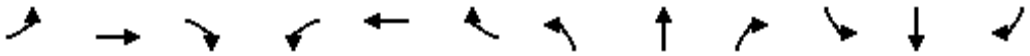
Intersection Summary			
HCM 2000 Control Delay	65.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	10	289	165	80	226	51	1480	59	1316
v/c Ratio	0.05	0.82	0.57	0.61	0.43	0.37	0.63	0.47	0.60
Control Delay	37.9	64.3	13.7	72.9	28.6	73.1	39.6	65.5	26.5
Queue Delay	0.0	0.0	77.7	670.0	0.0	0.0	1.1	0.0	30.1
Total Delay	37.9	64.3	91.4	742.9	28.6	73.1	40.8	65.5	56.6
Queue Length 50th (ft)	6	213	0	61	109	36	364	44	290
Queue Length 95th (ft)	19	#302	31	101	177	m52	419	79	348
Internal Link Dist (ft)		480			550		318		709
Turn Bay Length (ft)	130		100	140		100		150	
Base Capacity (vph)	236	384	290	140	599	137	2339	137	2198
Starvation Cap Reductn	0	0	0	0	0	0	572	0	0
Spillback Cap Reductn	0	0	195	140	0	0	0	0	948
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.75	1.74	80.00	0.38	0.37	0.84	0.43	1.05

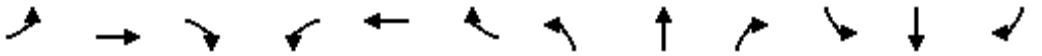
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	251	132	64	116	80	41	1301	27	47	1238	10
Future Volume (vph)	8	251	132	64	116	80	41	1301	27	47	1238	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	1739	1478	1652	1623		1652	4730		1652	4739	
Flt Permitted	0.62	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1073	1739	1478	1652	1623		1652	4730		1652	4739	
Peak-hour factor, PHF	0.80	0.87	0.80	0.80	0.92	0.80	0.80	0.90	0.80	0.80	0.95	0.80
Adj. Flow (vph)	10	289	165	80	126	100	51	1446	34	59	1303	12
RTOR Reduction (vph)	0	0	150	0	25	0	0	2	0	0	1	0
Lane Group Flow (vph)	10	289	15	80	201	0	51	1478	0	59	1315	0
Turn Type	Perm	NA	Over	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		6	3	5	2		3	8		7	4	
Permitted Phases	6											
Actuated Green, G (s)	24.5	24.5	11.2	8.0	38.3		11.2	56.9		7.5	53.2	
Effective Green, g (s)	24.5	24.5	11.2	8.0	38.3		11.2	56.9		7.5	53.2	
Actuated g/C Ratio	0.20	0.20	0.09	0.07	0.32		0.09	0.47		0.06	0.44	
Clearance Time (s)	5.5	5.5	6.0	5.8	5.5		6.0	5.8		6.0	5.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	219	355	137	110	518		154	2242		103	2100	
v/s Ratio Prot		c0.17	0.01	c0.05	0.12		0.03	c0.31		0.04	c0.28	
v/s Ratio Perm	0.01											
v/c Ratio	0.05	0.81	0.11	0.73	0.39		0.33	0.66		0.57	0.63	
Uniform Delay, d1	38.4	45.6	49.8	54.9	31.7		50.9	24.1		54.7	25.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.28	1.55		1.00	1.00	
Incremental Delay, d2	0.1	13.3	0.4	21.1	0.5		0.9	1.1		7.5	1.4	
Delay (s)	38.4	58.9	50.2	76.1	32.2		66.1	38.4		62.2	27.2	
Level of Service	D	E	D	E	C		E	D		E	C	
Approach Delay (s)		55.4			43.7			39.3			28.7	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.1
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	813	24	47	547	52	24	8	48	87	19	19
Future Volume (Veh/h)	13	813	24	47	547	52	24	8	48	87	19	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.83	0.80	0.80	0.93	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	16	980	30	59	588	65	30	10	60	109	24	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					377							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	653			1010			1463	1798	505	1266	1780	326
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459			1010			1336	1699	505	1122	1680	106
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			91			58	87	88	0	69	97
cM capacity (veh/h)	1014			682			71	76	512	109	78	857

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	506	520	353	359	100	157
Volume Left	16	0	59	0	30	109
Volume Right	0	30	0	65	60	24
cSH	1014	1700	682	1700	164	118
Volume to Capacity	0.02	0.31	0.09	0.21	0.61	1.33
Queue Length 95th (ft)	1	0	7	0	83	263
Control Delay (s)	0.5	0.0	2.7	0.0	56.2	265.5
Lane LOS	A		A		F	F
Approach Delay (s)	0.2		1.4		56.2	265.5
Approach LOS					F	F

Intersection Summary			
Average Delay	24.3		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

Appendix B Trip Generation Calculations

Overall Development				**AM Peak Hour**			**PM Peak Hour**			
Use	**ITE Code**	**Program**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Affordable Housing - Family	LADOT	81	DU	15	25	40	16	12	28	337
25% Transit Reduction		-25%		(4)	(6)	(10)	(4)	(3)	(7)	(84)
10% TDM Reduction		-10%		(2)	(3)	(4)	(2)	(1)	(3)	(34)
Adjusted Affordable Residential				10	17	26	10	8	18	219
Internal Trips				x	x	x	(2)	(2)	(5)	(52)
Net Affordable Residential				10	17	26	8	5	13	167
Market-Rate Residential	LADOT	320	DU	23	76	99	60	36	96	2,378
25% Transit Reduction		-25%		(6)	(19)	(25)	(15)	(9)	(24)	(595)
10% TDM Reduction		-10%		(2)	(8)	(10)	(6)	(4)	(10)	(238)
Adjusted Market Residential				15	50	64	39	23	62	1,545
Internal Trips				x	x	x	(9)	(7)	(17)	(369)
Net Market Residential				15	50	64	30	16	46	1,176
Supermarket	850	22,277	sf	51	34	85	130	124	254	2,792
25% Transit Reduction		-25%		(13)	(9)	(22)	(33)	(31)	(64)	(698)
10% TDM Reduction		-10%		(5)	(3)	(9)	(13)	(12)	(25)	(279)
Pass-by Trips		-40%		x	x	x	(34)	(32)	(66)	(66)
Adjusted Supermarket				33	22	55	50	48	99	1,749
Internal Trips				x	x	x	(5)	(6)	(10)	(287)
Net Supermarket				33	22	55	46	43	88	1,462
Retail	820	10,685	sf	6	4	10	50	54	104	1,314
25% Transit Reduction		-25%		(2)	(1)	(3)	(13)	(14)	(27)	(329)
10% TDM Reduction		-10%		(1)	(0)	(1)	(5)	(5)	(10)	(131)
Pass-by Trips		-50%		x	x	x	(16)	(17)	(33)	(33)
Adjusted Retail				3	3	6	16	17	33	820
Internal Trips				x	x	x	(1)	(2)	(4)	(135)
Net Retail				3	3	6	15	15	30	686
Restaurant	930	8,034	sf	11	6	17	63	51	114	2,532
25% Transit Reduction		-25%		(3)	(2)	(5)	(16)	(13)	(29)	(633)
10% TDM Reduction		-10%		(1)	(1)	(2)	(6)	(5)	(11)	(253)
Adjusted Retail				7	3	10	41	33	74	1,646
Internal Trips				x	x	x	(4)	(4)	(8)	-
Net Restaurant				7	3	10	37	29	66	1,646
Net New Trips				**67**	**94**	**161**	**135**	**108**	**243**	**5,137**

West Parcel				**AM Peak Hour**			**PM Peak Hour**			
Use	**ITE Code**	**Program**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Affordable Housing - Family	LADOT	45	DU	5	9	14	4	3	7	93
Market-Rate Residential	220	180	DU	8	28	36	17	9	26	662
Restaurant	820	4,023	sf	3	2	5	19	14	33	824
Retail	820	6,673	sf	2	2	4	9	10	19	428
Total				**18**	**41**	**59**	**49**	**36**	**85**	**2,007**

East Parcel				**AM Peak Hour**			**PM Peak Hour**			
Use	**ITE Code**	**Program**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Affordable Housing - Family	LADOT	36	DU	5	8	12	4	2	6	74
Market-Rate Residential	220	140	DU	7	22	28	13	7	20	514
Restaurant	820	4,011	sf	4	1	5	18	15	33	822
Retail	820	4,012	sf	1	1	2	6	5	11	258
Supermarket	850	22,277	sf	33	22	55	46	43	88	1,462
Total				**49**	**53**	**102**	**86**	**72**	**158**	**3,130**

Appendix C VMT Calculator Output

CITY OF LOS ANGELES VMT CALCULATOR Version 1.2

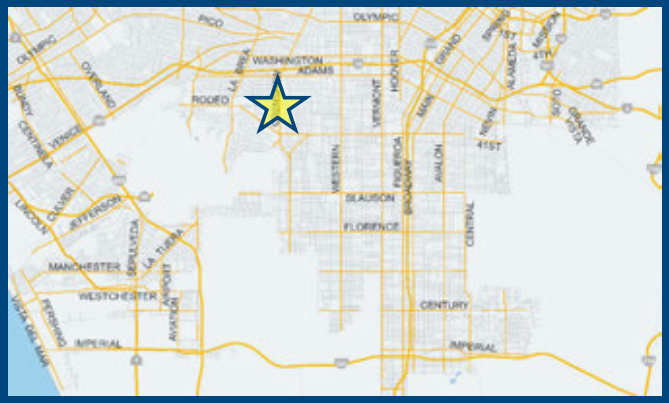
Project Screening Criteria: Is this project required to conduct a vehicle miles traveled analysis?

Project Information

Project: Crenshaw Crossing

Scenario: Build

Address: 3606 EXPOSITION BLVD, 90016



If the project is replacing an existing number of residential units with a smaller number of residential units, is the proposed project located within one-half mile of a fixed-rail or fixed-guideway transit station?

○ Yes ○ No

Existing Land Use

Land Use Type	Value	Unit
Retail | Quality Restaurant		ksf

☐ Click here to add a single custom land use type (will be included in the above list)

Proposed Project Land Use

Land Use Type	Value	Unit
Housing | Multi-Family	320	DU
Housing | Multi-Family	320	DU
Retail | General Retail	10.5	ksf
Retail | Supermarket	22.5	ksf
Retail | High-Turnover Sit-Down Restaurant	8.5	ksf
Housing | Affordable Housing - Family	81	DU

☐ Click here to add a single custom land use type (will be included in the above list)

Project Screening Summary

Existing Land Use	Proposed Project
0 Daily Vehicle Trips	4,307 Daily Vehicle Trips
0 Daily VMT	28,280 Daily VMT

Tier 1 Screening Criteria

Project will have less residential units compared to existing residential units & is within one-half mile of a fixed-rail station. ☐

Tier 2 Screening Criteria

The net increase in daily trips < 250 trips	4,307 Net Daily Trips
The net increase in daily VMT ≤ 0	28,280 Net Daily VMT
The proposed project consists of only retail land uses ≤ 50,000 square feet total.	41.500 ksf

The proposed project is required to perform VMT analysis.

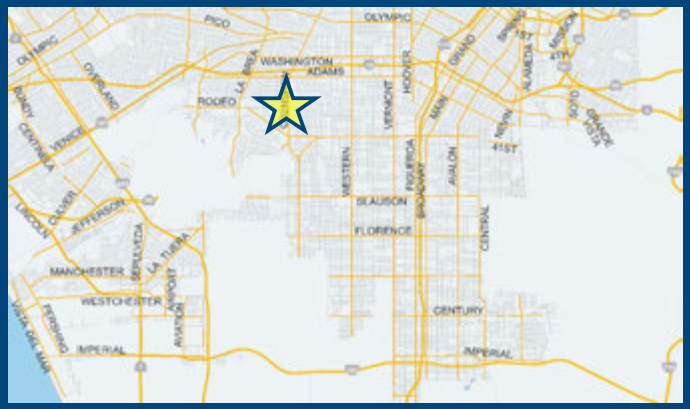
Measuring the Miles

4/17/2020

CITY OF LOS ANGELES VMT CALCULATOR Version 1.2

Project Information

Project: Crenshaw Crossing
Scenario: Build
Address: 3606 EXPOSITION BLVD, 90016



Proposed Project Land Use Type	Value	Unit
Housing | Multi-Family	320	DU
Retail | General Retail	10.5	ksf
Retail | Supermarket	22.5	ksf
Retail | High-Turnover Sit-Down Restaurant	8.5	ksf
Housing | Affordable Housing - Family	81	DU

TDM Strategies

Select each section to show individual strategies
Use ☑ to denote if the TDM strategy is part of the proposed project or is a mitigation strategy

	Proposed Project	With Mitigation
Max Home Based TDM Achieved?	**No**	**No**
Max Work Based TDM Achieved?	**No**	**No**

A Parking

Reduce Parking Supply
☑ Proposed Prj ☐ Mitigation
493 city code parking provision for the project site
484 actual parking provision for the project site

Unbundle Parking
☑ Proposed Prj ☐ Mitigation
125 monthly parking cost (dollar) for the project site

Parking Cash-Out
☐ Proposed Prj ☐ Mitigation
50 percent of employees eligible

Price Workplace Parking
☐ Proposed Prj ☐ Mitigation
6.00 daily parking charge (dollar)
25 percent of employees subject to priced parking

Residential Area Parking Permits
☑ Proposed Prj ☐ Mitigation
100 cost (dollar) of annual permit

B Transit

C Education & Encouragement

D Commute Trip Reductions

E Shared Mobility

F Bicycle Infrastructure

G Neighborhood Enhancement

Analysis Results

Proposed Project	With Mitigation
3,881 Daily Vehicle Trips	**3,881** Daily Vehicle Trips
25,495 Daily VMT	**25,495** Daily VMT
7.2 Household VMT per Capita	**7.2** Household VMT per Capita
N/A Work VMT per Employee	**N/A** Work VMT per Employee

Significant VMT Impact?

Proposed Project	With Mitigation
Household: Yes Threshold = 6.0 15% Below APC	**Household: Yes** Threshold = 6.0 15% Below APC
Work: N/A Threshold = 11.6 15% Below APC	**Work: N/A** Threshold = 11.6 15% Below APC

Measuring the Miles

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: April 17, 2020
Project Name: Crenshaw Crossing
Project Scenario: Build
Project Address: 3606 EXPOSITION BLVD, 90016

Version 1.2

Project Information			
Land Use Type		**Value**	**Units**
Housing	*Single Family*	*0*	*DU*
	Multi Family	320	DU
	Townhouse	*0*	*DU*
	Hotel	*0*	*Rooms*
	Motel	*0*	*Rooms*
Affordable Housing	Family	81	DU
	Senior	*0*	*DU*
	Special Needs	*0*	*DU*
	Permanent Supportive	*0*	*DU*
Retail	General Retail	10.500	ksf
	Furniture Store	*0.000*	*ksf*
	Pharmacy/Drugstore	*0.000*	*ksf*
	Supermarket	22.500	ksf
	Bank	*0.000*	*ksf*
	Health Club	*0.000*	*ksf*
	High-Turnover Sit-Down Restaurant	8.500	ksf
	Fast-Food Restaurant	*0.000*	*ksf*
	Quality Restaurant	*0.000*	*ksf*
	Auto Repair	*0.000*	*ksf*
	Home Improvement	*0.000*	*ksf*
	Free-Standing Discount	*0.000*	*ksf*
	Movie Theater	*0*	*Seats*
Office	*General Office*	*0.000*	*ksf*
	Medical Office	*0.000*	*ksf*
Industrial	*Light Industrial*	*0.000*	*ksf*
	Manufacturing	*0.000*	*ksf*
	Warehousing/Self-Storage	*0.000*	*ksf*
School	*University*	*0*	*Students*
	High School	*0*	*Students*
	Middle School	*0*	*Students*
	Elementary	*0*	*Students*
	Private School (K-12)	*0*	*Students*
Other		*0*	*Trips*

CITY OF LOS ANGELES VMT CALCULATOR

Report 1: Project & Analysis Overview

Date: April 17, 2020
Project Name: Crenshaw Crossing
Project Scenario: Build
Project Address: 3606 EXPOSITION BLVD, 90016

Version 1.2

Analysis Results			
Total Employees: 145 Total Population: 975			
Proposed Project		***With Mitigation***	
3,881	**Daily Vehicle Trips**	**3,881**	**Daily Vehicle Trips**
25,495	**Daily VMT**	**25,495**	**Daily VMT**
7.2	**Household VMT per Capita**	**7.2**	**Household VMT per Capita**
N/A	**Work VMT per Employee**	**N/A**	**Work VMT per Employee**

Significant VMT Impact?			
APC: South Los Angeles			
Impact Threshold: 15% Below APC Average Household = 6.0 Work = 11.6			
Proposed Project		***With Mitigation***	
VMT Threshold	**Impact**	**VMT Threshold**	**Impact**
Household > 6.0 Work > 11.6	Yes N/A	Household > 6.0 Work > 11.6	Yes N/A

TDM Strategy Inputs

Strategy Type		Description	Proposed Project	Mitigations
Parking	Reduce parking supply	City code parking provision (spaces)	493	493
		Actual parking provision (spaces)	484	484
	Unbundle parking	Monthly cost for parking ($)	$125	$125
	Parking cash-out	*Employees eligible (%)*	*0%*	*0%*
	Price workplace parking	*Daily parking charge ($)*	*$0.00*	*$0.00*
		Employees subject to priced parking (%)	*0%*	*0%*
	Residential area parking permits	Cost of annual permit ($)	$100	$100

(cont. on following page)

TDM Strategy Inputs, Cont.

Strategy Type		Description	Proposed Project	Mitigations
Transit	*Reduce transit headways*	*Reduction in headways (increase in frequency) (%)*	*0%*	*0%*
		Existing transit mode share (as a percent of total daily trips) (%)	*0%*	*0%*
		Lines within project site improved (<50%, >=50%)	*0*	*0*
	Implement neighborhood shuttle	*Degree of implementation (low, medium, high)*	*0*	*0*
		Employees and residents eligible (%)	*0%*	*0%*
	Transit subsidies	*Employees and residents eligible (%)*	*0%*	*0%*
		Amount of transit subsidy per passenger (daily equivalent) ($)	*$0.00*	*$0.00*
Education & Encouragement	*Voluntary travel behavior change program*	*Employees and residents participating (%)*	*0%*	*0%*
	Promotions and marketing	Employees and residents participating (%)	50%	50%

(cont. on following page)

TDM Strategy Inputs, Cont.

Strategy Type		Description	Proposed Project	Mitigations
Commute Trip Reductions	*Required commute trip reduction program*	*Employees participating (%)*	*0%*	*0%*
	Alternative Work Schedules and Telecommute	*Employees participating (%)*	*0%*	*0%*
		Type of program	*0*	*0*
	Employer sponsored vanpool or shuttle	*Degree of implementation (low, medium, high)*	*0*	*0*
		Employees eligible (%)	*0%*	*0%*
		Employer size (small, medium, large)	*0*	*0*
	Ride-share program	*Employees eligible (%)*	*0%*	*0%*
Shared Mobility	*Car share*	*Car share project setting (Urban, Suburban, All Other)*	*0*	*0*
	Bike share	*Within 600 feet of existing bike share station - OR- implementing new bike share station (Yes/No)*	*0*	*0*
	School carpool program	*Level of implementation (Low, Medium, High)*	*0*	*0*

(cont. on following page)

TDM Strategy Inputs, Cont.

Strategy Type		Description	Proposed Project	Mitigations
Bicycle Infrastructure	*Implement/Improve on-street bicycle facility*	*Provide bicycle facility along site (Yes/No)*	*0*	*0*
	Include Bike parking per LAMC	Meets City Bike Parking Code (Yes/No)	Yes	Yes
	Include secure bike parking and showers	*Includes indoor bike parking/lockers, showers, & repair station (Yes/No)*	*0*	*0*
Neighborhood Enhancement	*Traffic calming improvements*	*Streets with traffic calming improvements (%)*	*0%*	*0%*
		Intersections with traffic calming improvements (%)	*0%*	*0%*
	Pedestrian network improvements	Included (within project and connecting off-site/within project only)	within project and connecting off-site	within project and connecting off-site

CITY OF LOS ANGELES VMT CALCULATOR

Report 3: TDM Outputs

Date: April 17, 2020
Project Name: Crenshaw Crossing
Project Scenario: Build
Project Address: 3606 EXPOSITION BLVD, 90016

Version 1.2

TDM Adjustments by Trip Purpose & Strategy

Place type: Compact Infill

		Home Based Work Production		*Home Based Work Attraction*		*Home Based Other Production*		*Home Based Other Attraction*		*Non-Home Based Other Production*		*Non-Home Based Other Attraction*		*Source*
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Parking	Reduce parking supply	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	TDM Strategy Appendix, Parking sections 1 - 5
	Unbundle parking	15%	15%	*0%*	*0%*	15%	15%	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
	Parking cash-out	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
	Price workplace parking	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
	Residential area parking permits	0.14%	0.14%	*0.00%*	*0.00%*	0.14%	0.14%	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	
Transit	Reduce transit headways	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	TDM Strategy Appendix, Transit sections 1 - 3
	Implement neighborhood shuttle	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
	Transit subsidies	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
Education & Encouragement	Voluntary travel behavior change program	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	TDM Strategy Appendix, Education & Encouragement sections 1 - 2
	Promotions and marketing	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	*0%*	
Commute Trip Reductions	Required commute trip reduction program	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	TDM Strategy Appendix, Commute Trip Reductions sections 1 - 4
	Alternative Work Schedules and Telecommute Program	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
	Employer sponsored vanpool or shuttle	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
	Ride-share program	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	
Shared Mobility	Car-share	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	TDM Strategy Appendix, Shared Mobility sections 1 - 3
	Bike share	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	
	School carpool program	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	

TDM Adjustments by Trip Purpose & Strategy, Cont.

Place type: Compact Infill

		Home Based Work Production		*Home Based Work Attraction*		*Home Based Other Production*		*Home Based Other Attraction*		*Non-Home Based Other Production*		*Non-Home Based Other Attraction*		*Source*
		Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	
Bicycle Infrastructure	Implement/ Improve on-street bicycle facility	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	TDM Strategy Appendix, Bicycle Infrastructure sections 1 - 3
	Include Bike parking per LAMC	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	
	Include secure bike parking and showers	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	
Neighborhood Enhancement	Traffic calming improvements	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	TDM Strategy Appendix, Neighborhood Enhancement sections 1 - 2
	Pedestrian network improvements	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	

Final Combined & Maximum TDM Effect

	Home Based Work Production		*Home Based Work Attraction*		*Home Based Other Production*		*Home Based Other Attraction*		*Non-Home Based Other Production*		*Non-Home Based Other Attraction*	
	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated	Proposed	Mitigated
COMBINED TOTAL	*20%*	*20%*	*5%*	*5%*	*20%*	*20%*	*5%*	*5%*	*5%*	*5%*	*5%*	*4%*
MAX. TDM EFFECT	*20%*	*20%*	*5%*	*5%*	*20%*	*20%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*

= Minimum (X%, 1-[(1-A)*(1-B)…])
where X%=

PLACE TYPE MAX:	*urban*	*75%*
	compact infill	*40%*
	suburban center	*20%*
	suburban	*15%*

CITY OF LOS ANGELES VMT CALCULATOR

Report 4: MXD Methodology

Date: April 17, 2020
Project Name: Crenshaw Crossing
Project Scenario: Build
Project Address: 3606 EXPOSITION BLVD, 90016

Version 1.2

MXD Methodology - Project Without TDM

	Unadjusted Trips	MXD Adjustment	MXD Trips	Average Trip Length	Unadjusted VMT	MXD VMT
Home Based Work Production	537	-29.2%	380	8.5	4,565	3,230
Home Based Other Production	1,437	-32.8%	966	5.7	8,191	5,506
Non-Home Based Other Production	760	-11.8%	670	7.6	5,776	5,092
Home-Based Work Attraction	210	-35.2%	136	10.3	2,163	1,401
Home-Based Other Attraction	2,004	-32.3%	1,356	5.5	11,022	7,458
Non-Home Based Other Attraction	904	-11.6%	799	7.0	6,328	5,593

MXD Methodology with TDM Measures

	Proposed Project			*Project with Mitigation Measures*		
	TDM Adjustment	Project Trips	Project VMT	TDM Adjustment	Mitigated Trips	Mitigated VMT
Home Based Work Production	-19.7%	305	2,593	-19.7%	305	2,593
Home Based Other Production	-19.7%	775	4,420	-19.7%	775	4,420
Non-Home Based Other Production	-5.4%	634	4,815	-5.4%	634	4,815
Home-Based Work Attraction	-5.4%	129	1,325	-5.4%	129	1,325
Home-Based Other Attraction	-5.4%	1,282	7,053	-5.4%	1,282	7,053
Non-Home Based Other Attraction	-5.4%	756	5,289	-5.4%	756	5,289

MXD VMT Methodology Per Capita & Per Employee

Total Population: 975
Total Employees: 145
APC: South Los Angeles

	Proposed Project	*Project with Mitigation Measures*
Total Home Based Production VMT	**7,013**	**7,013**
Total Home Based Work Attraction VMT	**1,325**	**1,325**
Total Home Based VMT Per Capita	**7.2**	**7.2**
Total Work Based VMT Per Employee	**N/A**	**N/A**

VMT Calculator User Agreement

The Los Angeles Department of Transportation (LADOT), in partnership with the Department of City Planning and Fehr & Peers, has developed the City of Los Angeles Vehicle Miles Traveled (VMT) Calculator to estimate project-specific daily household VMT per capita and daily work VMT per employee for land use development projects. This application, the VMT Calculator, has been provided to You, the User, to assess vehicle miles traveled (VMT) outcomes of land use projects within the City of Los Angeles. The term "City" as used below shall refer to the City of Los Angeles. The terms "City" and "Fehr & Peers" as used below shall include their respective affiliates, subconsultants, employees, and representatives.

The City is pleased to be able to provide this information to the public. The City believes that the public is most effectively served when they are provided access to the technical tools that inform the public review process of private and public land use investments. However, in using the VMT Calculator, You agree to be bound by this VMT Calculator User Agreement (this Agreement).

VMT Calculator Application for the City of Los Angeles. The City's consultant calibrated the VMT Calculator's parameters in 2018 to estimate travel patterns of locations in the City, and validated those outcomes against empirical data. However, this calibration process is limited to locations within the City, and practitioners applying the VMT Calculator outside of the City boundaries should not apply these estimates without further calibration and validation of travel patterns to verify the VMT Calculator's accuracy in estimating VMT in such other locations.

Limited License to Use. This Agreement gives You a limited, non-transferrable, non-assignable, and non-exclusive license to use and execute a copy of the VMT Calculator on a computer system owned, leased or otherwise controlled by You in Your own facilities, as set out below, provided You do not use the VMT Calculator in an unauthorized manner, and that You do not republish, copy, distribute, reverse-engineer, modify, decompile, disassemble, transfer, or sell any part of the VMT Calculator, and provided that You know and follow the terms of this Agreement. Your failure to follow the terms of this Agreement shall automatically terminate this license and Your right to use the VMT Calculator.

Ownership. You understand and acknowledge that the City owns the VMT Calculator, and shall continue to own it through Your use of it, and that no transfer of ownership of any kind is intended in allowing You to use the VMT Calculator.

Warranty Disclaimer. In spite of the efforts of the City and Fehr & Peers, some information on the VMT Calculator may not be accurate. The VMT Calculator, OUTPUTS AND ASSOCIATED DATA ARE PROVIDED "as is" WITHOUT WARRANTY OF ANY KIND, whether expressed, implied, statutory, or otherwise including but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Limitation of Liability. It is understood that the VMT Calculator is provided without charge. Neither the City nor Fehr & Peers can be responsible or liable for any information derived from its use, or for any delays, inaccuracies, incompleteness, errors or omissions arising out of your use of the VMT Calculator or with respect to the material contained in the VMT Calculator. You understand and agree that Your sole remedy against the City or Fehr & Peers for loss or damage caused by any defect or failure of the

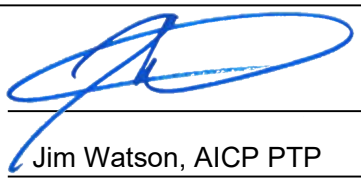
VMT Calculator, regardless of the form of action, whether in contract, tort, including negligence, strict liability or otherwise, shall be the repair or replacement of the VMT Calculator to the extent feasible as determined solely by the City. In no event shall the City or Fehr & Peers be responsible to You or anyone else for, or have liability for any special, indirect, incidental or consequential damages (including, without limitation, damages for loss of business profits or changes to businesses costs) or lost data or downtime, however caused, and on any theory of liability from the use of, or the inability to use, the VMT Calculator, whether the data, and/or formulas contained in the VMT Calculator are provided by the City or Fehr & Peers, or another third party, even if the City or Fehr & Peers have been advised of the possibility of such damages.

This Agreement and License shall be governed by the laws of the State of California without regard to their conflicts of law provisions, and shall be effective as of the date set forth below and, unless terminated in accordance with the above or extended by written amendment to this Agreement, shall terminate on the earlier of the date that You are not making use of the VMT Calculator or one year after the beginning of Your use of the VMT Calculator.

By using the VMT Calculator, You hereby waive and release all claims, responsibilities, liabilities, actions, damages, costs, and losses, known and unknown, against the City and Fehr & Peers for Your use of the VMT Calculator.

Before making decisions using the information provided in this application, contact City LADOT staff to confirm the validity of the data provided.

Print and sign below, and submit to LADOT along with the transportation assessment Memorandum of Understanding (MOU).

You, the User	
By:	
Print Name:	Jim Watson, AICP PTP
Title:	Principal
Company:	Nelson\Nygaard
Address:	706 S Hill St, Ste 1200, Los Angeles, CA 90014
Phone:	212-405-2538
Email Address:	jwatson@nelsonnygaard.com
Date:	January 15, 2019

Appendix D Transportation Assessment Memorandum of Understanding (MOU)

LADOT

Transportation Assessment Memorandum of Understanding (MOU)

This MOU acknowledges that the Transportation Assessment for the following Project will be prepared in accordance with the latest version of LADOT's Transportation Assessment Guidelines:

I. PROJECT INFORMATION

Project Name: Crenshaw Crossing

Project Address: 3606 West Exposition Boulevard/3645 Crenshaw Boulevard, Los Angeles, CA 90016

Project Description: 400 DU (320 market-rate, 80 affordable), 8,000 s.f. retail, 8,000 s.f. restaurant, 22,000 s.f. supermarket, 2,500 s.f. of community space. Project encompasses 2 parcels on west and east sides of Crenshaw Blvd, between Exposition Blvd and Obama Blvd, and adjacent to the existing Expo/Crenshaw Expo Line stop and under construction Crenshaw/LAX Line stop.

LADOT Project Case Number: _____ Project Site Plan attached? *(Required)* ☒ Yes ☐ No

II. TRIP GENERATION

Geographic Distribution: N 34.00 % S 28.00 % E 20.00 % W 18.00 %

Illustration of Project trip distribution percentages at Study intersections attached? *(Required)* ☒ Yes ☐ No

Trip Generation Rate(s): ITE 10th Edition / Other LADOT Guidelines rates for residential uses

Trip Generation Adjustment *(Exact amount of credit subject to approval by LADOT)*	**Yes**	**No**
Transit Usage	☒	☐
Transportation Demand Management	☒	☐
Existing Active Land Use	☐	☒
Previous Land Use	☐	☒
Internal Trip	☒	☐
Pass-By Trip	☒	☐

Trip generation table including a description of the proposed land uses, ITE rates, estimated morning and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc. attached? *(Required)* ☒ Yes ☐ No

	IN	OUT	TOTAL
AM Trips	67	94	160
PM Trips	137	109	246

III. STUDY AREA AND ASSUMPTIONS

Project Buildout Year: 2023 Ambient Growth Rate: 1 % Per Yr.

Related Projects List, researched by the consultant and approved by LADOT, attached? *(Required)* ☒ Yes ☐ No

Map of Study Intersections/Segments attached? ☒ Yes ☐ No

STUDY INTERSECTIONS *(May be subject to LADOT revision after access, safety and circulation analysis)*

1 Crenshaw/Exposition
2 Crenshaw/Obama Blvd
3 S. Victoria Ave/Obama Blvd
4 S. Victoria Ave/Exposition

Is this Project located on a street within the High Injury Network? ☒ Yes ☐ No

IV. ACCESS ASSESSMENT

Is the project on a lot that is 0.5-acre or more in total gross area? ☒ Yes ☐ No

Is the project's frontage 250 linear feet or more along an Avenue or Boulevard as classified by the City's General Plan? ☒ Yes ☐ No

Is the project's building frontage encompassing an entire block along an Avenue or Boulevard as classified by the City's General Plan? ☒ Yes ☐ No

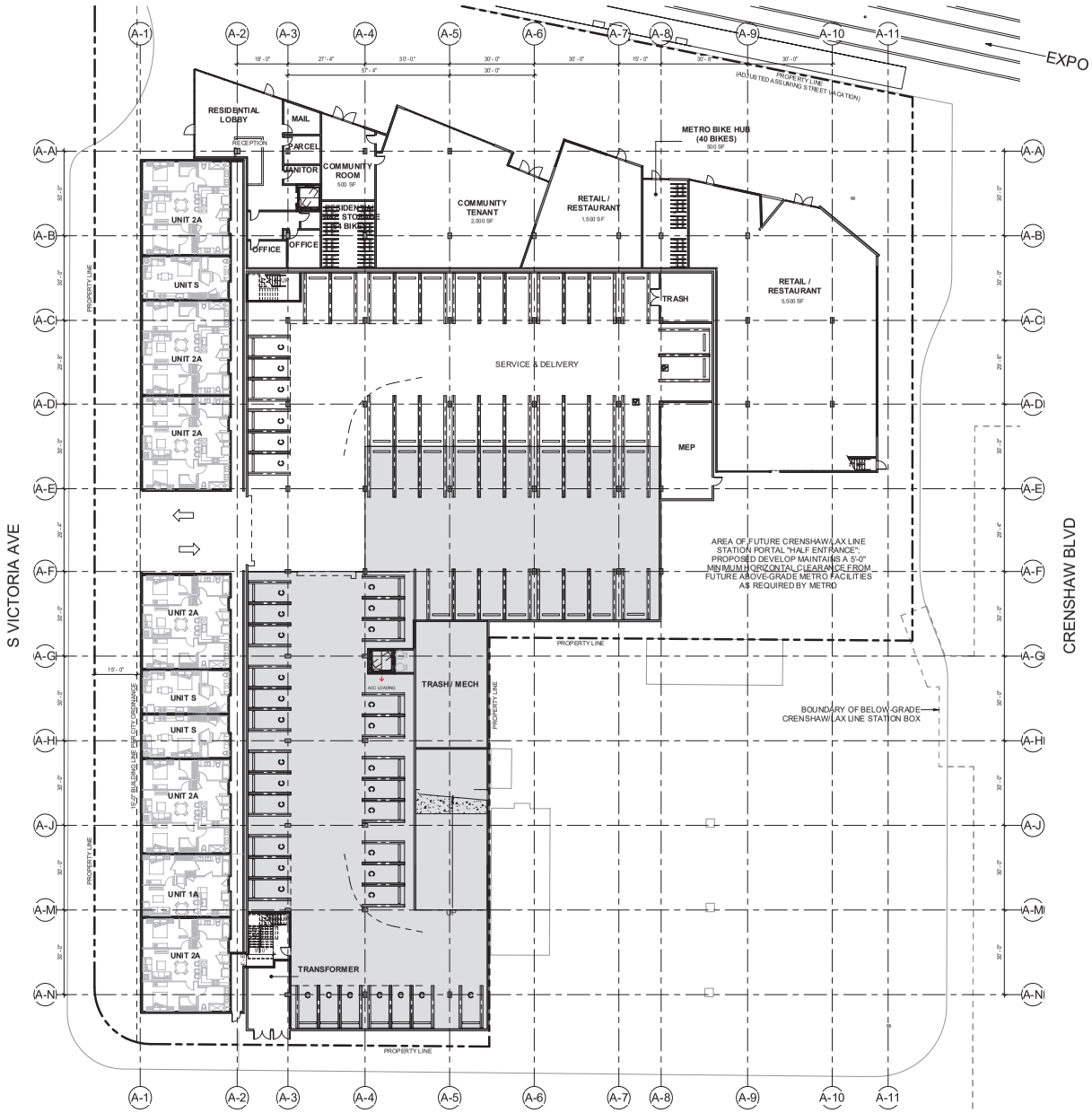
V. CONTACT INFORMATION

	CONSULTANT	DEVELOPER
Name:	Zachary Zabel - Nelson\Nygaard	Max Levenstein – Watt Investment Partners
Address:	706 S Hill St., Ste 1200, Los Angeles, CA 90014	2716 Ocean Park Blvd, Ste 2025, Santa Monica, CA 90405
Phone Number:	213.694.4450	310.314.2454
E-Mail:	zzabel@nelsonnygaard.com	mlevenstein@watt-ip.com

Approved by: X _____ 8/7/2019 X _____ 8/14/19

Consultant's Representative | Date | LADOT Representative | *Date

*MOUs are generally valid for two years after signing. If after two years a transportation assessment has not been submitted to LADOT, the developer's representative shall check with the appropriate LADOT office to determine if the terms of this MOU are still valid or if a new MOU is needed.



SITE A - LEVEL 1

SCALE: 1/16" = 1'-0"

CRENSHAW CROSSiNG

A 2.0

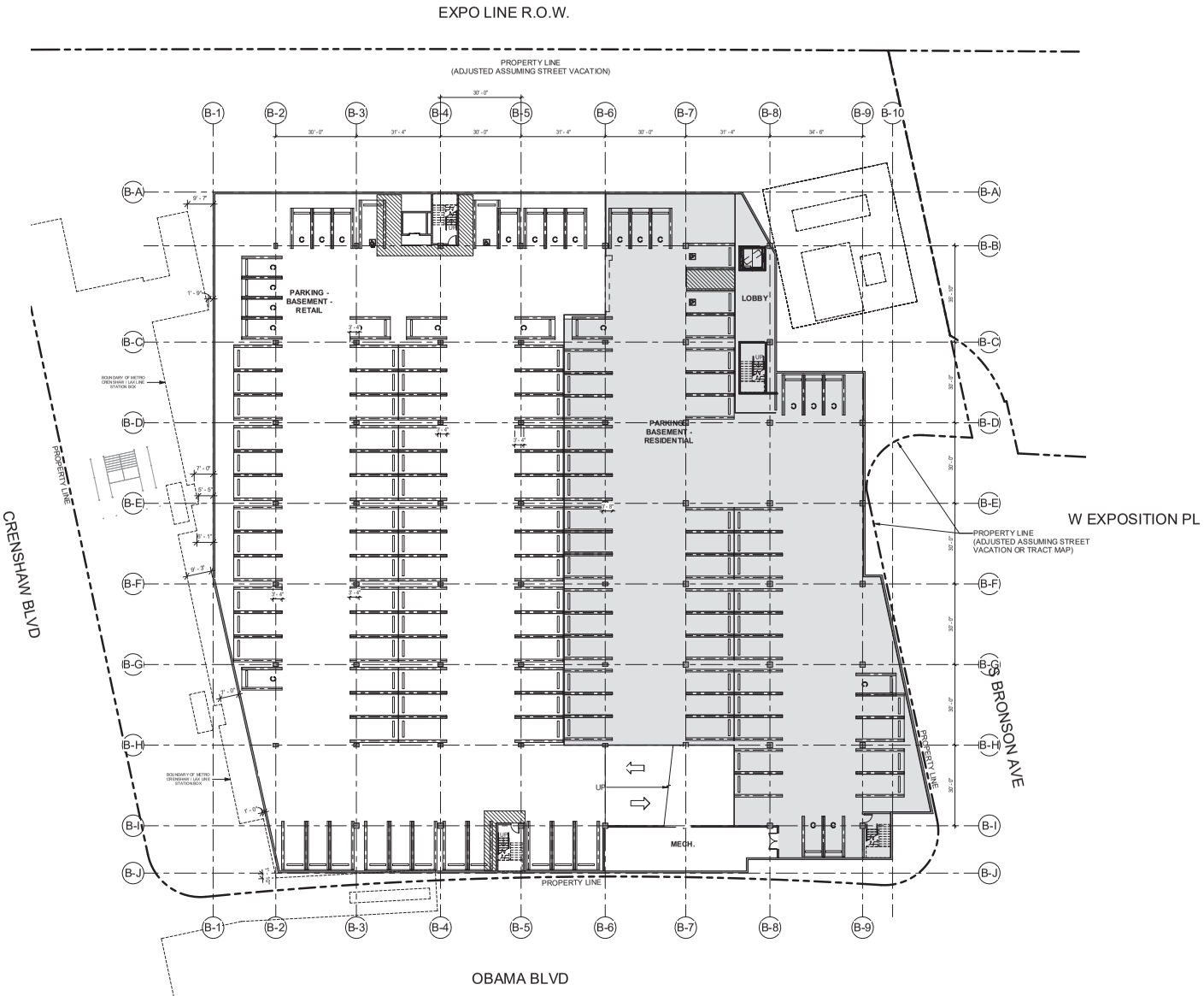
07/19/2018

WATT COMPANIES

RICHMAN GROUP

ba

SVA ARCHITECTS



SITE B - BASEMENT PARKING

SCALE: 1/16" = 1'-0"

CRENSHAW CROSSiNG

A 8.0

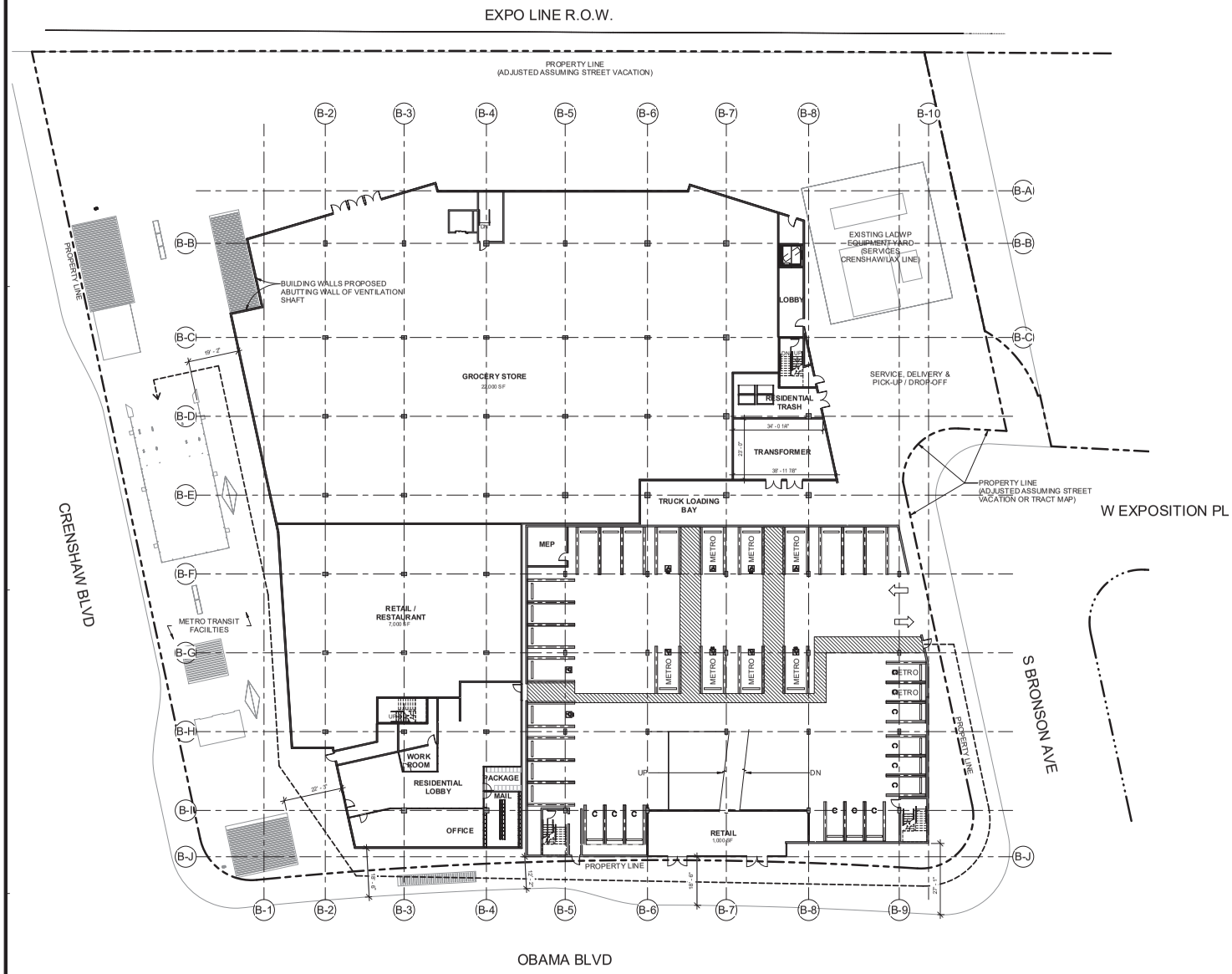
07/19/2018

WATT COMPANIES

RICHMAN GROUP

ba

SVA ARCHITECTS



SITE B - LEVEL 1

SCALE: 1/16" = 1'-0"

CRENSHAW CROSSiNG

A 9.0

07/19/2018

WATT COMPANIES

RICHMAN GROUP

ba

SVA ARCHITECTS


28%
W 30th St
Virginia Rd
Wellington Rd
Somerset Dr
S Victoria Ave
S Bronson Ave
S Norton Ave
12th Ave
11th Ave
Edgehill Dr
6%
W Jefferson Blvd
Crenshaw Blvd
W 36th St
5%
Exposition Blvd
Exposition Boulevard/
Crenshaw Boulevard
Exposition Blvd/
Victoria Avenue
Exposition Blvd
Exposition Pl
S Bronson Ave
Wellington Rd
Obama Blvd
13%
Obama Blvd/
Victoria Avenue
Obama Blvd/
Crenshaw Boulevard
6%
Exposition Pl
Buckingham Rd
Virginia Rd
Somerset Dr
S Victoria Ave
Rodeo Pl
S Norton Ave
14%
Coliseum St
Coliseum St
6%
Legend
Project Site
Study Intersections (% Trip Distribution)
Signalized
Unsignalized
Expo Line
Feet 0
500
1,000
Coliseum Pl
S Crenshaw Blvd
S Crenshaw Blvd
S Crenshaw Blvd
S Bronson Ave
Grayburn Ave
Edgehill Dr
Degnan Blvd
W 39th St
21%
McClung Dr
1%

Overall Development				**AM Peak Hour**			**PM Peak Hour**			
Use	**ITE Code**	**Program**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Affordable Housing - Family	LADOT	80	DU	14	25	39	16	12	28	333
25% Transit Reduction		-25%		(4)	(6)	(10)	(4)	(3)	(7)	(83)
10% TDM Reduction		-10%		(1)	(3)	(4)	(2)	(1)	(3)	(33)
Adjusted Affordable Residential				9	17	25	10	8	18	217
Internal Trips				x	x	x	(3)	(2)	(5)	(53)
Net Affordable Residential				9	17	25	8	5	13	164
Market-Rate Residential	LADOT	320	DU	23	76	99	60	36	96	2,378
25% Transit Reduction		-25%		(6)	(19)	(25)	(15)	(9)	(24)	(595)
10% TDM Reduction		-10%		(2)	(8)	(10)	(6)	(4)	(10)	(238)
Adjusted Market Residential				15	50	64	39	23	62	1,545
Internal Trips				x	x	x	(9)	(7)	(17)	(376)
Net Market Residential				15	50	64	30	16	46	1,169
Supermarket	850	22,000	sf	50	34	84	129	123	252	2,772
25% Transit Reduction		-25%		(13)	(9)	(22)	(32)	(31)	(63)	(693)
10% TDM Reduction		-10%		(5)	(3)	(8)	(13)	(12)	(25)	(277)
Pass-by Trips		-40%		x	x	x	(34)	(32)	(66)	(66)
Adjusted Supermarket				32	22	54	50	48	98	1,736
Internal Trips				x	x	x	(5)	(6)	(10)	(292)
Net Supermarket				32	22	54	46	42	88	1,444
Retail	820	10,500	sf	6	4	10	49	54	103	1,298
25% Transit Reduction		-25%		(2)	(1)	(3)	(12)	(14)	(26)	(325)
10% TDM Reduction		-10%		(1)	(0)	(1)	(5)	(5)	(10)	(130)
Pass-by Trips		-50%		x	x	x	(16)	(17)	(33)	(33)
Adjusted Retail				3	3	6	16	17	33	810
Internal Trips				x	x	x	(1)	(2)	(4)	(136)
Net Retail				3	3	6	15	15	30	673
Restaurant	930	8,500	sf	12	6	18	66	54	120	2,679
25% Transit Reduction		-25%		(3)	(2)	(5)	(17)	(14)	(31)	(670)
10% TDM Reduction		-10%		(1)	(1)	(2)	(7)	(5)	(12)	(268)
Adjusted Retail				8	3	11	42	35	77	1,741
Internal Trips				x	x	x	(4)	(4)	(8)	-
Net Retail				8	3	11	39	30	69	1,741
Net New Trips				**67**	**94**	**160**	**137**	**109**	**246**	**5,192**

West Parcel				**AM Peak Hour**			**PM Peak Hour**			
Use	**ITE Code**	**Program**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Affordable Housing - Family	LADOT	45	DU	5	9	14	4	3	7	92
Market-Rate Residential	220	182	DU	8	28	36	17	9	26	665
Restaurant	820	8,500	sf	8	3	11	39	30	69	1,741
Retail	820	2,500	sf	1	1	2	3	4	7	160
Total				**22**	**41**	**63**	**63**	**46**	**109**	**2,658**

East Parcel				**AM Peak Hour**			**PM Peak Hour**			
Use	**ITE Code**	**Program**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Affordable Housing - Family	LADOT	35	DU	4	8	11	4	2	6	72
Market-Rate Residential	220	138	DU	7	22	28	13	7	20	504
Retail	820	8,000	sf	3	2	5	11	12	23	513
Supermarket	850	22,000	sf	32	22	54	46	42	88	1,444
Total				**45**	**53**	**98**	**73**	**63**	**137**	**2,533**

CLATS

Case Logging and Tracking System

RELATED PROJECTS

Centroid Info:
PROJ ID: 48014
Address: 3606 W CRENSHAW BL
LOS ANGELES , CA 90016
Lat/Long: 34.0224, -118.336

Buffer Radius: 2640 feet

Search

Column

Include NULL "Trip info":
Include NULL "FirstStudySubmittalDate" (latest)
Include "Inactive" projects:
Include "Do not show in Related Project":

Net_AM_Trips - Select -
Net_PM_Trips - Select -
Net_Daily_Trips - Select -

Record Count: 4 | Record Per Page: 5 records

Results generated since: (2/4/2019 5:31:07 PM)

Proj ID	Office	Area	CD	Year	Project Title	Project Desc	Address	First Study Submittal Date	Distance (feet)	Trip Info

35093 — Metro | HWD | 10 | 2009 | Shopping Center | 298800 SF Shopping Center | 3650 CRENSHAW BLVD | 08/26/2009 | 462.5

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Retail	S.F. Gross Area	298800	102	446	4750	62	40	214	232	Total reflects credit for existing shopping center (85.1 KSF).
			102	**446**	**4750**		**62**	**40**	**214**	**232**

33981 — Metro | HWD | 10 | 2007 | Retail/Office Building | 13969 SF Retail, 25015 SF Office + 6000 SF Bank | 3060 S CRENSHAW BLVD | 04/18/2007 | 1568.2

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Office	S.F. Gross Area	24000								
Retail	S.F. Gross Area	15300								
Other	S.F. Gross Area	6000	47	84	880	36	11	34	50	(Bank) Total reflects credits for pass-by and internal trips, and existing uses.
			47	**84**	**880**		**36**	**11**	**34**	**50**

45207 — Metro | MTR | 10 | 2016 | 2905 Exposition Pl Condos | 78 condos | 2905 W Exposition place | 12/06/2016 | 2606.5

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Condominiums	Total Units	78	34	40	453	5	29	27	13	
			34	**40**	**453**		**5**	**29**	**27**	**13**

46431 — Metro | MTR | 10 | 2017 | LA 10th & 11th - Condos | 106 Condos | 3625 S 11TH AV | 10/25/2017 | 1923.9

Land_Use	Unit_ID	size	Net_AM_Trips	Net_PM_Trips	Net_Daily_Trips	NetAMIn	NetAMOut	NetPMIn	NetPMOut	Comments
Condominiums	Total Units	106	1	12	427	-31	32	22	-10	Total Net Project Trips
			1	**12**	**427**		**-31**	**32**	**22**	**-10**

From: Wes Pringle
To: Watson, Jim
Cc: Moore, Paul; Perlmutter, David
Subject: Re: Expo-Crenshaw Project Traffic Analysis
Date: Monday, February 4, 2019 8:40:56 PM
Attachments: Related Projects - 3606 Exposition Bl.pdf

Hi Jim,

I have the following comments on the MOU:

- The trip distribution is acceptable.
- The growth rate should be 1%. We have recently changed our policy on the growth rate because we are using a smaller radius for the related project list.
- I have attached a half-mile related project list that shows 4 projects. (We used to require a larger radius)
- We have recommended pass-by rates (Attachment D of the Traffic Study Guidelines) of 40% for supermarket and 50% for retail less than 50,000 SF.

Once the MOU is ready to be finally reviewed a $1,175 fee is required.

Wes

On Thu, Jan 31, 2019 at 5:07 PM Watson, Jim <JWatson@nelsonnygaard.com> wrote:

> Thanks again Wes. Attached is a draft of the MOU as it stands now. Note that the development program and site plan are preliminary and are still subject to change, but are expected to remain similar to what's shown. Otherwise, most of what's shown should reflect Tom's previous correspondence and discussions with you. We're particularly interested to understand if you agree with our growth and distribution assumptions as well as nearby related background developments (which we have not identified any). Feel free to let me know if you have any questions or comments.
>
> Jim
>
> **Jim Watson, AICP PTP**
>
> Principal, Principal NN
>
> **t** +12124052538
>
> **Nelson\Nygaard**
>
> **From:** Wes Pringle <wes.pringle@lacity.org>
> **Sent:** Wednesday, January 30, 2019 5:37 PM
> **To:** Watson, Jim <JWatson@nelsonnygaard.com>
> **Cc:** Moore, Paul <pmoore@nelsonnygaard.com>
> **Subject:** Re: Expo-Crenshaw Project Traffic Analysis
>
> Hi Jim,
>
> I am not available at noon tomorrow. I'm sure you can just send it over for a review via email.
>
> Wes
>
> On Wed, Jan 30, 2019 at 11:01 AM Watson, Jim <JWatson@nelsonnygaard.com> wrote:
>
> > Thanks again Wes. I know this one has been a bit piecemeal in terms of pulling together our assumptions, but we appreciate your previous willingness to work with our former coworker Tom on the project to confirm the study intersections and the use of the transit and TDM credits. At this point, we're interested in confirming our distribution assumptions (developed based on the existing traffic counts) and get your thoughts on nearby related background projects and growth.
> >
> > We have a draft of the MOU statement that we would like to come in and discuss with you. I apologize for the short notice, but if you're available tomorrow at noon, our team would love to come by. Alternatively, could we email you our draft MOU and continue that way?
> >
> > Thanks,

Jim

Jim Watson, AICP PTP

Principal, Principal NN

t +12124052538

Nelson\Nygaard

From: Wes Pringle <wes.pringle@lacity.org>
Sent: Monday, January 28, 2019 7:49 PM
To: Watson, Jim <JWatson@nelsonnygaard.com>
Cc: Moore, Paul <pmoore@nelsonnygaard.com>
Subject: Re: Expo-Crenshaw Project Traffic Analysis

Hi Jim,

The next couple of weeks do not look to busy for me (for meetings). I should be available most of the day Monday through Thursday.

Wes

On Mon, Jan 28, 2019 at 2:41 PM Watson, Jim <JWatson@nelsonnygaard.com> wrote:

> Good afternoon Wes,
>
> Thanks for taking the time for our team to bounce some ideas off of you back in the fall as we started working on the Expo-Crenshaw development with our client. We're starting to prepare a preliminary MOU for the development and would like to see if we could schedule a time in the coming weeks for our team to come in and discuss the project more in depth with you.
>
> Please let us know what availability that you may have for us to discuss further.
>
> Thanks again,
>
> Jim
>
> **Jim Watson, AICP PTP**
>
> Principal, Principal NN
>
> **t** +12124052538
>
> **Nelson\Nygaard**
>
> **From:** Wes Pringle <wes.pringle@lacity.org>
> **Sent:** Monday, October 15, 2018 9:04 AM
> **To:** Mericle, Thomas <TMericle@nelsonnygaard.com>
> **Subject:** Re: Expo-Crenshaw Project Traffic Analysis
>
> Hi Thomas,
>
> If TDM is being used as a mitigation measure due to impacts, we allow for up to a 10% discount for various strategies (spelled out in our letter) with no monitoring. If a greater amount of credit is needed to mitigate, then we require monitoring. I don't have a previous example on hand but we generally require annual reports from the project for between 3-5 years that demonstrate the project is meeting the required TDM goal.

Wes

On Fri, Oct 12, 2018 at 8:31 AM Mericle, Thomas <TMericle@nelsonnygaard.com> wrote:

> Good morning Wes,
>
> If you remember I am working on a mixed use development at Crenshaw Blvd and the Expo line. The project is a joint project between the Watt Companies and LA Metro. The developer is working on finalizing their site plan and trying to get the right mix of commercial, market rate housing, and low income housing. To help them do this we are running some traffic model scenarios for the potential impacts and want to know more about the allowable TDM reductions and internal trip reduction methodologies we can use. From what I understand from your guidelines it is on us to estimate the number of trips that would be reduced as a result of a TDM plan. We may also be able to apply the ITE internal trip reduction methodology. The following is from the guidelines:
>
> Section 3.5 - Transportation Mitigation Measures
>
> > *If the TDM Program is acceptable to LADOT, the applicant will be allowed to reduce the total Project trips by an amount determined to be commensurate with the measures proposed in the TDM Program.*
>
> Section 4.1 – Transportation Demand Management
>
> > *Development Projects proposing the construction of new, nonresidential development in excess of 25,000 square feet gross floor area are required by LAMC 12.26-J to provide and maintain minimal TDM measures, by way of a covenant and agreement associated with the land, prior to issuance of a building permit, that the owner or applicant agree.*
> >
> > *If TDM strategies are claimed as a mitigation of Project-related traffic impacts, or if required under any applicable TSP*
> >
> > *or other City ordinances, then the TDM program shall include the following elements:*
> >
> > *A. Statement of measurable goals to be achieved*
> >
> > *B. Estimate of trips to be reduced*
> >
> > *C. Key elements of the program*
> >
> > *D. Schedule and responsibilities for funding and implementation*
> >
> > *E. Method of monitoring program performance*
> >
> > *F. Contingency plan and/or penalties for failure to achieve goals*
> >
> > ***If the Project is a mixed use project that includes housing, LADOT will consider adjusting the Project's trip generation to account for the internal trip characteristics of the Project. This adjustment shall be limited to the trips that would be affected by the special features of the Project relative to ITE or TSP trip generation rates.*** *If the Project site is under one ownership or control; is uniquely located so as to permit accurate monitoring of all site trips; and extraordinary trip reduction goals are proposed, LADOT may recommend a trip cap agreement. Such an agreement typically places a cap on the total vehicle trips entering and leaving the site during peak hours and includes a monitoring and contingency plan.*
>
> For TDM measures can we just use the trip reductions in CAPCOA since that has a good body of backup documentation? Do you have projects that are currently being monitored that we can use as examples for the amount of reduction, or should we estimate based on our judgment? For internal trips we would just use the ITE methodology.
>
> I understand that some, if not most, of this will be spelled out in the MOU, but I am trying to get the developer to the point where they are comfortable with finishing a site plan so we can go through the MOU process.
>
> Thanks,
>
> **Thomas Mericle, PE, TE**
>
> Principal Traffic Engineer
>
> **Nelson\Nygaard | Celebrating 30 years of putting people first**
>
> 706 South Hill St., Los Angeles, CA 90014
>
> **t** 213.694.4455
>
> tmericle@nelsonnygaard.com

Appendix E CEQA Threshold T-1 Consistency Analysis

Plan Objectives	Project Consistency
City of Los Angeles Mobility Plan 2035	
Policy	
1.1) Design, plan, and operate streets to prioritize the safety of the most vulnerable roadway user.	**Not Applicable**. This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, the Project does include the merging of Lower Exposition Blvd, installation of street improvements (street trees), and an interactive urban design at its ground floor. The Project Site is generally pedestrian-oriented as the ground floor commercial uses on both sites would be oriented toward the Crenshaw Blvd and the Project's pedestrian promenade and to a lesser extent Obama Blvd, which are also oriented toward the two Metro rail stations and various bus lines on those streets. Primary vehicular access for residential and commercial uses would be provided via full-access driveways along S. Victoria Ave for the West Site and along S. Bronson Ave for the East Site, essentially the rear sides of the Project, minimizing pedestrian and vehicle interaction and conflict. These driveways would provide connection to the parking amenities. Pedestrian facilities included as part of the Project include improved pedestrian crossings at the intersection of Crenshaw Blvd and Obama Blvd, a dedicated pedestrian crossing—south of the Metro Expo Line—connecting the eastbound Expo Line platform to the new entrance to the new LAX/Crenshaw Line, improved sidewalk facilities and shade trees along all streets adjacent the Project Sites and street mergers of Lower W. Exposition Blvd abutting the East and West Sites that would provide a pedestrian promenade between each of the Project's sites and the Expo Line.. The Project supports pedestrian activity for the neighborhood by providing amenities to make walking safer and more comfortable, such as on-site landscaping, shade trees, appropriate lighting, and the creation of pedestrian-friendly conditions along the Crenshaw Corridor. In addition, the Project will have ground floor storefronts to provide pedestrian-oriented street frontages along with wide sidewalks and landscaping. The Project would also support and a safe and convenient access for bicycling as well with bicycle parking located throughout the ground floor uses near the various commercial and residential entrances. In addition, Metro will also provide a Metro Bike Parking facility within the ground floor uses on the West Site for the convenience of transit commuters.
1.2) Implement a balanced transportation system on all streets, tunnels, and bridges using complete streets principles to ensure the safety and mobility of all users.	**Not Applicable.** This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, the Project Site's location near mass transit, walking distance to services, retail stores, employment opportunities, and the availability of bike parking located on the Project Site promotes a variety of transportation options. Thus, the Project would promote this goal.

Plan Objectives	Project Consistency
1.4) Design streets to Targeted Operating Speeds as defined in the Complete Streets Design Guide.	**Not Applicable.** The Project would not require any changes to the Operating Speeds of existing traffic near the Project Site. Any changes would be at the discretion of the Los Angeles Department of Transportation (LADOT).
Objective	
1.6) Increase pedestrian safety improvements in the design and implementation of complete streets projects within the top 25% SB5651 disadvantaged communities located in the City of Los Angeles or as subsequently identified through tools utilized by the City.	**Not Applicable**. This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, as the Project would be required to make public right-of-way improvements adjacent to its Site, the Project would further the goal of pedestrian safety in the City's advancement of Complete Streets. The Project does lie within the boundaries of an identified disadvantaged community2 the Project Site's location near mass transit, walking distance to services, retail stores, employment opportunities, and the availability of bike parking located on the Project Site promotes a variety of transportation modes and options. The proximity to these pedestrian serving amenities would be further bolstered by the pedestrian safety improvements associated with the Project Site which would include pedestrian promenades north of the site, improved pedestrian crossings at Crenshaw Blvd, sidewalk improvements, street trees, and direct pedestrian access to two Metro Rail lines and Metro Bus stops. Thus, the Project would promote this goal.
Policy	
1.5) Reduce conflicts and improve safety at railroad crossings through design, planning, and operation.	**Not Applicable.** This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, the Project would not interfere with the City furthering this goal. The only railroad crossing within close proximity to the Project Site is the existing at-grade Metro Expo Line. The Project does not include changes to the existing Metro Expo line pedestrian railroad crossings located at the intersection of Crenshaw Blvd and W Exposition Blvd and therefore furthers this policy. The nearest stops in proximity to the Project Site are at either side of Crenshaw Blvd the intersection of W Exposition Blvd. The Project's merging of Lower Exposition Blvd would remove vehicular traffic at those intersections just below the Expo Line, therefore reducing the potential for vehicular/rail/pedestrian conflict. The Metro Crenshaw/LAX Line is anticipated to be open in 2020 and will be below-grade within the proximity of the Project Site.

[1] While the Mobility Plan references SB 565, the correct bill number regarding disadvantaged communities is SB 535.

[2] Census Tracts 6037234200 and 6037219500 are identified as disadvantaged communities by CalEnviroScreen. Disadvantaged communities are defined by SB535 areas which score in the top 25% from CalEnviroScreen, a scoring methodology developed as a result of SB535. Furthermore, disadvantaged communities are areas with high amounts of population and low populations, according to the California Office of Environmental Health Hazards Assessment (OEHHA).

Plan Objectives	Project Consistency
1.6) Design detour facilities to provide safe passage for all modes of travel during times of construction.	**Consistent.** No complete lane closures are anticipated during Project construction. If any partial street closures are required, flagmen would be used to facilitate the traffic flow until construction is complete.
1.7) Enhance roadway safety by maintaining the street, alley, tunnel, and bridge system in good to excellent condition.	**Not Applicable.** This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, the Project will not be an impediment to the City in their effort to enhance roadway safety by maintaining the street, alley, tunnel, and bridge system. As stated above in Policy 1.1 Project Consistency, the Project Site is generally pedestrian oriented and promotes safety in the design and improvements associated with the Project. Primary vehicular access for residential and commercial uses would be provided via full-access driveways along S. Victoria Ave for the West Site and along S. Bronson Ave for the East Site. This would provide connection to the parking amenities. Pedestrian facilities included as part of the Project include improved pedestrian crossings at the intersection of Crenshaw Blvd and Obama Blvd, a dedicated pedestrian crossing south of the Metro Expo Line connecting the eastbound Expo Line platform to the new entrance to the new LAX/Crenshaw Line, improved sidewalk facilities and shade trees along all streets adjacent the Project Sites and street mergers of Lower W. Exposition Blvd abutting to the East and West Sites. The Project supports pedestrian activity for the neighborhood by providing amenities to make walking safer and more comfortable, such as on-site landscaping and the creation of pedestrian-friendly conditions along the Crenshaw Corridor. Driveway access will be located along S. Victoria Ave and S. Bronson Ave, away from major commercial areas to minimize pedestrian/vehicular conflicts at driveways. As such, the Project will enhance roadway safety by improving pedestrian facilities by including pedestrian lighting, reduced vehicular traffic generation, and neighborhood serving infrastructure and uses emphasized in both the Project's design and uses.
2.3) Recognize walking as a component of every trip, and ensure high-quality pedestrian access in all site planning and public right-of-way modifications to provide a safe and comfortable walking environment.	**Consistent.** As stated above in Policy 1.1 Project Consistency, the Project Site is generally pedestrian-oriented. Primary vehicular access for residential and commercial uses would be provided via full-access driveways along S. Victoria Ave for the West Site and along S. Bronson Ave for the East Site. This would provide connection to the parking amenities. Pedestrian facilities included as part of the Project include improved pedestrian crossings at the intersection of Crenshaw Blvd and Obama Blvd, a pedestrian scramble south of the Metro Expo Line connecting the East and West entrances to the new LAX/Crenshaw Line, improved sidewalk facilities and shade trees along Crenshaw Blvd, and street dedications of Lower W. Exposition Blvd adjacent to the East and West Sites. The Project supports

Plan Objectives	Project Consistency
	pedestrian activity for the neighborhood by providing amenities to make walking safer and more comfortable, such as on-site landscaping and the creation of pedestrian-friendly conditions along the Crenshaw Corridor. Driveway access will be located along S. Victoria Ave and S. Bronson Ave, away from major commercial areas to minimize pedestrian/vehicular conflicts at driveways. As such, the Project will enhance roadway safety by improving pedestrian facilities by including pedestrian lighting, reduced vehicular traffic generation, and neighborhood serving infrastructure and uses emphasized in both the Project's design and uses.
2.6) Provide safe, convenient, and comfortable local and regional bicycling facilities for people of all types and abilities.	**Consistent.** There are several planned bike routes near the Project Site identified in Los Angeles County's 2012 Bicycle Master Plan3, slated for implementation by 2032. Notably, there are planned Class II bike lanes along Crenshaw Blvd, which will serve the Project Site directly. The Project will support biking by providing various bike parking locations including long-term bike parking for residents and short-term bike parking for commercial uses. The short-term bike parking will be located in areas with high pedestrian traffic and pedestrian scale lighting for safety and will be conveniently accessible to the commercial and residential entrances. Long-term bike parking would be located on multiple levels of the parking structure accessed via lobby elevators on the ground floor. Additionally, the Project would provide long-term bike storage for Metro transit riders.
2.9) Consider the role of each enhanced network when designing a street that includes multiple modes.	**Consistent.** This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, the Project Site's location near mass transit, walking distance to services, retail stores, employment opportunities, and the availability of bike parking located on the Project Site promotes a variety of transportation options and multiple modes. Thus, the Project would promote this goal. The Project has been designed to provide safe and efficient circulation for various modes of transportation. The Project Site is located along the Crenshaw Corridor which features steady pedestrian volume due to the various transit options available to pedestrians. In addition, The Project supports cycling as a transit option by providing various bicycle parking locations throughout the Project Site. Vehicular access to the West Site parking structure would be provided from S. Victoria Ave and vehicular access to the East Site parking structure would be provided from S. Bronson Ave. A vehicle drop-off and pick-up area is proposed at the northwest portion of the West Site along S. Victoria Ave adjacent to the Expo Line frontage to separate vehicular and pedestrian traffic

[3] Los Angeles County Bicycle Master Plan (2012) and LA City Bicycle Plan 2010. https://dpw.lacounty.gov/pdd/bike/docs/bmp/FINAL%20Bicycle%20Master%20Plan.pdf and http://clkrep.lacity.org/onlinedocs/2010/10-2385-s2_misc_2-3-2011a.pdf

Plan Objectives	Project Consistency
	and provide a safe and convenient environment for pedestrians entering and exiting vehicles.
Objective	
3.7) Install pedestrian access curb ramps at 100% of all intersections by 2035.	**Not applicable**. This goal is directed toward City goals and is not specifically applicable to the Project and is a Right-of-Way improvement. However, as required by the Project and any ROW improvements adjacent to its Project Site, curb ramps will be designed and constructed to be meet ADA and City standards as applicable.
Policy	
3.2) Accommodate the needs of people with disabilities when modifying or installing infrastructure in the public right-of-way.	Consistent. The Project would adhere to current and future California ADA construction and compliance requirements to accommodate the needs of people with disabilities when modifying or installing infrastructure in the public right-of-way.
3.3) Promote equitable land use decisions that result in fewer vehicle trips by providing greater proximity and access to jobs, destinations, and other neighborhood services.	Not Applicable. This goal is directed toward City goals and is not specifically applicable to the Project. Nonetheless, the Project Site is located in a Transit Priority Area (TPA) as defined by CEQA. Additionally, the Project would develop new residential and commercial uses within walking distance to numerous services, retail, and employment opportunities. Additionally, the Project Site is located adjacent to the Expo Metro Line and within a ½ mile of numerous bus routes with peak commute service intervals of 15 minutes or less. The location of the Project encourages a variety of transportation options, such as walking and biking. These features of the Project would reduce vehicles-per-miles traveled (VMT), and promote alternatives to driving. As such, the Project would be consistent with this objective.
3.8) Provide bicyclists with convenient, secure and well-maintained bicycle parking facilities.	**Consistent**. The Project will support biking by providing various bike parking locations including long-term bike parking for residents and short-term bike parking for commercial uses. The short-term bike parking will be located in areas with high pedestrian traffic and pedestrian scale lighting for safety and will be conveniently accessible to the commercial and residential entrances. Long-term bike parking would be located on multiple levels of the parking structure accessed via lobby elevators on the ground floor. Additionally, the Project would provide long-term bike storage for Metro transit riders.
4.8) Encourage greater utilization of Transportation Demand Management (TDM) strategies to reduce dependence on single-occupancy vehicles.	**Consistent**. The project utilizes several TDM measures that help to achieve a reduction in the Project's overall VMT, they are: a Reduction of Parking Supply, Unbundling of Parking from Lease Agreements, Residential Area Parking Permits, Promotions and Marketing of Alternatives, Bicycle Parking, and Pedestrian Network Improvements. The Project Site is located in an urbanized area in the City of Los Angeles within a TPA. The Project Site is well served by mass transit with more than a dozen of bus lines in walking distance with frequency of service

Plan Objectives	Project Consistency
	intervals of 15 minutes or less during peak commute periods. The Project would provide residents and visitors with convenient access to public transit and opportunities for walking and biking. As such, the location of the Project Site encourages a variety of transportation options consistent with this goal.
4.13) Balance on-street and off-street parking supply with other transportation and land use objectives.	**Consistent.** The Project would provide approximately 502 vehicle parking spaces, consisting of 232 spaces on Site A and 270 spaces on Site B. Due to the Project's uniqueness as a Metro and County Joint Development Program Project, which provides an added layer of development standards, the Project's site constraints in part due to the extensive Metro infrastructure as part of the Crenshaw/LAX Line, the need to comply with the ENA's requirements, and to comply with the Crenshaw Corridor Specific Plan's maximum parking requirement, the Project would provide residential parking consistent with the City's Density Ordinance Parking Option 1, while seeking a Density Bonus Waiver of Development Standards to allow for a reduced residential parking requirement from the Density Bonus Parking Option 1 by approximately 28 percent (28%) on Site A and by approximately 16 percent (16%) on Site B. The Project would provide commercial parking consistent with the Los Angeles State Enterprise Zone requirements. The East Site will contain an off-street parking garage with a supermarket, restaurant and retail uses at ground-level and residential uses above. Vehicular access to the parking garage would be provided from a two-way driveway along S. Bronson Ave, south of W Exposition Pl. The East Site would also include an entrance to the subterranean Metro Crenshaw/LAX Line station along Crenshaw Blvd. The West Site, between Crenshaw Blvd and S. Victoria Ave, would include an off-street parking garage wrapped by ground-level restaurant, retail and community uses, along with low-rise residential units situated along S. Victoria Ave. The presence of on-street parking, street trees, and parkways throughout much of the area neighborhood streets allows for additional separation between moving vehicles and pedestrians, furthering the balance of on- and off-street parking supply with other transportation and land use objectives.
Objective	
5.1) Decrease VMT per capita by 5% every five years, to 20% by 2035.	**Consistent.** In the LADOT VMT Model, transit improvement strategies affect both home-based work (HBW) production and home based other (HBO) production trips and subsequent VMT calculations. This methodology was carried forward in determining additional reduction factors due to the future transit conditions surrounding the Project Site. With the above referenced reductions factored into the VMT Model, a manual recalculation of HBW and HBO VMT was conducted and

Plan Objectives	Project Consistency
	applied to the overall VMT calculations4. The final adjusted per capita results with an additional 12.2% transit reduction credit is displayed in Table 4.17-5. With this additional VMT reduction, the household per capita VMT for the Project is below the VMT impact threshold. Therefore, the Project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) and would help the City achieve this goal.
City of Los Angeles – Crenshaw Corridor Specific Plan	
Purpose	
Purpose-E) To promote a high level of pedestrian activity in areas identified as Pedestrian-Oriented Areas and TOD Areas by promoting neighborhood serving uses, which encourage pedestrian activity and promote reduced traffic generation.	**Consistent.** The Project Site is generally pedestrian oriented. Primary vehicular access for residential and commercial uses would be provided via full-access driveways along S. Victoria Ave for the West Site and along S. Bronson Ave for the East Site. These driveways would provide connection to the parking amenities. Pedestrian facilities included as part of the Project include improved pedestrian crossings at the intersection of Crenshaw Blvd and Obama Blvd, a pedestrian scramble south of the Metro Expo Line connecting the East and West entrances to the new LAX/Crenshaw Line, improved sidewalk facilities and shade trees along Crenshaw Blvd, and street dedications of Lower W. Exposition Blvd adjacent to the East and West Sites. The Project supports pedestrian activity for the neighborhood by providing amenities to make walking safer and more comfortable, such as on-site landscaping and the creation of pedestrian-friendly conditions along the Crenshaw Corridor. In addition, the Project will have ground floor storefronts to provide pedestrian-oriented street frontages along with wide sidewalks and landscaping. Driveway access will be located along S. Victoria Ave and S. Bronson Ave, away from major commercial areas to minimize pedestrian/vehicular conflicts at driveways.
Purpose-F) To promote an attractive pedestrian environment in the areas designated as Pedestrian-Oriented Areas and TOD Areas by regulating the design and placement of buildings and structures which accommodate outdoor dining and other ground level retail activity.	**Consistent.** As stated above in Purpose-E, the Project will have ground floor storefronts to provide pedestrian-oriented street frontages along with wide sidewalks and landscaping.
Purpose-H) To encourage the creation of pedestrian-friendly TOD Areas consistent with the goals and policies of the Community Plan that promote health and sustainability by encouraging a mix of uses providing jobs, housing, goods and services,	**Consistent.** The Project includes the development of a mixed-use project, which would provide residents in close proximity to employment and patronage opportunities. Further, the Project is within walking distance of services, retail stores, and employment opportunities. The commercial uses on-site would further support the pedestrian activity in the community by

[4] Crenshaw Crossing Transportation Assessment Study, Section 4

Plan Objectives	Project Consistency
as well as access to open space, all within walking distance of the Mid City/Exposition and Crenshaw/LAX Light Rail Transit Corridor stations.	providing ground-floor commercial uses. As such, the Project would be consistent with this objective.