KITTELSON & ASSOCIATES

HAYWARD 2256 CLAREMONT COURT TRUCK TERMINAL TIA

Hayward, California

June 3, 2025

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Hayward 2256 Claremont Court Truck Terminal TIA

Hayward, California

Submitted to:
Steve Chang
Senior Transportation Planner
City of Hayward

Prepared by:
Kittelson & Associates, Inc.
155 Grand Avenue, Suite 505
Oakland, CA 94612
510.839.1742

Project Manager:
Michael Ruiz-Leon
Engineer/Planner

Project Principal:
Damian Stefanakis
Senior Principal Planner

City of Hayward Application #UP-24-0006
Kittelson Project Number 26188.005

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EXECUTIVE SUMMARY

This report presents the findings, conclusions, and local transportation impact analysis (LTA) conducted by Kittelson & Associates for the proposed truck terminal and maintenance facility at 2256 Claremont Court in the City of Hayward, CA, west of I-880 and south of Industrial Parkway West. The site is currently occupied by a 14,640 square foot truck terminal. The proposed project includes a 43,704 sf industrial building with approximately 50 standard parking spaces and 125 truck spaces. The project includes the demolition of the existing 14,640 sq. ft. truck terminal. Access to the project site is proposed via one existing full-access driveway into the project site via Claremont Court to access Industrial Parkway W. at Hopkins Street.

SUMMARY OF FINDINGS

The following recommendations outside CEQA requirements were made to be incorporated as part of this project to improve circulation and address potential deficiencies to the circulation network:

<u>All Conditions:</u>

- Ensure that the Project access at the Project Driveway and Claremont Court is designed for pedestrian visibility safety (e.g., sidewalks clearly delineated, improved visibility by minimizing tree overhangs, bushes, and large signs).

<u>Background Conditions:</u>

- Consider intersection control options at the unsignalized project access intersection of Hopkins Street/Industrial Parkway W (TWSC) as the intersection operates at LOS F during all study scenarios during the AM and PM peak hour periods. Consider use of "KEEP CLEAR" pavement markings and/or supplementation signage in order to establish a clear zone within the intersection to allow for northbound exiting project traffic to enter the intersection and improve overall intersection LOS.

<u>VMT Assessment</u>

- Under CEQA, the proposed project is located in an area that has below average VMT per employee. Therefore, it is not expected that the project will result in a significant impact to VMT under CEQA and is therefore less than significant (LTS).

1 Methodologies and Existing Conditions

The proposed project is located west of I-880 and south of Industrial Parkway West (W) at 2256 Claremont Ct. The proposed project is a truck terminal building with transfer, loading, and unloading points for trucks/automobiles, including cross dock freight transloading, equipment fueling, and servicing activities. The project is located in an industrial zone region.

The project is 43,704 sf with approximately 50 standard parking spaces and 125 truck spaces. The project includes the demolition of the existing 14,640 sq. ft. truck terminal building. Access to the project site is proposed via one existing full-access driveway into the project site via Claremont Court to access Industrial Parkway W. The project site is bound by industrial uses to the north, Ward Creek to the south, Hopkins Street to the west, and I-880 to the east. The project site and study area are shown in **Figure 1**. The proposed site plan is shown in **Figure 2**.

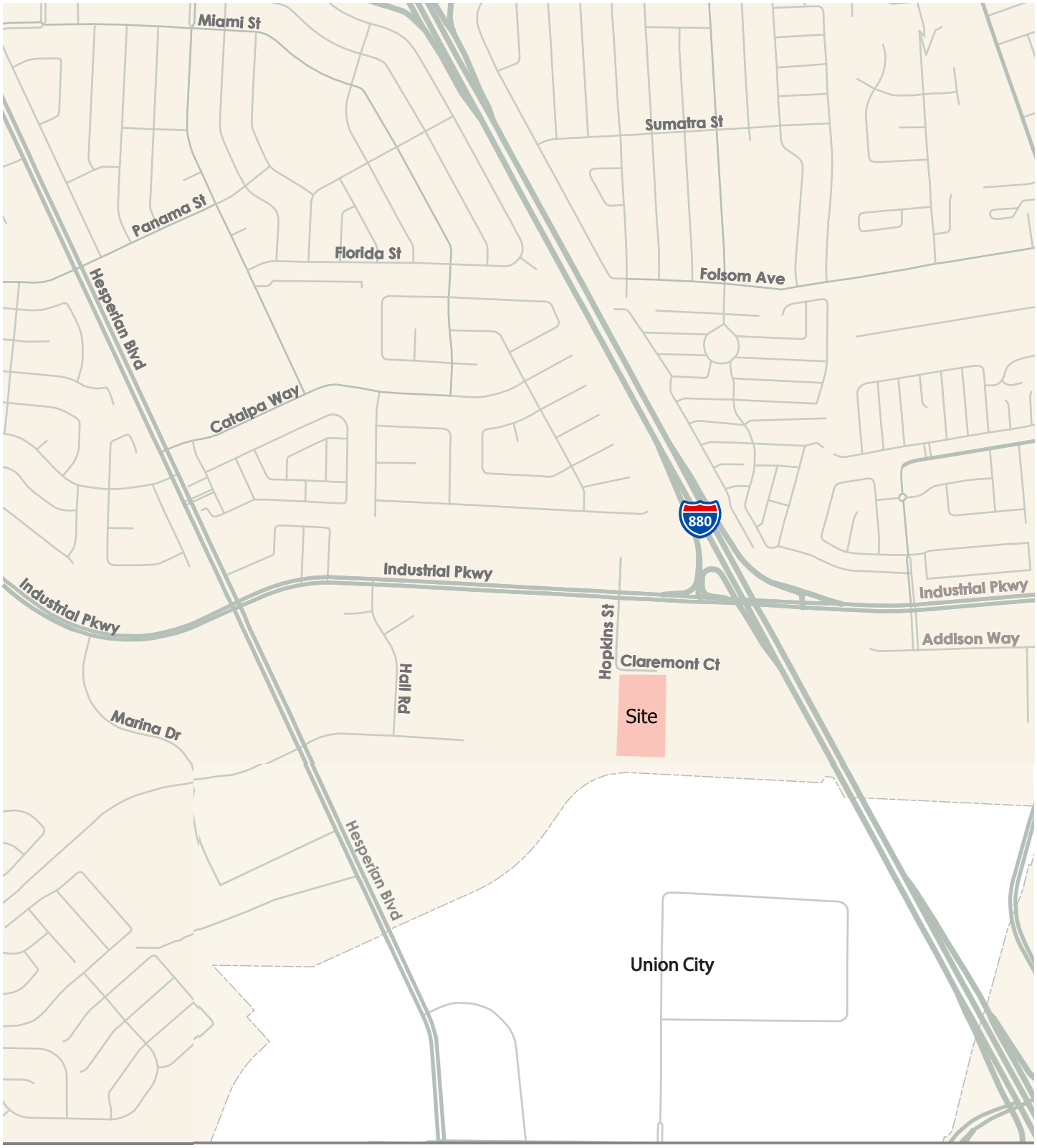
This transportation impact analysis is therefore subject to the regulations and standards currently in place in the City of Hayward. These standards are outlined in the *Hayward 2040 General Plan – Mobility Element* (2014), and the City of Hayward Traffic Study Guidelines for local transportation analysis (LTA), as summarized below.

The analysis methodology used in this report was approved by City Transportation Staff prior to commencement of the study.

1.1 IMPACT CRITERIA AND ANALYSIS STANDARDS

Under Senate Bill (SB) 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, level of service (LOS) and other similar vehicle delay or capacity metrics may no longer serve to determine environmental impact from projects being evaluated for potential impacts of the California Environmental Quality Act (CEQA). The Governor's Office of Planning and Research (OPR) has updated the CEQA Guidelines and provided a final technical advisory in December 2018 which recommends vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA. For land use and transportation projects, SB 743-compliant CEQA analysis become mandatory on July 1, 2020.

The City of Hayward has adopted VMT thresholds of significance and screening criteria, which are used in this study for impact analysis purposes and described in a separate CEQA report. In addition, LOS analysis (consistent with the City's traffic study guidelines and the City's 2040 General Plan policies) is considered part of the non-CEQA LTA analysis conducted to determine any negative project effects on local roadway operations and further described in this report.



Project Site

0 0.25 Miles

Figure 1

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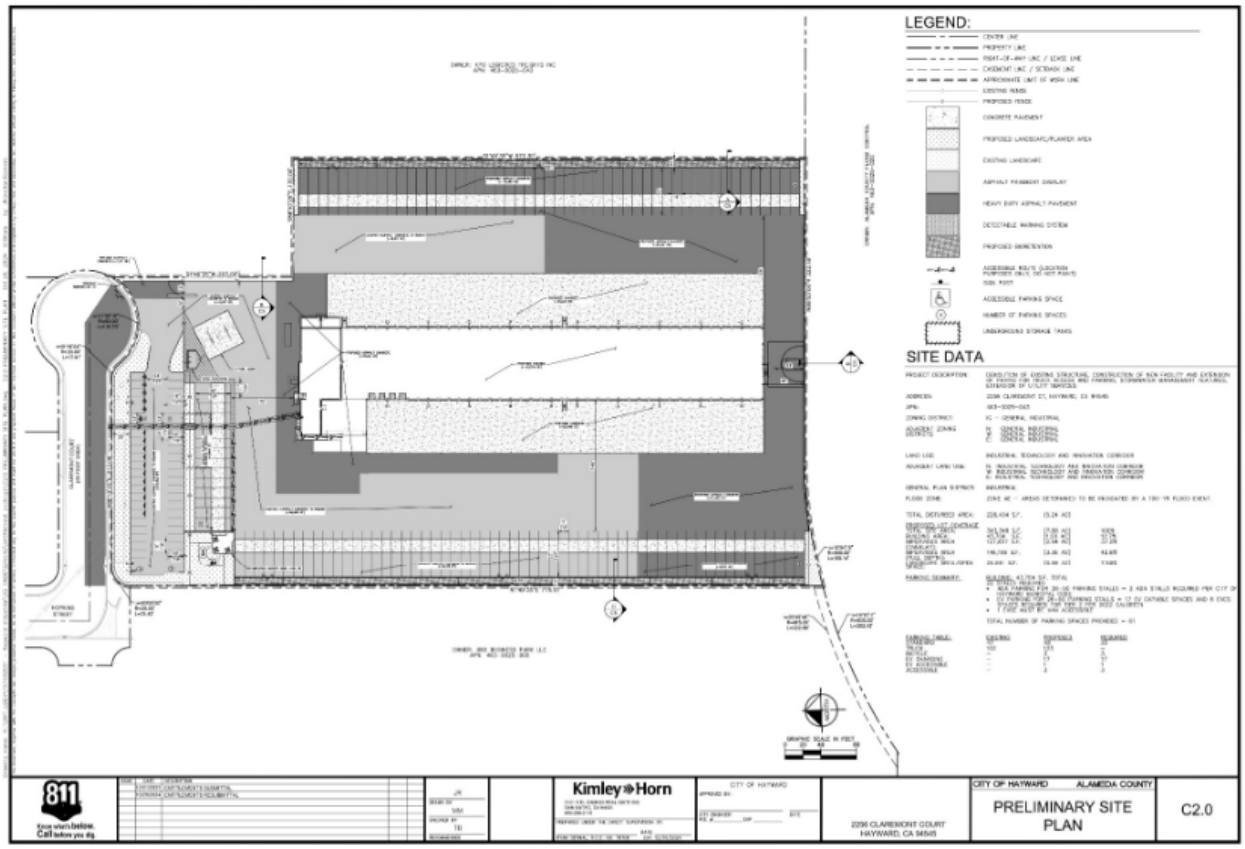
Study Area and Project Site
Hayward, California

Figure 2: Project Site Plan



1.1.1 Intersection Level of Service Standards

Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS is included for non-CEQA purposes to determine if local intersections operate acceptably and if the project would cause any deficiencies on local roadway operations. This approach is consistent with the City's adopted thresholds of significance and screening criteria.

Goal 4 Local Circulation-M-4.3 of the City of Hayward's 2040 General Plan requires intersections to maintain a peak-hour level of service (LOS) of E or better for signalized intersections. M-4.3 describes this as follows: The City shall maintain a minimum Level of Service E at signalized intersections during the peak commute periods except when a LOS F may be acceptable due to costs of needed improvements or when there would be other unacceptable consequences, such as right-of-way acquisition or degradation of the pedestrian environment due to increased crossing distances or unacceptable crossing delays.

1.1.1.1 SIGNALIZED INTERSECTIONS

Signalized intersection operational improvements should be identified if the project degrades the AM or PM peak hour conditions from an acceptable LOS E or better under the No Project scenario to an unacceptable LOS F under the Plus Project scenario. The exception to this criterion is when LOS F is determined by the City of Hayward as acceptable due to right-of-way constraints or when there would be adverse effects to other modes of travel, such as bicycle, pedestrian, or transit.

In addition, improvements should be identified at an intersection already operating at LOS F under an Existing or No Project scenario if the addition of project traffic results in an increase of 5.0 seconds or more in the intersection's average control delay.

1.1.1.2 UNSIGNALIZED INTERSECTIONS

At unsignalized intersections, the City does not set LOS goals, however, intersection operations are captured as follows:

- Traffic Signal Warrants Analysis, as outlined in Traffic Signal Warrants 4.14.
- Increase average delay by no more than 5 seconds for locations already at LOS F.

Note that solely triggering a warrant does not trigger the need for an intersection improvement, but the City will at its discretion require or not require a signal be installed, where warranted.

1.1.1.3 LEVEL OF SERVICE DEFINITIONS

In this report, LOS is based on the Highway Capacity Manual (HCM) 7th edition definitions, included as **Table 1** for ease of reference. The HCM methodology assigns a level of service (LOS) grade to an intersection based on the delay for vehicles at the intersection, ranging from LOS A to LOS F; LOS A signifies very slight delay with no approach phase fully utilized, while LOS F signifies very high delays and congestion, frequent cycle failures, and long queues. For signalized and all-way stop-controlled intersections, the average control delay for all vehicles is assessed; for two-way stop-controlled intersections, the intersection approach with the highest delay is utilized.

Table 1: Level of Service Standards

Level of Service	Delay Per Vehicle (Seconds)	
	Signalized Intersection	Unsignalized Intersection
A	< 10.0	< 10.0
B	> 10.0 to 20.0	> 10.0 to 15.0
C	> 20.0 to 35.0	> 15.0 to 25.0
D	> 35.0 to 55.0	> 25.0 to 35.0
E	> 55.0 to 80.0	> 35.0 to 50.0
F	> 80.0	> 50.0

Source: Highway Capacity Manual, 7th Edition

1.1.1.4 STUDY INTERSECTIONS

A total of five study intersections (listed in **Table 2** and shown in **Figure 3**) were selected for the purposes of this analysis, including the one project driveway. All study intersections are under the City of Hayward's jurisdiction, with the exception of the I-880 SB Ramps and I-880 NB On-Ramp at Industrial Parkway W, which are maintained by Caltrans. The study intersections were selected based on discussions with City staff as best representing project traffic distribution.

Table 2: Study Intersections

#	Intersection	Traffic Control
1	Hesperian Boulevard/Industrial Parkway W	Signalized
2	Hopkins Street/Industrial Parkway W	TWSC
3	I-880 SB Ramps/ Industrial Parkway W	Signalized
4	I-880 NB On-Ramp/Industrial Parkway W	Yield Controlled for Westbound Right-Turn and Eastbound Left-Turn
5	Project Driveway/ Claremont Court	AWSC

Note: TWSC = Two-way Stop-Controlled Intersection, AWSC = All-Way Stop-Controlled Intersection.

Study Intersections

Project Driveway

Project Site

0 0.25 Miles

Figure 3

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Intersection Study Locations
Hayward, California

1.2 DEVELOPMENT OF FUTURE TRAVEL DEMAND

Study intersection operations and queuing are evaluated under the Background Year 2029 conditions for non-CEQA local transportation analysis purposes. This evaluation has been conducted using projected peak hour traffic volumes derived from the City of Hayward General Plan Update version of the Alameda CTC Countywide Model.

The model includes future development throughout the region. Therefore, the traffic forecasts reflect traffic from growth in Hayward as well as traffic from future recently constructed or approved developments in the study area that may use the local roadways. Regional growth is derived from ABAG Projections. The method compares 2035 model volumes to existing year model volumes to identify the growth increment, and then adds this increment to the existing counts, thus smoothing out any model validation error compared to existing counts. The Background 2029 No Project Volumes were developed by interpolating volumes between existing and Cumulative 2035 volumes to develop an annual compound growth rate on each roadway. The analysis presented in this report applied a 0.68% to 3.29% compound annual growth rate to 2024 existing traffic volumes in the AM and PM peak hour, respectively, to estimate 2029 build-out year background traffic volumes. In addition, the background scenario includes recently approved nearby development projects, including traffic from the 31161 San Antonio Street Industrial, 1441 Industrial, and Ruus Road Industrial Projects.

As part of the Whipple/Industrial Interchange study, there will be a planned I-880 northbound off-ramp at Industrial Parkway W. The planned improvement is anticipated to change local travel patterns and access to the site. The cumulative conditions will assume the I-880 northbound off-ramp at Industrial Parkway W is in place and will utilize the model Cumulative 2035 volumes to develop Cumulative No Project volumes for the operational analysis.

1.3 EXISTING NETWORK

1.3.1 Roadways

The roadway system in the study area consists of arterial and local roadways that serve local and regional traffic demand. The vehicular facilities in the study area are discussed below. While the City of Hayward uses “collector” as an additional roadway classification, no road facilities in the study area are classified as such.

1.3.1.1 ARTERIAL ROADWAYS

Hesperian Boulevard is a north-south roadway that is classified as a Principal Arterial and a truck route by the City of Hayward. Hesperian Boulevard extends beyond the SR 92 interchange ending at SR 185 in the north and turns into Union City Boulevard at the city border between Hayward and Union City in the south. It is a six-lane facility with a center median within the study area, but it turns into a four-lane facility two blocks south of Industrial Parkway W at Eden Shores Boulevard. No street parking is available along Hesperian Boulevard. The route has a Class II bicycle lane south of Industrial Parkway W, and no bicycle

facilities are located north of Industrial Parkway W. Sidewalks are located along the entire corridor. Travels lanes are 11 feet wide south of Industrial Parkway W and 12 feet wide north of Industrial Parkway W. The posted speed limit is 35 mph. The curb-to-curb right-of-way varies, but the typical section is approximately 100 feet. Hesperian Boulevard provides access to a range of residential, commercial, and industrial land uses.

Industrial Parkway W/Industrial Boulevard is an east-west roadway that is classified as a Minor Arterial and a truck route by the City of Hayward. Industrial Boulevard extends to SR 238 in the east and turns into Industrial Parkway W at Hesperian Boulevard. It is a six-lane facility with a center median within the study area. Street parking is available along Industrial Parkway W; however, signs restrict parking for trucks and other large commercial vehicles. No street parking is permitted on Industrial Boulevard. The route has no bicycle facilities within the study area, but sidewalks are located along the entire corridor. Travel lanes are 11 feet wide. The posted speed limit is 40 mph east of Hopkins Street and 45 mph west of Hopkins Street. The curb-to-curb right-of-way is approximately 86 feet. Industrial Parkway W and Industrial Boulevard provide access to mostly commercial and industrial land uses within the study area.

1.3.1.2 LOCAL ROADWAYS

Hopkins Street is a north-south roadway that begins south of Industrial Boulevard. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way is approximately 48 feet. The facility has no sidewalks, and parking is permitted on the east side of the roadway only for vehicles under 25 feet. Hopkins Street serves exclusively industrial land uses.

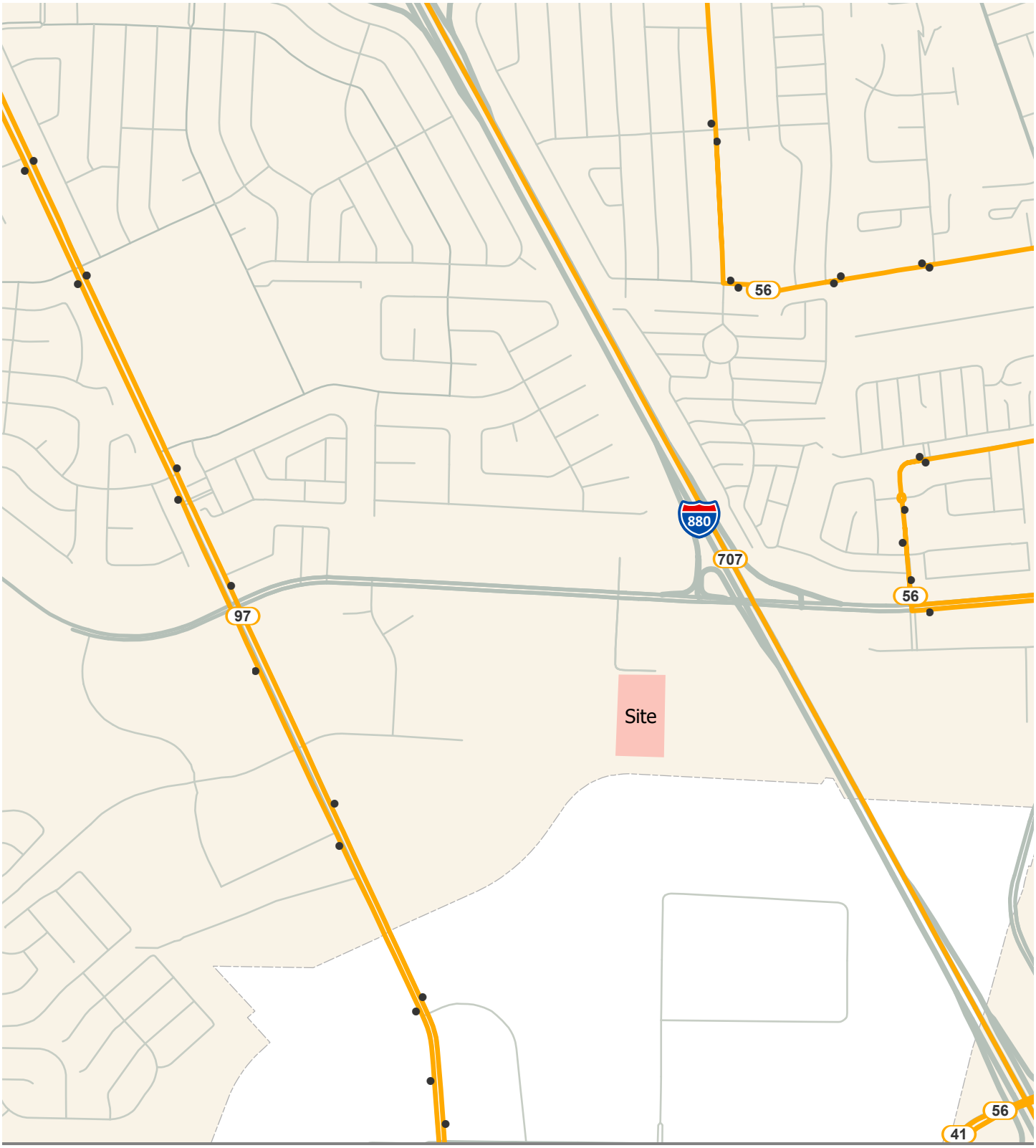
Claremont Court is an east-west roadway that begins east of Hopkins Street. It is a two-lane facility with a speed limit of 25 mph. The curb-to-curb right-of-way is approximately 48 feet. The facility has no sidewalks, and parking is permitted on the south side of the roadway only for vehicles under 25 feet. Claremont Court serves exclusively industrial land uses.

1.3.2 Transit Service

The transit system in the study area consists of local bus service. The transit facilities in the area are discussed below and shown in **Figure 4.**

1.3.2.1 ALAMEDA-CONTRA COASTA TRANSIT DISTRICT

Alameda-Contra Costa Transit District (AC Transit) provides bus service in the study area. AC line 97 provides service along Hesperian Boulevard, AC line 707 operates along the I-880 corridor, AC line 56 runs locally through neighborhoods east of I-880. There are no transit stops within a quarter-mile of the project site. AC Transit bus routes and local bus stops are shown in **Figure 4**.



AC Transit Stops

AC Transit Routes

Project Site

0 0.25 Miles

Figure 4

KITTELSON & ASSOCIATES

Transit Facilities within Study Area
Hayward, California

1.3.3 Pedestrian Facilities

The study area offers several types of facilities and amenities that support walking. The availability and quality of pedestrian facilities was analyzed using seven key factors as shown in **Table 3.**

Table 3: Pedestrian Facility Assessment

Factor	Description	Assessment
Sidewalk Availability	Sidewalk availability is core to supporting walkability and safety separating pedestrians from vehicles and other modes. In addition, it is important that sidewalks are present on both sides of the roadway and are available along the entire segment rather than end midblock.	Sidewalks are generally present on both sides of Hesperian Boulevard and Industrial Parkway W. The sidewalk adjacent to the westbound traffic on Industrial Boulevard ends approximately 750 feet west of Hesperian Boulevard. The sidewalk adjacent to the northbound traffic on Hopkins Street stops approximately 100 feet from Industrial Parkway W at a midblock location. No sidewalks are present along Hopkins Street north of Industrial Parkway W or Claremont Court. The roadways in the study area mostly traverse light industrial and commercial land uses, and most of the arterials and collectors are designated truck routes. Thus, pedestrian-oriented uses are generally not prioritized in the area.
Sidewalk Conditions	Cracked, broken, or otherwise damaged sidewalks can pose a safety hazard and discourage walking.	Sidewalks in the study area generally appear to be in good surface condition, based on aerial photography.
Crosswalk Availability	Marked crosswalks can safely accommodate pedestrians that need to cross streets. A lack of marked crosswalks could hinder walkability since pedestrians need to travel greater distances to reach a safe marked crossing point. Drivers may also be less likely to yield to intersections at unmarked crossings.	The Hesperian Boulevard/Industrial Parkway W intersection is marked with crosswalks on each approach. There are also marked crosswalks at the I-880 SB off-ramp and the I-880 NB on-ramp. No marked crosswalks exist at the intersection of Industrial Parkway W and Hopkins Street.
Shading	Shading, whether natural or artificial, can encourage walking in areas such as the Bay Area which are relatively warm with limited rainfall, especially in the summer.	Based on aerial imagery, there is consistent tree cover on Industrial Parkway W/Industrial Boulevard from Marina Drive to the I-880 SB Ramp. There is also tree cover present within 250 feet of the intersection between Hesperian

Factor	Description	Assessment
		and Industrial Boulevards. Tree cover is sparse on both Hopkins Street and Claremont Court.
Flat Grade	Steep hills and ravines can discourage walking, especially for pedestrians with limited mobility.	The study area is generally flat.
Buffer	Buffers which provide separation between pedestrians and moving vehicles can help improve the walking experience, and can include landscaping and/or parked vehicles, and bulb outs, which serve to both reduce pedestrian crossing distances at intersections and as a traffic calming measure.	Some stretches of sidewalk on the west side of Hesperian Boulevard and on both sides of Industrial Boulevard are buffered from the roadway with landscaping strips. No buffers are present between the sidewalk and roadway on the east side of Hesperian Boulevard. The sidewalk segment along Hopkins Street is also unbuffered.
Amenities	In addition to physical facilities that accommodate walking, useful or interesting amenities along sidewalks create a more interesting walking environment and increase pedestrian comfort. Amenities can include sidewalk-adjacent retail and restaurants, landscaping, and street furniture.	Street furniture is not generally provided along walking paths in the study area. As outlined in the transit section above, most bus stops do not provide any amenities other than a bus stop sign.

1.3.4 Bicycle Facilities

The study area contains a bicycle facilities network that consists primarily of dedicated street space for bicyclists. **Figure 5** displays the existing designated bicycle facilities in the study area.

Bicycle facilities are categorized into four types, as described below:

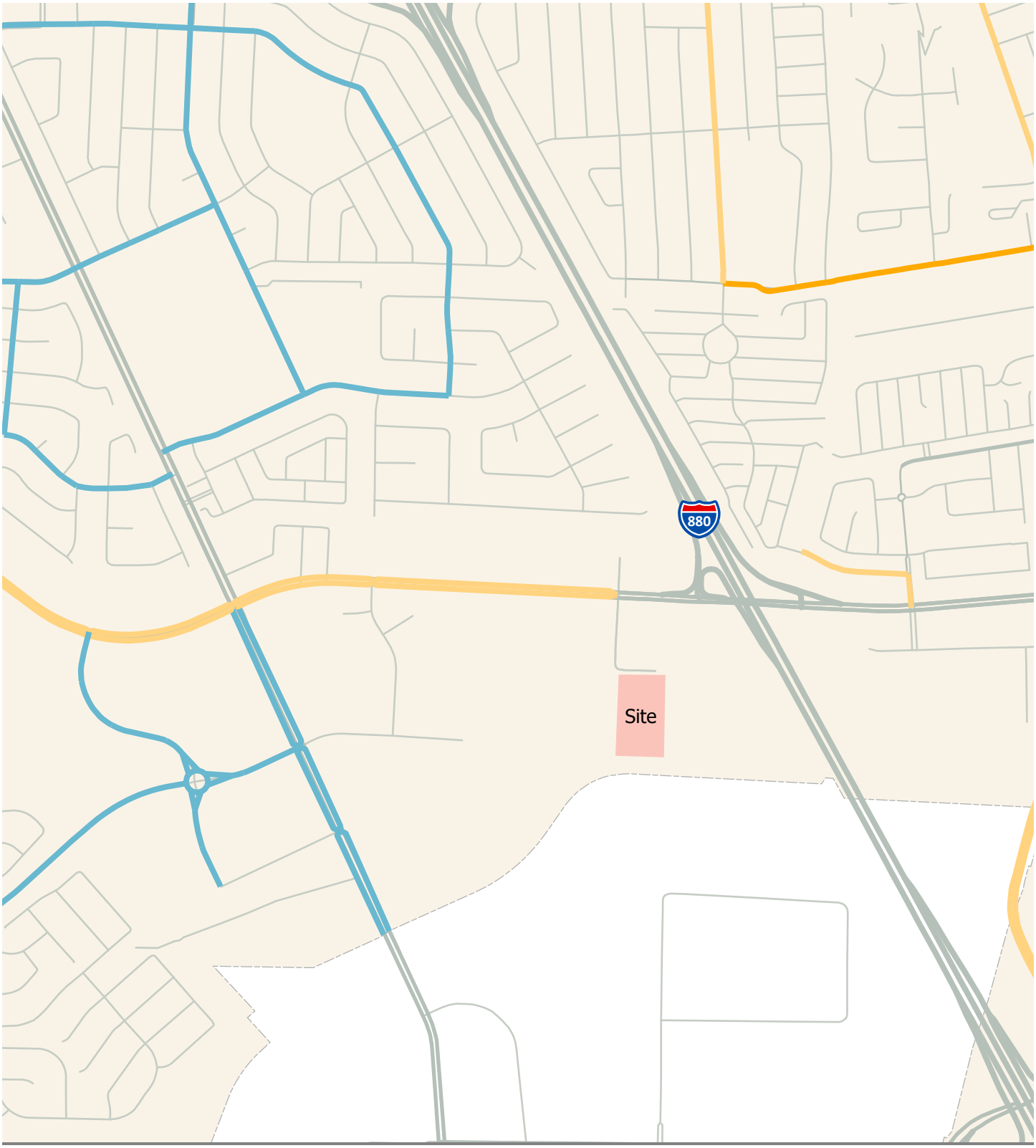
- **Class I Bikeway (Bike Path):** Also known as a shared path or multi-use path, a bike path is a paved right-of-way for bicycle travel that is completely separate from any street or highway.
- **Class II Bikeway (Bike Lane):** A striped and stenciled lane for one-way bicycle travel on a street or highway. This facility could include a buffered space between the bike lane and vehicle lane and the bike lane could be adjacent to on-street parking.
- **Class III Bikeway (Bike Route):** A signed route along a street where the bicyclist shares the right-of-way with motor vehicles. This facility can also be designated using a shared-lane marking (sharrow).
- **Class IV Bikeway (Separated Bike Lane):** A bikeway for the exclusive use of bicycles including a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

As shown in **Figure 5**, the existing bicycle facilities in the study area include:

- Class II bike lane on Hesperian Boulevard south of Industrial Boulevard
- Class III bike route on Industrial Boulevard and Industrial Parkway W west of Hopkins Street (Note: No signage or striping present designating such bicycle facilities between Hesperian Boulevard and Hopkins Street)

The City of Hayward Bicycle & Pedestrian Master Plan (BPMP) includes a map of roadways with the top bicycle prioritization scores, highlighting roads that are prime candidates for improvements. Within the study area, these include portions of Hesperian Boulevard and Industrial Boulevard. The plan includes the following improvements to the study area:

- Class IV separated bikeway on Hesperian Boulevard
- Class IV separated bikeway on Industrial Boulevard and Industrial Parkway W



Bicycle Facilities

- Bicycle Lanes
- Buffered Bicycle Lanes
- Bicycle Boulevard
- Bicycle Route

0 0.25 Miles

Figure 5

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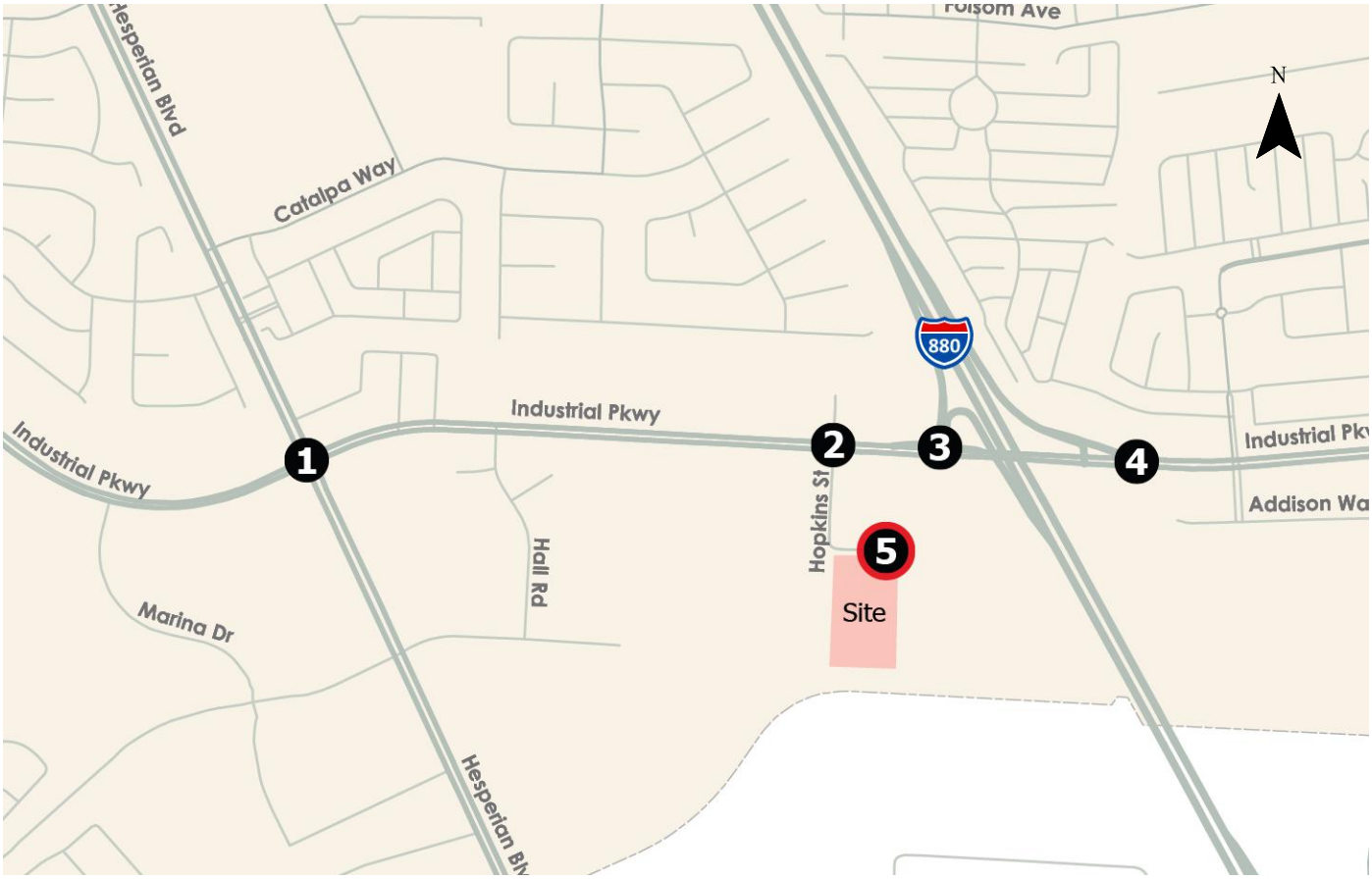
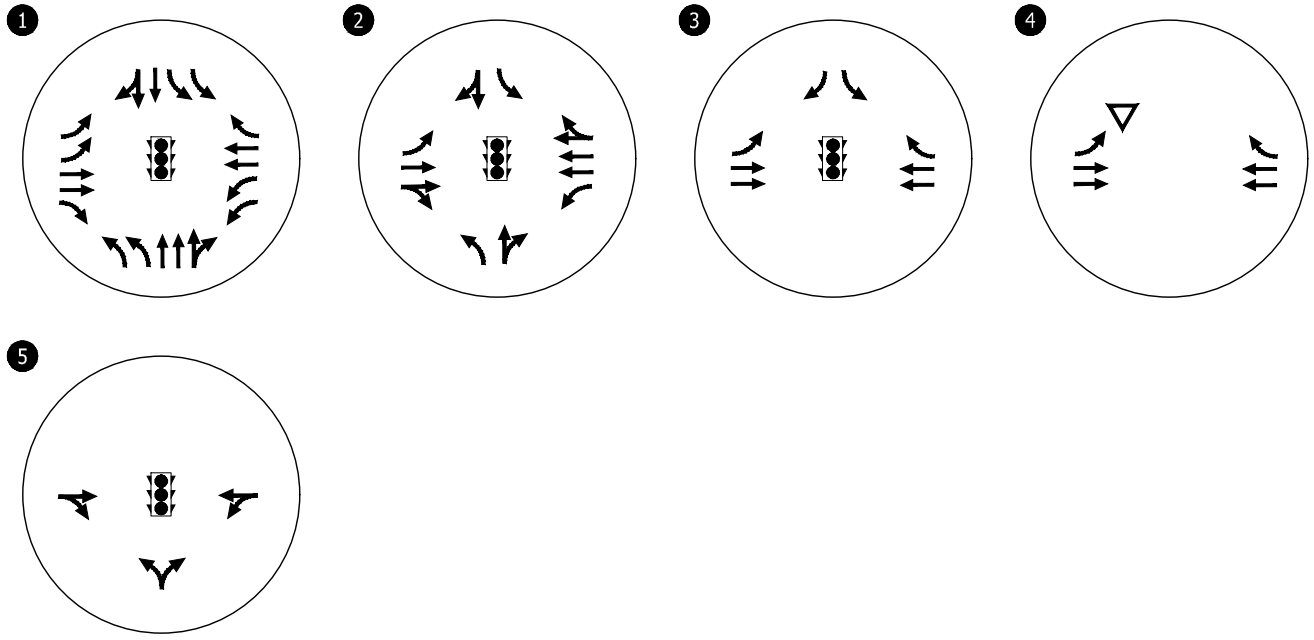
Existing Bicycle Network
Hayward, California

1.3.5 Automobile Traffic Volumes

Traffic counts were collected on a mid-weekday while schools were in session in October 2024 during the weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods.

Intersection control (i.e. signalized or stop-controlled) and lane geometries are shown in **Figure 6. Figure 7** and **Figure 8** show the existing AM and PM automobile peak hour volumes respectively at the study intersections. **Appendix A** contains the field collected count sheets. Given that conditions have generally improved since the Covid economic shutdown and new developments have opened in the study area, no further adjustments were made to the traffic count volumes.





- Signalized

- Yield-Controlled

Existing Lane Configuration & Traffic Control Devices
Hayward, CA

Figure 6

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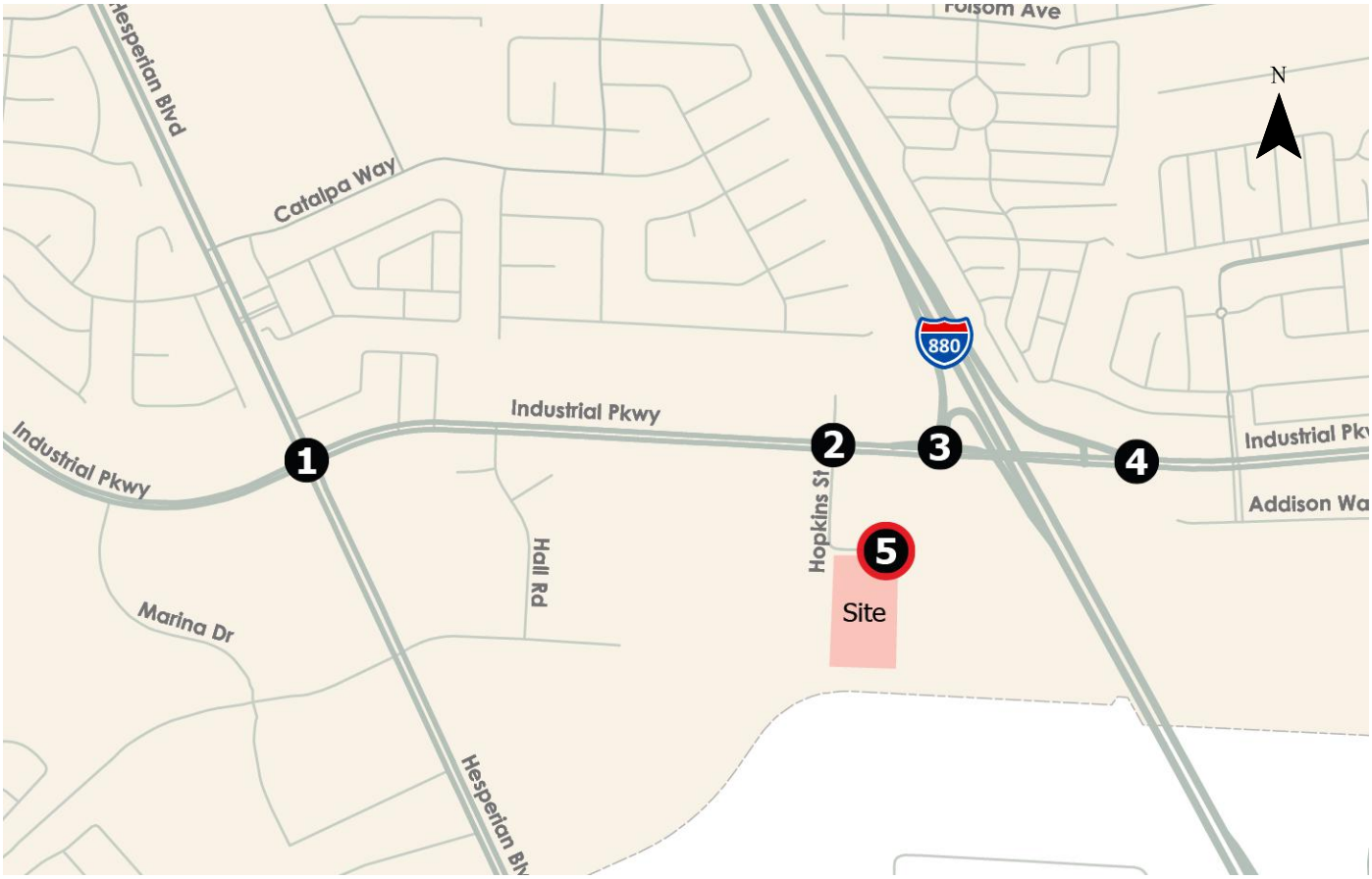

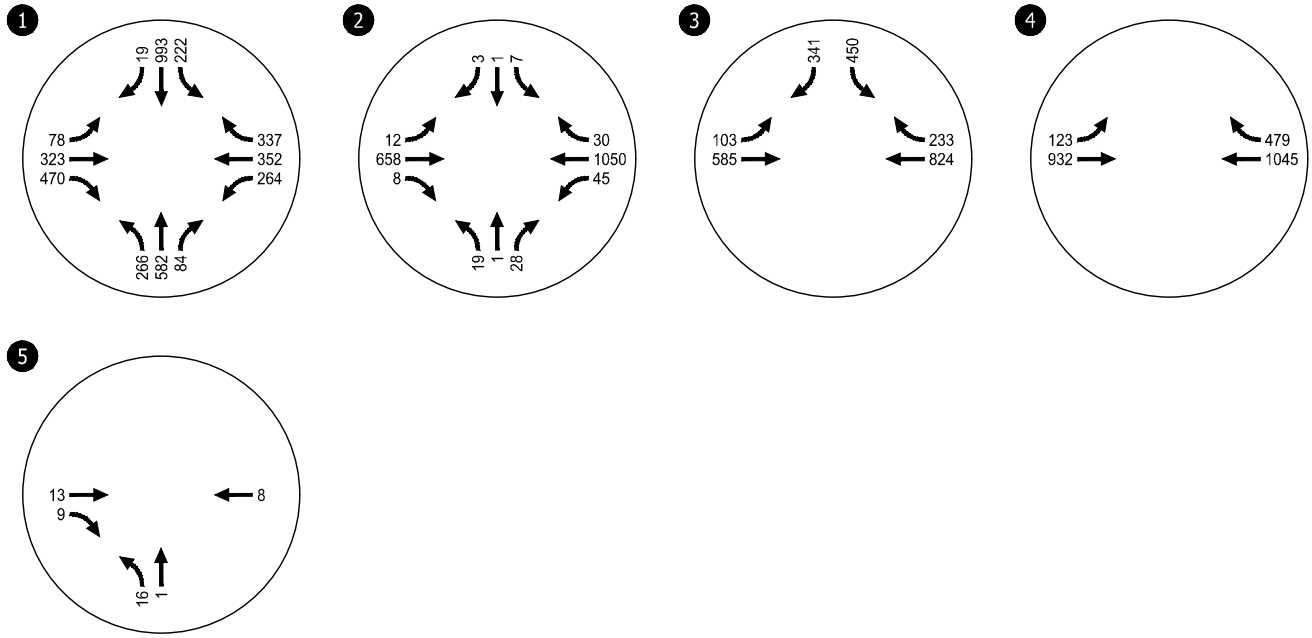

Existing Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
7

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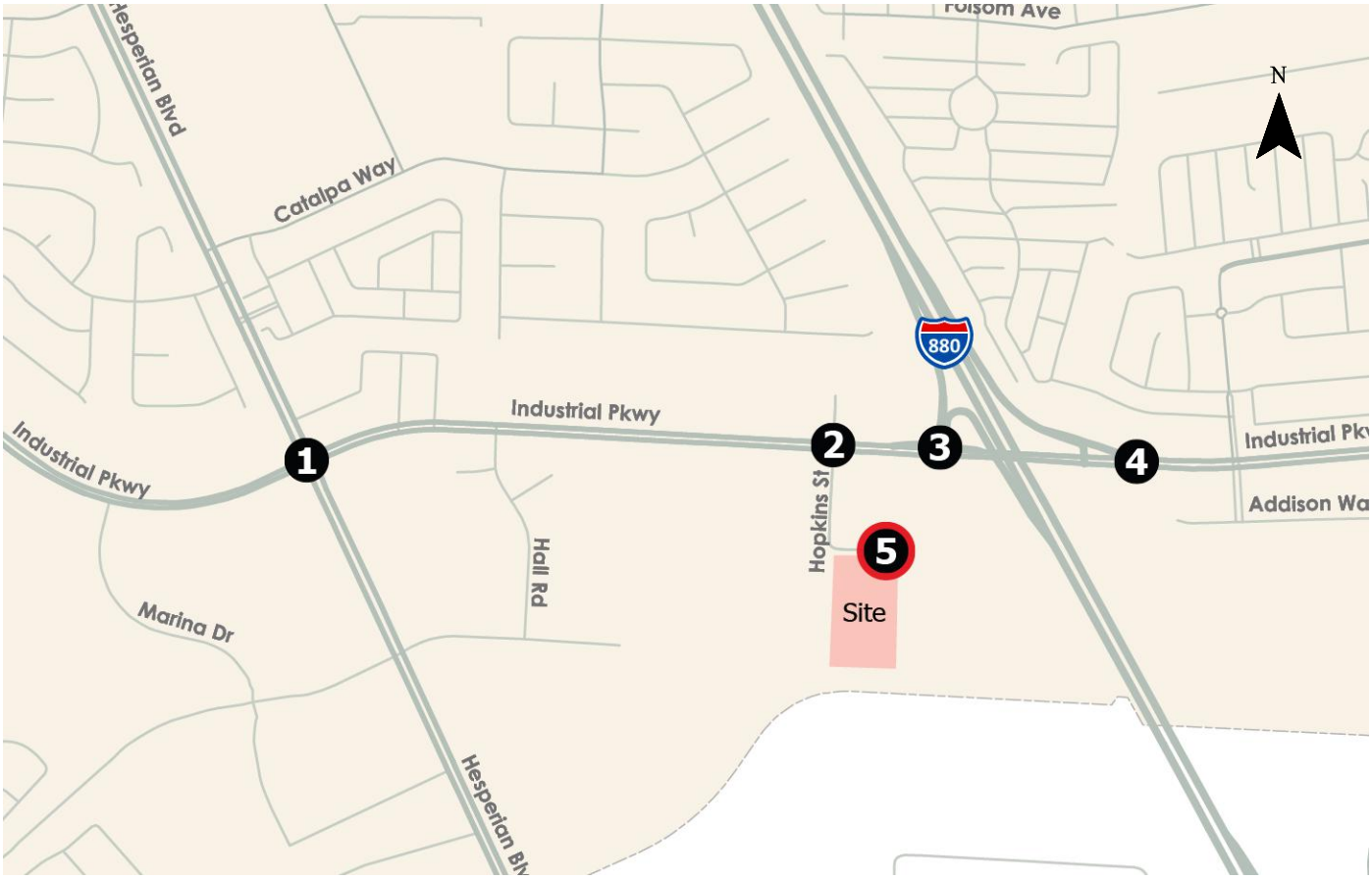

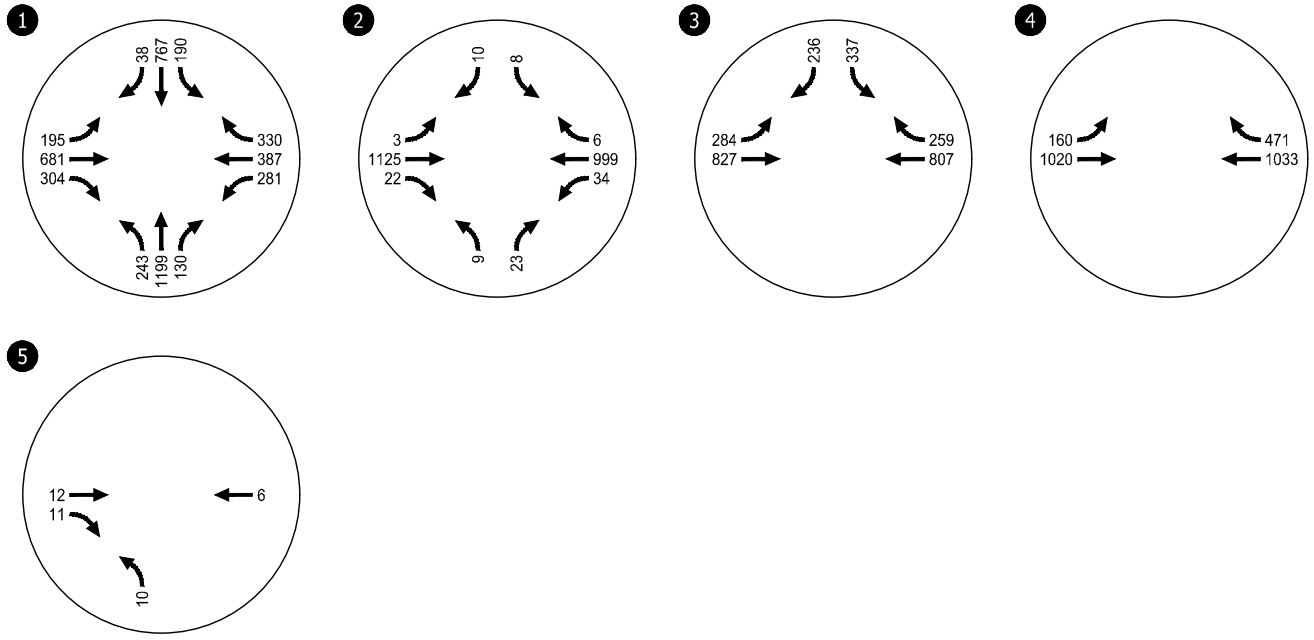

Existing Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
8

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1.3.6 Pedestrian and Bicyclist Volumes

Pedestrian and bicycle volumes were collected at the study intersections as part of the data collection effort. **Table 4** and **Table 5** present the pedestrian and bicycle volume data for the weekday AM and weekday PM peak hours, respectively. The tables indicate minimal pedestrian and bicycle activity in the study area, indicative of industrial land uses.

Table 4: Pedestrian and Bicycle Volumes (Weekday AM Peak Hour)

#	Intersection	Pedestrian Crossings (by intersection leg)				Northbound Bicycles			Southbound Bicycles			Eastbound Bicycles			Westbound Bicycles		
		N	S	E	W	L	T	R	L	T	R	L	T	R	L	T	R
1	Hesperian Boulevard/ Industrial Parkway W	2	-	-	6	-	-	-	-	4	2	-	-	-	-	1	-
2	Hopkins Street/Industrial Parkway W	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-
3	I-880 SB Ramps/ Industrial Parkway W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	I-880 NB On-Ramp/Industrial Parkway W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
5	Project Driveway/ Claremont Court	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: Quality Counts turning movement counts (October 2024).

Table 5: Pedestrian and Bicycle Volumes (Weekday PM Peak Hour)

#	Intersection	Pedestrian Crossings (by intersection leg)				Northbound Bicycles			Southbound Bicycles			Eastbound Bicycles			Westbound Bicycles		
		N	S	E	W	L	T	R	L	T	R	L	T	R	L	T	R
1	Hesperian Boulevard/Industrial Parkway W	2	4	4	16	-	1	-	-	1	2	3	-	-	-	1	-
2	Hopkins Street/Industrial Parkway W	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
3	I-880 SB Ramps/ Industrial Parkway W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	I-880 NB On-Ramp/Industrial Parkway W	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Project Driveway/ Claremont Court	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-

Source: Quality Counts turning movement counts (October 2024).

1.4 EXISTING TRAFFIC OPERATIONS AND PERFORMANCE

1.4.1 Automobile Level of Service

LOS at the study intersections were evaluated based on the HCM 7th Edition methodology, as implemented in the Synchro 12 software package. LOS analysis was performed for the weekday AM and PM peak hours using traffic counts collected in the field. **Table 6** provides a summary of the existing automobile level of service. **Appendix B** contains the Existing Conditions LOS and queueing worksheets at the study intersections.

As shown in **Table 6**, all study intersections operate acceptably (LOS E or better) under existing conditions, except for the following:

- Hopkins Street/Industrial Parkway W: LOS F during Weekday AM peak hour and Weekday PM peak hour

Table 6: Automobile Level of Service, Existing Conditions

#	Intersection	Traffic Control	Weekday AM Peak Hour		Weekday PM Peak Hour	
			Delay (Sec)	LOS	Delay (Sec)	LOS
1	Hesperian Boulevard/Industrial Parkway W	Signalized	34.5	C	40.7	D
2	Hopkins Street/Industrial Parkway W*	TWSC	**72.7**	**F**	**79.5**	**F**
3	I-880 SB Ramps/ Industrial Parkway W	Signalized	23.9	C	23.3	C
4	I-880 NB On-Ramp/Industrial Parkway W[1]	Yield Controlled for WBR	14.6	B	13.1	B
5	Project Driveway /Claremont Court	AWSC	9.3	A	9.2	A

Source: Kittelson & Associates, Inc. 2024
TWSC = Two Way Stop Controlled, AWSC = All Way Stop Controlled
[1] HCM 7th requires at least one stop-controlled approach at the intersection. As I-880 NB On-Ramp/Industrial Parkway W does not meet this requirement, HCM 2000 was used to analyze the intersection. Results reflect the eastbound left-turn movement LOS and delay.
Highlighted **bold** text signifies unacceptable operations. *The delay and LOS for the Hopkins Street/Industrial Parkway W intersection corresponds to the worst project-related movement, e.g., northbound-left.

1.4.2 Queue Storage

The 95th percentile queues at the study intersections were reviewed to identify locations where these may exceed the available storage, for informational purposes. The 95th percentile queue lengths represent queues that have only a 5% probability of exceeding the available storage lengths. This measure is typically used in traffic engineering as a conservative measure of queuing and since it only has a 5% probability of being exceeded, the average driver would likely experience shorter queue lengths than what is being reported.

For through movements and turning movements without a dedicated lane, the available storage is assumed to be the distance from the stop bar to the departure point of the nearest upstream stop-controlled or signalized intersection. For turning movements with an exclusive turn lane, the length of the turn bay is assumed to be the available storage.

Notably, the intersection of Hopkins Street/Industrial Parkway has a westbound left queue storage of 75 feet, allowing approximately three cars to queue. Expansion of the queue storage would be infeasible due to the eastbound left turn at the I-880 SB ramp. Queueing is not exceeded in any of the study scenarios.

No movements were found to queue beyond the available storage capacity at the 95th percentile demand level under Existing Conditions. A summary of the intersection turn lane queue storage and intersection queues can be found in Appendix C**.**

1.5 CRASH ANALYSIS

The study intersection crash history was obtained from the UC Berkeley Transportation Injury Mapping System (TIMS) for the period from January 1, 2018 to December 31, 2022. **Table 7** summarizes the reported crash frequency, type and severity by intersection.

Table 7: Study Intersection Crash Frequency and Severity (January 2018 through December 2022)

Location	Collision Type					Severity		Total Crashes	Observed Crash Rate[1]	State-Average Rate[2]
	Head On	Side-swipe	Rear End	Broad-side	Over-turned	PDO	Injury			
Hesperian Boulevard/Industrial Parkway W	2		1	4		0	7	7	0.08	0.33
Hopkins Street/Industrial Parkway W	1		2			0	3	3	0.07	0.20
I-880 SB Ramps/ Industrial Parkway W					1	0	1	1	0.02	0.33
I-880 NB On-Ramp/Industrial Parkway W		1				0	1	1	0.02	0.20

[1] Crash rate is calculated as the number of crashes per million entering vehicles. Average daily traffic volumes were estimated using weekday PM peak hour total entering volume at the intersection.
[2] Average crash rates are based on California average rates for intersections in urban areas as indicated in 2022 Collision Data on California State Highways.

As shown in **Table 7**, the study intersections' observed collision rates are lower than the state average collision rates. Additionally, there were no reported crashes involving a fatality or pedestrian and/or bicyclist during the analysis period considered. There was one reported truck crash during the analysis period.

No safety-based mitigation needs were identified through review of the available crash data. A detailed summary of the crash analysis is included in **Appendix D**.

2 Project Trip Generation and Distribution

This section provides the vehicle trip generation and distribution estimates for the proposed project.

2.1 TRIP GENERATION

Project trip generation was estimated for the following three weekday time periods:

- Weekday daily
- Weekday AM peak hour
- Weekday PM peak hour

At this time, the future tenants are unknown, however, the applicant has applied for a conditional use permit for a truck terminal. For the purpose of assessing transportation impacts with the project, trip rates associated with industrial uses were selected. Trips were estimated using data provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The trip rates were obtained in October 2024 from the most recent data available in the web-based Trip Generation database maintained by ITE. As shown in **Table 8,** a review of the following land uses were considered:

- General Light Industrial (Code 110)
- Warehousing (Code 150)
- High-Cube Fulfillment Center Warehouse, Non-Sort (Code 155)
- High-Cube Fulfillment Center Warehouse, Sort (Code 155).

The average rate and fitted curve equations are noted for each land use.

Table 8: ITE Trip Generation Rates

Land Use	ITE Trip Code	Rate	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
General Light Industrial	110	Average	4.87	88%	12%	0.74	14%	86%	0.65
		Fitted	T = 3.76(X) + 50.47			T = 0.68(X) + 3.81			Ln(T) = 0.72 Ln(X) + 0.38
Warehousing	150	Average	1.71	77%	23%	0.17	28%	72%	0.18
		Fitted	T = 1.58(X) + 38.29			T = 0.12(X) + 23.62			T = 0.12(X) + 26.48
High-Cube Transload and Short-Term Storage Warehouse	154	Average	1.4	77%	23%	0.08	28%	72%	0.10
		Fitted	Not Given			Not Given			Not Given
High-Cube Fulfillment Center Warehouse (Non-Sort)	155	Average	1.81	81%	19%	0.15	39%	61%	0.16
		Fitted	T = 2.00(X) - 173.61			Not Given			Not Given
High-Cube Fulfillment Center Warehouse (Sort)	155	Average	6.44	81%	19%	0.87	39%	61%	1.2
		Fitted	Not Given			Not Given			Not Given

Based on the four ITE categories that were considered, trip generation for the project was estimated using average trip rates for **High-Cube Fulfillment Center Warehouse - Sort (Code 155)** as it represents the most conservative land use type. The project also includes the demolition of an existing 14,640 square foot truck terminal building previously occupied by Central Transport. The October 2024 traffic volume data collection effort included turning movements to and from the existing use driveway. These were used to apply a credit for existing use activity. The project trip generation estimate is shown in **Table 9**.

Table 9: Project Trip Generation Estimate

Land Use	ITE Trip Generation Manual Land Use Code	Size (TSF)	Weekday Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Project	155 (Sort)	43.7	281	31	7	38	20	32	52
Existing Industrial Use	based on counts	-14.6	113[1]	9	17	26	11	10	21
Net New Trips (Proposed – Existing)			**168**	**22**	**-10**	**12**	**9**	**22**	**31**
Auto Trips (10%)			17	2	N/A	1	1	2	3
Truck Trips (90%)[2]			151	20	N/A	11	8	20	28

Notes: TSF= thousand square feet
[1] Daily trips were estimated using the ratio of the ITE 155 (Sort) weekday daily and PM peak hour trip generation and applying the ratio to the counted weekday PM peak hour trips generation for the existing use. Traffic counts were collected on October 10, 2024 and October 16, 2024 during the weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods.
[2] Based on the applicant's business and operations plan dated February 2024, 90% of trips are computed to be truck traffic (10% are autos). Appendix J contains the business and operations plan.
The fleet mix is unknown at this time, but the assumption for a truck terminal is 80% of the trucks are 5-axle and 20% are 3 to 4-axle.

As shown in **Table 9**, after applying the existing use credit, the project is expected to generate 168 weekday daily vehicle trips, 12 weekday AM peak hour vehicle trips, and 31 weekday PM peak hour net new vehicle trips. Of these daily trips, based on information from the applicant, 90% are estimated to be truck trips (151) and 10% are auto trips (17). As shown in **Table 9**, the weekday AM peak hour net new outbound trips are assumed to be negative. The weekday AM peak hour net new outbound trips were capped at 0 for a conservative analysis.

2.2 TRIP DISTRIBUTION

Project trip distribution was developed using the City of Hayward General Plan travel demand model. The project trip distribution is based on a select zone analysis from the model's distribution of trips in and out of the traffic analysis zone (TAZ) representing the project site, as well as adjustments to reflect local travel patterns and circulation conditions.

The trip distribution for the project is as follows:

- **10%** to/from the west via Industrial Parkway
- **32%** to/from the northwest via Hesperian Boulevard
- **9%** to/from the southwest via Hesperian Boulevard
- **11%** to/from the northeast via the I-880 Highway
- **10%** to/from the southeast via the I-880 Highway
- **28%** to/from the east via Industrial Parkway

All trip distribution destinations total up to 100%.

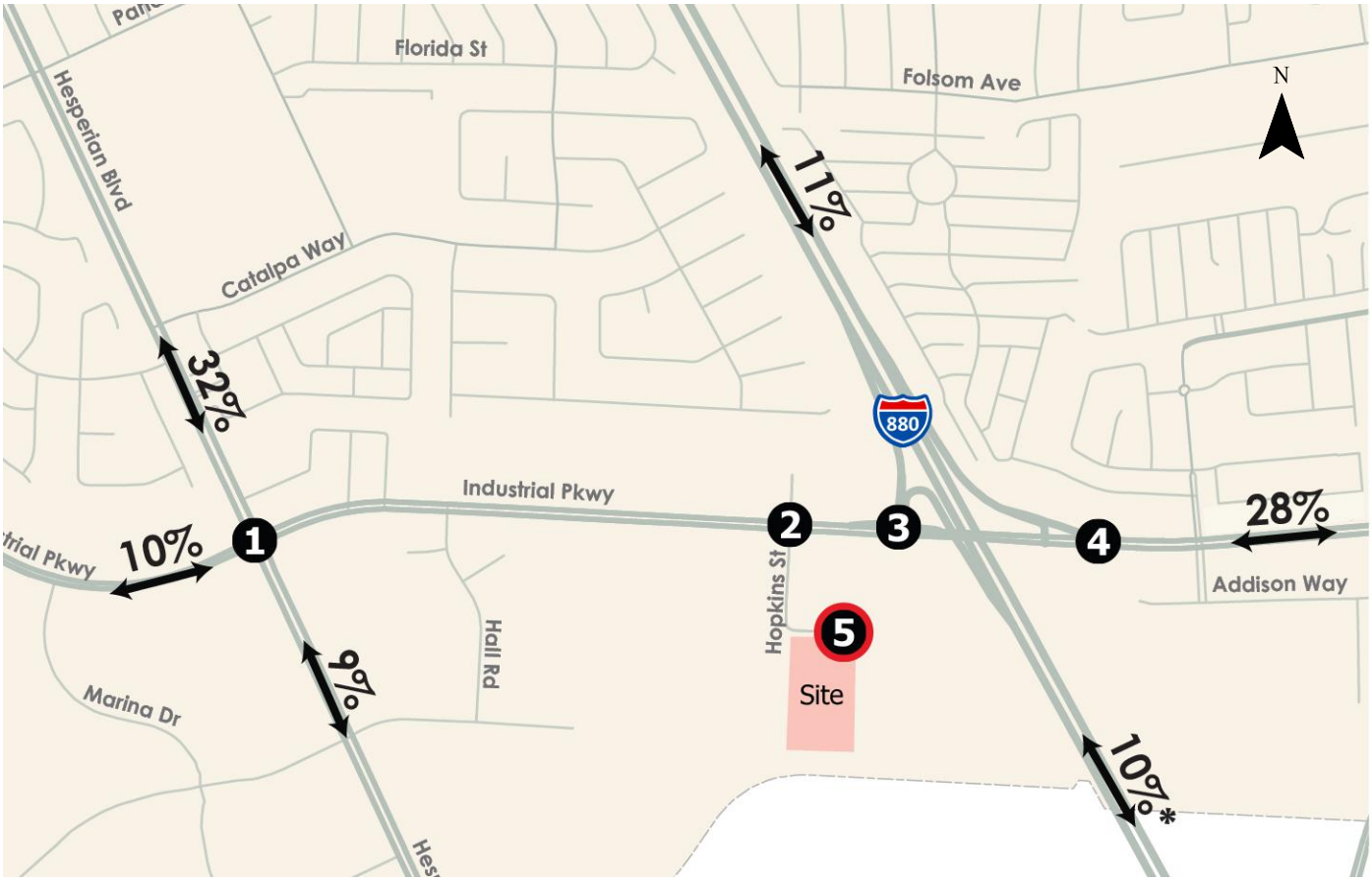
Under existing and background conditions, entering project trips traveling to the site via northbound I-880 are assumed to exit at the I-880/ Whipple Road interchange and then circulating on Industrial Parkway from the east. The estimated trip distribution pattern and site generated trips at the intersection count locations for the weekday AM and weekday PM peak hours are shown in **Figure 9** and **Figure 10**, for the existing weekday AM and weekday PM peak hours, respectively.

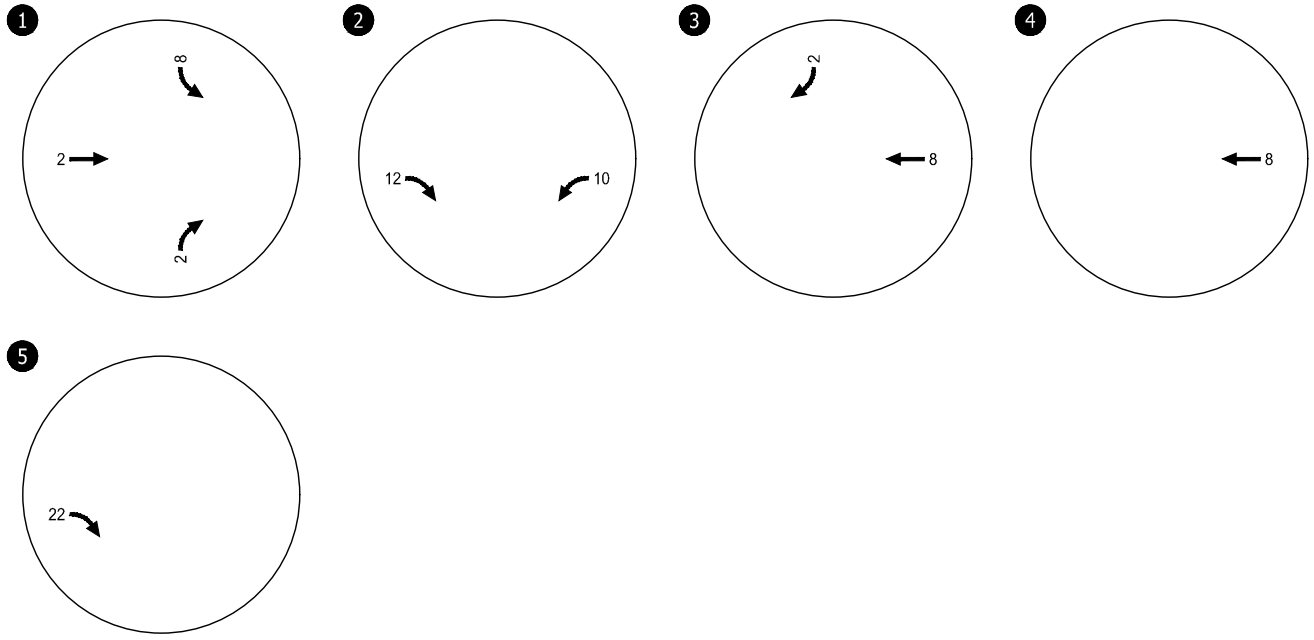
In the future cumulative conditions, there will be a planned I-880 northbound off-ramp at Industrial Parkway as part of the Whipple/Industrial Interchange study. The planned improvement is anticipated to change local travel patterns and access to the site and has been analyzed under cumulative conditions. The cumulative project trip distribution was developed using the City of Hayward General Plan travel demand model assuming the I-880 northbound off-ramp on Industrial Parkway is in place and is shown in Appendix I. The addition of this ramp changes the travel patterns and trip distribution from the existing condition and should reduce truck circulation and improve routing to the project site. This results in slightly different trip distribution under cumulative conditions, especially for trips arriving from the south.

The cumulative trip distribution for the project is as follows:

- **11%** to/from the west via Industrial Parkway
- **31%** to/from the northwest via Hesperian Boulevard
- **7%** to/from the southwest via Hesperian Boulevard
- **11%** to/from the northeast via the I-880 Highway
- **20%** to/from the southeast via the I-880 Highway
- **20%** to/from the east via Industrial Parkway

All trip distribution destinations total up to 100%. The estimated trip distribution pattern and site generated trips at the intersection locations for the weekday AM and weekday PM peak hours for the cumulative weekday AM and weekday PM peak hours are shown in Appendix I.





* Existing I-880 NB entering trips assumed to exit at the I-880/Whipple Road interchange and enter the site from the east on Industrial Parkway.

XX%
Trip Distribution

Estimated Trip Distribution Pattern & Site Generated Trips
Weekday AM Peak Hour
Hayward, CA

Figure
9

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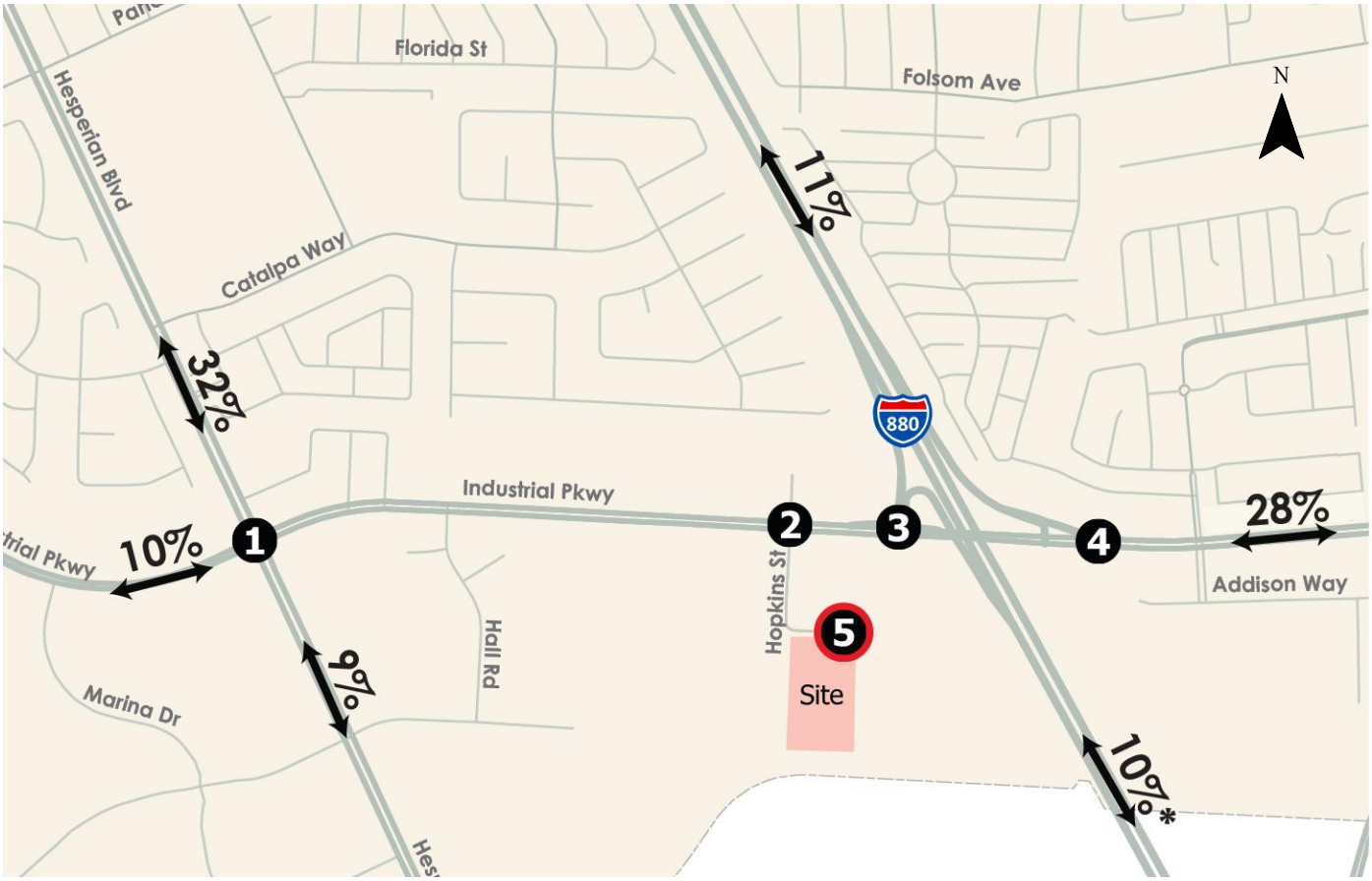

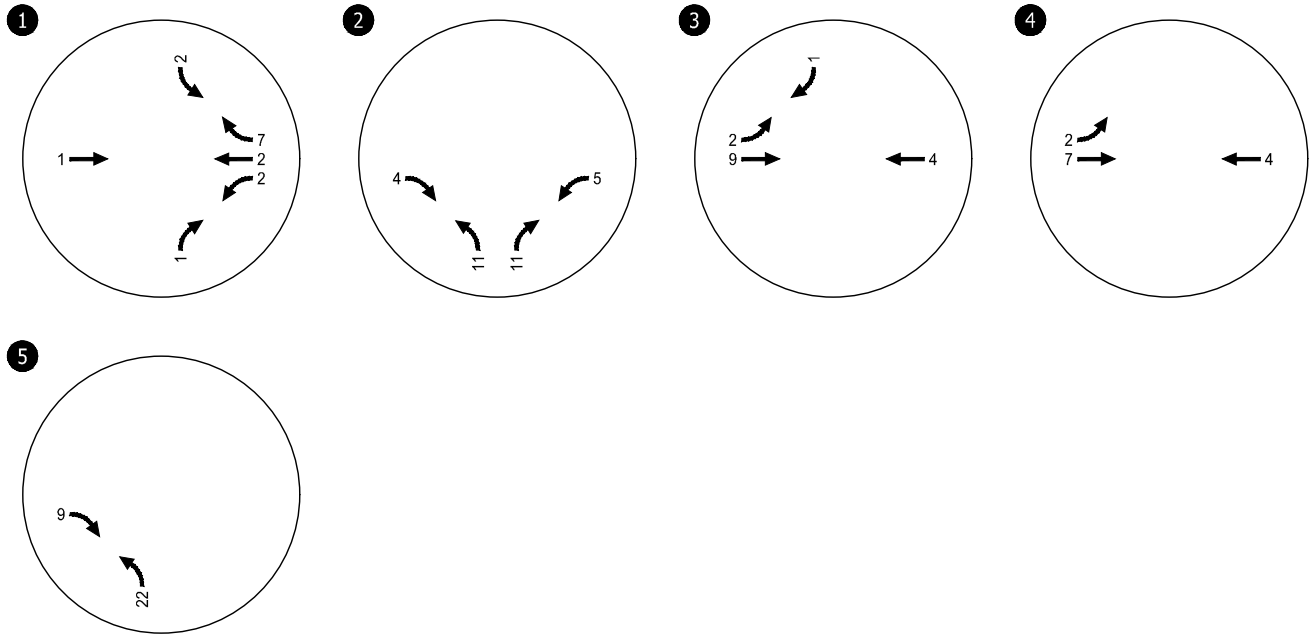

* Existing I-880 NB entering trips assumed to exit at the I-880/Whipple Road interchange and enter the site from the east on Industrial Parkway.

XX%
Trip Distribution

Estimated Trip Distribution Pattern & Site Generated Trips
Weekday PM Peak Hour
Hayward, CA

Figure
10

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3 Existing Plus Project Traffic Conditions

This chapter discusses the results of the Existing Plus Project traffic operations analysis, which was conducted for non-CEQA local transportation analysis (LTA) purposes.

3.1 EXISTING PLUS PROJECT AUTOMOBILE LEVEL OF SERVICE

The automobile turning movement counts for the Existing Plus Project scenario were developed by adding the Existing Conditions turning movement counts to the Project Only turning movements previously displayed in **Figure 9** and **Figure 10**.

Figure 11 presents the AM peak hour Existing Plus Project turning movements, and **Figure 12** present the PM peak hour Existing Plus Project turning movements. **Table 10** presents the Existing Conditions and Existing Plus Project delays and LOS for the study intersections. The table also compares the change in delay between the two scenarios. **Appendix E** contains the Existing Plus Project LOS and queueing worksheets.

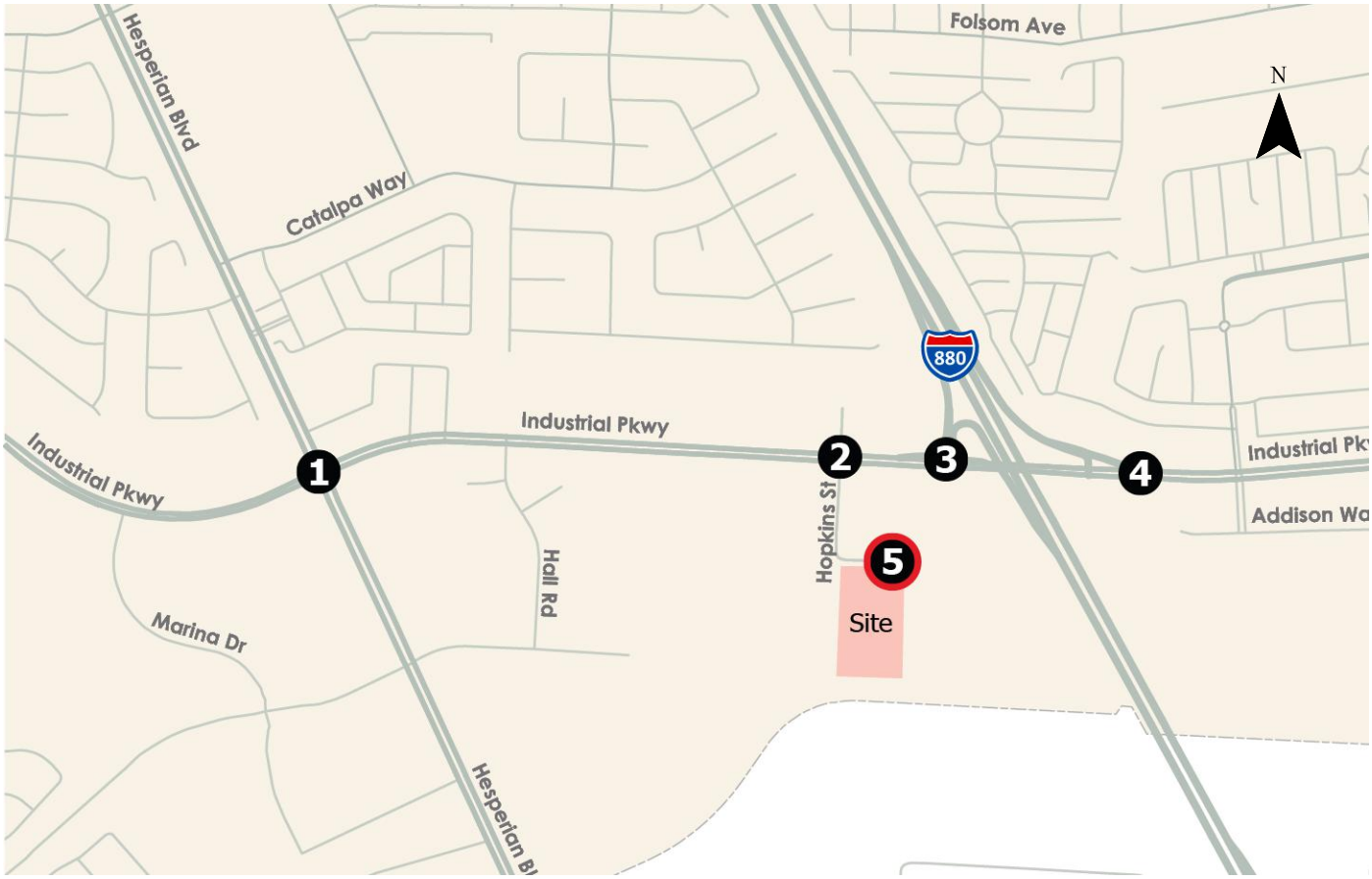
As shown in the table, all study intersections are forecast to operate acceptably (LOS E or better) under Existing Plus Project, except for the following:

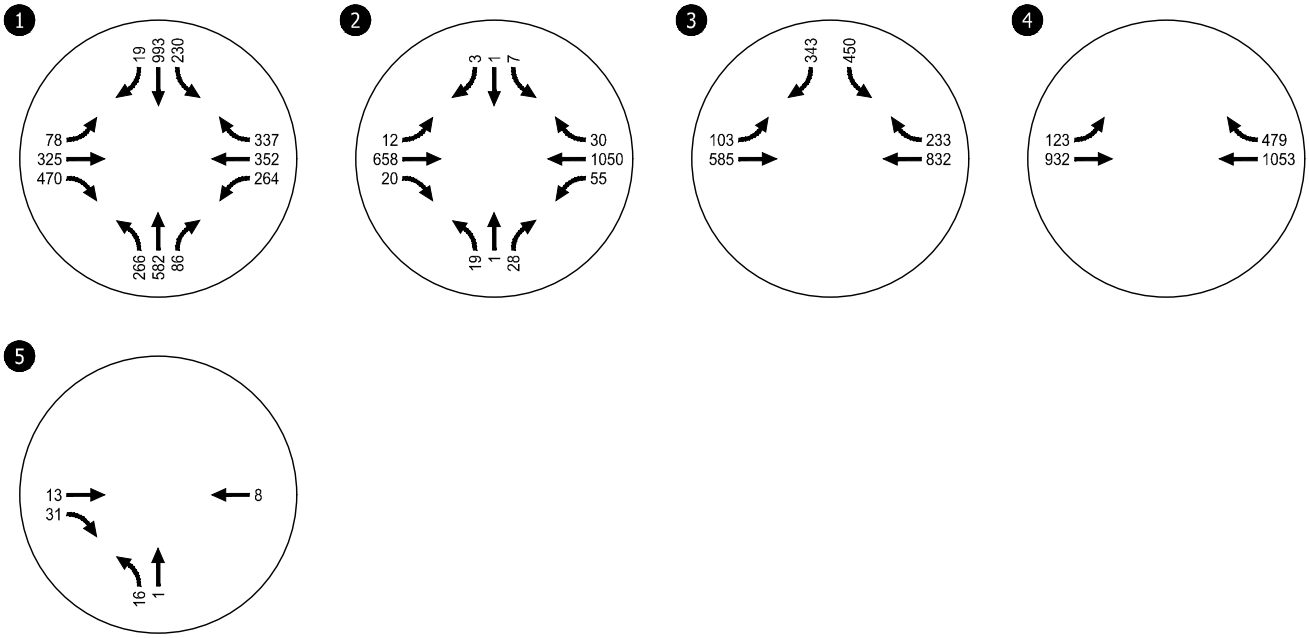
> Hopkins Street/Industrial Parkway W: LOS F during Weekday AM peak hour and Weekday PM peak hour. The delay and LOS for the Hopkins Street/Industrial Parkway W intersection reported in the tables corresponds to the worst project-related movement, e.g., northbound-left. The northbound left movement has a 0.308 v/c ratio and a delay of 79.4 seconds in the Weekday AM peak hour, and a 0.386 v/c ratio and a delay of 105.6 seconds in the Weekday PM peak hour. Additionally, the southbound left movement has a 0.143 v/c ratio and a delay of 81.7 seconds in the Weekday AM peak hour, and a 0.154 v/c ratio and a delay of 80.7 seconds in the Weekday PM peak hour. The increased delays at the northbound left and southbound left movements suggest that drivers are having to wait to find enough gaps between the high westbound and eastbound through-volumes to conveniently make a left turn. However, the vehicle queues can be contained within the project site.

Table 10: Automobile Level of Service, Existing Plus Project Conditions

#	Intersection	Traffic Control	Existing				Existing Plus Project				Weekday AM	Weekday PM
			Weekday AM		Weekday PM		Weekday AM		Weekday PM			
			Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay Increase (Sec)	Delay Increase (Sec)
1	Hesperian Boulevard/Industrial Parkway W	Signalized	34.5	C	40.7	D	34.6	C	40.9	D	0.1	0.2
2	Hopkins Street/Industrial Parkway W*	TWSC	**72.7**	**F**	**79.5**	**F**	**79.4**	**F**	**105.6**	**F**	6.7	26.1
3	I-880 SB Ramps/ Industrial Parkway W	Signalized	23.9	C	23.3	C	23.9	C	23.4	C	0.0	0.1
4	I-880 NB On-Ramp/Industrial Parkway W[1]	Yield Controlled for WBR	14.6	B	13.1	B	25.6	D	21.3	C	11.0	8.2
5	Project Driveway /Claremont Court	AWSC	9.3	A	9.2	A	9.4	A	9.3	A	0.1	0.1

Source: Kittelson & Associates, Inc. 2024
TWSC = Two Way Stop Controlled, AWSC = All Way Stop Controlled
[1] HCM 7th requires at least one stop-controlled approach at the intersection. As I-880 NB On-Ramp/Industrial Parkway W does not meet this requirement, HCM 2000 was used to analyze the intersection. Results reflect the eastbound left-turn movement LOS and delay.
Highlighted **bold** text signifies unacceptable operations. *The delay and LOS for the Hopkins Street/Industrial Parkway W intersection corresponds to the worst project-related movement, e.g., northbound-left.





Existing Plus Project Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
11

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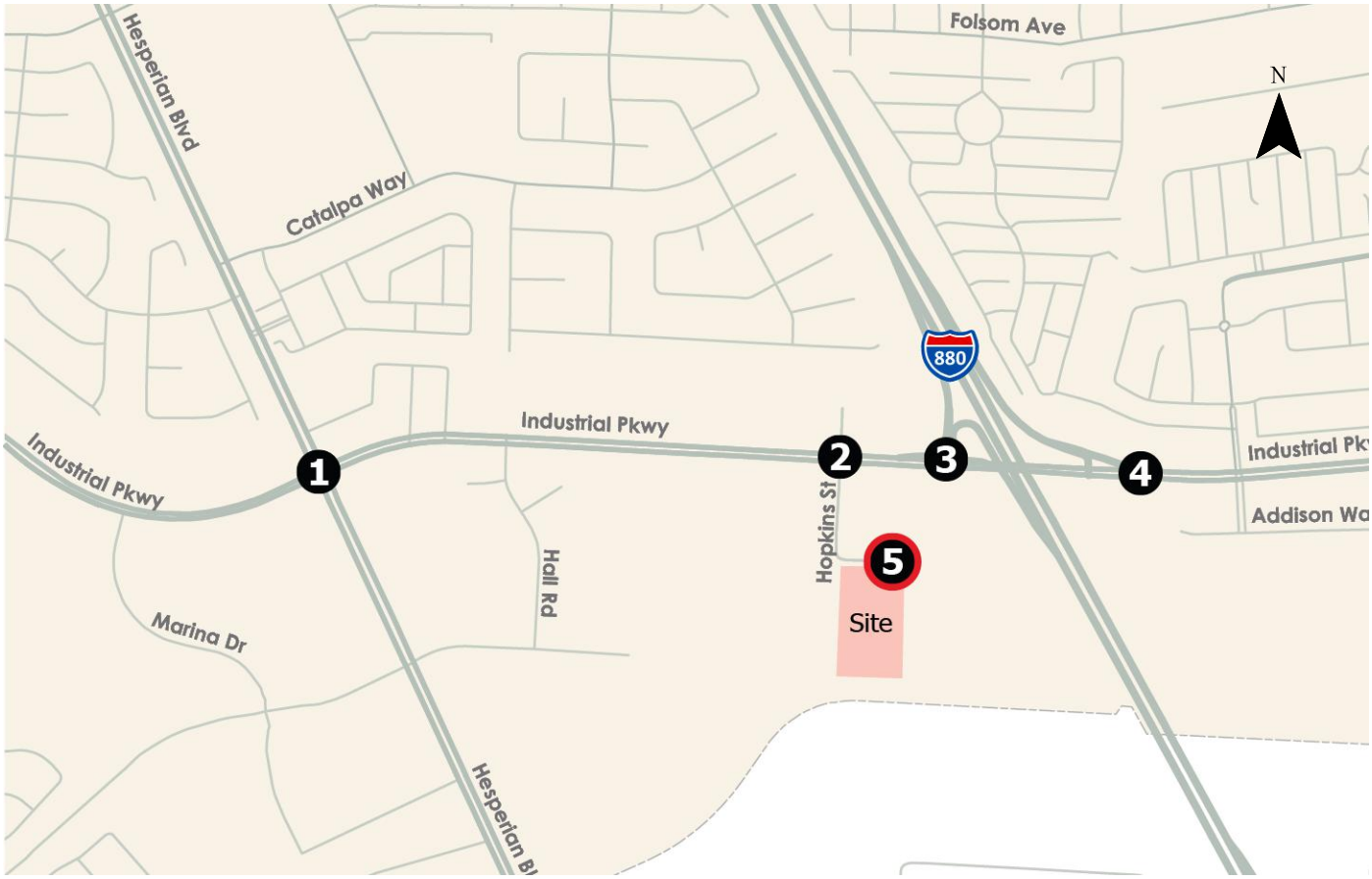

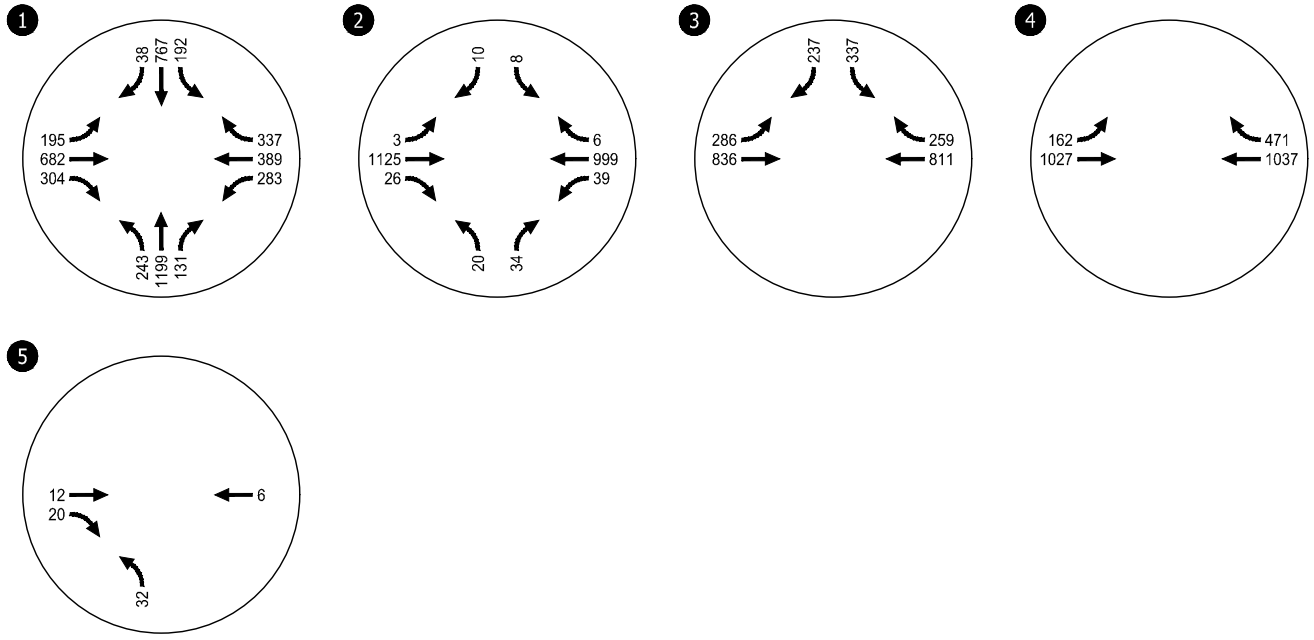

Existing Plus Project Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
12

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3.2 EXISTING PLUS PROJECT TRAFFIC SIGNAL WARRANTS

3.2.1 Traffic Signal Warrants

Traffic signal warrants are standards that provide guidelines in the determination of the need for a traffic signal. A traffic signal should not be installed if no warrants are met, since the installation of traffic signals may increase delays for the majority of through traffic and may increase the potential for accidents.

As stated in the FHWA/Caltrans 2014 California Manual of Uniform Traffic Control Devices (CA-MUTCD), "An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location. The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants and other factors related to existing operation and safety at the study location:

- Warrant 1, Eight-Hour Vehicular Volume.
- Warrant 2, Four-Hour Vehicular Volume.
- Warrant 3, Peak Hour.
- Warrant 4, Pedestrian Volume.
- Warrant 5, School Crossing.
- Warrant 6, Coordinated Signal System.
- Warrant 7, Crash Experience.
- Warrant 8, Roadway Network.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

This traffic impact analysis did not evaluate the full panoply of warrants for traffic signals, but instead focused on the peak hour warrant. The peak hour warrant is being used in this study as an "indicator" of the likelihood of an existing or future unsignalized intersection warranting a traffic signal. Intersections that fail to exceed the peak hour warrant are considered (for the purposes of this impact analysis) to be unlikely to meet one or more of the other signal warrants (such as the 4-hour or 8-hour warrants). However, this does not mean that a signal is definitely unwarranted. A signal may be warranted by other criteria, some of which cannot be known until the intersection is constructed and operational. This peak hour analysis is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction.

As discussed in Section 1.1.1, the need for improvements at unsignalized intersections is based on LOS and delay, and whether any of the following are met:

- Traffic signal warrant,
- Pedestrian signal warrant, or
- All-way stop warrant

Note that solely triggering a warrant does not trigger the need for an intersection improvement, but the City will at its discretion require or not require a signal be installed, where warranted.

Regardless of intersection control, per the City of Hayward Transportation Impact Analysis Guidelines (2020), improvements would be required at an intersection already operating at LOS F under an Existing or No Project scenario if the addition of project traffic results in an increase of 5.0 seconds or more in the intersection's average control delay. Unsignalized intersections were evaluated using the Peak Hour Volume Warrant (Warrant No. 3) in the CA-MUTCD. Even if the Peak Hour Volume Warrant is met, a more detailed signal warrant study is recommended before a signal is installed. The more detailed study should consider volumes during the daily peak hours of roadway traffic, pedestrian traffic, and collision histories. **Table 11** presents a summary of the traffic signal warrants for the Existing Conditions scenario. **Appendix F** contains the existing plus project traffic signal warrant worksheets.

As shown in **Table 11**, the Hopkins Street/Industrial Parkway W study intersection does not meet the peak hour signal warrant.

Table 11: Traffic Signal Peak Hour Warrants, Existing Plus Project Conditions

#	Intersection	Traffic Control	Peak Hour	Warrant Met?
2	Hopkins Street/Industrial Parkway W	TWSC	AM	No
			PM	No

Source: Kittelson & Associates, Inc. 2024
Based on California MUTCD Peak Hour Warrant.

3.3 EXISTING PLUS PROJECT QUEUE STORAGE SERVICE

The 95th percentile queues at the study intersections were reviewed to identify locations where these may exceed the available storage. No movements were found to queue beyond the available storage capacity at the 95th percentile demand level under Existing Plus Project conditions, as shown in **Table 12** and **Table 13**. A summary of the intersection turn lane queue storage and intersection queues in all of the study scenarios can be found in Appendix C**.**

Table 12: Queue Storage Service, Existing Plus Project Conditions (AM)

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Feet)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	50.0	2.1	NO
		EBR	100	4	0.0	0.0	NO
		WBL	230	9.2	175.0	6.7	NO
		NBL	500	20	175.0	6.8	NO
		SBL	200	8	150.0	5.9	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	0.1	NO
		WBL	75	3	0.0	0.3	NO
		NBL	515	20.6	25.0	1.1	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	100.0	4.2	NO
		WBR	100	4	75.0	3.1	NO
		SBR	350	14	0.0	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	50.0	2.1	NO

Source: Kittelson & Associates, Inc. 2024

Table 13: Queue Storage Service, Existing Plus Project Conditions (PM)

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Feet)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	150.0	5.6	NO
		EBR	100	4	0.0	0.0	NO
		WBL	230	9.2	200.0	7.9	NO
		NBL	500	20	175.0	7.1	NO
		SBL	200	8	150.0	5.6	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	0.0	NO
		WBL	75	3	0.0	0.3	NO
		NBL	515	20.6	25.0	1.4	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	300.0	11.6	NO
		WBR	100	4	100.0	3.9	NO
		SBR	350	14	0.0	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	50.0	2.2	NO

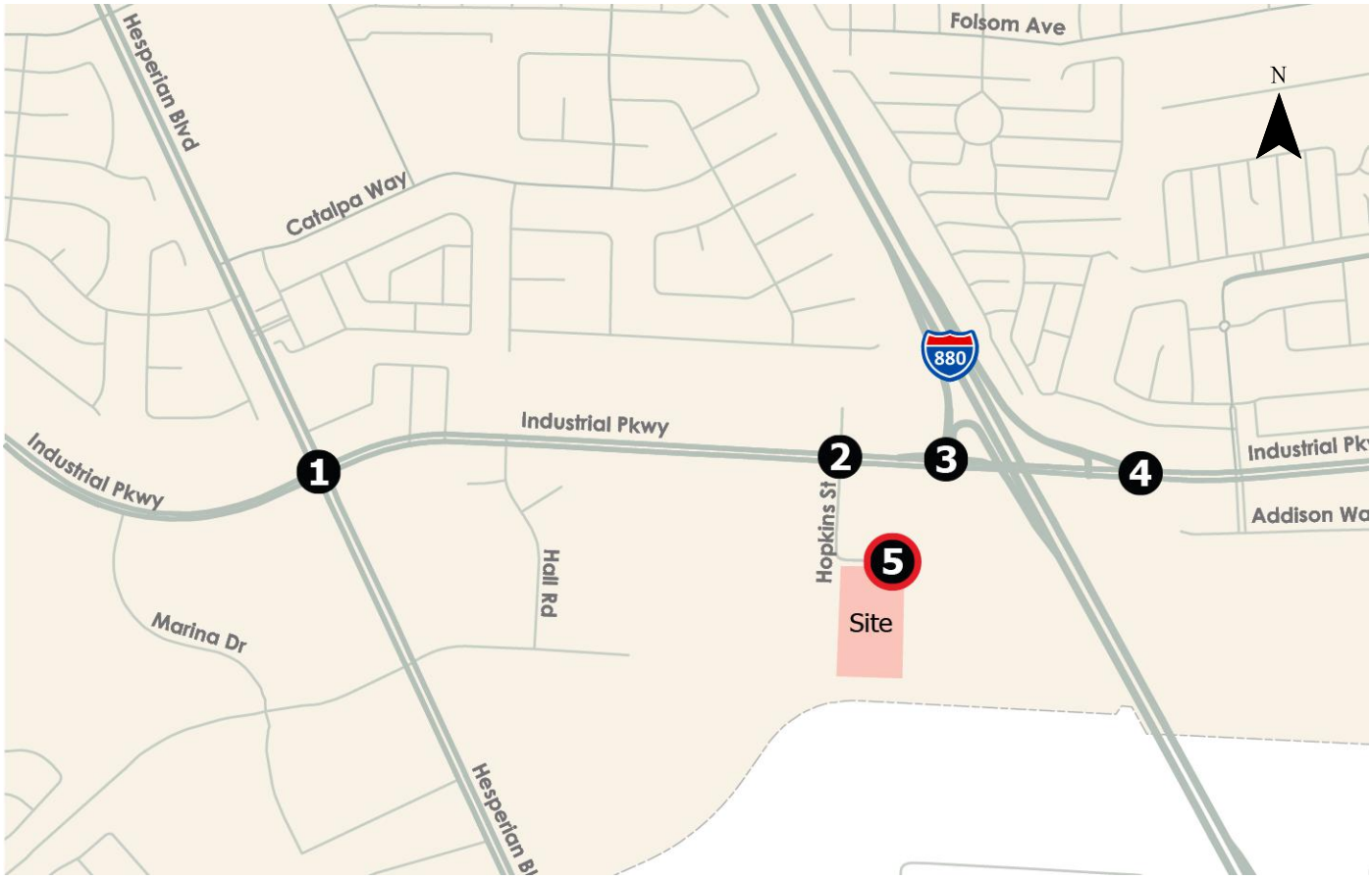
Source: Kittelson & Associates, Inc. 2024

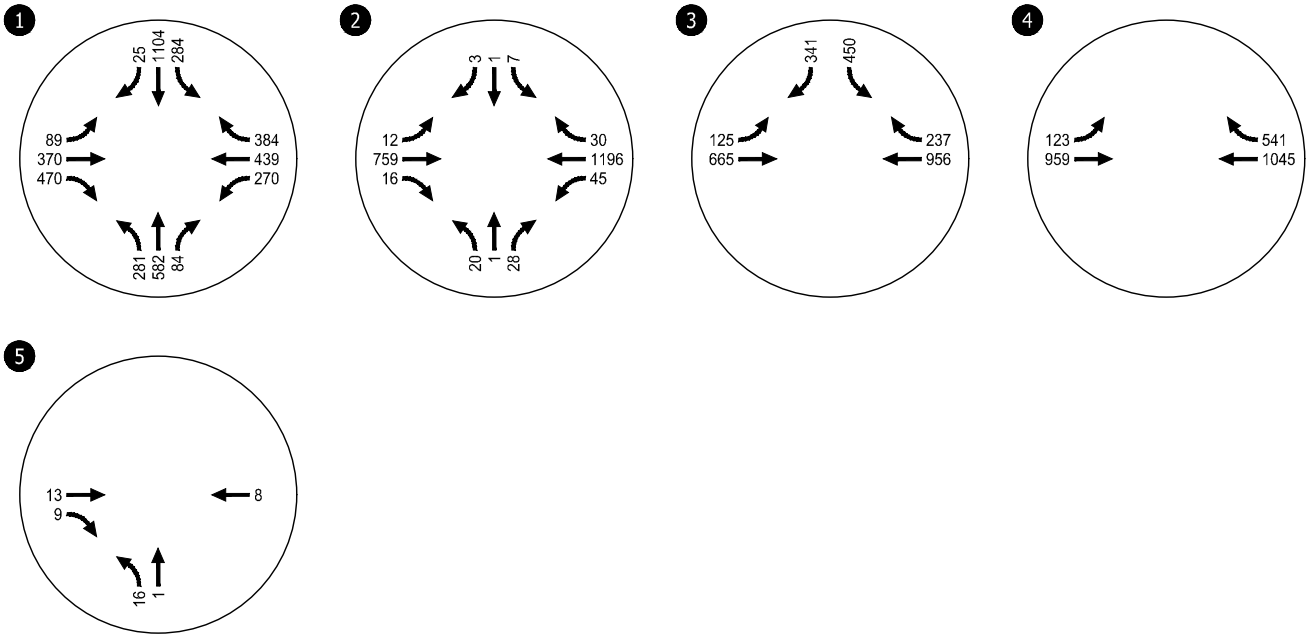
4 Background Traffic Conditions

The potential operational effects on the transportation system were evaluated under the Background Year 2029 Condition for non-CEQA local transportation analysis purposes. The year 2029 was selected for the background condition as it matches the anticipated opening year for the project. The operational deficiencies to the intersections were evaluated using projected peak hour traffic volumes derived from the Hayward General Plan Update version of the Alameda CTC Countywide Model. In addition, the background scenario includes recently approved nearby development projects, including traffic from the 31161 San Antonio Street Industrial, 1441 Industrial, and Ruus Road Projects

4.1 BACKGROUND DEMAND

Figure 13 presents the AM peak hour Background 2029 volumes and **Figure 14** presents the PM peak hour Background 2029 No Project volumes derived between an interpolation of existing volumes and the 2035 travel demand model forecasts described in Development of Future Travel Demand. The automobile turning movement counts for the Background Plus Project scenario were developed from the sum of the Background No Project volumes and the Project Only turning movements described in Section 2. **Figure 15** presents the AM peak hour Background Plus Project volumes, and **Figure 16** presents the PM peak hour Background Plus Project volumes.





Background Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
13

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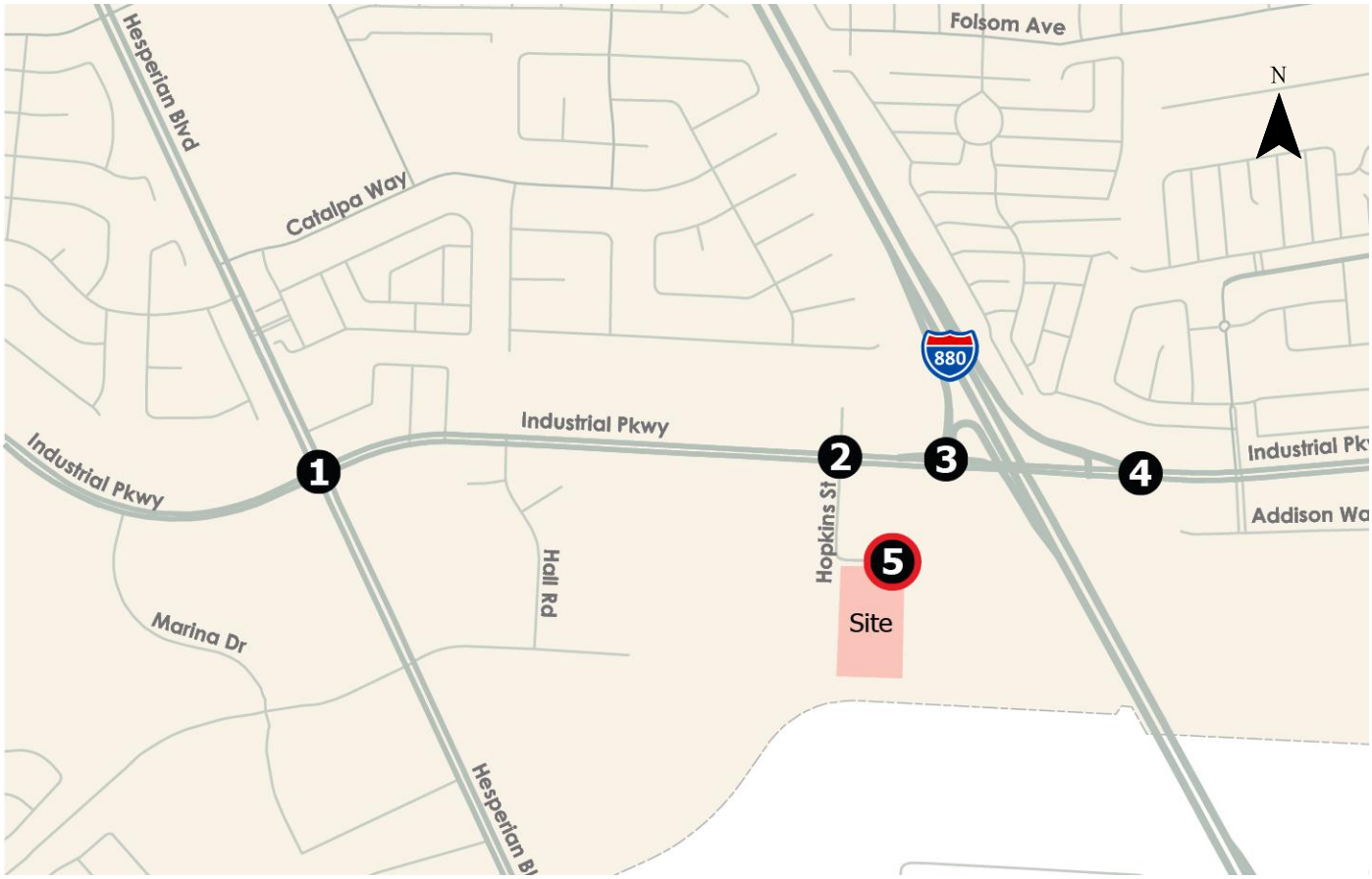

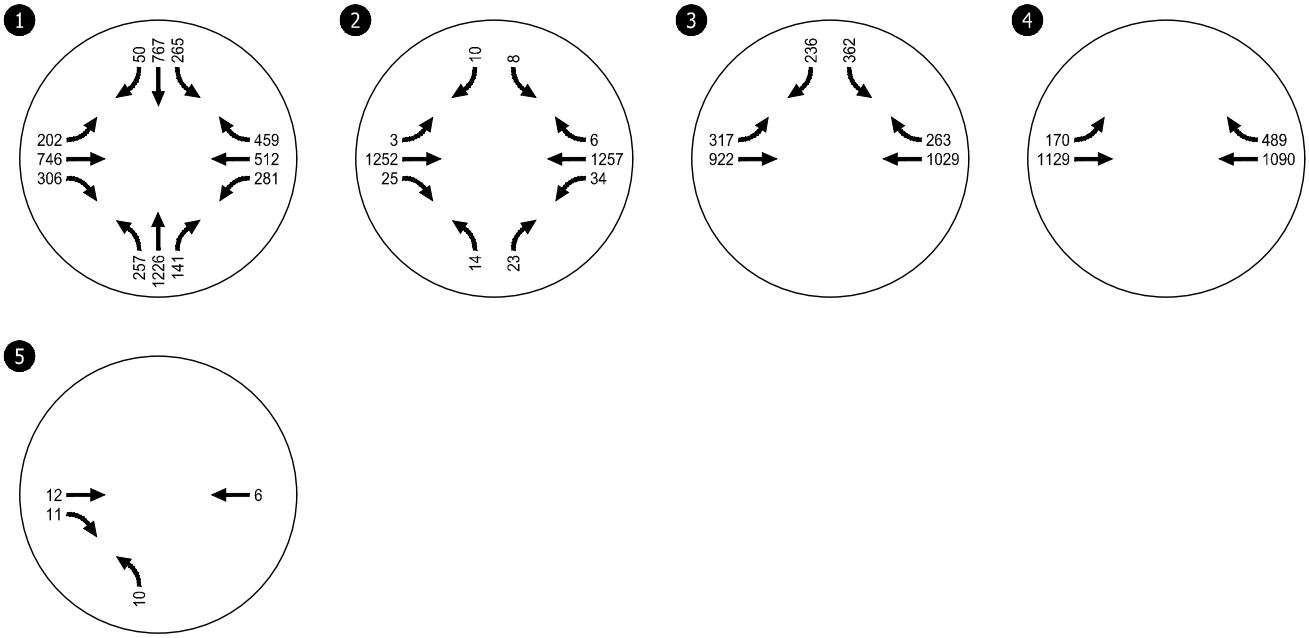

Background Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
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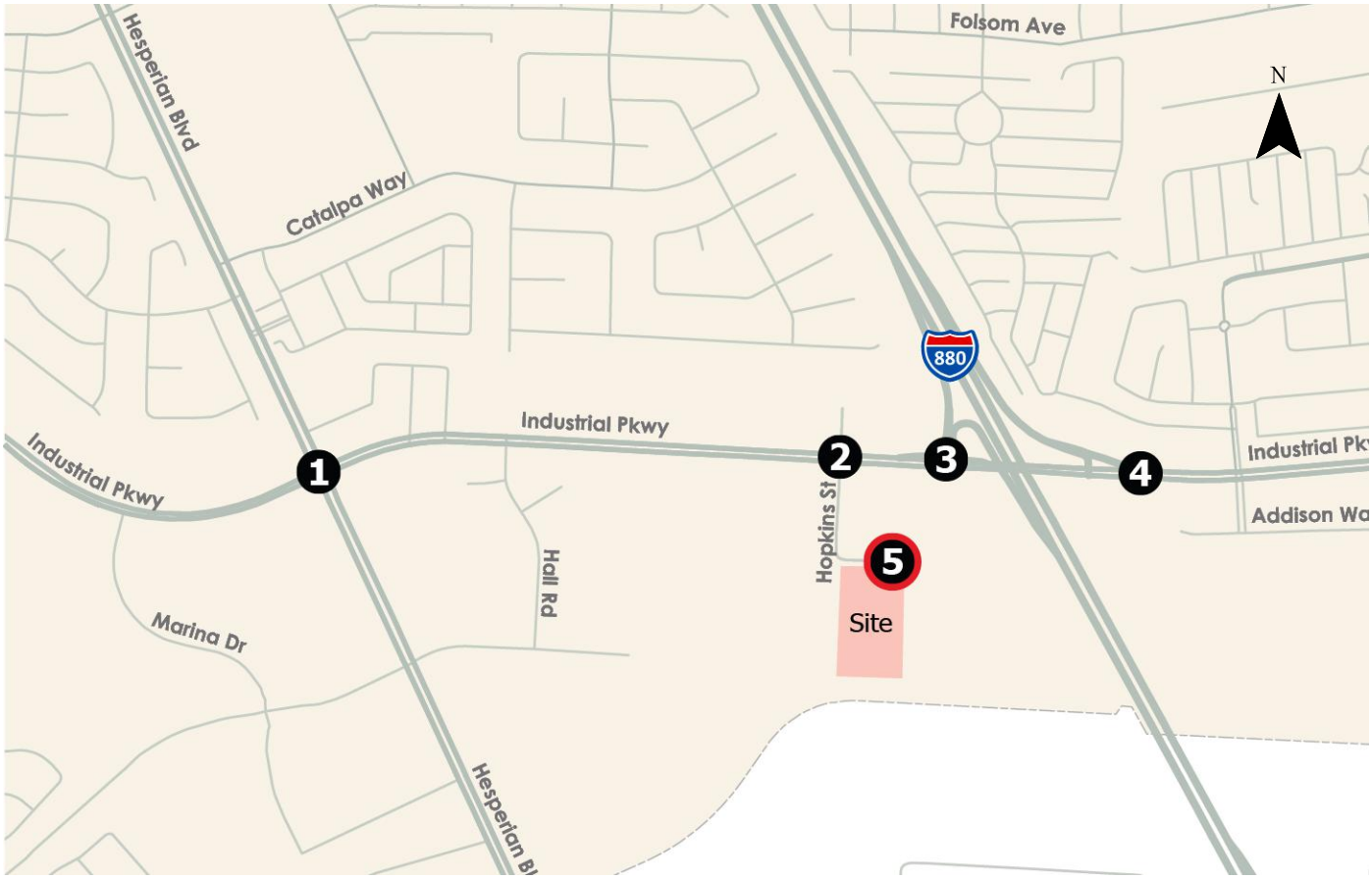

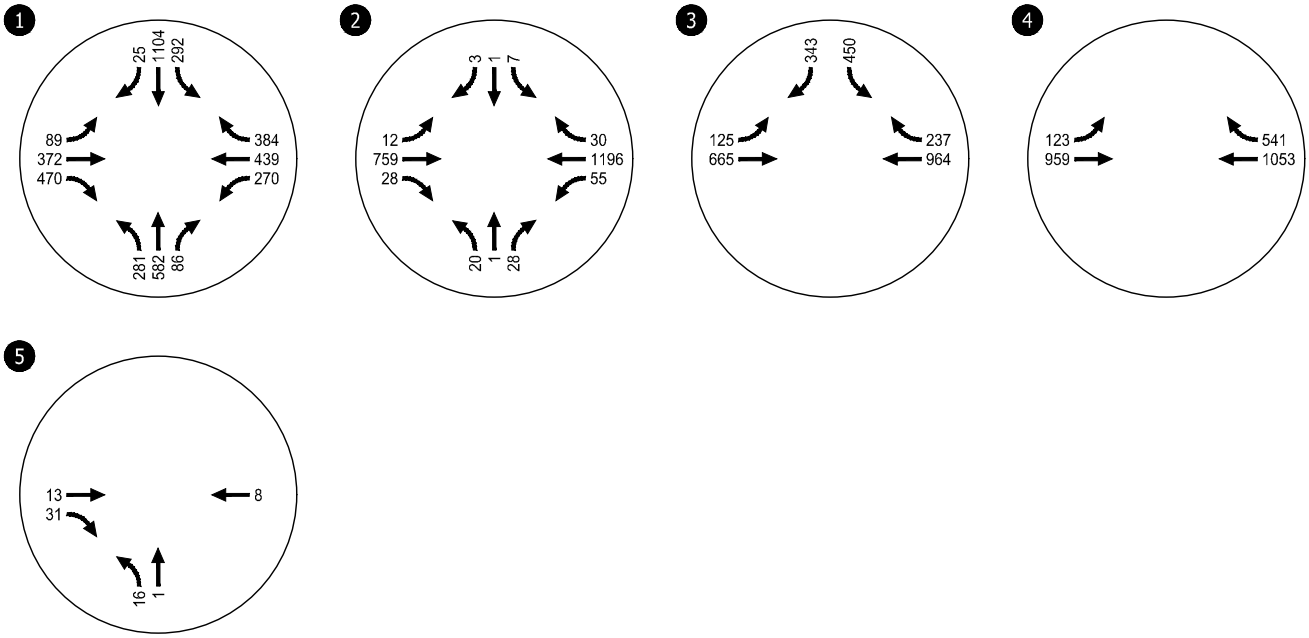

Background Plus Project Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
15

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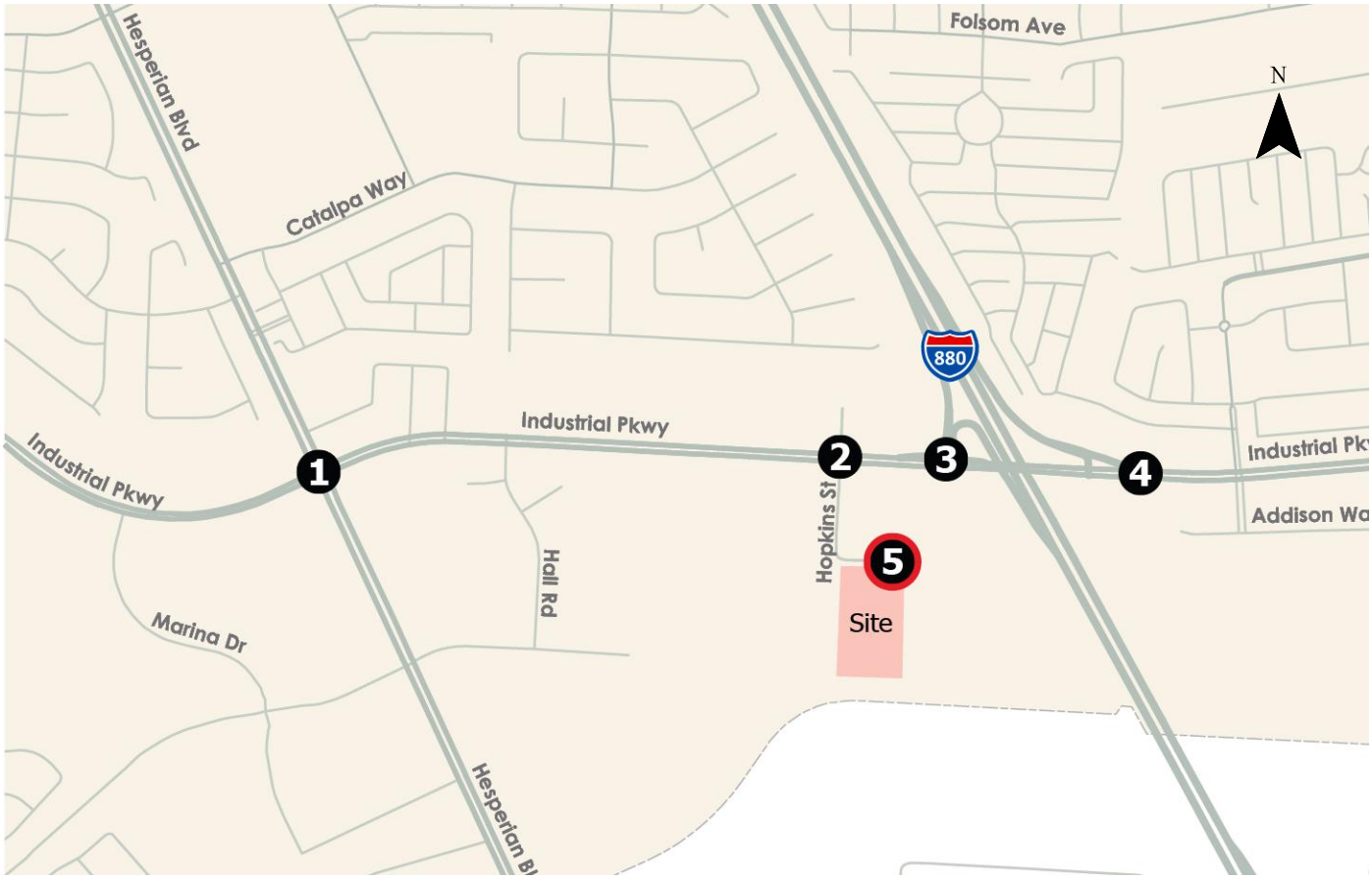

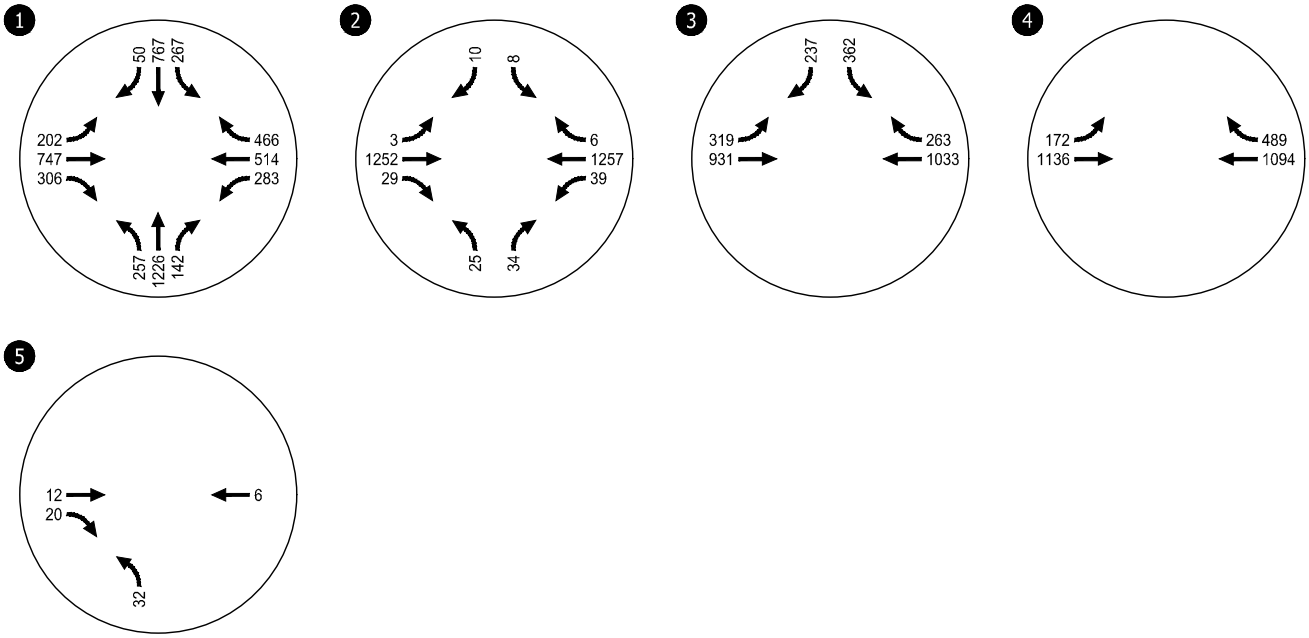

Background Plus Project Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
16

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4.2 BACKGROUND 2029 PLUS PROJECT AUTOMOBILE LEVEL OF SERVICE

Table 14 presents the Background 2029 and Background 2029 Plus Project delays and LOS for the study intersections. The table also compares the change in delay between the two scenarios. **Appendix G** and **Appendix H** contain the LOS and queueing worksheets for these scenarios.

Table 14: Automobile Level of Service, Year 2029 Background Plus Project Conditions

#	Intersection	Traffic Control	2029 Background				2029 Background Plus Project				Weekday AM	Weekday PM
			Weekday AM		Weekday PM		Weekday AM		Weekday PM			
			Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay Increase (Sec)	Delay Increase (Sec)
1	Hesperian Boulevard/ Industrial Parkway W	Signalized	39.7	D	45.7	D	39.8	D	45.9	D	0.1	0.2
2	Hopkins Street/Industrial Parkway W*	TWSC	**120.7**	**F**	**154.6**	**F**	**134.3**	**F**	**239.1**	**F**	**13.6**	**84.5**
3	I-880 SB Ramps/ Industrial Parkway W	Signalized	24.7	C	26.9	C	24.8	C	27	C	0.1	0.1
4	I-880 NB On-Ramp/Industrial Parkway W[1]	Yield Controlled for WBR	14.6	B	14	B	14.7	B	14.1	B	0.1	0.1
5	Project Driveway /Claremont Court	AWSC	9.3	A	9.2	A	9.4	A	9.3	A	0.1	0.1

Source: Kittelson & Associates, Inc. 2024
TWSC = Two Way Stop Controlled, AWSC = All Way Stop Controlled
[1] HCM 7th requires at least one stop-controlled approach at the intersection. As I-880 NB On-Ramp/Industrial Parkway W does not meet this requirement, HCM 2000 was used to analyze the intersection. Results reflect the eastbound left-turn movement LOS and delay.
Highlighted **bold** text signifies unacceptable operations. *The delay and LOS for the Hopkins Street/Industrial Parkway W intersection corresponds to the worst project-related movement, e.g., northbound-left.

As shown in **Table 14**, Hopkins Street/ Industrial Parkway W continues to be forecast to exceed the LOS standard during the weekday AM and weekday PM peak hours during both the 2029 Background conditions and the 2029 Background Plus Project conditions. In the Background conditions, the northbound left movement has a 0.433 v/c ratio and a delay of 120.7 seconds in the Weekday AM peak hour, and a 0.401 v/c ratio and a delay of 154.6 seconds in the Weekday PM peak hour. Additionally, the southbound left and southbound through-right movements experience a LOS F and E, respectively, with a v/c ratio of 0.2 and 0.043, respectively, in the Weekday AM peak hour. In the Weekday PM peak hour, the southbound left turn movement experiences a LOS F with a 145.6 second delay and a v/c ratio of 0.256. In the Background Plus Project conditions, the northbound left movement has a 0.466 v/c ratio and a delay of 134.3 seconds in the Weekday AM peak hour, and a 0.745 v/c ratio and a delay of 239.1 seconds in Weekday PM peak hour. The southbound left and through-right movements experience a LOS F and E, respectively, with a v/c ratio of 0.212 and 0.046, respectively, in the Weekday AM peak hour. In the Weekday PM peak hour, the southbound left turn movement experiences a LOS F with a 158.7 second delay and a v/c ratio of 0.274. The increased delays at the northbound left and southbound left movements suggest that drivers are having to wait to find enough gaps between the high westbound and eastbound through-volumes to conveniently make a left turn. However, the vehicle queues can be contained onsite.

The intersection of Hopkins Street/ Industrial Parkway W is forecast to operate at LOS F during the weekday AM and weekday PM peak hours under the Background Plus Project conditions and the project is anticipated to increase the intersection delay by more than 5 seconds during both peak hours.

Table 15 presents a summary of the traffic signal warrants for the Background Plus Project scenario. The peak hour signal warrant was analyzed for the Hopkins Street/ Industrial Parkway W intersection. As shown in **Table 15**, peak hour traffic signal warrants are not met for the weekday AM or weekday PM peak hours in the Background Plus Project conditions. **Appendix F** contains the background scenario traffic signal warrant worksheets.

Table 15: Traffic Signal Peak Hour Warrants, Background Plus Project Conditions

#	Intersection	Traffic Control	Peak Hour	Warrant Met?
2	Hopkins Street/Industrial Parkway W	TWSC	AM	No
			PM	No

Source: Kittelson & Associates, Inc. 2024
Based on California MUTCD Peak Hour Warrant.

4.3 BACKGROUND 2029 PLUS PROJECT QUEUE STORAGE

The 95th percentile queues at the study intersections were reviewed to identify locations where these may exceed the available storage. **Table 16** details the movements which were found to queue beyond the available storage capacity at the 95th percentile demand level under Background Plus Project conditions. A summary of the intersection turn lane queue storage and intersection queues can be found in Appendix C**.**

Table 16: Queue Lengths in Excess of Capacity, Background Plus Project Conditions

#	Intersection	Movement	Peak Hour	Description
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EB L	PM	Storage is exceeded in the Background PM condition and the Background Plus Project PM condition. The project is not contributing to the queue spillover. Queues spill past the available striped storage by one vehicle length but are contained within the turn lane before the taper begins.
		SB L	AM	Storage is exceeded in the Background Plus Project AM condition. The project contributes less than one vehicle to the SB L queue. Queues spill past the available striped storage by one vehicle length but are contained within the turn lane before the taper begins.
			PM	Storage is exceeded in the Background PM and the Background Plus Project PM conditions. The project is not contributing to the queue spillover.

#	Intersection	Movement	Peak Hour	Description
				Queues spill past the available striped storage by one vehicle length but are contained within the turn lane before the taper begins.
3	Industrial Pkwy W/I-880 SB Ramp	WB R	PM	Storage is exceeded in the Background PM and the Background Plus Project PM conditions. The project is not contributing to the queue spillover. Queues spill past the available striped storage by one vehicle length but are contained within the turn lane before the taper begins.

Source: Kittelson & Associates, Inc. 2024

5 Truck Analysis

Average daily traffic (ADT) counts were conducted at three (3) locations: Industrial Parkway West, west of Hesperian Boulevard, and Hesperian Boulevard north and south of Industrial Parkway W.

The ADT counts were conducted in October 2024. These counts were conducted to analyze the daily truck traffic under the long-range cumulative conditions at these locations and determine any potential impacts to the pavement index.

Table 17 shows that existing daily truck traffic at the three count locations varies between 2.2% and 9.0% of overall daily traffic.

The addition of truck terminal project would contribute to increase the daily truck traffic at the three count locations by up to 12.9%, however, the project's increase in total daily traffic due to the new truck trips would be less than 1%. As shown in the level of service analysis, the increase in truck traffic is not expected to have an adverse effect on traffic operations for the surrounding roadway network.

Table 17: Daily Truck Traffic: Project Share

#	Roadway Segment	Direction	Existing Conditions			Project Conditions			
			Average Daily Traffic	Daily Truck Traffic	Daily Truck %	Daily Project Truck Trips[1]	Increase in Truck Trips	Daily Truck % with Added Project Trucks	Increase in Daily Trips
1	Industrial Parkway W west of Hesperian Boulevard	EB	12,118	1,094	9.0%	14	1.3%	9.1%	0.1%
		WB	12,154	993	8.2%	9	0.9%	8.2%	0.1%
2	Hesperian Boulevard north of Industrial Boulevard/ Parkway	NB	14,512	319	2.2%	32	10.0%	2.4%	0.2%
		SB	13,161	348	2.6%	45	12.9%	3.0%	0.3%
3	Hesperian Boulevard south of Industrial Boulevard/ Parkway	NB	13,752	604	4.4%	14	2.3%	4.5%	0.1%
		SB	17,542	649	3.7%	9	1.4%	3.8%	0.05%

Source: Kittelson & Associates, Inc. 2024

[1] Based on the applicant's business and operations plan dated February 2024, 90% of trips were considered truck traffic. Appendix J contains the business and operations plan.

Traffic Index (TI) is a measure of the deteriorating effects that truck traffic has on asphalt concrete pavement. The traffic index was calculated at the three roadway segments for the daily project truck trips.

Table 18 shows that the TI for the three count locations vary between 6.5 and 7.5. Caltrans requires the minimum traffic index required for "light ramp truck" conditions to be less than 8.0. Therefore, the TIs at these three count locations are not expected to have an adverse effect on the asphalt concrete pavement and the existing streets are expected to handle the increased truck traffic.

Table 18: Traffic Index

#	Roadway Segment	Daily Project Truck Trips	ESALs Constant[1]	ESAL (A) x (B)	TI [2]	CalTrans Standard[3]
1	Industrial Parkway W west of Hesperian Boulevard	23	3,680	84,640	6.5	8.0
2	Hesperian Boulevard north of Industrial Boulevard/ Parkway	77	3,680	283,360	7.5	8.0
3	Hesperian Boulevard south of Industrial Boulevard/ Parkway	23	3,680	84,640	6.5	8.0

Source: Kittelson & Associates, Inc. 2024, and Caltrans Highway Design Manual Chapter 610 Pavement Engineering Consideration (2022)
[1] Equivalent Single Axle Load for 20-year constant; ESAL totals already adjusted for lane distribution factor; Table 613.3A of the Caltrans Highway Design Manual Chapter 610 Pavement Engineering Consideration (2022)
[2] Table 613.3C of the Caltrans Highway Design Manual Chapter 610 Pavement Engineering Consideration (2022)
[3] Table 613.4A of the Caltrans Highway Design Manual Chapter 610 Pavement Engineering Consideration (2022), Light Ramp chosen to be the most conservative for this analysis.

Cumulative Forecast volumes were extracted from the Hayward General Plan version of the Alameda CTC Countywide Model for the pavement Traffic Index (TI) and Air Quality and Noise analyses. These volumes are presented in Appendix I. The year 2035 represents the City of Hayward general plan buildout year and was selected for the cumulative condition. In addition, the cumulative scenario includes recently approved nearby development projects, including traffic from the 31161 San Antonio Street Industrial, 1441 Industrial, and Ruus Road Projects.

6 Circulation and Access

This section provides an overview of other transportation issues associated with the project, including site access and on-site circulation.

6.1 PARKING

The City of Hayward Off-Street Parking Regulations require one parking space per 2,000 square feet for an industrial use. In total, the project will need 22 parking spaces. The project would provide 48 standard parking stalls, thus meeting and exceeding the City parking requirements.

6.2 TRUCK ACCESS

The nearest fire station (Hayward Fire Department Station #4) is located approximately 1 mile northwest of the project site at 27836 Loyola Avenue, Hayward. The curb radii at the site driveway can accommodate the turning radius of a City fire truck. Per City requirements, all driveways and drive aisles are at least 20 feet wide and would accommodate Emergency Vehicle access. Therefore, smaller emergency trucks and vans would also be able to access the parking garage.

The civil plan set prepared by the applicant's engineer for the development will document the design of the vehicle driveway and internal circulation for trucks and emergency vehicles.

6.3 PASSENGER ACCESS

Turning templates were not prepared for passenger vehicles, since the fire truck and semitrailer templates prepared in the civil plan set represent the largest vehicles expected to enter and exit the site. Given the results of the truck turning templates, it is expected that the driveways and drive aisles are sufficient to accommodate passenger vehicles. In addition, the exiting vehicle queues at the project driveway is not expected to exceed the available storage nor conflict with internal site intersections; therefore, no conflict is expected between exiting queuing vehicles, parking spaces, and internal drive aisle intersections. In addition, a single outbound lane at the driveways (to be shared by outbound left and right turns) is sufficient.

6.4 PEDESTRIAN AND BICYCLES

As discussed in Section 1.3, there are limited sidewalks along the project site. Sidewalks are generally present on both sides of Hesperian Boulevard and Industrial Parkway W. No sidewalks are present along Hopkins Street north of Industrial Parkway W or Claremont Court. The roadways in the study area mostly traverse light industrial and commercial land uses, and most of the arterials and collectors are designated truck routes. Thus, pedestrian-oriented uses are generally not prioritized in the area. No additional pedestrian infrastructure is proposed as part of site development. The project would not generate activities that would interfere with access or circulation for people walking.

As discussed in Section 1.3, the project site is accessible by a Class III bike route on Industrial Boulevard and Industrial Parkway west of Hopkins street. No additional bicycle infrastructure is proposed as part of site development. The project would not generate activities that would interfere with access or circulation for people biking.

The proposed project would not conflict with a program, plan, ordinance, or policy addressing the pedestrian and bicycle circulation systems, and impacts would be less-than-significant.

6.5 SIGHT DISTANCE

Table 19 summarizes the guidance provided in the American Association of State Highway and Transportation Officials (AASHTO) Green Book, 2018 for intersection sight distance (ISD).

Table 19: Site Driveway Required ISD Sight Distances

#	Site Driveway	Posted Roadway Speed	AASHTO Sight Distance Standards
5	Claremont Court	25 MPH	Right turn from a stop: 240 feet Left turn from a stop: 280 feet

A review of the site driveway found no obstructions limiting adequate visibility for drivers. Claremont Court is a cul-de-sac that terminates at the site driveway and experiences low traffic volumes, with most trips anticipated to be related to the project. Therefore, sight distance at the site driveway is expected to be sufficient.

Landscaping, above ground utilities, and any signage should be located and maintained in a manner that preserves adequate intersection sight distance.

8 VMT Analysis

Senate Bill 743 (SB 743) was signed into law in September 2013 and requires changes to guidelines for the California Environmental Quality Act (CEQA). Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for CEQA analysis. For land use and transportation projects, SB 743-compliant CEQA analysis based on vehicle miles travel (VMT) became mandatory on July 1, 2020. Residential projects are assessed based on VMT per capita, and commercial/office/industrial projects are assessed based on VMT per employment.

The City of Hayward has developed guidelines for VMT thresholds of significance and screening criteria. Based on the City's VMT guideline maps, the project is located in an area that has below average VMT per employee. Therefore, it is not expected that the project will result in a significant impact to VMT under CEQA and is therefore less than significant (LTS).

The VMT analysis can be found as part of the Project Scoping and VMT Analysis memorandum, dated December 2 2024 included in **Appendix K.**.

9 Findings

The following recommendations for the LTA outside CEQA requirements were made to be incorporated as part of this Project to improve circulation and address potential deficiencies to the circulation network:

All Conditions:

- Ensure that the Project access at the Project Driveway and Claremont Court is designed for pedestrian visibility safety (e.g., sidewalks clearly delineated, improved visibility by minimizing tree overhangs, bushes, and large signs).

Background Conditions:

- Consider intersection control options at the Hopkins Street/Industrial Parkway W (TWSC) as the intersection operates at LOS F during all study scenarios during the AM and PM peak hour periods. Consider use of "KEEP CLEAR" pavement markings and/or supplementation signage in order to establish a clear zone within the intersection to allow for northbound project traffic to enter the intersection and improve overall intersection LOS.

Truck Traffic Index:

- The calculated pavement truck traffic index (TI) with the proposed project would not exceed the Caltrans threshold for typical light ramp traffic of 8.0.

VMT Assessment

- Under CEQA, the proposed project is located in an area that has below average VMT per employee. Therefore, it is not expected that the project will result in a significant impact to VMT under CEQA and is therefore less than significant (LTS).

Appendix A Count Sheets

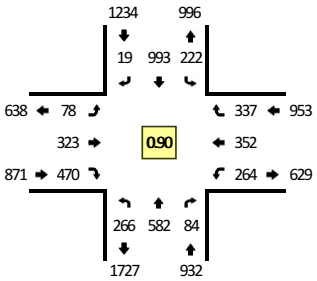
Type of peak hour being reported: Intersection Peak

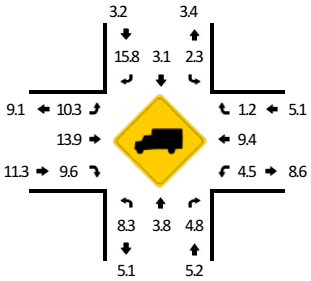
Method for determining peak hour: Total Entering Volume

LOCATION: Hesperian Blvd -- Industrial Blvd/Industrial Pkwy W
CITY/STATE: Hayward, CA

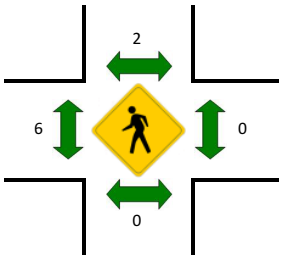
QC JOB #: 16788201
DATE: Thu, Oct 10 2024

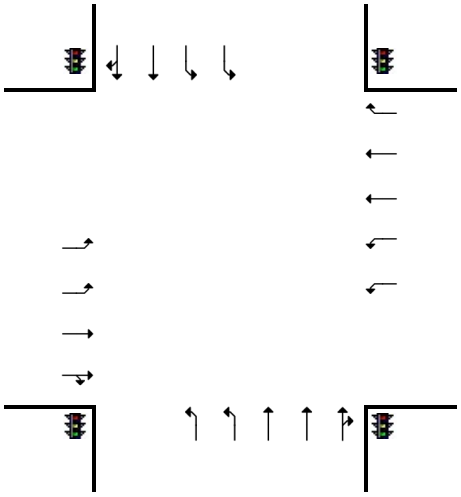
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

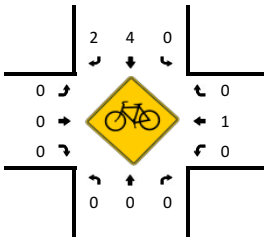


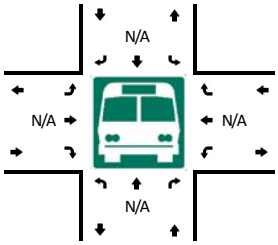


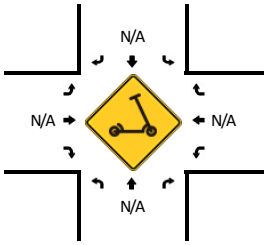
TRUE DATA TO IMPROVE MOBILITY











5-Min Count Period Beginning At	Hesperian Blvd (Northbound)				Hesperian Blvd (Southbound)				Industrial Blvd/Industrial Pkwy W (Eastbound)				Industrial Blvd/Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	10	23	3	0	13	106	3	0	2	20	26	0	6	13	12	0	237	
7:05 AM	15	9	4	0	11	87	1	0	1	19	17	0	20	23	8	0	215	
7:10 AM	19	15	4	0	10	73	0	1	2	21	25	0	17	22	15	0	224	
7:15 AM	28	31	7	0	24	86	1	0	4	13	25	0	9	15	13	0	256	
7:20 AM	10	23	5	0	16	93	1	0	3	23	29	0	16	29	9	0	257	
7:25 AM	13	28	5	0	9	64	1	0	1	30	39	0	19	31	13	0	253	
7:30 AM	21	33	10	0	22	88	0	0	5	15	27	0	12	28	4	0	265	
7:35 AM	9	28	13	0	16	114	2	0	0	19	28	0	8	17	11	0	265	
7:40 AM	13	51	6	0	23	74	2	0	6	38	23	0	21	28	17	0	302	
7:45 AM	32	41	8	0	21	70	1	0	6	34	32	0	10	33	25	0	313	
7:50 AM	23	51	14	0	15	117	3	0	3	14	48	0	14	25	23	0	350	
7:55 AM	17	48	4	0	9	61	1	0	2	33	48	0	19	40	29	0	311	3248
8:00 AM	29	42	7	0	7	63	1	0	9	27	43	0	21	20	16	0	285	3296
8:05 AM	23	74	5	0	17	90	1	0	7	16	42	0	16	23	32	0	346	3427
8:10 AM	22	52	8	0	10	90	1	0	12	19	47	1	34	26	35	0	357	3560
8:15 AM	19	47	12	0	20	86	2	0	5	40	46	0	7	38	42	0	364	3668
8:20 AM	17	53	6	0	24	102	5	0	9	22	42	0	28	25	45	0	378	3789
8:25 AM	23	49	3	0	20	89	1	0	8	27	33	0	41	33	37	0	364	3900
8:30 AM	16	32	5	0	13	74	1	0	10	37	41	0	26	30	21	0	306	3941
8:35 AM	32	42	6	0	43	77	0	0	0	16	25	0	27	31	15	0	314	3990
8:40 AM	18	50	8	0	16	97	2	0	5	20	24	0	25	16	20	0	301	3989
8:45 AM	19	32	11	0	11	52	1	0	18	25	28	0	18	37	19	0	271	3947
8:50 AM	23	34	10	0	9	60	2	0	5	13	21	0	17	20	15	0	229	3826
8:55 AM	16	39	3	0	13	65	4	0	1	14	20	0	16	9	13	0	213	3728

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	236	596	84	0	256	1108	32	0	88	356	484	0	304	384	496	0	4424
Heavy Trucks	20	12	8		0	36	4		8	40	56		4	36	4		228
Buses																	
Pedestrians		0				4				12				0			16
Bicycles	0	0	0		0	4	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

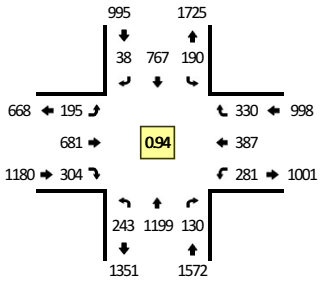
Type of peak hour being reported: Intersection Peak

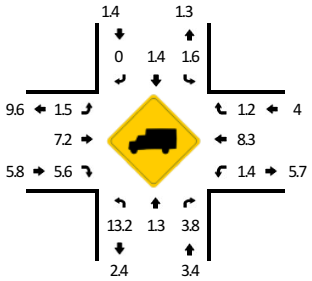
Method for determining peak hour: Total Entering Volume

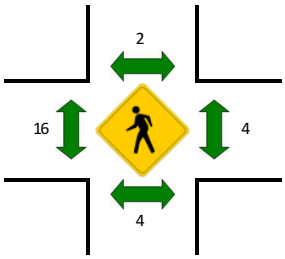
LOCATION: Hesperian Blvd -- Industrial Blvd/Industrial Pkwy W
CITY/STATE: Hayward, CA

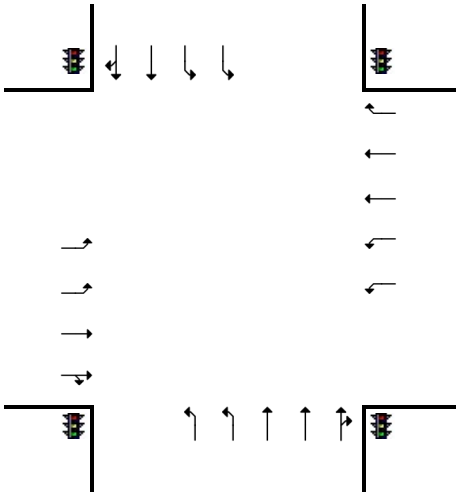
QC JOB #: 16788202
DATE: Thu, Oct 10 2024

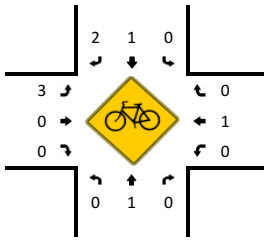
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

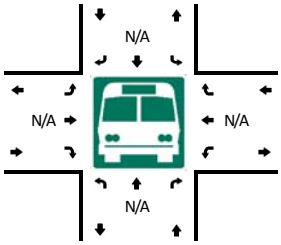


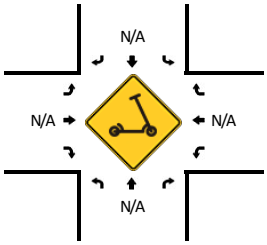












5-Min Count Period Beginning At	Hesperian Blvd (Northbound)				Hesperian Blvd (Southbound)				Industrial Blvd/Industrial Pkwy W (Eastbound)				Industrial Blvd/Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	17	101	15	0	13	60	2	1	9	42	21	0	24	43	16	0	364	
4:05 PM	25	117	17	1	15	44	3	1	13	44	15	0	24	27	24	0	370	
4:10 PM	29	100	16	2	16	59	5	0	18	65	22	0	31	35	25	0	423	
4:15 PM	21	96	15	0	15	33	2	0	12	59	29	0	26	27	32	1	368	
4:20 PM	21	104	13	0	7	57	1	1	10	41	16	0	21	48	37	0	377	
4:25 PM	22	104	12	1	16	59	1	0	14	45	24	0	24	36	22	0	380	
4:30 PM	23	94	7	0	23	59	4	1	7	56	27	0	16	47	35	0	399	
4:35 PM	20	116	10	0	16	74	3	0	13	51	29	1	20	25	25	0	403	
4:40 PM	25	108	11	0	11	57	3	0	17	46	27	0	22	35	24	0	386	
4:45 PM	25	88	9	0	12	50	2	1	13	57	31	0	25	35	28	0	376	
4:50 PM	22	85	8	0	7	45	1	1	28	50	22	1	26	37	34	0	367	
4:55 PM	18	100	14	0	11	58	6	0	11	67	20	0	13	39	29	0	386	4599
5:00 PM	21	101	7	0	13	52	4	1	13	55	30	0	21	27	23	0	368	4603
5:05 PM	16	118	6	0	21	68	1	0	13	62	20	0	22	24	30	0	401	4634
5:10 PM	21	126	14	0	16	76	3	0	14	62	21	0	20	24	33	0	430	4641
5:15 PM	17	102	10	0	18	67	3	0	19	53	34	0	21	43	26	0	413	4686
5:20 PM	29	104	12	0	18	60	3	0	18	51	36	0	28	29	28	0	416	4725
5:25 PM	20	91	3	0	11	72	1	0	22	58	16	0	33	37	17	0	381	4726
5:30 PM	18	98	8	0	14	53	2	0	15	70	33	0	25	37	42	0	415	4742
5:35 PM	17	92	11	0	14	63	2	0	16	65	27	0	27	29	24	1	388	4727
5:40 PM	23	76	18	0	21	60	3	0	17	42	19	0	23	36	30	0	368	4709
5:45 PM	19	100	17	0	14	76	3	0	20	45	23	0	19	34	29	0	399	4732
5:50 PM	24	91	10	0	18	62	7	0	17	51	25	0	28	28	19	0	380	4745
5:55 PM	17	99	10	0	10	49	2	0	18	38	25	0	27	24	19	0	338	4697

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	268	1328	144	0	208	812	36	0	204	664	364	0	276	384	348	0	5036
Heavy Trucks	20	28	8		4	4	0		8	36	16		8	40	0		172
Buses																	
Pedestrians		0				0				4				4			8
Bicycles	0	0	0		0	0	8		4	0	0		0	0	0		12
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

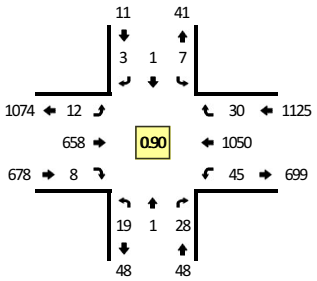
Type of peak hour being reported: Intersection Peak

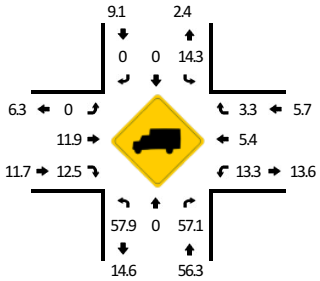
Method for determining peak hour: Total Entering Volume

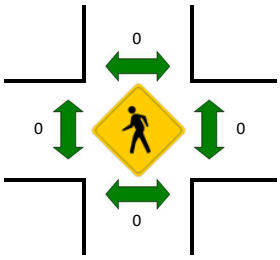
LOCATION: Hopkins St -- Industrial Pkwy W
CITY/STATE: Hayward, CA

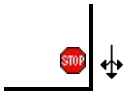
QC JOB #: 16788203
DATE: Thu, Oct 10 2024

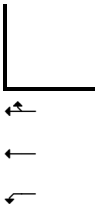
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

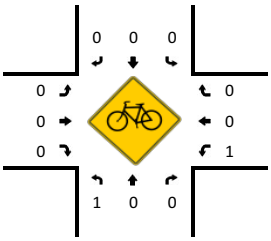


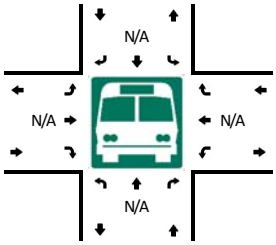


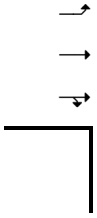


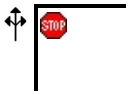


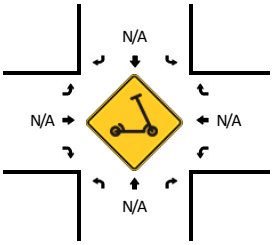












5-Min Count Period Beginning At	Hopkins St (Northbound)				Hopkins St (Southbound)				Industrial Pkwy W (Eastbound)				Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	1	0	0	50	0	0	3	53	0	0	107	
7:05 AM	0	0	5	0	2	0	0	0	0	41	1	0	1	48	1	0	99	
7:10 AM	0	0	4	0	0	0	0	0	0	39	1	0	3	62	1	0	110	
7:15 AM	0	0	3	0	1	0	0	0	0	45	0	0	5	46	1	0	101	
7:20 AM	1	0	0	0	0	0	0	0	0	58	1	0	4	65	3	0	132	
7:25 AM	0	0	5	0	0	0	0	0	0	43	0	0	5	55	3	0	111	
7:30 AM	2	0	3	0	0	0	0	0	1	53	0	0	8	44	1	1	113	
7:35 AM	1	0	4	0	0	0	0	0	0	60	1	0	3	56	1	0	126	
7:40 AM	0	0	4	0	1	0	0	0	0	65	0	0	3	67	1	0	141	
7:45 AM	1	0	3	0	0	0	0	0	2	70	0	0	4	72	2	0	154	
7:50 AM	1	1	3	0	1	0	0	0	3	52	3	0	7	77	1	0	149	
7:55 AM	3	0	1	0	0	1	0	0	0	46	1	0	2	101	3	1	159	1502
8:00 AM	1	0	1	0	0	0	0	0	0	34	0	1	3	78	6	0	124	1519
8:05 AM	2	0	1	0	2	0	1	0	2	44	0	0	6	83	1	0	142	1562
8:10 AM	0	0	4	0	0	0	0	0	0	53	0	0	2	98	2	0	159	1611
8:15 AM	2	0	0	0	0	0	1	0	1	63	0	1	3	86	2	1	160	1670
8:20 AM	1	0	2	0	1	0	0	0	0	47	0	0	2	131	6	1	191	1729
8:25 AM	2	0	5	0	1	0	0	0	1	69	1	0	0	84	2	0	165	1783
8:30 AM	2	0	3	0	1	0	0	0	0	50	0	0	4	87	1	2	150	1820
8:35 AM	3	0	2	0	0	0	0	0	0	60	2	0	5	92	2	1	167	1861
8:40 AM	1	0	3	0	1	0	1	0	1	70	1	0	1	61	2	0	142	1862
8:45 AM	1	0	3	0	1	0	1	0	1	58	0	0	5	57	2	0	129	1837
8:50 AM	0	0	4	0	0	0	0	0	4	33	1	0	7	51	1	0	101	1789
8:55 AM	1	0	4	0	0	0	0	0	1	33	1	0	3	47	0	0	90	1720

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	0	28	0	8	0	4	0	8	716	4	4	20	1204	40	8	2064
Heavy Trucks	12	0	24		0	0	0		0	60	0		4	48	0		148
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

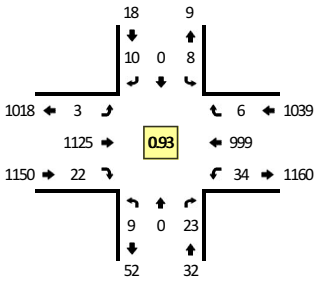
Type of peak hour being reported: Intersection Peak

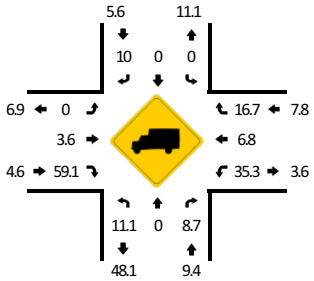
Method for determining peak hour: Total Entering Volume

LOCATION: Hopkins St -- Industrial Pkwy W
CITY/STATE: Hayward, CA

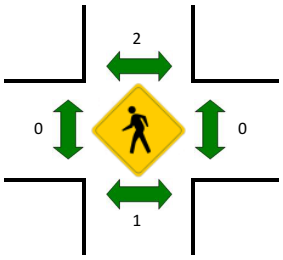
QC JOB #: 16788204
DATE: Thu, Oct 10 2024

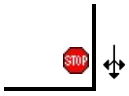
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

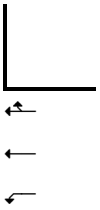


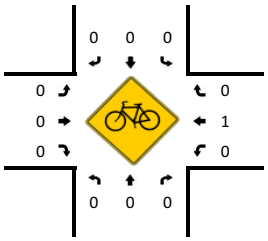


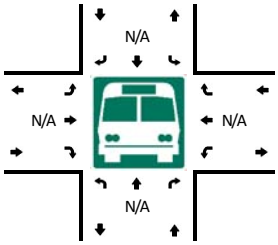
TRUE DATA TO IMPROVE MOBILITY

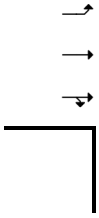


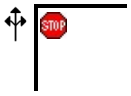


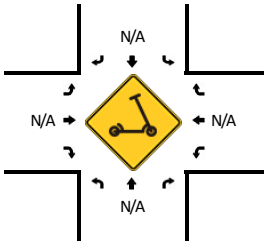












5-Min Count Period Beginning At	Hopkins St (Northbound)				Hopkins St (Southbound)				Industrial Pkwy W (Eastbound)				Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	4	0	0	0	1	0	0	100	0	0	2	83	0	0	192	
4:05 PM	2	0	4	0	1	0	1	0	1	95	0	0	2	75	1	0	182	
4:10 PM	0	0	1	0	1	0	1	0	1	121	1	0	1	90	1	0	218	
4:15 PM	1	0	3	0	1	0	1	0	0	96	0	0	2	83	1	0	188	
4:20 PM	0	0	2	0	0	0	1	0	0	64	1	0	3	101	1	0	173	
4:25 PM	1	0	2	0	2	0	2	0	0	92	1	0	4	94	0	0	198	
4:30 PM	0	0	2	0	0	0	2	0	0	91	1	0	5	83	0	0	184	
4:35 PM	0	0	2	0	1	0	0	0	0	108	2	0	3	83	1	0	200	
4:40 PM	0	0	3	0	1	0	1	0	0	82	1	0	2	74	1	2	167	
4:45 PM	1	0	2	0	1	0	0	0	1	99	3	0	5	93	1	0	206	
4:50 PM	2	0	0	0	0	0	0	0	1	71	2	0	3	66	0	0	145	
4:55 PM	0	0	3	0	0	0	0	0	0	93	1	0	2	81	0	2	182	2235
5:00 PM	0	0	1	0	1	0	0	0	0	100	1	0	1	66	1	0	171	2214
5:05 PM	1	0	2	0	1	0	2	0	0	104	4	0	2	79	2	0	197	2229
5:10 PM	4	0	1	0	0	0	3	0	1	110	3	0	0	84	0	0	206	2217
5:15 PM	0	0	2	0	0	0	0	0	0	94	0	0	1	103	0	0	200	2229
5:20 PM	0	0	3	0	1	0	0	0	0	81	3	0	2	93	0	0	183	2239
5:25 PM	1	0	4	0	0	0	0	0	0	91	1	0	2	80	0	0	179	2220
5:30 PM	0	0	1	0	0	0	0	0	0	85	2	0	2	68	0	0	158	2194
5:35 PM	1	0	1	0	1	0	0	0	0	87	0	0	1	104	0	1	196	2190
5:40 PM	0	0	5	0	0	0	0	0	0	97	2	0	2	92	0	0	198	2221
5:45 PM	1	0	5	0	1	0	0	0	2	89	3	0	2	70	0	0	173	2188
5:50 PM	1	0	4	0	0	0	0	0	0	89	1	0	4	94	0	0	193	2236
5:55 PM	0	0	3	0	0	0	0	0	0	61	1	0	1	83	1	4	154	2208

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	0	20	0	4	0	20	0	4	1232	28	0	12	1064	8	0	2412
Heavy Trucks	0	0	4		0	0	0		0	48	24		8	72	0		156
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

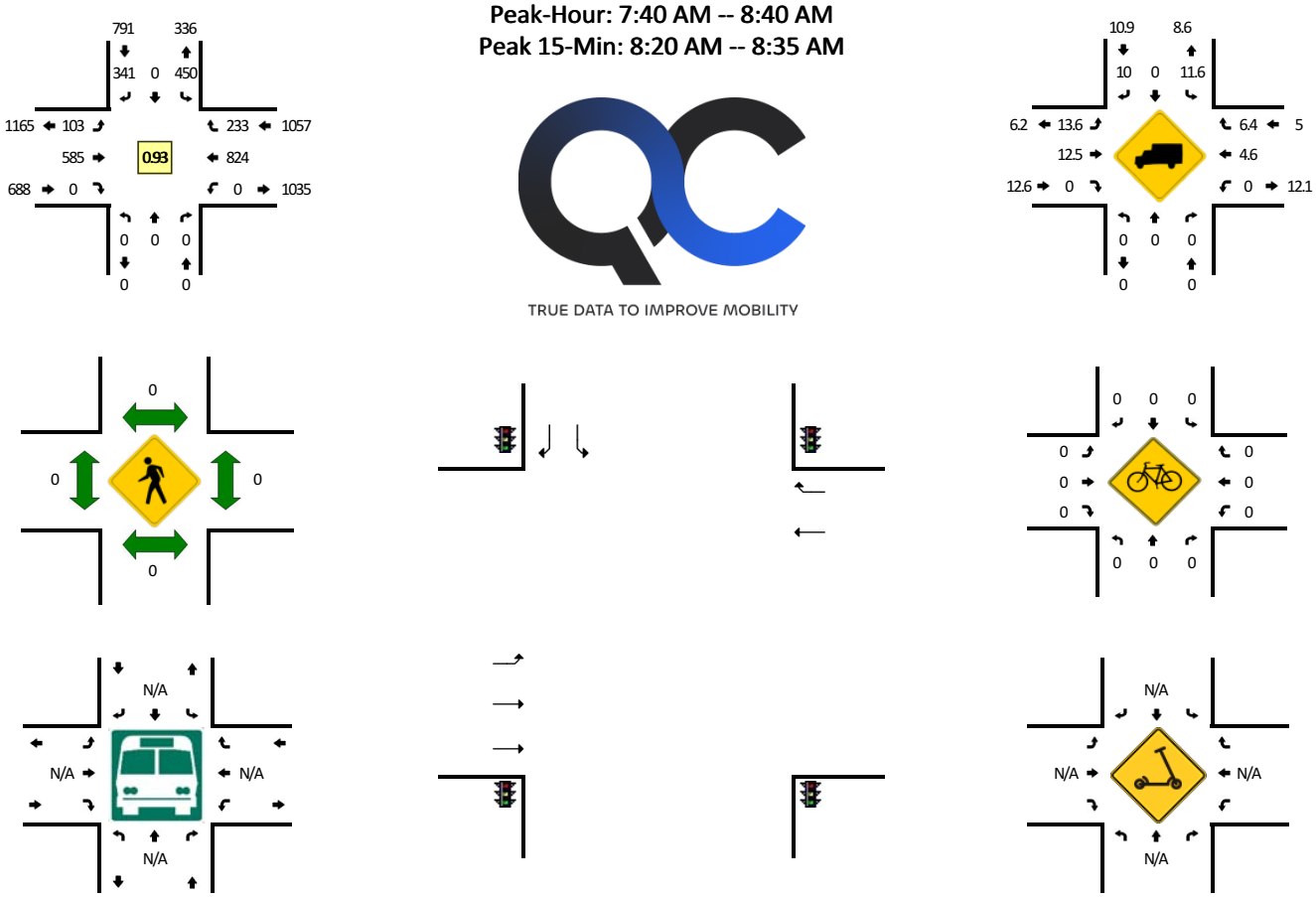
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: I-880 SB Ramps -- Industrial Pkwy W
CITY/STATE: Hayward, CA

QC JOB #: 16788205
DATE: Thu, Oct 10 2024

Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 8:20 AM -- 8:35 AM



TRUE DATA TO IMPROVE MOBILITY

5-Min Count Period Beginning At	I-880 SB Ramps (Northbound)				I-880 SB Ramps (Southbound)				Industrial Pkwy W (Eastbound)				Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	28	0	17	0	10	40	0	0	0	37	24	0	156	
7:05 AM	0	0	0	0	26	0	16	0	22	32	0	0	0	37	27	0	160	
7:10 AM	0	0	0	0	26	0	21	0	15	26	0	0	0	43	32	0	163	
7:15 AM	0	0	0	0	20	0	18	0	12	13	0	0	0	34	30	0	127	
7:20 AM	0	0	0	0	37	0	18	0	8	46	0	0	0	53	27	0	189	
7:25 AM	0	0	0	0	23	0	13	0	15	37	0	0	0	48	26	0	162	
7:30 AM	0	0	0	0	19	0	12	0	13	38	0	0	0	41	25	0	148	
7:35 AM	0	0	0	0	34	0	15	0	12	46	0	0	0	45	38	0	190	
7:40 AM	0	0	0	0	35	0	19	0	18	47	0	0	0	54	30	0	203	
7:45 AM	0	0	0	0	29	0	15	0	18	63	0	0	0	62	25	0	212	
7:50 AM	0	0	0	0	38	0	19	0	11	44	0	0	0	69	21	0	202	
7:55 AM	0	0	0	0	40	0	26	0	2	47	0	0	0	83	23	0	221	2133
8:00 AM	0	0	0	0	36	0	26	0	6	33	0	0	0	61	19	0	181	2158
8:05 AM	0	0	0	0	37	0	28	0	7	42	0	0	0	68	21	0	203	2201
8:10 AM	0	0	0	0	32	0	24	0	6	47	0	0	0	71	17	0	197	2235
8:15 AM	0	0	0	0	36	0	31	0	6	64	0	0	0	75	12	0	224	2332
8:20 AM	0	0	0	0	40	0	38	0	3	45	0	0	0	106	15	0	247	2390
8:25 AM	0	0	0	0	43	0	34	0	11	46	0	0	0	47	20	0	201	2429
8:30 AM	0	0	0	0	37	0	43	0	8	60	0	0	0	68	16	0	232	2513
8:35 AM	0	0	0	0	47	0	38	0	7	47	0	0	0	60	14	0	213	2536
8:40 AM	0	0	0	0	32	0	15	0	8	66	0	0	0	51	7	0	179	2512
8:45 AM	0	0	0	0	42	0	21	0	8	46	0	0	0	42	22	0	181	2481
8:50 AM	0	0	0	0	41	0	27	0	5	33	0	0	0	40	15	0	161	2440
8:55 AM	0	0	0	0	50	0	20	0	4	32	0	0	0	32	22	0	160	2379

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	480	0	460	0	88	604	0	0	0	884	204	0	2720
Heavy Trucks	0	0	0		60	0	32		8	84	0		0	48	12		244
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

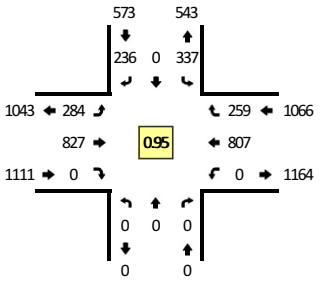
Type of peak hour being reported: Intersection Peak

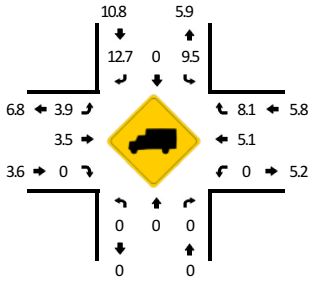
Method for determining peak hour: Total Entering Volume

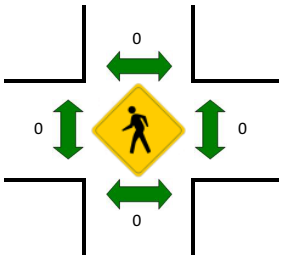
LOCATION: I-880 SB Ramps -- Industrial Pkwy W
CITY/STATE: Hayward, CA

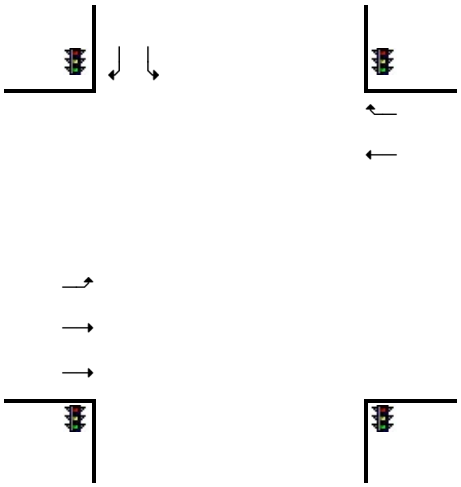
QC JOB #: 16788206
DATE: Thu, Oct 10 2024

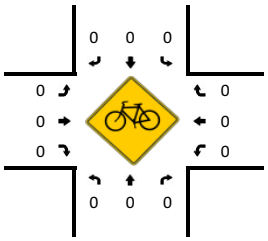
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:35 PM -- 5:50 PM

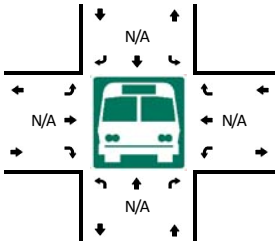


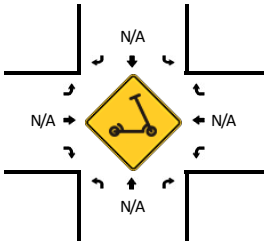












5-Min Count Period Beginning At	I-880 SB Ramps (Northbound)				I-880 SB Ramps (Southbound)				Industrial Pkwy W (Eastbound)				Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	33	0	24	0	17	79	0	0	0	64	21	0	238	
4:05 PM	0	0	0	0	25	0	19	0	27	76	0	0	0	55	16	0	218	
4:10 PM	0	0	0	0	21	0	21	0	22	82	0	0	0	71	25	0	242	
4:15 PM	0	0	0	0	26	0	11	0	32	79	0	0	0	73	6	1	228	
4:20 PM	0	0	0	0	37	0	26	0	14	52	0	0	0	79	17	0	225	
4:25 PM	0	0	0	0	26	0	14	0	29	61	0	0	0	86	17	0	233	
4:30 PM	0	0	0	0	22	0	20	0	27	71	0	0	0	69	15	0	224	
4:35 PM	0	0	0	0	33	0	18	0	24	80	0	0	0	68	21	0	244	
4:40 PM	0	0	0	0	37	0	19	0	27	60	0	0	0	55	25	0	223	
4:45 PM	0	0	0	0	23	0	22	0	29	57	0	1	0	76	15	0	223	
4:50 PM	0	0	0	0	31	0	16	0	33	56	0	0	0	52	14	0	202	
4:55 PM	0	0	0	0	27	0	16	0	17	79	0	0	0	69	17	0	225	2725
5:00 PM	0	0	0	0	20	0	20	0	24	76	0	0	0	61	16	0	217	2704
5:05 PM	0	0	0	0	23	0	17	0	26	78	0	0	0	62	18	0	224	2710
5:10 PM	0	0	0	0	27	0	21	0	22	81	0	0	0	56	21	0	228	2696
5:15 PM	0	0	0	0	31	0	16	0	17	53	0	0	0	82	32	0	231	2699
5:20 PM	0	0	0	0	23	0	19	0	22	68	0	0	0	77	20	0	229	2703
5:25 PM	0	0	0	0	27	0	20	0	28	67	0	0	0	65	28	0	235	2705
5:30 PM	0	0	0	0	34	0	20	0	30	64	0	0	0	48	15	0	211	2692
5:35 PM	0	0	0	0	22	0	26	0	25	58	0	0	0	82	30	0	243	2691
5:40 PM	0	0	0	0	30	0	15	0	20	78	0	0	0	81	20	0	244	2712
5:45 PM	0	0	0	0	29	0	19	0	29	73	0	0	0	60	26	0	236	2725
5:50 PM	0	0	0	0	44	0	27	0	24	52	0	0	0	64	16	0	227	2750
5:55 PM	0	0	0	0	30	0	19	0	23	58	0	0	0	69	13	0	212	2737

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	324	0	240	0	296	836	0	0	0	892	304	0	2892
Heavy Trucks	0	0	0		44	0	40		16	32	0		0	44	24		200
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

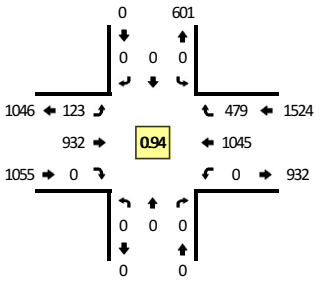
Type of peak hour being reported: Intersection Peak

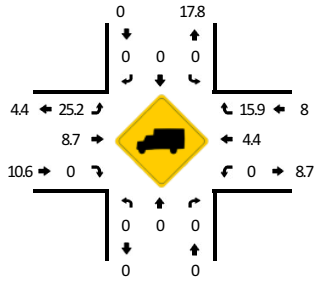
Method for determining peak hour: Total Entering Volume

LOCATION: I-880 NB Ramps -- Industrial Pkwy W
CITY/STATE: Hayward, CA

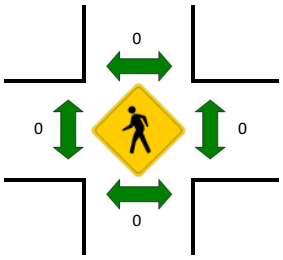
QC JOB #: 16788207
DATE: Thu, Oct 10 2024

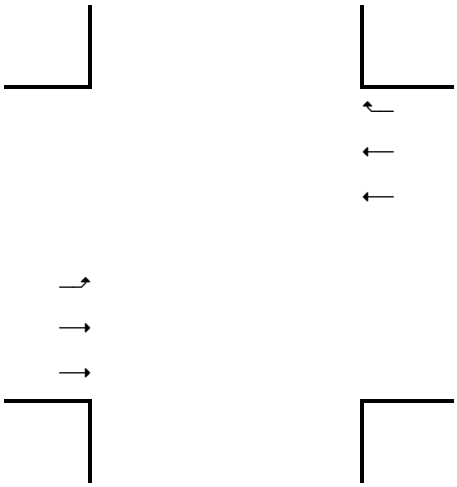
Peak-Hour: 7:40 AM -- 8:40 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

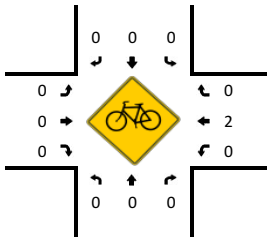


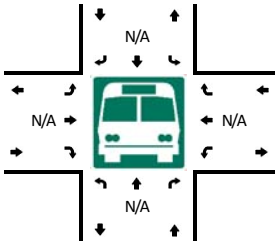


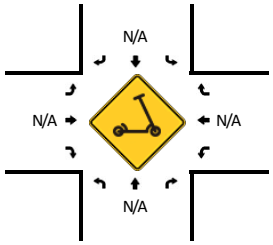
TRUE DATA TO IMPROVE MOBILITY











5-Min Count Period Beginning At	I-880 NB Ramps (Northbound)				I-880 NB Ramps (Southbound)				Industrial Pkwy W (Eastbound)				Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	5	62	0	0	0	52	31	0	150	
7:05 AM	0	0	0	0	0	0	0	0	8	52	0	0	0	72	35	0	167	
7:10 AM	0	0	0	0	0	0	0	0	14	41	0	0	0	71	37	0	163	
7:15 AM	0	0	0	0	0	0	0	0	9	43	0	0	0	69	35	0	156	
7:20 AM	0	0	0	0	0	0	0	0	10	71	0	0	0	82	45	0	208	
7:25 AM	0	0	0	0	0	0	0	0	9	57	0	0	0	69	42	0	177	
7:30 AM	0	0	0	0	0	0	0	0	16	39	0	1	0	78	46	0	180	
7:35 AM	0	0	0	0	0	0	0	0	7	68	0	0	0	78	51	0	204	
7:40 AM	0	0	0	0	0	0	0	0	6	78	0	0	0	84	35	0	203	
7:45 AM	0	0	0	0	0	0	0	0	14	87	0	0	0	83	47	0	231	
7:50 AM	0	0	0	0	0	0	0	0	13	68	0	0	0	94	28	0	203	
7:55 AM	0	0	0	0	0	0	0	0	8	81	0	0	0	95	39	0	223	2265
8:00 AM	0	0	0	0	0	0	0	0	9	61	0	0	0	75	32	0	177	2292
8:05 AM	0	0	0	0	0	0	0	0	5	75	0	0	0	100	48	0	228	2353
8:10 AM	0	0	0	0	0	0	0	0	11	69	0	0	0	82	40	0	202	2392
8:15 AM	0	0	0	0	0	0	0	0	12	77	0	1	0	108	40	0	238	2474
8:20 AM	0	0	0	0	0	0	0	0	11	82	0	0	0	93	43	0	229	2495
8:25 AM	0	0	0	0	0	0	0	0	5	79	0	0	0	93	45	0	222	2540
8:30 AM	0	0	0	0	0	0	0	0	17	88	0	0	0	65	44	0	214	2574
8:35 AM	0	0	0	0	0	0	0	0	11	87	0	0	0	73	38	0	209	2579
8:40 AM	0	0	0	0	0	0	0	0	13	84	0	0	0	62	27	0	186	2562
8:45 AM	0	0	0	0	0	0	0	0	10	79	0	0	0	73	36	0	198	2529
8:50 AM	0	0	0	0	0	0	0	0	15	68	0	0	0	45	33	0	161	2487
8:55 AM	0	0	0	0	0	0	0	0	8	61	0	0	0	65	34	0	168	2432

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	0	0	112	952	0	4	0	1176	512	0	2756
Heavy Trucks	0	0	0		0	0	0		40	64	0		0	48	68		220
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

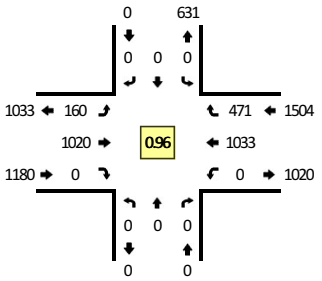
Type of peak hour being reported: Intersection Peak

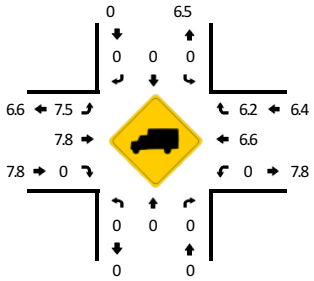
Method for determining peak hour: Total Entering Volume

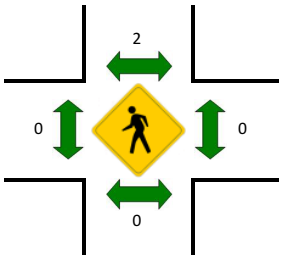
LOCATION: I-880 NB Ramps -- Industrial Pkwy W
CITY/STATE: Hayward, CA

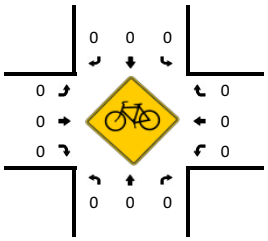
QC JOB #: 16788208
DATE: Thu, Oct 10 2024

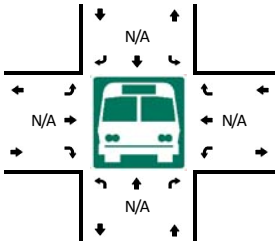
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:10 PM -- 4:25 PM

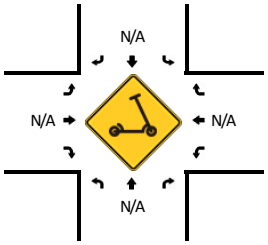












5-Min Count Period Beginning At	I-880 NB Ramps (Northbound)				I-880 NB Ramps (Southbound)				Industrial Pkwy W (Eastbound)				Industrial Pkwy W (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	14	94	0	0	0	81	45	0	234	
4:05 PM	0	0	0	0	0	0	0	0	10	84	0	0	0	91	43	0	228	
4:10 PM	0	0	0	0	0	0	0	0	20	90	0	0	0	85	33	0	228	
4:15 PM	0	0	0	0	0	0	0	0	12	97	0	0	0	91	36	0	236	
4:20 PM	0	0	0	0	0	0	0	0	16	76	0	0	0	101	42	0	235	
4:25 PM	0	0	0	0	0	0	0	0	9	82	0	0	0	81	42	0	214	
4:30 PM	0	0	0	0	0	0	0	0	14	74	0	0	0	82	44	0	214	
4:35 PM	0	0	0	0	0	0	0	0	18	92	0	0	0	98	37	0	245	
4:40 PM	0	0	0	0	0	0	0	0	19	83	0	0	0	95	29	0	226	
4:45 PM	0	0	0	0	0	0	0	0	11	73	0	0	0	75	36	0	195	
4:50 PM	0	0	0	0	0	0	0	0	4	87	0	0	0	80	43	0	214	
4:55 PM	0	0	0	0	0	0	0	0	13	88	0	0	0	73	41	0	215	2684
5:00 PM	0	0	0	0	0	0	0	0	15	77	0	0	0	79	39	0	210	2660
5:05 PM	0	0	0	0	0	0	0	0	17	87	0	0	0	81	45	0	230	2662
5:10 PM	0	0	0	0	0	0	0	0	13	99	0	0	0	88	40	0	240	2674
5:15 PM	0	0	0	0	0	0	0	0	11	70	0	2	0	97	29	0	209	2647
5:20 PM	0	0	0	0	0	0	0	0	9	81	0	1	0	89	53	0	233	2645
5:25 PM	0	0	0	0	0	0	0	0	14	79	0	1	0	86	41	0	221	2652
5:30 PM	0	0	0	0	0	0	0	0	7	88	0	0	0	88	35	0	218	2656
5:35 PM	0	0	0	0	0	0	0	0	16	63	0	1	0	94	39	0	213	2624
5:40 PM	0	0	0	0	0	0	0	0	16	93	0	1	0	79	37	0	226	2624
5:45 PM	0	0	0	0	0	0	0	0	11	92	0	1	0	93	31	0	228	2657
5:50 PM	0	0	0	0	0	0	0	0	11	82	0	1	0	72	43	0	209	2652
5:55 PM	0	0	0	0	0	0	0	0	10	82	0	0	0	74	28	0	194	2631

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	0	0	0	192	1052	0	0	0	1108	444	0	2796
Heavy Trucks	0	0	0		0	0	0		24	96	0		0	84	28		232
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

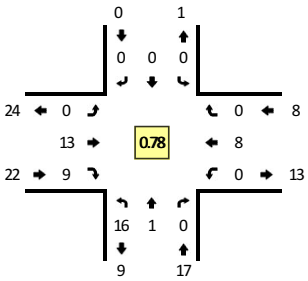
Type of peak hour being reported: Intersection Peak

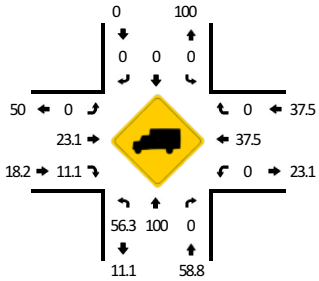
Method for determining peak hour: Total Entering Volume

LOCATION: Project Dwy -- Claremont Ct
CITY/STATE: Hayward, CA

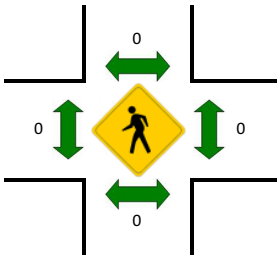
QC JOB #: 16788209
DATE: Wed, Oct 16 2024

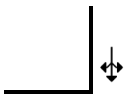
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

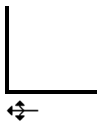


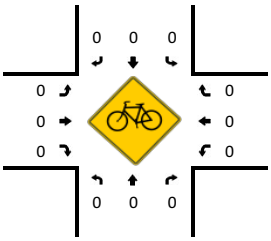


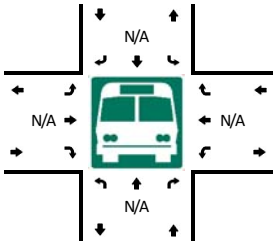
TRUE DATA TO IMPROVE MOBILITY

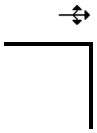


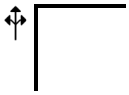


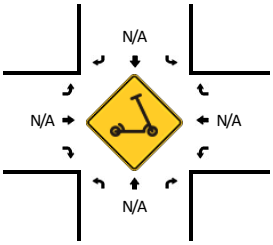












5-Min Count Period Beginning At	Project Dwy (Northbound)				Project Dwy (Southbound)				Claremont Ct (Eastbound)				Claremont Ct (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	
7:05 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	
7:10 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2	
7:15 AM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
7:20 AM	0	0	0	0	0	0	2	0	1	1	1	0	0	0	0	0	5	
7:25 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
7:35 AM	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	4	
7:40 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	
7:45 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3	
7:50 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3	
7:55 AM	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	5	35
8:00 AM	2	0	0	0	0	0	0	0	0	1	2	0	0	2	0	0	7	39
8:05 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	39
8:10 AM	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	41
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	40
8:20 AM	1	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	4	39
8:25 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	39
8:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3	41
8:35 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	38
8:40 AM	2	1	0	0	0	0	0	0	0	6	2	0	0	0	0	0	11	47
8:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	45
8:50 AM	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	4	46
8:55 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	4	45

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	0	0	0	0	0	0	0	0	8	16	0	0	12	0	0	60
Heavy Trucks	16	0	0		0	0	0		0	0	0		0	4	0		20
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

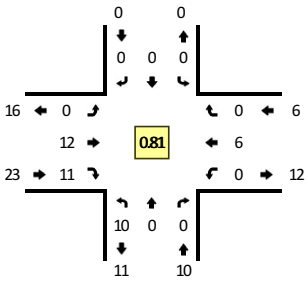
Type of peak hour being reported: Intersection Peak

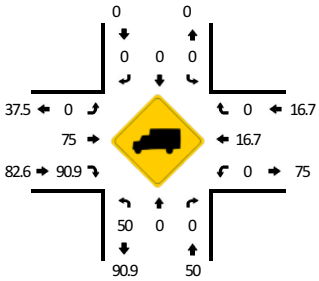
Method for determining peak hour: Total Entering Volume

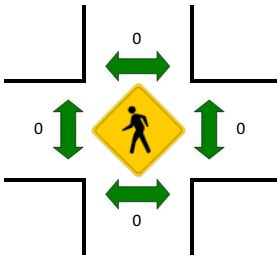
LOCATION: Project Dwy -- Claremont Ct
CITY/STATE: Hayward, CA

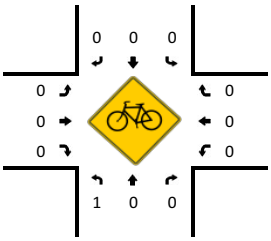
QC JOB #: 16788210
DATE: Wed, Oct 16 2024

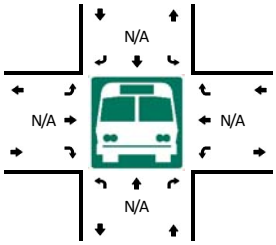
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

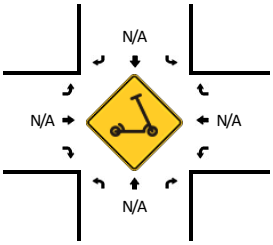












5-Min Count Period Beginning At	Project Dwy (Northbound)				Project Dwy (Southbound)				Claremont Ct (Eastbound)				Claremont Ct (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	5	
4:05 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	
4:20 PM	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	3	
4:25 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
4:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	
4:35 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
4:40 PM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
4:50 PM	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	
4:55 PM	1	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	6	31
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
5:05 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	27
5:10 PM	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	30
5:15 PM	1	0	0	0	0	0	0	0	0	1	3	0	0	1	0	0	6	34
5:20 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	32
5:25 PM	1	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0	5	36
5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	34
5:35 PM	2	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5	37
5:40 PM	1	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	4	39
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
5:50 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	4	38
5:55 PM	2	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	4	36

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	0	0	0	0	0	0	0	0	4	20	0	0	12	0	0	48
Heavy Trucks	4	0	0		0	0	0		0	4	20		0	4	0		32
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	4	0	0		0	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 10/23/2024 2:56 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B
Existing LOS Sheets

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	323	470	264	352	337	266	582	84	222	993	19
Future Volume (veh/h)	78	323	470	264	352	337	266	582	84	222	993	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1693	1752	1826	1767	1885	1781	1841	1826	1870	1856	1663
Adj Flow Rate, veh/h	87	359	0	293	391	77	296	647	82	247	1103	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	10	14	10	5	9	1	8	4	5	2	3	16
Cap, veh/h	147	513		396	777	364	382	2007	252	333	1504	27
Arrive On Green	0.05	0.16	0.00	0.12	0.23	0.23	0.12	0.44	0.44	0.10	0.42	0.42
Sat Flow, veh/h	3237	3216	1485	3374	3357	1573	3291	4519	567	3456	3541	64
Grp Volume(v), veh/h	87	359	0	293	391	77	296	478	251	247	549	574
Grp Sat Flow(s),veh/h/ln	1618	1608	1485	1687	1678	1573	1646	1675	1736	1728	1763	1843
Q Serve(g_s), s	2.7	10.9	0.0	8.6	10.4	4.1	9.0	9.5	9.7	7.2	26.8	26.8
Cycle Q Clear(g_c), s	2.7	10.9	0.0	8.6	10.4	4.1	9.0	9.5	9.7	7.2	26.8	26.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		0.03
Lane Grp Cap(c), veh/h	147	513		396	777	364	382	1488	771	333	749	782
V/C Ratio(X)	0.59	0.70		0.74	0.50	0.21	0.78	0.32	0.33	0.74	0.73	0.73
Avail Cap(c_a), veh/h	943	1249		983	1304	611	959	1627	843	1007	856	895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	40.9	0.0	43.9	34.4	32.0	44.2	18.6	18.6	45.3	24.7	24.8
Incr Delay (d2), s/veh	5.4	2.5	0.0	3.9	0.7	0.4	3.4	0.4	0.9	3.2	5.4	5.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	7.7	0.0	6.6	7.5	2.8	6.8	6.6	7.1	5.7	17.4	18.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.6	43.4	0.0	47.8	35.1	32.4	47.6	19.0	19.5	48.5	30.1	29.9
LnGrp LOS	D	D		D	D	C	D	B	B	D	C	C
Approach Vol, veh/h		446			761			1025			1370	
Approach Delay, s/veh		45.4			39.7			27.4			33.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	50.7	8.7	29.6	15.9	48.7	16.1	22.2
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	9.2	11.7	4.7	12.4	11.0	28.8	10.6	12.9
Green Ext Time (p_c), s	0.8	13.4	0.4	3.9	1.0	14.9	1.4	3.1

Intersection Summary	
HCM 7th Control Delay, s/veh	34.5
HCM 7th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	658	8	45	1050	30	19	1	28	7	1	3
Future Vol, veh/h	12	658	8	45	1050	30	19	1	28	7	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	12	12	13	5	3	58	0	57	14	0	0
Mvmt Flow	13	731	9	50	1167	33	21	1	31	8	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1200	0	0	740	0	0	1329	2062	370	1676	2050	600
Stage 1	-	-	-	-	-	-	762	762	-	1283	1283	-
Stage 2	-	-	-	-	-	-	567	1300	-	393	767	-
Critical Hdwy	5.3	-	-	4.36	-	-	8.11	6.5	8.04	7.23	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	7.66	5.5	-	7.58	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.86	5.5	-	6.78	5.5	-
Follow-up Hdwy	3.1	-	-	2.33	-	-	4.23	4	3.87	3.79	4	3.9
Pot Cap-1 Maneuver	318	-	-	794	-	-	84	55	493	70	56	384
Stage 1	-	-	-	-	-	-	254	416	-	116	238	-
Stage 2	-	-	-	-	-	-	338	233	-	553	414	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	318	-	-	794	-	-	73	50	493	58	51	384
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	50	-	58	51	-
Stage 1	-	-	-	-	-	-	244	399	-	109	223	-
Stage 2	-	-	-	-	-	-	312	219	-	495	397	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.3	0.39	38.1	60.18
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	73	377	318	-	-	794	-	-	58	145
HCM Lane V/C Ratio	0.287	0.085	0.042	-	-	0.063	-	-	0.135	0.031
HCM Control Delay (s/veh)	72.7	15.4	16.8	-	-	9.8	-	-	77.1	30.6
HCM Lane LOS	F	C	C	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	1	0.3	0.1	-	-	0.2	-	-	0.4	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	585	824	233	450	341
Future Volume (veh/h)	103	585	824	233	450	341
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1693	1722	1826	1811	1722	1752
Adj Flow Rate, veh/h	111	629	886	147	484	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	14	12	5	6	12	10
Cap, veh/h	137	1895	1542	682	513	
Arrive On Green	0.08	0.58	0.44	0.44	0.31	0.00
Sat Flow, veh/h	1612	3358	3561	1535	1640	1485
Grp Volume(v), veh/h	111	629	886	147	484	0
Grp Sat Flow(s),veh/h/ln	1612	1636	1735	1535	1640	1485
Q Serve(g_s), s	5.7	8.4	16.0	4.9	24.2	0.0
Cycle Q Clear(g_c), s	5.7	8.4	16.0	4.9	24.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	137	1895	1542	682	513	
V/C Ratio(X)	0.81	0.33	0.57	0.22	0.94	
Avail Cap(c_a), veh/h	269	1895	1542	682	586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.8	9.2	17.4	14.3	28.2	0.0
Incr Delay (d2), s/veh	4.3	0.5	1.6	0.7	21.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.2	4.8	10.1	3.1	17.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	42.1	9.7	19.0	15.1	49.9	0.0
LnGrp LOS	D	A	B	B	D	
Approach Vol, veh/h		740	1033		484	
Approach Delay, s/veh		14.5	18.4		49.9	
Approach LOS		B	B		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.3	42.2			53.6	30.4
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	14.0	26.0			45.0	30.0
Max Q Clear Time (g_c+I1), s	7.7	18.0			10.4	26.2
Green Ext Time (p_c), s	0.0	0.9			0.8	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	23.9
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	932	1045	0	0	0
Future Volume (Veh/h)	123	932	1045	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.92	0.92
Hourly flow rate (vph)	131	991	1112	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.94	
vC, conflicting volume	1112				1870	556
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1112				1801	556
tC, single (s)	4.6				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	74				100	100
cM capacity (veh/h)	506				50	475

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	131	496	496	556	556	0
Volume Left	131	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	506	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.29	0.29	0.33	0.33	0.00
Queue Length 95th (ft)	26	0	0	0	0	0
Control Delay (s/veh)	14.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.7			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	9	0	8	16	0
Future Vol, veh/h	13	9	0	8	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	23	11	0	38	56	0
Mvmt Flow	17	12	0	10	21	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	33	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	-	-	4.1	-	6.96	6.2
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	-	-	2.2	-	4.004	3.3
Pot Cap-1 Maneuver	-	-	1598	-	859	1060
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	889	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1598	-	859	1060
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.29
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	859	-	-	1598	-
HCM Lane V/C Ratio	0.024	-	-	-	-
HCM Control Delay (s/veh)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	681	304	281	387	330	243	1199	130	190	767	38
Future Volume (veh/h)	195	681	304	281	387	330	243	1199	130	190	767	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1885	1781	1885	1707	1885	1841	1870	1885	1900
Adj Flow Rate, veh/h	207	724	0	299	412	86	259	1276	131	202	816	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	7	6	1	8	1	13	1	4	2	1	0
Cap, veh/h	289	889		391	979	454	328	1838	189	274	1267	59
Arrive On Green	0.08	0.26	0.00	0.11	0.29	0.29	0.10	0.39	0.39	0.08	0.36	0.36
Sat Flow, veh/h	3456	3413	1535	3483	3385	1571	3155	4729	485	3456	3480	162
Grp Volume(v), veh/h	207	724	0	299	412	86	259	926	481	202	420	434
Grp Sat Flow(s),veh/h/ln	1728	1706	1535	1742	1692	1571	1577	1716	1783	1728	1791	1851
Q Serve(g_s), s	6.9	23.5	0.0	9.8	11.6	4.9	9.5	26.7	26.7	6.8	23.0	23.0
Cycle Q Clear(g_c), s	6.9	23.5	0.0	9.8	11.6	4.9	9.5	26.7	26.7	6.8	23.0	23.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		0.09
Lane Grp Cap(c), veh/h	289	889		391	979	454	328	1334	693	274	652	674
V/C Ratio(X)	0.72	0.81		0.76	0.42	0.19	0.79	0.69	0.69	0.74	0.64	0.64
Avail Cap(c_a), veh/h	877	1155		884	1146	532	801	1452	755	877	758	783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	41.0	0.0	50.9	34.0	31.6	51.7	30.2	30.2	53.2	31.2	31.2
Incr Delay (d2), s/veh	4.7	4.1	0.0	4.4	0.4	0.3	4.3	2.5	4.8	3.9	3.9	3.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	15.2	0.0	7.9	8.2	3.3	7.0	16.7	17.8	5.5	15.8	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.5	45.1	0.0	55.3	34.4	31.9	55.9	32.8	35.0	57.1	35.2	35.0
LnGrp LOS	E	D		E	C	C	E	C	D	E	D	D
Approach Vol, veh/h		931			797			1666			1056	
Approach Delay, s/veh		47.9			42.0			37.0			39.3	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	50.9	13.9	40.0	16.3	48.0	17.3	36.6
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	8.8	28.7	8.9	13.6	11.5	25.0	11.8	25.5
Green Ext Time (p_c), s	0.6	17.2	1.0	4.1	0.8	12.9	1.4	5.2

Intersection Summary	
HCM 7th Control Delay, s/veh	40.7
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1125	22	34	999	6	9	0	23	8	0	10
Future Vol, veh/h	3	1125	22	34	999	6	9	0	23	8	0	10
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	4	59	35	7	17	11	0	9	0	0	10
Mvmt Flow	3	1210	24	37	1074	6	10	0	25	9	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1083	0	0	1234	0	0	1732	2385	618	1764	2393	542
Stage 1	-	-	-	-	-	-	1229	1229	-	1153	1153	-
Stage 2	-	-	-	-	-	-	503	1156	-	611	1241	-
Critical Hdwy	5.3	-	-	4.8	-	-	7.17	6.5	7.08	6.95	6.5	7.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.5	-	7.3	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.92	5.5	-	6.5	5.5	-
Follow-up Hdwy	3.1	-	-	2.55	-	-	3.76	4	3.39	3.65	4	4
Pot Cap-1 Maneuver	363	-	-	408	-	-	66	35	416	70	34	399
Stage 1	-	-	-	-	-	-	171	252	-	162	274	-
Stage 2	-	-	-	-	-	-	468	273	-	439	249	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	362	-	-	408	-	-	58	31	415	60	31	398
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	31	-	60	31	-
Stage 1	-	-	-	-	-	-	170	250	-	147	249	-
Stage 2	-	-	-	-	-	-	415	248	-	409	247	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.48	32.59	41.45
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	58	415	362	-	-	408	-	-	60	398
HCM Lane V/C Ratio	0.168	0.06	0.009	-	-	0.09	-	-	0.144	0.027
HCM Control Delay (s/veh)	79.5	14.2	15	-	-	14.7	-	-	75.4	14.3
HCM Lane LOS	F	B	C	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.6	0.2	0	-	-	0.3	-	-	0.5	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	284	827	807	259	337	236
Future Volume (veh/h)	284	827	807	259	337	236
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1826	1781	1767	1707
Adj Flow Rate, veh/h	299	871	849	164	355	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	5	8	9	13
Cap, veh/h	332	2338	1498	652	386	
Arrive On Green	0.19	0.67	0.43	0.43	0.23	0.00
Sat Flow, veh/h	1753	3589	3561	1510	1682	1447
Grp Volume(v), veh/h	299	871	849	164	355	0
Grp Sat Flow(s),veh/h/ln	1753	1749	1735	1510	1682	1447
Q Serve(g_s), s	14.8	9.8	16.4	6.2	18.3	0.0
Cycle Q Clear(g_c), s	14.8	9.8	16.4	6.2	18.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	332	2338	1498	652	386	
V/C Ratio(X)	0.90	0.37	0.57	0.25	0.92	
Avail Cap(c_a), veh/h	473	2338	1498	652	473	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	6.5	19.0	16.1	33.5	0.0
Incr Delay (d2), s/veh	12.3	0.5	1.6	0.9	19.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.5	5.3	10.5	3.8	14.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	47.6	7.0	20.6	17.0	52.6	0.0
LnGrp LOS	D	A	C	B	D	
Approach Vol, veh/h		1170	1013		355	
Approach Delay, s/veh		17.3	20.0		52.6	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	21.1	43.3			64.4	24.6
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	24.0	26.0			55.0	25.0
Max Q Clear Time (g_c+I1), s	16.8	18.4			11.8	20.3
Green Ext Time (p_c), s	0.1	0.8			1.1	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	23.3
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	1020	1033	0	0	0
Future Volume (Veh/h)	160	1020	1033	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.92	0.92
Hourly flow rate (vph)	167	1062	1076	0	0	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.92	
vC, conflicting volume	1078				1943	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1078				1847	540
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	73				100	100
cM capacity (veh/h)	608				44	486

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	167	531	531	538	538	0
Volume Left	167	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	608	1700	1700	1700	1700	1700
Volume to Capacity	0.27	0.31	0.31	0.32	0.32	0.00
Queue Length 95th (ft)	28	0	0	0	0	0
Control Delay (s/veh)	13.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.8			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	11	0	6	10	0
Future Vol, veh/h	12	11	0	6	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	75	91	0	17	50	0
Mvmt Flow	15	14	0	7	12	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	29	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	-	-	4.1	-	6.9	6.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.3
Pot Cap-1 Maneuver	-	-	1598	-	876	1062
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1598	-	876	1062
Mov Cap-2 Maneuver	-	-	-	-	876	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.17
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	876	-	-	1598	-
HCM Lane V/C Ratio	0.014	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix C
Queue Analysis

Existing AM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	2.1	NO
		EBR	100	4	0.0	NO
		WBL	230	9.2	6.6	NO
		NBL	500	20	6.8	NO
		SBL	200	8	5.7	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	NO
		WBL	75	3	0.2	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	4.2	NO
		WBR	100	4	3.1	NO
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	1.0	NO

Existing PM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	5.6	NO
		EBR	100	4	0.0	NO
		WBL	230	9.2	7.9	NO
		NBL	500	20	7.0	NO
		SBL	200	8	5.5	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.6	NO
		WBL	75	3	0.0	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	11.5	NO
		WBR	100	4	3.8	NO
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	1.1	NO

Existing + PR AM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	2.1	NO
		EBR	100	4	0.0	NO
		WBL	230	9.2	6.7	NO
		NBL	500	20	6.8	NO
		SBL	200	8	5.9	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.1	NO
		WBL	75	3	0.3	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	4.2	NO
		WBR	100	4	3.1	NO
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	2.1	NO

Existing + PR PM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	5.6	NO
		EBR	100	4	0.0	NO
		WBL	230	9.2	7.9	NO
		NBL	500	20	7.1	NO
		SBL	200	8	5.6	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	NO
		WBL	75	3	0.3	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	11.6	NO
		WBR	100	4	3.9	NO
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	2.2	NO

BG AM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Feet)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	75.0	2.6	NO
		EBR	100	4	0.0	0.0	NO
		WBL	230	9.2	200.0	7.5	NO
		NBL	500	20	200.0	7.9	NO
		SBL	200	8	200.0	7.9	NO
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	0.2	NO
		WBL	75	3	0.0	0.2	NO
		NBL	515	20.6	50.0	1.6	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	125.0	5.0	NO
		WBR	100	4	75.0	3.3	NO
		SBR	350	14	0.0	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	25.0	1.0	NO

BG PM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	6.4	YES
		EBR	100	4	0.0	NO
		WBL	230	9.2	8.5	NO
		NBL	500	20	8.0	NO
		SBL	200	8	8.2	YES
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	NO
		WBL	75	3	0.3	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	13.1	NO
		WBR	100	4	4.3	YES
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	1.3	NO

BG + PR AM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	2.6	NO
		EBR	100	4	0.0	NO
		WBL	230	9.2	7.5	NO
		NBL	500	20	7.9	NO
		SBL	200	8	8.1	YES
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.2	NO
		WBL	75	3	0.3	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	5.0	NO
		WBR	100	4	3.3	NO
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	1.0	NO

BG + PR PM

#	Intersection	Movement	Existing Storage (Feet)	Existing Storage (Vehicles)	95th Percentile Queue (Vehicles)	Storage Exceeded?
1	Hesperian Blvd/Industrial Blvd/Industrial Pkwy W	EBL	150	6	6.4	YES
		EBR	100	4	0.0	NO
		WBL	230	9.2	8.5	NO
		NBL	500	20	8.0	NO
		SBL	200	8	8.2	YES
2	Hopkins St/ Industrial Pkwy W	EBL	150	6	0.0	NO
		WBL	75	3	0.4	NO
3	Industrial Pkwy W/I-880 SB Ramp	EBL	360	14.4	13.2	NO
		WBR	100	4	4.3	YES
		SBR	350	14	0.0	NO
4	Industrial Pkwy W/I-880 NB Ramp	EBL	180	7.2	1.3	NO

Appendix D
Crash Analysis Spreadsheet

Location	Collision Type					Severity		Total Crashes	90th Percentile Crash Rate	Observed Crash Rate	Does Observed Exceed 90th Rate?
	Head On	Sideswipe	Rear End	Broadside	Overturned	PDO	Injury				
Hesperian/Industrial	2		1	4		0	7	7	1.08	0.08	**No**
Hopkins/Industrial	1		2			0	3	3	1.08	0.07	**No**
I-880 SB/Industrial					1	0	1	1	1.08	0.02	**No**
I-880 NB/Industrial		1				0	1	1	0.48	0.02	**No**

Appendix E
Existing Plus Project LOS Worksheets

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	325	470	264	352	337	266	582	86	230	993	19
Future Volume (veh/h)	78	325	470	264	352	337	266	582	86	230	993	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1693	1752	1826	1767	1885	1781	1841	1826	1870	1856	1663
Adj Flow Rate, veh/h	87	361	0	293	391	77	296	647	85	256	1103	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	10	14	10	5	9	1	8	4	5	2	3	16
Cap, veh/h	146	515		396	779	365	382	1984	258	343	1503	27
Arrive On Green	0.05	0.16	0.00	0.12	0.23	0.23	0.12	0.44	0.44	0.10	0.42	0.42
Sat Flow, veh/h	3237	3216	1485	3374	3357	1573	3291	4498	585	3456	3541	64
Grp Volume(v), veh/h	87	361	0	293	391	77	296	480	252	256	549	574
Grp Sat Flow(s),veh/h/ln	1618	1608	1485	1687	1678	1573	1646	1675	1733	1728	1763	1843
Q Serve(g_s), s	2.7	10.9	0.0	8.7	10.4	4.1	9.0	9.6	9.8	7.4	26.8	26.9
Cycle Q Clear(g_c), s	2.7	10.9	0.0	8.7	10.4	4.1	9.0	9.6	9.8	7.4	26.8	26.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		0.03
Lane Grp Cap(c), veh/h	146	515		396	779	365	382	1477	764	343	748	782
V/C Ratio(X)	0.59	0.70		0.74	0.50	0.21	0.78	0.32	0.33	0.75	0.73	0.73
Avail Cap(c_a), veh/h	942	1248		982	1302	610	958	1625	840	1006	855	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	41.0	0.0	44.0	34.4	32.0	44.3	18.8	18.8	45.2	24.8	24.8
Incr Delay (d2), s/veh	5.4	2.5	0.0	3.9	0.7	0.4	3.4	0.5	0.9	3.2	5.4	5.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.1	7.8	0.0	6.7	7.5	2.8	6.8	6.7	7.2	5.9	17.4	18.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.7	43.4	0.0	47.9	35.1	32.4	47.7	19.3	19.8	48.4	30.2	30.0
LnGrp LOS	D	D		D	D	C	D	B	B	D	C	C
Approach Vol, veh/h		448			761			1028			1379	
Approach Delay, s/veh		45.4			39.7			27.6			33.5	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.2	50.5	8.7	29.7	16.0	48.7	16.1	22.3
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	9.4	11.8	4.7	12.4	11.0	28.9	10.7	12.9
Green Ext Time (p_c), s	0.8	13.4	0.4	3.9	1.0	14.9	1.4	3.1

Intersection Summary	
HCM 7th Control Delay, s/veh	34.6
HCM 7th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	658	20	55	1050	30	19	1	28	7	1	3
Future Vol, veh/h	12	658	20	55	1050	30	19	1	28	7	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	12	12	13	5	3	58	0	57	14	0	0
Mvmt Flow	13	731	22	61	1167	33	21	1	31	8	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1200	0	0	753	0	0	1358	2091	377	1698	2086	600
Stage 1	-	-	-	-	-	-	769	769	-	1306	1306	-
Stage 2	-	-	-	-	-	-	589	1322	-	393	780	-
Critical Hdwy	5.3	-	-	4.36	-	-	8.11	6.5	8.04	7.23	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	7.66	5.5	-	7.58	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.86	5.5	-	6.78	5.5	-
Follow-up Hdwy	3.1	-	-	2.33	-	-	4.23	4	3.87	3.79	4	3.9
Pot Cap-1 Maneuver	318	-	-	784	-	-	80	53	488	67	54	384
Stage 1	-	-	-	-	-	-	252	413	-	112	232	-
Stage 2	-	-	-	-	-	-	326	228	-	553	409	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	318	-	-	784	-	-	69	47	488	55	47	384
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	47	-	55	47	-
Stage 1	-	-	-	-	-	-	241	396	-	103	214	-
Stage 2	-	-	-	-	-	-	296	210	-	495	392	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.29	0.48	40.93	63.6
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	69	368	318	-	-	784	-	-	55	138
HCM Lane V/C Ratio	0.308	0.087	0.042	-	-	0.078	-	-	0.143	0.032
HCM Control Delay (s/veh)	79.4	15.7	16.8	-	-	10	-	-	81.7	31.9
HCM Lane LOS	F	C	C	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	1.1	0.3	0.1	-	-	0.3	-	-	0.5	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	585	832	233	450	343
Future Volume (veh/h)	103	585	832	233	450	343
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1693	1722	1826	1811	1722	1752
Adj Flow Rate, veh/h	111	629	895	147	484	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	14	12	5	6	12	10
Cap, veh/h	137	1895	1542	682	513	
Arrive On Green	0.08	0.58	0.44	0.44	0.31	0.00
Sat Flow, veh/h	1612	3358	3561	1535	1640	1485
Grp Volume(v), veh/h	111	629	895	147	484	0
Grp Sat Flow(s),veh/h/ln	1612	1636	1735	1535	1640	1485
Q Serve(g_s), s	5.7	8.4	16.2	4.9	24.2	0.0
Cycle Q Clear(g_c), s	5.7	8.4	16.2	4.9	24.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	137	1895	1542	682	513	
V/C Ratio(X)	0.81	0.33	0.58	0.22	0.94	
Avail Cap(c_a), veh/h	269	1895	1542	682	586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.8	9.2	17.5	14.3	28.2	0.0
Incr Delay (d2), s/veh	4.3	0.5	1.6	0.7	21.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.2	4.8	10.2	3.1	17.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	42.1	9.7	19.1	15.1	49.9	0.0
LnGrp LOS	D	A	B	B	D	
Approach Vol, veh/h		740	1042		484	
Approach Delay, s/veh		14.5	18.5		49.9	
Approach LOS		B	B		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.3	42.2			53.6	30.4
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	14.0	26.0			45.0	30.0
Max Q Clear Time (g_c+I1), s	7.7	18.2			10.4	26.2
Green Ext Time (p_c), s	0.0	0.9			0.8	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	23.9
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	932	1053	479	0	0
Future Volume (Veh/h)	123	932	1053	479	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	131	991	1120	510	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.94	
vC, conflicting volume	1630				1878	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1630				1810	560
tC, single (s)	4.6				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	57				100	100
cM capacity (veh/h)	303				38	477

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	131	496	496	560	560	510
Volume Left	131	0	0	0	0	0
Volume Right	0	0	0	0	0	510
cSH	303	1700	1700	1700	1700	1700
Volume to Capacity	0.43	0.29	0.29	0.33	0.33	0.30
Queue Length 95th (ft)	52	0	0	0	0	0
Control Delay (s/veh)	25.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	D					
Approach Delay (s/veh)	3.0			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	31	0	8	16	0
Future Vol, veh/h	13	31	0	8	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	23	11	0	38	56	0
Mvmt Flow	17	40	0	10	21	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	56	0	47	37
Stage 1	-	-	-	-	37	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	-	-	4.1	-	6.96	6.2
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	-	-	2.2	-	4.004	3.3
Pot Cap-1 Maneuver	-	-	1561	-	843	1042
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	889	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1561	-	843	1042
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.38
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	843	-	-	1561	-
HCM Lane V/C Ratio	0.024	-	-	-	-
HCM Control Delay (s/veh)	9.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	682	304	283	389	337	243	1199	131	192	767	38
Future Volume (veh/h)	195	682	304	283	389	337	243	1199	131	192	767	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1885	1781	1885	1707	1885	1841	1870	1885	1900
Adj Flow Rate, veh/h	207	726	0	301	414	94	259	1276	132	204	816	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	7	6	1	8	1	13	1	4	2	1	0
Cap, veh/h	288	890		393	982	456	328	1833	190	276	1266	59
Arrive On Green	0.08	0.26	0.00	0.11	0.29	0.29	0.10	0.39	0.39	0.08	0.36	0.36
Sat Flow, veh/h	3456	3413	1535	3483	3385	1571	3155	4725	489	3456	3480	162
Grp Volume(v), veh/h	207	726	0	301	414	94	259	927	481	204	420	434
Grp Sat Flow(s),veh/h/ln	1728	1706	1535	1742	1692	1571	1577	1716	1783	1728	1791	1851
Q Serve(g_s), s	6.9	23.7	0.0	9.9	11.7	5.4	9.5	26.8	26.8	6.8	23.1	23.1
Cycle Q Clear(g_c), s	6.9	23.7	0.0	9.9	11.7	5.4	9.5	26.8	26.8	6.8	23.1	23.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		0.09
Lane Grp Cap(c), veh/h	288	890		393	982	456	328	1331	692	276	652	674
V/C Ratio(X)	0.72	0.82		0.77	0.42	0.21	0.79	0.70	0.70	0.74	0.64	0.64
Avail Cap(c_a), veh/h	875	1152		881	1142	530	798	1447	752	875	755	781
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	41.1	0.0	51.1	34.0	31.8	51.9	30.4	30.4	53.3	31.3	31.3
Incr Delay (d2), s/veh	4.7	4.2	0.0	4.4	0.4	0.3	4.3	2.6	4.9	3.9	4.0	3.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	15.3	0.0	7.9	8.3	3.6	7.1	16.8	17.9	5.6	15.8	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.7	45.3	0.0	55.5	34.4	32.1	56.1	33.0	35.3	57.2	35.3	35.2
LnGrp LOS	E	D		E	C	C	E	C	D	E	D	D
Approach Vol, veh/h		933			809			1667			1058	
Approach Delay, s/veh		48.1			42.0			37.2			39.5	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	51.0	13.9	40.2	16.3	48.1	17.4	36.7
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	8.8	28.8	8.9	13.7	11.5	25.1	11.9	25.7
Green Ext Time (p_c), s	0.6	17.1	1.0	4.1	0.8	12.8	1.4	5.2

Intersection Summary	
HCM 7th Control Delay, s/veh	40.9
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1125	26	39	999	6	20	0	34	8	0	10
Future Vol, veh/h	3	1125	26	39	999	6	20	0	34	8	0	10
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	4	59	35	7	17	11	0	9	0	0	10
Mvmt Flow	3	1210	28	42	1074	6	22	0	37	9	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1083	0	0	1239	0	0	1745	2398	620	1775	2408	542
Stage 1	-	-	-	-	-	-	1231	1231	-	1163	1163	-
Stage 2	-	-	-	-	-	-	514	1167	-	611	1245	-
Critical Hdwy	5.3	-	-	4.8	-	-	7.17	6.5	7.08	6.95	6.5	7.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.5	-	7.3	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.92	5.5	-	6.5	5.5	-
Follow-up Hdwy	3.1	-	-	2.55	-	-	3.76	4	3.39	3.65	4	4
Pot Cap-1 Maneuver	363	-	-	407	-	-	64	34	414	69	33	399
Stage 1	-	-	-	-	-	-	171	252	-	159	271	-
Stage 2	-	-	-	-	-	-	461	270	-	439	248	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	362	-	-	406	-	-	56	30	414	56	30	398
Mov Cap-2 Maneuver	-	-	-	-	-	-	56	30	-	56	30	-
Stage 1	-	-	-	-	-	-	169	249	-	142	243	-
Stage 2	-	-	-	-	-	-	402	242	-	397	246	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.56	48.28	43.82
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	56	414	362	-	-	406	-	-	56	398
HCM Lane V/C Ratio	0.386	0.088	0.009	-	-	0.103	-	-	0.154	0.027
HCM Control Delay (s/veh)	105.6	14.5	15	-	-	14.9	-	-	80.7	14.3
HCM Lane LOS	F	B	C	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	1.4	0.3	0	-	-	0.3	-	-	0.5	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	286	836	811	259	337	237
Future Volume (veh/h)	286	836	811	259	337	237
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1826	1781	1767	1707
Adj Flow Rate, veh/h	301	880	854	164	355	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	5	8	9	13
Cap, veh/h	334	2338	1494	650	386	
Arrive On Green	0.19	0.67	0.43	0.43	0.23	0.00
Sat Flow, veh/h	1753	3589	3561	1510	1682	1447
Grp Volume(v), veh/h	301	880	854	164	355	0
Grp Sat Flow(s),veh/h/ln	1753	1749	1735	1510	1682	1447
Q Serve(g_s), s	14.9	9.9	16.5	6.2	18.3	0.0
Cycle Q Clear(g_c), s	14.9	9.9	16.5	6.2	18.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	334	2338	1494	650	386	
V/C Ratio(X)	0.90	0.38	0.57	0.25	0.92	
Avail Cap(c_a), veh/h	473	2338	1494	650	473	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	6.5	19.1	16.2	33.5	0.0
Incr Delay (d2), s/veh	12.6	0.5	1.6	0.9	19.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.6	5.4	10.6	3.9	14.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	47.8	7.0	20.7	17.1	52.6	0.0
LnGrp LOS	D	A	C	B	D	
Approach Vol, veh/h		1181	1018		355	
Approach Delay, s/veh		17.4	20.1		52.6	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	21.2	43.2			64.4	24.6
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	24.0	26.0			55.0	25.0
Max Q Clear Time (g_c+I1), s	16.9	18.5			11.9	20.3
Green Ext Time (p_c), s	0.1	0.8			1.1	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	23.4
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	162	1027	1037	471	0	0
Future Volume (Veh/h)	162	1027	1037	471	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	169	1070	1080	491	0	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.92	
vC, conflicting volume	1573				1955	542
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1573				1859	542
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	56				100	100
cM capacity (veh/h)	388				34	490

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	169	535	535	540	540	491
Volume Left	169	0	0	0	0	0
Volume Right	0	0	0	0	0	491
cSH	388	1700	1700	1700	1700	1700
Volume to Capacity	0.44	0.31	0.31	0.32	0.32	0.29
Queue Length 95th (ft)	54	0	0	0	0	0
Control Delay (s/veh)	21.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s/veh)	2.9			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	20	0	6	32	0
Future Vol, veh/h	12	20	0	6	32	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	75	91	0	17	50	0
Mvmt Flow	15	25	0	7	40	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	40	0	35	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	-	-	4.1	-	6.9	6.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.3
Pot Cap-1 Maneuver	-	-	1583	-	869	1054
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	869	1054
Mov Cap-2 Maneuver	-	-	-	-	869	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.34
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	869	-	-	1583	-
HCM Lane V/C Ratio	0.045	-	-	-	-
HCM Control Delay (s/veh)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Appendix F
Signal Warrants (Plus Project Scenarios)

KITTELSON & ASSOCIATES

Project #:	26188.005
Project Name:	Claremont Court TIA (Hayward)
Analyst:	KVP
Analysis Date:	1/29/2025
File:	H:\26\26188 - Hayward Transportation On-Call\005 - Hayward 2256 Claremont Court Truck TIA\analysis\Signal
Intersection:	Hopkins St/Industrial Pkwy W
Scenario:	Existing AM + Project
Data Date:	10/10/2024

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
7:45 AM	8:45 AM	690	1135	48	11
2nd Highest Hour		653	1074	45	10
3rd Highest Hour		644	1059	45	10
4th Highest Hour		616	1014	43	10
5th Highest Hour		607	999	42	10
6th Highest Hour		607	999	42	10
7th Highest Hour		580	953	40	9
8th Highest Hour		570	938	40	9
9th Highest Hour		552	908	38	9
10th Highest Hour		515	847	36	8
11th Highest Hour		497	817	35	8
12th Highest Hour		488	802	34	8
13th Highest Hour		469	772	33	7
14th Highest Hour		405	666	28	6
15th Highest Hour		322	530	22	5
16th Highest Hour		304	499	21	5
17th Highest Hour		212	348	15	3
18th Highest Hour		175	288	12	3
19th Highest Hour		92	151	6	1
20th Highest Hour		64	106	4	1
21st Highest Hour		55	91	4	1
22nd Highest Hour		37	61	3	1
23rd Highest Hour		18	30	1	0
24th Highest Hour		18	30	1	0

Warrant Summary

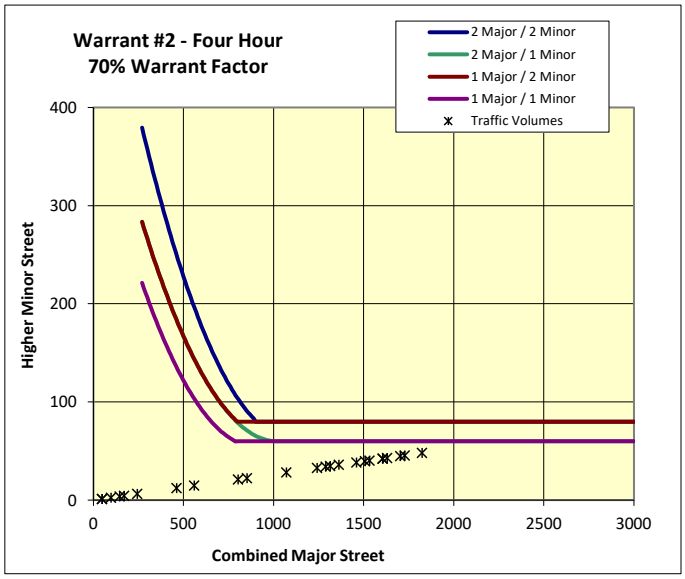
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

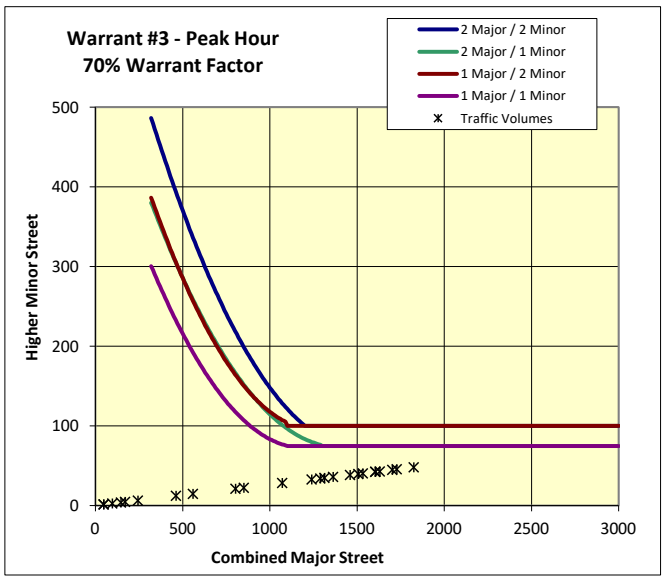
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	0	No	
56%	A	336	84	0	No	**No**
	B	504	42	6	No	





KITTELSON & ASSOCIATES

Project #:	26188.005
Project Name:	Claremont Court TIA (Hayward)
Analyst:	KVP
Analysis Date:	1/29/2025
File:	H:\26\26188 - Hayward Transportation On-Call\005 - Hayward 2256 Claremont Court Truck TIA\analysis\Signal
Intersection:	Hopkins St/Industrial Pkwy W
Scenario:	Existing PM + Project
Data Date:	10/10/2024

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:25 PM	5:25 PM	1154	1044	54	18
2nd Highest Hour		1092	988	51	17
3rd Highest Hour		1077	974	50	17
4th Highest Hour		1031	933	48	16
5th Highest Hour		1016	919	48	16
6th Highest Hour		1016	919	48	16
7th Highest Hour		969	877	45	15
8th Highest Hour		954	863	45	15
9th Highest Hour		923	835	43	14
10th Highest Hour		862	780	40	13
11th Highest Hour		831	752	39	13
12th Highest Hour		815	738	38	13
13th Highest Hour		785	710	37	12
14th Highest Hour		677	612	32	11
15th Highest Hour		539	487	25	8
16th Highest Hour		508	459	24	8
17th Highest Hour		354	320	17	6
18th Highest Hour		292	264	14	5
19th Highest Hour		154	139	7	2
20th Highest Hour		108	97	5	2
21st Highest Hour		92	84	4	1
22nd Highest Hour		62	56	3	1
23rd Highest Hour		31	28	1	0
24th Highest Hour		31	28	1	0

Warrant Summary

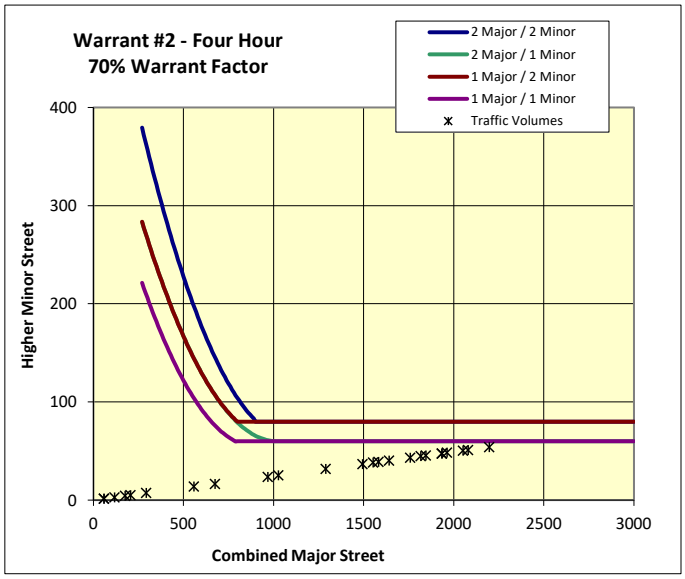
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

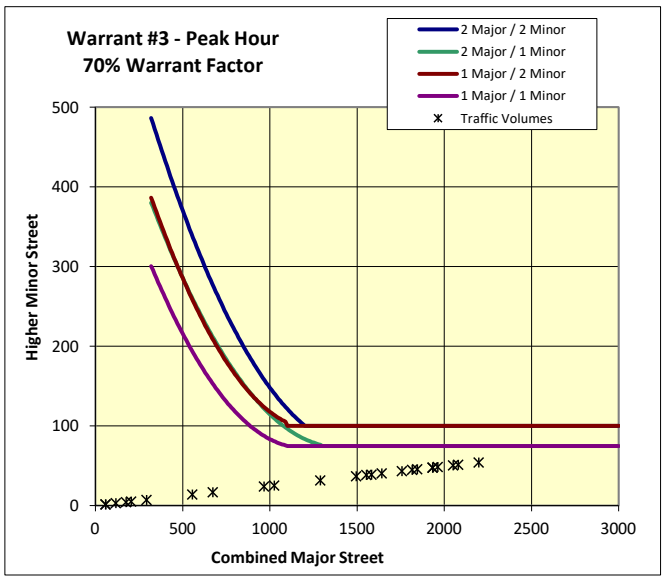
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	1	No	
56%	A	336	84	0	No	**Yes**
	B	504	42	9	Yes	





KITTELSON & ASSOCIATES

Project #:	26188.005
Project Name:	Claremont Court TIA (Hayward)
Analyst:	KVP
Analysis Date:	1/29/2025
File:	H:\26\26188 - Hayward Transportation On-Call\005 - Hayward 2256 Claremont Court Truck TIA\analysis\Signal
Intersection:	Hopkins St/Industrial Pkwy W
Scenario:	BG + Project AM
Data Date:	10/10/2024

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
7:45 AM	8:45 AM	1281	799	49	11
2nd Highest Hour		1213	756	46	10
3rd Highest Hour		1196	746	46	10
4th Highest Hour		1144	714	44	10
5th Highest Hour		1127	703	43	10
6th Highest Hour		1127	703	43	10
7th Highest Hour		1076	671	41	9
8th Highest Hour		1059	661	41	9
9th Highest Hour		1025	639	39	9
10th Highest Hour		956	597	37	8
11th Highest Hour		922	575	35	8
12th Highest Hour		905	565	35	8
13th Highest Hour		871	543	33	7
14th Highest Hour		752	469	29	6
15th Highest Hour		598	373	23	5
16th Highest Hour		564	352	22	5
17th Highest Hour		393	245	15	3
18th Highest Hour		325	202	12	3
19th Highest Hour		171	107	7	1
20th Highest Hour		120	75	5	1
21st Highest Hour		102	64	4	1
22nd Highest Hour		68	43	3	1
23rd Highest Hour		34	21	1	0
24th Highest Hour		34	21	1	0

Warrant Summary

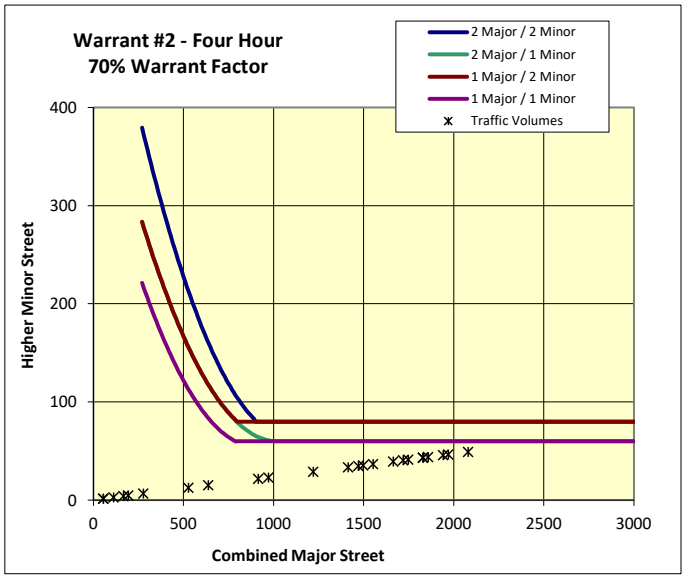
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

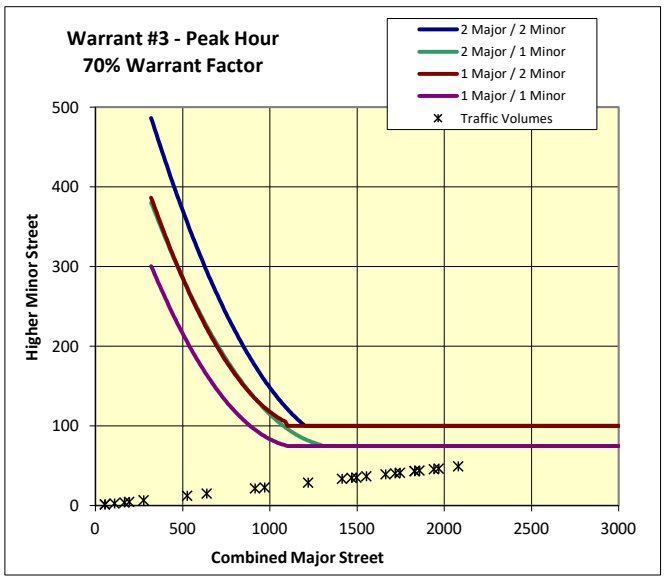
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	0	No	
56%	A	336	84	0	No	**No**
	B	504	42	7	No	





KITTELSON & ASSOCIATES

Project #:	26188.005
Project Name:	Claremont Court TIA (Hayward)
Analyst:	KVP
Analysis Date:	1/29/2025
File:	H:\26\26188 - Hayward Transportation On-Call\005 - Hayward 2256 Claremont Court Truck TIA\analysis\Signal
Intersection:	Hopkins St/Industrial Pkwy W
Scenario:	Background PM + Project
Data Date:	10/10/2024

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:25 PM	5:25 PM	1284	1302	59	18
2nd Highest Hour		1216	1233	56	17
3rd Highest Hour		1198	1215	55	17
4th Highest Hour		1147	1163	53	16
5th Highest Hour		1130	1146	52	16
6th Highest Hour		1130	1146	52	16
7th Highest Hour		1079	1094	50	15
8th Highest Hour		1061	1076	49	15
9th Highest Hour		1027	1042	47	14
10th Highest Hour		959	972	44	13
11th Highest Hour		924	937	42	13
12th Highest Hour		907	920	42	13
13th Highest Hour		873	885	40	12
14th Highest Hour		753	764	35	11
15th Highest Hour		599	608	28	8
16th Highest Hour		565	573	26	8
17th Highest Hour		394	399	18	6
18th Highest Hour		325	330	15	5
19th Highest Hour		171	174	8	2
20th Highest Hour		120	122	6	2
21st Highest Hour		103	104	5	1
22nd Highest Hour		68	69	3	1
23rd Highest Hour		34	35	2	0
24th Highest Hour		34	35	2	0

Warrant Summary

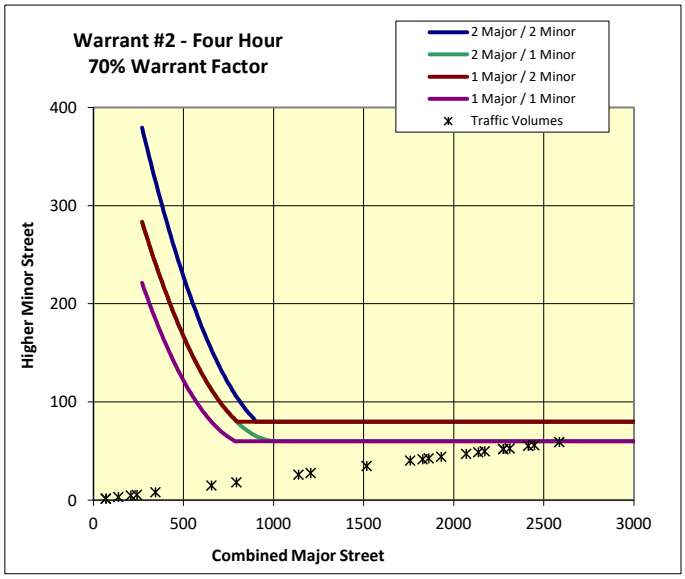
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

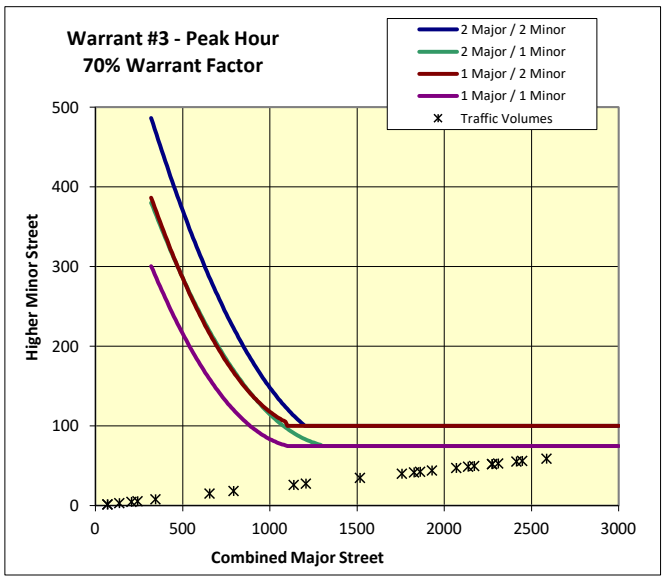
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	89%
Minor Street: 8th-Highest Hour / Peak Hour	83%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	150	0	No	**No**
	B	900	75	0	No	
80%	A	480	120	0	No	**No**
	B	720	60	0	No	
70%	A	420	105	0	No	**No**
	B	630	53	4	No	
56%	A	336	84	0	No	**Yes**
	B	504	42	12	Yes	





Appendix G
Background LOS Worksheets

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	370	470	270	439	384	281	582	84	284	1104	25
Future Volume (veh/h)	89	370	470	270	439	384	281	582	84	284	1104	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1693	1752	1826	1767	1885	1781	1841	1826	1870	1856	1663
Adj Flow Rate, veh/h	99	411	0	300	488	130	312	647	82	316	1227	27
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	10	14	10	5	9	1	8	4	5	2	3	16
Cap, veh/h	159	558		394	809	379	391	1929	242	400	1493	33
Arrive On Green	0.05	0.17	0.00	0.12	0.24	0.24	0.12	0.43	0.43	0.12	0.42	0.42
Sat Flow, veh/h	3237	3216	1485	3374	3357	1573	3291	4519	567	3456	3525	78
Grp Volume(v), veh/h	99	411	0	300	488	130	312	478	251	316	613	641
Grp Sat Flow(s),veh/h/ln	1618	1608	1485	1687	1678	1573	1646	1675	1736	1728	1763	1840
Q Serve(g_s), s	3.4	13.6	0.0	9.7	14.5	7.7	10.4	10.7	10.9	10.0	34.6	34.6
Cycle Q Clear(g_c), s	3.4	13.6	0.0	9.7	14.5	7.7	10.4	10.7	10.9	10.0	34.6	34.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		0.04
Lane Grp Cap(c), veh/h	159	558		394	809	379	391	1430	741	400	747	779
V/C Ratio(X)	0.62	0.74		0.76	0.60	0.34	0.80	0.33	0.34	0.79	0.82	0.82
Avail Cap(c_a), veh/h	864	1144		900	1194	560	878	1490	772	922	784	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.4	44.0	0.0	48.1	37.9	35.3	48.2	21.5	21.6	48.4	28.6	28.7
Incr Delay (d2), s/veh	5.5	2.7	0.0	4.3	1.0	0.8	3.8	0.5	1.0	3.5	9.0	8.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	9.3	0.0	7.5	9.8	5.3	7.9	7.6	8.0	7.9	22.4	23.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.9	46.7	0.0	52.4	38.9	36.0	52.0	22.0	22.6	51.9	37.7	37.4
LnGrp LOS	E	D		D	D	D	D	C	C	D	D	D
Approach Vol, veh/h		510			918			1041			1570	
Approach Delay, s/veh		48.9			42.9			31.1			40.4	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	53.0	9.5	32.9	17.4	52.6	17.1	25.3
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	12.0	12.9	5.4	16.5	12.4	36.6	11.7	15.6
Green Ext Time (p_c), s	1.0	13.2	0.4	4.9	1.0	11.0	1.4	3.5

Intersection Summary	
HCM 7th Control Delay, s/veh	39.7
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	759	16	45	1196	30	20	1	28	7	1	3
Future Vol, veh/h	12	759	16	45	1196	30	20	1	28	7	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	12	12	13	5	3	58	0	57	14	0	0
Mvmt Flow	13	843	18	50	1329	33	22	1	31	8	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1362	0	0	861	0	0	1511	2341	431	1894	2333	681
Stage 1	-	-	-	-	-	-	879	879	-	1446	1446	-
Stage 2	-	-	-	-	-	-	632	1462	-	449	888	-
Critical Hdwy	5.3	-	-	4.36	-	-	8.11	6.5	8.04	7.23	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	7.66	5.5	-	7.58	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.86	5.5	-	6.78	5.5	-
Follow-up Hdwy	3.1	-	-	2.33	-	-	4.23	4	3.87	3.79	4	3.9
Pot Cap-1 Maneuver	266	-	-	710	-	-	60	37	444	49	37	341
Stage 1	-	-	-	-	-	-	210	368	-	88	199	-
Stage 2	-	-	-	-	-	-	303	195	-	512	365	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	266	-	-	710	-	-	51	33	444	39	33	341
Mov Cap-2 Maneuver	-	-	-	-	-	-	51	33	-	39	33	-
Stage 1	-	-	-	-	-	-	200	350	-	82	185	-
Stage 2	-	-	-	-	-	-	278	181	-	451	346	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.29	0.37	59.91	91.21
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	51	309	266	-	-	710	-	-	39	102
HCM Lane V/C Ratio	0.433	0.104	0.05	-	-	0.07	-	-	0.2	0.043
HCM Control Delay (s/veh)	120.7	18	19.3	-	-	10.5	-	-	119.4	41.8
HCM Lane LOS	F	C	C	-	-	B	-	-	F	E
HCM 95th %tile Q(veh)	1.6	0.3	0.2	-	-	0.2	-	-	0.6	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	125	665	956	237	450	341
Future Volume (veh/h)	125	665	956	237	450	341
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1693	1722	1826	1811	1722	1752
Adj Flow Rate, veh/h	134	715	1028	151	484	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	14	12	5	6	12	10
Cap, veh/h	163	1895	1486	657	513	
Arrive On Green	0.10	0.58	0.43	0.43	0.31	0.00
Sat Flow, veh/h	1612	3358	3561	1535	1640	1485
Grp Volume(v), veh/h	134	715	1028	151	484	0
Grp Sat Flow(s),veh/h/ln	1612	1636	1735	1535	1640	1485
Q Serve(g_s), s	6.8	9.9	20.2	5.2	24.2	0.0
Cycle Q Clear(g_c), s	6.8	9.9	20.2	5.2	24.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	163	1895	1486	657	513	
V/C Ratio(X)	0.82	0.38	0.69	0.23	0.94	
Avail Cap(c_a), veh/h	269	1895	1486	657	586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.0	9.5	19.5	15.2	28.2	0.0
Incr Delay (d2), s/veh	4.0	0.6	2.7	0.8	21.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.0	5.6	12.5	3.3	17.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	41.0	10.1	22.2	16.0	49.9	0.0
LnGrp LOS	D	B	C	B	D	
Approach Vol, veh/h		849	1179		484	
Approach Delay, s/veh		15.0	21.4		49.9	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.7	40.9			53.6	30.4
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	14.0	26.0			45.0	30.0
Max Q Clear Time (g_c+I1), s	8.8	22.2			11.9	26.2
Green Ext Time (p_c), s	0.0	0.8			0.9	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	24.7
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	959	1045	0	0	0
Future Volume (Veh/h)	123	959	1045	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	131	1020	1112	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.93	
vC, conflicting volume	1112				1884	556
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1112				1799	556
tC, single (s)	4.6				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	74				100	100
cM capacity (veh/h)	506				50	480

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	131	510	510	556	556	0
Volume Left	131	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	506	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.30	0.30	0.33	0.33	0.00
Queue Length 95th (ft)	26	0	0	0	0	0
Control Delay (s/veh)	14.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.7			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	9	0	8	16	0
Future Vol, veh/h	13	9	0	8	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	23	11	0	38	56	0
Mvmt Flow	17	12	0	10	21	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	33	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	-	-	4.1	-	6.96	6.2
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	-	-	2.2	-	4.004	3.3
Pot Cap-1 Maneuver	-	-	1598	-	859	1060
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	889	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1598	-	859	1060
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.29
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	859	-	-	1598	-
HCM Lane V/C Ratio	0.024	-	-	-	-
HCM Control Delay (s/veh)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	746	306	281	512	459	257	1226	141	265	767	50
Future Volume (veh/h)	202	746	306	281	512	459	257	1226	141	265	767	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1885	1781	1885	1707	1885	1841	1870	1885	1900
Adj Flow Rate, veh/h	215	794	0	299	545	223	273	1304	143	282	816	51
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	7	6	1	8	1	13	1	4	2	1	0
Cap, veh/h	291	926		384	1006	467	337	1736	190	353	1248	78
Arrive On Green	0.08	0.27	0.00	0.11	0.30	0.30	0.11	0.37	0.37	0.10	0.37	0.37
Sat Flow, veh/h	3456	3413	1535	3483	3385	1571	3155	4693	515	3456	3418	214
Grp Volume(v), veh/h	215	794	0	299	545	223	273	953	494	282	428	439
Grp Sat Flow(s),veh/h/ln	1728	1706	1535	1742	1692	1571	1577	1716	1777	1728	1791	1840
Q Serve(g_s), s	7.8	28.3	0.0	10.7	17.3	14.9	10.8	31.1	31.1	10.2	25.5	25.5
Cycle Q Clear(g_c), s	7.8	28.3	0.0	10.7	17.3	14.9	10.8	31.1	31.1	10.2	25.5	25.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		0.12
Lane Grp Cap(c), veh/h	291	926		384	1006	467	337	1269	657	353	654	672
V/C Ratio(X)	0.74	0.86		0.78	0.54	0.48	0.81	0.75	0.75	0.80	0.65	0.65
Avail Cap(c_a), veh/h	809	1065		815	1056	490	738	1338	693	809	698	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.3	44.4	0.0	55.5	37.7	36.9	56.0	35.2	35.2	56.3	33.9	33.9
Incr Delay (d2), s/veh	5.2	6.9	0.0	4.9	0.7	1.1	4.7	3.6	6.8	4.2	4.2	4.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.4	18.3	0.0	8.5	11.4	9.6	8.0	19.4	20.7	8.2	17.3	17.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	62.5	51.2	0.0	60.4	38.4	38.0	60.7	38.9	42.1	60.4	38.1	38.0
LnGrp LOS	E	D		E	D	D	E	D	D	E	D	D
Approach Vol, veh/h		1009			1067			1720			1149	
Approach Delay, s/veh		53.6			44.5			43.3			43.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	52.4	14.8	43.9	17.7	51.8	18.1	40.6
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	12.2	33.1	9.8	19.3	12.8	27.5	12.7	30.3
Green Ext Time (p_c), s	0.9	14.3	1.0	5.8	0.8	12.2	1.4	4.4

Intersection Summary	
HCM 7th Control Delay, s/veh	45.7
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1252	25	34	1257	6	14	0	23	8	0	10
Future Vol, veh/h	3	1252	25	34	1257	6	14	0	23	8	0	10
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	4	59	35	7	17	11	0	9	0	0	10
Mvmt Flow	3	1346	27	37	1352	6	15	0	25	9	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1360	0	0	1374	0	0	1981	2800	688	2110	2811	681
Stage 1	-	-	-	-	-	-	1367	1367	-	1430	1430	-
Stage 2	-	-	-	-	-	-	614	1433	-	680	1381	-
Critical Hdwy	5.3	-	-	4.8	-	-	7.17	6.5	7.08	6.95	6.5	7.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.5	-	7.3	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.92	5.5	-	6.5	5.5	-
Follow-up Hdwy	3.1	-	-	2.55	-	-	3.76	4	3.39	3.65	4	4
Pot Cap-1 Maneuver	266	-	-	354	-	-	44	19	373	41	18	322
Stage 1	-	-	-	-	-	-	140	217	-	103	202	-
Stage 2	-	-	-	-	-	-	399	201	-	400	214	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	266	-	-	353	-	-	38	16	373	34	16	322
Mov Cap-2 Maneuver	-	-	-	-	-	-	38	16	-	34	16	-
Stage 1	-	-	-	-	-	-	138	214	-	92	181	-
Stage 2	-	-	-	-	-	-	345	180	-	369	211	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.43	68.04	73.91
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	38	373	266	-	-	353	-	-	34	322
HCM Lane V/C Ratio	0.401	0.066	0.012	-	-	0.104	-	-	0.256	0.033
HCM Control Delay (s/veh)	154.6	15.3	18.7	-	-	16.4	-	-	145.6	16.6
HCM Lane LOS	F	C	C	-	-	C	-	-	F	C
HCM 95th %tile Q(veh)	1.4	0.2	0	-	-	0.3	-	-	0.8	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	317	922	1029	263	362	236
Future Volume (veh/h)	317	922	1029	263	362	236
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1826	1781	1767	1707
Adj Flow Rate, veh/h	334	971	1083	168	381	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	5	8	9	13
Cap, veh/h	367	2286	1378	600	411	
Arrive On Green	0.21	0.65	0.40	0.40	0.24	0.00
Sat Flow, veh/h	1753	3589	3561	1510	1682	1447
Grp Volume(v), veh/h	334	971	1083	168	381	0
Grp Sat Flow(s),veh/h/ln	1753	1749	1735	1510	1682	1447
Q Serve(g_s), s	16.6	11.9	24.4	6.7	19.7	0.0
Cycle Q Clear(g_c), s	16.6	11.9	24.4	6.7	19.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	367	2286	1378	600	411	
V/C Ratio(X)	0.91	0.42	0.79	0.28	0.93	
Avail Cap(c_a), veh/h	473	2286	1378	600	473	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	7.4	23.5	18.2	32.9	0.0
Incr Delay (d2), s/veh	16.4	0.6	4.6	1.2	21.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.1	6.6	15.2	4.3	15.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	50.8	8.0	28.1	19.4	54.5	0.0
LnGrp LOS	D	A	C	B	D	
Approach Vol, veh/h		1305	1251		381	
Approach Delay, s/veh		18.9	26.9		54.5	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	22.8	40.2			63.1	25.9
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	24.0	26.0			55.0	25.0
Max Q Clear Time (g_c+I1), s	18.6	26.4			13.9	21.7
Green Ext Time (p_c), s	0.1	0.0			1.2	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	26.9
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	170	1129	1090	0	0	0
Future Volume (Veh/h)	170	1129	1090	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	177	1176	1135	0	0	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.89	
vC, conflicting volume	1137				2079	570
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1137				1965	570
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	69				100	100
cM capacity (veh/h)	577				35	470

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	177	588	588	568	568	0
Volume Left	177	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	577	1700	1700	1700	1700	1700
Volume to Capacity	0.31	0.35	0.35	0.33	0.33	0.00
Queue Length 95th (ft)	32	0	0	0	0	0
Control Delay (s/veh)	14.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.8			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	11	0	6	10	0
Future Vol, veh/h	12	11	0	6	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	75	91	0	17	50	0
Mvmt Flow	15	14	0	7	12	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	29	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	-	-	4.1	-	6.9	6.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.3
Pot Cap-1 Maneuver	-	-	1598	-	876	1062
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1598	-	876	1062
Mov Cap-2 Maneuver	-	-	-	-	876	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.17
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	876	-	-	1598	-
HCM Lane V/C Ratio	0.014	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix H
Background Plus Project LOS Worksheets

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	372	470	270	439	384	281	582	86	292	1104	25
Future Volume (veh/h)	89	372	470	270	439	384	281	582	86	292	1104	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1693	1752	1826	1767	1885	1781	1841	1826	1870	1856	1663
Adj Flow Rate, veh/h	99	413	0	300	488	130	312	647	85	324	1227	27
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	10	14	10	5	9	1	8	4	5	2	3	16
Cap, veh/h	159	560		394	811	380	391	1907	248	408	1492	33
Arrive On Green	0.05	0.17	0.00	0.12	0.24	0.24	0.12	0.42	0.42	0.12	0.42	0.42
Sat Flow, veh/h	3237	3216	1485	3374	3357	1573	3291	4498	585	3456	3525	78
Grp Volume(v), veh/h	99	413	0	300	488	130	312	480	252	324	613	641
Grp Sat Flow(s),veh/h/ln	1618	1608	1485	1687	1678	1573	1646	1675	1733	1728	1763	1840
Q Serve(g_s), s	3.4	13.7	0.0	9.7	14.5	7.7	10.4	10.8	11.0	10.3	34.6	34.7
Cycle Q Clear(g_c), s	3.4	13.7	0.0	9.7	14.5	7.7	10.4	10.8	11.0	10.3	34.6	34.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		0.04
Lane Grp Cap(c), veh/h	159	560		394	811	380	391	1420	734	408	746	779
V/C Ratio(X)	0.62	0.74		0.76	0.60	0.34	0.80	0.34	0.34	0.79	0.82	0.82
Avail Cap(c_a), veh/h	863	1143		899	1193	559	877	1488	770	921	783	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	44.0	0.0	48.2	37.9	35.3	48.3	21.8	21.9	48.3	28.7	28.7
Incr Delay (d2), s/veh	5.5	2.7	0.0	4.3	1.0	0.8	3.8	0.5	1.0	3.5	9.1	8.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	9.3	0.0	7.5	9.8	5.3	7.9	7.7	8.1	8.1	22.5	23.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	58.0	46.8	0.0	52.5	38.9	36.0	52.0	22.3	22.9	51.8	37.8	37.5
LnGrp LOS	E	D		D	D	D	D	C	C	D	D	D
Approach Vol, veh/h		512			918			1044			1578	
Approach Delay, s/veh		48.9			42.9			31.3			40.6	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	52.7	9.5	33.0	17.4	52.6	17.1	25.4
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	12.3	13.0	5.4	16.5	12.4	36.7	11.7	15.7
Green Ext Time (p_c), s	1.0	13.3	0.4	4.9	1.0	11.0	1.4	3.5

Intersection Summary	
HCM 7th Control Delay, s/veh	39.8
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	759	28	55	1196	30	20	1	28	7	1	3
Future Vol, veh/h	12	759	28	55	1196	30	20	1	28	7	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	12	12	13	5	3	58	0	57	14	0	0
Mvmt Flow	13	843	31	61	1329	33	22	1	31	8	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1362	0	0	874	0	0	1540	2370	437	1917	2369	681
Stage 1	-	-	-	-	-	-	886	886	-	1468	1468	-
Stage 2	-	-	-	-	-	-	654	1484	-	449	901	-
Critical Hdwy	5.3	-	-	4.36	-	-	8.11	6.5	8.04	7.23	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	7.66	5.5	-	7.58	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.86	5.5	-	6.78	5.5	-
Follow-up Hdwy	3.1	-	-	2.33	-	-	4.23	4	3.87	3.79	4	3.9
Pot Cap-1 Maneuver	266	-	-	702	-	-	57	35	439	47	35	341
Stage 1	-	-	-	-	-	-	208	366	-	85	194	-
Stage 2	-	-	-	-	-	-	292	190	-	512	360	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	266	-	-	702	-	-	48	31	439	37	31	341
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	31	-	37	31	-
Stage 1	-	-	-	-	-	-	198	347	-	77	177	-
Stage 2	-	-	-	-	-	-	263	174	-	450	342	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.29	0.46	65.7	97.23
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	48	301	266	-	-	702	-	-	37	97
HCM Lane V/C Ratio	0.466	0.107	0.05	-	-	0.087	-	-	0.212	0.046
HCM Control Delay (s/veh)	134.3	18.4	19.3	-	-	10.6	-	-	127.6	44
HCM Lane LOS	F	C	C	-	-	B	-	-	F	E
HCM 95th %tile Q(veh)	1.7	0.4	0.2	-	-	0.3	-	-	0.7	0.1

HCM 7th Signalized Intersection Summary
3: Industrial Pkwy W & I-880 SB Ramp

12/23/2024

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	125	665	964	237	450	343
Future Volume (veh/h)	125	665	964	237	450	343
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1693	1722	1826	1811	1722	1752
Adj Flow Rate, veh/h	134	715	1037	151	484	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	14	12	5	6	12	10
Cap, veh/h	163	1895	1486	657	513	
Arrive On Green	0.10	0.58	0.43	0.43	0.31	0.00
Sat Flow, veh/h	1612	3358	3561	1535	1640	1485
Grp Volume(v), veh/h	134	715	1037	151	484	0
Grp Sat Flow(s),veh/h/ln	1612	1636	1735	1535	1640	1485
Q Serve(g_s), s	6.8	9.9	20.5	5.2	24.2	0.0
Cycle Q Clear(g_c), s	6.8	9.9	20.5	5.2	24.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	163	1895	1486	657	513	
V/C Ratio(X)	0.82	0.38	0.70	0.23	0.94	
Avail Cap(c_a), veh/h	269	1895	1486	657	586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.0	9.5	19.6	15.2	28.2	0.0
Incr Delay (d2), s/veh	4.0	0.6	2.7	0.8	21.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.0	5.6	12.6	3.3	17.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	41.0	10.1	22.3	16.0	49.9	0.0
LnGrp LOS	D	B	C	B	D	
Approach Vol, veh/h		849	1188		484	
Approach Delay, s/veh		15.0	21.5		49.9	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.7	40.9			53.6	30.4
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	14.0	26.0			45.0	30.0
Max Q Clear Time (g_c+I1), s	8.8	22.5			11.9	26.2
Green Ext Time (p_c), s	0.0	0.7			0.9	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	24.8
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	959	1053	0	0	0
Future Volume (Veh/h)	123	959	1053	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	131	1020	1120	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.93	
vC, conflicting volume	1120				1892	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1120				1807	560
tC, single (s)	4.6				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	74				100	100
cM capacity (veh/h)	502				49	477

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	131	510	510	560	560	0
Volume Left	131	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	502	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.30	0.30	0.33	0.33	0.00
Queue Length 95th (ft)	26	0	0	0	0	0
Control Delay (s/veh)	14.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.7			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	31	0	8	16	0
Future Vol, veh/h	13	31	0	8	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	23	11	0	38	56	0
Mvmt Flow	17	40	0	10	21	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	56	0	47	37
Stage 1	-	-	-	-	37	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	-	-	4.1	-	6.96	6.2
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	-	-	2.2	-	4.004	3.3
Pot Cap-1 Maneuver	-	-	1561	-	843	1042
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	889	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1561	-	843	1042
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.38
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	843	-	-	1561	-
HCM Lane V/C Ratio	0.024	-	-	-	-
HCM Control Delay (s/veh)	9.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

12/23/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	747	306	283	514	466	257	1226	142	267	767	50
Future Volume (veh/h)	202	747	306	283	514	466	257	1226	142	267	767	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1885	1781	1885	1707	1885	1841	1870	1885	1900
Adj Flow Rate, veh/h	215	795	0	301	547	231	273	1304	144	284	816	51
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	7	6	1	8	1	13	1	4	2	1	0
Cap, veh/h	291	926		385	1008	468	337	1731	191	355	1248	78
Arrive On Green	0.08	0.27	0.00	0.11	0.30	0.30	0.11	0.37	0.37	0.10	0.37	0.37
Sat Flow, veh/h	3456	3413	1535	3483	3385	1571	3155	4689	518	3456	3418	214
Grp Volume(v), veh/h	215	795	0	301	547	231	273	954	494	284	428	439
Grp Sat Flow(s),veh/h/ln	1728	1706	1535	1742	1692	1571	1577	1716	1776	1728	1791	1840
Q Serve(g_s), s	7.8	28.5	0.0	10.8	17.4	15.6	10.9	31.2	31.2	10.3	25.6	25.6
Cycle Q Clear(g_c), s	7.8	28.5	0.0	10.8	17.4	15.6	10.9	31.2	31.2	10.3	25.6	25.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		0.12
Lane Grp Cap(c), veh/h	291	926		385	1008	468	337	1267	656	355	654	672
V/C Ratio(X)	0.74	0.86		0.78	0.54	0.49	0.81	0.75	0.75	0.80	0.65	0.65
Avail Cap(c_a), veh/h	806	1062		813	1053	489	736	1335	691	806	697	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	44.5	0.0	55.6	37.8	37.2	56.1	35.4	35.4	56.4	34.0	34.0
Incr Delay (d2), s/veh	5.2	7.0	0.0	4.9	0.7	1.2	4.7	3.7	6.9	4.2	4.2	4.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.4	18.3	0.0	8.5	11.5	10.0	8.0	19.5	20.8	8.2	17.4	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	62.7	51.5	0.0	60.5	38.5	38.3	60.8	39.1	42.4	60.6	38.3	38.2
LnGrp LOS	E	D		E	D	D	E	D	D	E	D	D
Approach Vol, veh/h		1010			1079			1721			1151	
Approach Delay, s/veh		53.9			44.6			43.5			43.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	52.5	14.8	44.1	17.7	51.9	18.2	40.7
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	12.3	33.2	9.8	19.4	12.9	27.6	12.8	30.5
Green Ext Time (p_c), s	0.9	14.2	1.0	5.9	0.8	12.2	1.4	4.4

Intersection Summary	
HCM 7th Control Delay, s/veh	45.9
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1252	29	39	1257	6	25	0	34	8	0	10
Future Vol, veh/h	3	1252	29	39	1257	6	25	0	34	8	0	10
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	4	59	35	7	17	11	0	9	0	0	10
Mvmt Flow	3	1346	31	42	1352	6	27	0	37	9	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1360	0	0	1378	0	0	1994	2813	690	2120	2826	681
Stage 1	-	-	-	-	-	-	1369	1369	-	1441	1441	-
Stage 2	-	-	-	-	-	-	625	1444	-	680	1385	-
Critical Hdwy	5.3	-	-	4.8	-	-	7.17	6.5	7.08	6.95	6.5	7.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.5	-	7.3	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.92	5.5	-	6.5	5.5	-
Follow-up Hdwy	3.1	-	-	2.55	-	-	3.76	4	3.39	3.65	4	4
Pot Cap-1 Maneuver	266	-	-	352	-	-	43	18	372	40	18	322
Stage 1	-	-	-	-	-	-	140	216	-	101	200	-
Stage 2	-	-	-	-	-	-	392	199	-	400	213	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	266	-	-	352	-	-	36	16	372	31	16	322
Mov Cap-2 Maneuver	-	-	-	-	-	-	36	16	-	31	16	-
Stage 1	-	-	-	-	-	-	138	213	-	89	176	-
Stage 2	-	-	-	-	-	-	334	175	-	356	210	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.5	110.38	79.72
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	36	372	266	-	-	352	-	-	31	322
HCM Lane V/C Ratio	0.745	0.098	0.012	-	-	0.119	-	-	0.274	0.033
HCM Control Delay (s/veh)	239.1	15.7	18.7	-	-	16.6	-	-	158.7	16.6
HCM Lane LOS	F	C	C	-	-	C	-	-	F	C
HCM 95th %tile Q(veh)	2.7	0.3	0	-	-	0.4	-	-	0.9	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	319	931	1033	263	362	237
Future Volume (veh/h)	319	931	1033	263	362	237
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1826	1781	1767	1707
Adj Flow Rate, veh/h	336	980	1087	168	381	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	5	8	9	13
Cap, veh/h	369	2286	1374	598	411	
Arrive On Green	0.21	0.65	0.40	0.40	0.24	0.00
Sat Flow, veh/h	1753	3589	3561	1510	1682	1447
Grp Volume(v), veh/h	336	980	1087	168	381	0
Grp Sat Flow(s),veh/h/ln	1753	1749	1735	1510	1682	1447
Q Serve(g_s), s	16.7	12.0	24.5	6.7	19.7	0.0
Cycle Q Clear(g_c), s	16.7	12.0	24.5	6.7	19.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	369	2286	1374	598	411	
V/C Ratio(X)	0.91	0.43	0.79	0.28	0.93	
Avail Cap(c_a), veh/h	473	2286	1374	598	473	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.3	7.4	23.6	18.3	32.9	0.0
Incr Delay (d2), s/veh	16.6	0.6	4.7	1.2	21.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	13.2	6.7	15.3	4.3	15.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	50.9	8.0	28.4	19.4	54.5	0.0
LnGrp LOS	D	A	C	B	D	
Approach Vol, veh/h		1316	1255		381	
Approach Delay, s/veh		19.0	27.2		54.5	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	22.9	40.1			63.1	25.9
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	24.0	26.0			55.0	25.0
Max Q Clear Time (g_c+I1), s	18.7	26.5			14.0	21.7
Green Ext Time (p_c), s	0.1	0.0			1.2	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	27.0
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	172	1136	1094	0	0	0
Future Volume (Veh/h)	172	1136	1094	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	179	1183	1140	0	0	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.89	
vC, conflicting volume	1142				2092	572
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1142				1977	572
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	69				100	100
cM capacity (veh/h)	574				34	468

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	179	592	592	570	570	0
Volume Left	179	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	574	1700	1700	1700	1700	1700
Volume to Capacity	0.31	0.35	0.35	0.34	0.34	0.00
Queue Length 95th (ft)	33	0	0	0	0	0
Control Delay (s/veh)	14.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.9			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.3

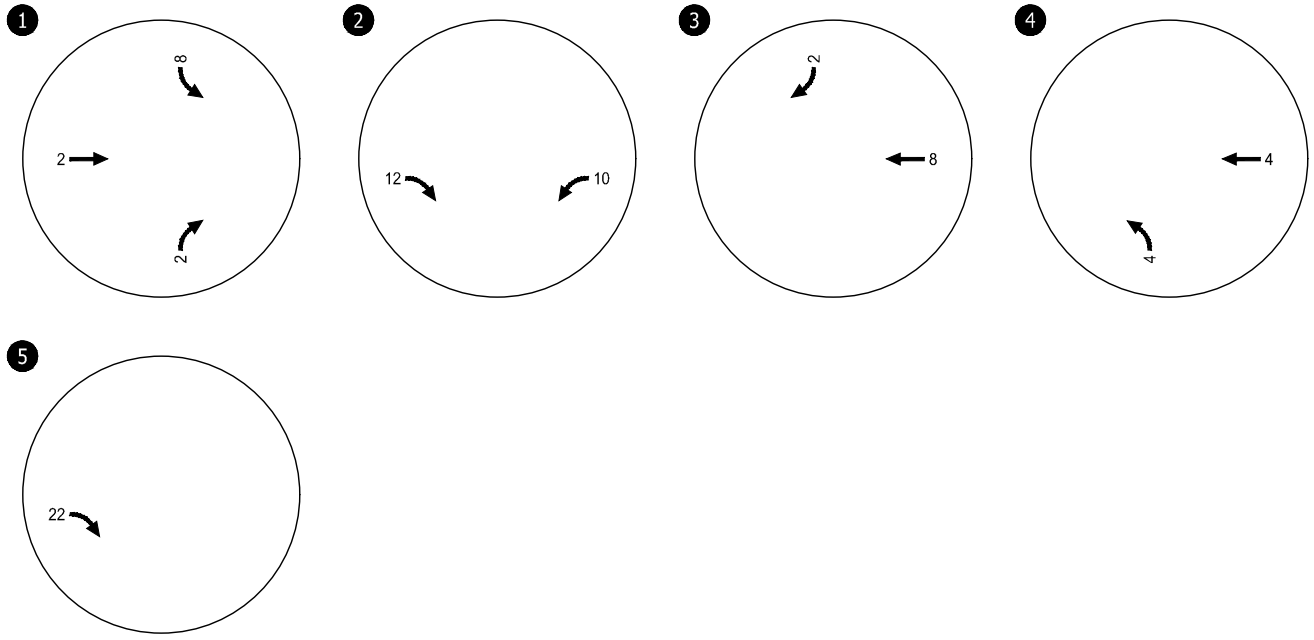
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	20	0	6	32	0
Future Vol, veh/h	12	20	0	6	32	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	75	91	0	17	50	0
Mvmt Flow	15	25	0	7	40	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	40	0	35	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	-	-	4.1	-	6.9	6.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.3
Pot Cap-1 Maneuver	-	-	1583	-	869	1054
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	869	1054
Mov Cap-2 Maneuver	-	-	-	-	869	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.34
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	869	-	-	1583	-
HCM Lane V/C Ratio	0.045	-	-	-	-
HCM Control Delay (s/veh)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Appendix I
Cumulative Scenario



XX%
Trip Distribution

Estimated Trip Distribution Pattern & Site Generated Trips
Cumulative | Weekday AM Peak Hour
Hayward, CA

Figure
I-1

KITTELSON & ASSOCIATES

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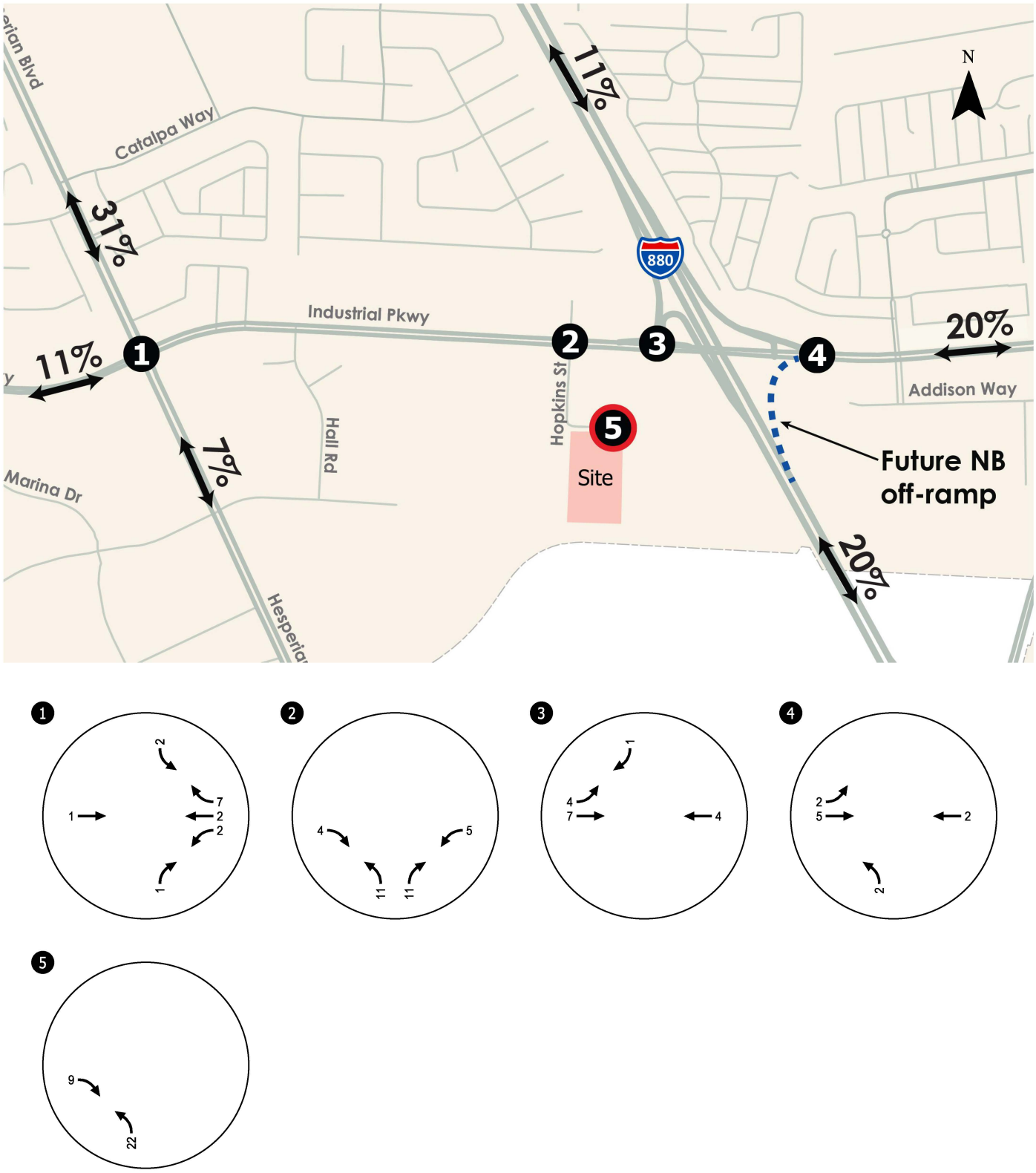
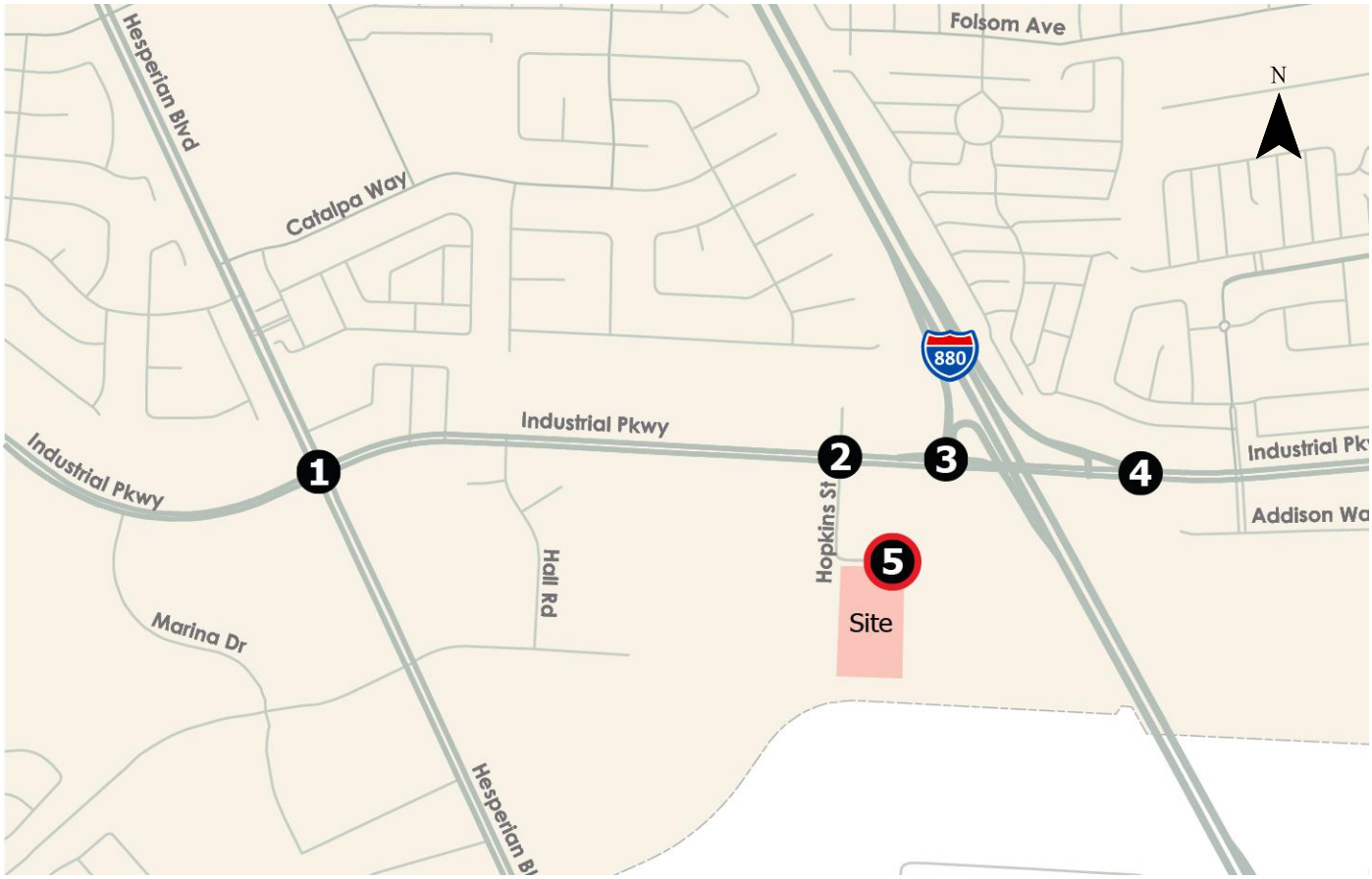


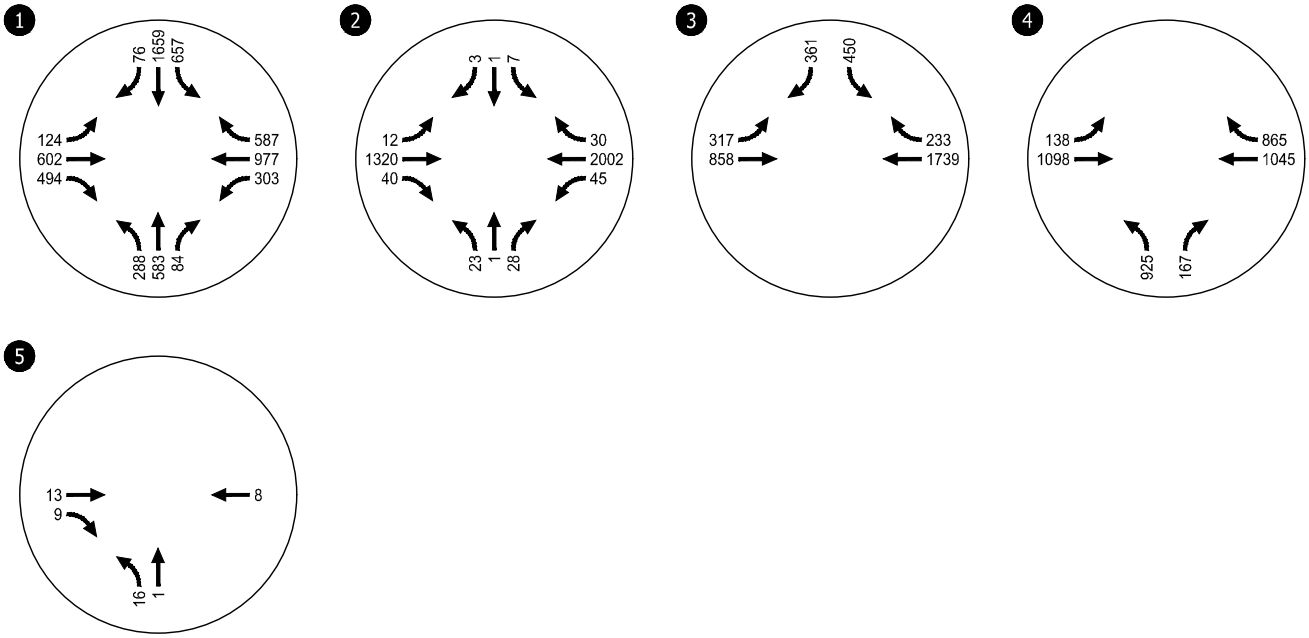
XX%
Trip Distribution

Estimated Trip Distribution Pattern & Site Generated Trips
Cumulative | Weekday PM Peak Hour
Hayward, CA

Figure
I-2

H:\26\26188 - Hayward Transportation On-Call\005 - Hayward 2256 Claremont Court Truck TIA\report\figs\26188-05_2256ClaremontCt_Figures_20241114.dwg Jun 03, 2025 - 4:11pm - kphan Layout Tab: CUMUL_TA_PM





Cumulative Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
I-3

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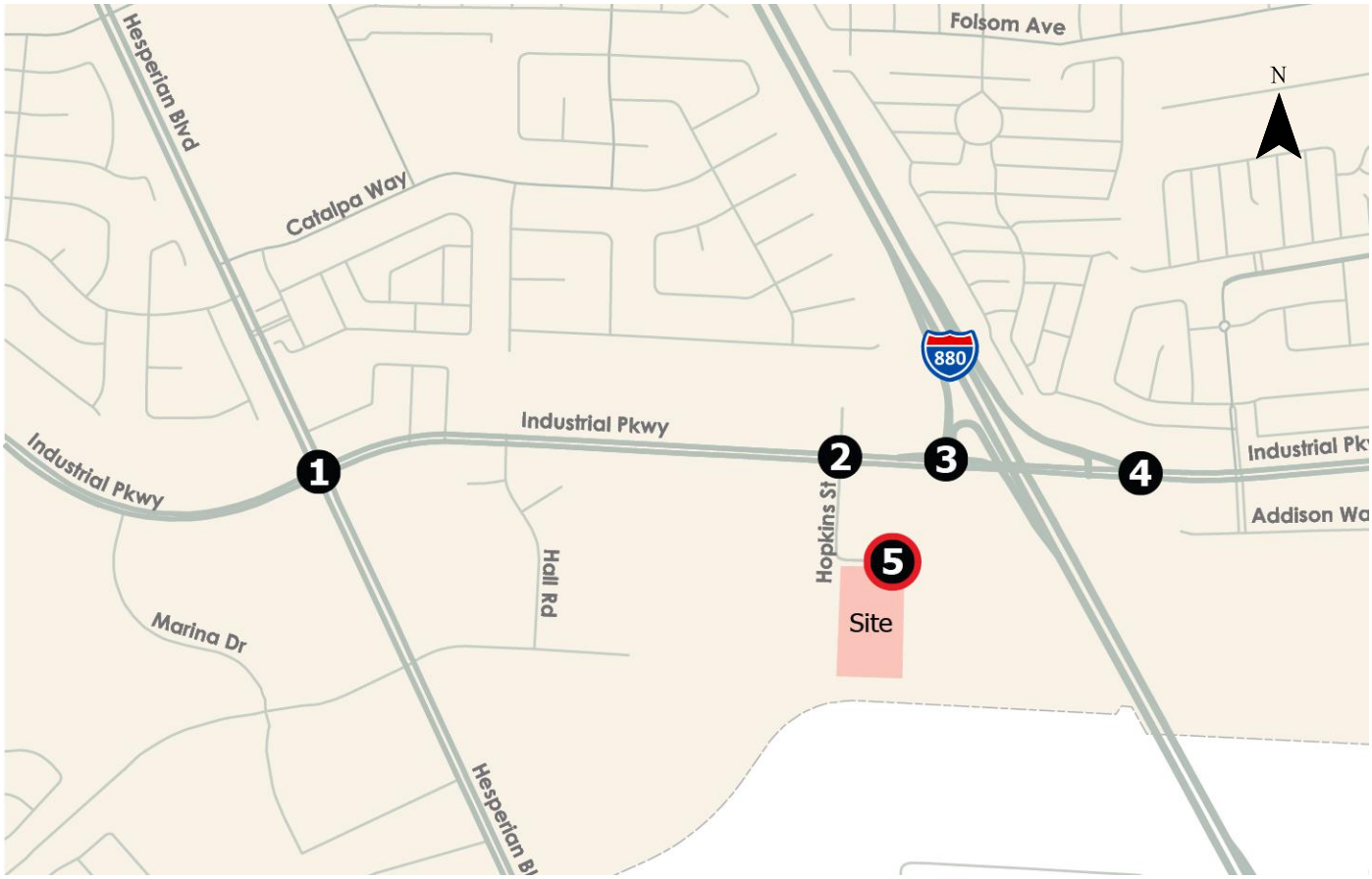

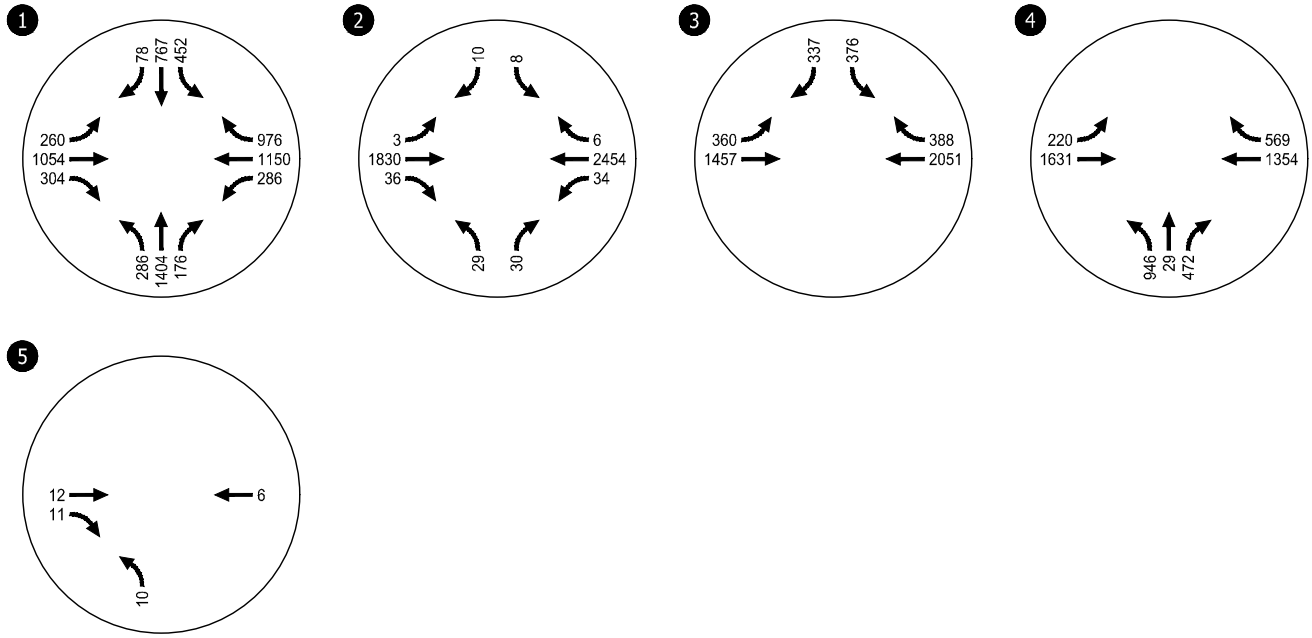

Cumulative Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
I-4

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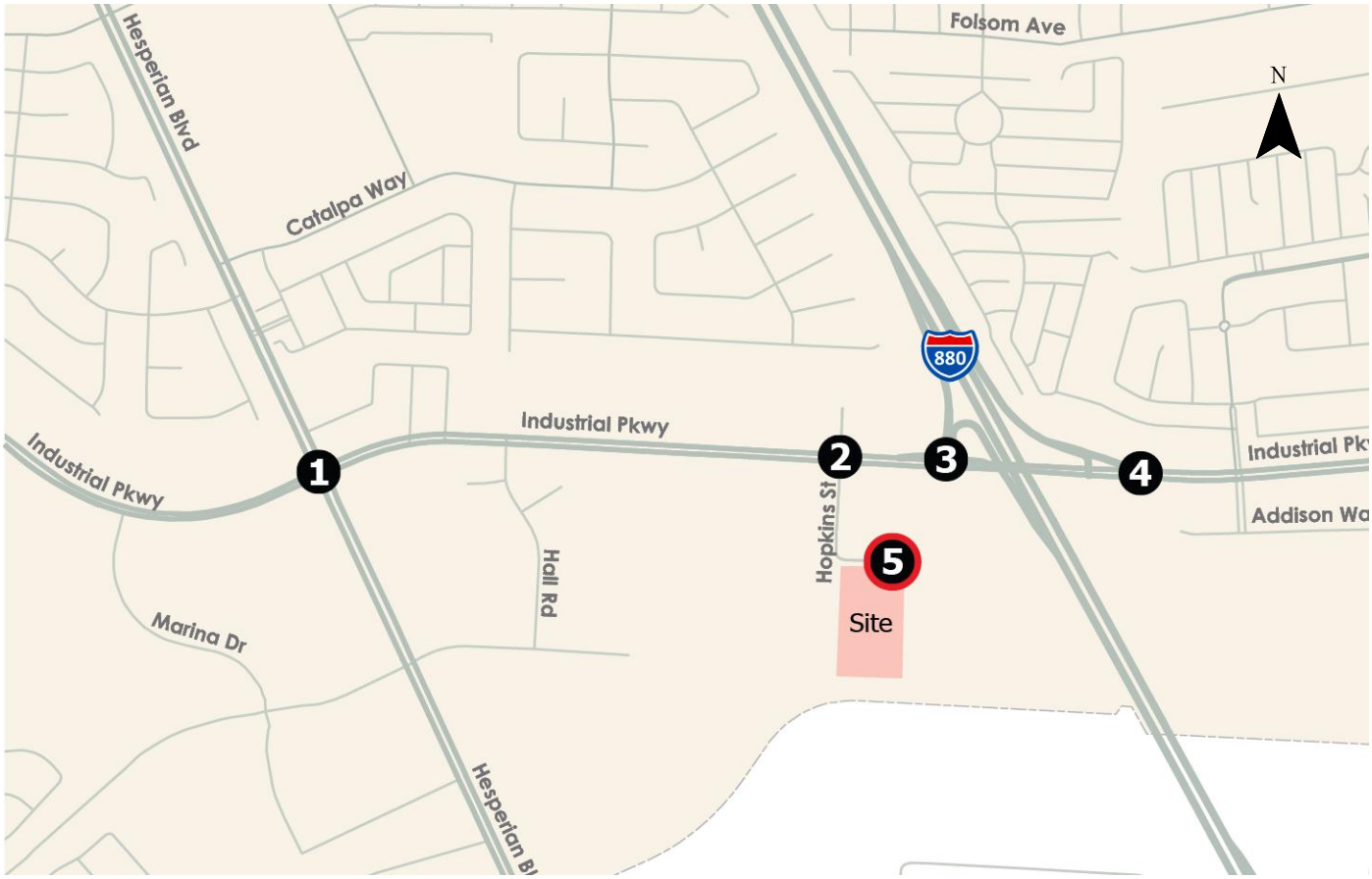

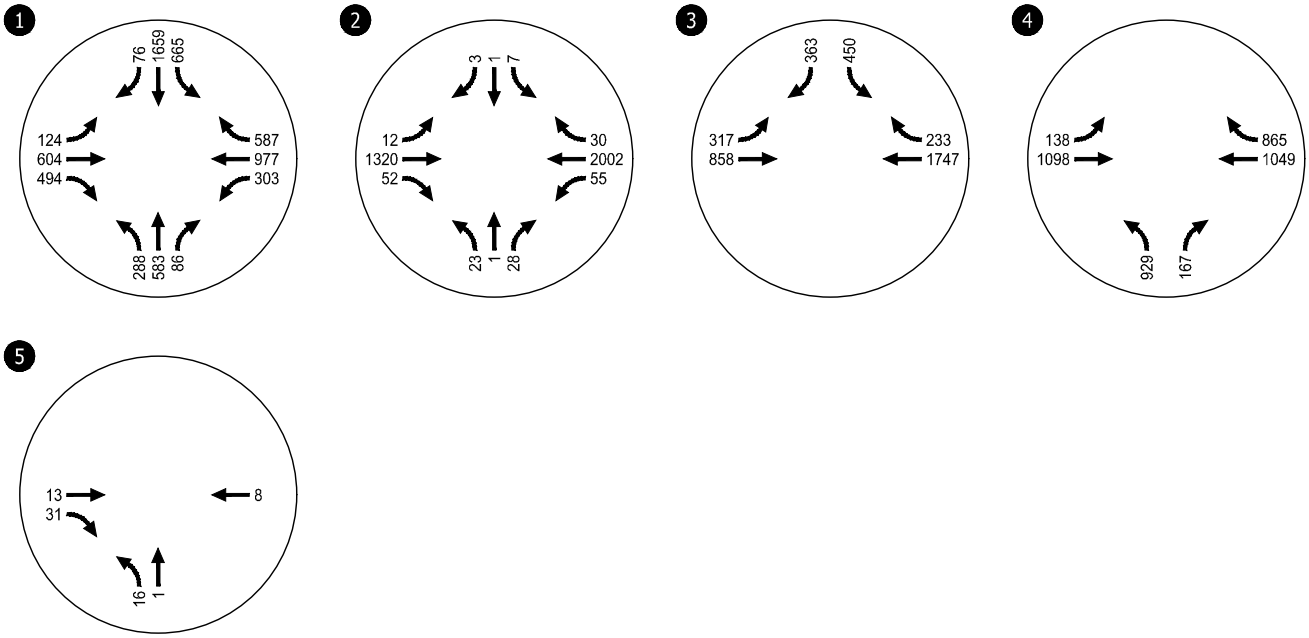

Cumulative Plus Project Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
I-5

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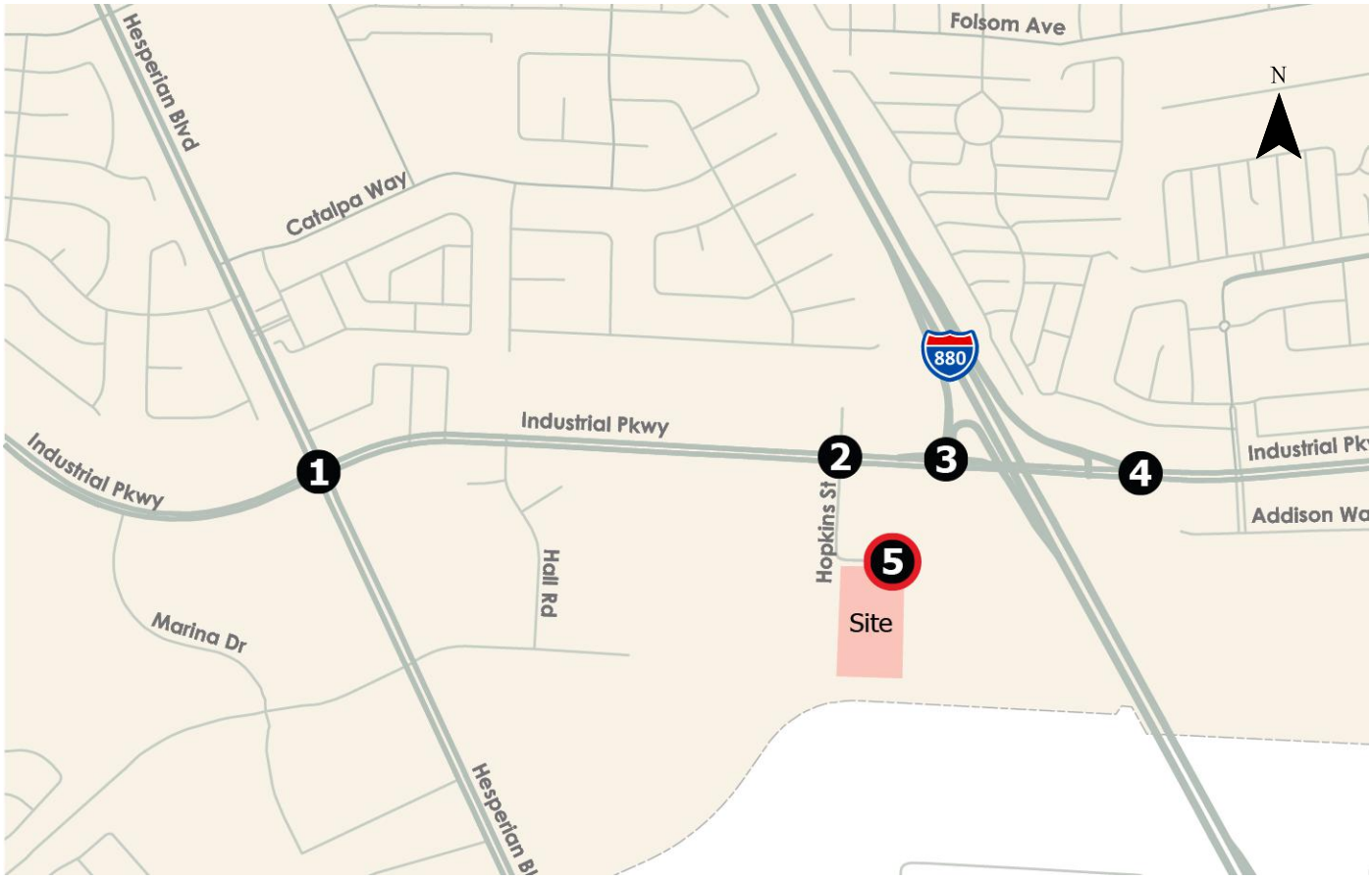

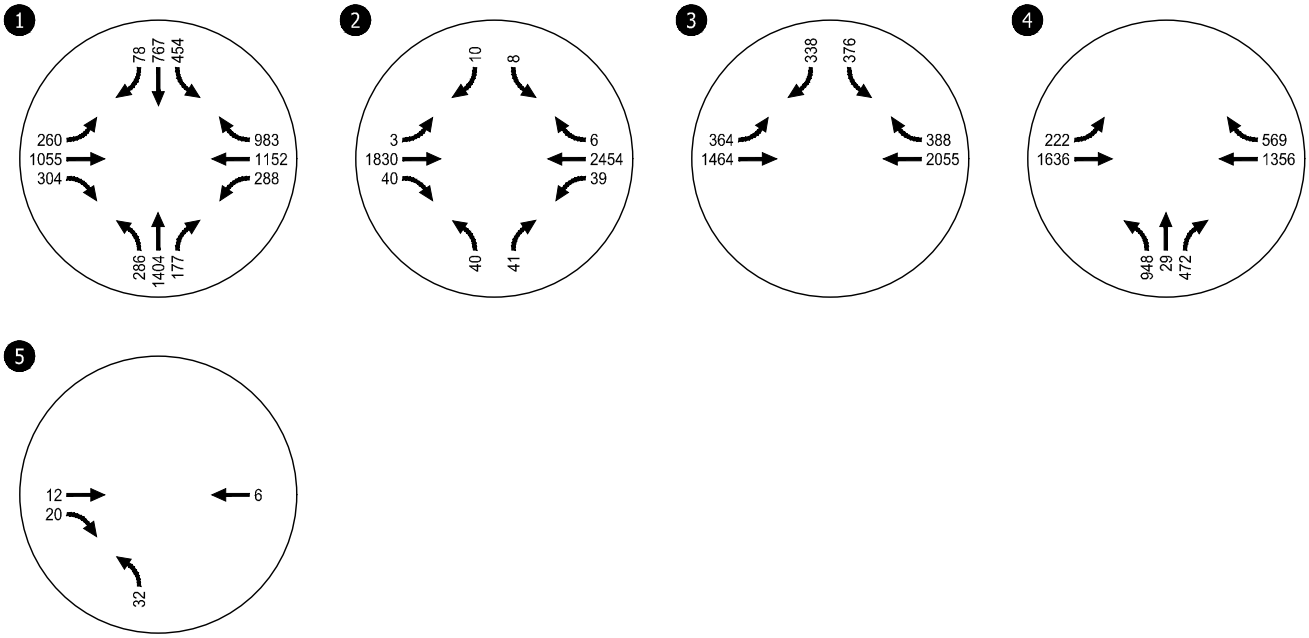

Cumulative Plus Project Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
I-6

C:\Users\kphan\appdata\local\temp\AcPublish_13504\26188-05_2256ClaremontCt_Figures_20241114.dwg Jun 03, 2025 - 4:06pm - kphan Layout Tab: CUMUL + PR_PM

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Appendix J
Business and Operations Plan

BUSINESS AND OPERATIONS PLAN

To: Nicola Taylor

From: Kimley-Horn and Associates, Inc.

Date: 02/12/2024

Subject: Hayward Industrial – Business and Operations Plan

Below is the business and operations plan, coordinated with your operations staff. Please include this with entitlements submittal and for site operations.

Business and Operations Information:

Hours of Operation: 8:00 AM to 5:00 PM

Number of Employees: 51

Processes to Occur in Facility: Transfer of good between truck trailers for shipping and storage. Facility is only for distribution processing. Inbound freight is reconsolidated and transported to haulage trailers. There is no extended storage at the site.

Truck Trips: 150 daily

Truck Size: WB-67 (max)

Building Operations Information:

Building will be constructed in compliance with the CalGreen standards, including following features:

- LED lighting
- Water conserving fixtures (faucets, toilets, etc.) which will reduce water and sewer demand
- Electric pallet jacks for material loading/unloading

Site Operations Information:

Site is being constructed with low water use landscaping to reduce water demand. Additionally, the following operational steps are being taken:

- Trucks enter/exiting the site will not be left idle. Trucks that will be parked for more than one minute will be instructed to shut off engine.
- Site is equipped with electric trailer movers. This will eliminate need for trucks (typically fueled by fossil fuels) to be used to move trailers between storage and building and will minimize combustion of fossil fuels on site.

Appendix K
Project Scoping VMT Analysis Memorandum

KITTELSON & ASSOCIATES
155 Grand Avenue, Suite 505
Oakland, CA 94612
P 510.839.1742

MEMORANDUM

December 2, 2024 Project# 26188.005

To: Steve Chang, City of Hayward

From: Michael Ruiz-Leon, Karen Phan, and Damian Stefanakis, Kittelson & Associates, Inc.

Project: Hayward 2256 Claremont Court Truck TIA

Subject: **Project Scoping and Existing Conditions Analysis**
(City of Hayward Application #24-0006)

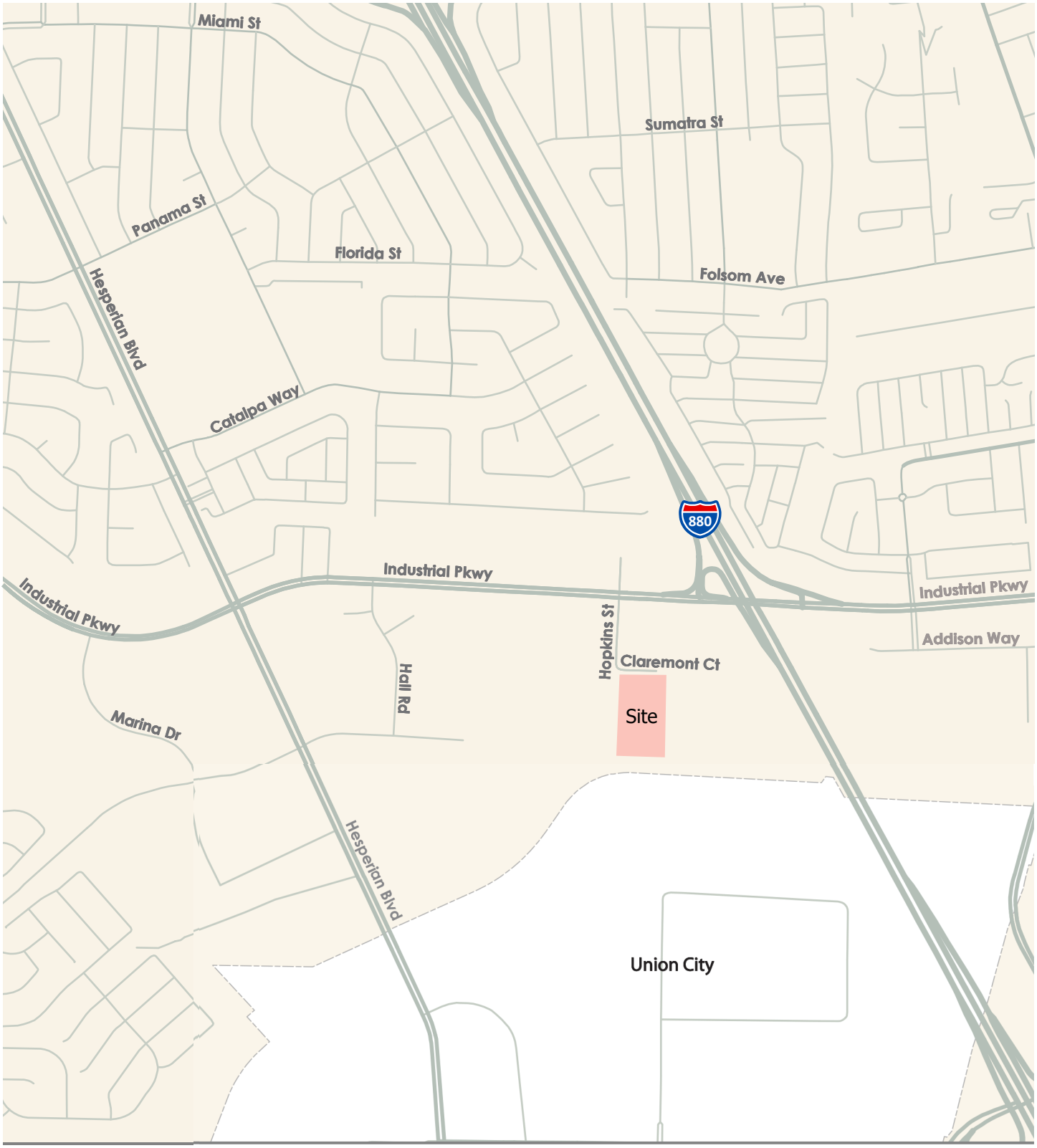
Kittelson & Associates, Inc. (Kittelson) prepared this scoping memorandum that summarizes all project assumptions, including volume development, existing traffic conditions, trip generation, trip distribution and VMT assessment to be used in the transportation analysis for the proposed truck terminal and maintenance facility at 2256 Claremont Court in the City of Hayward, CA. The analysis will follow the latest City of Hayward TIA Guidelines, dated December 2020. This memorandum is presented to City staff for review prior to proceeding with the detailed local transportation impact study, and includes the following sections:

- A description of the project's uses and proposed access plan
- A review of proposed volume development including preliminary existing traffic conditions
- Estimated trip generation for the proposed uses at the site
- Estimated distribution of project vehicle trips to and from the site
- VMT impact analysis

PROJECT DESCRIPTION

The proposed project is located west of I-880 and south of Industrial Parkway West at 2256 Claremont Ct. The proposed project is a truck terminal building with transfer, loading, and unloading points for trucks/automobiles, including cross dock freight transloading, equipment fueling, and servicing activities. The project is located in an industrial zone region.

The proposed project includes a 43,704 sf industrial building with approximately 50 standard parking spaces and 125 truck spaces. The project includes the demolition of existing industrial structures. The site is currently being used as a truck terminal. Access to the project site is proposed via one existing full-access driveway into the project site via Claremont Court to access Industrial Parkway W. The project site is bound by industrial uses to the north, Ward Creek to the south, Hopkins Street to the west, and I-880 to the east. The project site and study area are shown in **Figure 1**. The proposed site plan is shown in **Figure 2**.



Project Site

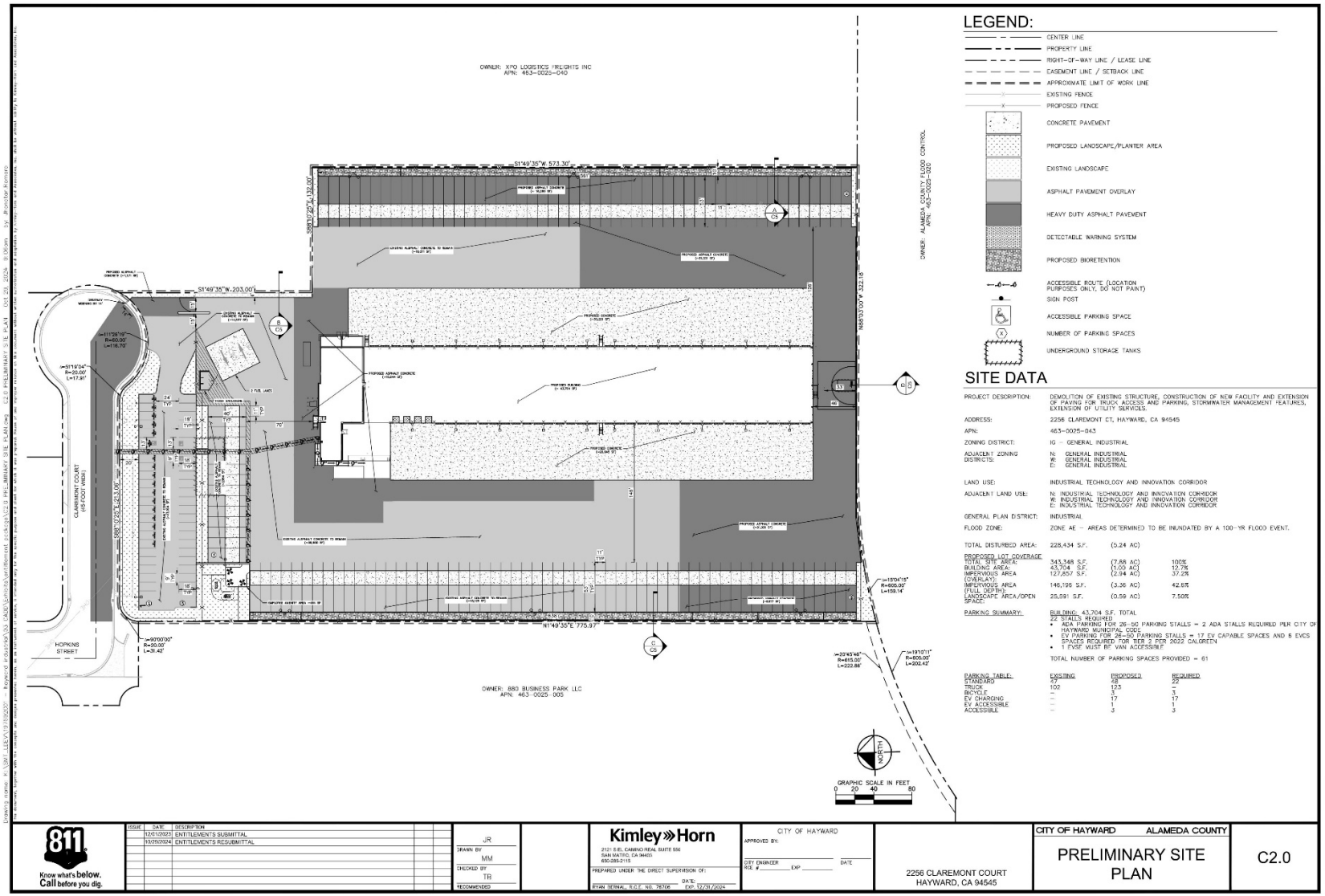
0 0.25 Miles

Figure 1

KITTELSON & ASSOCIATES

Study Area and Project Site
Hayward, California

Figure 2: Site Plan



Source: Kimley Horn, dated10/29/2024

TRAFFIC VOLUMES

As part of the project's local transportation analysis, weekday AM and PM peak hour traffic operations will be assessed at four key intersections around the project site and the project driveway, as shown in **Table 1** and **Figure 3**. Peak hour turning movement counts were collected on a mid-weekday during the morning (7:00-9:00 AM) and evening (4:00-6:00 PM) peak hours while nearby schools were in session in October 2024. Peak hour turning movement counts were collected at the existing project driveway to capture the existing use trip generation. For a conservative analysis, individual intersection peak hour volumes were used rather than a network peak hour. While these counts are representative of post-Covid conditions with schools in session, Kittelson does recognize they may be lower than historical counts due to a shift in travel habits and travel patterns.

Table 1. Study Intersections

#	Intersection	Traffic Control
1	Hesperian Boulevard/Industrial Parkway W	Signalized
2	Hopkins Street/ Industrial Parkway W	TWSC
3	I-880 SB Ramps/ Industrial Parkway W	Signalized
4	I-880 NB On-Ramp/Industrial Parkway W	Yield Controlled for Westbound Right-Turn
5	Project Driveway/ Claremont Court	AWSC

Note: TWSC = Two-way Stop-Controlled Intersection, AWSC = All-Way Stop-Controlled Intersection.

In coordination with the City, two roadway segments were selected for average daily traffic (ADT) volume data collection and truck counts for Pavement Index:

- Industrial Parkway W, east and west of Hopkins Street.
- Hesperian Boulevard, north and south of Industrial Parkway W.

Study Intersections

Project Driveway

Project Site

0 0.25 Miles

Figure 3

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Intersection Study Locations
Hayward, California

TRAFFIC OPERATIONS

Intersection Level of Service Standards

Under Senate Bill (SB) 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS is included for non-CEQA purposes to determine if local intersections operate acceptably and if the project would cause any negative effects on local roadway operations. This approach is consistent with the City's adopted thresholds of significance and screening criteria.

Policy Goal 4 Local Circulation-M-4.3 of the City of Hayward's 2040 General Plan requires intersections to maintain a peak-hour level of service (LOS) of E or better for signalized intersections. Goal M-4.3 describes this as follows: The City shall maintain a minimum Level of Service "E" at signalized intersections during the peak commute periods except when a LOS F may be acceptable due to costs of needed improvements or when there would be other unacceptable consequences, such as right-of-way acquisition or degradation of the pedestrian environment due to increased crossing distances or unacceptable crossing delays.

Signalized Intersections

Signalized intersection improvements should be identified if the project would degrade the AM or PM peak hour conditions from an acceptable LOS E or better under the No Project scenario to an unacceptable LOS F under the Plus Project scenario. The exception to this criterion is when LOS F is determined by the City of Hayward to be acceptable due to right-of-way constraints or when there would be adverse effects to other modes of travel, such as bicycle, pedestrian, or transit.

In addition, improvements should be identified at an intersection already operating at LOS F under an Existing or No Project scenario if the addition of project traffic results in an increase of 5.0 seconds or more in the intersection's average control delay.

Unsignalized Intersections

At unsignalized intersections, the City does not set LOS goals, however, intersection operations are captured as follows:

- Traffic Signal Warrants Analysis, as outlined in Traffic Signal Warrants 4.14.
- Increase average delay by no more than 5 seconds for locations already at LOS F.

Note that solely triggering a warrant does not trigger the need for an intersection improvement, but the City will at its discretion require or not require a signal be installed, where warranted.

Performance Measures

Operations analyses will be performed in accordance with the procedures stated in the 7th *Edition Highway Capacity Manual* using Synchro 12 software.

Peak 15-minute flow rates will be used in the evaluation of all intersection levels of service to provide analyses based on a reasonable worst-case scenario. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour.

Existing Traffic Conditions

The weekday AM and PM peak-hour turning-movement volumes shown in **Figure 4** and **Figure 5** were used to conduct an operational analysis at the study intersections to determine the existing traffic conditions. *Appendix "A"* contains the year 2024 existing traffic conditions worksheets.

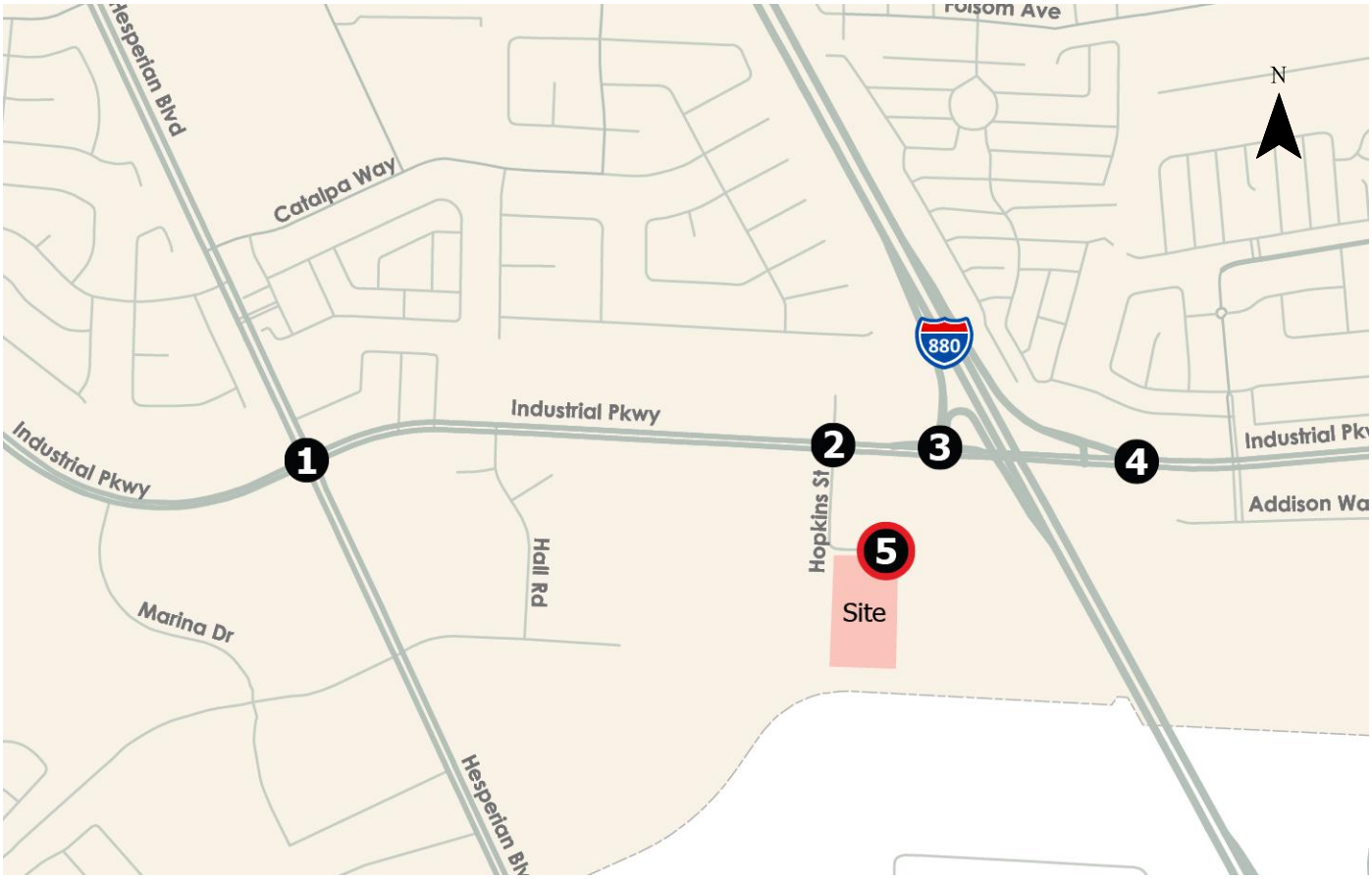
Table 2 shows the year 2024 existing traffic conditions for the weekday AM and PM peak hours. Existing traffic conditions are preliminary and are provided at the request of the City.

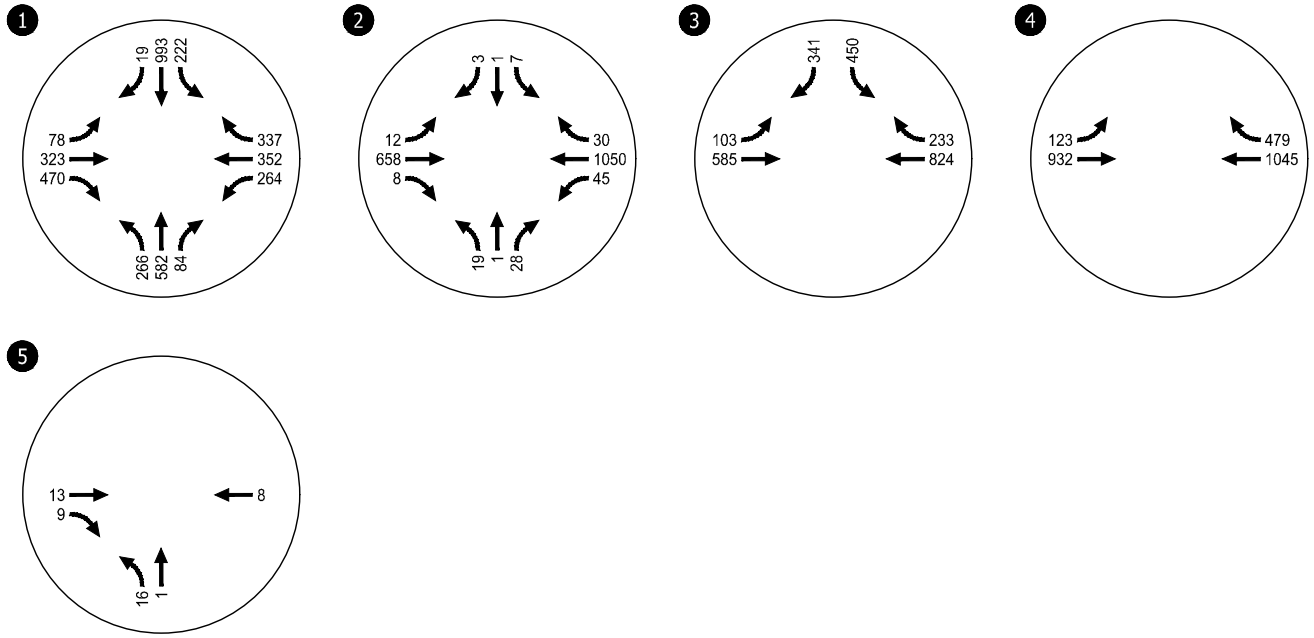
Table 2. Year 2024 Existing Traffic Conditions

#	Intersection	Traffic Control	Weekday AM Peak Hour		Weekday PM Peak Hour	
			Delay (Sec)	LOS	Delay (Sec)	LOS
1	Hesperian Boulevard/Industrial Parkway W	Signalized	34.5	C	40.7	D
2	Hopkins Street/Industrial Parkway W	TWSC	**72.7**	**F**	**79.5**	**F**
3	I-880 SB Ramps/ Industrial Parkway W	Signalized	23.9	C	23.3	C
4	I-880 NB On-Ramp/Industrial Parkway W[1]	Yield Controlled for WBR	14.6	B	13.1	B
5	Project Driveway /Claremont Court	AWSC	9.3	A	9.2	A

Source: Kittelson & Associates, Inc. 2024
TWSC = Two Way Stop Controlled, AWSC = All Way Stop Controlled
[1] HCM 7th requires at least one stop-controlled approach at the intersection. As I-880 NB On-Ramp/Industrial Parkway W does not meet this requirement, HCM 2000 was used to analyze the intersection. Results reflect the eastbound left-turn movement LOS and delay.

As shown in **Table 2**, all signalized study intersections operate at LOS E or better under existing conditions. The unsignalized Hopkins Street/Industrial Parkway W intersection operates at LOS F under existing conditions with 72.7 seconds of delay during the weekday AM peak hour and 79.5 seconds of delay during the PM peak hour. The local transportation analysis report will analyze signal warrants for stop-controlled intersections operating at LOS F.





Existing Traffic Volumes
Weekday AM Peak Hour
Hayward, CA

Figure
4

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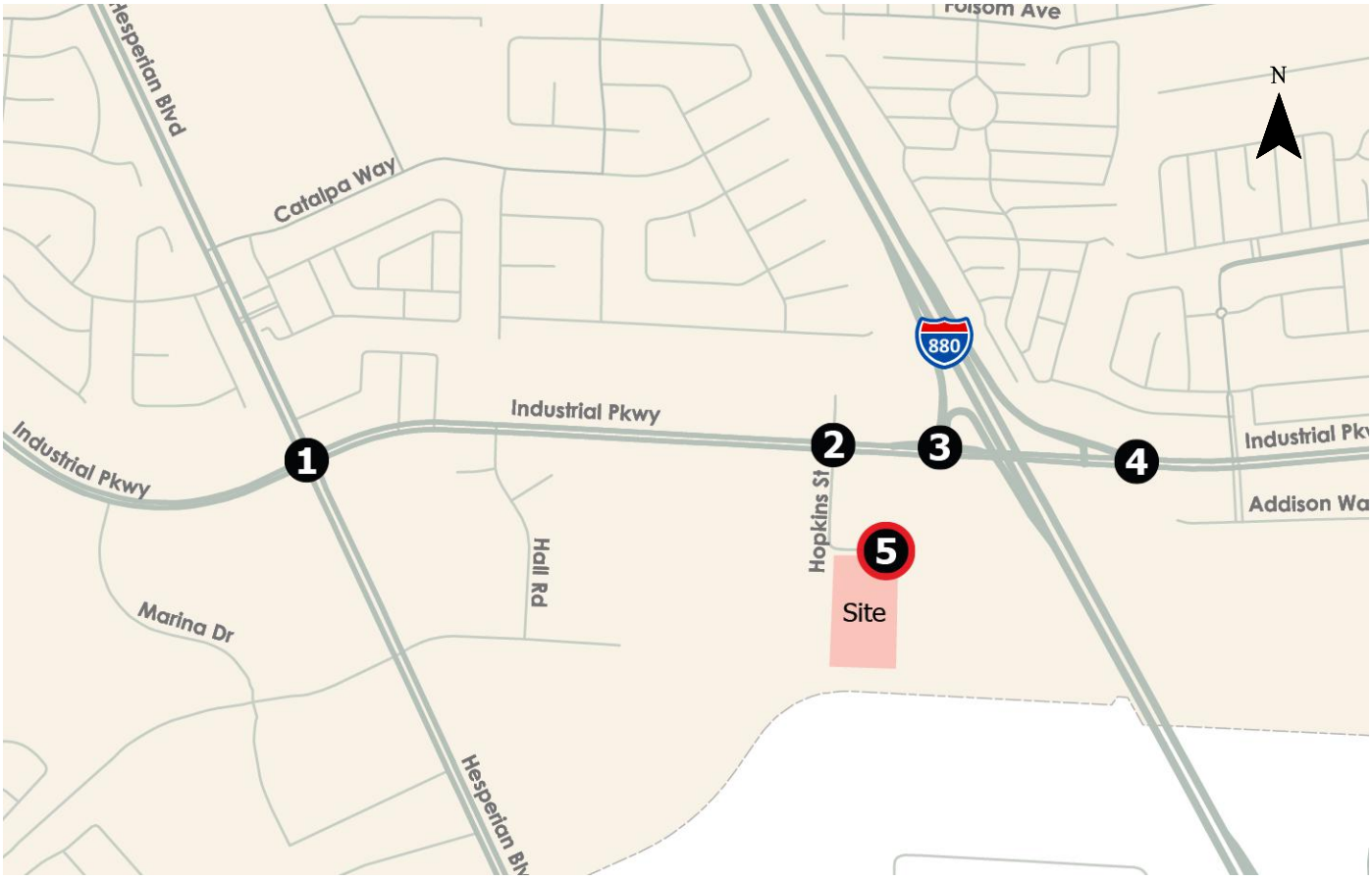

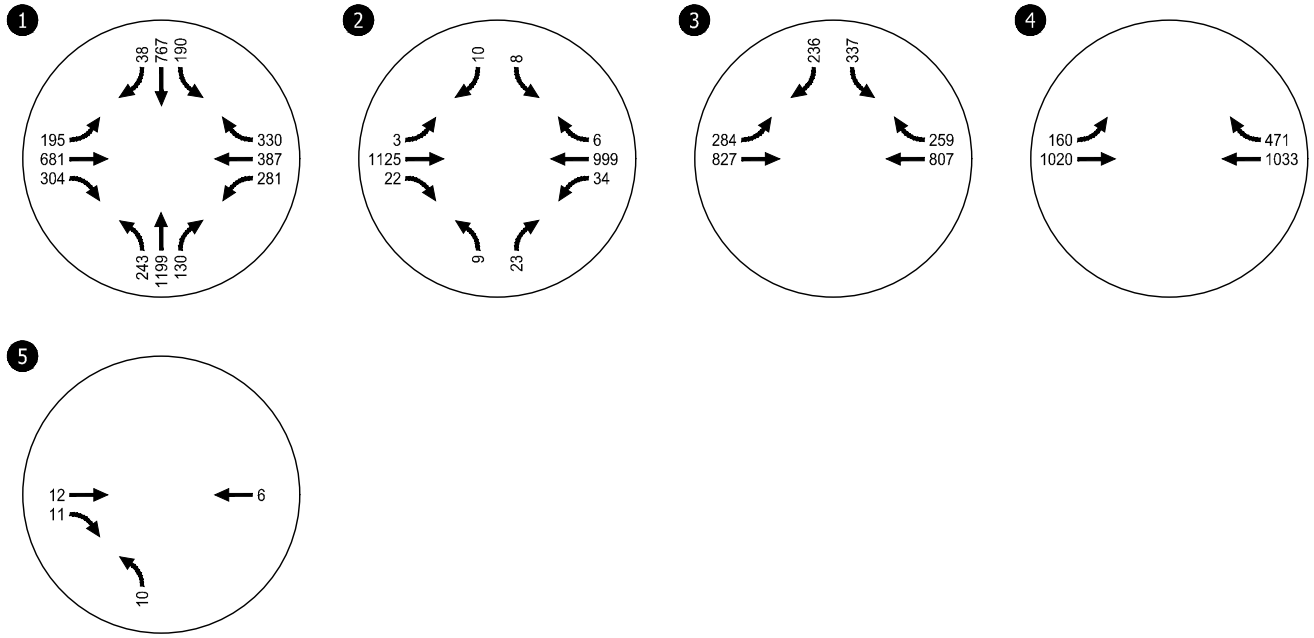

Existing Traffic Volumes
Weekday PM Peak Hour
Hayward, CA

Figure
5

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TRIP GENERATION ESTIMATE

Project trip generation was estimated for the following three weekday time periods:

- Weekday daily
- Weekday AM peak hour
- Weekday PM peak hour

At this time, the future tenants are unknown, so for the purpose of assessing transportation impacts with the project, trip rates associated with industrial uses were selected. Trips were estimated using data provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The trip rates were obtained in October 2024 from the most recent data available in the web-based Trip Generation database maintained by ITE. As shown in **Table 3,** a review of the following land uses were considered:

- General Light Industrial (Code 110)
- Warehousing (Code 150)
- High-Cube Fulfillment Center Warehouse, Non-Sort (Code 155)
- High-Cube Fulfillment Center Warehouse, Sort (Code 155).

The average rate and fitted curve equations are noted for each land use.

Table 3. ITE Trip Generation Rates

Land Use	ITE Trip Code	Rate	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
General Light Industrial	110	Average	4.87	88%	12%	0.74	14%	86%	0.65
		Fitted	T = 3.76(X) + 50.47			T = 0.68(X) + 3.81			Ln(T) = 0.72 Ln(X) + 0.38
Warehousing	150	Average	1.71	77%	23%	0.17	28%	72%	0.18
		Fitted	T = 1.58(X) + 38.29			T = 0.12(X) + 23.62			T = 0.12(X) + 26.48
High-Cube Transload and Short-Term Storage Warehouse	154	Average	1.4	77%	23%	0.08	28%	72%	0.10
		Fitted	Not Given			Not Given			Not Given
High-Cube Fulfillment Center Warehouse (Non-Sort)	155	Average	1.81	81%	19%	0.15	39%	61%	0.16
		Fitted	T = 2.00(X) - 173.61			Not Given			Not Given
High-Cube Fulfillment Center Warehouse (Sort)	155	Average	6.44	81%	19%	0.87	39%	61%	1.2
		Fitted	Not Given			Not Given			Not Given

Notes: Trip rates are based on trip rates from ITE's Trip Generation Manual, 11th Edition.

Trip generation for the project was estimated using average trip rates for High-Cute Fulfillment Center Warehouse - Sort (Code 155) as it is the most conservative land use. The project also includes the demolition of an existing truck terminal building previously occupied by Central Transport. The October 2024 traffic volume data collection effort included turning movements to and from the existing use driveway. The project trip generation estimate is shown in **Table 4**.

Table 4. Project Trip Generation Estimate

Land Use	ITE Trip Generation Manual Land Use Code	Size (TSF)	Weekday Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Project	155 (Sort)	43.7	281	31	7	38	20	32	52
Existing Industrial Use	N/A	N/A	113[1]	9	17	26	11	10	21
Net New Trips (Proposed – Existing)			**168**	**22**	**-10**	**12**	**9**	**22**	**31**

Notes: TSF= thousand square feet
[1] Daily trips were estimated using the ratio of the ITE 155 (Sort) weekday daily and PM peak hour trip generation and applying the ratio to the counted weekday PM peak hour trips generation for the existing use.

As shown in **Table 4**, the project is expected to generate 168 weekday daily vehicle trips, 12 weekday AM peak hour vehicle trips, and 31 weekday PM peak hour net new vehicle trips. As shown in **Table 4**, the weekday AM peak hour net new outbound trips are assumed to be negative. The weekday AM peak hour net new outbound trips were capped at 0 for a conservative analysis. Given the project trips are less than 100 weekday PM peak trips, no Alameda CTC CMP analysis is required.

TRIP DISTRIBUTION

Project trip distribution was developed using the City of Hayward General Plan travel demand model. The project trip distribution is based on a select zone analysis from the model's distribution of trips in and out of the traffic analysis zone (TAZ) representing the project site, as well as adjustments to reflect local travel patterns and circulation conditions. The project trip distribution and intersection count locations are shown in **Figure 6**.

As shown in **Figure 6**, the trip distribution for the project is as follows:

- 10% to/from the west via Industrial Parkway
- 32% to/from the northwest via Hesperian Boulevard
- 9% to/from the southwest via Hesperian Boulevard
- 11% to/from the northeast via the I-880 Highway
- 10% to/from the southeast via the I-880 Highway
- 28% to/from the east via Industrial Parkway

All trip distribution destinations total up to 100%.

Under existing and background conditions, entering project trips traveling to the site via northbound I-880 are assumed to exit at the I-880/ Whipple Road interchange and then circulating on Industrial Parkway from the east. The trip distribution for the Existing Plus Project and Background Plus Project analysis scenarios is shown in **Figure 6**.

In the future cumulative conditions, as part of the Whipple/Industrial Interchange study, there will be a planned I-880 northbound off-ramp at Industrial Parkway. The planned improvement is anticipated to change local travel patterns and access to the site. The cumulative project trip distribution was developed using the City of Hayward General Plan travel demand model assuming the I-880 northbound off-ramp on Industrial Parkway is in place and is shown in **Figure 7**. This ramp changes the travel patterns and trip distribution from the existing condition and should reduce truck circulation and routing to the project site.

As shown in **Figure 7**, the cumulative trip distribution for the project is as follows:

- 11% to/from the west via Industrial Parkway
- 31% to/from the northwest via Hesperian Boulevard
- 7% to/from the southwest via Hesperian Boulevard
- 11% to/from the northeast via the I-880 Highway
- 20% to/from the southeast via the I-880 Highway
- 20% to/from the east via Industrial Parkway

Figure 7 will be used for the Cumulative Plus Project analysis scenarios.

All trip distribution destinations total up to 100%.

Study Intersections

Project Driveway

Trip Distribution

Project Site

*Existing I-880 NB entering trips assumed to exit at the I-880/Whipple Road interchange and enter the site from the east on Industrial Parkway

0 0.25 Miles

Figure 6

KITTELSON & ASSOCIATES

Project Trip Distributions
Hayward, California

Study Intersections

Project Site

Project Driveway

Trip Distribution

0 0.25 Miles

Figure 7

KITTELSON & ASSOCIATES

Cumulative Project Trip Distributions
Hayward, California

ANALYSES AND SCENARIOS

The following summarizes the scenarios and analyses that will be provided in the transportation impact analysis report (LTA):

- Develop traffic volumes for 6 scenarios, including Existing, Existing Plus Project, Background (5-Year Interpolation) No Project, Background Plus Project, Cumulative Conditions, and Cumulative Plus Project Conditions. Kittelson will use the Citywide General Plan model to prepare the background volumes using appropriate interpolation to 2029 (or anticipated opening year) and include any pending or recently approved projects as identified by City staff. The study will include recent projects in the vicinity, including 31161 San Antonio Street Industrial, 1441 Industrial, and Ruus Road project trips.
- Conduct intersection level of service (LOS) and impact analysis for No Project and Plus Project conditions for the Existing, Background, and Cumulative at the 5 study locations, as well as traffic signal warrants for any unsignalized study locations. Kittelson will use appropriate HCM methods per City Guidelines.
- Assess the site plan for circulation and access issues, parking, and bike parking.
- Evaluate driveway sight distance for visibility.
- Review ADT segment truck counts at Industrial Parkway W, east and west of Hopkins Street, and Hesperian Boulevard, north and south of Industrial Parkway W.
- Prepare intersection deficiency mitigation measures (if needed) and share with City staff for concurrence.
- Conduct queuing analysis at the study intersections under all scenarios.
- Calculate project fair share percentages, if intersections or roadways deficiencies are identified.
- Conduct collision history for safety assessment per SWITRS or City crash data.
- If operational deficiencies are identified at any unsignalized intersections, conduct traffic signal warrant analyses using the peak hour warrant 3 criteria.
- Review the turn templates provided by the project applicant, assess the site plan for circulation and access issues, for emergency vehicles and any applicable trucks that may be accessing the project site.
- Assess potential effects on pedestrians, bicyclists, and transit.
- Assess the potential for multimodal transportation options at the project frontage.
- Assess the safety needs and need for potential traffic calming measures in the vicinity of the proposed project.
- Compare the project's parking supply to City requirements and include a qualitative review of off-site parking in the vicinity of the project site.

VEHICLE MILES TRAVELED IMPACT ANALYSIS

Senate Bill 743 (SB 743) was signed into law in September 2013 and requires changes to guidelines for the California Environmental Quality Act (CEQA). Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for CEQA analysis. For land use and transportation projects, SB 743-compliant CEQA analysis based on vehicle miles travel (VMT) became mandatory on July 1, 2020.

The City of Hayward has developed VMT thresholds of significance and screening criteria, which are used in this memorandum for impact analysis purposes. The City's thresholds of significance by land use are shown in **Table 5**. Given that the project is an industrial warehouse with primarily industrial use, it was determined that the employment-industrial threshold (VMT per employee below the existing regional average) would be appropriate to apply to the project.

Table 5. Thresholds of Significance for Residential and Employment Projects

Land Use	Threshold of Significance
Residential	15% below existing average VMT per capita for the City of Hayward
Employment - Office	15% below existing regional average VMT per employee
Employment - Industrial	**Below existing regional average VMT per employee**
Retail	Net increase in total regional VMT

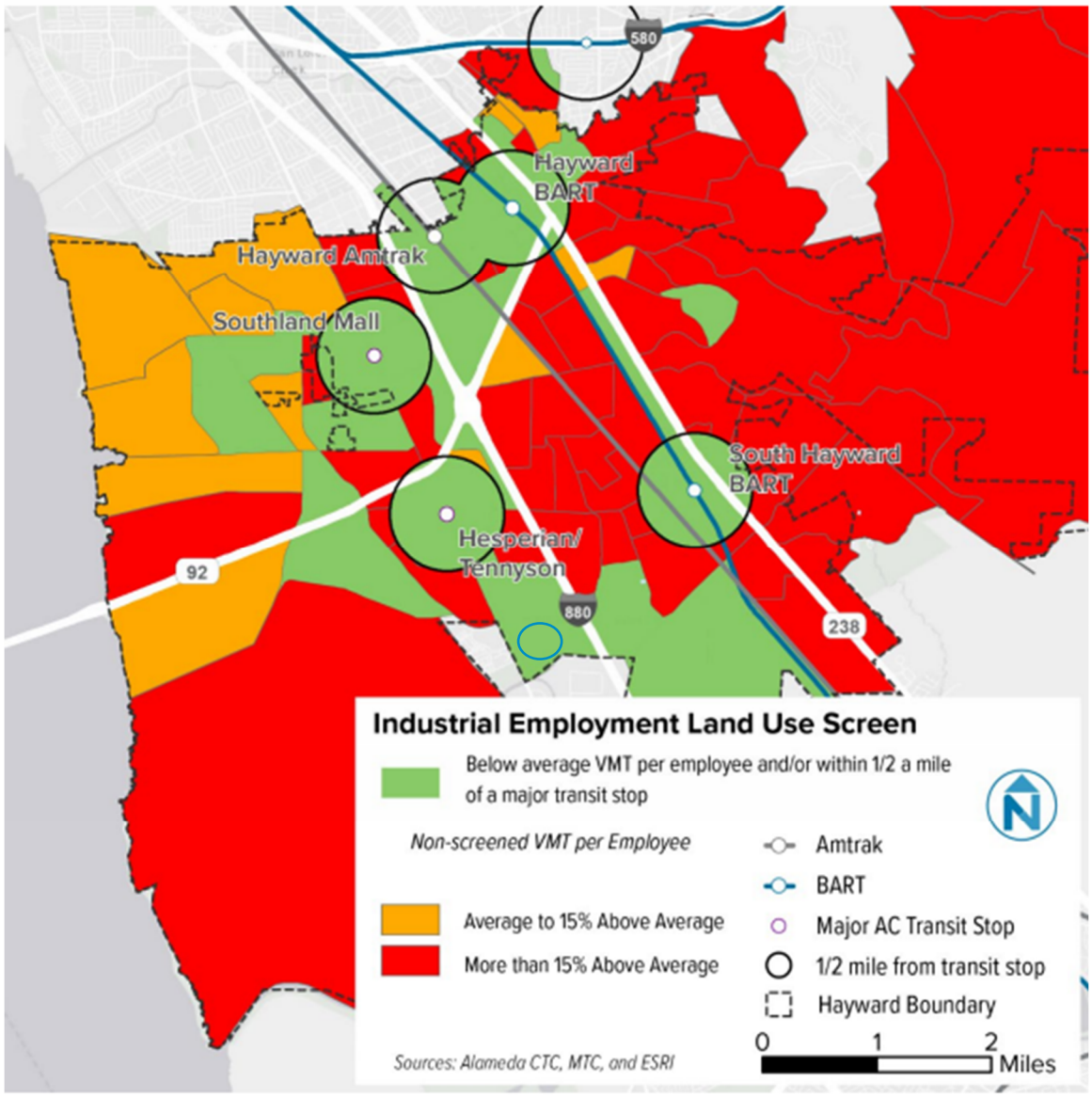
Source: Figure 8, City of Hayward TIA Guidelines, 2020
Bold signifies the appropriate significant impact threshold for this project.

The City has also provided screening criteria, which can be used to quickly identify when a project should be expected to cause a less-than-significant impact related to VMT. Before any VMT analysis is undertaken, the project must undergo this screening assessment to determine if it can be screened out of a detailed VMT study. The City's screening criterion for projects analyzed under the employment-industrial threshold is detailed below. Note, all of the following conditions must be met for the project to be screened out.

- Located in areas with below average VMT per employee and/or within a half mile of a major transit stop or corridor.
- Include low VMT-supporting features that will produce low VMT per employee.
- Must include features that are similar to or better than what exists today for density and parking to support no increase in VMT per industrial employee.

Based on the City's VMT Guideline maps (**Figure 8**), it appears the project is located in an area with below average VMT (green region in figure). Therefore, it is not expected to result in a significant impact to VMT under CEQA.

Figure 8: Employment-Industrial Land Use Screening Map



Project Location

Source: City of Hayward TIA Guideline, December 2020,

CONCLUSIONS

The following summarizes the findings based on the analysis Kittelson conducted related to existing traffic counts and the project's trip generation, trip distribution, and VMT estimates.

- The project will consist of 43,704 square feet of industrial uses with 50 standard parking spaces and 125 truck spaces.
- Access to the project site would be via one existing full-access driveway into the project site via Claremont Court to access Industrial Parkway W.
- Weekday AM and PM peak hour traffic counts taken in October 2024 will be used for the traffic impact analysis.
- All study intersections operate at LOS E or better under existing conditions, except for the Hopkins Street/Industrial Parkway W intersection. This two-way stop controlled intersection operates at LOS F in the weekday AM peak hour and the weekday PM peak hour.
- The project is expected to generate 168 weekday daily vehicle trips, 12 weekday AM peak hour vehicle trips, and 31 weekday PM peak hour net new vehicle trips. The project includes the demolition of existing structures. The site buildings are currently occupied, therefore trip credits are being recommended for the existing buildings located on the project site.
- The existing and background project trip distribution was estimated using the citywide travel demand model:
    - 10% to/from the west via Industrial Parkway
    - 32% to/from the northwest via Hesperian Boulevard
    - 9% to/from the southwest via Hesperian Boulevard
    - 11% to/from the north east via the I-880 Highway
    - 10% to/from the southeast via the I-880 Highway
    - 28% to/from the east via Industrial Parkway
- The cumulative project trip distribution was estimated using the citywide travel demand model:
    - 11% to/from the west via Industrial Parkway
    - 31% to/from the northwest via Hesperian Boulevard
    - 7% to/from the southwest via Hesperian Boulevard
    - 11% to/from the north east via the I-880 Highway
    - 20% to/from the southeast via the I-880 Highway
    - 20% to/from the east via Industrial Parkway
- The transportation analysis will review site access, internal circulation, parking, bike parking, turn restrictions, queueing, and potential effects on pedestrians, bicyclists and transit, and assess safety.
- The transportation analysis will review potential multimodal transportation options on the site frontage per the City's request.
- The transportation analysis will evaluate sight distance at the Hopkins Street and Industrial Parkway W site access.
- Based on the City's VMT Guideline maps, the project is located in an area that has above average VMT per employee. Therefore, it is not expected to result in a significant impact to VMT under CEQA.

Following a review and approval of these assumptions by City Transportation staff, Kittelson will proceed with the detailed transportation (LTA) draft report per our scope.

APPENDICES

Appendix A - 2024 Existing Operations Worksheets

Appendix A

2024 Existing Operations Worksheets

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

11/06/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	323	470	264	352	337	266	582	84	222	993	19
Future Volume (veh/h)	78	323	470	264	352	337	266	582	84	222	993	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1693	1752	1826	1767	1885	1781	1841	1826	1870	1856	1663
Adj Flow Rate, veh/h	87	359	0	293	391	77	296	647	82	247	1103	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	10	14	10	5	9	1	8	4	5	2	3	16
Cap, veh/h	147	513		396	777	364	382	2007	252	333	1504	27
Arrive On Green	0.05	0.16	0.00	0.12	0.23	0.23	0.12	0.44	0.44	0.10	0.42	0.42
Sat Flow, veh/h	3237	3216	1485	3374	3357	1573	3291	4519	567	3456	3541	64
Grp Volume(v), veh/h	87	359	0	293	391	77	296	478	251	247	549	574
Grp Sat Flow(s),veh/h/ln	1618	1608	1485	1687	1678	1573	1646	1675	1736	1728	1763	1843
Q Serve(g_s), s	2.7	10.9	0.0	8.6	10.4	4.1	9.0	9.5	9.7	7.2	26.8	26.8
Cycle Q Clear(g_c), s	2.7	10.9	0.0	8.6	10.4	4.1	9.0	9.5	9.7	7.2	26.8	26.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		0.03
Lane Grp Cap(c), veh/h	147	513		396	777	364	382	1488	771	333	749	782
V/C Ratio(X)	0.59	0.70		0.74	0.50	0.21	0.78	0.32	0.33	0.74	0.73	0.73
Avail Cap(c_a), veh/h	943	1249		983	1304	611	959	1627	843	1007	856	895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	40.9	0.0	43.9	34.4	32.0	44.2	18.6	18.6	45.3	24.7	24.8
Incr Delay (d2), s/veh	5.4	2.5	0.0	3.9	0.7	0.4	3.4	0.4	0.9	3.2	5.4	5.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.3	0.0	3.7	4.2	1.5	3.8	3.7	3.9	3.2	11.8	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.6	43.4	0.0	47.8	35.1	32.4	47.6	19.0	19.5	48.5	30.1	29.9
LnGrp LOS	D	D		D	D	C	D	B	B	D	C	C
Approach Vol, veh/h		446			761			1025			1370	
Approach Delay, s/veh		45.4			39.7			27.4			33.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	50.7	8.7	29.6	15.9	48.7	16.1	22.2
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	9.2	11.7	4.7	12.4	11.0	28.8	10.6	12.9
Green Ext Time (p_c), s	0.8	13.4	0.4	3.9	1.0	14.9	1.4	3.1

Intersection Summary	
HCM 7th Control Delay, s/veh	34.5
HCM 7th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	658	8	45	1050	30	19	1	28	7	1	3
Future Vol, veh/h	12	658	8	45	1050	30	19	1	28	7	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	12	12	13	5	3	58	0	57	14	0	0
Mvmt Flow	13	731	9	50	1167	33	21	1	31	8	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1200	0	0	740	0	0	1329	2062	370	1676	2050	600
Stage 1	-	-	-	-	-	-	762	762	-	1283	1283	-
Stage 2	-	-	-	-	-	-	567	1300	-	393	767	-
Critical Hdwy	5.3	-	-	4.36	-	-	8.11	6.5	8.04	7.23	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	7.66	5.5	-	7.58	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.86	5.5	-	6.78	5.5	-
Follow-up Hdwy	3.1	-	-	2.33	-	-	4.23	4	3.87	3.79	4	3.9
Pot Cap-1 Maneuver	318	-	-	794	-	-	84	55	493	70	56	384
Stage 1	-	-	-	-	-	-	254	416	-	116	238	-
Stage 2	-	-	-	-	-	-	338	233	-	553	414	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	318	-	-	794	-	-	73	50	493	58	51	384
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	50	-	58	51	-
Stage 1	-	-	-	-	-	-	244	399	-	109	223	-
Stage 2	-	-	-	-	-	-	312	219	-	495	397	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.3	0.39	38.1	60.18
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	73	377	318	-	-	794	-	-	58	145
HCM Lane V/C Ratio	0.287	0.085	0.042	-	-	0.063	-	-	0.135	0.031
HCM Control Delay (s/veh)	72.7	15.4	16.8	-	-	9.8	-	-	77.1	30.6
HCM Lane LOS	F	C	C	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	1	0.3	0.1	-	-	0.2	-	-	0.4	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	585	824	233	450	341
Future Volume (veh/h)	103	585	824	233	450	341
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1693	1722	1826	1811	1722	1752
Adj Flow Rate, veh/h	111	629	886	147	484	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	14	12	5	6	12	10
Cap, veh/h	137	1895	1542	682	513	
Arrive On Green	0.08	0.58	0.44	0.44	0.31	0.00
Sat Flow, veh/h	1612	3358	3561	1535	1640	1485
Grp Volume(v), veh/h	111	629	886	147	484	0
Grp Sat Flow(s),veh/h/ln	1612	1636	1735	1535	1640	1485
Q Serve(g_s), s	5.7	8.4	16.0	4.9	24.2	0.0
Cycle Q Clear(g_c), s	5.7	8.4	16.0	4.9	24.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	137	1895	1542	682	513	
V/C Ratio(X)	0.81	0.33	0.57	0.22	0.94	
Avail Cap(c_a), veh/h	269	1895	1542	682	586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.8	9.2	17.4	14.3	28.2	0.0
Incr Delay (d2), s/veh	4.3	0.5	1.6	0.7	21.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.6	6.1	1.7	12.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	42.1	9.7	19.0	15.1	49.9	0.0
LnGrp LOS	D	A	B	B	D	
Approach Vol, veh/h		740	1033		484	
Approach Delay, s/veh		14.5	18.4		49.9	
Approach LOS		B	B		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.3	42.2			53.6	30.4
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	14.0	26.0			45.0	30.0
Max Q Clear Time (g_c+I1), s	7.7	18.0			10.4	26.2
Green Ext Time (p_c), s	0.0	0.9			0.8	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	23.9
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	932	1045	0	0	0
Future Volume (Veh/h)	123	932	1045	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.92	0.92
Hourly flow rate (vph)	131	991	1112	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.94	
vC, conflicting volume	1112				1870	556
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1112				1801	556
tC, single (s)	4.6				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	74				100	100
cM capacity (veh/h)	506				50	475

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	131	496	496	556	556	0
Volume Left	131	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	506	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.29	0.29	0.33	0.33	0.30
Queue Length 95th (ft)	26	0	0	0	0	0
Control Delay (s/veh)	14.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.7			0.0		
Approach LOS						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	9	0	8	16	0
Future Vol, veh/h	13	9	0	8	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	23	11	0	38	56	0
Mvmt Flow	17	12	0	10	21	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	33	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	10	-
Critical Hdwy	-	-	4.1	-	6.96	6.2
Critical Hdwy Stg 1	-	-	-	-	5.96	-
Critical Hdwy Stg 2	-	-	-	-	5.96	-
Follow-up Hdwy	-	-	2.2	-	4.004	3.3
Pot Cap-1 Maneuver	-	-	1598	-	859	1060
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	889	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1598	-	859	1060
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.29
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	859	-	-	1598	-
HCM Lane V/C Ratio	0.024	-	-	-	-
HCM Control Delay (s/veh)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th Signalized Intersection Summary
1: Hesperian Blvd & Industrial Blvd/Industrial Pkwy W

11/06/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	681	304	281	387	330	243	1199	130	190	767	38
Future Volume (veh/h)	195	681	304	281	387	330	243	1199	130	190	767	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1885	1781	1885	1707	1885	1841	1870	1885	1900
Adj Flow Rate, veh/h	207	724	0	299	412	86	259	1276	131	202	816	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	7	6	1	8	1	13	1	4	2	1	0
Cap, veh/h	289	889		391	979	454	328	1838	189	274	1267	59
Arrive On Green	0.08	0.26	0.00	0.11	0.29	0.29	0.10	0.39	0.39	0.08	0.36	0.36
Sat Flow, veh/h	3456	3413	1535	3483	3385	1571	3155	4729	485	3456	3480	162
Grp Volume(v), veh/h	207	724	0	299	412	86	259	926	481	202	420	434
Grp Sat Flow(s),veh/h/ln	1728	1706	1535	1742	1692	1571	1577	1716	1783	1728	1791	1851
Q Serve(g_s), s	6.9	23.5	0.0	9.8	11.6	4.9	9.5	26.7	26.7	6.8	23.0	23.0
Cycle Q Clear(g_c), s	6.9	23.5	0.0	9.8	11.6	4.9	9.5	26.7	26.7	6.8	23.0	23.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		0.09
Lane Grp Cap(c), veh/h	289	889		391	979	454	328	1334	693	274	652	674
V/C Ratio(X)	0.72	0.81		0.76	0.42	0.19	0.79	0.69	0.69	0.74	0.64	0.64
Avail Cap(c_a), veh/h	877	1155		884	1146	532	801	1452	755	877	758	783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	41.0	0.0	50.9	34.0	31.6	51.7	30.2	30.2	53.2	31.2	31.2
Incr Delay (d2), s/veh	4.7	4.1	0.0	4.4	0.4	0.3	4.3	2.5	4.8	3.9	3.9	3.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	10.0	0.0	4.4	4.7	1.8	3.9	11.2	12.1	3.1	10.5	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	57.5	45.1	0.0	55.3	34.4	31.9	55.9	32.8	35.0	57.1	35.2	35.0
LnGrp LOS	E	D		E	C	C	E	C	D	E	D	D
Approach Vol, veh/h		931			797			1666			1056	
Approach Delay, s/veh		47.9			42.0			37.0			39.3	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	50.9	13.9	40.0	16.3	48.0	17.3	36.6
Change Period (Y+Rc), s	4.0	5.0	4.0	5.8	4.0	5.0	4.0	5.8
Max Green Setting (Gmax), s	30.0	50.0	30.0	40.0	30.0	50.0	30.0	40.0
Max Q Clear Time (g_c+I1), s	8.8	28.7	8.9	13.6	11.5	25.0	11.8	25.5
Green Ext Time (p_c), s	0.6	17.2	1.0	4.1	0.8	12.9	1.4	5.2

Intersection Summary	
HCM 7th Control Delay, s/veh	40.7
HCM 7th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1125	22	34	999	6	9	0	23	8	0	10
Future Vol, veh/h	3	1125	22	34	999	6	9	0	23	8	0	10
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	75	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	4	59	35	7	17	11	0	9	0	0	10
Mvmt Flow	3	1210	24	37	1074	6	10	0	25	9	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1083	0	0	1234	0	0	1732	2385	618	1764	2393	542
Stage 1	-	-	-	-	-	-	1229	1229	-	1153	1153	-
Stage 2	-	-	-	-	-	-	503	1156	-	611	1241	-
Critical Hdwy	5.3	-	-	4.8	-	-	7.17	6.5	7.08	6.95	6.5	7.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.5	-	7.3	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.92	5.5	-	6.5	5.5	-
Follow-up Hdwy	3.1	-	-	2.55	-	-	3.76	4	3.39	3.65	4	4
Pot Cap-1 Maneuver	363	-	-	408	-	-	66	35	416	70	34	399
Stage 1	-	-	-	-	-	-	171	252	-	162	274	-
Stage 2	-	-	-	-	-	-	468	273	-	439	249	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	362	-	-	408	-	-	58	31	415	60	31	398
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	31	-	60	31	-
Stage 1	-	-	-	-	-	-	170	250	-	147	249	-
Stage 2	-	-	-	-	-	-	415	248	-	409	247	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.04	0.48	32.59	41.45
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	58	415	362	-	-	408	-	-	60	398
HCM Lane V/C Ratio	0.168	0.06	0.009	-	-	0.09	-	-	0.144	0.027
HCM Control Delay (s/veh)	79.5	14.2	15	-	-	14.7	-	-	75.4	14.3
HCM Lane LOS	F	B	C	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	0.6	0.2	0	-	-	0.3	-	-	0.5	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	284	827	807	259	337	236
Future Volume (veh/h)	284	827	807	259	337	236
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1841	1841	1826	1781	1767	1707
Adj Flow Rate, veh/h	299	871	849	164	355	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	5	8	9	13
Cap, veh/h	332	2338	1498	652	386	
Arrive On Green	0.19	0.67	0.43	0.43	0.23	0.00
Sat Flow, veh/h	1753	3589	3561	1510	1682	1447
Grp Volume(v), veh/h	299	871	849	164	355	0
Grp Sat Flow(s),veh/h/ln	1753	1749	1735	1510	1682	1447
Q Serve(g_s), s	14.8	9.8	16.4	6.2	18.3	0.0
Cycle Q Clear(g_c), s	14.8	9.8	16.4	6.2	18.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	332	2338	1498	652	386	
V/C Ratio(X)	0.90	0.37	0.57	0.25	0.92	
Avail Cap(c_a), veh/h	473	2338	1498	652	473	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.2	6.5	19.0	16.1	33.5	0.0
Incr Delay (d2), s/veh	12.3	0.5	1.6	0.9	19.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	3.0	6.3	2.1	9.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	47.6	7.0	20.6	17.0	52.6	0.0
LnGrp LOS	D	A	C	B	D	
Approach Vol, veh/h		1170	1013		355	
Approach Delay, s/veh		17.3	20.0		52.6	
Approach LOS		B	C		D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	21.1	43.3			64.4	24.6
Change Period (Y+Rc), s	4.2	4.9			4.9	4.2
Max Green Setting (Gmax), s	24.0	26.0			55.0	25.0
Max Q Clear Time (g_c+I1), s	16.8	18.4			11.8	20.3
Green Ext Time (p_c), s	0.1	0.8			1.1	0.1

Intersection Summary	
HCM 7th Control Delay, s/veh	23.3
HCM 7th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	160	1020	1033	0	0	0
Future Volume (Veh/h)	160	1020	1033	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.92	0.92
Hourly flow rate (vph)	167	1062	1076	0	0	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		869				
pX, platoon unblocked					0.92	
vC, conflicting volume	1078				1943	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1078				1847	540
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	73				100	100
cM capacity (veh/h)	608				44	486

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	167	531	531	538	538	0
Volume Left	167	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	608	1700	1700	1700	1700	1700
Volume to Capacity	0.27	0.31	0.31	0.32	0.32	0.29
Queue Length 95th (ft)	28	0	0	0	0	0
Control Delay (s/veh)	13.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s/veh)	1.8			0.0		
Approach LOS						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	11	0	6	10	0
Future Vol, veh/h	12	11	0	6	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	75	91	0	17	50	0
Mvmt Flow	15	14	0	7	12	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	28	0	29	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	-	-	4.1	-	6.9	6.2
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.2	-	3.95	3.3
Pot Cap-1 Maneuver	-	-	1598	-	876	1062
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1598	-	876	1062
Mov Cap-2 Maneuver	-	-	-	-	876	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	9.17
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	876	-	-	1598	-
HCM Lane V/C Ratio	0.014	-	-	-	-
HCM Control Delay (s/veh)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-