

# HAYWARD ENTERPRISE AVE INDUSTRIAL EIR- CEQA ANALYSIS

3636 ENTERPRISE AVENUE

HAYWARD, CALIFORNIA

June 2, 2022



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# Hayward Enterprise Ave Industrial EIR- CEQA Analysis 3636 Enterprise Ave Hayward, California

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## Executive Summary

## EXECUTIVE SUMMARY

This report presents the findings, conclusions, and transportation impact analysis conducted by Kittelson & Associates for the proposed 3636 Enterprise Avenue Industrial Project (Project) located in Hayward, California. The project is located at 3636 Enterprise Avenue, north of State Route 92 (SR-92) and west of Whitesell Road. The site has small existing structures and antennas used for telecommunications but is currently vacant. The project is 219,656 square feet (sf) of industrial/warehouse uses consisting of 208,673 sf of warehouse and 10,983 sf of office space. The project would include two new access driveways, a 5-foot wide paved sidewalk on the south side of Enterprise Avenue from the western site boundary to the intersection with Whitesell Street, and bike racks.

## SUMMARY OF FINDINGS

An assessment of vehicle miles traveled (VMT) determined the Project cannot be screened out of a detailed VMT analysis under the City's SB 743-consistent VMT criteria. The project is located in an area with higher than average VMT compared to the regional average. Therefore, it was determined that the project would need to include VMT mitigation improvements.

The analysis concluded that the Project VMT must be reduced from 20.64 VMT per employee to 18.15 VMT per employee, representing a 12.1% decrease. To achieve the 12.1% VMT per employee reduction, the project applicant and/or operator of the facility shall implement a combination of TDM measures:

1. Rideshare program + Fully-subsidized employee transit subsidies (including "Guaranteed Ride Home" program) = 12.8% total VMT per employee reduction
2. Rideshare program + Promotions and marketing program + Fully-subsidized Employee transit passes = 16.3% total VMT per employee reduction

To support the use of transit and non-auto travel, as a project design feature, a 5-foot wide sidewalk will be constructed on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street. It is also recommended that a class II bicycle lane is implemented on both sides of Enterprise Avenue from the project site western boundary to the intersection of Whitesell street. These improvements are described in Section 4.2.

Section 2 describes each TDM measure in detail, the level of subsidies and incentives, and the project design features and infrastructure that would encourage users to adopt the measures that would reduce VMT. With the implementation of any of the combination of measures outlined above, would reduce the significant project impact and significant cumulative impact to **less-than-significant** with mitigation.



# Section 1

## Methodologies and Existing Conditions

# 1 METHODOLOGIES AND EXISTING CONDITIONS

The project is located at 3636 Enterprise Avenue, north of State Route 92 (SR-92) and west of Whitesell Road, in the City of Hayward, CA. The site consists of 10.86 acres on one parcel (APN 439-0099-036-02). The proposed project consists of the development of one new warehousing spec building on a vacant lot.

The project is 219,656 square feet (sf) of industrial/warehouse uses consisting of 208,673 sf of warehouse and 10,983 sf of office space. The project would also include a parking lot with 151 automobile parking spaces. Access to the project site would be via two driveways along Enterprise Road. Both driveways would be located at the northern portion of the site with access to Enterprise Avenue. 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 Interim Traffic Study Guidelines, 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 impacts from projects being evaluated for potential impacts under 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 became 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.

### 1.1.1 VMT IMPACT SIGNIFICANT CRITERIA

The City's thresholds of significance by land use to evaluate project impacts under CEQA are shown in **Table 1**.

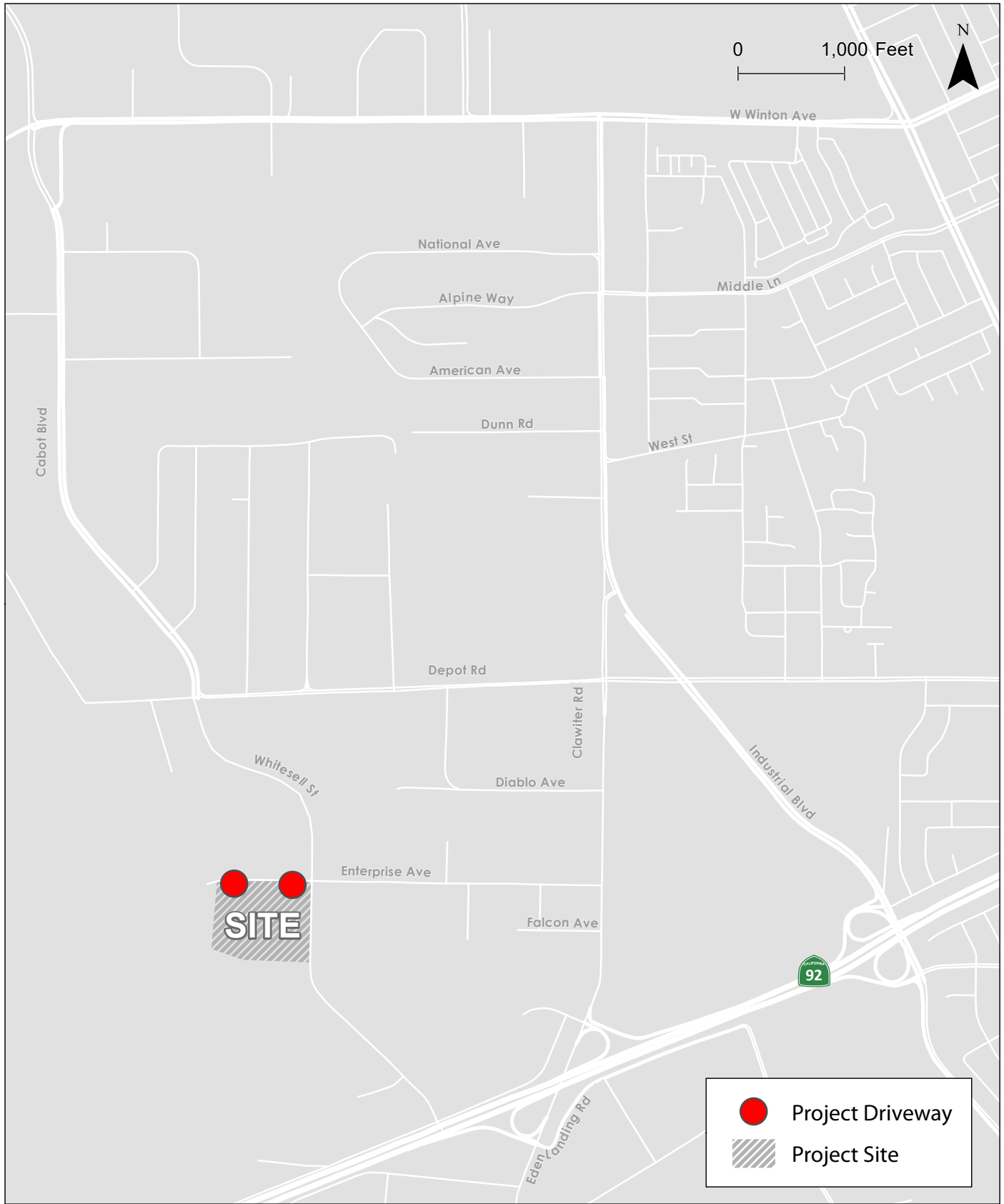
**Table 1: Thresholds of Significance for Residential and Employment Projects**

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: City of Hayward, December 2020

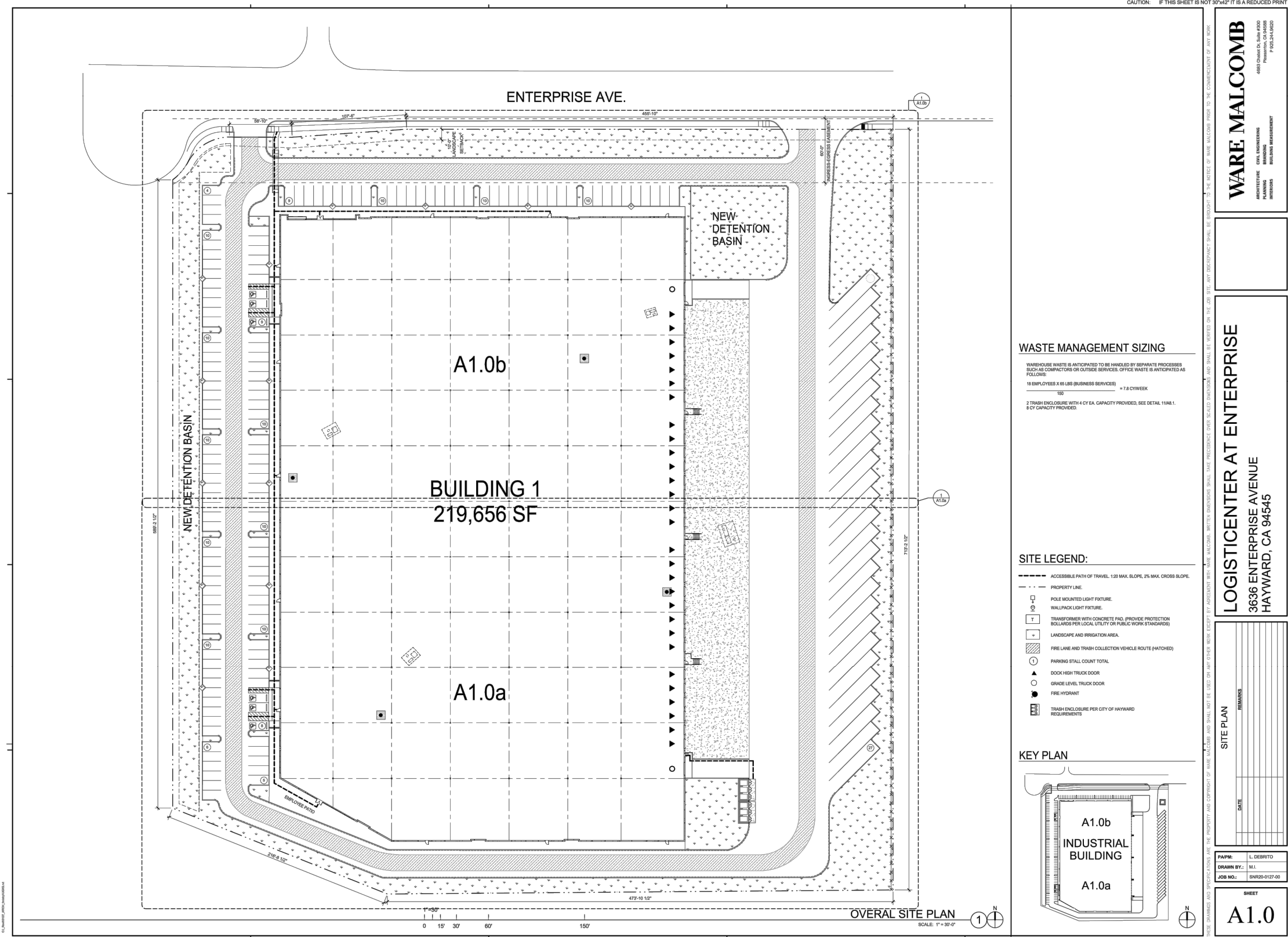
The City has also adopted screening criteria, which can be used to quickly identify when a project should be expected to cause a less-than-significant impact related to VMT and would not require a detailed VMT analysis. Before any VMT analysis is undertaken, the project must undergo this screening assessment to determine if it can be screened out of a detailed VMT study. The City's screening criterion for industrial projects 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.



**Study Area and Project Site  
Hayward, California**

**Figure  
1**



Project Site Plan  
Hayward, CA

Figure  
2



## 1.2 EXISTING NETWORK

### 1.2.1 ROADWAYS

The roadway system in the study area consists of arterial, collector, and local roadways that serve local and regional traffic demand. The vehicular facilities in the study area are discussed below

#### 1.2.1.1 Arterial Roadways

**Clawiter Road** is a north-south facility that is classified as a Minor Arterial north of Depot Road and designated as a truck route by the City of Hayward. Clawiter Road extends from Winton Avenue and ends at the SR 92 interchange, where it connects to Eden Landing Road. North of Industrial Boulevard, it is a four-lane facility with a two-way left-turn lane in the center and street parking on both sides of the road. The inner lanes are 10 feet wide and the outer lanes are 18 feet wide to accommodate street parking. The speed limit is 35 mph. The curb-to-curb right-of-way is about 72 feet. Clawiter Road provides access to mostly light industrial and commercial land uses. About 1000 feet north of Depot Road, Clawiter Road becomes a Collector Street. Clawiter Road is designated as a bicycle route.

**Winton Avenue** is an east-west facility that is classified as a Minor Arterial and truck route. It is a four-lane facility with a two-way left-turn lane in the center. The curb-to-curb right-of-way is approximately 72 feet and widens to about 90 feet at the intersection with Clawiter Road. Travel lanes are typically 11 feet wide and widen to 18 feet when street parking is available. The posted speed limit is 35 mph. Winton Avenue begins at the Hayward Regional Shoreline to the west, passes by the Hayward Executive Airport and I-880, and terminates at the intersection of SR 92. Winton Avenue is a bicycle route west of Clawiter Road and has a buffered bike lane on the south side east of Clawiter Road.

**Industrial Boulevard** is a north-south facility that is classified as a Minor Arterial north of Depot Road and designated as a truck route by the City of Hayward. It begins about 1000 feet north of the intersection of Depot Road and Clawiter Road and diverges southwest. It crosses SR 92 and turns into Industrial Parkway at Hesperian Boulevard. It is a four-lane facility with intermittent concrete medians and two-way left-turn lanes. The curb-to-curb right-of-way is approximately 72 feet and widens to 90 feet at the intersection of Depot Road. The inner travel lanes are 11 feet wide, and the outer travel lanes are 18 feet wide to accommodate a bicycle route. The posted speed limit is 35 mph.

#### 1.2.1.2 Collector Roadways

**Clawiter Road** is a north-south Collector south of Depot Road and designated as a truck route by the City of Hayward. It is a two-lane facility south of Industrial Boulevard. A two-way left-turn lane runs between Enterprise Avenue and the railroad crossing north of the SR 92 interchange. The curb-to-curb right-of-way is 35 to 45 feet and the travel lanes are about 16 feet wide. The posted speed limit is 35 mph north of the SR 92 interchange and 25 mph south of the interchange. Sidewalks are available intermittently and street parking is prohibited. Clawiter Road is designated as a bicycle route.

**Eden Landing Road** is a north-south Collector south of SR 92. It connects to Clawiter Road at the SR 92 interchange and extends to the east through a light industrial area and terminates to the south at Mt. Eden Creek. It is a four-lane facility that narrows to a two-lane facility with a speed limit of 25 mph. The curb-to-curb right-of-way is about 48 feet and the travel lanes are 12 to 24 feet wide. On-street parking is prohibited. Eden Landing Road has buffered bike lanes southwest of Clawiter Road and has bike lanes to the east.

**Depot Road** is an east-west Collector that begins to the west at the shoreline and terminates at Hesperian Boulevard, where it becomes Cathy Way. It is a four-lane facility that is a bicycle route. The curb-to-curb right-of-way is 48 feet west of Clawiter Road and expands to approximately 60 feet wide to the east to

accommodate turn pockets. East of Industrial Boulevard, Depot Road narrows to 48 feet. Travel lanes are about 12 feet wide. There are sidewalks on both sides of the road, but no on-street parking west of Industrial Boulevard.

**Cabot Boulevard** is a north-south Collector south of Winton Avenue and is not designated as a truck route by the City of Hayward. It is a four-lane facility north of Depot Road and south of Winton Avenue. The curb-to-curb right of way is 70 feet and the travel lanes are about 15 feet wide. The posted speed limit is 35 mph. Sidewalks are available and street parking is prohibited. Cabot Boulevard is designated as a bicycle route.

**Enterprise Avenue** is an east-west Collector that begins in the west at the project site west of Whitesell Street, and extends to the east at a t-intersection on Clawiter Road. Enterprise Avenue is designated as a truck route by the City of Hayward. It is a two-lane facility servicing the mostly industrial areas near the project site. The curb-to-curb right of way is 44 feet with two wide travel lanes for truck use. The posted speed limit is 25 mph. Some sidewalks are available and street parking is permitted. Enterprise Avenue is not designated as a bicycle route.

### 1.2.1.3 Local Roadways

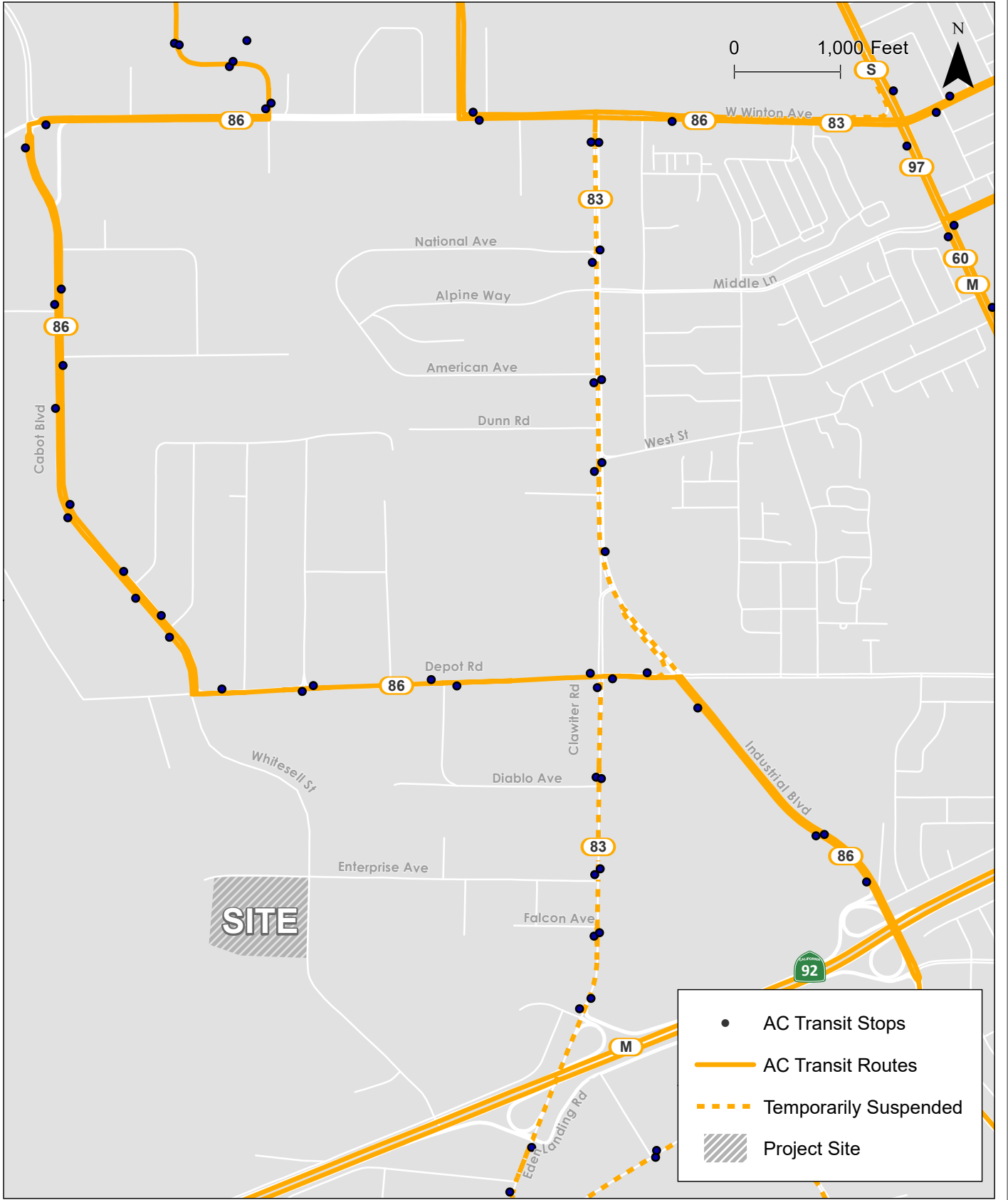
**Diablo Avenue** is an east-west Local roadway that begins at an unnamed road west of Viking St and ends at Clawiter Road to the east. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way at Clawiter Road is about 65 feet but narrows to 48 feet to the west. No sidewalks, on-street parking, or bicycle facilities exist on the roadway.

**West Street** is an east-west Local roadway that begins east of Clawiter Road. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way at Clawiter Road is about 34 feet but expands to 40 feet to the east. Sidewalks and on-street parking facilities exist on the roadway.

**Whitesell Street** is a north-south Local roadway that begins south of Depot Road. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way at Depot Road is 56 feet. The facility has sidewalks, bicycles, and has prohibited street parking.

## 1.2.2 TRANSIT SERVICE

The transit system in the study area consists of local bus service. The transit facilities in the study area are discussed below and shown in **Figure 3**.



Existing Transit Network  
Hayward, California

Figure  
4

### 1.2.2.1 Alameda-Contra Costa Transit District

Alameda-Contra Costa Transit District (AC Transit) provides bus service in the study area. AC Transit bus routes and local bus stops are shown in **Figure 3**. In addition, weekday bus service in the study area is documented in **Table 2**.

**Table 2: Existing AC Transit Weekday Service**

Route	Beginning and End Points		Peak / Off-Peak Frequency (in Minutes)
	North/West	South/East	
86	Hayward BART	South Hayward BART	35/35
M	Hayward BART	Hillsdale Caltrain	40/45

Data Source: AC Transit (2022)


The nearest bus stop to the project site is located on Depot Road east of Whitesell Street, approximately ¼ mile distance to the north. This bus stop can be accessed via sidewalks and bike lanes on Whitesell Street and is currently served by AC Transit Line 86 which operates at 35-minute headways during both peak and off-peak times. Route 86 begins at the Hayward BART station and travels west on Winton Avenue, south on Cabot Boulevard, and east on Depot Road. It then travels south on Industrial Boulevard and east on Tennyson Road before terminating at the South Hayward BART station. Route M, which runs between the Hayward BART and Hillsdale Caltrain stations, travels along SR-92 and Hesperian Boulevard in the study area.

On Winton Avenue, there is an AC Transit bus stop about 650 feet east of the intersection at Clawiter Road and another AC Transit bus stop about 1,200 feet west of the intersection at Clawiter. These two bus stops feature a bench and a shelter. All AC Transit buses are equipped with bike racks at the front of the bus. Bicycles are allowed inside buses between midnight and 5:30 a.m. weekdays and between midnight and 9 a.m. weekends and holidays, if the rack is full and there is room inside<sup>1</sup>.






### 1.2.3 PEDESTRIAN FACILITIES

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

**Table 3: Pedestrian Facility Conditions**

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.	Most roadways in the study area such as Enterprise Avenue do not have sidewalks. Whitesell Street north and south of Enterprise Avenue have sidewalks on both sides of the road. 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 generally do not exist in the area.

<sup>1</sup> [Bikes on Buses | Alameda-Contra Costa Transit District \(actransit.org\)](https://www.actransit.org/bikes-on-buses)

Factor	Description	Assessment
 <b>Sidewalk Conditions</b>	Cracked, broken, or otherwise damaged sidewalks can pose a safety hazard and discourage walking.	Where sidewalks exist, in particular Whitesell Street, they generally appear in good condition based on aerial photography.
 <b>Crosswalk Availability</b>	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.	Most intersections along Whitesell Street feature marked crosswalks on at least two legs. The intersection of Whitesell Street at Enterprise Avenue includes 4 crosswalks, the intersection is stop-controlled.
 <b>Shading</b>	Shading, whether natural or artificial, can encourage walking in areas such as Southern California which are relatively warm with limited rainfall, especially in the summer.	Shading around the study streets is provided intermittently by street trees and buildings. There are relatively long stretches of Enterprise Avenue and Whitesell Street that are not shaded.
 <b>Flat Grade</b>	Steep hills and ravines can discourage walking, especially for pedestrians with limited mobility.	The study area is generally flat with mild inclines or declines for short stretches (e.g.: SR-92 overpass at Clawiter Road).
 <b>Buffer</b>	Buffers which provide separation between pedestrians and moving vehicles can help improve the walking experience, and can include landscaping, parked vehicles, and bulbouts, which serve to both reduce pedestrian crossing distances at intersections and as a traffic calming measure.	Buffers in the form of landscaping and street parking are present intermittently along all the study roadways. On Whitesell Street the sidewalks include a planted buffer that provides an approximately 3-foot buffer from the sidewalk to the curb.
 <b>Amenities</b>	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 generally is not included along the roadways in the study area. As outlined in the transit section above, some bus stops do not provide any amenities other than a bus stop sign.

The draft City of Hayward Bicycle & Pedestrian Master Plan (BPMP) includes a map of roadways with the top pedestrian prioritization scores, highlighting roads that are prime candidates for improvements. Within the study area, these include portions of Clawiter Road, Depot Road, and Winton Avenue. No improvements have been identified on Enterprise Avenue.

## 1.2.4 BICYCLE FACILITIES

The study area contains a bicycle facilities network that consists primarily of dedicated street space for bicyclists.

**Figure 4** 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.

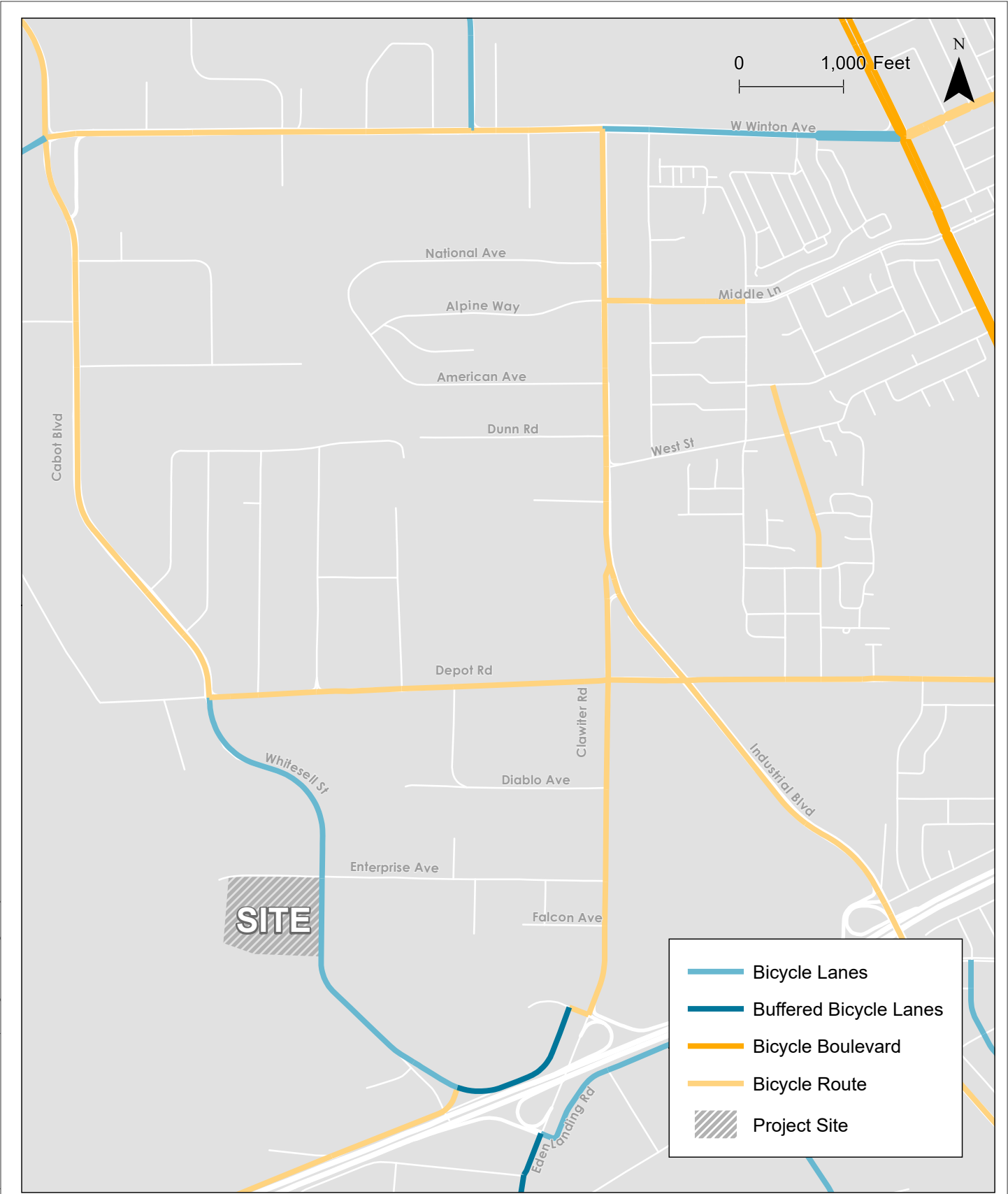
As shown in **Figure 4**, the existing bicycle facilities in the study area include:

- Class II bike lane on Whitesell Street south of Depot Road
- Class III bike route on Depot Road
- Class III bike route on Industrial Boulevard
- Class III bike route on Cabot Boulevard north of Depot Road to Winton Road
- Class III bike route on Clawiter Road
- Class II buffered bike lanes on Eden Landing Road south of SR-92
- Class III bike route on Winton Avenue west of Clawiter Road and on the north side of Winton Avenue east of Clawiter Road
- Class II bike lane on the south side of Winton Avenue east of Clawiter Road

The City of Hayward Bicycle & Pedestrian Master Plan (BPMP), which is currently in public draft form, 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, Clawiter Road, Winton Avenue, Industrial Boulevard, Depot Road, and Breakwater Avenue (parallel to SR 92). The draft plan includes the following bicycle improvements in the study area:

- Class II bicycle lane on Depot Road east of Industrial Boulevard
- Class IV separated bikeway on Depot Road west of Industrial Boulevard
- Class IV separated bikeway on Clawiter Road
- Class IV separated bikeway on Industrial Boulevard
- Class IV separated bikeway on Winton Avenue
- Class IV separated bikeway on Hesperian Boulevard

H:\2626915 - Hayward Enterprise Ave Industrial EIR\GIS\New Graphics\Figure 06 Existing Bikeway Network.mxd - mnaiz-leon - 4:36 PM 11/19/2021



**Existing Crosswalk Ramps  
Hayward, California**

**Figure  
5**



## Section 2

### VMT Impact Analysis



## 2 VMT IMPACT ANALYSIS

The project is located at 3636 Enterprise Avenue, north of State Route 92 (SR-92) and west of Whitesell Road, in the City of Hayward, CA. The site consists of 10.86 acres on one parcel (APN 439-0099-036-02). The proposed project consists of the development of one new warehousing spec building on a vacant lot.

The project is 219,656 square feet (sf) of industrial/warehouse uses consisting of 208,673 sf of warehouse and 10,983 sf of office space. The project would also include a parking lot with 151 automobile parking spaces. Access to the project site would be via two driveways along Enterprise Road. Both driveways would be located at the northern portion of the site with access to Enterprise Avenue. The project site and study area are shown in **Figure 1**. The proposed site plan is shown in **Figure 2**.

This section discusses the results of the VMT analysis using the City's SB 743-consistent VMT thresholds of significance and screening criteria.

### 2.1 EQUIVALENT LAND USE AND APPLICABLE THRESHOLDS AND SCREENING CRITERIA

The City of Hayward has developed VMT impact thresholds of significance that cover residential, office employment, industrial employment, and retail projects. This is generally consistent with OPR's technical advisory, which provided recommended metrics and impact thresholds for residential, office, and retail projects, since they tend to have the greatest influence of land use projects on VMT in California.

The City's thresholds of significance by land use are shown in **Figure 5**. Given that the project is an industrial park with primarily industrial uses and other minor supporting uses, it was determined that the employment-industrial threshold (VMT per employee below the existing regional average) would be appropriate to apply to the project.

### 2.2 VMT SCREENING

Before any VMT analysis is undertaken, the Project must undergo screening using the City's screening criteria to determine if it can be expected to cause a less-than-significant impact without conducting 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.

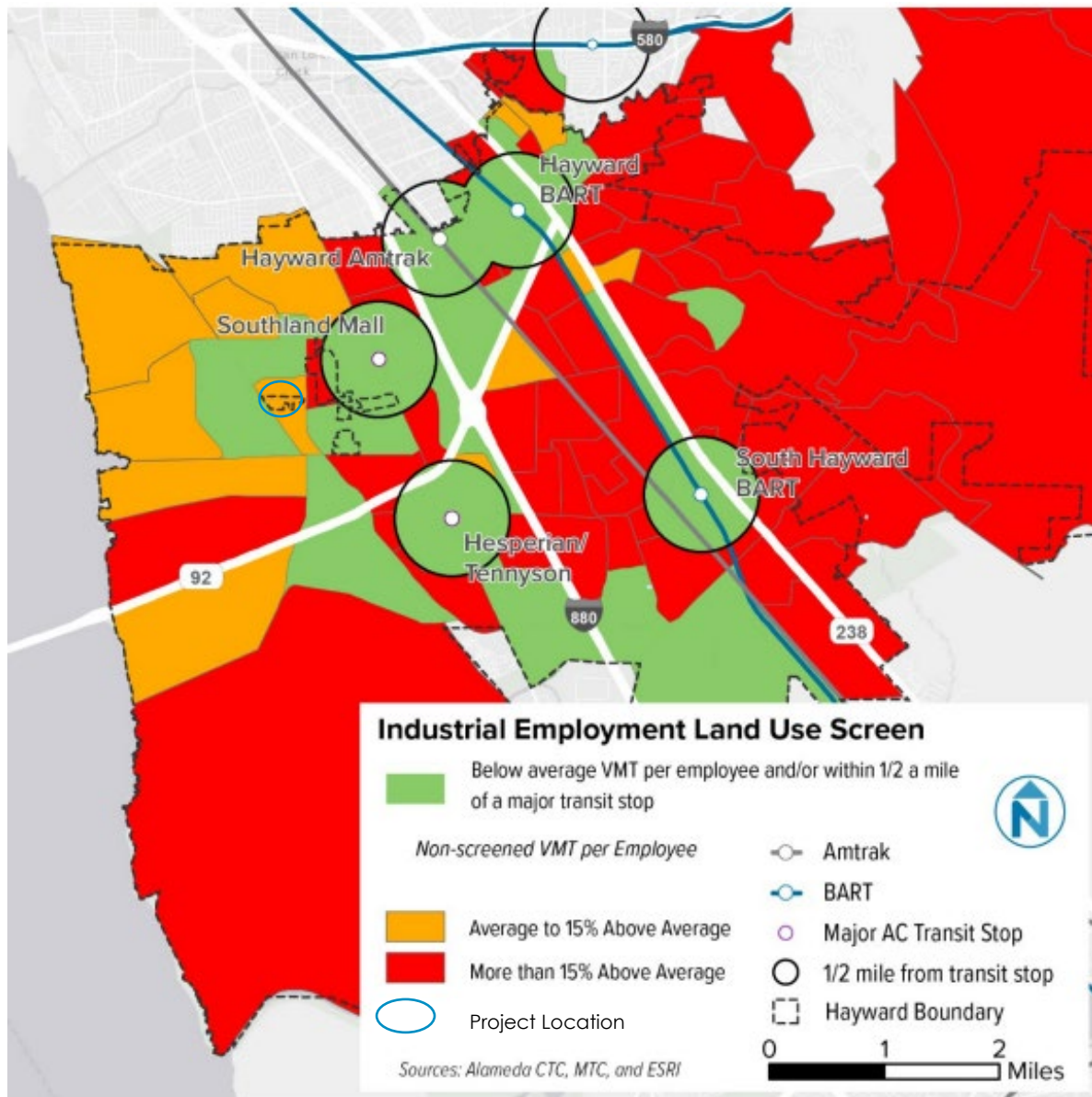
The low-VMT area screening criterion does not apply to this project and therefore the project cannot be screened out of a detailed VMT analysis for the following reasons:

- As shown in **Figure 5**, the project is located in an area with more than 15% above average VMT.
- The project includes low-VMT supporting features:
  - Vehicle parking would include both a carpool-designated preferred area, as well as electric vehicle charging stations.
  - The project incentivizes commuting by bike, with bike racks and storage facilities.

- An on-site food truck space will be made available, so employees are likelier to remain on-site for lunch.
- The project includes features that are similar to or better than what exists today for density and parking to support no increase in VMT per industrial employee. The project improves conditions compared to what is currently on the site:
  - Increases density: The site is currently vacant. With the project, this would increase the developed space by approximately 219,656 square feet.
  - Increases parking: With the project, on-site parking will increase to 151 auto parking spaces.

The average VMT per employee in Alameda County is 18.15, and the project area zone has an average VMT per employee of 20.64. Therefore, the project is in an area that reports more than 15% above the average VMT per employee. Therefore, VMT reductions would be needed for the project to meet the VMT threshold. The project requires a VMT reduction of 12.1% to achieve the County regional average VMT per employee.

Figure 5: Employment-Industrial Land Use VMT Screening Map



## 2.3 VMT MITIGATION

The City of Hayward's guidelines recommend mitigating VMT impacts by reducing the number of single-occupant vehicles generated by a site. This can be accomplished by changing the proposed land use or by implementing Transportation Demand Management (TDM) strategies. The guidelines provide recommended mitigation measures for residential, office, retail, and mixed-use developments based on a "pre-approved" list. The city guidelines also refer to using the Alameda CTC VMT Reduction Calculator Tool-Design Document where appropriate. The Alameda CTC VMT reduction calculator tool is based on the San Diego Association of Governments (SANDAG) VMT Reduction Calculator Tool (2019) and research from California Air Pollution Control Officers Association (CAPCOA) *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, published in August 2021. The Alameda CTC VMT Reduction Calculator Tool was not used in this analysis as the tool does not support the analysis of low-density areas. The project TAZ (#747) land density is too low for the tool to apply. This analysis therefore uses the City of Hayward's and CAPCOA approved mitigation measures.

Given that general light industrial are employment projects with home-based work VMT as the metric, the commute-focused mitigation measures provided in **Table 4** were selected from the City of Hayward's "pre-approved" list of mitigation measures and CAPCOA. The City's list and CAPCOA provides maximum VMT reductions based on information that has been made available since the publication of the 2021 CAPCOA documentation as well as accounts for City conditions.

**Table 4: Applicable Mitigation Measures**

Measure	Description	Source
Rideshare Program	<p>A rideshare program includes TDM strategies designed to increase average vehicle occupancy by encouraging carpooling and vanpooling. Carpooling and Vanpooling allows persons to connect with others who live and work nearby, have similar work schedules, and are interested in carpooling and/or vanpooling to and from work. Employers can encourage carpooling by providing ride matching assistance to employees, providing priority parking for carshare vehicles, and providing incentives for carpooling. Vanpooling is another form of ridesharing; it is a flexible form of public transportation that provides groups of generally 5 to 10 people with a cost-effective and convenient rideshare option for commuting. An employer can encourage ridesharing by subsidizing vanpooling for employees.</p> <p>The Metropolitan Transportation Commission (MTC) 511 program offers multiple ways to help share a ride, including long-term and one-time carpools and vanpools. Carpooling and vanpooling can be encouraged through programmatic features, such as a platform or database that matches potential riders (e.g. Zimride), and through incentives, such as payments to individuals who participate in each mode. Vanpool vehicles can be rented through a third-party provider, such as Commute With Enterprise, be owned by an individual or provided by an employer. For the proposed project, it is recommended the following:</p> <ul style="list-style-type: none"> <li>- Subsidize employees who participate in carpool and vanpool programs by fully covering the fair share cost of the employee enrolled in a carpool or vanpool (up to \$75 per month).</li> <li>- Providing priority parking in a prime location near an entrance as an incentive to carpool and vanpool</li> </ul>	CAPCOA Measure 3.4.7
Employee Transit Subsidies	Employers can encourage employees to take transit by providing subsidized or discounted daily or monthly public transit passes to employees. Currently, the Bay Area Commuter Benefits Program has multiple options related to employer-provided transit or transit subsidy (see below). Commute.org has a Guaranteed	City of Hayward Measure 1D

Measure	Description	Source
	<p>Ride Home program and a commuter shuttle program available to encourage transit use as well.</p> <p>For the proposed project, it is recommended the following incentives for employees who regularly carpool, vanpool, bike, walk or take transit to work:</p> <ul style="list-style-type: none"> <li>- cover the monthly cost of the employee's commute (up to \$75 per month) or allow employees to exclude their transit or vanpooling expenses from taxable income, up to the maximum of \$270 per month allowed by the federal tax code</li> <li>- provide a free and reliable ride home when one of life's unexpected emergencies arise.</li> </ul>	
Promotions and Marketing Program	<p>Commute trip reduction marketing programs are part of a traditional TDM program and often focus on advertising non-driving options to individuals. This may include direct outreach, help with trip planning, and development of promotional materials. This strategy can include the deployment of products, such as TransitScreen, that provide real-time transit and other transportation information in common spaces of a development. This strategy's efficacy is affected by the level of investment in the program, the staff involved, and the other measures implemented.</p> <p>For the proposed project, it is recommended the following:</p> <ul style="list-style-type: none"> <li>- Promote and educate employees so they are aware of the TDM programs and incentives available to them via brochures and printed information on transit, shuttles and bike maps. This shall include information material in employee handbook, new-hire packets, and internal postings in common areas</li> <li>- Monthly drawings for employees who use a commute alternative for 50 percent of their trips, and log them in a company maintained trip diary</li> </ul>	CAPCOA Measure 3.4.6

It shall be noted that the Bay Area Commuter Benefits Program is a regulation requiring employers within the jurisdiction (including Hayward) of the Bay Area Air Quality Management District (BAAQMD) to offer commuter benefits. The program requires all employers with 50 or more full-time employees to provide commuter benefits to their employees. The operator of the proposed project may be required to meet BAAQMD's commuter benefits program if more than 49 full-time employees are employed. Employers must select one or more of four commuter benefit options.

- Option 1: Pre-Tax Benefit. The employer allows employees to exclude their transit or vanpooling expenses from taxable income, up to the maximum of \$270 per month allowed by the federal tax code.
- Option 2: Employer-provided transit or vanpool subsidy (or transit pass) which covers the monthly cost of the employee's commute (up to \$75 per month).
- Option 3: Employer-Provided Transit. The employer provides a free or low-cost transit service for employees, such as a bus, shuttle, or vanpool service.
- Option 4: Alternative Commuter Benefit. The employer provides an alternative commuter benefit that is as effective in reducing single-occupancy commute trips (or motor vehicle emissions) as Options 1-3.

AC Transit bus service is available within an approximately ¼ to ½-mile walking distance from the Project site. The nearest bus stop to the project is located along Depot Road near the intersection of Depot Road/Whitesell Street. This stop currently serves AC Transit Line 86, which currently operates at 35-minute headways during both peak and off-peak times. Additional transit stops are located along Clawiter Road, which are more than ½-mile walk from the Project site. All AC Transit buses are equipped with bike racks,

bikes are allowed inside if the rack is full and there is room inside.<sup>2</sup> The bus stop would be accessed from the project site via sidewalks and via a Class II bike lane on Whitesell Street, which consists of the majority of the route. As discussed in Section 1.2.4, no additional bicycle facilities are planned in the City's General Plan and the City's BPMP. A review of existing daily traffic volumes of 331 vehicles on Enterprise Avenue west of Whitesell Street indicates the traffic volume is low.

For transit planning purposes, a ½ -mile walk distance is considered acceptable as a bus catchment area. AC Transit's guidelines<sup>3</sup> has standards for how long passengers should travel to reach a bus route. For areas like Hayward, AC Transit assumes the catchment area for a bus stop to be ½-mile, therefore the project site is within the catchment area for bus service. Bus service with headways of 45 minutes or less connects to 2 BART stations (at Hayward and Bay Fair), which is acceptable for this type of industrial area.

The Depot Road bus stop access will require employees to walk east along Enterprise Avenue to Whitesell Street. Enterprise Avenue currently has minimal sidewalks, however, to support the use of transit and non-auto travel, as a project design feature, a 5-foot wide sidewalk will be constructed on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street. From Whitesell Street, employees would use existing sidewalks along either side of Whitesell Street to access the bus stop at Depot Road. The project would include two new access driveways, a 5-foot wide paved sidewalk on the south side of Enterprise Avenue from the western site boundary to the intersection with Whitesell Street, and on-site bike racks. However, given that the nearest bus stop is closer to the 1/2-mile catchment threshold, it is recommended that the project implement additional measures to further encourage transit usage, such as improving sidewalk access along the project frontage and along Enterprise Avenue, and if compatible with the street right of way and City Bike plan, potentially striping bicycle lanes along Enterprise Avenue from the project site to Whitesell Street (see Section 4.2) and implementing a "Guaranteed Ride Home" program as part of the project's transit subsidies. Guaranteed Ride Home is a reimbursement program for registered commuters. It provides registered commuters a sense of comfort knowing they can take care of family emergencies or stay late completing a project while still taking transit and/or alternative modes of commuting. A "Guaranteed Ride Home" program subsidizes rides up to a certain amount for up to a few times per year via taxis or on-demand services such as Lyft and Uber for employees when emergency situations occur, or if transit is temporarily unavailable. It is further recommended that the applicant coordinate with the transit agency to ensure that future bus service planning can account for this development and reduce walking distance further.

The select measures listed in **Table 4** (Rideshare Program, Employee Transit Subsidies, and Promotions and Marketing) were compared to the VMT reductions necessary for Industrial projects in each of the two areas. A menu of mitigation measures that could be applied at each location are detailed below, along with the assumptions necessary to reduce VMT per employee below the threshold of 18.15 VMT per employee. Note, the CAPCOA and City of Hayward methodologies provide reductions which are sensitive to an area's land use and transportation context (urban, suburban-center, or suburban). For calculation purposes, the city's land use and transportation context were characterized as suburban-center.

Project VMT must be reduced from 20.64 VMT per employee to 18.15 VMT per employee, representing a 12.1% decrease. The following individual TDM measures may be applicable, with the expected VMT per employee reductions. The VMT per employee reductions shown below assume 100% of employees would be eligible to participate:

- Rideshare Program.
- Employee Transit Subsidies, including a "Guaranteed Ride Home" Program

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<sup>2</sup> [Bikes on Buses | Alameda-Contra Costa Transit District \(actransit.org\)](#)

<sup>3</sup> [https://www.actransit.org/sites/default/files/2020-09/bp\\_545\\_-\\_service\\_standards\\_design-1.pdf](https://www.actransit.org/sites/default/files/2020-09/bp_545_-_service_standards_design-1.pdf)

- Promotions and Marketing Program

### **VMT Mitigation Measures**

**TRAF-1:** To achieve the 12.1% VMT per employee reduction, the project applicant and/or operator of the facility shall implement one of the two combination of TDM measures below where 100% of full time employees shall be eligible to participate:

1. Rideshare Program + Employee Transit Subsidies (including a "Guaranteed Ride Home" program)
2. Rideshare Program + Promotions and Marketing Program + Employee Transit Subsidies

The applicable TDM measures as part of the mitigation measures for the project are:

- Rideshare Program:
  - Subsidize employees who participate in carpool and vanpool programs by fully covering the fair share cost of the employee enrolled in a carpool or vanpool (up to \$75 per month)
  - Provide priority parking in a prime location near an entrance as an incentive to carpool and vanpool
- Employee Transit Subsidies:
  - Cover the monthly cost of the employee's commute (up to \$75 per month) or allow employees to exclude their transit or vanpooling expenses from taxable income, up to the maximum of \$270 per month allowed by the federal tax code
  - Provide a guarantee ride home program
  - Prior to building occupancy the operator of the warehouse shall request AC Transit to provide more frequent and transit service closer to the project site to ensure that future bus service planning can account for this development and reduce walking distance further
- Promotions and Marketing Program:
  - Promote and educate employees so they are aware of the TDM programs and incentives available to them via brochures and printed information on transit, shuttles and bike maps. This shall include information material in an employee handbook, new-hire packets, and internal postings in common areas
  - Monthly drawings for employees who use a commute alternative for 50 percent of their trips, and log them in a company maintained trip diary

Detailed VMT calculations can be found in Appendix A.

Mitigation measures that consist of TDM measures could be applied to the project to reduce vehicle trips and VMT per employee below thresholds. With the implementation of any of the 2 combination of measures outlined above, this would contribute to reduce the significant project impact and significant cumulative impact to **less-than-significant with mitigation**.



## Section 3

# Project Trip Generation and Distribution



# 3 PROJECT TRIP GENERATION AND DISTRIBUTION

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

## 3.1 TRIP GENERATION

Project trip generation was estimated for the following three 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 light industrial tenants was selected. Trips were estimated using data provided by the Institute of Transportation Engineers (ITE) and shown in **Table 5**. Trip generation for the project was estimated using average trip rates for Light Industrial (Code 110). The trip rates were extracted from the most recent data available in the web-based Trip Generation database maintained by ITE. It shall be noted that trip rates derived from the regression curve for the light industrial land use code in the ITE Trip Generation Manual was considered. However, the average trip rates yields more conservative trip generation estimates and it was therefore proposed for the analysis. As shown in **Table 5**, the project is expected to generate 1,070 weekday daily vehicle trips, 163 weekday AM peak hour vehicle trips, and 143 weekday PM peak hour vehicle trips. As the site is currently vacant, no trip credits are being recommended for the existing buildings located on the project site.

**Table 5: Project Trip Generation Estimate**

Trip Generation Estimate									
Land Use	ITE Trip Generation Manual Edition	Size	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Project	11 <sup>th</sup>	219.66 TSF	1070	143	20	163	20	123	143

Trip Generation Rates									
Land Use	ITE Trip Generation Manual Land Use Code	Rate	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
General Light Industrial	110	TSF	4.87	88%	12%	0.74	14%	86%	0.65

Source: Kittelson & Associates, Inc., 2022; Institute of Transportation Engineers, 2021.  
 Notes: KSF signifies thousand square feet.

## 3.2 TRIP DISTRIBUTION

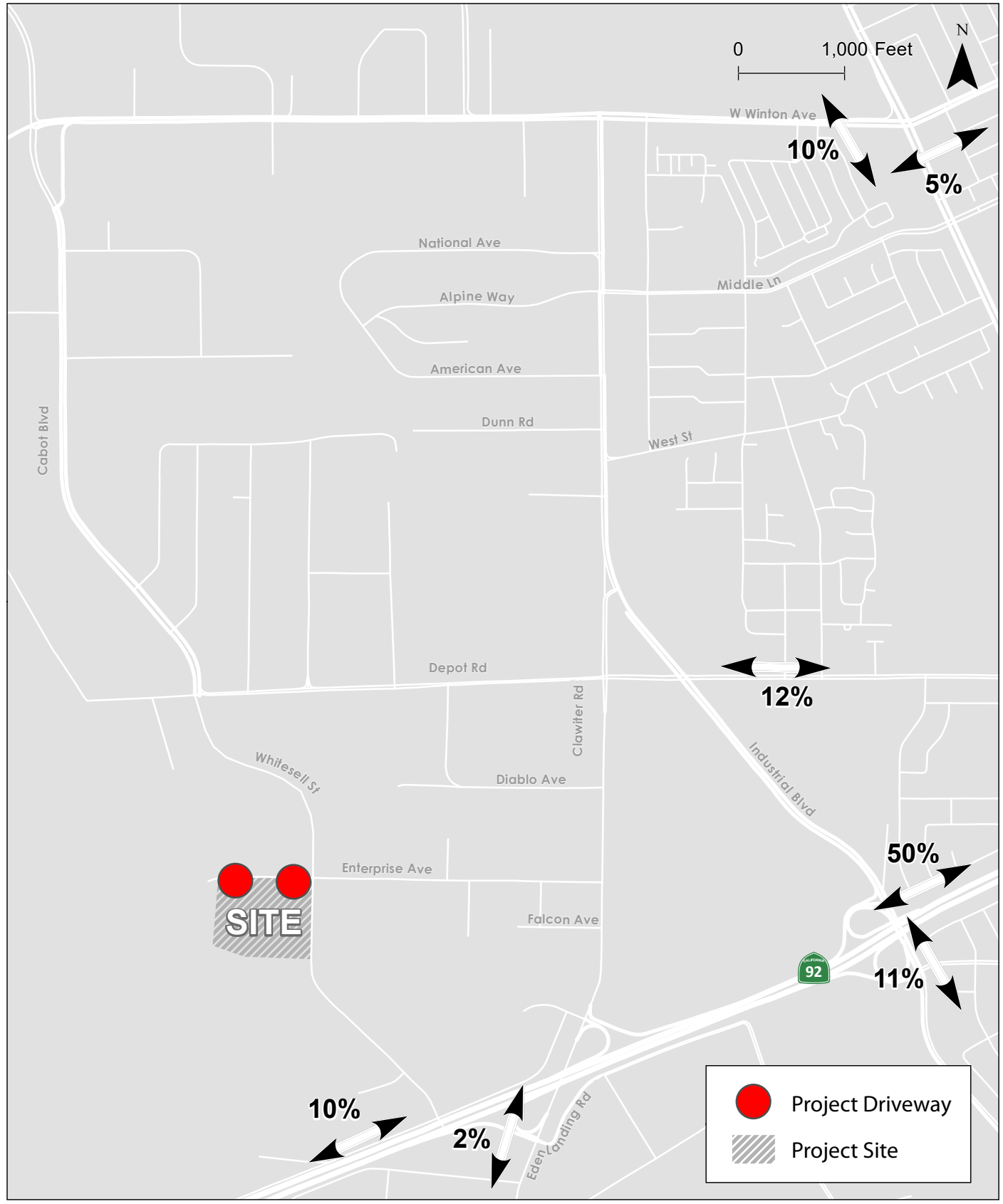
Project trip distribution was developed using the City of Hayward General Plan travel demand model. The project trip distribution is based on the model's distribution of trips in and out of the traffic analysis zone (TAZ) representing the project site, as well as adjustments to reflect local travel patterns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

The trip distribution for the project is as follows:

- 10% to/from the west via SR-92
- 10% to/from the north via Hesperian Boulevard
- 5% to/from the northwest via Winton Avenue
- 50% to/from destinations in the north, east, and south/southeast via SR-92
- 12% to/from the south/southeast via Hesperian Boulevard
- 11% to/from the south/southeast via Industrial Boulevard
- 2% to/from the south via Eden Landing Road and Arden Road

All trip distribution destinations total up to 100%.

C:\Users\mruiz-leon\OneDrive - Kittelson & Associates, Inc\Documents\Figure 6 CEQA.mxd - mruiz-leon - 5:29 PM 5/31/2022



**Project Trip Distribution Percentages  
Hayward, California**

**Figure  
8**



## Section 4

# Public Transit, Pedestrian, and Bicycle Assessment

## 4 PUBLIC TRANSIT, PEDESTRIAN, AND BICYCLE ASSESSMENT

This section discusses potential effects on public transit, pedestrians, and bicyclists. To supplement this analysis, the Alameda County Transportation Commission (ACTC) Development Review Complete Streets Checklist was completed and is included as Appendix B.

### 4.1 PUBLIC TRANSIT ASSESSMENT

The project is not expected to degrade access to transit facilities. The nearest bus stop to the project site is located on Depot Road east of Whitesell Street, approximately ¼ mile distance to the north. This bus stop can be accessed via sidewalks and bike lanes on Whitesell Street and is currently served by AC Transit Line 86 which operates at 35-minute headways during both peak and off-peak times. The project includes the construction of a paved 5-foot wide sidewalk on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street. This would provide a continuous paved sidewalk from the project to the nearest bus stop on Depot Avenue via Enterprise and Whitesell. The project would not affect any existing or planned bus stops or sidewalks in the study area. Therefore, implementation of the Project would not conflict with plans, programs, and policies regarding transit facilities, or decrease the performance of such facilities.

### 4.2 PEDESTRIAN AND BICYCLE ASSESSMENT

Most roadways in the study area such as Enterprise Avenue do not have sidewalks. Whitesell Street north and south of Enterprise Avenue has sidewalks on both sides of the road. 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 generally do not exist in the area. The project would construct a paved 5-foot wide sidewalk on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street.

The site plan includes bike racks, consistent with California Green Building Code (CALGreen) requirements for developers to provide bicycle parking for 5% of the vehicular parking spaces added on a site. 8 Short-term bike racks and 8 long-term bike racks are required, and the project has proposed to provide 8 of each. The bicyclist access points to the project consist of the two driveways along Enterprise Avenue. The study area features bike routes, including a bike route along Whitesell Street, Depot Road, and Clawiter Road, as discussed in Section 1.3.4. Cyclists accessing the project on a bike would need to ride a short section of Enterprise Avenue of approximately 300 feet between the eastern site access driveway to Whitesell Street. The provision of a bike lane would support the use of bicycle travel and/or transit to reduce VMT with the project. A preliminary review suggests that installing a class II bike lane on this section of Enterprise Avenue may be feasible given curbside parking is prohibited on both sides of the road, the limited number of existing and future access driveways directly to Enterprise Avenue, and the right of way of 60 feet for the 2-lane road. The right of way should be able to accommodate a class II bike lane. However, it should be noted that given the industrial-nature of the area and anticipated truck traffic along Enterprise Avenue, sharrows or a class III bicycle route would not be recommended. The bicycle facility is recommended on both sides of Enterprise Avenue between Whitesell Street and the project site's western property boundary. The design and installation of a bike lane shall be implemented under the City of

Hayward and State of California applicable standards and to the satisfaction of the City of Hayward Public Works staff.

Potential pedestrian and bicycle-oriented treatments that could be considered as part of design review and conditions of approval could include:

- Ensure that the west and east driveways on Enterprise Avenue are designed for pedestrian and bicycle visibility (sidewalks clearly delineated, improved visibility by minimizing bushes and large signs).
- Coordinate with the City of Hayward to install warning signage (such as bikeway signage, and caution signage for exiting vehicles).



## Section 5

### Findings

## 5 FINDINGS

The following recommendations were made to be incorporated as part of this Project to address potential impacts to the circulation network:

An assessment of vehicle miles traveled (VMT) determined the Project cannot be screened out of a detailed VMT analysis under the City's SB 743-consistent VMT criteria, since the project is in an area with above average VMT. Therefore, it was determined that the project may be impacted for VMT and would have to have VMT and TDM improvements.

Project VMT must be reduced from 20.64 VMT per employee to 18.15 VMT per employee, representing a 12.1% decrease. To achieve the 12.1% VMT per employee reduction, the project applicant and/or operator of the facility shall implement a combination of TDM measures:

1. Rideshare program + Employee transit subsidies (including "Guaranteed Ride Home" program) = 12.8% total VMT per employee reduction
2. Rideshare program + Promotions and marketing program + Employee transit subsidies = 16.3% total VMT per employee reduction

To support the use of transit and non-auto travel, as a project design feature, a 5-foot wide sidewalk will be constructed on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street. It is also recommended that a class II bicycle lane is implemented on both sides of Enterprise Avenue from the project site western boundary to the intersection of Whitesell street. These improvements are described in Section 4.2.

Section 2 describes each TDM measure in detail, the level of subsidies and incentives, and the project design features and infrastructure that would encourage users to adopt the measures that would reduce VMT. To support the use of non-auto travel, pedestrian and bicycle improvements are described in Section 4.2. With the implementation of any of the two combination of measures outlined above, this would contribute to reduce the significant project impact and significant cumulative impact to **less-than-significant with mitigation**.



## Appendix A: VMT Calculations

**VMT analysis (reduce by 12.1%)**

Mitigation Measure and Source	Formula and Variables	Relevant Tables and Other Info	Assumptions	Reduction (100% Employees Eligible)																													
Price Workplace Parking (CAPCOA 3.4.14)	$\% \text{ VMT Reduction} = A * B$ Where A = Percentage reduction in commute VMT B = Percent of employees subject to priced parking	<table border="1"> <thead> <tr> <th colspan="5">A:</th> </tr> <tr> <th rowspan="2">Project Location</th> <th colspan="4">Daily Parking Charge</th> </tr> <tr> <th>\$1</th> <th>\$2</th> <th>\$3</th> <th>\$6</th> </tr> </thead> <tbody> <tr> <td>Low-Density Suburb</td> <td>0.5%</td> <td>1.2%</td> <td>1.9%</td> <td>2.8%</td> </tr> <tr> <td>Suburban Center</td> <td>1.8%</td> <td>3.7%</td> <td>5.4%</td> <td>6.8%</td> </tr> <tr> <td>Urban</td> <td>6.9%</td> <td>12.5%</td> <td>16.8%</td> <td>19.7%</td> </tr> </tbody> </table>	A:					Project Location	Daily Parking Charge				\$1	\$2	\$3	\$6	Low-Density Suburb	0.5%	1.2%	1.9%	2.8%	Suburban Center	1.8%	3.7%	5.4%	6.8%	Urban	6.9%	12.5%	16.8%	19.7%	Suburban Center; daily parking charge of \$2	3.7%
A:																																	
Project Location	Daily Parking Charge																																
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Low-Density Suburb	0.5%	1.2%	1.9%	2.8%																													
Suburban Center	1.8%	3.7%	5.4%	6.8%																													
Urban	6.9%	12.5%	16.8%	19.7%																													
Rideshare Program (CAPCOA 3.4.7)	$\% \text{ VMT Reduction} = \text{Commute} * \text{Employee}$ Where Commute = % reduction in commute VMT Employee = % employees eligible		Suburban Center	8.0%																													
Employee Transit Subsidies (SANDAG 1D)	$\% \text{ change in VMT} = \% \text{ of employees eligible} \times \% \text{ change in commute VMT}$ Where: % of employees eligible will usually be 100%. % change in commute VMT differs by place type (low-density suburb, suburban center, or urban) and level of daily transit subsidy (\$1 to \$4)	<table border="1"> <thead> <tr> <th rowspan="2">Place Type</th> <th colspan="4">Change in Commute VMT:</th> </tr> <tr> <th colspan="4">Subsidy Level Per Day</th> </tr> <tr> <th></th> <th>\$1</th> <th>\$2</th> <th>\$3</th> <th>\$4</th> </tr> </thead> <tbody> <tr> <td>Low-Density Suburb</td> <td>-0.1%</td> <td>-0.2%</td> <td>-0.4%</td> <td>-0.6%</td> </tr> <tr> <td>Suburban Center</td> <td>-1.1%</td> <td>-2.4%</td> <td>-4.1%</td> <td>-5.8%</td> </tr> <tr> <td>Urban</td> <td>-2.2%</td> <td>-4.7%</td> <td>-7.8%</td> <td>-10.9%</td> </tr> </tbody> </table>	Place Type	Change in Commute VMT:				Subsidy Level Per Day					\$1	\$2	\$3	\$4	Low-Density Suburb	-0.1%	-0.2%	-0.4%	-0.6%	Suburban Center	-1.1%	-2.4%	-4.1%	-5.8%	Urban	-2.2%	-4.7%	-7.8%	-10.9%	Suburban Center; EZ Pass subsidy of approximately \$3.67, interpolated between \$3 and \$4.	5.2%
Place Type	Change in Commute VMT:																																
	Subsidy Level Per Day																																
	\$1	\$2	\$3	\$4																													
Low-Density Suburb	-0.1%	-0.2%	-0.4%	-0.6%																													
Suburban Center	-1.1%	-2.4%	-4.1%	-5.8%																													
Urban	-2.2%	-4.7%	-7.8%	-10.9%																													
Promotions and Marketing (CAPCOA 3.4.6)	$\% \text{ Commute VMT Reduction} = A * B * C$ Where A = % reduction in commute vehicle trips B = % employees eligible C = Adjustment from commute VT to commute VMT	A: 4% C: 1.0	n/a	4.0%																													

Combination of Measures:	Assumptions	Combined Reduction
Price Workplace Parking + Rideshare Program	100% of employees subject to \$2 per day parking charge and 100% of employees eligible for rideshare program	11.4%
Rideshare Program + Employee Transit Subsidies	100% of employees eligible for both programs	12.8%
Rideshare Program + Promotions and Marketing	100% of employees eligible for both programs	11.7%
Price Workplace Parking + Employee Transit Subsidies + Promotions and Marketing	100% of employees subject to \$2 per day parking charge and 100% of employees eligible for rideshare program and promotions/marketing	12.4%
Rideshare Program + Promotions and Marketing + Price Workplace Parking	100% of employees subject to \$2 per day parking charge and 100% of employees eligible for rideshare program and promotions/marketing	14.9%
Rideshare Program + Promotions and Marketing + Employee Transit Subsidies	100% of employees subject to \$2 per day parking charge and 100% of employees eligible for rideshare program and transit subsidies	16.3%

Note: Combined VMT reduction calculated using the formula Total VMT Reduction % = 1-(1-Measure A reduction)\*(1-Measure B reduction)\*(1-Measure C reduction).

Appendix B: ACTC Development Review  
Complete Streets Checklist

## Development Review Complete Streets Checklist

This checklist is designed to assist the applicant and jurisdiction staff identify and assess a range of Complete Streets-related needs in the vicinity of each development. These needs, if addressed, would better serve the multimodal transportation needs of those coming and going from the site and the surrounding area. The checklist is to be completed during the pre-application phase, but can be used as a reference throughout the development and design of the project. Following completion of the checklist, staff will identify and document project modifications for further evaluation and discussion.

Project Name: 3636 Enterprise Avenue Industrial Project Project Description / Project Type: Industrial Park  
Project Location: 3636 Enterprise Avenue, Hayward, CA  
Project Manager \_\_\_\_\_  
Anticipated construction date \_\_\_\_\_

### Pre-Application Phase

#### Project Description

1. What are the proposed land uses (check all that apply)?
  - residential
  - commercial /mixed use
  - industrial
  - civic/institutional
  - other \_\_\_\_\_
2. What are the major trip generators near the project site, if any? (existing and future)
  - a) Schools yes no
  - b) Major employers yes no
  - c) Civic/community destinations yes no
  - d) Medium to high-density residential yes no
  - e) Senior centers/healthcare facilities yes no
  - f) Daily needs (grocery, retail, etc.) yes no
  - g) Other \_\_\_\_\_
3. Is the project site located on the path to/from nearby trip generators?  
yes no  
Explain: Located directly on Enterprise Ave. and adjacent to freeway ramps
4. Based on the modal priority maps (available at <https://alameda-ctc.maps.arcgis.com/apps/View/index.html?appid=2040175145de4305>

[a5f59c6e82ca16c7](#)), list the modal priorities on adjacent streets (check all that apply):

Adjacent Street 1 Name: Enterprise Avenue

Auto	<input type="checkbox"/> First	<input type="checkbox"/> Second	<input checked="" type="checkbox"/> Other
Bicycle	<input checked="" type="checkbox"/> First	<input type="checkbox"/> Second	<input type="checkbox"/> Other
Pedestrian	<input type="checkbox"/> First	<input checked="" type="checkbox"/> Second	<input type="checkbox"/> Other
Transit	<input type="checkbox"/> First	<input type="checkbox"/> Second	<input checked="" type="checkbox"/> Other
Trucks	<input type="checkbox"/> First	<input type="checkbox"/> Second	<input checked="" type="checkbox"/> Other

Work with Transportation and Engineering Staff to fill out questions 5-8.

5. Within the past five years, have there been any fatal or severe injury collisions within ¼ mile of the site? yes no  
*If yes, explain: From 2015 to 2019, six along SR-92 and one at the WB ramp intersection at Industrial Blvd.*
6. Within the past five years, have there been any collisions within ¼ mile of the site involving pedestrians or bicyclists? yes no

If yes, explain: One bike collision on Clawiter between Diablo Ave. and Enterprise Ave. One bike collision at the SR-92 WB ramp intersection at Industrial blvd.

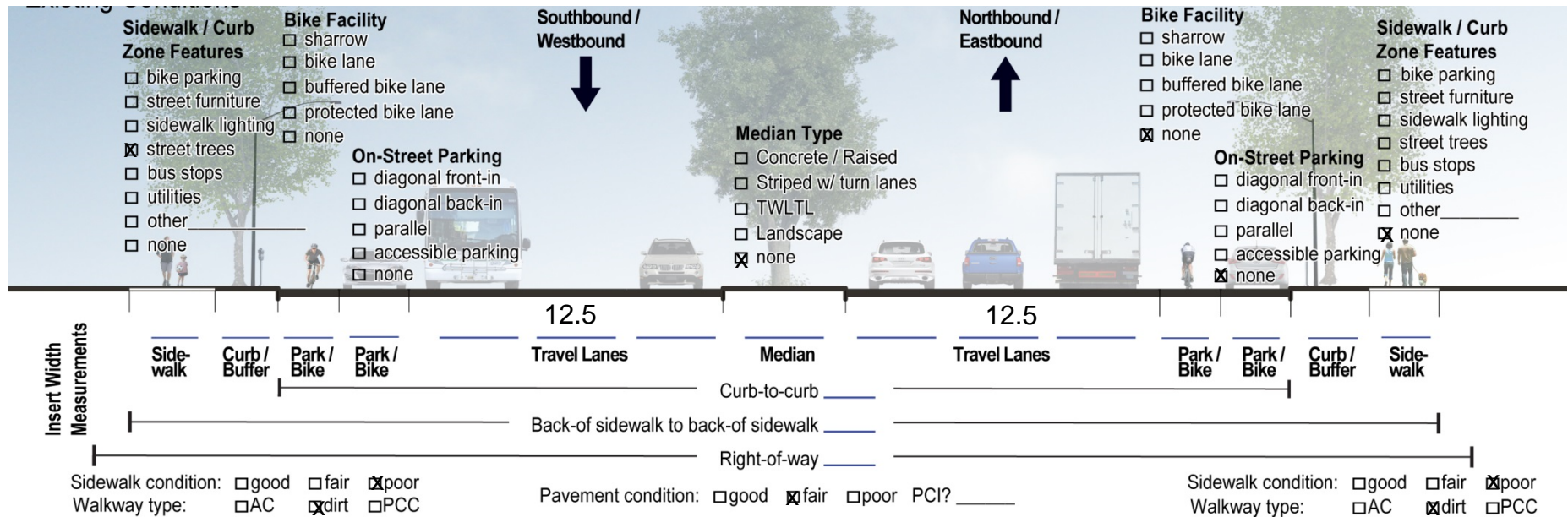
7. Have you observed other opportunities to improve safety performance? (based on field observation) yes no If yes, note:

If yes, explain: Improve sidewalks (e.g. Re-stripe crosswalks to be high-visibility); add sidewalks

### Existing Physical Conditions

8. What are the existing right-of-way elements adjacent to the project site? Use cross section graphic for each street adjacent to the site.

Adjacent Street 1: Street name Enterprise Avenue



TWLTL = two-way left turn lane | AC = asphalt concrete | PCC = poured cement concrete | PCI = pavement condition index

Plans, Policies, Guidelines, and Standards

9. What are **relevant ongoing or existing plans**?

Plan	Identified Needs (yes or no)				
	Ped	Bike	Transit	Vehicular	Other
Bicycle and Pedestrian Master Plan	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no

List any transportation improvement needs identified in the plan documents listed above:

The Hayward Bicycle and Pedestrian Master Plan (BPMP).

The BPMP includes a map of roadways with the top pedestrian prioritization scores, highlighting roads that are prime candidates for improvements. Within the study area these includes portions of Clawiter Road, Winton Avenue, Industrial Boulevard, Depot Road, and Breakwater Avenue (Parallel to SR 92).

Transportation Evaluation

10. Indicate whether the following elements have been evaluated for existing conditions at the site and surrounding area and list the result for each mode:

**Pedestrian**

- Internal site circulation and pedestrian routes  yes  no
- Site access and street frontage  yes  no
- Signage and wayfinding  yes  no
- Intersections and street crossings  yes  no
- Access to/from surrounding area  yes  no
- Lighting  yes  no
- ADA facilities  yes  no
- Other \_\_\_\_\_  yes  no

List any pedestrian deficiencies identified:

**Bicycle**

- Parking supply and ease of use  yes  no
- Site access  yes  no
- Signage and wayfinding  yes  no
- Intersections  yes  no
- Access to/from surrounding area  yes  no
- Other \_\_\_\_\_  yes  no

List any bicycle deficiencies identified:

**Auto**

- On-street parking  yes  no
- Off-street parking  yes  no
- Disabled parking  yes  no
- Green infrastructure  yes  no
- Driveway placement and ped/bike conflict points  yes  no
- Other \_\_\_\_\_  yes  no

List any auto deficiencies identified:

**Transit**

Bus stop placement

yes  no

Waiting area amenities and stop design parameters

yes  no

Other \_\_\_\_\_

yes  no

List any transit deficiencies identified:

**Trucks and Heavy Vehicles**

Curbside loading areas

yes  no

On-site loading areas

yes  no

Turning radii

yes  no

Emergency vehicle access

yes  no

Other \_\_\_\_\_

yes  no

List any truck/heavy vehicle deficiencies identified:

11. How does the proposed **site design** impact conditions for each mode? If negative or positive, note the impact. (Note: both negative and positive impacts could be found for one mode.)

Mode	Impacts	
Auto	<input type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	<i>Potential for intersection delay, including at driveways.</i>
Bicycle	<input checked="" type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	Improve on-site bike facilities.  Potential for increased traffic along bike routes at driveways.
Pedestrian	<input checked="" type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	Improve sidewalk facilities.  Potential for increased heavy vehicle-pedestrian conflicts at driveways and on-site.
Transit	<input type="checkbox"/> positive <input checked="" type="checkbox"/> neutral <input type="checkbox"/> negative	<i>No transit routes in immediate vicinity of project.</i>
Trucks	<input type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	<i>Potential for intersection delay, including at driveways.</i>

Other mode?	<input type="checkbox"/> positive <input type="checkbox"/> neutral <input type="checkbox"/> negative	
-------------	--	--

### External Agency/Stakeholder Coordination

12. List agencies requiring coordination: N/A

Agency	Has coordination occurred? Note any issues that are outstanding.
	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no

### Maintenance and Construction Phase Considerations

13. How will access for all modes be maintained during construction (check one box per mode)?

Agency	Auto	Bicycle	Pedestrian	Transit	Trucks
Detour for duration of project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time-of-day closures only (e.g. nighttime)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Short-term closures (e.g. 24 hour) with detour route	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access maintained with reduced facilities*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full access maintained (work does not impact mode)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\*"Access maintained with reduced facilities" could mean some travel lanes closed for vehicles; could mean bicycle lane is closed, with signage for bicycles to share travel lane; could mean that sidewalk is closed with pedestrian space provided on shoulder; could mean that some transit stops are closed; etc.)

14. Will any transportation facilities or street elements be privately maintained?  yes  no If yes, explain:

15. Will Complete Streets design be applied on privately maintained facilities?  yes  no



# HAYWARD ENTERPRISE AVE INDUSTRIAL EIR – LOCAL TRANSPORTATION ASSESSMENT

3636 ENTERPRISE AVENUE  
HAYWARD, CALIFORNIA

June 2, 2022



Inside front cover

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# Hayward Enterprise Ave Industrial EIR – Local Transportation Assessment

## 3636 Enterprise Ave Hayward, California

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Kittelson Project Number 26915  
City of Hayward Planning Application 202102725

June 2, 2022



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**Appendix H:** Truck Turning Templates



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## Executive Summary

## EXECUTIVE SUMMARY

This report presents the findings, conclusions, and transportation impact analysis conducted by Kittelson & Associates for the proposed 3636 Enterprise Avenue Industrial Project (Project) located in Hayward, California. The project is located at 3636 Enterprise Avenue, north of State Route 92 (SR-92) and west of Whitesell Road. The site has small existing structures and antennas used for telecommunications but is currently vacant. The project is 219,656 square feet (sf) of industrial/warehouse uses consisting of 208,673 sf of warehouse and 10,983 sf of office space. The project would include two new access driveways, a 5-foot wide paved sidewalk on the south side of Enterprise Avenue from the western site boundary to the intersection with Whitesell Street, and bike racks.

## 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:

- Optimize signal timing at the intersection of Clawiter Road and SR-92 WB ramps/Eden Landing Road (study intersection #1) to improve degraded traffic operations under the Background 2025 Plus Project conditions.
- Install a traffic signal, or make similar improvements along Clawiter road, at the intersection of Clawiter Road and SR-92 EB ramps/Eden Landing Road (study intersection #2) to improve degraded traffic operations under the Existing Plus Project and Background 2025 Plus Project conditions.
- Optimize signal timing at the intersection of Industrial Boulevard and Depot Road (study intersection #9) to improve degraded operations under the Existing Plus Project and Background 2025 Plus Project conditions.
- Ensure that the Project driveways on Enterprise Road are designed for pedestrian visibility safety (e.g., sidewalks clearly delineated, improved visibility by minimizing bushes and large signs).
- Coordinate with the City of Hayward to install warning signage (e.g., bikeway signage and caution signage for exiting vehicles) and continental crosswalks at the Project driveways.
- The project applicant shall contribute toward the intersection improvements listed above. The project fair share identifies the number of project trips that affects an intersection and the ratio of project traffic to the projected traffic increase at that location. Intersection fair share calculations are included in Section 8.



# Section 1

## Methodologies and Existing Conditions

# 1 METHODOLOGIES AND EXISTING CONDITIONS

The project is located at 3636 Enterprise Avenue, north of State Route 92 (SR-92) and west of Whitesell Road, in the City of Hayward, CA. The site consists of 10.86 acres on one parcel (APN 439-0099-036-02). The proposed project consists of the development of one new warehousing spec building on a vacant lot.

The project is 219,656 square feet (sf) of industrial/warehouse uses consisting of 208,673 sf of warehouse and 10,983 sf of office space. The project would also include a parking lot with 151 automobile parking spaces. Access to the project site would be via two driveways along Enterprise Road. Both driveways would be located at the northern portion of the site with access to Enterprise Avenue. The project site and study area are shown in **Figure 1**. The proposed site plan is shown in **Figure 2**.

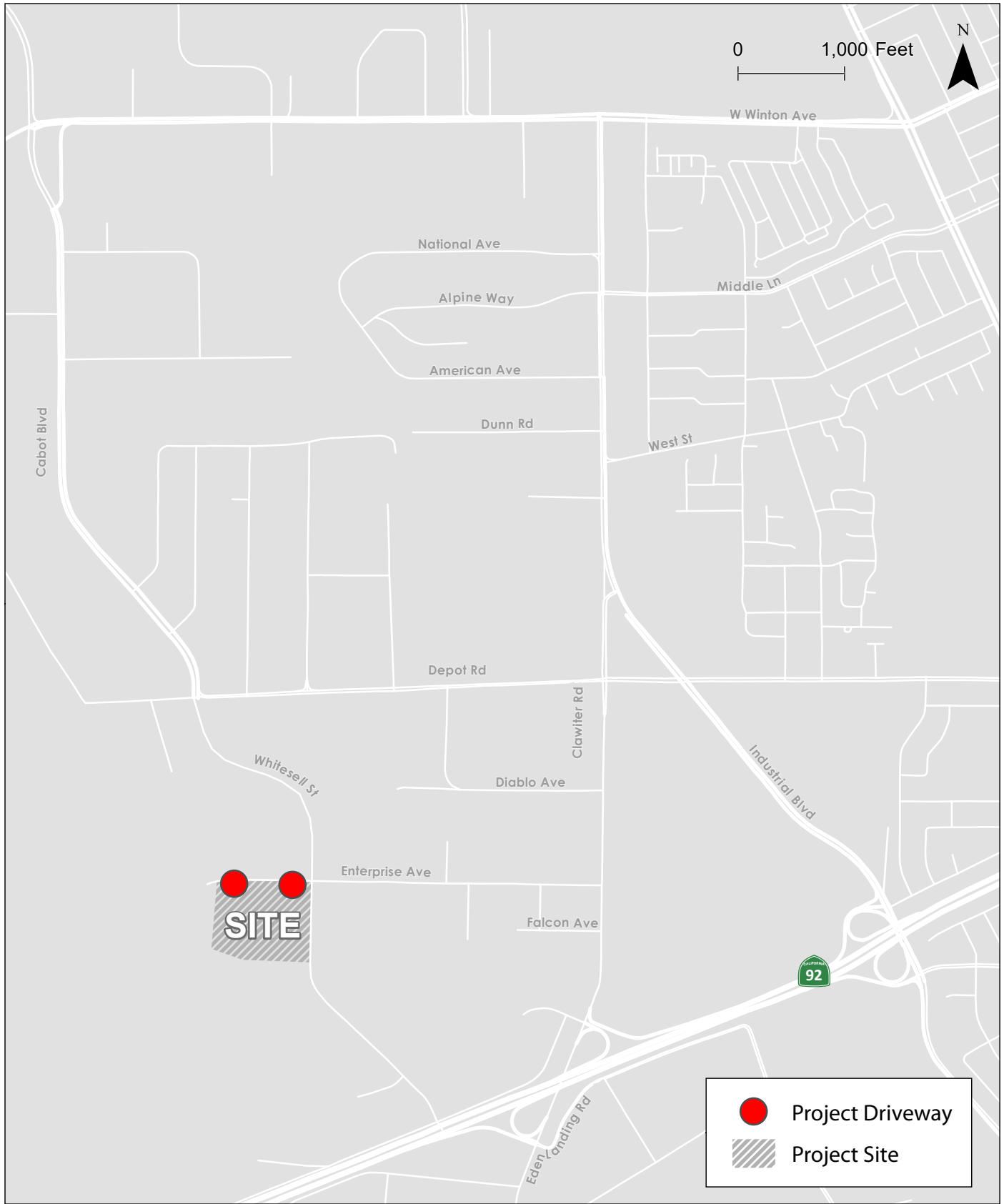
This transportation impact analysis is therefore subject to the regulations and standards currently in place in the City of Hayward. These standards are outlined in the *Hayward 2040 General Plan – Mobility Element* (2014), and the City of Hayward Interim Traffic Study Guidelines, as summarized below.

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

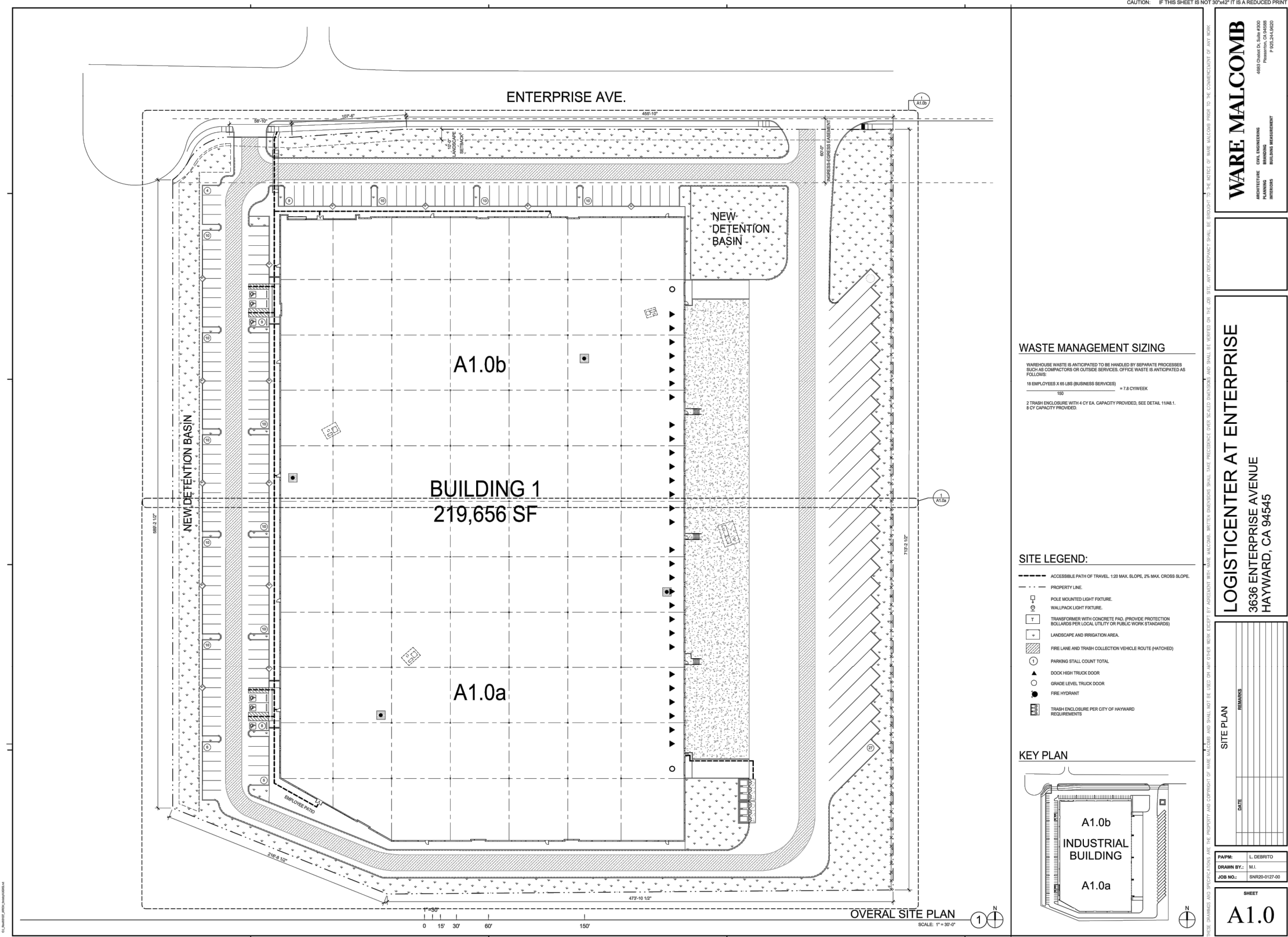
Under Senate Bill (SB) 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, level of service (LOS) and other similar vehicle delay or capacity metrics may no longer serve to determine environmental impacts from projects being evaluated for potential impacts under 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 became 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. In addition, LOS analysis (consistent with the City's traffic study guidelines and the City's 2040 General Plan polices) is considered part of the non-CEQA analysis conducted to determine any negative project effects on local roadway operations.



**Study Area and Project Site  
Hayward, California**

**Figure  
1**



Project Site Plan  
Hayward, CA

Figure  
2

## 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 negative effects 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.

### 1.1.2.1 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 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.

### 1.1.2.2 Unsignalized Intersections

At unsignalized intersections, the need for improvements 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.



### 1.1.2.3 Level of Service Definitions

In this report, LOS is based on the Highway Capacity Manual (HCM) 6<sup>th</sup> 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, 6th Edition

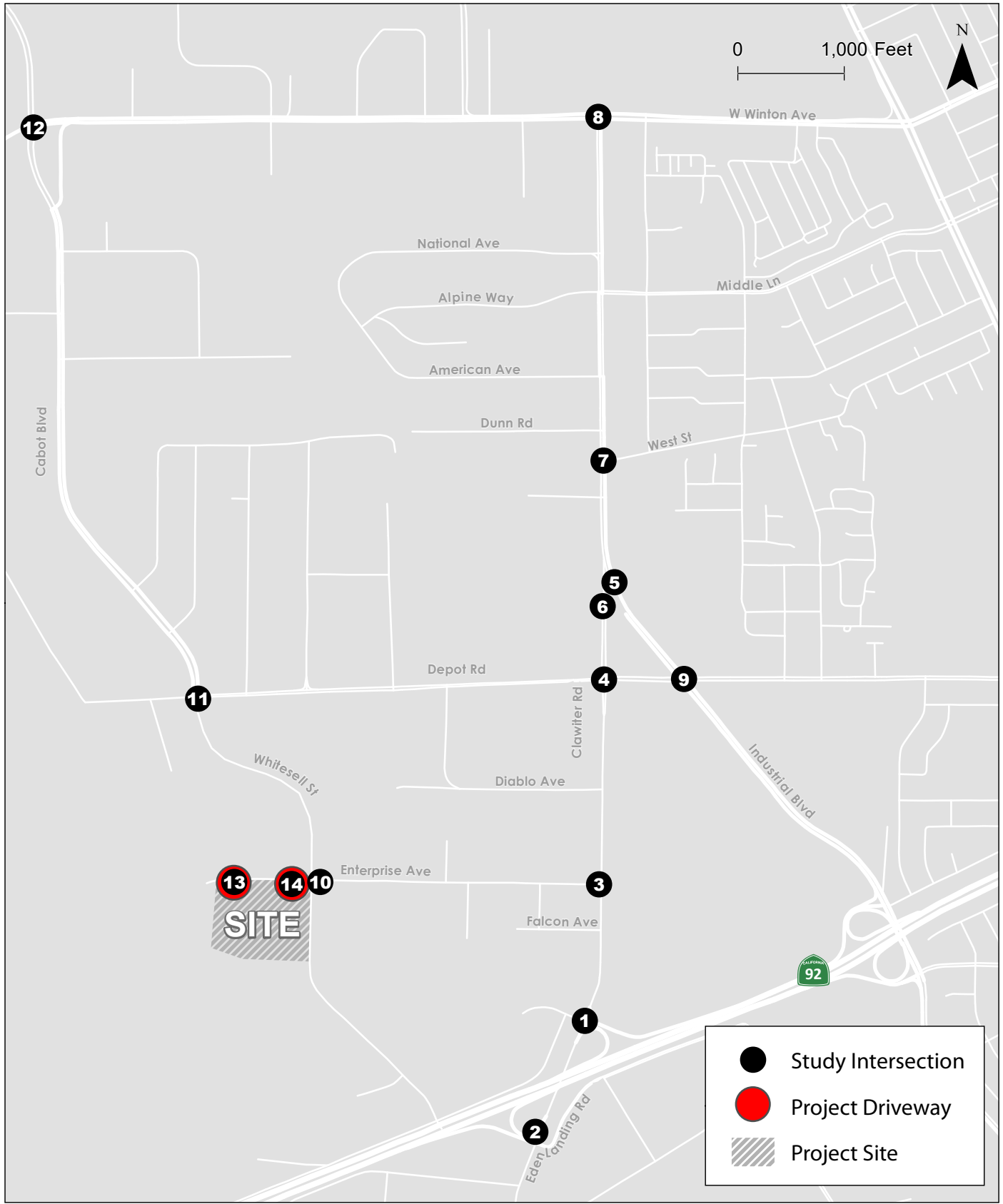
### 1.1.2.4 Study Intersections

A total of twelve study intersections (listed in **Table 2** and shown in **Figure 3**) were selected for the purposes of this analysis, including two project driveways. All study intersections are under the City of Hayward’s jurisdiction except for the two SR-92 ramp intersections, which are Caltrans intersections. These study intersections were selected based on discussions with City staff as best representing project traffic distribution.

**Table 2: Study Intersections**

	Intersection	Traffic Control
1	Clawiter Rd. / SR 92 WB Ramps-Breakwater Ct.	Signal
2	Clawiter Rd. / SR 92 EB Ramps	AWSC
3	Clawiter Rd. / Enterprise Ave.	Signal
4	Clawiter Rd. / Depot Rd.	Signal
5	Clawiter Rd. / Industrial Blvd. (east)	Signal
6	Clawiter Rd. / Industrial Blvd. (west)	TWSC
7	Clawiter Rd. / West St.	Signal
8	Clawiter Rd. / Winton Ave.	Signal
9	Industrial Blvd / Depot Rd.	Signal
10	Whitesell Rd. / Enterprise Ave.	AWSC
11	Whitesell Rd. / Depot Rd.	AWSC
12	Cabot Blvd. / Winton Ave.	AWSC
13	West Dwy. / Enterprise Ave.	TWSC
14	East Dwy. / Enterprise Ave.	TWSC

*Note: TWSC signifies a two-way stop-controlled intersection. AWSC signifies an all-way stop-controlled intersection.*



**Intersection Study Locations  
Hayward, California**

**Figure  
3**

## 1.2 DEVELOPMENT OF FUTURE TRAVEL DEMAND

Study intersection operations and queuing are evaluated under the Background Year 2025 conditions for non-CEQA local transportation analysis purposes. This evaluation has been conducted using projected peak hour traffic volumes derived from the 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 developments in the region that may use the local roadways. 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 2025 No Project Volumes were developed by interpolating volumes between existing and Cumulative 2035 volumes to develop an annual compound growth rate. The analysis presented in this report applied a 1.0% compound annual growth rate to 2021 existing traffic volumes in the AM and PM peak hour to estimate 2025 build-out year background traffic volumes. In addition, the background scenario includes recently approved nearby development projects, including traffic from the Gillig and the Berkeley Farms projects. A cumulative scenario was determined not to be necessary in consultation with City staff.

## 1.3 EXISTING NETWORK

### 1.3.1 ROADWAYS

The roadway system in the study area consists of arterial, collector, and local roadways that serve local and regional traffic demand. The vehicular facilities in the study area are discussed below

#### 1.3.1.1 Arterial Roadways

**Clawiter Road** is a north-south facility that is classified as a Minor Arterial north of Depot Road and designated as a truck route by the City of Hayward. Clawiter Road extends from Winton Avenue and ends at the SR 92 interchange, where it connects to Eden Landing Road. North of Industrial Boulevard, it is a four-lane facility with a two-way left-turn lane in the center and street parking on both sides of the road. The inner lanes are 10 feet wide and the outer lanes are 18 feet wide to accommodate street parking. The speed limit is 35 mph. The curb-to-curb right-of-way is about 72 feet. Clawiter Road provides access to mostly light industrial and commercial land uses. About 1000 feet north of Depot Road, Clawiter Road becomes a Collector Street. Clawiter Road is designated as a bicycle route.

**Winton Avenue** is an east-west facility that is classified as a Minor Arterial and truck route. It is a four-lane facility with a two-way left-turn lane in the center. The curb-to-curb right-of-way is approximately 72 feet and widens to about 90 feet at the intersection with Clawiter Road. Travel lanes are typically 11 feet wide and widen to 18 feet when street parking is available. The posted speed limit is 35 mph. Winton Avenue begins at the Hayward Regional Shoreline to the west, passes by the Hayward Executive Airport and I-880, and terminates at the intersection of SR 92. Winton Avenue is a bicycle route west of Clawiter Road and has a buffered bike lane on the south side east of Clawiter Road.

**Industrial Boulevard** is a north-south facility that is classified as a Minor Arterial north of Depot Road and designated as a truck route by the City of Hayward. It begins about 1000 feet north of the intersection of Depot Road and Clawiter Road and diverges southwest. It crosses SR 92 and turns into Industrial Parkway at Hesperian Boulevard. It is a four-lane facility with intermittent concrete medians and two-way left-turn lanes. The curb-to-curb right-of-way is approximately 72 feet and widens to 90 feet at the intersection of Depot Road. The inner travel lanes are 11 feet wide, and the outer travel lanes are 18 feet wide to accommodate a bicycle route. The posted speed limit is 35 mph.

### 1.3.1.2 Collector Roadways

**Clawiter Road** is a north-south Collector south of Depot Road and designated as a truck route by the City of Hayward. It is a two-lane facility south of Industrial Boulevard. A two-way left-turn lane runs between Enterprise Avenue and the railroad crossing north of the SR 92 interchange. The curb-to-curb right-of-way is 35 to 45 feet and the travel lanes are about 16 feet wide. The posted speed limit is 35 mph north of the SR 92 interchange and 25 mph south of the interchange. Sidewalks are available intermittently and street parking is prohibited. Clawiter Road is designated as a bicycle route.

**Eden Landing Road** is a north-south Collector south of SR 92. It connects to Clawiter Road at the SR 92 interchange and extends to the east through a light industrial area and terminates to the south at Mt. Eden Creek. It is a four-lane facility that narrows to a two-lane facility with a speed limit of 25 mph. The curb-to-curb right-of-way is about 48 feet and the travel lanes are 12 to 24 feet wide. On-street parking is prohibited. Eden Landing Road has buffered bike lanes southwest of Clawiter Road and has bike lanes to the east.

**Depot Road** is an east-west Collector that begins to the west at the shoreline and terminates at Hesperian Boulevard, where it becomes Cathy Way. It is a four-lane facility that is a bicycle route. The curb-to-curb right-of-way is 48 feet west of Clawiter Road and expands to approximately 60 feet wide to the east to accommodate turn pockets. East of Industrial Boulevard, Depot Road narrows to 48 feet. Travel lanes are about 12 feet wide. There are sidewalks on both sides of the road, but no on-street parking west of Industrial Boulevard.

**Cabot Boulevard** is a north-south Collector south of Winton Avenue and is not designated as a truck route by the City of Hayward. It is a four-lane facility north of Depot Road and south of Winton Avenue. The curb-to-curb right of way is 70 feet and the travel lanes are about 15 feet wide. The posted speed limit is 35 mph. Sidewalks are available and street parking is prohibited. Cabot Boulevard is designated as a bicycle route.

**Enterprise Avenue** is an east-west Collector that begins in the west at the project site west of Whitesell Street, and extends to the east at a t-intersection on Clawiter Road. Enterprise Avenue is designated as a truck route by the City of Hayward. It is a two-lane facility servicing the mostly industrial areas near the project site. The curb-to-curb right of way is 44 feet with two wide travel lanes for truck use. The posted speed limit is 25 mph. Some sidewalks are available and street parking is permitted. Enterprise Avenue is not designated as a bicycle route.

### 1.3.1.3 Local Roadways

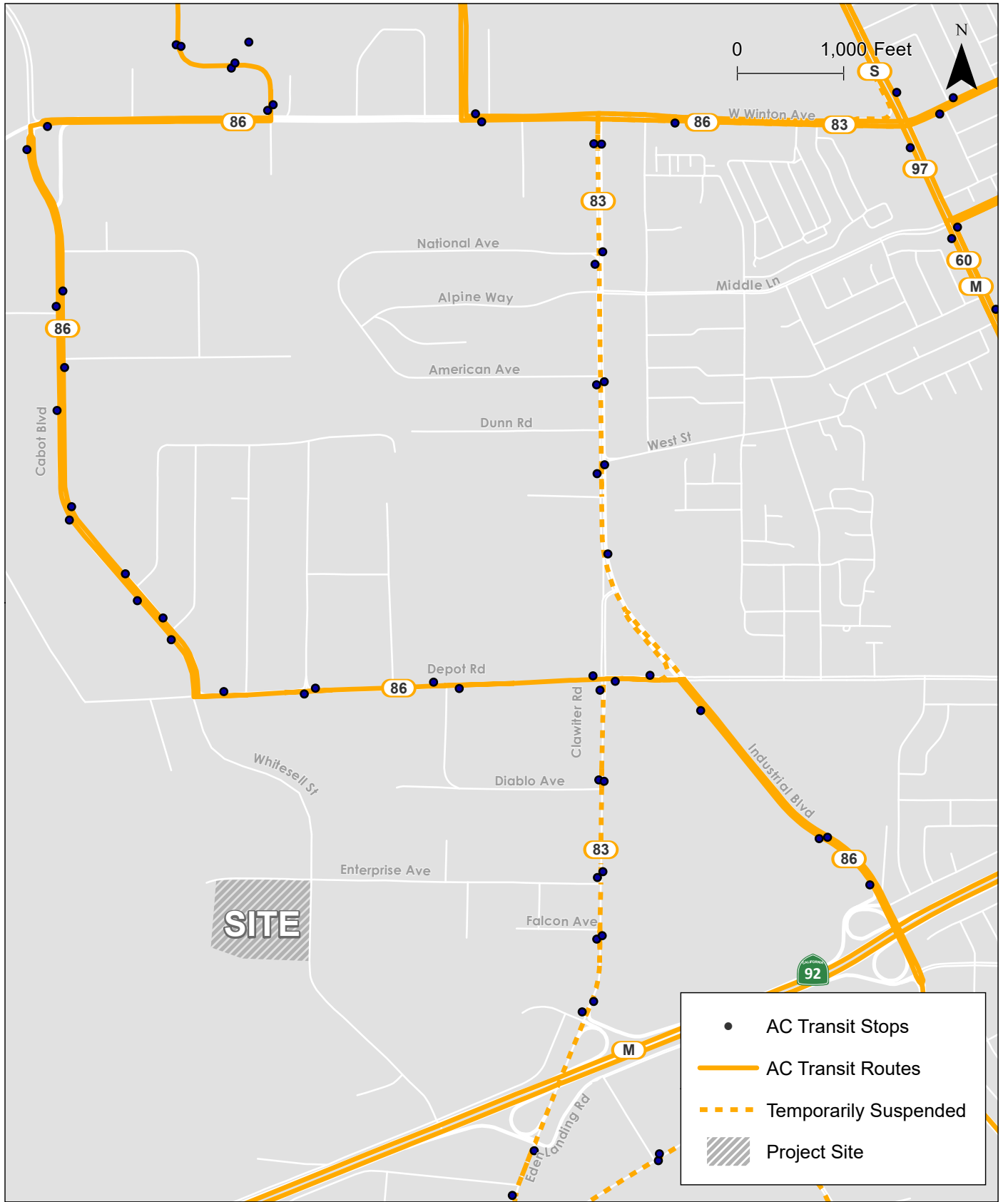
**Diablo Avenue** is an east-west Local roadway that begins at an unnamed road west of Viking St and ends at Clawiter Road to the east. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way at Clawiter Road is about 65 feet but narrows to 48 feet to the west. No sidewalks, on-street parking, or bicycle facilities exist on the roadway.

**West Street** is an east-west Local roadway that begins east of Clawiter Road. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way at Clawiter Road is about 34 feet but expands to 40 feet to the east. Sidewalks and on-street parking facilities exist on the roadway.

**Whitesell Street** is a north-south Local roadway that begins south of Depot Road. It is a two-lane facility with a posted speed limit of 25 mph. The curb-to-curb right-of-way at Depot Road is 56 feet. The facility has sidewalks, bicycles, and has prohibited street parking.

## 1.3.2 TRANSIT SERVICE

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



Existing Transit Network  
Hayward, California

Figure  
4

### 1.3.2.1 Alameda-Contra Costa Transit District

Alameda-Contra Costa Transit District (AC Transit) provides bus service in the study area. AC Transit bus routes and local bus stops are shown in **Figure 4**. In addition, weekday bus service in the study area is documented in **Table 3**.

**Table 3: Existing AC Transit Weekday Service**

Route	Beginning and End Points		Peak / Off-Peak Frequency (in Minutes)
	North/West	South/East	
86	Hayward BART	South Hayward BART	35/35
M	Hayward BART	Hillsdale Caltrain	40/45

Data Source: AC Transit (2022)


The nearest bus stop to the project site is located on Depot Road east of Whitesell Street, approximately ¼ mile distance to the north. This bus stop can be accessed via sidewalks and bike lanes on Whitesell Street and is currently served by AC Transit Line 86 which operates at 35-minute headways during both peak and off-peak times. Route 86 begins at the Hayward BART station and travels west on Winton Avenue, south on Cabot Boulevard, and east on Depot Road. It then travels south on Industrial Boulevard and east on Tennyson Road before terminating at the South Hayward BART station. Route M, which runs between the Hayward BART and Hillsdale Caltrain stations, travels along SR-92 and Hesperian Boulevard in the study area.

On Winton Avenue, there is an AC Transit bus stop about 650 feet east of the intersection at Clawiter Road and another AC Transit bus stop about 1,200 feet west of the intersection at Clawiter. These two bus stops feature a bench and a shelter. All AC Transit buses are equipped with bike racks at the front of the bus. Bicycles are allowed inside buses between midnight and 5:30 a.m. weekdays and between midnight and 9 a.m. weekends and holidays, if the rack is full and there is room inside<sup>1</sup>.

### 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 can be analyzed using seven key factors as shown in **Table 4**.

**Table 4: Pedestrian Facility Conditions**

Factor	Description	Assessment
 <p><b>Sidewalk Availability</b></p>	<p>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.</p>	<p>Most roadways in the study area such as Enterprise Avenue do not have sidewalks. Whitesell Street north and south of Enterprise Avenue have sidewalks on both sides of the road.</p> <p>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 generally do not exist in the area.</p>

<sup>1</sup> [Bikes on Buses | Alameda-Contra Costa Transit District \(actransit.org\)](https://www.actransit.org/bikes-on-buses)

Factor	Description	Assessment
 <b>Sidewalk Conditions</b>	Cracked, broken, or otherwise damaged sidewalks can pose a safety hazard and discourage walking.	Where sidewalks exist, in particular Whitesell Street, they generally appear in good condition based on aerial photography.
 <b>Crosswalk Availability</b>	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.	Most intersections along Whitesell Street feature marked crosswalks on at least two legs. The intersection of Whitesell Street at Enterprise Avenue includes 4 crosswalks, the intersection is stop-controlled.
 <b>Shading</b>	Shading, whether natural or artificial, can encourage walking in areas such as Southern California which are relatively warm with limited rainfall, especially in the summer.	Shading around the study streets is provided intermittently by street trees and buildings. There are relatively long stretches of Enterprise Avenue and Whitesell Street that are not shaded.
 <b>Flat Grade</b>	Steep hills and ravines can discourage walking, especially for pedestrians with limited mobility.	The study area is generally flat with mild inclines or declines for short stretches (e.g.: SR-92 overpass at Clawiter Road).
 <b>Buffer</b>	Buffers which provide separation between pedestrians and moving vehicles can help improve the walking experience, and can include landscaping, parked vehicles, and bulbouts, which serve to both reduce pedestrian crossing distances at intersections and as a traffic calming measure.	Buffers in the form of landscaping and street parking are present intermittently along all the study roadways. On Whitesell Street the sidewalks include a planted buffer that provides an approximately 3-foot buffer from the sidewalk to the curb.
 <b>Amenities</b>	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 generally is not included along the roadways in the study area. As outlined in the transit section above, some bus stops do not provide any amenities other than a bus stop sign.

The draft City of Hayward Bicycle & Pedestrian Master Plan (BPMP) includes a map of roadways with the top pedestrian prioritization scores, highlighting roads that are prime candidates for improvements. Within the study area, these include portions of Clawiter Road, Depot Road, and Winton Avenue. No improvements have been identified on Enterprise Avenue.



## 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:

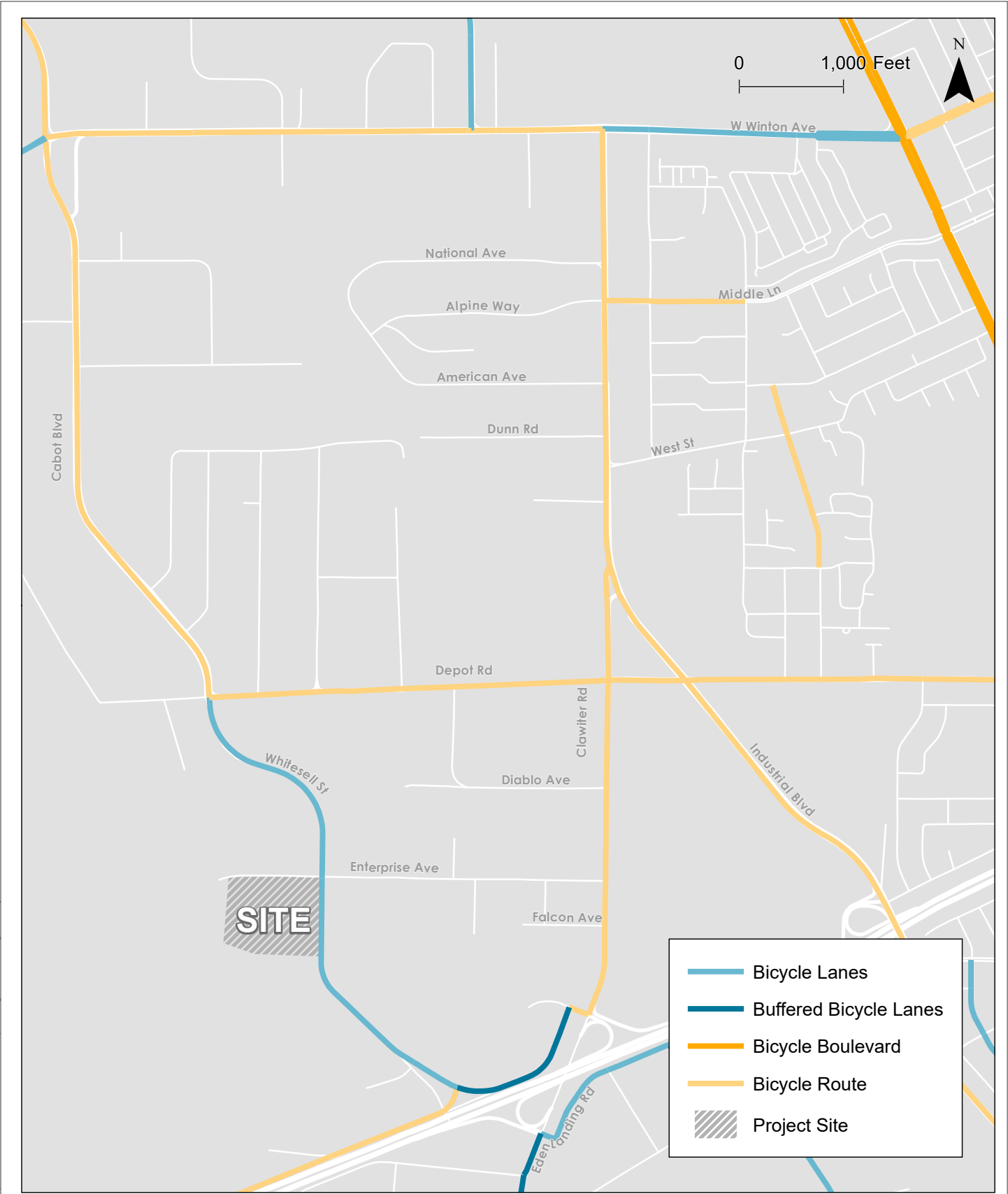
- **Class I Bikeway (Bike Path).** Also known as a shared path or multi-use path, a bike path is a paved right-of-way for bicycle travel that is completely separate from any street or highway.
- **Class II Bikeway (Bike Lane).** A striped and stenciled lane for one-way bicycle travel on a street or highway. 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 Whitesell Street south of Depot Road
- Class III bike route on Depot Road
- Class III bike route on Industrial Boulevard
- Class III bike route on Cabot Boulevard north of Depot Road to Winton Road
- Class III bike route on Clawiter Road
- Class II buffered bike lanes on Eden Landing Road south of SR-92
- Class III bike route on Winton Avenue west of Clawiter Road and on the north side of Winton Avenue east of Clawiter Road
- Class II bike lane on the south side of Winton Avenue east of Clawiter Road

The City of Hayward Bicycle & Pedestrian Master Plan (BPMP), which is currently in public draft form, 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, Clawiter Road, Winton Avenue, Industrial Boulevard, Depot Road, and Breakwater Avenue (parallel to SR 92). The draft plan includes the following bicycle improvements in the study area:

- Class II bicycle lane on Depot Road east of Industrial Boulevard
- Class IV separated bikeway on Depot Road west of Industrial Boulevard
- Class IV separated bikeway on Clawiter Road
- Class IV separated bikeway on Industrial Boulevard
- Class IV separated bikeway on Winton Avenue
- Class IV separated bikeway on Hesperian Boulevard



**Existing Bikeway Network  
Hayward, California**

**Figure  
5**

## 1.4 EXISTING TRAFFIC VOLUMES

### 1.4.1 AUTOMOBILE TRAFFIC VOLUMES

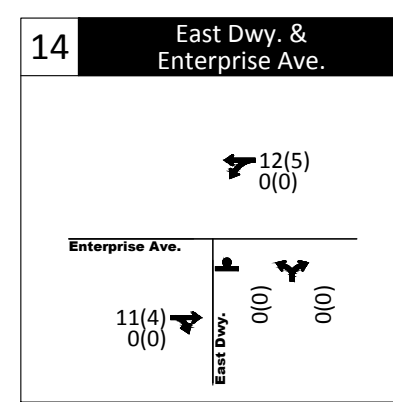
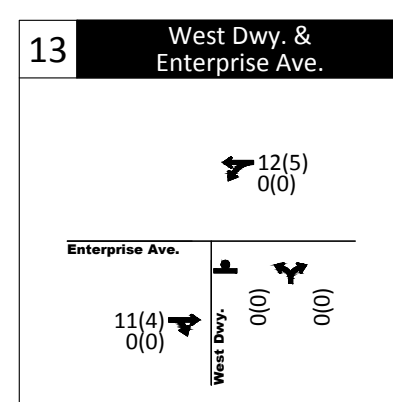
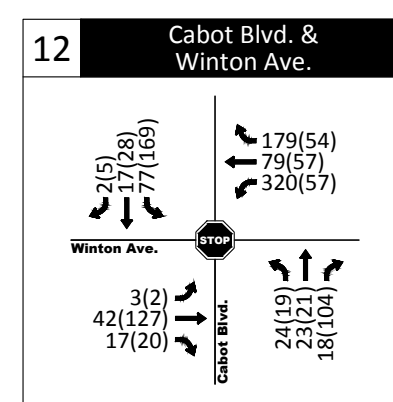
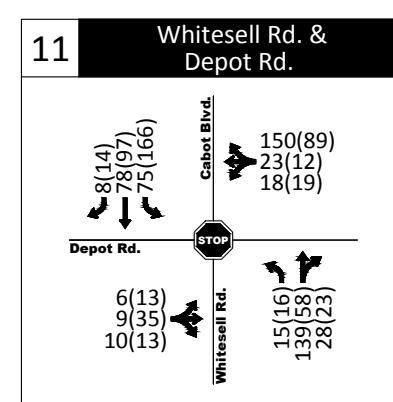
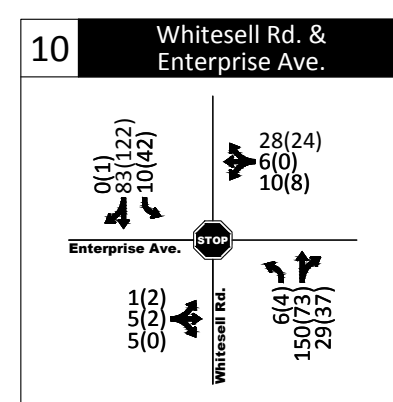
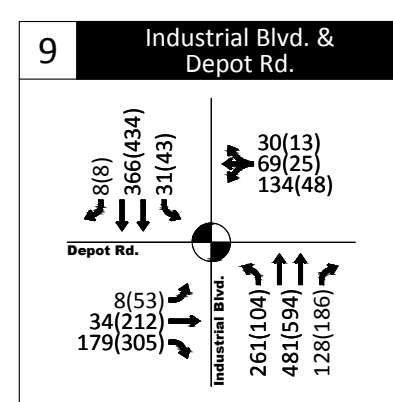
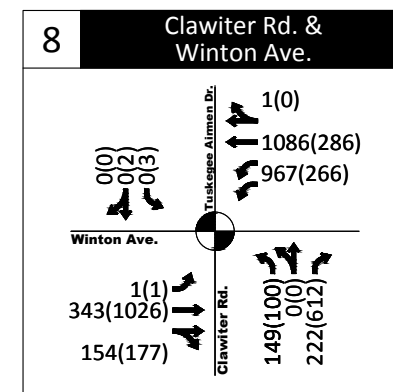
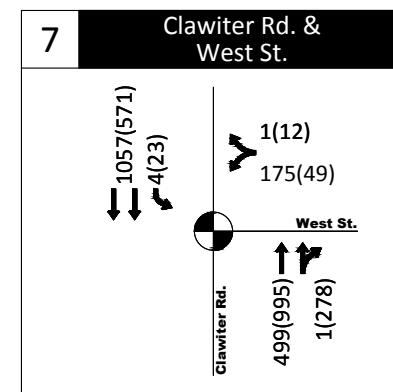
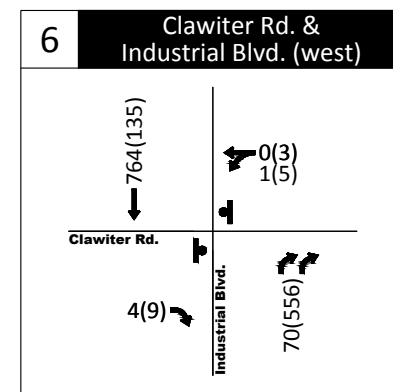
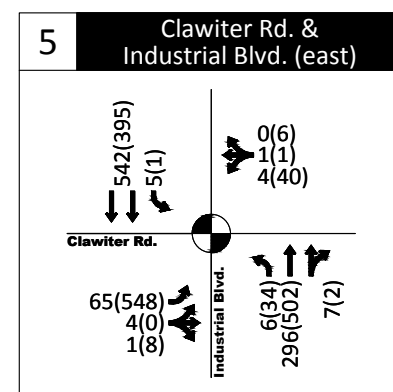
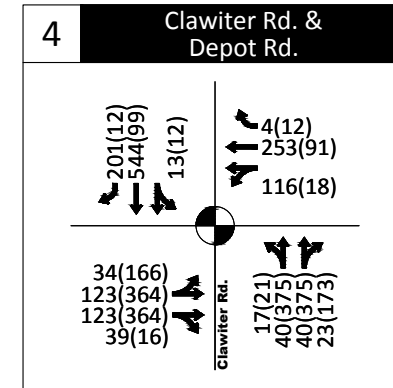
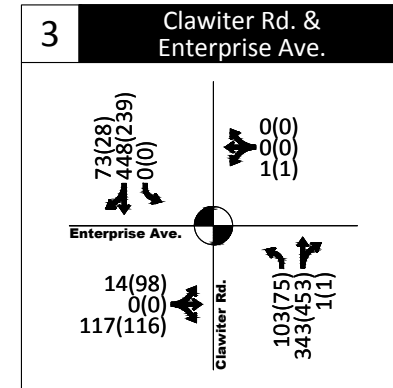
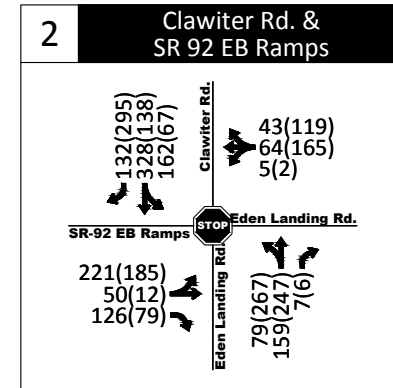
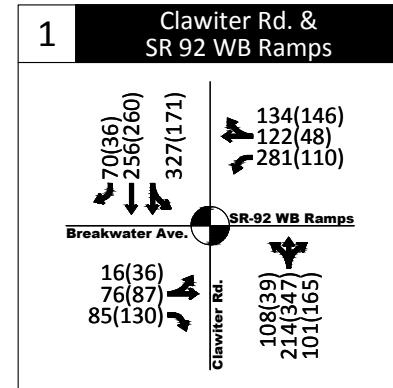
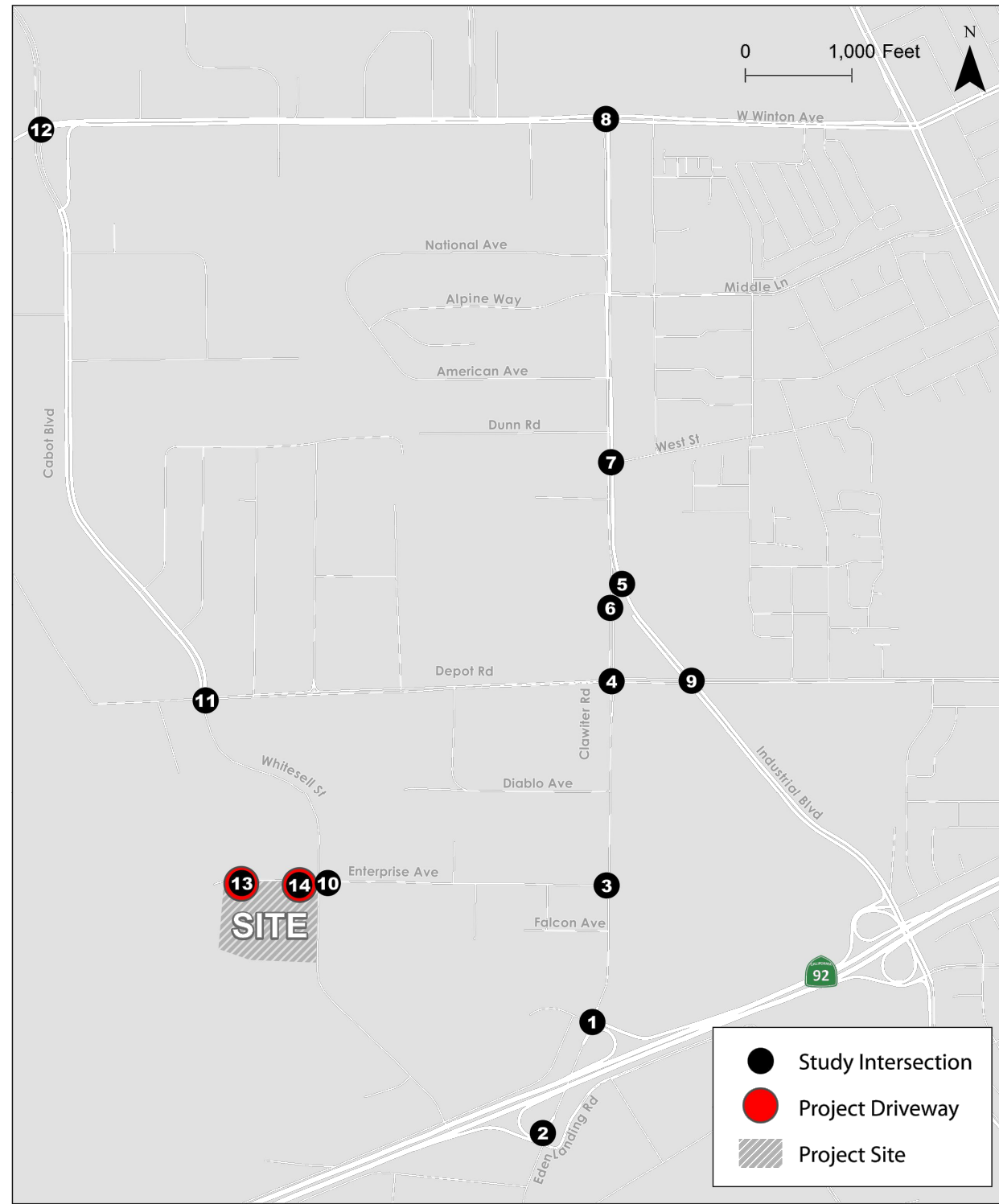
Vehicle turning movement data was collected on Thursday, November 18, 2021 and Thursday, December 2, 2021<sup>2</sup> during the weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods. Because the traffic counts were collected during the COVID-19 pandemic, the counts were anticipated to be lower than normal. Therefore, the counts were compared to historic traffic counts collected during more typical conditions from February 2016, July 2017, or January 2020 at five of the study intersections (intersections #1, #2, #4, #5, and #8). Generally, it was found that the AM peak hour counts were up to 20% lower in 2020 and the PM peak hour counts were up to 20% lower in 2021. Therefore, it was concluded that:

- Historical counts would be used to analyze intersections #1, #2, #4, #5, and #8.
- For the remaining intersections, the November 2021 counts would be used with growth applied uniformly (20% to the AM counts and 20% to the PM counts).
- Adjustments would be made to balance volumes between the two Clawiter Road & Industrial Boulevard intersections (east and west).
- Eastbound and westbound through volumes at the project's eastern and western driveways (which are not used at this time) would be estimated based on adjacent intersections.
- The adjustment methodology was verified and approved by City Transportation staff.

**Figure 6** shows the existing automobile peak hour volumes at the study intersections, including the adjusted volumes where applicable. Intersection control (i.e., signalized or stop-controlled) and lane geometries are also shown. Appendix A contains the field-collected count sheets and the COVID-19 adjustment calculations.

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<sup>2</sup>Clawiter Road/Enterprise Avenue, Clawiter Road/SR 92 WB Ramps, and Clawiter Road/SR 92 EB Ramps TMCs were recounted due to counting equipment failure on November 18, 2021.



AM(PM) - Traffic Volume  
 - All-Way Stop  
 - Stop Sign  
 - Traffic Signal

Existing Automobile Peak Hour Volumes  
 Hayward, CA  
 Figure 6

## 1.4.2 PEDESTRIAN AND BICYCLE VOLUMES

Pedestrian and bicycle volumes were collected at the study intersections as part of the data collection effort. **Table 5** and **Table 6** 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 5: 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	Clawiter Rd. & Breakwater Ct./SR-92 WB Ramps	-	-	-	-	-	-	-	-	3	-	1	-	-	-	-	-
2	Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
3	Clawiter Rd. & Enterprise Ave.	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
4	Clawiter Rd. & Depot Rd.	-	-	-	-	-	-	-	-	2	1	-	-	-	-	2	-
5	Clawiter Rd. & Industrial Blvd. (east)	-	-	2	-	-	-	-	-	1	3	-	-	-	-	-	-
6	Clawiter Rd. & Industrial Blvd. (west)	-	-	6	1	-	-	-	-	1	-	-	-	-	-	-	-
7	Clawiter Rd. & West St.	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
8	Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.	-	3	-	-	-	-	-	-	-	-	-	-	-	-	5	-
9	Industrial Blvd. & Depot Rd	-	3	-	-	1	-	-	-	1	-	-	-	-	2	2	-
10	Whitesell St. & Enterprise Ave.	-	-	-	2	-	-	-	-	1	-	-	-	-	-	-	-
11	Cabot Blvd. & Depot Rd.	-	-	1	1	-	-	-	-	-	-	-	-	-	1	-	-
12	Cabot Blvd. & Winton Ave.	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	2
13	West Dwy. & Enterprise Ave.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	East Dwy. & Enterprise Ave.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Source: Quality Counts manual turning movement counts (November 2021).

**Table 6: 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	Clawiter Rd. & Breakwater Ct./SR-92 WB Ramps	-	-	-	-	-	3	-	-	-	1	1	-	-	-	-	-
2	Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1
3	Clawiter Rd. & Enterprise Ave.	-	-	1	-	2	4	-	-	1	-	-	-	-	-	-	-
4	Clawiter Rd. & Depot Rd.	1	-	-	3	-	3	1	-	-	-	-	1	-	-	-	-
5	Clawiter Rd. & Industrial Blvd. (east)	-	1	-	-	-	3	-	-	-	-	1	-	-	-	-	-
6	Clawiter Rd. & Industrial Blvd. (west)	-	-	1	-	-	1	-	-	-	-	2	-	-	-	-	-
7	Clawiter Rd. & West St.	-	-	-	3	-	2	1	-	-	-	-	-	-	-	-	-
8	Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.	-	8	-	2	-	-	-	-	-	-	-	2	-	-	-	-
9	Industrial Blvd. & Depot Rd	1	-	-	-	-	1	-	-	1	-	-	3	-	-	-	-
10	Whitesell St. & Enterprise Ave.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
11	Cabot Blvd. & Depot Rd.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
12	Cabot Blvd. & Winton Ave.	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-
13	West Dwy. & Enterprise Ave.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	East Dwy. & Enterprise Ave.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Source: Quality Counts manual turning movement counts (November 2021).

# 1.5 EXISTING TRAFFIC OPERATIONS AND PERFORMANCE

## 1.5.1 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 1.1.2.2, 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 Interim Traffic Study Guidelines (2017), 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 7** presents a summary of the traffic signal warrants for the Existing Conditions scenario. Appendix B contains the existing traffic signal warrant worksheets.

As shown in **Table 7**, peak hour traffic signal warrants are met at the intersection of Clawiter Road & SR-92 EB Ramps/Eden Landing Road during both peak hours under existing conditions.

**Table 7: Traffic Signal Peak Hour Warrants, Existing Conditions**

#	Intersection	Traffic Control	Peak Hour	Warrant Met?
2	Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.	AWSC	AM	YES
			PM	YES
6	Clawiter Rd. & Industrial Blvd. (west)	TWSC	AM	No
			PM	No
10	Whitesell St. & Enterprise Ave.	AWSC	AM	No
			PM	No
11	Whitesell St. & Depot Rd.	AWSC	AM	No
			PM	No
12	Cabot Blvd. & Winton Ave.	AWSC	AM	No
			PM	No

Based on California MUTCD Peak Hour Warrant.  
 Source: Kittelson & Associates, Inc. 2022

### 1.5.2 AUTOMOBILE LEVEL OF SERVICE

LOS at the study intersections were evaluated based on the HCM 6<sup>th</sup> Edition methodology, as implemented in the Synchro 10 software package. LOS analysis was performed for the weekday AM and PM peak hours using COVID-adjusted traffic counts collected in the field. **Table 8** provides a summary of the existing automobile level of service. Appendix B contains the Existing Conditions LOS worksheets at the study intersections.

As shown in **Table 8**, all study intersections operate acceptably (LOS E or better) under existing conditions, with the exception of the following:

- **Intersection #2 (Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.):** LOS F during the AM and PM peak hours
- **Intersection #8 (Clawiter Rd. / Winton Ave. & Tuskegee Airmen Dr.):** LOS F during the PM peak hour
- **Intersection #9 (Industrial Blvd. / Depot Rd.):** LOS F during the AM peak hour



**Table 8: Automobile Level of Service, Existing Conditions**

#	Intersection	Traffic Control	Weekday AM		Weekday PM	
			Delay (Sec)	LOS	Delay (Sec)	LOS
1	Clawiter Rd. / SR 92 WB Ramps-Breakwater Ct.	Signal	45.0	D	34.6	C
2	Clawiter Rd. / SR 92 EB Ramps	AWSC	<b>52.0</b>	<b>F</b>	<b>137.9</b>	<b>F</b>
3	Clawiter Rd. / Enterprise Ave.	Signal	20.3	C	22.8	C
4	Clawiter Rd. / Depot Rd.	Signal	24.2	C	27.5	C
5	Clawiter Rd. / Industrial Blvd. (east)	Signal	5.8	A	25.7	C
6	Clawiter Rd. / Industrial Blvd. (west)	TWSC	22.2	C	9.8	A
7	Clawiter Rd. / West St.	Signal	7.7	A	7.3	A
8	Clawiter Rd. / Winton Ave. & Tuskegee Airmen Dr.	Signal	27.4	C	<b>134.3</b>	<b>F</b>
9	Industrial Blvd. / Depot Rd.	Signal	<b>108.7</b>	<b>F</b>	21.4	C
10	Whitesell Rd. / Enterprise Ave.	AWSC	9.4	A	8.9	A
11	Whitesell Rd. / Depot Rd.	AWSC	10.9	A	10.7	B
12	Cabot Blvd. / Winton Ave.	AWSC	13.1	B	11.2	B
13	West Dwy. / Enterprise Ave.	TWSC	-	-	-	-
14	East Dwy. / Enterprise Ave.	TWSC	-	-	-	-

Source: Kittelson & Associates, Inc. 2022

Intersections 13 and 14 are future driveways implemented with the project.

**Bold** signifies unacceptable operations.

### 1.5.3 QUEUE STORAGE

The 95<sup>th</sup> percentile queues at the study intersections were reviewed to identify locations where these may exceed the available storage, for informational purposes. The 95<sup>th</sup> 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. **Table 9** details the movements which were found to queue beyond their available storage capacity at the 95<sup>th</sup> percentile demand level under Existing Conditions. A detailed summary of the intersection turn lane queue storage and intersection queues are included in Appendix D.

**Table 9: Queue Lengths in Excess of Capacity, Existing Conditions**

#	Intersection	Movement	Peak Hour	Description
1	Clawiter Rd. & Breakwater Ct./SR-92 WB Ramps	EB L/T	AM & PM	Queues on this approach spills back to the adjacent two-way stop-controlled intersection at Breakwater Ave.
2	Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.	NB L/T	PM	Queues on this approach spills back to the adjacent all-way stop-controlled intersection at Point Eden Wy during the PM peak hour.
8	Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.	NBL	AM	Queues on this movement spills back beyond the length of its exclusive turn lane. However, a longer shared left/thru lane is also available.
		WBL	AM	Queues on this movement spills back beyond the length of its exclusive turn lane.

Source: Kittelson & Associates, Inc. 2022

Note: Appendix D includes all intersection queue storage and 95<sup>th</sup> percentile queues.



## Section 2

# Project Trip Generation and Distribution

# 2 PROJECT TRIP GENERATION AND DISTRIBUTION

This selection 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 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 light industrial tenants was selected. Trips were estimated using data provided by the Institute of Transportation Engineers (ITE) and shown in **Table 10**. Trip generation for the project was estimated using average trip rates for Light Industrial (Code 110). The trip rates were extracted from the most recent data available in the web-based Trip Generation database maintained by ITE. It shall be noted that trip rates derived from the regression curve for the light industrial land use code in the ITE Trip Generation Manual was considered. However, the average trip rates yields more conservative trip generation estimates and it was therefore proposed for the analysis. As shown in **Table 10**, the project is expected to generate 1,070 weekday daily vehicle trips, 163 weekday AM peak hour vehicle trips, and 143 weekday PM peak hour vehicle trips. As the site is currently vacant, no trip credits are being recommended for the existing buildings located on the project site.

**Table 10: Project Trip Generation Estimate**

Trip Generation Estimate									
Land Use	ITE Trip Generation Manual Edition	Size	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Project	11 <sup>th</sup>	219.66 TSF	1070	143	20	163	20	123	143

Trip Generation Rates									
Land Use	ITE Trip Generation Manual Land Use Code	Rate	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
General Light Industrial	110	TSF	4.87	88%	12%	0.74	14%	86%	0.65

Source: Kittelson & Associates, Inc., 2022; Institute of Transportation Engineers, 2021.

Notes: KSF signifies thousand square feet.

## 2.2 TRIP DISTRIBUTION

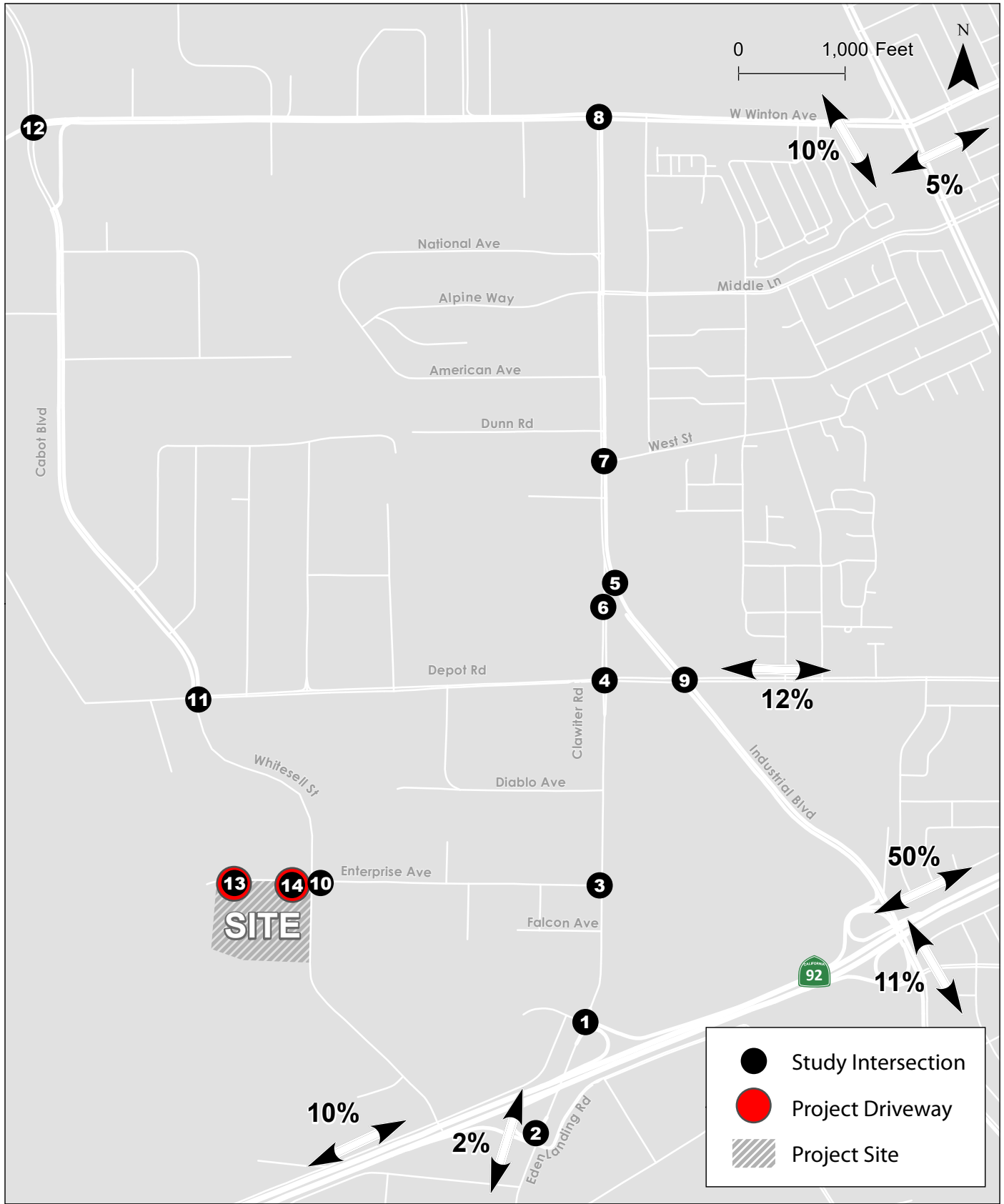
Project trip distribution was developed using the City of Hayward General Plan travel demand model. The project trip distribution is based on the model's distribution of trips in and out of the traffic analysis zone (TAZ) representing the project site, as well as adjustments to reflect local travel patterns and circulation conditions. The project trip distribution and intersection count locations are shown in **Figure 7**.

The trip distribution for the project is as follows:

- 10% to/from the west via SR-92
- 10% to/from the north via Hesperian Boulevard
- 5% to/from the northwest via Winton Avenue
- 50% to/from destinations in the north, east, and south/southeast via SR-92
- 12% to/from the south/southeast via Hesperian Boulevard
- 11% to/from the south/southeast via Industrial Boulevard
- 2% to/from the south via Eden Landing Road and Arden Road

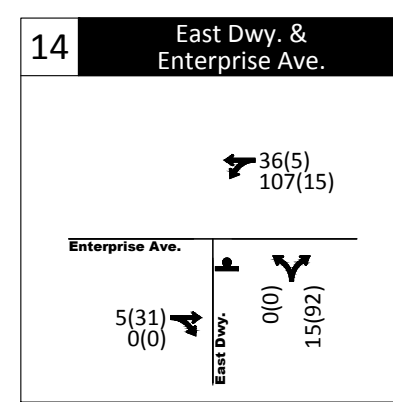
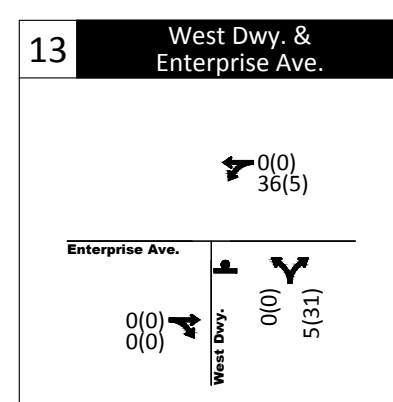
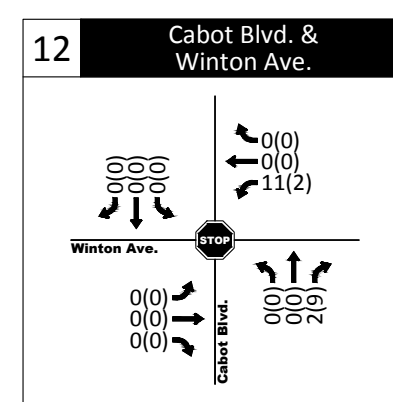
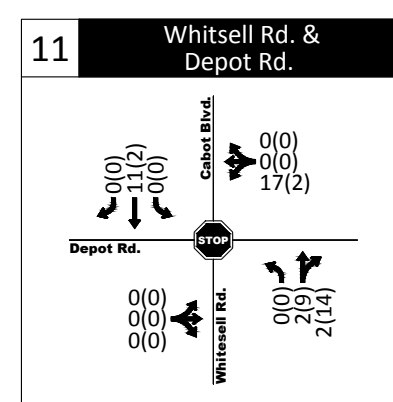
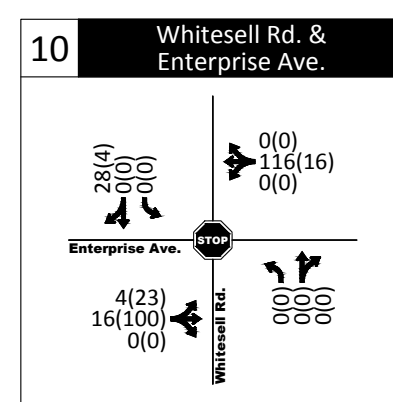
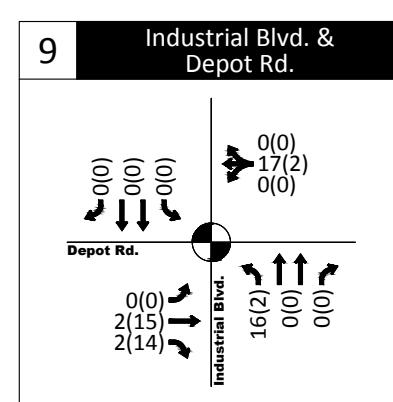
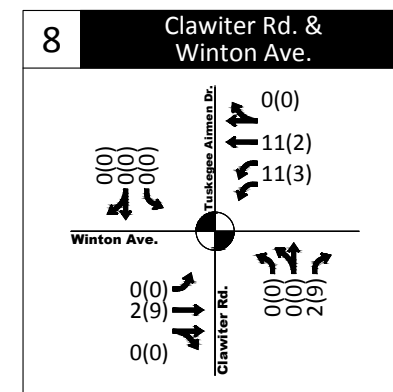
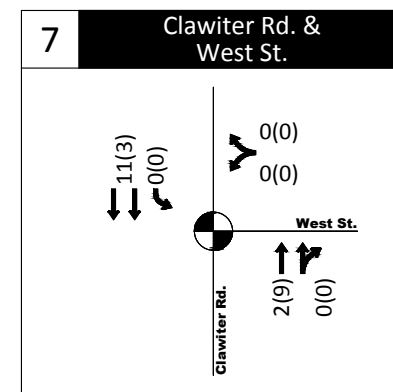
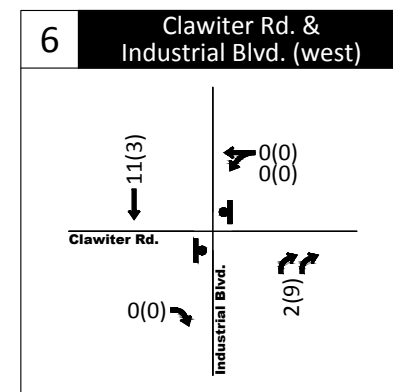
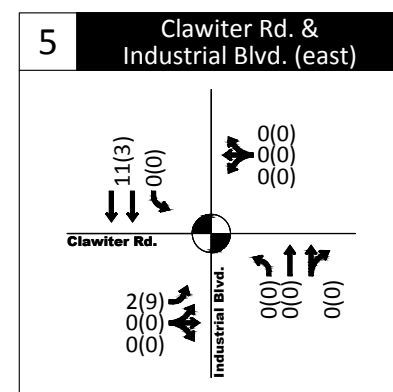
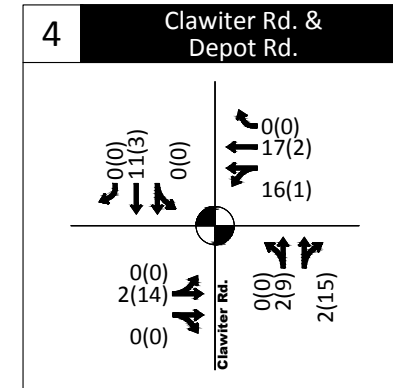
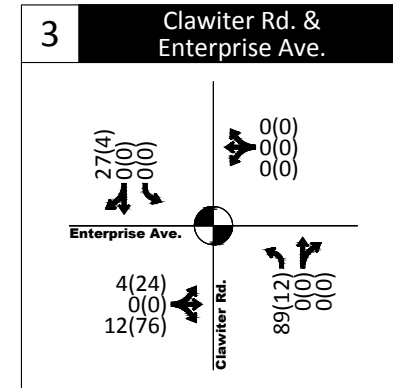
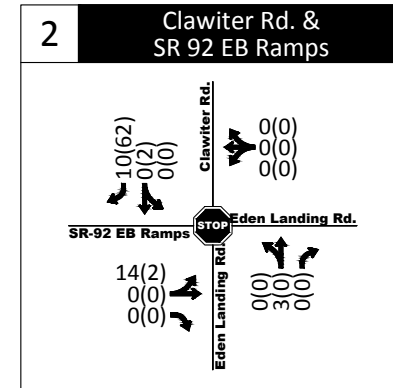
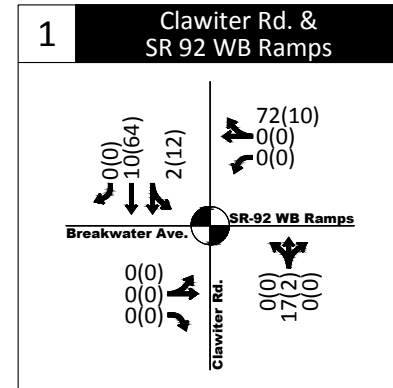
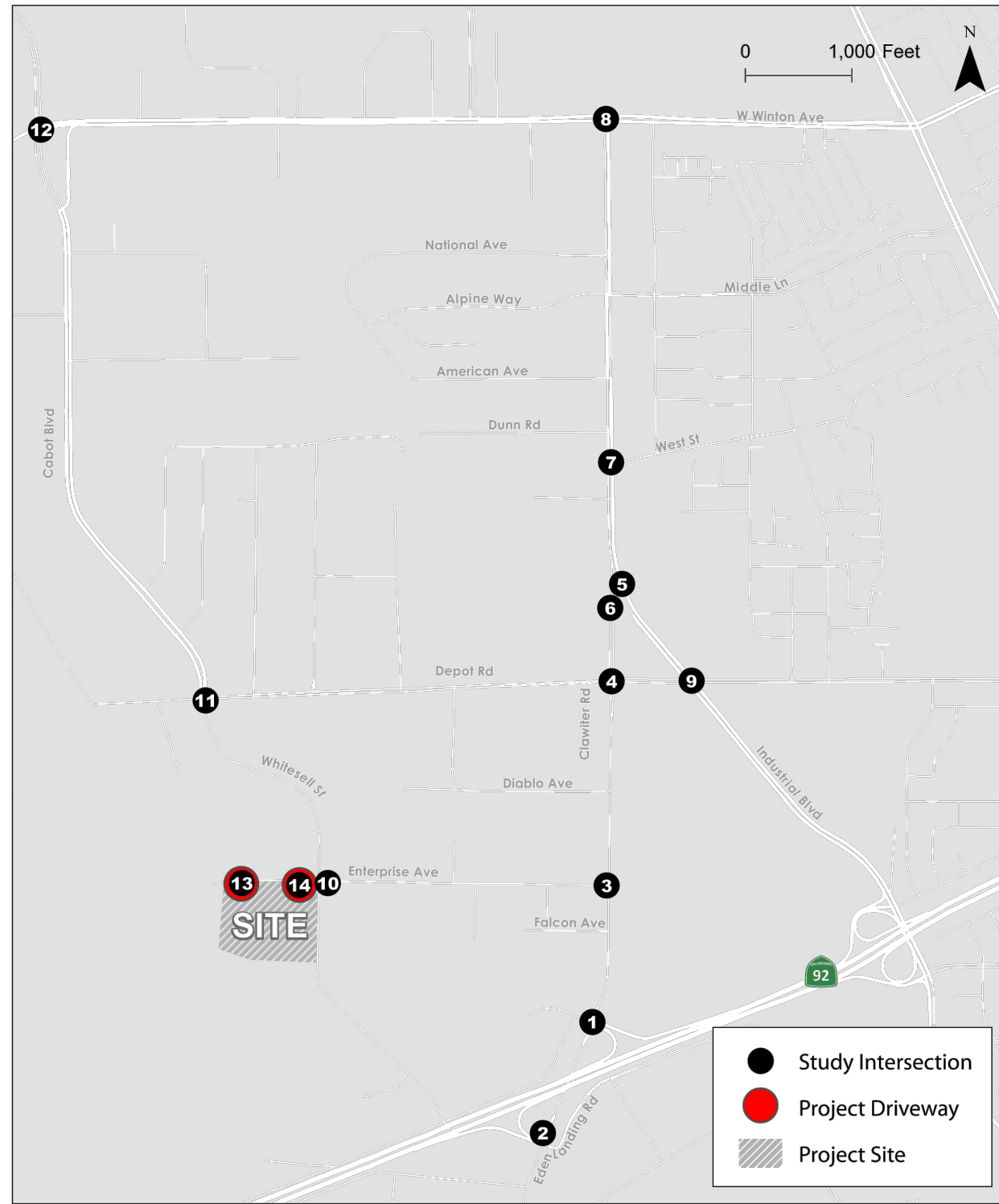
All trip distribution destinations total up to 100%.

**Figure 8** presents the weekday AM and PM project-only turning movements that were derived from the trip generation and trip distribution discussed in this section. These project-only volumes will be used in the Existing Plus Project and Background 2025 Plus Project analyses.



**Project Trip Distribution Percentages  
Hayward, California**

**Figure  
7**



AM(PM) - Traffic Volume  
 - All-Way Stop  
 - Stop Sign  
 - Traffic Signal

Project-Only Trips  
 Hayward, CA  
 Figure 8



# Section 3

## Existing Plus Project Traffic Conditions



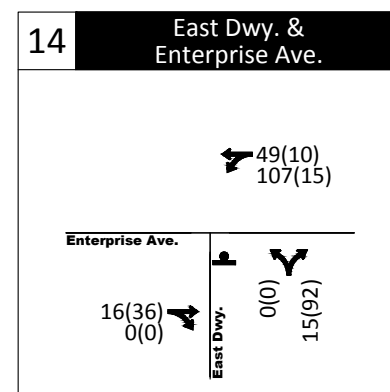
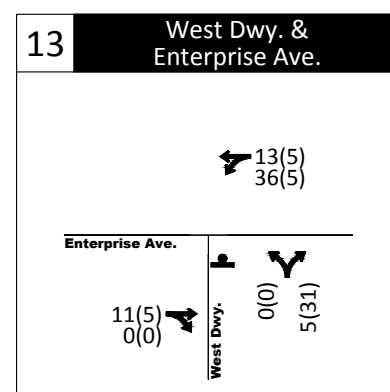
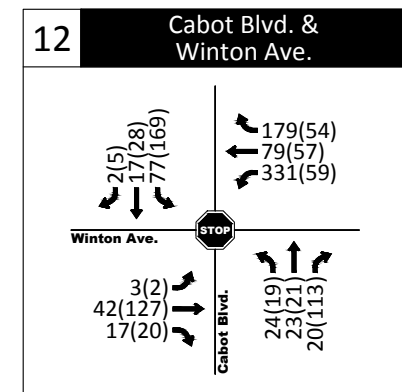
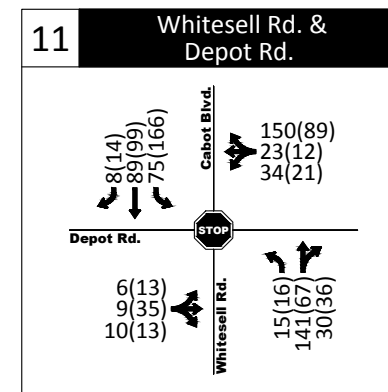
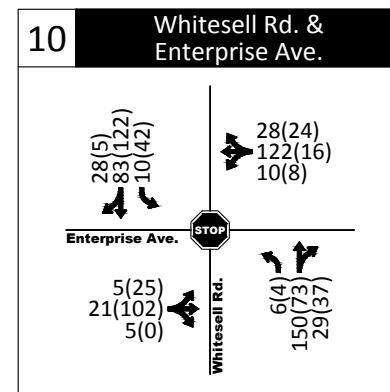
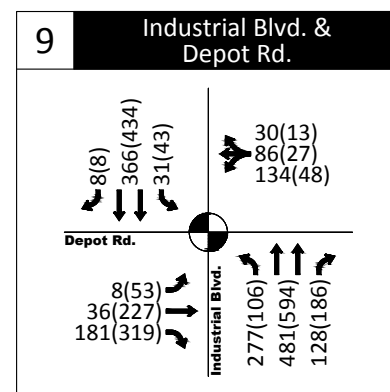
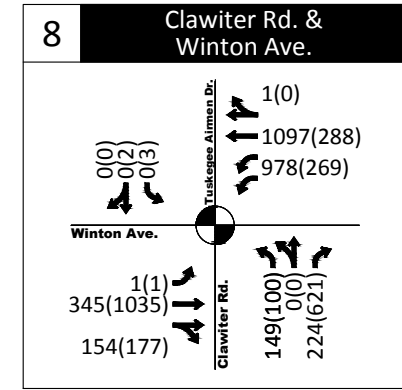
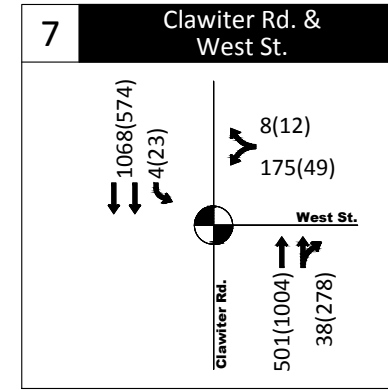
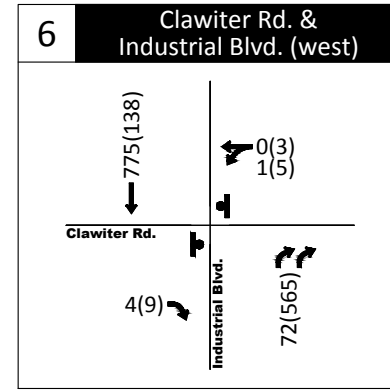
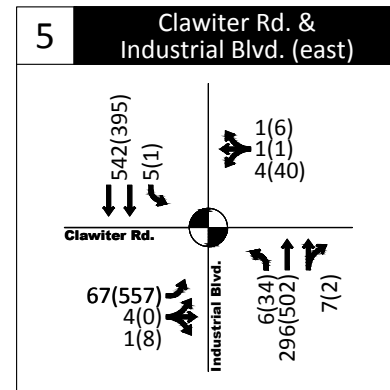
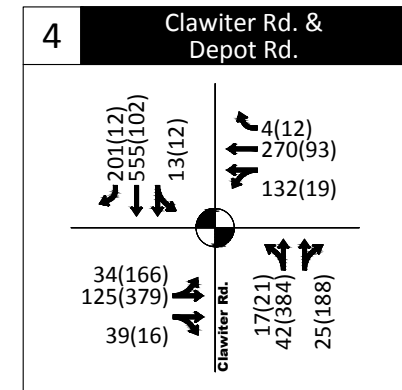
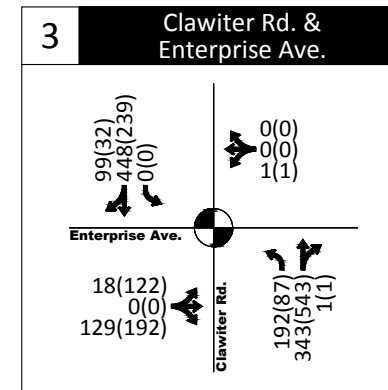
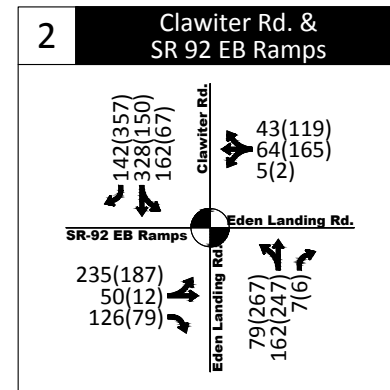
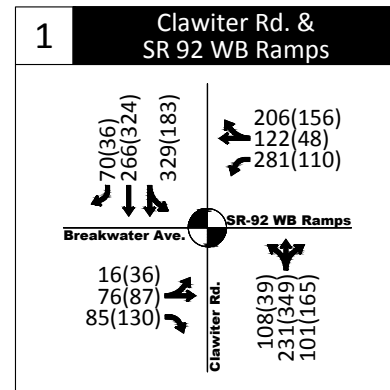
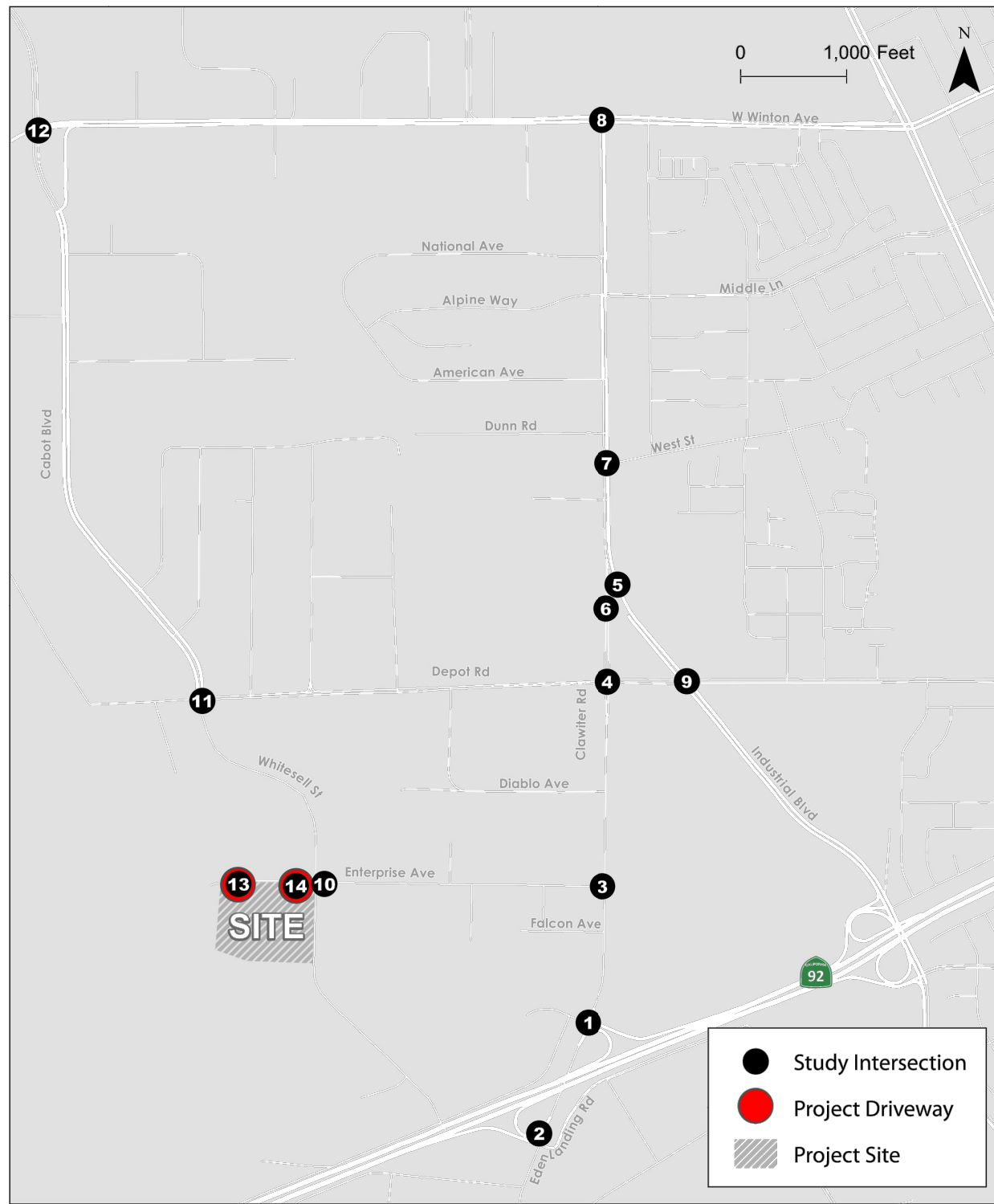
# 3 EXISTING PLUS PROJECT TRAFFIC CONDITIONS

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 from the sum of the Existing Conditions turning movement counts and the Project Only turning movements displayed in **Figure 8**. **Figure 9** presents the Existing Plus Project turning movements.

**Table 11** 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 C contains the Existing Plus Project LOS worksheets.



AM(PM) - Traffic Volume  
 - All-Way Stop  
 - Stop Sign  
 - Traffic Signal

Existing Plus Project Turning Movement Forecasts  
Hayward, CA

Figure  
9

**Table 11: 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 Increase (Sec)	Delay Increase (Sec)
			Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS		
1	Clawiter Rd. / SR 92 WB Ramps-Breakwater Ct.	Signal	45.0	D	34.6	C	72.4	E	43.6	D	27.4	9.0
2	Clawiter Rd. / SR 92 EB Ramps	AWSC	<b>52.0</b>	<b>F</b>	<b>137.9</b>	<b>F</b>	<b>54.1</b>	<b>F</b>	<b>139.8</b>	<b>F</b>	2.1	1.9
3	Clawiter Rd. / Enterprise Ave.	Signal	20.3	C	22.8	C	27.8	C	36.3	D	7.5	13.5
4	Clawiter Rd. / Depot Rd.	Signal	24.2	C	28.2	C	24.8	C	27.7	C	0.6	0.2
5	Clawiter Rd. / Industrial Blvd. (east)	Signal	5.8	A	25.7	C	6.0	A	42.4	D	0.2	16.7
6	Clawiter Rd. / Industrial Blvd. (west)	TWSC	22.2	C	9.8	A	22.9	C	9.8	A	0.7	0.0
7	Clawiter Rd. / West St.	Signal	7.7	A	7.3	A	7.8	A	7.3	A	0.1	0.0
8	Clawiter Rd. / Winton Ave.	Signal	27.4	C	<b>134.3</b>	<b>F</b>	28.3	C	<b>138.3</b>	<b>F</b>	0.9	4.0
9	Industrial Blvd / Depot Rd.	Signal	<b>108.7</b>	<b>F</b>	21.4	C	<b>122.2</b>	<b>F</b>	21.9	C	<b>13.5</b>	0.5
10	Whitesell Rd. / Enterprise Ave.	AWSC	9.4	A	8.9	A	10.7	B	10.5	B	1.3	1.6
11	Whitesell Rd. / Depot Rd.	AWSC	10.9	A	10.7	B	11.4	B	11.0	B	0.5	0.3
12	Cabot Blvd. / Winton Ave.	AWSC	13.1	B	11.2	B	13.6	B	11.3	B	0.5	0.1
13	West Dwy. / Enterprise Ave.	TWSC	-	-	-	-	8.4	A	8.8	A	-	-
14	East Dwy. / Enterprise Ave.	TWSC	-	-	-	-	8.4	A	11.6	B	-	-

Source: Kittelson & Associates, Inc. 2022

**Bold** signifies unacceptable operations.

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

- **#2 Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.:** This intersection operates unacceptably at LOS F during the weekday AM and PM peak hour under Existing conditions and continues to operate at LOS F under Existing Plus Project conditions. The increase in delay is expected to be less than five seconds.
- **#8 Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.:** This intersection operates unacceptably at LOS F during the weekday PM peak hour under Existing conditions and continues to operate at LOS F under Existing Plus Project conditions. The increase in delay is expected to be less than five seconds.

- **#9 Industrial Blvd./Depot Rd.:** This intersection operates unacceptably at LOS F during the weekday AM peak hour under Existing conditions and continues to operate at LOS F under Existing Plus Project conditions. However, the increase in delay is expected to be more than five seconds.

Given that the intersection of Clawiter Road & SR-92 EB Ramps/Eden Landing Road operates at LOS F during the weekday AM and PM peak hour under Existing Conditions with a delay increase of less than five seconds under Existing Plus Project Conditions, intersection improvements are not required.

Given that the intersection of Clawiter Road/Tuskegee Airmen Drive and Winton Avenue operates at LOS F during the weekday PM peak hour under Existing conditions with a delay increase less than five seconds under Existing Plus Project conditions, intersection improvements are not required.

Given that the intersection of Industrial Boulevard & Depot Road operates at LOS F during the weekday AM peak hour under Existing Conditions with a delay increase of more than five seconds under Existing Plus Project Conditions, intersection improvements should be identified. With signal timing adjustments, including increasing the cycle length to provide more green time for all movements, the intersection would operate acceptably at LOS C (29.8) under Existing Plus Project conditions during the weekday AM peak hour.

**Table 12** presents Existing Plus Project conditions intersections deficiencies without and with improvements. Appendix C contains the Existing Plug Project LOS improvement worksheets.

**Table 12: Existing Plus Project Operations - Intersections Deficiencies and Improvements**

#	Intersection	Without Improvements				With Improvements			
		Weekday AM		Weekday PM		Weekday AM		Weekday PM	
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS
9	Industrial Blvd / Depot Rd.	122.2	F	21.9	C	29.8	C	-	-

Source: Kittelson & Associates, Inc. 2022

## 3.2 EXISTING PLUS PROJECT QUEUE STORAGE SERVICE

The 95<sup>th</sup> percentile queues at the study intersections were reviewed to identify locations where these may exceed the available storage. **Table 13** details the movements which were found to queue beyond their available storage capacity at the 95<sup>th</sup> percentile demand level under Existing Plus Project conditions.

Appendix D contains intersection queue spreadsheets for all study intersections.

**Table 13: Queue Lengths in Excess of Capacity, Existing Plus Project Conditions**

#	Intersection	Movement	Peak Hour	Description
1	Clawiter Rd. & Breakwater Ct./SR-92 WB Ramps	EB L/T	AM & PM	Queues on this approach spill back to the adjacent two-way stop-controlled intersection at Breakwater Ave. The project is expected to add less than one car length (25 ft) in both the AM and PM peak hours.
2	Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.	NB L/T	PM	Queues on this approach spill back to the adjacent all-way stop-controlled intersection at Point Eden Wy during the PM peak hour. Project traffic would add less than one car length in both the AM and PM peak hours.
8	Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.	NBL	AM	This movement spills back beyond the length of its exclusive turn lane. However, a longer shared left/thru lane is also available. Project traffic is not expected to add any trips or additional queueing to this movement in the AM and PM peak hours.
		WBL	AM	This movement spills back beyond the length of its exclusive turn lane. Project traffic would add less than one car length of queueing to the project

Source: Kittelson & Associates, Inc. 2022

Note: Appendix D includes all intersection queue storage and 95<sup>th</sup> percentile queues.



## Section 4

# Background Traffic Conditions

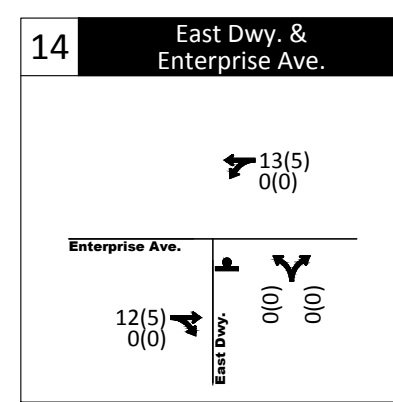
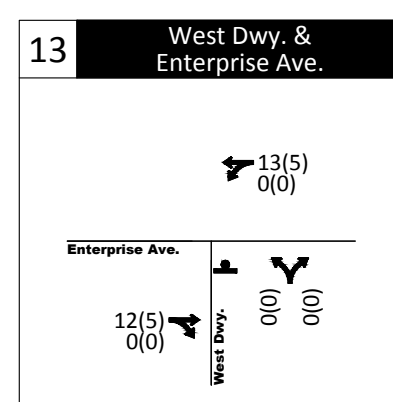
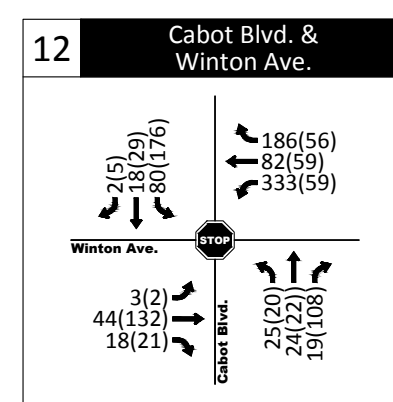
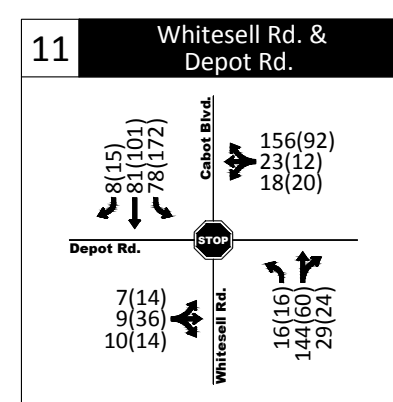
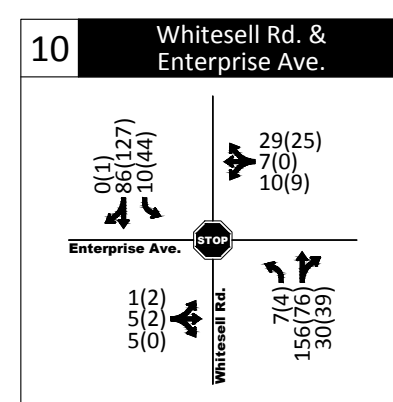
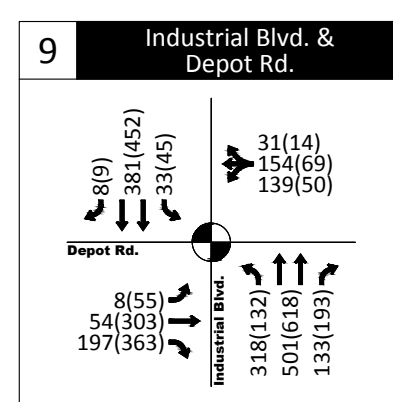
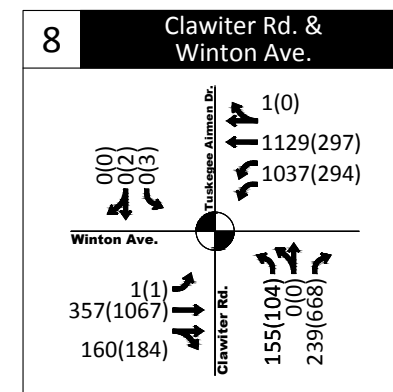
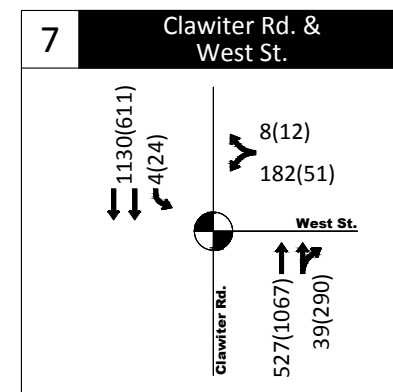
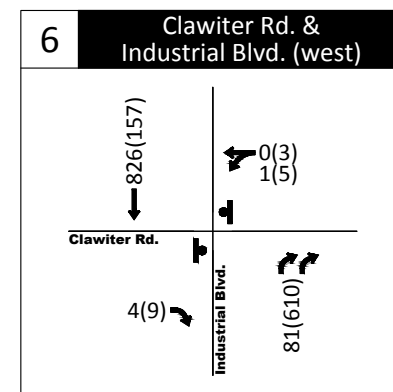
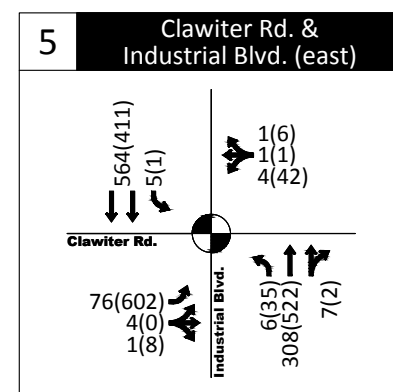
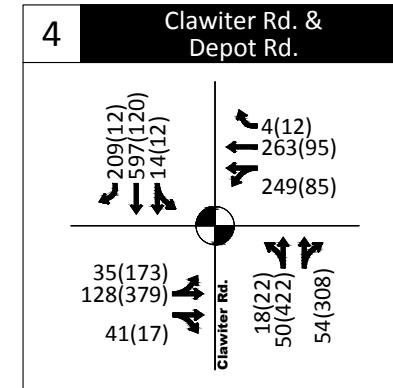
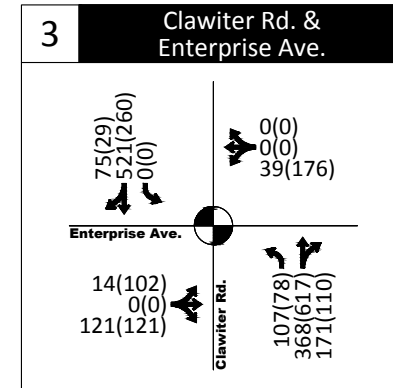
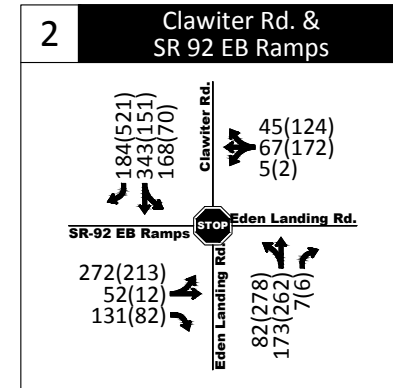
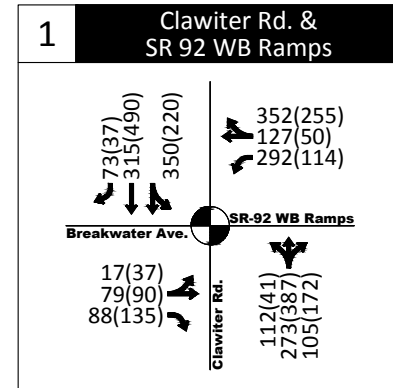
# 4 BACKGROUND TRAFFIC CONDITIONS

The potential operational effects on the transportation system were evaluated under the Background Year 2025 Condition for non-CEQA local transportation analysis purposes. The year 2025 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 Gillig and the Berkeley Farms projects.

## 4.1 BACKGROUND DEMAND

**Figure 10** presents the Background 2025 volumes derived from the travel demand model and the incremental adjustment process described in Section 1.2.

The automobile turning movement counts for the Background Plus Project scenario were developed from the sum of the Background 2025 No Project volumes and the Project Only turning movements described in Section 2 (and displayed in **Figure 8**). **Figure 11** presents the Background Plus Project volumes.

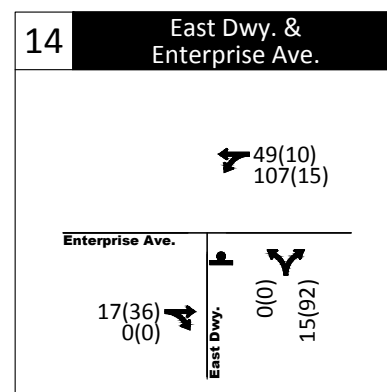
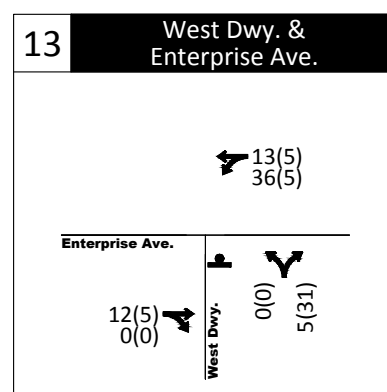
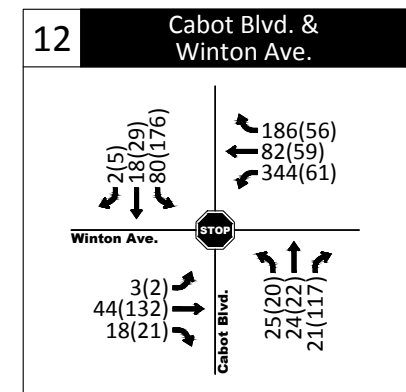
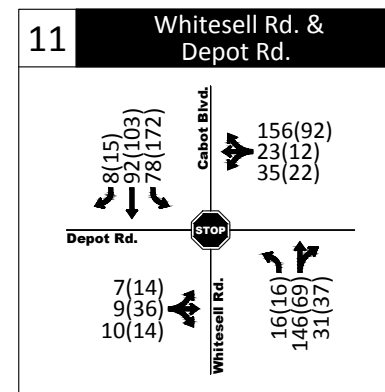
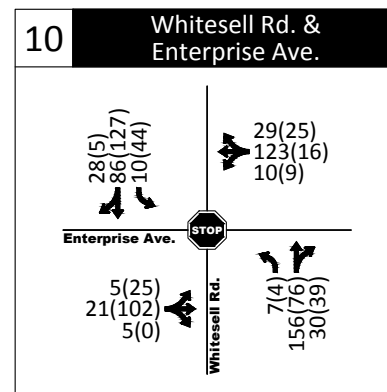
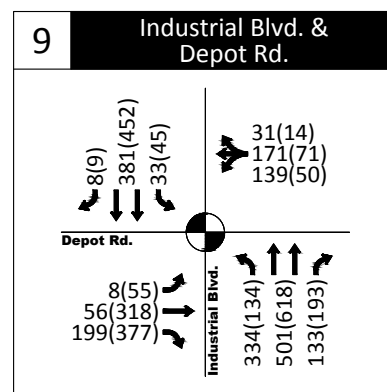
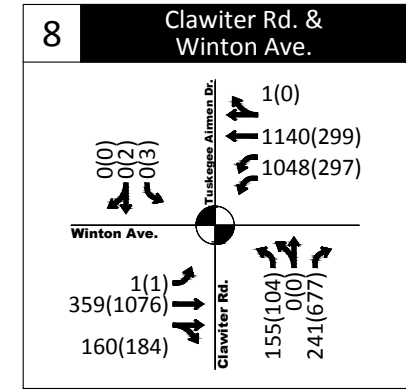
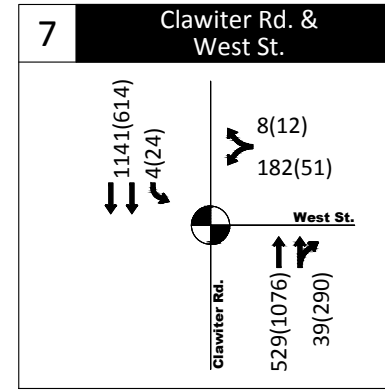
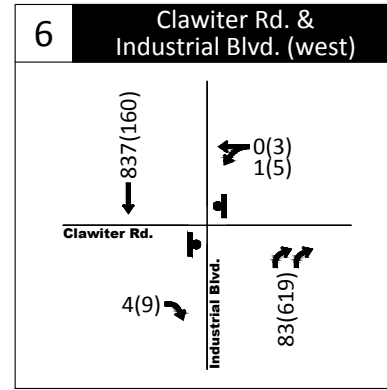
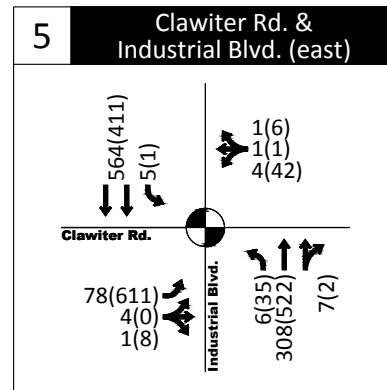
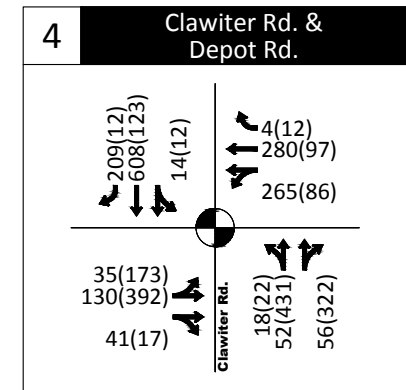
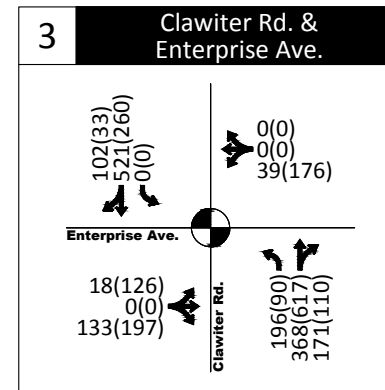
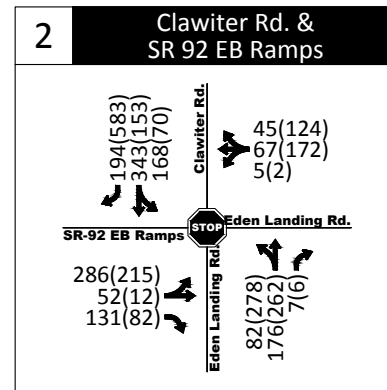
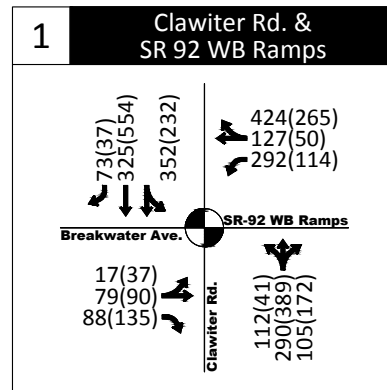
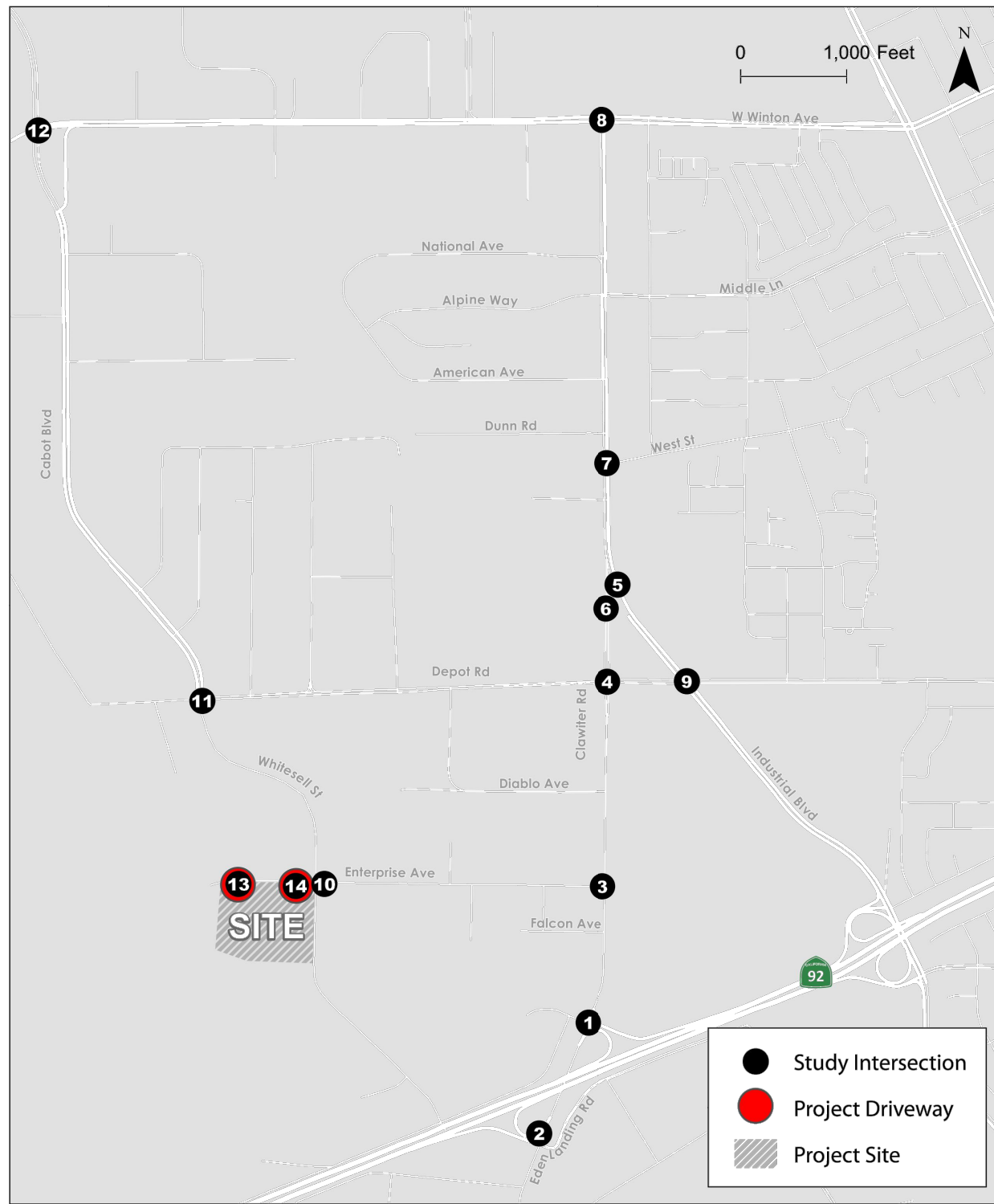


AM(PM) - Traffic Volume  
 - All-Way Stop  
 - Stop Sign  
 - Traffic Signal

Background 2025 Turning Movement Forecasts  
Hayward, CA

Figure  
**10**





AM(PM) - Traffic Volume  
 - All-Way Stop  
 - Stop Sign  
 - Traffic Signal

Background 2025 Plus Project Turning Movement Forecasts  
Hayward, CA

Figure  
11

## 4.2 BACKGROUND 2025 PLUS PROJECT AUTOMOBILE LEVEL OF SERVICE

**Table 14** presents the Background 2025 and Background 2025 Plus Project delays and LOS for the study intersections. The table also compares the change in delay between the two scenarios. Appendix E and Appendix F contain the LOS worksheets for these scenarios.

**Table 14: Automobile Level of Service, Year 2025 Background Plus Project Conditions**

#	Intersection	Traffic Control	2025 Background				2025 Background Plus Project				Weekday AM Delay Increase (Sec)	Weekday PM Delay Increase (Sec)
			Weekday AM		Weekday PM		Weekday AM		Weekday PM			
			Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS		
1	Clawiter Rd. / SR 92 WB Ramps-Breakwater Ct.	Signal	128.6	F	96.1	F	160.6	F	109.7	F	32.0	13.6
2	Clawiter Rd. / SR 92 EB Ramps	AWSC	69.4	F	215.9	F	72.4	F	243.7	F	3.0	27.8
3	Clawiter Rd. / Enterprise Ave.	Signal	23.4	C	32.7	C	34.3	C	46.8	D	10.9	14.1
4	Clawiter Rd. / Depot Rd.	Signal	26.3	C	28.5	C	26.7	C	28.8	C	0.4	0.3
5	Clawiter Rd. / Industrial Blvd. (east)	Signal	6.2	A	42.1	D	6.3	A	42.2	D	0.1	0.1
6	Clawiter Rd. / Industrial Blvd. (west)	TWSC	24.9	C	10.0	B	25.5	C	10	B	0.6	0.0
7	Clawiter Rd. / West St.	Signal	8.0	A	7.7	A	8.0	A	7.8	A	0.0	0.1
8	Clawiter Rd. / Winton Ave.	Signal	30.5	C	159.2	F	30.9	C	163.4	F	0.4	4.2
9	Industrial Blvd / Depot Rd.	Signal	154.3	F	27.7	C	169.4	F	28.8	C	15.1	1.1
10	Whitesell Rd. / Enterprise Ave.	AWSC	9.5	A	9.0	A	10.8	B	10.6	B	1.3	1.6
11	Whitesell Rd. / Depot Rd.	AWSC	11.1	B	11.0	B	11.7	B	11.2	B	0.6	0.2
12	Cabot Blvd. /	AWSC	13.7	B	11.5	B	14.2	B	11.5	B	0.5	0.0

#	Intersection	Traffic Control	2025 Background				2025 Background Plus Project				Weekday AM	Weekday PM
			Weekday AM		Weekday PM		Weekday AM		Weekday PM		Delay Increase (Sec)	Delay Increase (Sec)
			Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS		
	Winton Ave.											
13	West Dwy. / Enterprise Ave.	TWSC	-	-	-	-	8.6	A	8.8	A	-	-
14	East Dwy. / Enterprise Ave.	TWSC	-	-	-	-	8.8	A	11.6	B	-	-

Source: Kittelson & Associates, Inc. 2022  
**Bold** signifies unacceptable operations.

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

- **#1 Clawiter Rd. & SR-92 WB Ramps/Breakwater Ct.:** This intersection operates acceptably at LOS F during the weekday AM peak hour under Background conditions and operates at LOS F under Background Plus Project conditions. The increase in delay is expected to be more than five seconds, which is considered a substantial increase.
- **#2 Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.:** This intersection operates unacceptably at LOS F during the weekday PM peak hour under Background conditions and continues to operate at LOS F under Background Plus Project conditions. The increase in delay is expected to be more than five seconds, which is considered a substantial increase.
- **#8 Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.:** This intersection operates unacceptably at LOS F during the weekday PM peak hour under Background conditions and continues to operate at LOS F under Background Plus Project conditions. The increase in delay is expected to be less than five seconds and therefore not substantial.
- **#9 Industrial Blvd./Depot Rd.:** This intersection operates unacceptably at LOS F during the weekday AM peak hour under Background conditions and continues to operate at LOS F under Existing Plus Project conditions. However, the increase in delay is expected to be more than five seconds, which is considered a substantial increase.

Given that the intersection of Clawiter Road & SR-92 WB Ramps/Breakwater Court operates at LOS F during the weekday AM and PM peak hours under Background Plus Project Conditions, intersection improvements should be identified. With signal timing adjustments, including providing more green time to the southbound approach to reduce the delay in the approach with the most delay, the intersection would still operate at LOS F but would have lower delay than Background conditions at LOS F (148.0) during the weekday AM peak hour and LOS F (101.7) during the PM peak hour.

Given that the intersection of Clawiter Road & SR-92 EB Ramps/Eden Landing Road operates at LOS F during the weekday AM and PM peak hour under Background Conditions with a delay increase of more than five seconds under Background Plus Project Conditions, intersection improvements should be identified. In addition to operating unacceptably, peak hour signal warrants are met at this intersection under Existing and Existing Plus Project conditions. Future interchange improvements at this location are currently being planned as part of the Alameda CTC SR 92/Clawiter Phase II Interchange project. It is expected that future interchange improvements at this location will address operational deficiencies at this intersection. Installation of a traffic signal at this location could also reduce project deficiency to an

acceptable LOS. With signalization, the intersection would operate acceptably at LOS E (59.4) during the weekday AM peak hour and operate with better delay in the weekday PM peak hour at LOS F (100.4).

Given that the intersection of Clawiter Road/Tuskegee Airmen Drive and Winton Avenue operates at LOS F during the weekday PM peak hour under Background conditions with a delay increase of less than five seconds under Background Plus Project conditions, intersection improvements are not required.

Given that the intersection of Industrial Boulevard & Depot Road operates at LOS F during the weekday AM peak hour under Background Conditions with a delay increase of more than five seconds under Existing Plus Project Conditions, intersection improvements should be identified. With signal timing adjustments, including increasing the cycle length to provide more green time for all movements, the intersection would operate acceptably at LOS C (27.6) under Background Plus Project conditions during the weekday AM peak hour.

**Table 15** presents Background Plus Project conditions intersections deficiencies without and with improvements. Appendix F contains the Background Plug Project LOS improvement worksheets.

**Table 15: Year 2025 Background Plus Project Operations - Intersections Deficiencies and Improvements**

#	Intersection	Without Improvements				With Improvements			
		Weekday AM		Weekday PM		Weekday AM		Weekday PM	
		Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS	Delay (Sec)	LOS
1	Clawiter Rd. / SR 92 WB Ramps- Breakwater Ct.	160.6	F	109.7	F	148.0	F	101.7	F
2	Clawiter Rd. / SR 92 EB Ramps	72.4	F	243.7	F	59.4	E	100.4	F
9	Industrial Blvd / Depot Rd.	169.4	F	28.8	C	27.6	C	-	-

Source: Kittelson & Associates, Inc. 2022

## 4.3 BACKGROUND 2025 PLUS PROJECT QUEUE STORAGE

The 95<sup>th</sup> 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 their available storage capacity at the 95<sup>th</sup> percentile demand level under Background and Background Plus Project conditions.

Appendix D contains intersection queue spreadsheets for all study intersections.

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

#	Intersection	Movement	Peak Hour	Description
1	Clawiter Rd. & Breakwater Ct./SR-92 WB Ramps	EB L/T	AM & PM	Queues on this approach spill back to the adjacent two-way stop-controlled intersection at Breakwater Ave. The project is expected to add less than one car length (25 ft) in both the AM and PM peak hours. The project is not expected to add any trips to this movement.
2	Clawiter Rd. & SR-92 EB Ramps/Eden Landing Rd.	NB L/T	PM	Queues on this approach spill back to the adjacent all-way stop-controlled intersection at Point Eden Wy during the PM peak hour. The project is expected to add less than one car length in the PM peak hour. Project traffic would add one car length in the AM peak hour, but the movement is within storage during the AM peak hour.
8	Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.	NBL	AM & PM	This movement spills back beyond the length of its exclusive turn lane. However, a longer shared left/thru lane is also available. The project is not expected to add any trips or additional queueing to this movement in the AM and PM peak hours.
		WBL	AM	This movement spills back beyond the length of its turn lane. However, project traffic would add less than one car length of queueing to the project.
9	Industrial Blvd. & Depot Rd.	NBL	AM	The movement spills back beyond the length of its exclusive turn lane during background and background plus project conditions. Project traffic would add one vehicle length to the queue during the AM peak hour. Signal timing changes would improve NBL queueing to be within the storage.

Source: Kittelson & Associates, Inc. 2022

Note: Appendix D includes all intersection queue storage and 95<sup>th</sup> percentile queues.



## Section 5

### Public Transit, Pedestrian, and Bicycle Assessment

# 5 PUBLIC TRANSIT, PEDESTRIAN, AND BICYCLE ASSESSMENT

This section discusses potential effects on public transit, pedestrians, and bicyclists. To supplement this analysis, the Alameda County Transportation Commission (ACTC) Development Review Complete Streets Checklist was completed and is included as Appendix G.

## 5.1 PUBLIC TRANSIT ASSESSMENT

The project is not expected to degrade access to transit facilities. The nearest bus stop to the project site is located on Depot Road east of Whitesell Street, approximately ¼ mile distance to the north. This bus stop can be accessed via sidewalks and bike lanes on Whitesell Street and is currently served by AC Transit Line 86 which operates at 35-minute headways during both peak and off-peak times. The project includes the construction of a paved 5-foot wide sidewalk on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street. This would provide a continuous paved sidewalk from the project to the nearest bus stop on Depot Avenue via Enterprise and Whitesell. The project would not affect any existing or planned bus stops or sidewalks in the study area. Therefore, implementation of the Project would not conflict with plans, programs, and policies regarding transit facilities, or decrease the performance of such facilities.

## 5.2 PEDESTRIAN AND BICYCLE ASSESSMENT

Most roadways in the study area such as Enterprise Avenue do not have sidewalks. Whitesell Street north and south of Enterprise Avenue has sidewalks on both sides of the road. 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 generally do not exist in the area. The project would construct a paved 5-foot wide sidewalk on the south side of Enterprise Avenue along the property boundary extending to the corner of Whitesell Street.

The site plan includes bike racks, consistent with California Green Building Code (CALGreen) requirements for developers to provide bicycle parking for 5% of the vehicular parking spaces added on a site. 8 Short-term bike racks and 8 long-term bike racks are required, and the project has proposed to provide 8 of each. The bicyclist access points to the project consist of the two driveways along Enterprise Avenue. The study area features bike routes, including a bike route along Whitesell Street, Depot Road, and Clawiter Road, as discussed in Section 1.3.4. Cyclists accessing the project on a bike would need to ride a short section of Enterprise Avenue of approximately 300 feet between the eastern site access driveway to Whitesell Street. The provision of a bike lane would support the use of bicycle travel and/or transit to reduce VMT with the project. A preliminary review suggests that installing a class II bike lane on this section of Enterprise Avenue may be feasible given curbside parking is prohibited on both sides of the road, the limited number of existing and future access driveways directly to Enterprise Avenue, and the right of way of 60 feet for the 2-lane road. The right of way should be able to accommodate a class II bike lane. However, it should be noted that given the industrial-nature of the area and anticipated truck traffic along Enterprise Avenue, sharrows or a class III bicycle route would not be recommended. The bicycle facility is recommended on both sides of Enterprise Avenue between Whitesell Street and the project site's western property boundary. The design and installation of a bike lane shall be implemented under the City of Hayward and State of California applicable standards and to the satisfaction of the City of Hayward Public Works staff.

Potential pedestrian and bicycle-oriented treatments that could be considered as part of design review and conditions of approval could include:

- Ensure that the west and east driveways on Enterprise Avenue are designed for pedestrian and bicycle visibility (sidewalks clearly delineated, improved visibility by minimizing bushes and large signs).
- Coordinate with the City of Hayward to install warning signage (such as bikeway signage, and caution signage for exiting vehicles).





## Section 6

### Traffic Calming

## 6 TRAFFIC CALMING

The City of Hayward has expressed concerns regarding the potential for vehicles to divert to or pass-through residential streets to local arterial and regional roads in the study area. Generally, pass-through vehicle concerns can be addressed with traffic calming measures to slow vehicles down to safer speeds.

Examples of traffic calming measures can include:

- Narrowing roadways
  - Adding on-street parking
  - Installing a bike lane
  - Adding curb extensions and bulbouts
  - Adding bollards and planters
  - Removing lanes
- Vertical deflection such as speed bumps, humps, or tables
- Horizontal deflection
  - Lateral shift with a median island and curb extensions
  - Lateral shift with a chicane and curb extensions
- Enforcement and education
  - Speed cameras
  - Vehicle activated speed signs
- Lowering speed limits

As discussed in Section 2.2, project trips are expected to remain along arterial roads, collector roads, and SR-92. In addition, land uses around the project site generally consist of industrial and commercial. Given the lack of residential uses and streets near the project, and the lack of cut-through opportunities in the study area, traffic calming techniques have not been deemed necessary.



## Section 7

### Circulation and Access

# 7 CIRCULATION AND ACCESS

This section provides an overview of site access and on-site circulation. AutoTurn truck turning templates are provided as Figures I-1 through I-5 in Appendix H.

## 7.1 PARKING

The City of Hayward Off-Street Parking Regulations require one parking space for every 250 square feet in an office building, one space per 9,000 square feet for a data center, and 1 space per 2,000 square feet for an industrial use. In total, the project will need 149 parking spaces. The project would provide 151 standard parking stalls.

## 7.2 TRUCK ACCESS

An analysis of the project driveways and internal site was conducted using AutoCAD AutoTurn to assess circulation and site access for trucks and emergency vehicles. Specifically, AutoTurn templates were prepared for a 31.17-foot-long fire truck and a standard eighteen-wheel semitrailer. The findings are detailed below:

**Fire Truck:** As shown in Appendix H, a standard fire truck is able navigate the project driveways and the drive aisles.

**Semitrailer:** As shown in Appendix H, a standard eighteen-wheel semitrailer is able navigate the project driveways, drive aisles, and loading/unloading docks.

## 7.3 PASSENGER VEHICLES

AutoTurn templates were not prepared for passenger vehicles, since the fire truck and semitrailer templates 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 driveways are 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.

## 7.4 PEDESTRIAN AND BICYCLISTS

As discussed in Section 5.2, a pedestrian path will connect the new sidewalk on the right side of the western access driveway along Enterprise Avenue. The bicyclist access points to the project consist of the two driveways along Enterprise Avenue. Recommended pedestrian- and bicyclist-oriented improvements for the project driveways and project site are provided in Section 5.2.



## Section 8 Fair Share Calculation

# 8 FAIR SHARE CALCULATION

At intersections where an operational deficiency was identified, this traffic impact analysis identified the number of project trips that would affect the intersection and the ratio of project traffic to the projected traffic increase at that location. In other words, the project fair share percentage equals the project traffic divided by the difference of future traffic and existing traffic at all approaches entering the intersection:

$$\text{Project Fair Share \%} = \frac{\text{Project Traffic}}{(\text{Future Traffic Volume} - \text{Existing Traffic Volume})}$$

Fair share contributions are noted as an acceptable mitigation when the project applicant is responsible for only a portion of a costly transportation enhancement. In other words, it is applicable when there are other proposed development projects nearby that may also contribute toward the cost or when the city has other funding sources for the improvement. **Table 17** and **Table 18** present a summary of Project fair share percentages for existing and background conditions for intersections where AM or PM peak hour is the period that the deficiencies have been identified. The fair share percentage for Existing with Project conditions is 100 percent as this project traffic is the only new traffic in the area. In 2025 Background with Project conditions, the fair share percentage for each affected intersection ranges from 16 to 20 percent.

**Table 17: Project Fair-Share, Existing with Project Conditions**

Intersection	Period	Existing Volumes	Project Traffic	Existing With Project	New Traffic	Fair Share %
9. Industrial Blvd / Depot Rd.	AM	1,728	37	1,765	37	100%
	-	-	-	-	-	-

Source: Kittelson & Associates, Inc., 2022

**Table 18: Project Fair-Share, Year 2025 Background with Project Conditions**

Intersection	Period	Existing Volumes	Project Traffic	2025 Background With Project	New Traffic	Fair Share %
1. Clawiter Rd. & Breakwater Ct./SR-92 WB Ramps	AM	1,790	101	2,284	494	20%
	PM	1,575	88	2,117	542	16%
2. Clawiter Rd. & SR-92 EB ramps/Eden Landing Rd.	-	-	-	-	-	-
	PM	1,582	66	1,958	376	18%

Source: Kittelson & Associates, Inc., 2022



Section 9  
Summary of Findings

## 9 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:

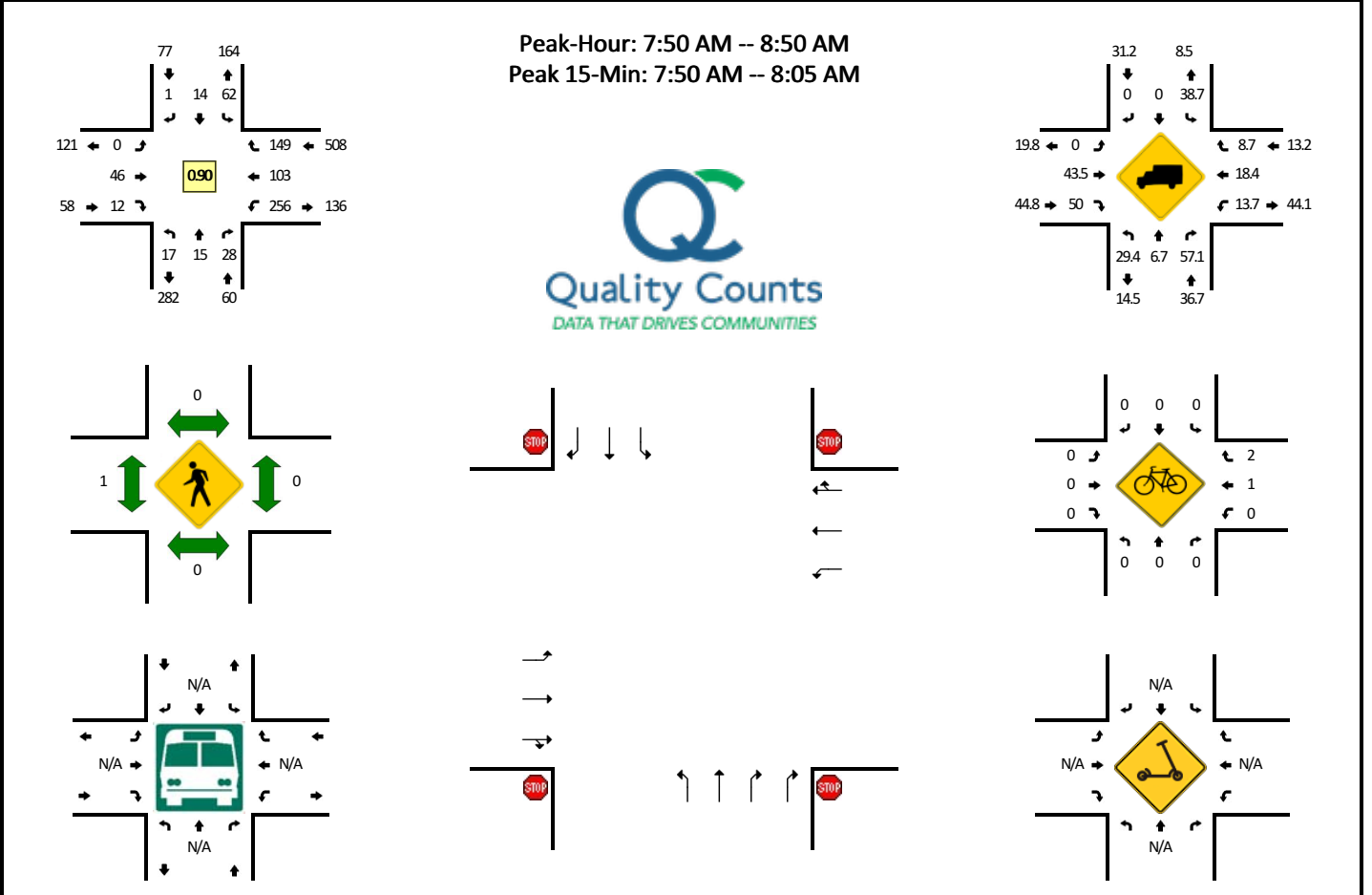
- Optimize signal timing at the intersection of Industrial Boulevard and Depot Road (study intersection #9) to improve degraded operations under the Existing Plus Project conditions.
- Optimize signal timing at the intersection of Clawiter Road and SR-92 WB ramps/Eden Landing Road (study intersection #1) to improve degraded traffic operations under the Background 2025 Plus Project conditions.
- Contribute fair-share toward installation of a traffic signal, or make similar improvements along Clawiter road, at the intersection of Clawiter Road and SR-92 EB ramps/Eden Landing Road (study intersection #2) to improve degraded traffic operations under the Existing Plus Project and Background 2025 Plus Project conditions. It should be noted that there are planned interchange improvements at this location.
- Ensure that the Project driveways on Enterprise Road are designed for pedestrian visibility safety (e.g., sidewalks clearly delineated, improved visibility by minimizing bushes and large signs).
- Coordinate with the City of Hayward to install warning signage (e.g., bikeway signage and caution signage for exiting vehicles) and continental crosswalks at the Project driveways.
- The project applicant shall contribute toward the intersection improvements listed above. The project fair share identifies the number of project trips that affects an intersection and the ratio of project traffic to the projected traffic increase at that location. Intersection fair share calculations are included in Section 10.



# Appendix A: Traffic Counts and COVID-19 Adjustment Calculations

**LOCATION:** Cabot Blvd -- W Winton Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606401  
**DATE:** Thu, Nov 18 2021

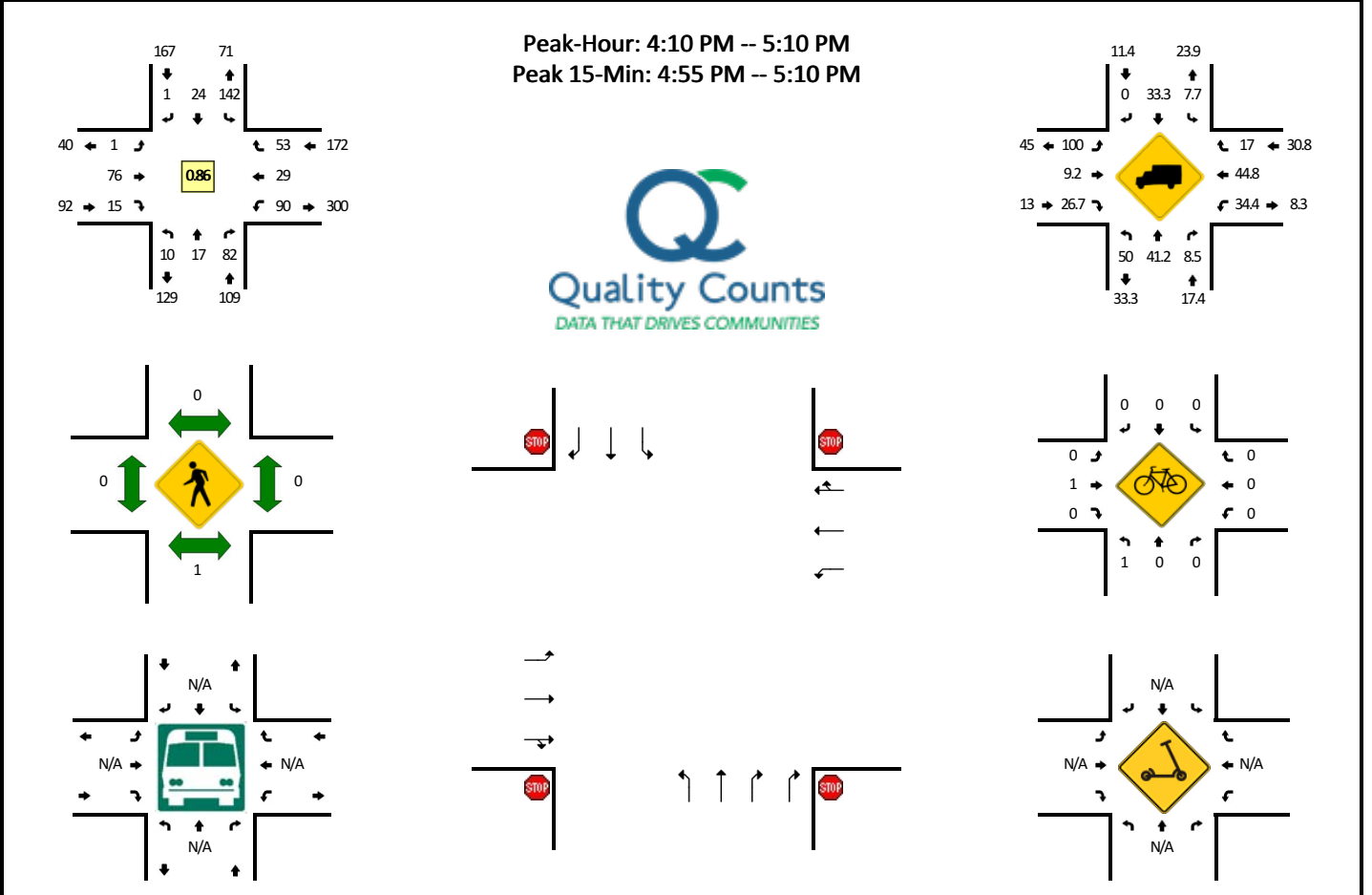


5-Min Count Period Beginning At	Cabot Blvd (Northbound)				Cabot Blvd (Southbound)				W Winton Ave (Eastbound)				W Winton Ave (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	1	2	3	0	2	2	0	0	0	0	6	0	0	20	5	10	0	51	
7:05 AM	2	0	2	0	3	0	0	0	0	0	5	0	0	23	8	21	0	64	
7:10 AM	0	3	1	0	2	0	0	0	0	0	3	0	0	21	5	6	0	41	
7:15 AM	1	4	2	0	6	1	0	0	0	0	4	0	0	14	6	7	0	45	
7:20 AM	1	0	2	0	1	1	0	0	0	0	3	0	0	19	5	11	0	43	
7:25 AM	2	0	4	0	3	0	0	0	0	0	0	0	0	18	10	11	0	48	
7:30 AM	0	1	2	0	8	2	0	0	0	0	4	1	0	19	3	10	0	50	
7:35 AM	0	0	3	0	8	1	0	0	0	0	4	1	0	15	8	8	0	48	
7:40 AM	0	0	0	0	5	0	0	0	0	0	3	2	0	22	6	6	0	44	
7:45 AM	1	2	4	0	3	0	0	0	0	0	3	3	0	22	3	8	0	49	
7:50 AM	2	1	0	0	4	0	0	0	0	0	4	0	0	33	11	15	0	70	
7:55 AM	2	1	3	0	4	0	0	0	0	0	3	1	0	19	9	21	0	63	616
8:00 AM	0	0	1	0	8	0	0	0	0	0	5	1	0	23	9	15	0	62	627
8:05 AM	2	3	5	0	3	1	0	0	0	0	4	1	0	24	13	12	0	68	631
8:10 AM	1	2	3	0	5	3	0	0	0	0	3	1	0	16	7	17	0	58	648
8:15 AM	1	2	4	0	5	2	0	0	0	0	5	0	0	20	7	7	0	53	656
8:20 AM	1	1	2	0	5	2	0	0	0	0	3	2	0	21	7	12	0	56	669
8:25 AM	5	0	0	0	6	1	0	0	0	0	6	0	0	24	13	11	0	66	687
8:30 AM	0	1	2	0	8	0	0	0	0	0	4	1	0	20	3	12	0	51	688
8:35 AM	0	0	2	0	4	3	1	0	0	0	4	3	0	16	8	9	0	50	690
8:40 AM	2	3	2	0	5	0	0	0	0	0	2	0	0	20	10	10	0	54	700
8:45 AM	1	1	4	0	5	2	0	0	0	0	3	2	0	20	6	8	0	52	703
8:50 AM	3	0	0	0	1	0	0	0	0	0	5	0	0	18	6	7	0	40	673
8:55 AM	2	2	5	0	2	1	0	0	0	0	4	1	0	17	9	5	0	48	658
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	16	8	16	0	64	0	0	0	0	48	8	0	300	116	204	0	780		
Heavy Trucks	0	4	4		28	0	0		0	20	4		28	12	4		104		
Buses																			
Pedestrians		0				0				0				0			0		
Bicycles	0	0	0		0	0	0		0	0	0		0	4	8		12		
Scoters																			

*Comments:*

**LOCATION:** Cabot Blvd -- W Winton Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606402  
**DATE:** Thu, Nov 18 2021

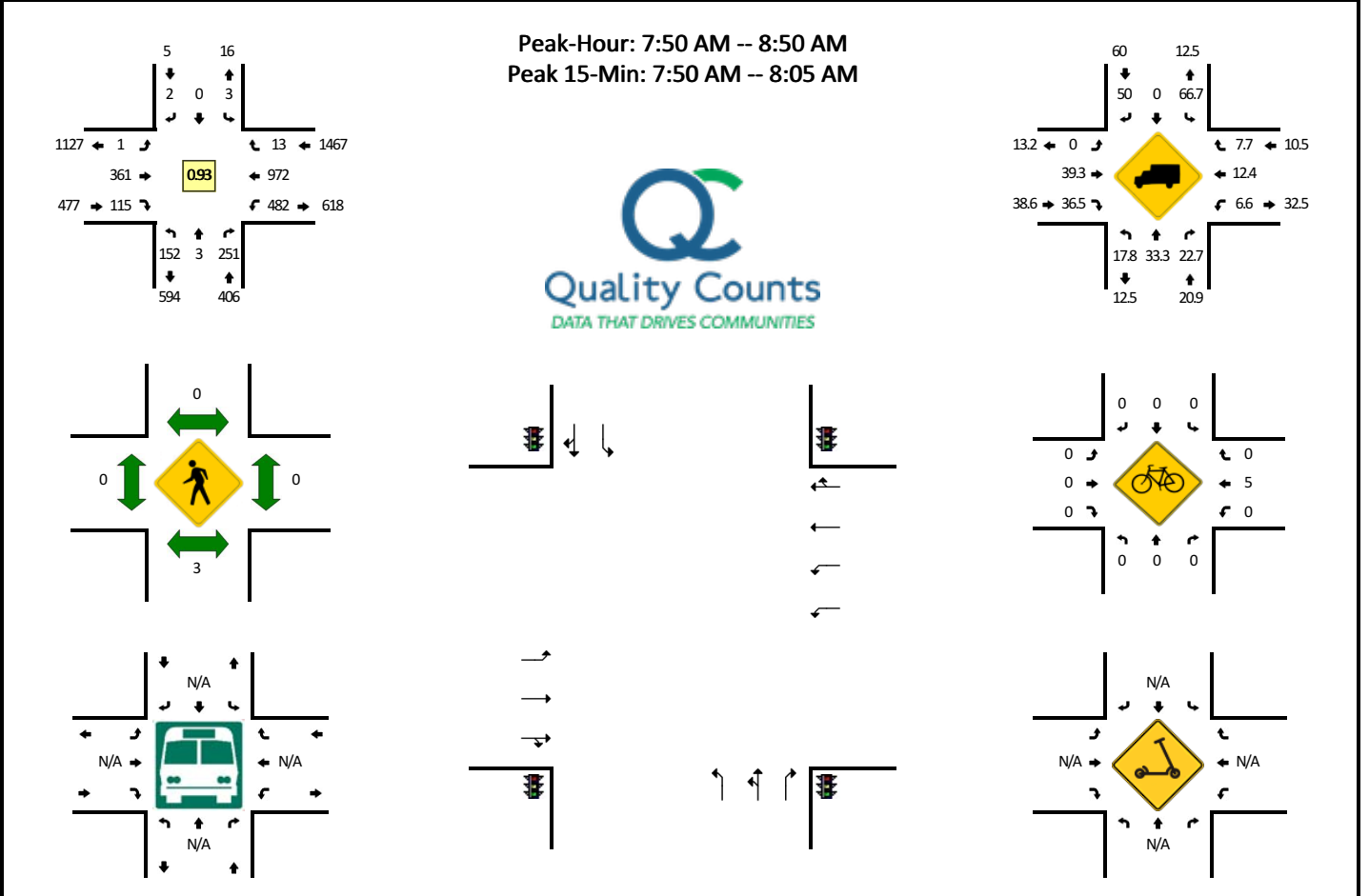


5-Min Count Period Beginning At	Cabot Blvd (Northbound)				Cabot Blvd (Southbound)				W Winton Ave (Eastbound)				W Winton Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	2	4	0	13	5	0	0	0	11	1	0	8	2	3	0	50	
4:05 PM	0	2	3	0	11	3	1	0	1	10	1	0	7	2	6	0	47	
4:10 PM	2	1	3	0	7	2	0	0	0	8	0	0	15	2	10	0	50	
4:15 PM	0	1	9	0	9	1	0	0	0	7	1	0	10	2	10	0	50	
4:20 PM	1	4	7	0	4	1	0	0	0	4	3	0	7	0	4	0	35	
4:25 PM	1	0	4	0	10	3	0	0	0	5	0	0	11	2	5	0	41	
4:30 PM	0	3	10	0	15	4	0	0	0	5	1	0	5	1	6	0	50	
4:35 PM	1	2	3	0	15	2	0	0	0	8	2	0	7	3	2	0	45	
4:40 PM	0	0	5	0	15	7	0	0	1	7	1	0	5	4	3	0	48	
4:45 PM	1	0	5	0	6	0	0	0	0	3	0	0	5	3	5	0	28	
4:50 PM	1	1	6	0	11	1	0	0	0	5	2	0	4	3	2	0	36	
4:55 PM	1	2	7	0	18	0	0	0	0	11	2	0	7	2	1	0	51	531
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5:10 PM	0	1	3	0	13	2	0	0	0	6	3	0	5	5	3	0	41	531
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5:20 PM	0	1	6	0	11	2	0	0	0	1	0	0	1	2	1	0	25	502
5:25 PM	0	0	8	0	4	2	0	0	0	2	0	0	4	1	4	0	25	486
5:30 PM	0	0	11	0	5	0	0	0	0	5	0	0	2	3	1	0	27	463
5:35 PM	0	1	4	0	8	1	0	0	0	9	0	0	4	2	6	0	35	453
5:40 PM	0	0	5	0	2	1	0	0	0	4	1	0	3	2	5	0	23	428
5:45 PM	1	0	2	0	8	1	1	0	0	5	0	0	5	0	1	0	24	424
5:50 PM	0	1	5	0	7	1	0	0	0	6	0	0	3	2	0	0	25	413
5:55 PM	1	0	2	0	9	1	0	0	0	3	1	0	2	1	3	0	23	385
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	20	120	0	200	12	4	0	0	96	20	0	84	36	24	0	628	
Heavy Trucks	8	8	4		16	4	0		0	8	8		32	16	4		108	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	4	0	0		0	0	0		0	0	0		0	0	0		4	
Scoters																		

Comments:

**LOCATION:** Tuskegee Airmen Dr/Clawiter Rd -- W Winton Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606403  
**DATE:** Thu, Nov 18 2021

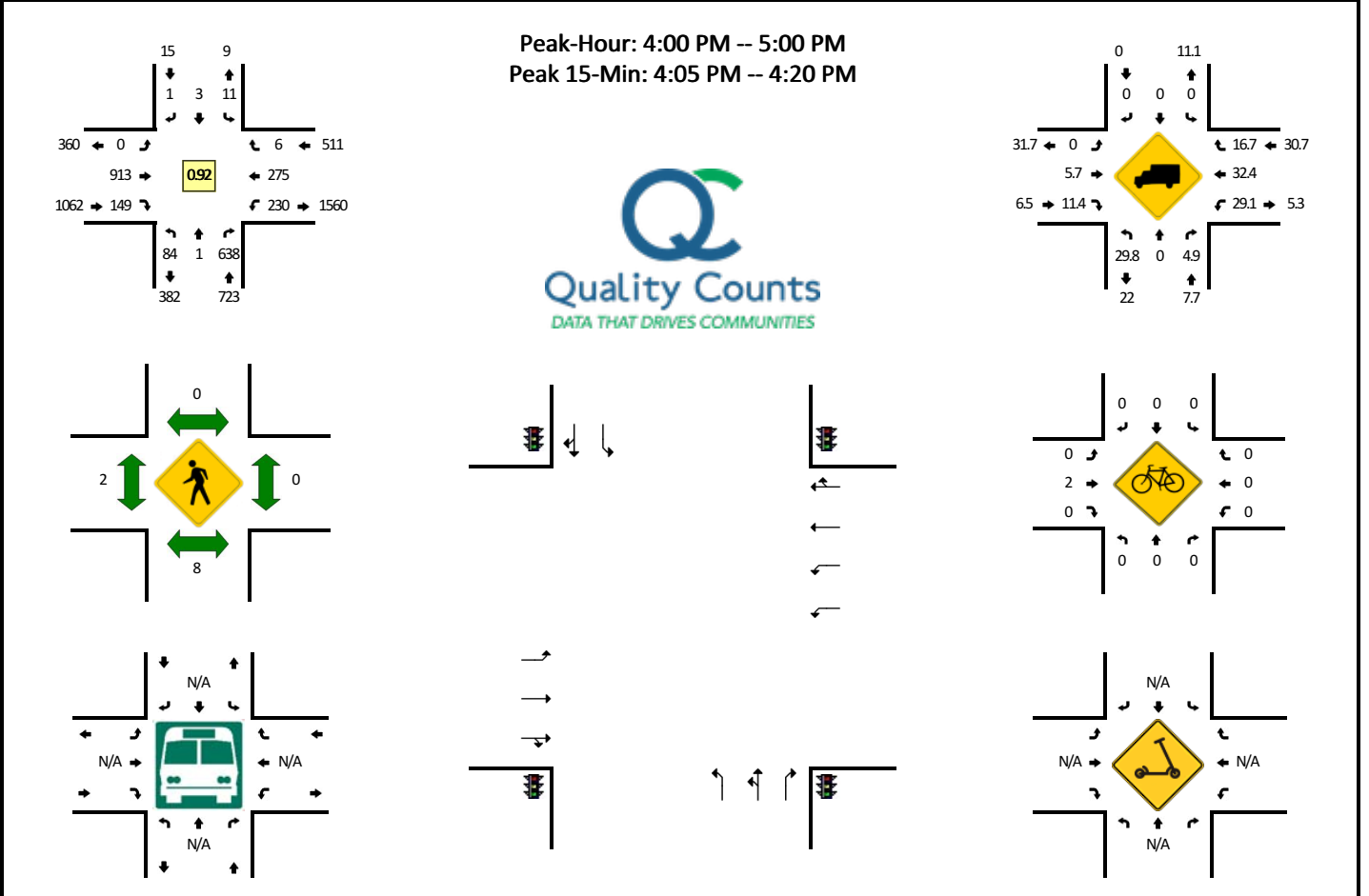


5-Min Count Period Beginning At	Tuskegee Airmen Dr/Clawiter Rd (Northbound)				Tuskegee Airmen Dr/Clawiter Rd (Southbound)				W Winton Ave (Eastbound)				W Winton Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	0	16	0	2	0	0	0	0	35	9	0	34	88	2	0	189	
7:05 AM	8	1	18	0	1	0	0	0	0	34	7	0	45	66	0	0	180	
7:10 AM	8	0	17	0	0	0	0	0	0	25	3	0	47	85	0	0	185	
7:15 AM	14	0	20	0	0	0	0	0	0	24	5	0	33	62	0	0	158	
7:20 AM	11	0	18	0	0	0	0	0	0	30	10	0	36	71	0	1	177	
7:25 AM	10	0	17	0	0	0	0	0	0	13	6	0	50	83	1	0	180	
7:30 AM	7	0	15	0	0	0	0	0	0	34	9	0	34	69	1	0	169	
7:35 AM	11	0	14	0	0	0	0	0	0	26	5	1	40	68	0	0	165	
7:40 AM	7	0	9	0	0	0	0	0	0	29	5	0	48	72	0	0	170	
7:45 AM	14	0	11	0	0	0	0	0	0	30	6	0	49	79	0	0	189	
7:50 AM	13	0	19	0	0	0	0	0	0	17	8	0	57	92	0	0	206	
7:55 AM	19	0	23	0	0	0	0	0	0	35	6	0	57	100	0	1	241	2209
8:00 AM	15	1	17	0	0	0	1	0	0	24	8	0	24	94	1	0	185	2205
8:05 AM	16	0	17	0	0	0	0	0	0	31	8	0	47	84	1	0	204	2229
8:10 AM	15	0	28	0	1	0	0	0	0	22	11	0	41	74	2	0	194	2238
8:15 AM	10	0	22	0	0	0	0	0	0	40	14	0	44	75	0	0	205	2285
8:20 AM	10	1	22	0	0	0	0	0	0	33	7	0	33	90	0	0	196	2304
8:25 AM	14	0	28	0	2	0	1	0	0	34	10	1	40	78	1	1	210	2334
8:30 AM	10	0	18	0	0	0	0	0	0	36	9	0	31	80	1	1	186	2351
8:35 AM	10	0	21	0	0	0	0	0	0	31	13	0	23	62	1	0	161	2347
8:40 AM	9	1	21	0	0	0	0	0	0	34	8	0	37	62	3	0	175	2352
8:45 AM	11	0	15	0	0	0	0	0	0	24	13	0	45	81	3	0	192	2355
8:50 AM	9	0	17	0	0	0	0	0	0	28	9	0	31	64	2	0	160	2309
8:55 AM	7	0	18	0	0	0	0	0	0	30	6	0	34	52	0	0	147	2215
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	188	4	236	0	0	0	4	0	0	304	88	0	552	1144	4	4	2528	
Heavy Trucks	24	0	60	0	0	0	0	0	0	124	24	0	20	100	0	0	352	
Buses																		
Pedestrians		4				0				0				0			4	
Bicycles	0	0	0		0	0	0			0	0	0	0	8	0		8	
Scoters																		

*Comments:*

**LOCATION:** Tuskegee Airmen Dr/Clawiter Rd -- W Winton Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606404  
**DATE:** Thu, Nov 18 2021

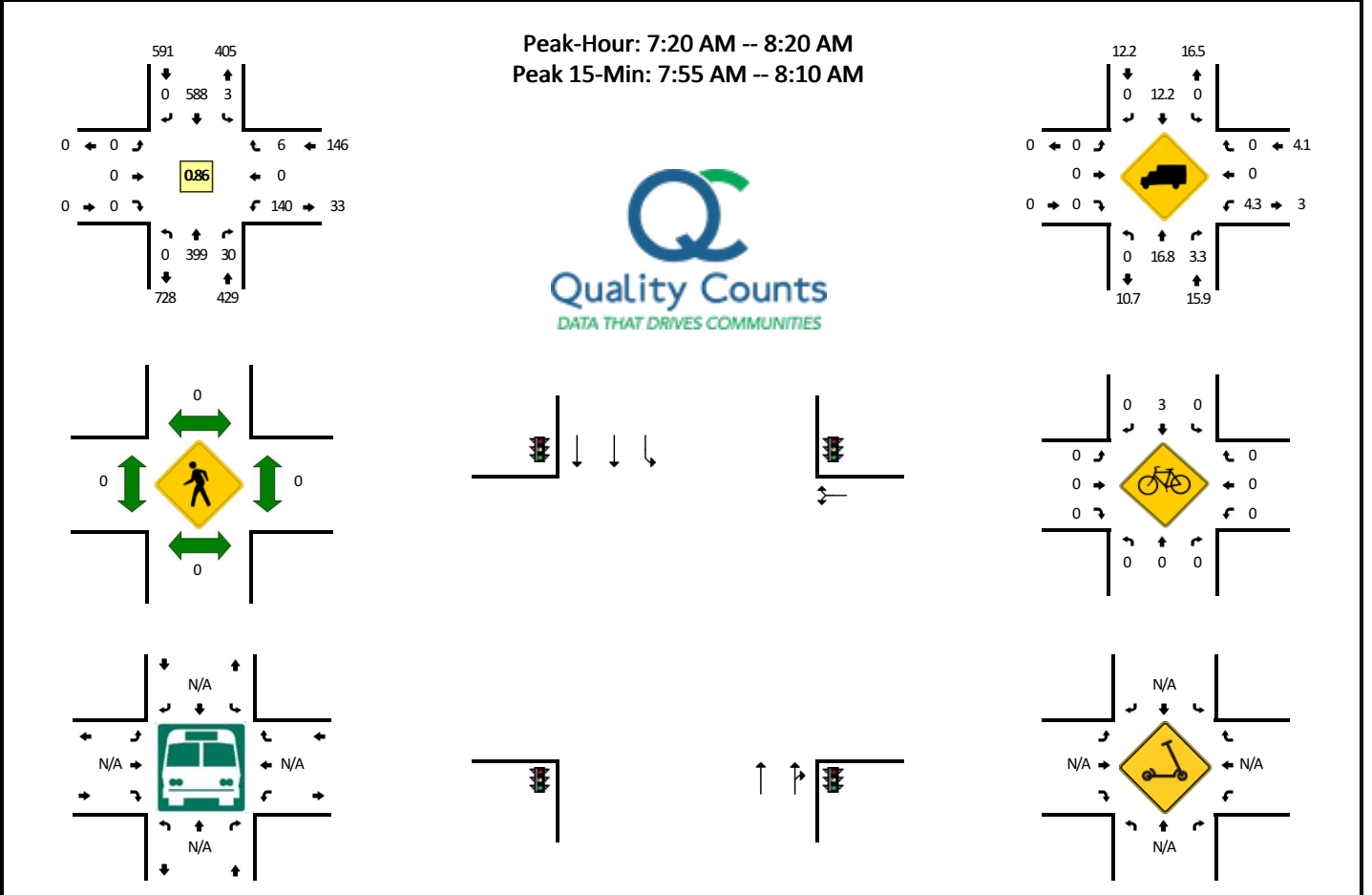


5-Min Count Period Beginning At	Tuskegee Airmen Dr/Clawiter Rd (Northbound)				Tuskegee Airmen Dr/Clawiter Rd (Southbound)				W Winton Ave (Eastbound)				W Winton Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	0	65	0	0	2	0	0	0	70	17	0	20	24	0	0	207	
4:05 PM	4	0	42	0	0	0	0	0	0	101	14	0	16	33	2	0	212	
4:10 PM	9	0	64	0	1	0	0	0	0	71	13	0	19	30	0	0	207	
4:15 PM	3	1	59	0	1	0	0	1	0	77	12	0	30	26	0	0	210	
4:20 PM	10	0	62	0	0	0	0	1	0	66	7	0	22	21	0	0	189	
4:25 PM	7	0	55	0	0	0	0	0	0	48	7	0	11	22	0	0	150	
4:30 PM	5	0	44	0	1	0	1	0	0	80	13	0	18	15	2	0	179	
4:35 PM	10	0	54	0	1	0	0	0	0	96	16	0	16	27	2	0	222	
4:40 PM	12	0	40	0	3	0	0	0	0	78	17	0	13	19	0	0	182	
4:45 PM	3	0	53	0	0	1	0	0	0	84	13	0	23	18	0	0	195	
4:50 PM	7	0	50	0	1	0	0	0	0	71	13	0	23	17	0	0	182	
4:55 PM	5	0	50	0	1	0	0	0	0	71	7	0	19	23	0	0	176	2311
5:00 PM	4	0	43	0	0	0	0	0	0	72	17	0	21	26	0	0	183	2287
5:05 PM	5	0	42	0	0	0	0	0	0	108	19	0	23	21	0	0	218	2293
5:10 PM	6	0	44	0	0	0	0	0	0	93	26	0	8	17	0	0	194	2280
5:15 PM	6	0	37	0	0	0	0	0	0	97	22	0	13	16	0	0	191	2261
5:20 PM	8	1	50	0	1	0	0	0	0	85	21	0	8	14	0	0	188	2260
5:25 PM	2	0	58	0	3	1	0	0	0	48	8	0	19	16	0	0	155	2265
5:30 PM	7	0	39	0	0	0	0	0	0	49	13	0	10	14	0	0	132	2218
5:35 PM	4	0	44	0	0	0	0	0	0	76	6	0	18	15	1	0	164	2160
5:40 PM	8	0	49	0	0	0	0	0	0	91	19	0	15	15	0	0	197	2175
5:45 PM	7	0	47	0	0	0	0	0	0	67	8	0	10	14	0	0	153	2133
5:50 PM	3	0	51	0	0	0	0	0	0	62	8	0	8	12	0	0	144	2095
5:55 PM	4	0	64	0	1	0	0	0	0	36	5	0	14	14	0	0	138	2057
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	64	4	660	0	8	0	0	4	0	996	156	0	260	356	8	0	2516	
Heavy Trucks	24	0	36	0	0	0	0	0	0	32	20	0	88	120	4	0	324	
Buses																		
Pedestrians		8				0				0				0			8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*

**LOCATION:** Clawiter Rd -- West St  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606405  
**DATE:** Thu, Nov 18 2021

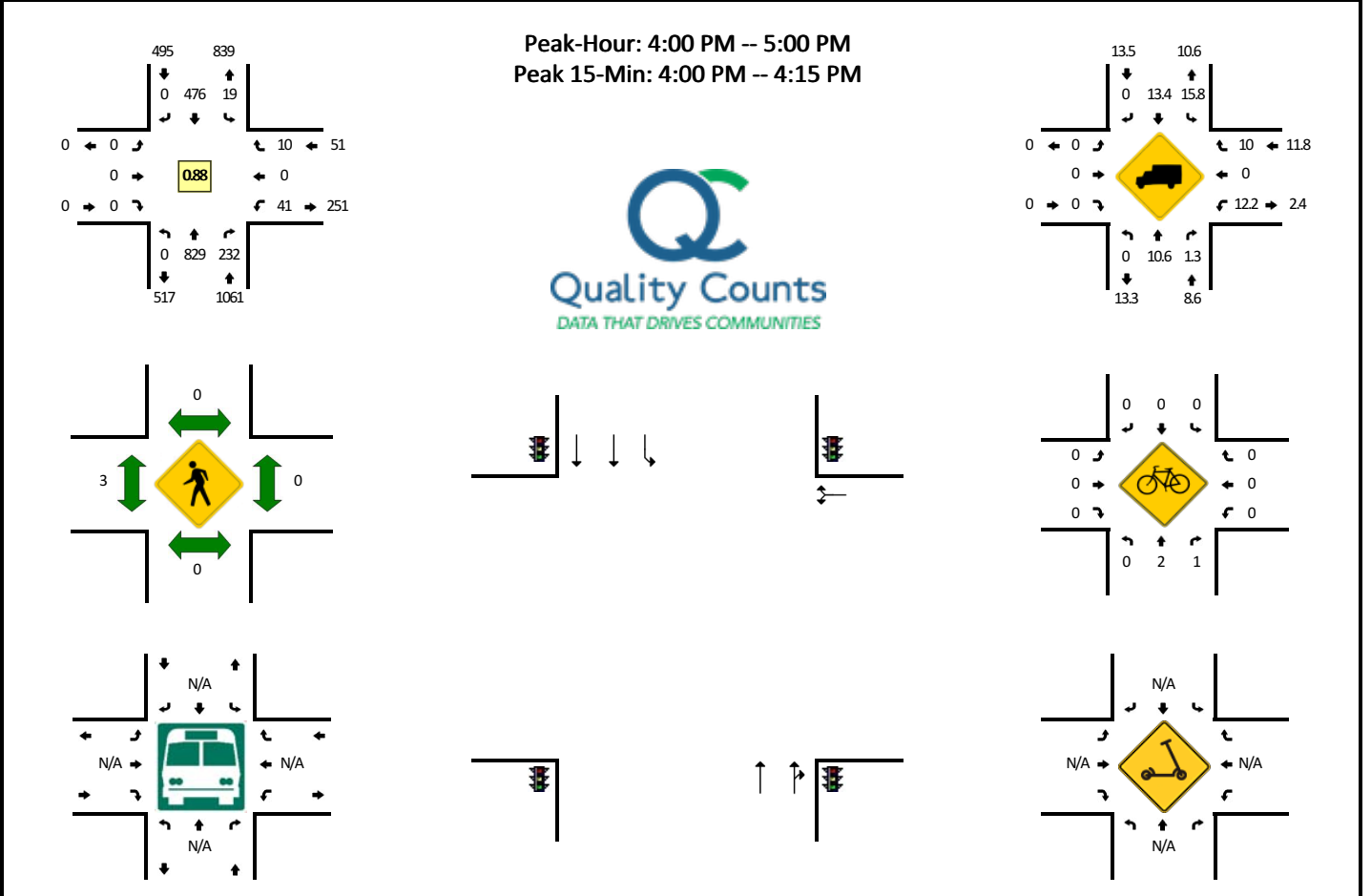


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				West St (Eastbound)				West St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	18	2	0	0	36	0	0	0	0	0	0	10	0	0	0	66	
7:05 AM	0	34	3	0	1	63	0	0	0	0	0	0	7	0	0	0	108	
7:10 AM	0	16	3	0	0	32	0	0	0	0	0	0	10	0	1	0	62	
7:15 AM	0	21	3	0	0	44	0	0	0	0	0	0	8	0	0	0	76	
7:20 AM	0	30	2	0	0	57	0	0	0	0	0	0	12	0	1	0	102	
7:25 AM	0	26	2	0	0	61	0	0	0	0	0	0	14	0	0	0	103	
7:30 AM	0	24	2	0	0	46	0	0	0	0	0	0	12	0	0	0	84	
7:35 AM	0	26	2	0	0	44	0	0	0	0	0	0	13	0	2	0	87	
7:40 AM	0	26	3	0	0	39	0	0	0	0	0	0	16	0	1	0	85	
7:45 AM	0	24	2	0	0	48	0	0	0	0	0	0	11	0	0	0	85	
7:50 AM	0	35	1	0	1	54	0	0	0	0	0	0	8	0	0	0	99	
7:55 AM	0	47	5	0	0	49	0	0	0	0	0	0	11	0	0	0	112	1069
8:00 AM	0	39	1	0	0	43	0	0	0	0	0	0	14	0	1	0	98	1101
8:05 AM	0	52	2	0	1	57	0	0	0	0	0	0	14	0	1	0	127	1120
8:10 AM	0	29	4	0	1	43	0	0	0	0	0	0	9	0	0	0	86	1144
8:15 AM	0	41	4	0	0	47	0	0	0	0	0	0	6	0	0	0	98	1166
8:20 AM	0	37	5	0	0	34	0	0	0	0	0	0	13	0	2	0	91	1155
8:25 AM	0	42	5	0	0	41	0	0	0	0	0	0	7	0	2	0	97	1149
8:30 AM	0	32	1	0	0	33	0	0	0	0	0	0	3	0	0	0	69	1134
8:35 AM	0	24	2	0	1	31	0	0	0	0	0	0	9	0	1	0	68	1115
8:40 AM	0	23	5	0	1	49	0	0	0	0	0	0	5	0	1	0	84	1114
8:45 AM	0	29	6	0	1	33	0	0	0	0	0	0	6	0	1	0	76	1105
8:50 AM	0	34	3	0	0	38	0	0	0	0	0	0	5	0	1	0	81	1087
8:55 AM	0	31	1	0	0	36	0	0	0	0	0	0	8	0	0	0	76	1051
Peak 15-Min Flows	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	552	32	0	4	596	0	0	0	0	0	0	156	0	8	0	1348	
Heavy Trucks	0	112	0		0	72	0		0	0	0		4	0	0		188	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

**LOCATION:** Clawiter Rd -- West St  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606406  
**DATE:** Thu, Nov 18 2021

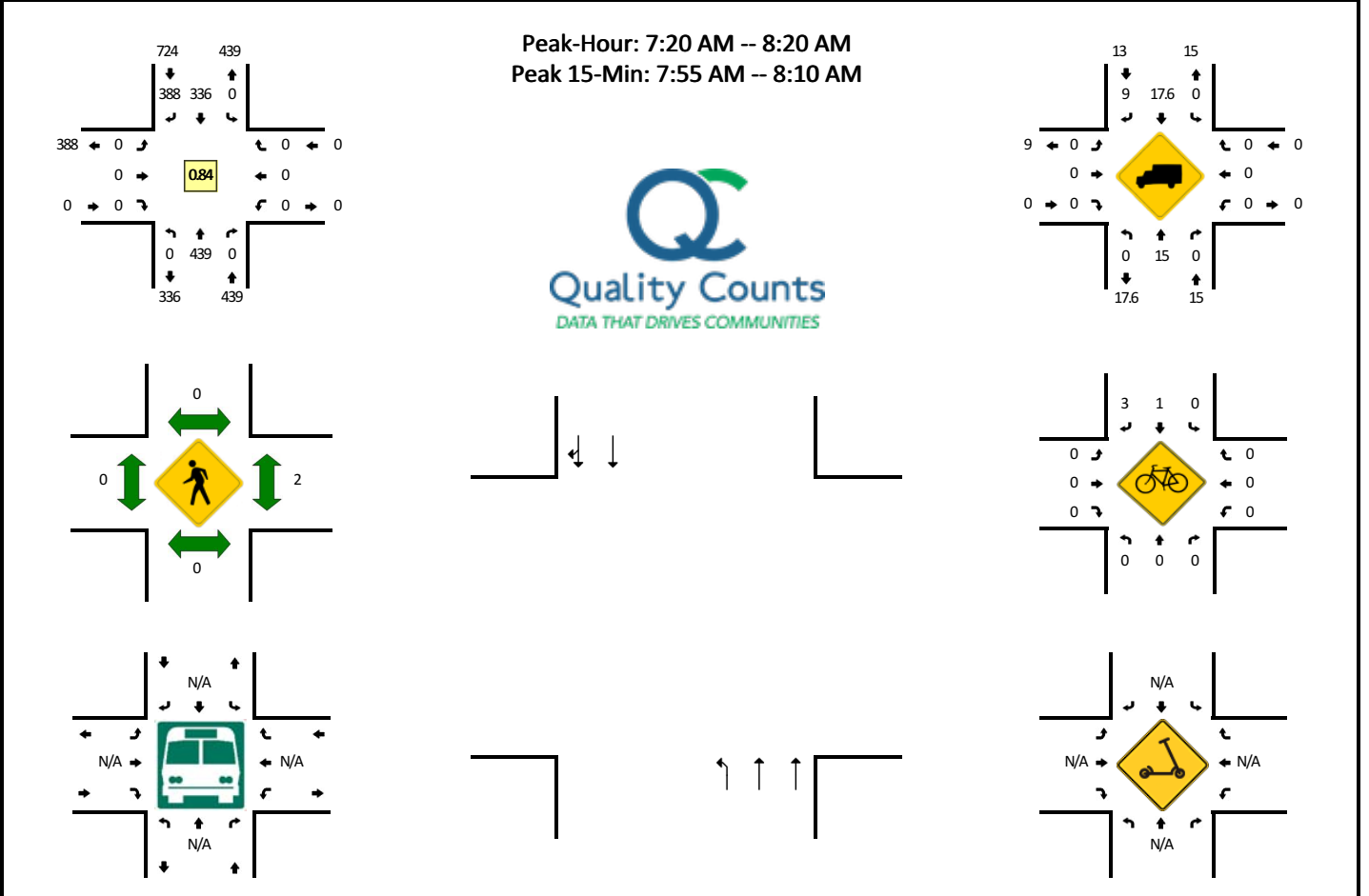


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				West St (Eastbound)				West St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	81	18	0	1	52	0	0	0	0	0	0	4	0	0	0	156	
4:05 PM	0	87	22	0	2	50	0	0	0	0	0	0	2	0	1	0	164	
4:10 PM	0	74	18	0	2	40	0	0	0	0	0	0	4	0	0	0	138	
4:15 PM	0	77	19	0	3	40	0	0	0	0	0	0	4	0	2	0	145	
4:20 PM	0	62	18	0	1	31	0	0	0	0	0	0	2	0	0	0	114	
4:25 PM	0	74	24	0	1	30	0	0	0	0	0	0	2	0	2	0	133	
4:30 PM	0	61	18	0	1	41	0	0	0	0	0	0	4	0	2	0	127	
4:35 PM	0	78	26	0	1	42	0	0	0	0	0	0	3	0	2	0	152	
4:40 PM	0	72	18	0	3	40	0	0	0	0	0	0	8	0	0	0	141	
4:45 PM	0	44	10	0	1	37	0	0	0	0	0	0	2	0	0	0	94	
4:50 PM	0	69	21	0	2	39	0	0	0	0	0	0	2	0	1	0	134	
4:55 PM	0	50	20	0	1	34	0	0	0	0	0	0	4	0	0	0	109	1607
5:00 PM	0	50	18	0	0	38	0	0	0	0	0	0	4	0	1	0	111	1562
5:05 PM	0	89	24	0	1	54	0	0	0	0	0	0	1	0	1	0	170	1568
5:10 PM	0	67	14	0	2	41	0	0	0	0	0	0	1	0	0	0	125	1555
5:15 PM	0	52	23	0	0	41	0	0	0	0	0	0	4	0	0	0	120	1530
5:20 PM	0	61	17	0	0	39	0	0	0	0	0	0	2	0	1	0	120	1536
5:25 PM	0	54	20	0	1	24	0	0	0	0	0	0	2	0	0	0	101	1504
5:30 PM	0	58	20	0	2	23	0	0	0	0	0	0	3	0	1	0	107	1484
5:35 PM	0	68	27	0	0	28	0	0	0	0	0	0	2	0	1	0	126	1458
5:40 PM	0	72	19	0	1	29	0	0	0	0	0	0	2	0	1	0	124	1441
5:45 PM	0	56	9	0	2	23	0	0	0	0	0	0	2	0	0	0	92	1439
5:50 PM	0	62	7	0	0	21	0	0	0	0	0	0	4	0	0	0	94	1399
5:55 PM	0	70	15	0	0	27	0	0	0	0	0	0	3	0	0	0	115	1405
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	968	232	0	20	568	0	0	0	0	0	0	40	0	4	0	1832	
Heavy Trucks	0	84	0	0	0	68	0	0	0	0	0	0	8	0	0	0	160	
Buses																		
Pedestrians		0				0				4				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

**LOCATION:** Clawiter Rd/Industrial Blvd (east) -- Clawiter Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606407  
**DATE:** Thu, Nov 18 2021



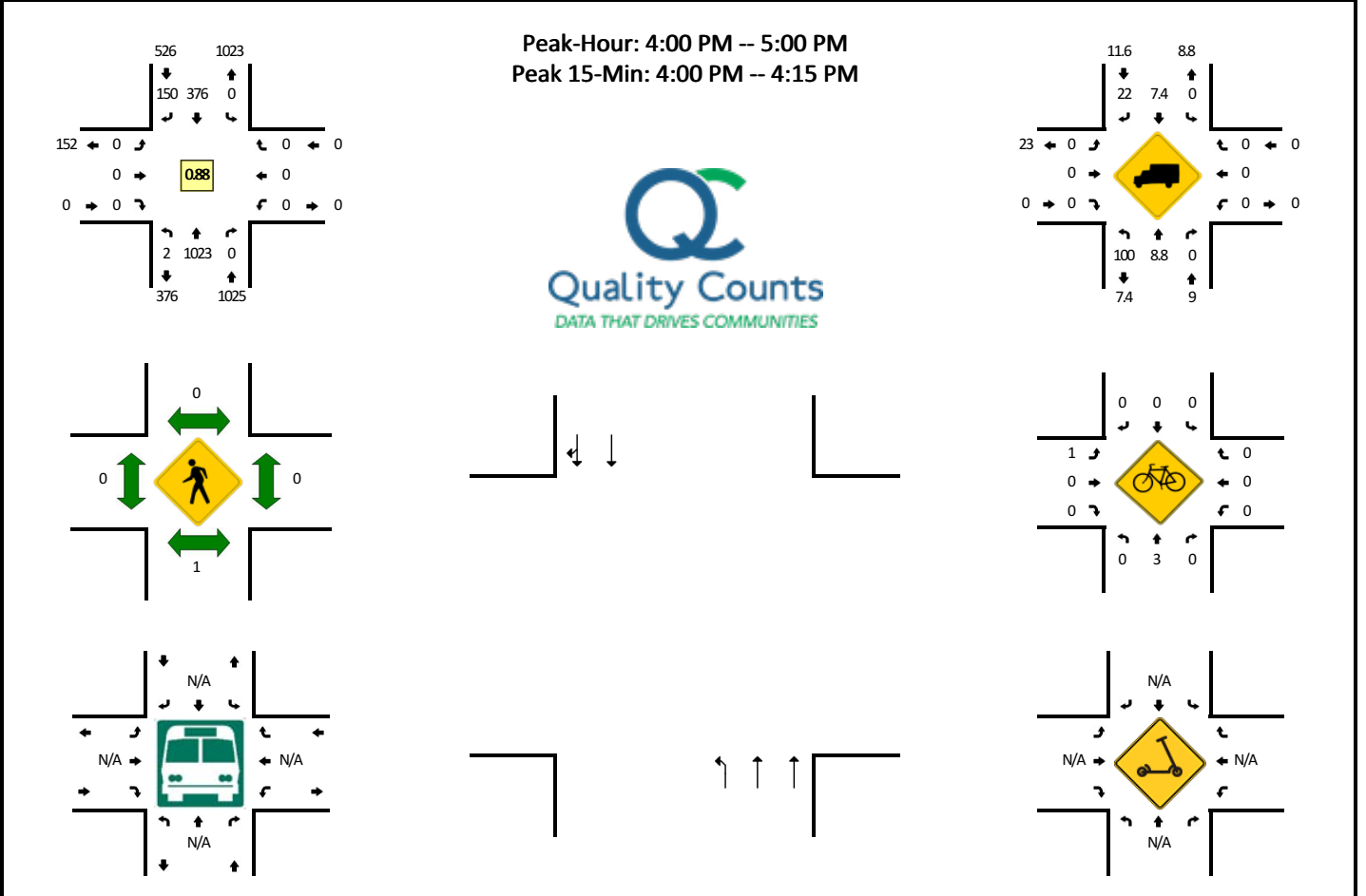
5-Min Count Period Beginning At	Clawiter Rd/Industrial Blvd (east) (Northbound)				Clawiter Rd/Industrial Blvd (east) (Southbound)				Clawiter Rd (Eastbound)				Clawiter Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	26	0	0	0	14	29	0	0	0	0	0	0	0	0	0	69	
7:05 AM	0	41	0	0	0	24	41	0	0	0	0	0	0	0	0	0	106	
7:10 AM	0	19	0	0	0	20	23	0	0	0	0	0	0	0	0	0	62	
7:15 AM	0	21	0	0	0	14	34	0	0	0	0	0	0	0	0	0	69	
7:20 AM	0	31	0	0	0	39	30	0	0	0	0	0	0	0	0	0	100	
7:25 AM	0	28	0	0	0	24	39	0	0	0	0	0	0	0	0	0	91	
7:30 AM	0	26	0	0	0	28	31	0	0	0	0	0	0	0	0	0	85	
7:35 AM	0	31	0	0	0	23	33	0	0	0	0	0	0	0	0	0	87	
7:40 AM	0	28	0	0	0	21	34	0	0	0	0	0	0	0	0	0	83	
7:45 AM	0	33	0	0	0	27	30	0	0	0	0	0	0	0	0	0	90	
7:50 AM	0	36	0	0	0	28	40	0	0	0	0	0	0	0	0	0	104	
7:55 AM	0	56	0	0	0	30	32	0	0	0	0	0	0	0	0	0	118	1064
8:00 AM	0	37	0	0	0	32	30	0	0	0	0	0	0	0	0	0	99	1094
8:05 AM	0	59	0	0	0	33	37	0	0	0	0	0	0	0	0	0	129	1117
8:10 AM	0	34	0	0	0	23	24	0	0	0	0	0	0	0	0	0	81	1136
8:15 AM	0	40	0	0	0	28	28	0	0	0	0	0	0	0	0	0	96	1163
8:20 AM	0	41	0	0	0	26	22	0	0	0	0	0	0	0	0	0	89	1152
8:25 AM	0	51	0	0	0	18	31	0	0	0	0	0	0	0	0	0	100	1161
8:30 AM	0	38	0	0	0	21	17	0	0	0	0	0	0	0	0	0	76	1152
8:35 AM	0	25	0	0	0	17	25	0	0	0	0	0	0	0	0	0	67	1132
8:40 AM	0	25	0	0	0	24	31	0	0	0	0	0	0	0	0	0	80	1129
8:45 AM	0	39	0	0	0	21	15	0	0	0	0	0	0	0	0	0	75	1114
8:50 AM	0	36	0	0	0	15	22	0	0	0	0	0	0	0	0	0	73	1083
8:55 AM	0	37	0	0	0	11	32	0	0	0	0	0	0	0	0	0	80	1045
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	608	0	0	0	380	396	0	0	0	0	0	0	0	0	0	1384	
Heavy Trucks	0	112	0	0	0	64	40	0	0	0	0	0	0	0	0	0	216	
Buses																		
Pedestrians		0				0				0				4			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																		

Comments:



**LOCATION:** Clawiter Rd/Industrial Blvd (east) -- Clawiter Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606408  
**DATE:** Thu, Nov 18 2021

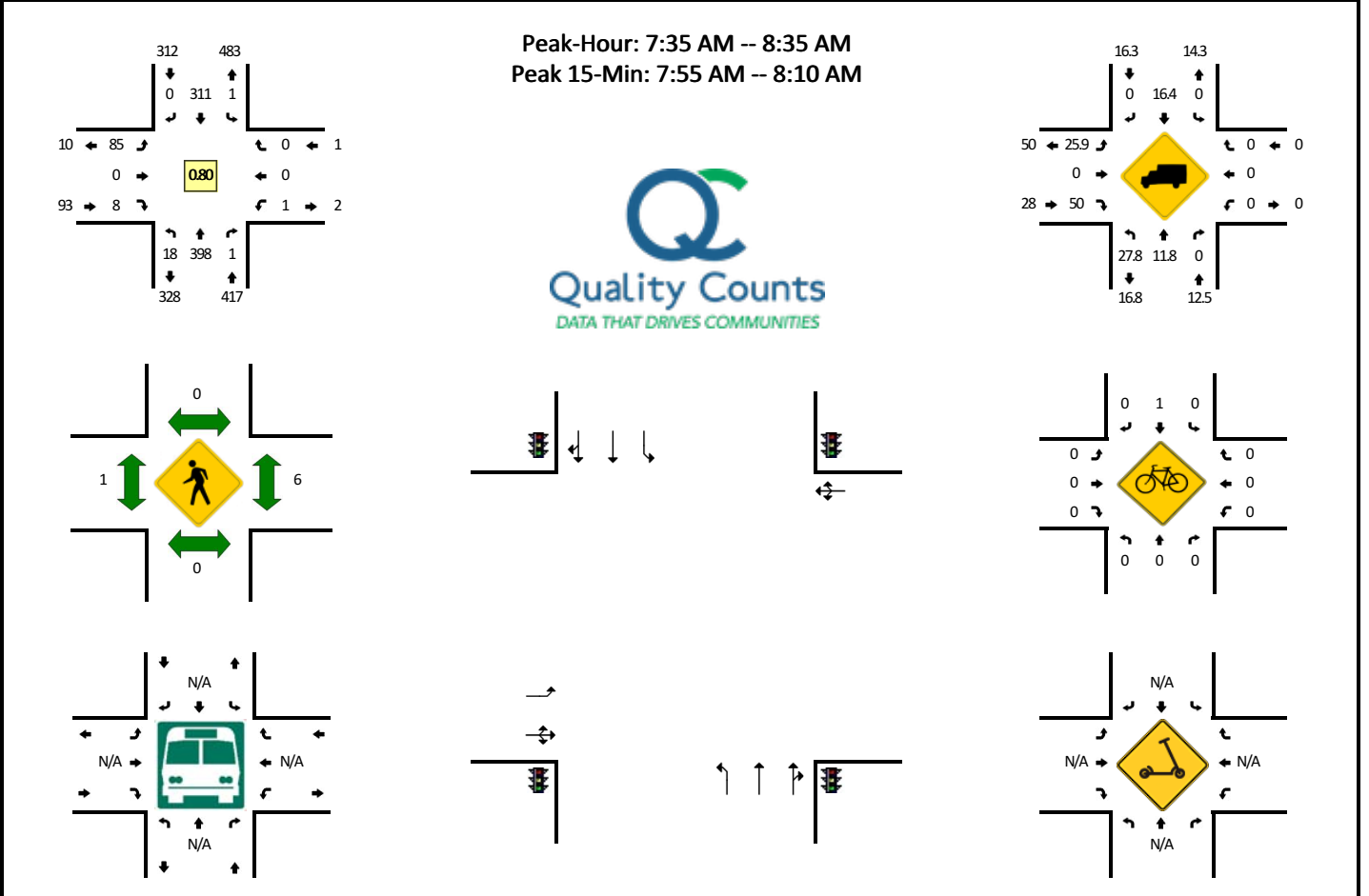


5-Min Count Period Beginning At	Clawiter Rd/Industrial Blvd (east) (Northbound)				Clawiter Rd/Industrial Blvd (east) (Southbound)				Clawiter Rd (Eastbound)				Clawiter Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	92	0	0	0	38	18	0	0	0	0	0	0	0	0	0	148	
4:05 PM	0	105	0	0	0	42	12	0	0	0	0	0	0	0	0	0	159	
4:10 PM	1	88	0	0	0	31	15	0	0	0	0	0	0	0	0	0	135	
4:15 PM	0	99	0	0	0	31	15	0	0	0	0	0	0	0	0	0	145	
4:20 PM	1	76	0	0	0	24	11	0	0	0	0	0	0	0	0	0	112	
4:25 PM	0	91	0	0	0	23	7	0	0	0	0	0	0	0	0	0	121	
4:30 PM	0	69	0	0	0	37	11	0	0	0	0	0	0	0	0	0	117	
4:35 PM	0	108	0	0	0	38	12	0	0	0	0	0	0	0	0	0	158	
4:40 PM	0	80	0	0	0	28	15	0	0	0	0	0	0	0	0	0	123	
4:45 PM	0	78	0	0	0	32	11	0	0	0	0	0	0	0	0	0	121	
4:50 PM	0	75	0	0	0	32	10	0	0	0	0	0	0	0	0	0	117	
4:55 PM	0	62	0	0	0	20	13	0	0	0	0	0	0	0	0	0	95	1551
5:00 PM	0	66	0	0	0	27	14	0	0	0	0	0	0	0	0	0	107	1510
5:05 PM	0	108	0	0	0	44	13	0	0	0	0	0	0	0	0	0	165	1516
5:10 PM	0	86	0	0	0	32	13	0	0	0	0	0	0	0	0	0	131	1512
5:15 PM	0	69	0	0	0	32	10	0	0	0	0	0	0	0	0	0	111	1478
5:20 PM	0	80	0	0	0	33	15	0	0	0	0	0	0	0	0	0	128	1494
5:25 PM	0	63	0	0	0	18	8	0	0	0	0	0	0	0	0	0	89	1462
5:30 PM	0	80	0	0	0	18	10	0	0	0	0	0	0	0	0	0	108	1453
5:35 PM	0	94	0	0	0	20	7	0	0	0	0	0	0	0	0	0	121	1416
5:40 PM	0	84	0	0	0	18	10	0	0	0	0	0	0	0	0	0	112	1405
5:45 PM	0	56	0	0	0	17	10	0	0	0	0	0	0	0	0	0	83	1367
5:50 PM	0	71	0	0	0	21	7	0	0	0	0	0	0	0	0	0	99	1349
5:55 PM	0	90	0	0	0	22	7	0	0	0	0	0	0	0	0	0	119	1373
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	4	1140	0	0	0	444	180	0	0	0	0	0	0	0	0	0	1768	
Heavy Trucks	4	84	0	0	0	32	40	0	0	0	0	0	0	0	0	0	160	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

*Comments:*

**LOCATION:** Clawiter Rd/Industrial Blvd (west) -- Clawiter Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606409  
**DATE:** Thu, Nov 18 2021

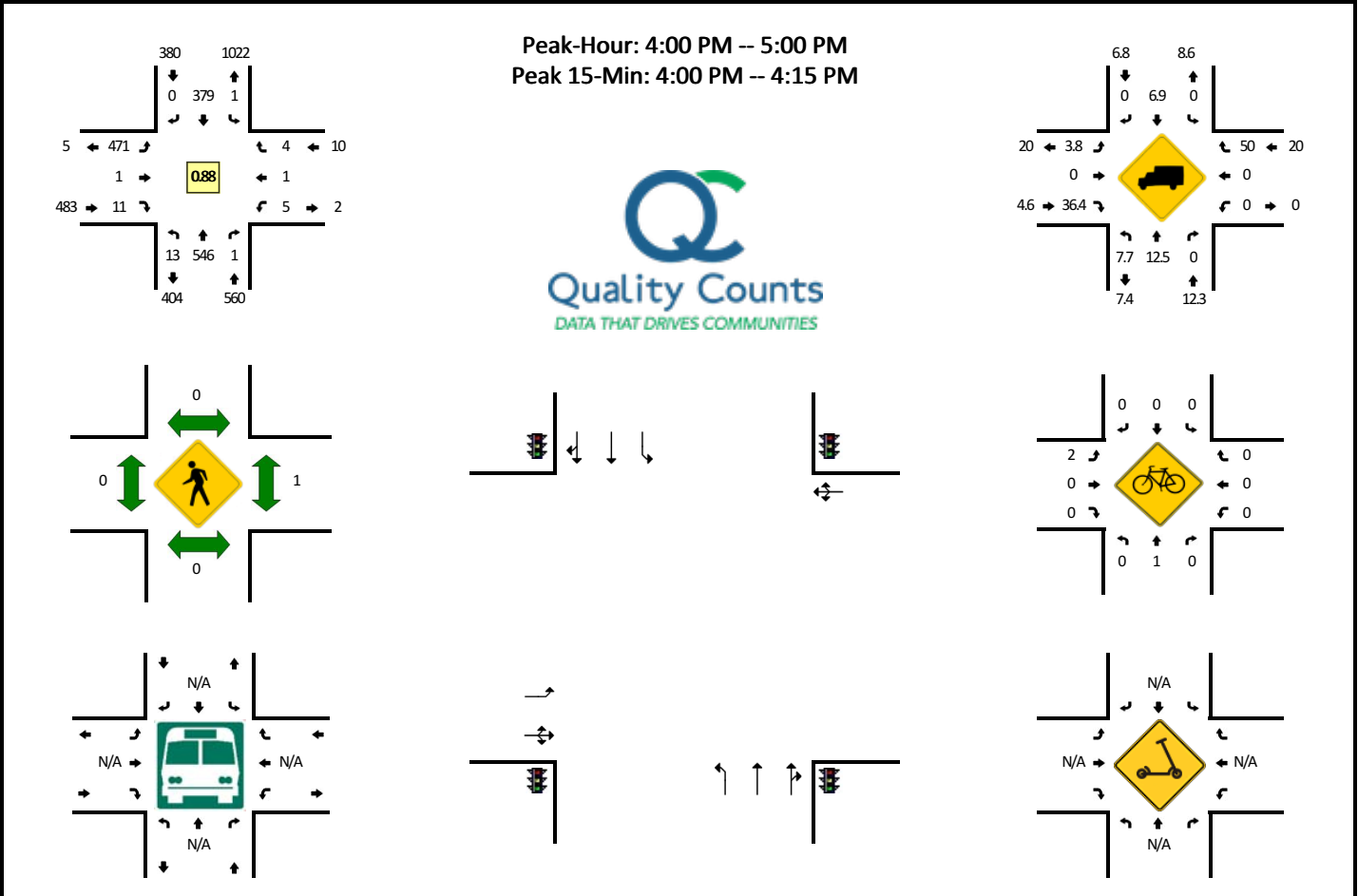


5-Min Count Period Beginning At	Clawiter Rd/Industrial Blvd (west) (Northbound)				Clawiter Rd/Industrial Blvd (west) (Southbound)				Clawiter Rd (Eastbound)				Clawiter Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	20	1	0	0	14	0	0	7	0	0	0	0	0	0	0	42	
7:05 AM	1	32	0	0	0	24	0	0	9	0	0	0	0	0	0	0	66	
7:10 AM	1	13	0	0	0	20	0	0	7	0	0	0	1	0	0	0	42	
7:15 AM	0	18	0	1	0	14	0	0	4	0	1	0	0	0	0	0	38	
7:20 AM	0	24	0	0	0	38	0	0	6	0	1	0	0	0	0	0	69	
7:25 AM	1	25	1	0	0	25	0	0	2	0	0	0	0	0	0	0	54	
7:30 AM	0	13	0	0	0	28	0	0	12	0	0	0	0	0	0	0	53	
7:35 AM	0	25	0	0	0	23	0	0	8	0	2	0	0	0	0	0	58	
7:40 AM	1	21	0	0	0	21	0	0	5	0	0	0	0	0	0	0	48	
7:45 AM	1	31	0	0	0	27	0	0	2	0	2	0	0	0	0	0	63	
7:50 AM	0	33	0	0	0	25	0	0	2	0	0	0	0	0	0	0	60	
7:55 AM	0	53	0	1	1	32	0	0	5	0	0	0	0	0	0	0	92	685
8:00 AM	3	35	1	0	0	32	0	0	6	0	1	0	0	0	0	0	78	721
8:05 AM	1	46	0	1	0	32	0	0	7	0	1	0	0	0	0	0	88	743
8:10 AM	0	28	0	3	0	21	0	0	10	0	1	0	0	0	0	0	63	764
8:15 AM	1	26	0	1	0	33	0	0	10	0	1	0	0	0	0	0	72	798
8:20 AM	1	35	0	1	0	26	0	0	6	0	0	0	0	0	0	0	69	798
8:25 AM	1	41	0	0	0	18	0	0	11	0	0	0	1	0	0	0	72	816
8:30 AM	1	24	0	1	0	21	0	0	13	0	0	0	0	0	0	0	60	823
8:35 AM	0	19	1	0	1	16	0	0	6	0	0	0	0	0	0	0	43	808
8:40 AM	0	18	1	0	0	25	0	0	7	1	0	0	1	0	0	0	53	813
8:45 AM	1	34	1	0	1	20	0	0	4	0	1	0	0	0	1	0	63	813
8:50 AM	0	28	0	0	0	14	0	0	7	0	1	0	1	0	0	0	51	804
8:55 AM	1	29	1	0	0	12	0	0	8	1	0	0	1	0	0	0	53	765
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	16	536	4	8	4	384	0	0	72	0	8	0	0	0	0	0	1032	
Heavy Trucks	12	88	0		0	60	0	0	24	0	8	0	0	0	0	0	192	
Buses																		
Pedestrians		0				0				4			4				8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

**LOCATION:** Clawiter Rd/Industrial Blvd (west) -- Clawiter Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606410  
**DATE:** Thu, Nov 18 2021

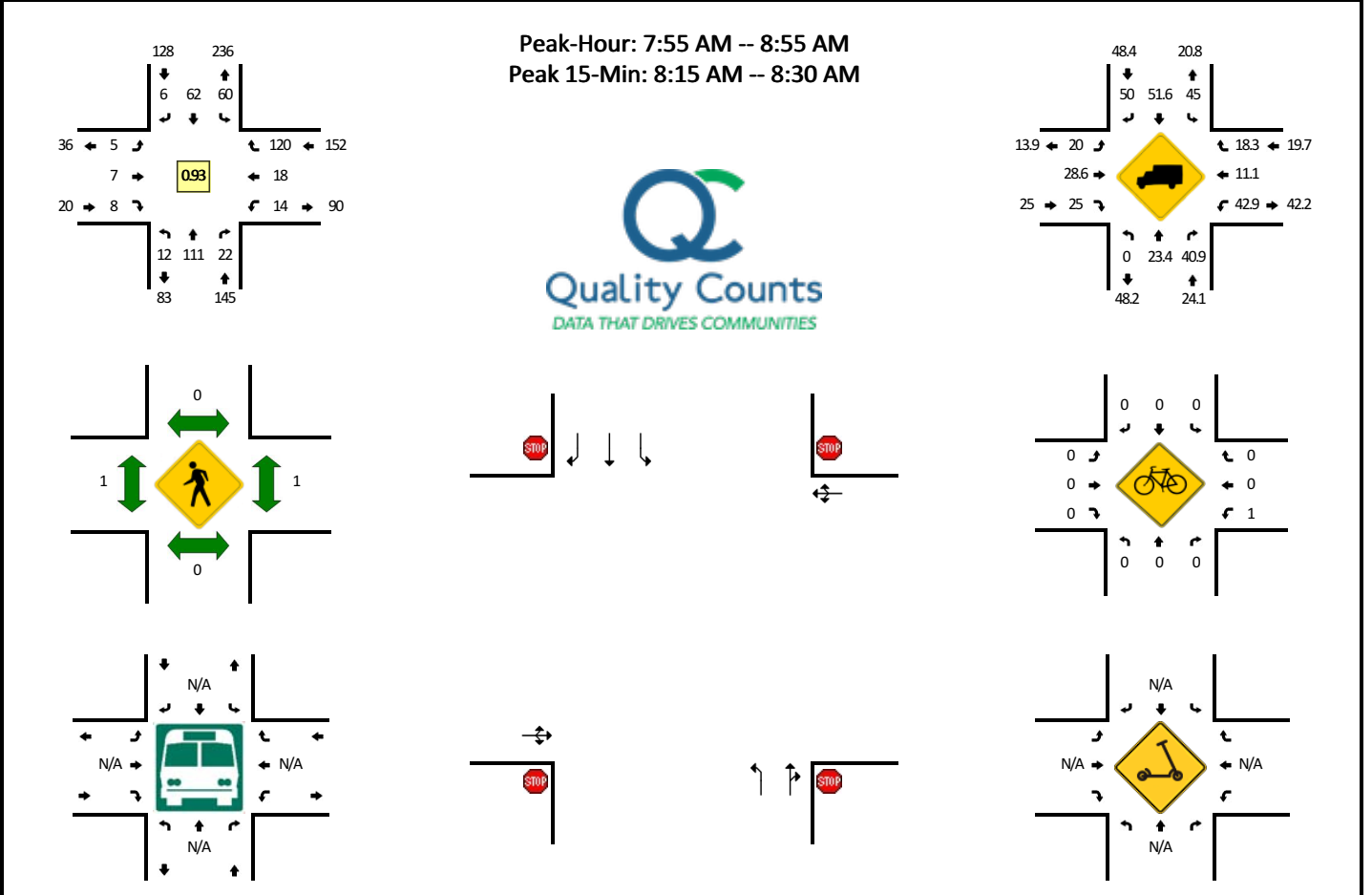


5-Min Count Period Beginning At	Clawiter Rd/Industrial Blvd (west) (Northbound)				Clawiter Rd/Industrial Blvd (west) (Southbound)				Clawiter Rd (Eastbound)				Clawiter Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	66	0	1	0	42	0	0	23	0	1	0	1	0	0	0	134	
4:05 PM	0	54	0	0	0	43	0	0	48	0	0	0	0	0	1	0	146	
4:10 PM	0	42	0	0	0	31	0	0	48	0	3	0	0	0	2	0	126	
4:15 PM	0	43	0	1	0	31	0	0	54	0	0	0	0	0	0	0	129	
4:20 PM	2	41	0	0	0	18	0	1	36	0	1	0	2	0	1	0	102	
4:25 PM	0	59	0	0	0	25	0	0	36	0	1	0	1	0	0	0	122	
4:30 PM	0	37	0	1	0	38	0	0	31	0	4	0	0	1	0	0	112	
4:35 PM	1	54	0	1	0	40	0	0	46	1	0	0	1	0	0	0	144	
4:40 PM	0	34	0	3	0	28	0	0	47	0	1	0	0	0	0	0	113	
4:45 PM	0	46	0	1	0	32	0	0	32	0	0	0	0	0	0	0	111	
4:50 PM	1	35	1	0	0	31	0	0	40	0	0	0	0	0	0	0	108	
4:55 PM	0	35	0	1	0	20	0	0	30	0	0	0	0	0	0	0	86	1433
5:00 PM	1	40	0	0	0	27	0	0	29	0	0	0	1	0	0	0	98	1397
5:05 PM	0	49	0	0	0	43	0	0	54	0	0	0	0	0	0	0	146	1397
5:10 PM	1	40	0	1	0	31	0	0	45	0	0	0	1	1	0	0	120	1391
5:15 PM	0	32	0	0	0	31	0	0	36	0	1	0	1	0	0	0	101	1363
5:20 PM	0	27	0	0	0	28	0	0	56	0	0	0	0	1	0	0	112	1373
5:25 PM	0	29	0	1	0	22	0	0	33	0	0	0	0	0	0	0	85	1336
5:30 PM	0	44	0	1	0	17	0	0	35	0	0	0	2	0	0	0	99	1323
5:35 PM	0	41	1	0	0	22	0	0	55	0	0	0	1	0	1	0	121	1300
5:40 PM	1	37	0	1	0	19	0	0	42	0	0	0	0	0	0	0	100	1287
5:45 PM	0	31	0	0	0	15	0	0	25	0	1	0	1	0	0	0	73	1249
5:50 PM	1	31	0	2	0	20	0	0	42	0	0	0	0	0	0	0	96	1237
5:55 PM	0	47	0	0	0	20	0	0	41	0	1	0	1	0	1	0	111	1262
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	648	0	4	0	464	0	0	476	0	16	0	4	0	12	0	1624	
Heavy Trucks	0	64	0	0	0	28	0	0	20	0	4	0	0	0	8	0	124	
Buses																		
Pedestrians		0				0				0				4			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*

**LOCATION:** Cabot Blvd/Whitesell St -- Depot Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606411  
**DATE:** Thu, Nov 18 2021

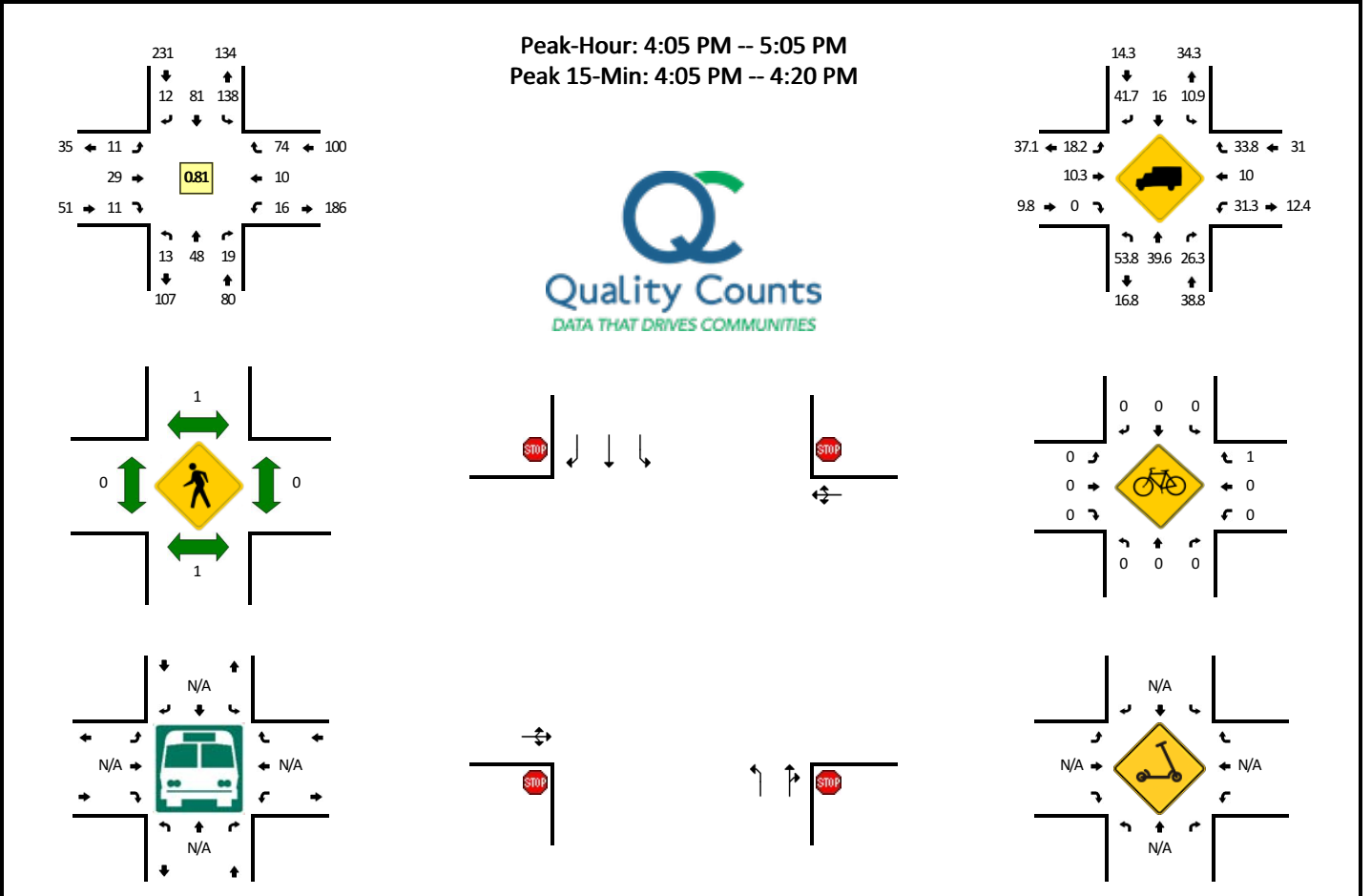


5-Min Count Period Beginning At	Cabot Blvd/Whitesell St (Northbound)				Cabot Blvd/Whitesell St (Southbound)				Depot Rd (Eastbound)				Depot Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	6	1	0	2	5	0	0	0	2	2	0	0	0	0	8	0	26	
7:05 AM	2	11	2	0	2	2	0	0	0	0	0	0	0	1	1	10	0	31	
7:10 AM	0	13	2	0	4	2	1	0	0	0	0	3	0	1	0	8	0	34	
7:15 AM	1	2	5	0	4	8	0	0	0	0	0	2	0	1	2	10	0	35	
7:20 AM	1	4	3	0	4	8	1	0	0	0	1	1	0	0	0	15	0	38	
7:25 AM	0	10	1	0	8	7	0	0	0	0	1	0	0	0	0	8	0	35	
7:30 AM	1	12	0	0	4	4	0	0	0	0	0	0	0	1	1	8	0	31	
7:35 AM	1	8	1	0	6	5	0	0	0	1	0	0	0	0	4	7	0	33	
7:40 AM	2	11	1	0	4	4	0	0	0	0	1	2	0	1	0	6	0	32	
7:45 AM	5	9	1	0	4	5	1	0	0	0	0	0	0	1	3	3	0	32	
7:50 AM	0	8	1	0	5	5	1	0	0	0	1	0	0	0	1	13	0	35	
7:55 AM	3	12	5	0	4	5	1	0	2	1	0	0	0	0	0	11	1	45	407
8:00 AM	0	10	2	0	1	3	0	0	0	0	0	0	0	2	2	12	0	32	413
8:05 AM	1	8	0	0	3	5	1	0	1	0	1	0	0	0	3	10	0	33	415
8:10 AM	2	7	3	0	1	6	1	0	0	1	2	0	0	1	1	9	0	34	415
8:15 AM	1	11	2	0	6	6	2	0	0	0	0	0	0	1	1	12	0	42	422
8:20 AM	0	12	0	0	8	6	0	0	0	1	0	0	0	1	1	13	0	42	426
8:25 AM	1	7	2	0	8	3	0	0	0	0	1	0	0	0	2	12	0	36	427
8:30 AM	0	9	2	0	4	4	0	0	0	1	1	0	0	2	2	12	0	37	433
8:35 AM	3	9	2	0	6	7	0	0	0	2	1	0	0	1	1	6	0	38	438
8:40 AM	0	7	2	0	5	3	0	0	1	0	0	0	0	1	2	8	0	29	435
8:45 AM	0	7	1	0	8	5	1	0	0	1	1	0	0	2	0	10	0	36	439
8:50 AM	1	12	1	0	6	9	0	0	1	0	1	0	0	2	3	5	0	41	445
8:55 AM	1	15	0	0	4	2	0	0	0	0	1	0	0	0	1	5	0	29	429
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	8	120	16	0	88	60	8	0	0	4	4	0	8	16	148	0	480		
Heavy Trucks	0	16	8		44	44	8		0	0	4		8	0	32		164		
Buses																			
Pedestrians		0				0				0				0				0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																		0	

*Comments:*

**LOCATION:** Cabot Blvd/Whitesell St -- Depot Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606412  
**DATE:** Thu, Nov 18 2021

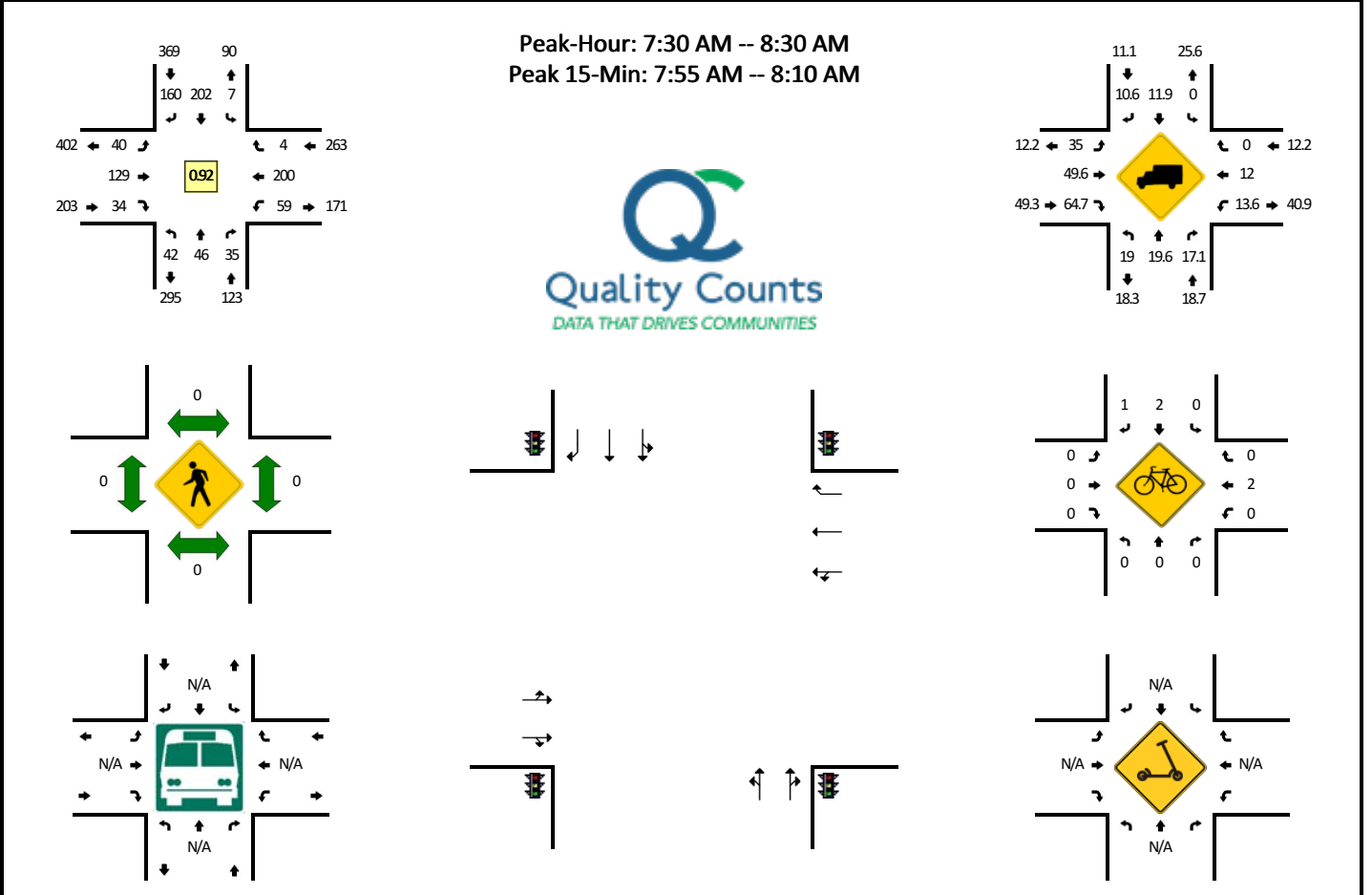


5-Min Count Period Beginning At	Cabot Blvd/Whitesell St (Northbound)				Cabot Blvd/Whitesell St (Southbound)				Depot Rd (Eastbound)				Depot Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	6	0	0	12	7	0	0	1	7	2	0	0	1	3	0	41	
4:05 PM	0	5	4	0	14	5	0	0	1	7	2	0	0	4	11	0	53	
4:10 PM	3	8	2	0	10	3	1	0	4	3	4	0	2	1	9	0	50	
4:15 PM	1	2	2	0	13	8	1	0	0	1	1	0	1	0	10	0	40	
4:20 PM	0	4	1	0	5	4	4	0	0	2	0	0	0	1	4	0	25	
4:25 PM	0	6	3	0	13	7	0	0	0	1	0	0	0	1	5	0	36	
4:30 PM	0	3	2	0	17	7	0	0	1	3	0	0	1	1	11	0	46	
4:35 PM	1	3	1	0	15	10	1	0	0	3	1	0	2	0	4	0	41	
4:40 PM	2	2	0	0	10	6	1	0	2	3	1	0	1	1	4	0	33	
4:45 PM	1	2	2	0	8	8	1	0	1	1	1	0	1	0	6	0	32	
4:50 PM	3	1	0	0	12	10	0	0	1	0	0	0	3	0	3	0	33	
4:55 PM	1	8	1	0	6	4	0	1	0	0	0	0	2	0	4	0	27	457
5:00 PM	1	4	1	0	14	9	3	0	1	5	1	0	2	1	3	1	46	462
5:05 PM	1	8	0	0	11	4	2	0	2	1	0	0	0	1	6	0	36	445
5:10 PM	0	1	0	0	12	15	0	0	2	3	1	0	0	0	2	0	36	431
5:15 PM	0	5	4	0	10	10	1	0	0	3	2	0	0	0	4	0	39	430
5:20 PM	0	3	1	0	5	5	1	0	1	3	3	0	1	1	2	0	26	431
5:25 PM	0	3	0	0	6	6	0	0	2	3	1	0	0	0	2	0	23	418
5:30 PM	0	4	0	0	15	8	0	0	0	2	0	0	0	0	4	0	33	405
5:35 PM	0	3	0	0	8	11	0	0	2	0	1	0	0	1	3	0	29	393
5:40 PM	0	4	0	0	7	4	0	0	2	0	0	0	0	1	4	0	22	382
5:45 PM	0	1	0	0	6	6	0	0	0	0	1	0	1	0	1	0	16	366
5:50 PM	2	1	0	0	2	3	1	0	0	1	1	0	0	0	0	0	11	344
5:55 PM	0	5	0	0	5	3	0	0	0	0	1	0	0	0	0	0	14	331
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	16	60	32	0	148	64	8	0	20	44	28	0	12	20	120	0	572	
Heavy Trucks	12	12	4		20	16	4		8	0	0		4	4	36		120	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*

**LOCATION:** Clawiter Rd -- Depot Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606413  
**DATE:** Thu, Nov 18 2021

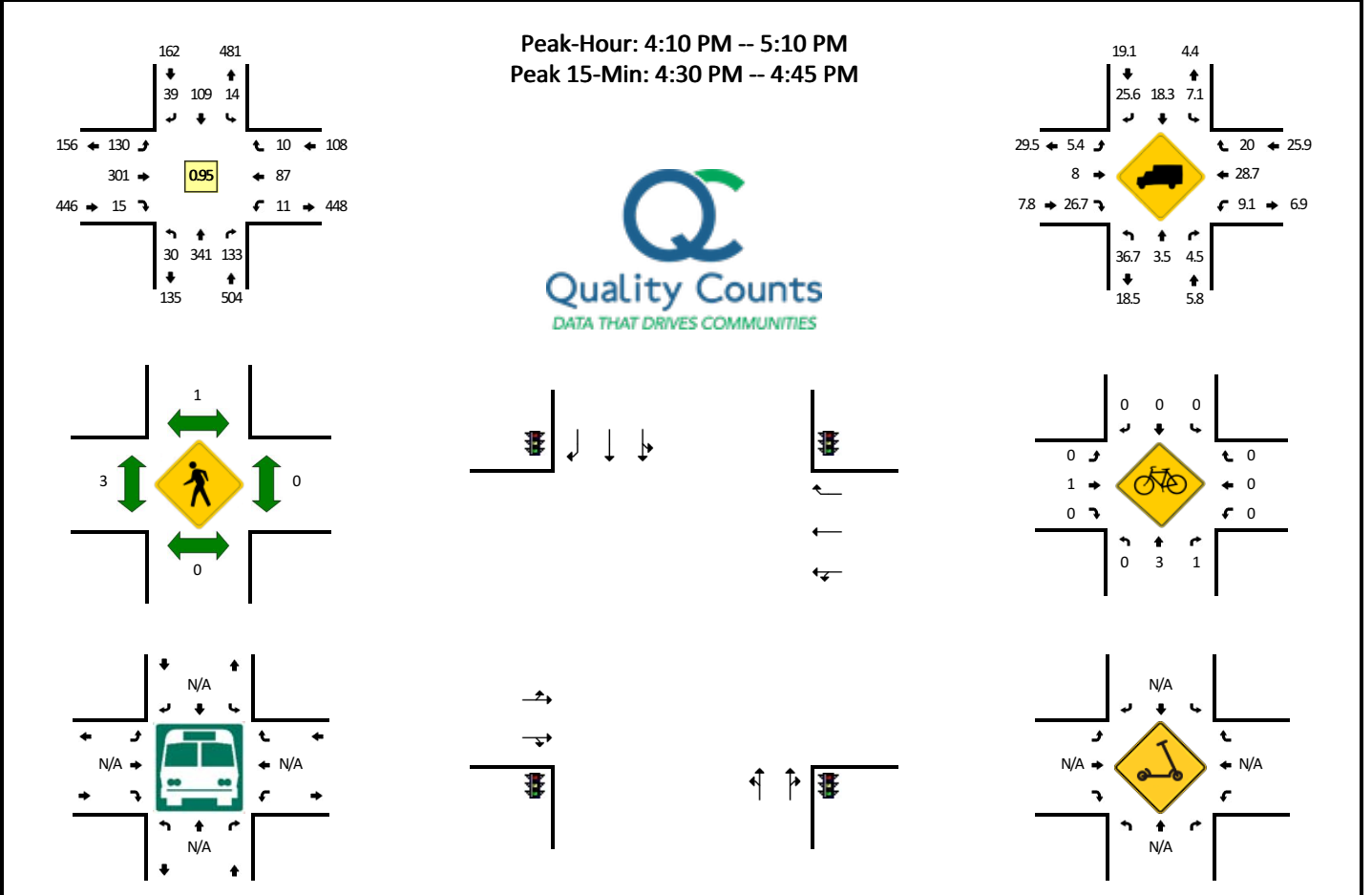


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				Depot Rd (Eastbound)				Depot Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	1	1	0	0	10	19	0	2	9	0	0	4	17	0	0	65	
7:05 AM	5	4	3	0	1	20	15	0	5	10	1	0	4	11	2	0	81	
7:10 AM	0	4	2	0	0	17	8	0	3	6	2	0	2	15	1	0	60	
7:15 AM	5	3	0	0	1	22	11	0	3	10	3	0	6	10	1	0	75	
7:20 AM	1	2	0	0	0	23	6	0	1	16	5	0	2	17	3	0	76	
7:25 AM	5	3	2	0	1	23	12	0	1	6	4	0	2	13	0	0	72	
7:30 AM	2	5	3	0	0	21	14	0	3	12	3	0	1	14	0	0	78	
7:35 AM	3	6	1	0	2	16	13	0	3	13	4	0	3	6	0	0	70	
7:40 AM	6	3	0	0	0	19	17	0	3	5	3	0	2	19	2	0	79	
7:45 AM	2	2	0	0	1	14	14	0	1	10	6	0	6	15	1	0	72	
7:50 AM	5	2	4	0	0	18	20	0	1	12	1	0	5	19	0	0	87	
7:55 AM	3	1	3	0	0	15	15	0	3	11	3	0	7	24	0	0	85	900
8:00 AM	4	3	3	0	1	21	8	0	4	17	2	0	9	16	0	0	88	923
8:05 AM	4	5	2	0	2	21	15	0	5	10	5	0	5	14	0	0	88	930
8:10 AM	3	4	7	0	0	14	9	0	2	5	1	0	2	16	1	0	64	934
8:15 AM	3	4	3	0	0	17	10	0	6	13	3	0	6	14	0	0	79	938
8:20 AM	5	3	6	0	1	12	10	0	5	10	3	0	9	21	0	0	85	947
8:25 AM	2	8	3	0	0	14	15	0	4	11	0	0	4	22	0	0	83	958
8:30 AM	5	5	2	0	2	10	9	0	4	12	5	0	2	9	0	0	65	945
8:35 AM	1	5	6	0	0	16	10	0	2	5	4	0	2	13	2	0	66	941
8:40 AM	3	4	5	0	0	12	11	0	4	8	2	0	6	18	1	0	74	936
8:45 AM	6	3	1	0	0	14	10	0	2	11	2	0	2	15	2	0	68	932
8:50 AM	5	4	2	0	2	17	4	0	0	8	5	0	1	12	0	0	60	905
8:55 AM	1	6	0	0	0	17	13	0	3	10	3	0	1	12	0	1	67	887
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	44	36	32	0	12	228	152	0	48	152	40	0	84	216	0	0	1044	
Heavy Trucks	12	4	4		0	16	24		20	80	20		8	28	0		216	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4	
Scoters																		

*Comments:*

**LOCATION:** Clawiter Rd -- Depot Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606414  
**DATE:** Thu, Nov 18 2021

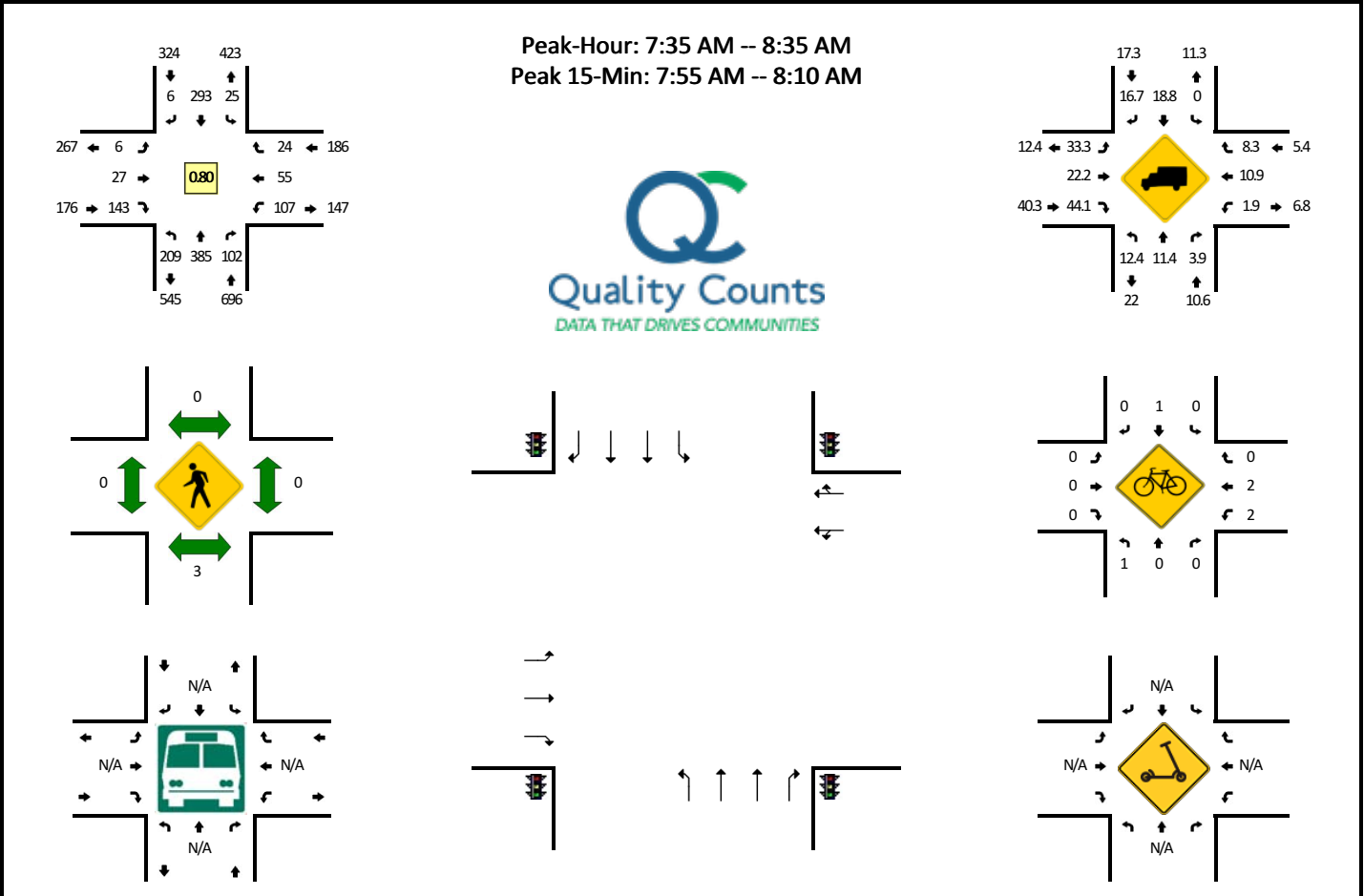


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				Depot Rd (Eastbound)				Depot Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	22	12	0	0	13	4	0	11	31	2	0	2	10	2	0	112	
4:05 PM	1	47	14	0	1	6	4	0	9	29	1	0	2	9	2	0	125	
4:10 PM	2	26	13	0	2	16	3	0	12	34	2	0	1	10	1	0	122	
4:15 PM	2	34	6	0	2	10	3	0	10	29	0	0	3	7	2	0	108	
4:20 PM	2	26	14	0	0	9	4	0	10	14	0	0	1	6	0	0	86	
4:25 PM	3	25	9	0	1	4	1	0	8	25	0	0	2	7	3	0	88	
4:30 PM	4	27	8	0	2	8	2	0	18	29	5	0	0	13	0	0	116	
4:35 PM	1	27	14	0	0	8	5	0	18	32	1	0	1	3	0	0	110	
4:40 PM	3	32	14	0	0	10	2	0	6	18	1	0	1	9	0	0	96	
4:45 PM	2	27	16	0	3	9	2	0	9	17	2	0	0	6	2	0	95	
4:50 PM	3	29	6	0	1	9	3	0	7	26	2	0	0	6	0	0	92	
4:55 PM	3	22	8	0	1	8	7	0	3	11	0	0	0	5	1	0	69	1219
5:00 PM	1	25	13	0	1	9	5	0	12	33	2	0	2	6	1	0	110	1217
5:05 PM	4	41	12	0	1	9	2	0	17	33	0	0	0	9	0	0	128	1220
5:10 PM	3	26	6	0	1	9	6	0	9	24	1	0	0	3	1	0	89	1187
5:15 PM	6	24	7	0	0	8	4	0	17	24	2	0	1	5	0	0	98	1177
5:20 PM	0	35	12	0	1	10	5	0	16	15	2	0	1	4	0	0	101	1192
5:25 PM	3	21	2	0	0	9	2	0	7	13	2	0	0	2	0	0	61	1165
5:30 PM	1	33	15	0	0	7	2	0	12	25	3	0	0	7	0	0	105	1154
5:35 PM	2	33	13	0	0	5	0	0	15	19	2	0	0	6	0	0	95	1139
5:40 PM	5	35	10	0	0	11	1	0	7	9	0	0	0	7	0	0	85	1128
5:45 PM	0	25	4	0	0	11	1	0	6	17	0	0	2	0	0	0	66	1099
5:50 PM	2	27	6	0	0	5	1	0	8	14	1	0	0	1	0	0	65	1072
5:55 PM	1	33	2	0	1	5	1	0	11	16	1	0	0	2	0	0	73	1076
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	32	344	144	0	8	104	36	0	168	316	28	0	8	100	0	0	1288	
Heavy Trucks	8	4	12		0	8	16		12	36	8		0	36	0	0	140	
Buses																		
Pedestrians		0				0				4				0			4	
Bicycles	0	4	0		0	0	0		0	4	0		0	0	0		8	
Scoters																		

Comments:

**LOCATION:** Industrial Blvd -- Depot Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606415  
**DATE:** Thu, Nov 18 2021



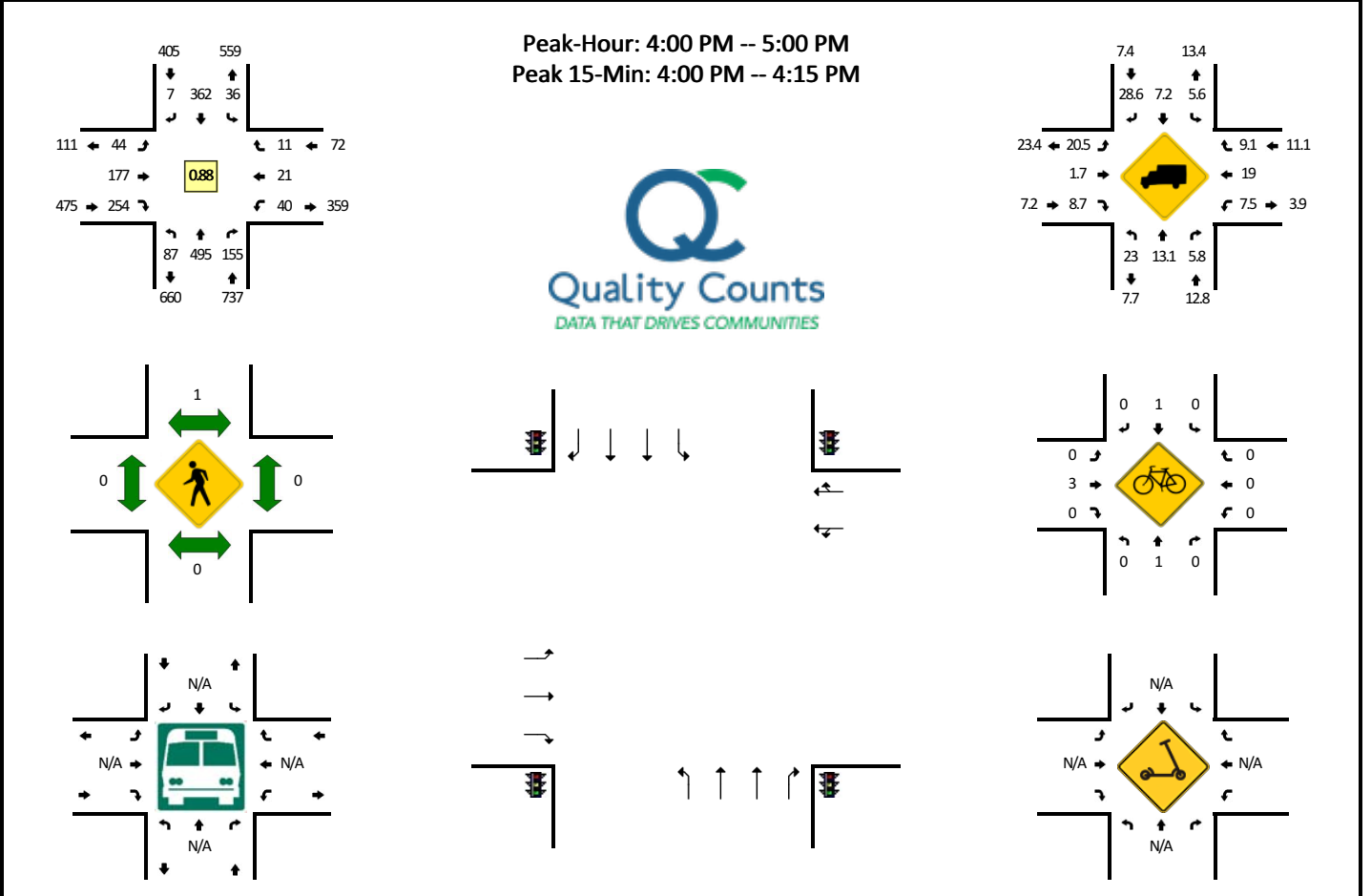
5-Min Count Period Beginning At	Industrial Blvd (Northbound)				Industrial Blvd (Southbound)				Depot Rd (Eastbound)				Depot Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	15	22	3	0	1	14	0	0	0	1	7	0	2	5	3	0	73	
7:05 AM	16	31	4	0	2	22	0	0	1	3	7	0	5	5	1	0	97	
7:10 AM	10	15	3	0	0	19	2	0	0	0	12	0	5	4	1	0	71	
7:15 AM	15	17	2	0	0	15	1	0	1	2	8	0	7	6	2	0	76	
7:20 AM	16	22	2	0	1	37	0	0	0	1	13	0	5	3	2	0	102	
7:25 AM	12	27	4	0	2	23	1	0	1	1	9	0	12	5	1	0	98	
7:30 AM	8	14	3	1	1	22	2	0	0	2	10	0	9	6	0	0	78	
7:35 AM	6	26	5	0	1	21	2	1	0	1	9	0	6	5	0	0	83	
7:40 AM	22	21	5	0	4	16	1	0	1	3	9	0	3	2	4	0	91	
7:45 AM	16	28	8	0	1	26	0	0	1	0	10	0	9	6	1	0	106	
7:50 AM	24	40	7	1	4	22	0	4	0	1	13	0	6	4	3	0	129	
7:55 AM	20	41	19	0	2	28	0	0	0	2	14	0	8	7	3	1	145	1149
8:00 AM	27	36	8	0	2	28	1	0	1	2	15	0	14	3	2	0	139	1215
8:05 AM	15	40	17	1	0	32	0	1	1	0	13	0	15	7	4	0	146	1264
8:10 AM	12	32	8	0	0	23	0	0	0	3	12	0	10	3	0	0	103	1296
8:15 AM	16	37	7	0	2	25	0	0	1	5	12	0	15	4	0	0	124	1344
8:20 AM	20	22	9	0	0	32	1	0	1	3	12	0	10	8	2	0	120	1362
8:25 AM	18	39	5	1	0	21	1	1	0	3	12	0	4	6	4	0	115	1379
8:30 AM	10	23	4	0	1	19	0	1	0	4	12	0	6	0	1	0	81	1382
8:35 AM	10	20	3	0	1	14	1	1	1	1	9	0	7	7	1	0	76	1375
8:40 AM	20	18	1	0	0	23	0	0	1	4	7	0	4	6	0	0	84	1368
8:45 AM	16	35	7	0	2	18	1	0	0	1	12	0	3	2	4	0	101	1363
8:50 AM	14	25	3	0	2	19	0	1	0	0	9	0	4	3	4	0	84	1318
8:55 AM	9	29	6	0	1	12	0	0	0	4	9	0	5	5	0	0	80	1253
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	248	468	176	4	16	352	4	4	8	16	168	0	148	68	36	4	1720	
Heavy Trucks	32	80	8		0	60	0		8	0	80		4	4	0		276	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4	
Scoters																		

*Comments:*



**LOCATION:** Industrial Blvd -- Depot Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606416  
**DATE:** Thu, Nov 18 2021

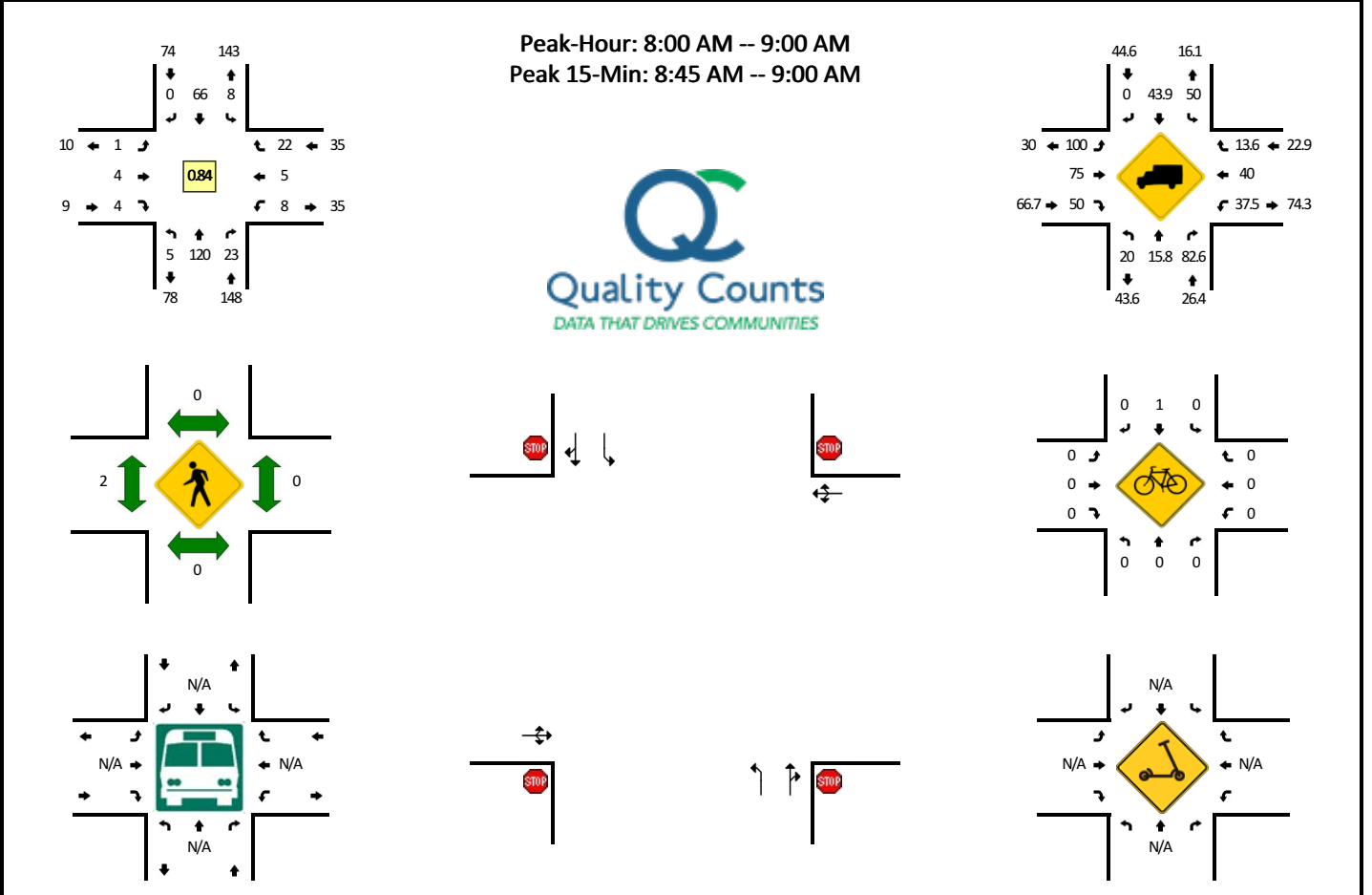


5-Min Count Period Beginning At	Industrial Blvd (Northbound)				Industrial Blvd (Southbound)				Depot Rd (Eastbound)				Depot Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	8	57	7	0	2	38	0	1	3	21	21	0	6	1	3	0	168	
4:05 PM	12	49	7	0	1	37	1	0	6	14	26	0	5	1	1	0	160	
4:10 PM	10	40	15	0	4	33	2	0	6	10	25	0	6	0	0	0	151	
4:15 PM	8	39	11	0	4	23	2	0	3	12	22	0	5	1	1	0	131	
4:20 PM	8	41	14	1	1	25	0	2	2	11	21	0	2	3	1	0	132	
4:25 PM	7	49	12	0	2	24	1	0	5	19	21	0	3	2	1	0	146	
4:30 PM	10	38	15	0	6	36	0	2	5	18	19	0	4	2	0	0	155	
4:35 PM	1	41	16	0	1	41	0	0	3	19	24	0	1	0	0	0	147	
4:40 PM	9	34	10	0	0	28	0	0	1	13	19	0	1	1	0	0	116	
4:45 PM	0	42	20	0	2	25	0	2	3	11	26	0	2	7	1	0	141	
4:50 PM	5	31	16	0	2	29	1	2	2	16	17	0	3	2	2	0	128	
4:55 PM	5	34	12	3	2	23	0	0	5	13	13	0	2	1	1	0	114	1689
5:00 PM	7	44	13	1	0	29	0	1	1	17	24	0	3	0	1	0	141	1662
5:05 PM	9	36	15	0	6	27	0	0	5	26	24	0	3	1	0	0	152	1654
5:10 PM	1	41	18	1	3	34	0	0	0	7	19	0	4	0	2	0	130	1633
5:15 PM	5	29	11	0	2	38	0	1	5	17	14	0	3	1	1	0	127	1629
5:20 PM	5	20	11	0	5	28	0	1	5	14	13	0	4	1	0	0	107	1604
5:25 PM	5	25	7	0	1	19	0	0	1	9	12	0	1	0	0	0	80	1538
5:30 PM	2	42	11	0	2	19	0	0	3	12	22	0	7	1	1	0	122	1505
5:35 PM	7	40	19	0	2	25	0	0	5	4	23	0	0	0	1	0	126	1484
5:40 PM	7	30	14	0	1	20	0	1	1	8	13	0	1	0	0	0	96	1464
5:45 PM	1	29	9	0	1	17	0	0	4	10	11	0	4	1	1	0	88	1411
5:50 PM	1	29	15	0	4	20	0	0	2	7	15	0	1	0	0	0	94	1377
5:55 PM	1	42	19	0	1	17	1	1	2	4	9	0	1	3	2	0	103	1366
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	120	584	116	0	28	432	12	4	60	180	288	0	68	8	16	0	1916	
Heavy Trucks	32	68	12	0	0	28	0	0	12	4	20	0	12	0	4	0	192	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

**LOCATION:** Whitesell St -- Enterprise Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606417  
**DATE:** Thu, Dec 2 2021

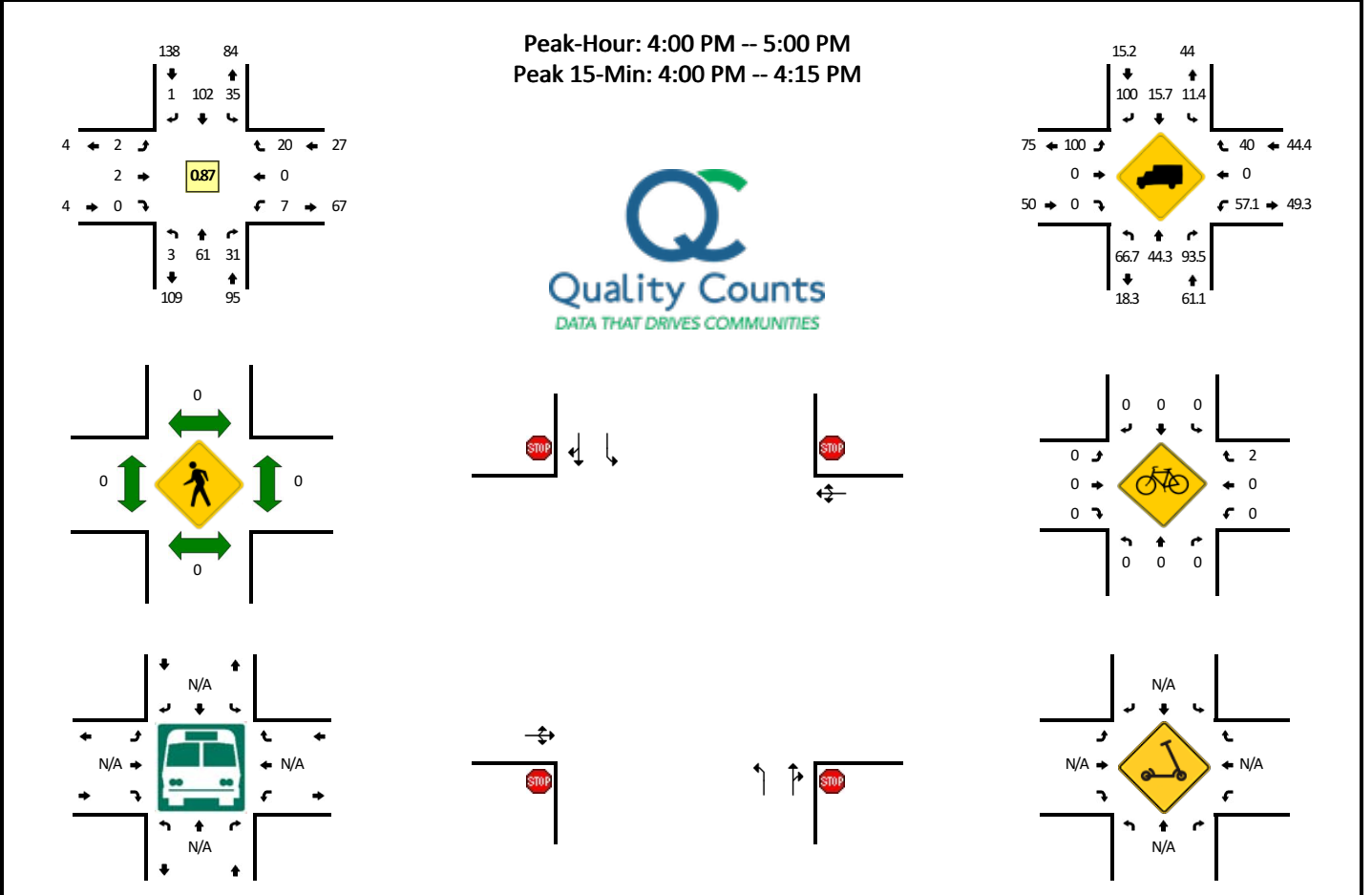


5-Min Count Period Beginning At	Whitesell St (Northbound)				Whitesell St (Southbound)				Enterprise Ave (Eastbound)				Enterprise Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	8	0	0	1	8	0	0	0	0	1	0	0	0	1	0	19	
7:05 AM	0	8	0	0	0	4	0	0	0	0	1	0	0	1	2	0	16	
7:10 AM	1	9	0	0	1	3	0	0	0	0	0	0	1	0	3	0	18	
7:15 AM	0	9	0	0	1	9	0	0	0	0	0	0	1	0	0	0	20	
7:20 AM	0	17	0	0	0	9	0	0	0	0	0	0	1	1	2	0	30	
7:25 AM	0	6	1	0	0	5	0	0	0	0	0	0	0	0	2	0	14	
7:30 AM	1	7	0	0	0	8	0	0	1	0	0	0	0	1	0	0	18	
7:35 AM	0	13	0	0	0	18	0	0	0	0	0	0	1	0	0	0	32	
7:40 AM	1	10	0	0	0	5	0	0	2	0	0	0	1	1	1	0	21	
7:45 AM	0	11	1	0	0	6	0	0	0	0	0	0	0	1	1	0	20	
7:50 AM	0	11	0	0	1	2	0	0	0	0	0	0	0	1	0	0	15	
7:55 AM	0	14	0	0	1	8	0	0	0	0	0	0	0	0	2	0	25	248
8:00 AM	0	11	1	0	1	7	0	0	1	0	0	0	0	0	0	0	21	250
8:05 AM	0	10	0	0	0	7	0	0	0	0	0	0	1	3	1	0	22	256
8:10 AM	1	6	0	0	1	6	0	0	0	0	0	0	0	0	2	0	16	254
8:15 AM	1	11	2	0	1	2	0	0	0	1	0	0	0	0	2	0	20	254
8:20 AM	1	6	1	0	2	11	0	0	0	0	1	0	0	0	2	0	24	248
8:25 AM	0	10	3	0	0	5	0	0	0	0	0	0	1	0	1	0	20	254
8:30 AM	2	12	3	0	0	6	0	0	0	0	1	0	0	0	1	0	25	261
8:35 AM	0	5	2	0	1	3	0	0	0	0	1	0	1	1	3	0	17	246
8:40 AM	0	9	4	0	0	4	0	0	0	0	0	0	0	0	5	0	22	247
8:45 AM	0	11	3	0	0	6	0	0	0	2	1	0	3	0	2	0	28	255
8:50 AM	0	12	2	0	0	7	0	0	0	0	0	0	1	0	1	0	23	263
8:55 AM	0	17	2	0	2	2	0	0	0	1	0	0	1	1	2	0	28	266
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	160	28	0	8	60	0	0	0	12	4	0	20	4	20	0	316	
Heavy Trucks	0	32	20		4	28	0		0	8	4		4	0	4		104	
Buses																		
Pedestrians		0				0				4				0			4	
Bicycles	0	0	0		0	4	0		0	0	0		0	0	0		4	
Scoters																		

*Comments:*

**LOCATION:** Whitesell St -- Enterprise Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606418  
**DATE:** Thu, Dec 2 2021

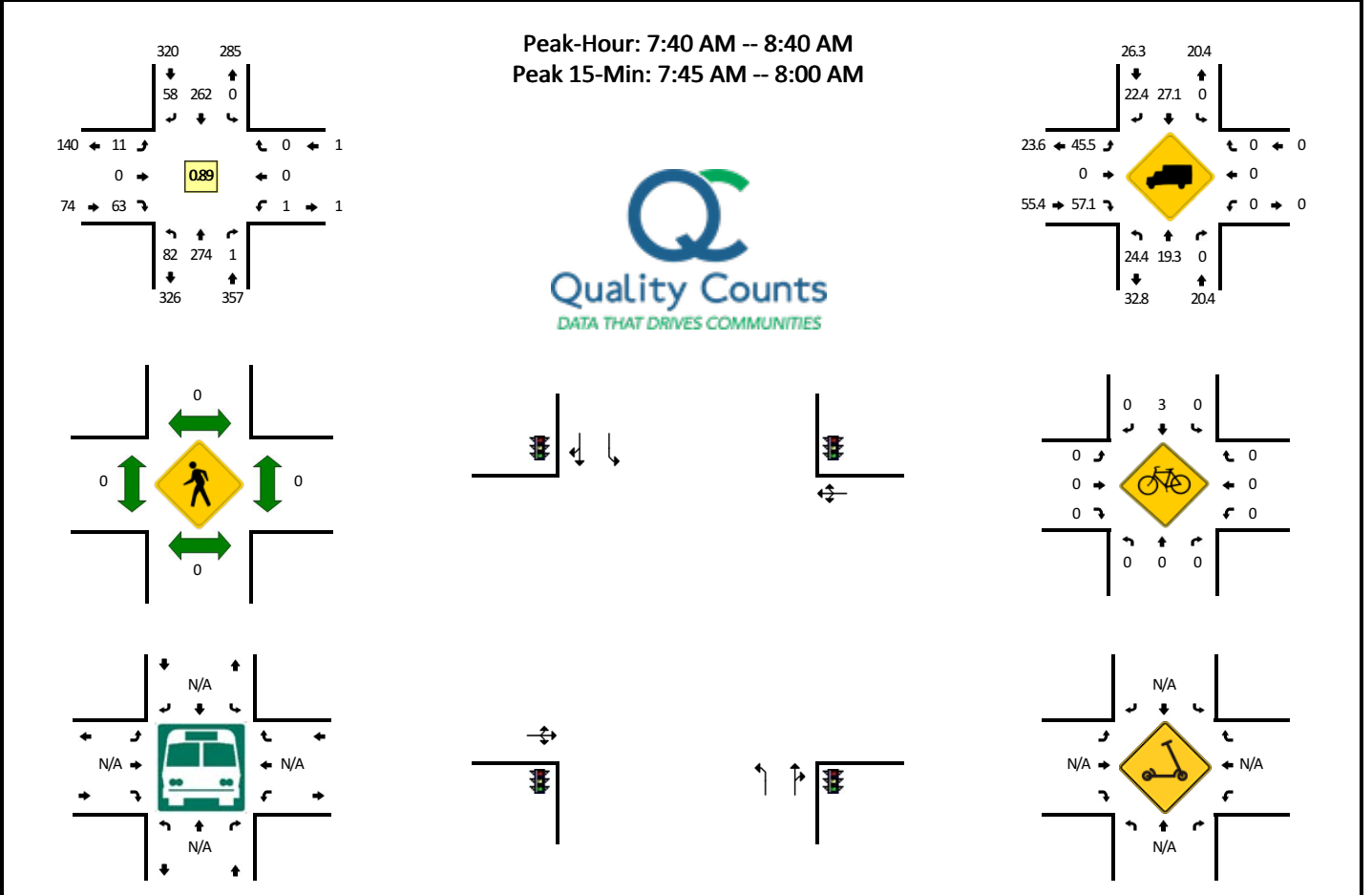


5-Min Count Period Beginning At	Whitesell St (Northbound)				Whitesell St (Southbound)				Enterprise Ave (Eastbound)				Enterprise Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	4	1	0	4	12	0	0	0	0	0	0	0	0	3	0	24	
4:05 PM	0	7	6	0	0	10	0	0	1	0	0	0	1	0	1	0	26	
4:10 PM	0	5	5	0	4	8	0	0	0	0	0	0	0	0	4	0	26	
4:15 PM	1	6	3	0	2	4	0	0	0	0	0	0	1	0	3	0	20	
4:20 PM	1	6	5	0	3	8	0	0	0	0	0	0	0	0	0	0	23	
4:25 PM	0	5	2	0	3	7	0	1	0	0	0	0	1	0	3	0	22	
4:30 PM	0	6	4	0	3	8	0	0	0	1	0	0	2	0	1	0	25	
4:35 PM	1	6	1	0	2	9	1	0	0	0	0	0	0	0	3	0	23	
4:40 PM	0	2	2	0	5	9	0	0	0	0	0	0	1	0	0	0	19	
4:45 PM	0	4	0	0	1	16	0	0	0	0	0	0	0	0	1	0	22	
4:50 PM	0	6	2	0	3	8	0	0	1	1	0	0	1	0	0	0	22	
4:55 PM	0	4	0	0	4	3	0	0	0	0	0	0	0	0	1	0	12	264
5:00 PM	0	2	0	0	2	9	0	0	0	0	0	0	1	0	1	0	15	255
5:05 PM	0	5	0	0	1	10	0	0	0	2	1	0	0	0	0	0	19	248
5:10 PM	0	6	0	0	0	4	0	0	0	1	0	0	0	0	0	0	11	233
5:15 PM	0	1	0	0	4	7	0	0	0	0	1	0	0	0	1	0	14	227
5:20 PM	0	4	0	0	0	7	0	0	0	0	0	0	1	0	0	0	12	216
5:25 PM	0	1	1	0	1	6	0	0	0	0	0	0	0	0	0	0	9	203
5:30 PM	0	6	0	0	2	5	0	0	0	1	0	0	0	1	0	0	15	193
5:35 PM	0	2	0	0	1	7	0	0	1	0	0	0	0	0	1	0	12	182
5:40 PM	0	2	0	0	1	10	0	0	0	0	1	0	0	0	0	0	14	177
5:45 PM	0	2	1	0	1	7	0	0	0	1	0	0	0	0	1	0	13	168
5:50 PM	0	1	0	0	2	6	1	0	0	0	0	0	0	1	2	0	13	159
5:55 PM	0	1	0	0	0	6	0	0	0	0	2	0	0	0	2	0	11	158
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	64	48	0	32	120	0	0	4	0	0	0	4	0	32	0	304	
Heavy Trucks	0	40	48		0	24	0		4	0	0		4	0	12		132	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

*Comments:*

**LOCATION:** Clawiter Rd -- Enterprise Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606419  
**DATE:** Thu, Dec 2 2021

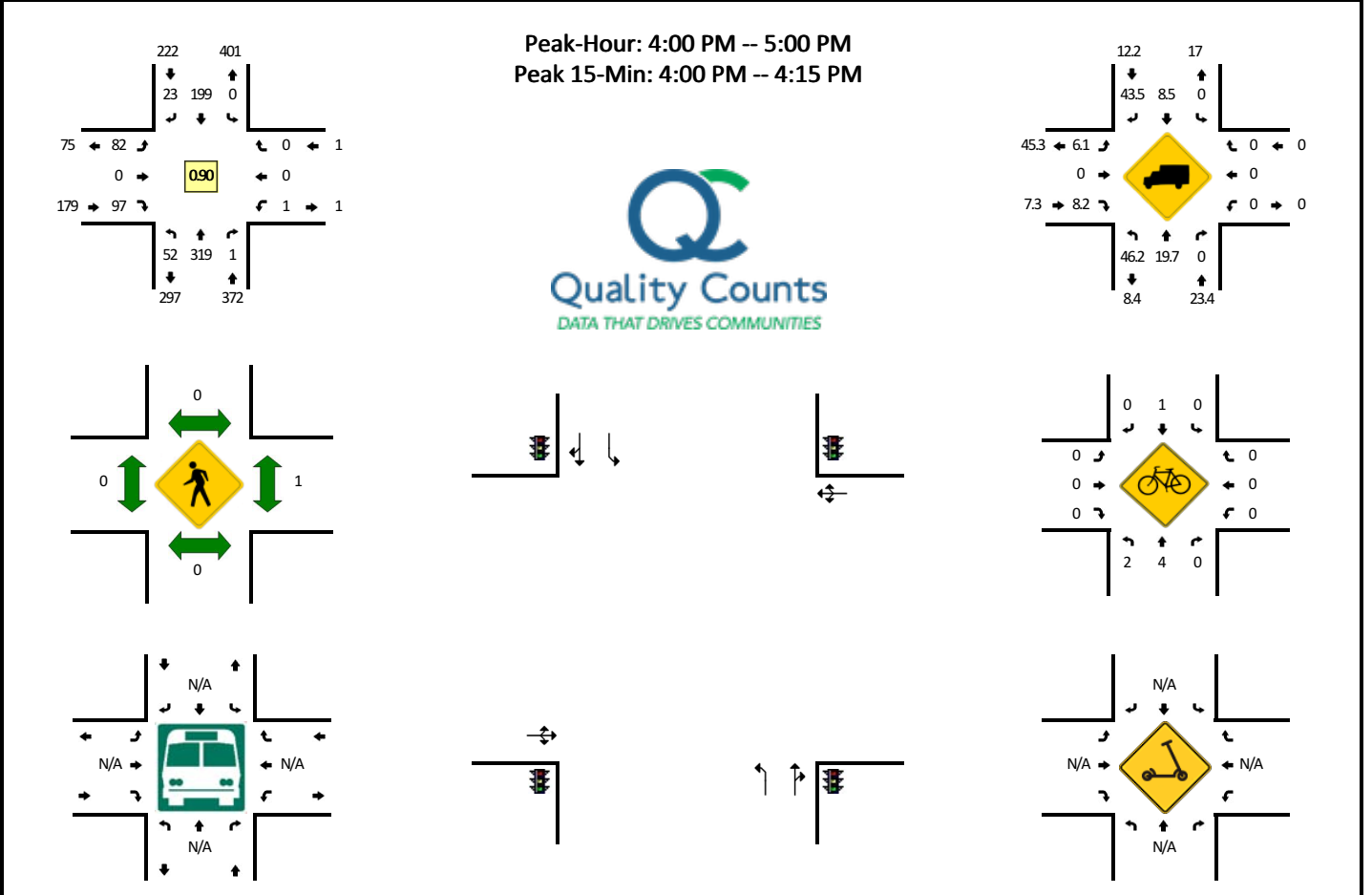


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				Enterprise Ave (Eastbound)				Enterprise Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	11	16	0	0	0	19	5	0	2	0	2	0	0	0	0	0	55	
7:05 AM	7	16	0	0	0	20	1	0	0	0	3	0	0	0	0	0	47	
7:10 AM	10	14	0	0	0	17	0	0	0	0	5	0	0	0	0	0	46	
7:15 AM	2	10	0	0	0	22	1	0	2	0	7	0	0	0	0	0	44	
7:20 AM	9	24	0	0	0	18	3	0	1	0	2	0	0	0	0	0	57	
7:25 AM	3	12	0	0	0	17	3	0	1	0	6	0	0	0	0	0	42	
7:30 AM	8	28	0	0	0	16	3	0	0	0	5	0	0	0	0	0	60	
7:35 AM	7	17	0	0	0	22	2	0	2	0	5	0	0	0	0	0	55	
7:40 AM	7	22	0	0	0	20	5	0	1	0	7	0	0	0	0	0	62	
7:45 AM	8	17	0	0	0	30	5	0	0	0	6	0	0	0	0	0	66	
7:50 AM	4	26	1	0	0	27	9	0	2	0	2	0	0	0	0	0	71	
7:55 AM	8	25	0	0	0	23	10	0	0	0	8	0	1	0	0	0	75	680
8:00 AM	6	25	0	0	0	15	1	0	1	0	5	0	0	0	0	0	53	678
8:05 AM	13	22	0	0	0	23	4	0	0	0	2	0	0	0	0	0	64	695
8:10 AM	3	20	0	0	0	22	4	0	1	0	4	0	0	0	0	0	54	703
8:15 AM	5	25	0	0	0	20	1	0	0	0	6	0	0	0	0	0	57	716
8:20 AM	3	22	0	0	0	22	4	0	1	0	6	0	0	0	0	0	58	717
8:25 AM	8	18	0	0	0	18	5	0	3	0	4	0	0	0	0	0	56	731
8:30 AM	6	28	0	0	0	19	7	0	0	0	8	0	0	0	0	0	68	739
8:35 AM	11	24	0	0	0	23	3	0	2	0	5	0	0	0	0	0	68	752
8:40 AM	7	25	0	0	0	13	4	0	1	0	2	0	0	0	0	0	52	742
8:45 AM	9	25	0	0	0	14	0	0	2	0	2	0	0	0	0	0	52	728
8:50 AM	6	18	0	0	0	16	4	0	2	0	3	0	0	0	0	0	49	706
8:55 AM	5	34	0	0	0	16	2	0	2	0	4	0	0	0	0	0	63	694
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	80	272	4	0	0	320	96	0	8	0	64	0	4	0	0	0	848	
Heavy Trucks	16	48	0	0	0	80	12	0	4	0	32	0	0	0	0	0	192	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*

**LOCATION:** Clawiter Rd -- Enterprise Ave  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606420  
**DATE:** Thu, Dec 2 2021

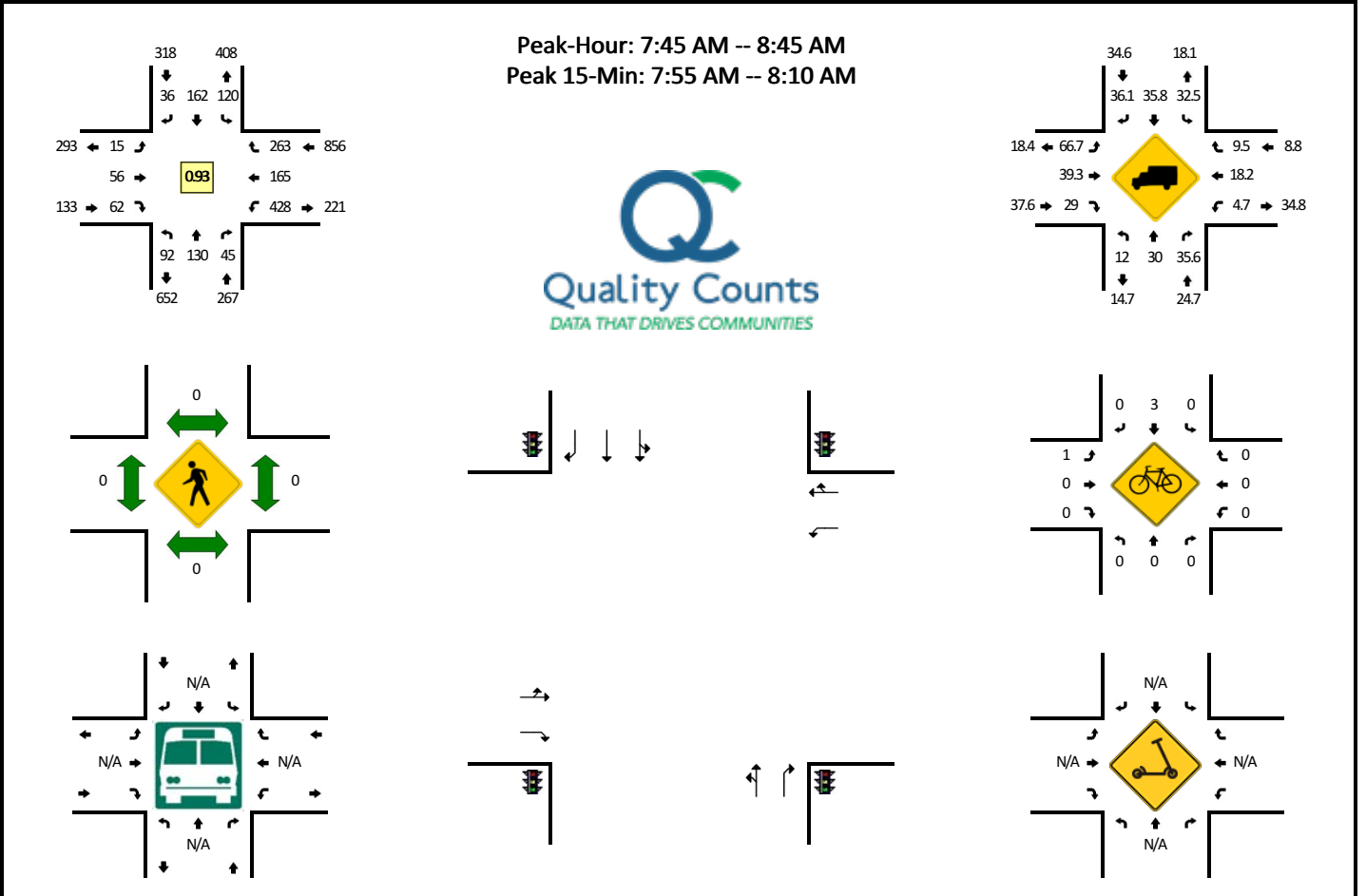


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				Enterprise Ave (Eastbound)				Enterprise Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	27	1	0	0	24	4	0	4	0	9	0	1	0	0	0	75	
4:05 PM	6	17	0	0	0	22	0	0	8	0	17	0	0	0	0	0	70	
4:10 PM	5	35	0	0	0	13	1	0	6	0	10	0	0	0	0	0	70	
4:15 PM	9	25	0	0	0	9	1	0	8	0	9	0	0	0	0	0	61	
4:20 PM	4	22	0	0	0	16	4	0	6	0	6	0	0	0	0	0	58	
4:25 PM	3	17	0	0	0	19	4	0	4	0	8	0	0	0	0	0	55	
4:30 PM	1	31	0	0	0	12	0	0	4	0	6	0	0	0	0	0	54	
4:35 PM	5	21	0	0	0	15	4	0	17	0	7	0	0	0	0	0	69	
4:40 PM	4	38	0	0	0	19	0	0	9	0	5	0	0	0	0	0	75	
4:45 PM	7	34	0	0	0	17	1	0	7	0	4	0	0	0	0	0	70	
4:50 PM	1	24	0	0	0	17	2	0	4	0	12	0	0	0	0	0	60	
4:55 PM	2	28	0	0	0	16	2	0	5	0	4	0	0	0	0	0	57	774
5:00 PM	2	25	0	0	0	21	0	0	6	0	7	0	0	0	0	0	61	760
5:05 PM	1	34	0	0	0	26	1	0	6	0	8	0	0	0	0	0	76	766
5:10 PM	4	23	0	0	0	19	0	0	2	0	6	0	0	0	0	0	54	750
5:15 PM	5	26	0	0	0	14	0	0	2	0	6	0	0	0	0	0	53	742
5:20 PM	6	23	0	0	0	13	2	0	3	0	6	0	0	0	0	0	53	737
5:25 PM	0	25	0	0	0	19	0	0	3	0	10	0	0	0	0	0	57	739
5:30 PM	2	31	0	0	0	18	1	0	5	0	1	0	0	0	0	0	58	743
5:35 PM	2	42	0	0	0	20	0	0	4	0	5	0	0	0	0	0	73	747
5:40 PM	0	23	0	0	0	20	0	0	1	0	5	0	0	0	0	0	49	721
5:45 PM	2	26	0	0	0	11	0	0	2	0	5	0	0	0	0	0	46	697
5:50 PM	5	14	0	0	0	10	1	0	5	0	10	0	0	0	0	0	45	682
5:55 PM	2	17	0	0	0	9	0	0	1	0	3	0	0	0	0	0	32	657
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	64	316	4	0	0	236	20	0	72	0	144	0	4	0	0	0	860	
Heavy Trucks	20	72	0	0	0	24	16	0	0	0	12	0	0	0	0	0	144	
Buses																		
Pedestrians		0				0				0				4			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*

**LOCATION:** Clawiter Rd -- Breakwater Ave/SR 92 WB Ramps  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606421  
**DATE:** Thu, Dec 2 2021

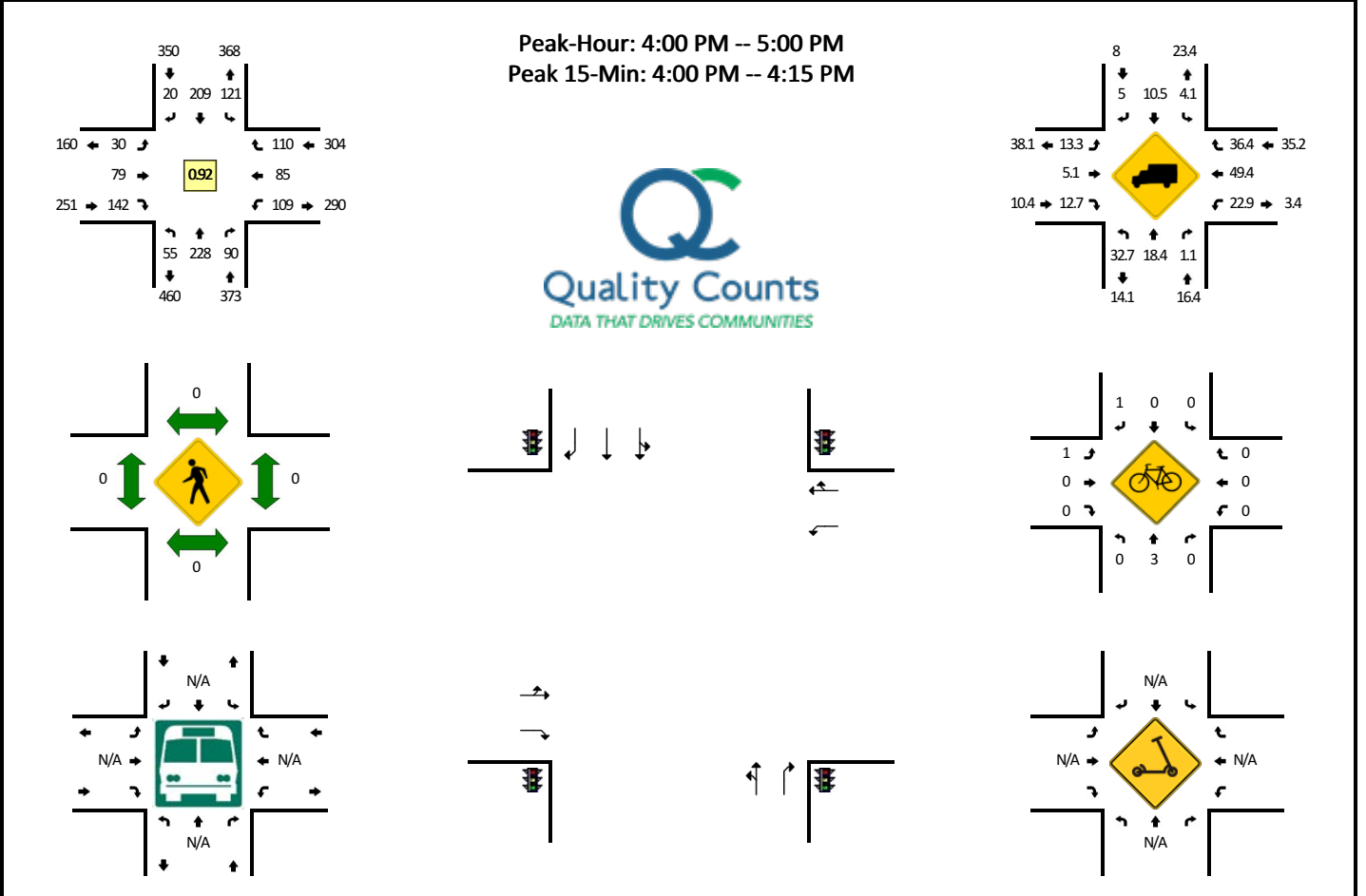


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				Breakwater Ave/SR 92 WB Ramps (Eastbound)				Breakwater Ave/SR 92 WB Ramps (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	1	4	0	14	10	3	0	0	8	4	0	41	18	29	0	136	
7:05 AM	7	7	4	0	12	11	0	0	1	6	9	0	22	12	25	0	116	
7:10 AM	6	7	0	0	8	8	1	0	1	2	4	0	28	13	22	0	100	
7:15 AM	8	6	1	0	14	9	4	0	1	7	7	0	21	13	21	0	112	
7:20 AM	4	6	3	0	17	7	3	0	2	8	7	0	35	9	22	0	123	
7:25 AM	7	15	2	0	12	13	2	0	0	11	5	0	18	10	12	0	107	
7:30 AM	4	10	4	0	12	5	1	0	3	6	3	0	24	10	23	0	105	
7:35 AM	7	8	4	0	18	11	2	0	1	2	7	0	24	14	16	0	114	
7:40 AM	9	7	4	0	9	15	2	0	1	14	7	0	16	12	28	0	124	
7:45 AM	9	12	5	0	17	12	2	0	2	5	4	0	27	11	26	0	132	
7:50 AM	9	10	3	0	14	12	4	0	1	3	5	0	36	12	19	0	128	
7:55 AM	13	12	3	0	22	13	6	0	0	4	4	0	28	14	26	0	145	1442
8:00 AM	3	7	4	0	5	12	4	0	0	5	6	0	57	19	24	0	146	1452
8:05 AM	6	11	4	0	14	9	1	0	1	8	5	0	31	15	25	0	130	1466
8:10 AM	5	10	2	0	7	13	3	0	2	2	6	0	43	13	17	0	123	1489
8:15 AM	10	7	6	0	5	20	2	0	3	5	7	0	29	15	17	0	126	1503
8:20 AM	9	12	5	0	10	10	3	0	1	7	6	0	36	8	23	0	130	1510
8:25 AM	7	11	6	0	7	17	2	0	0	6	5	0	38	12	12	0	123	1526
8:30 AM	8	16	2	0	6	14	2	0	2	4	6	0	30	12	21	0	123	1544
8:35 AM	7	14	2	0	8	18	3	0	2	6	4	0	29	12	19	0	124	1554
8:40 AM	6	8	3	0	5	12	4	0	1	1	4	0	44	22	34	0	144	1574
8:45 AM	10	13	3	0	5	7	3	0	2	3	5	0	30	13	20	0	114	1556
8:50 AM	11	10	5	0	12	12	1	0	0	5	7	0	37	23	20	0	143	1571
8:55 AM	11	11	3	0	5	10	1	0	2	1	9	0	41	27	19	0	140	1566
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	88	120	44	0	164	136	44	0	4	68	60	0	464	192	300	0	1684	
Heavy Trucks	12	32	16		48	64	20		4	40	4		12	12	20		284	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

**LOCATION:** Clawiter Rd -- Breakwater Ave/SR 92 WB Ramps  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606422  
**DATE:** Thu, Dec 2 2021

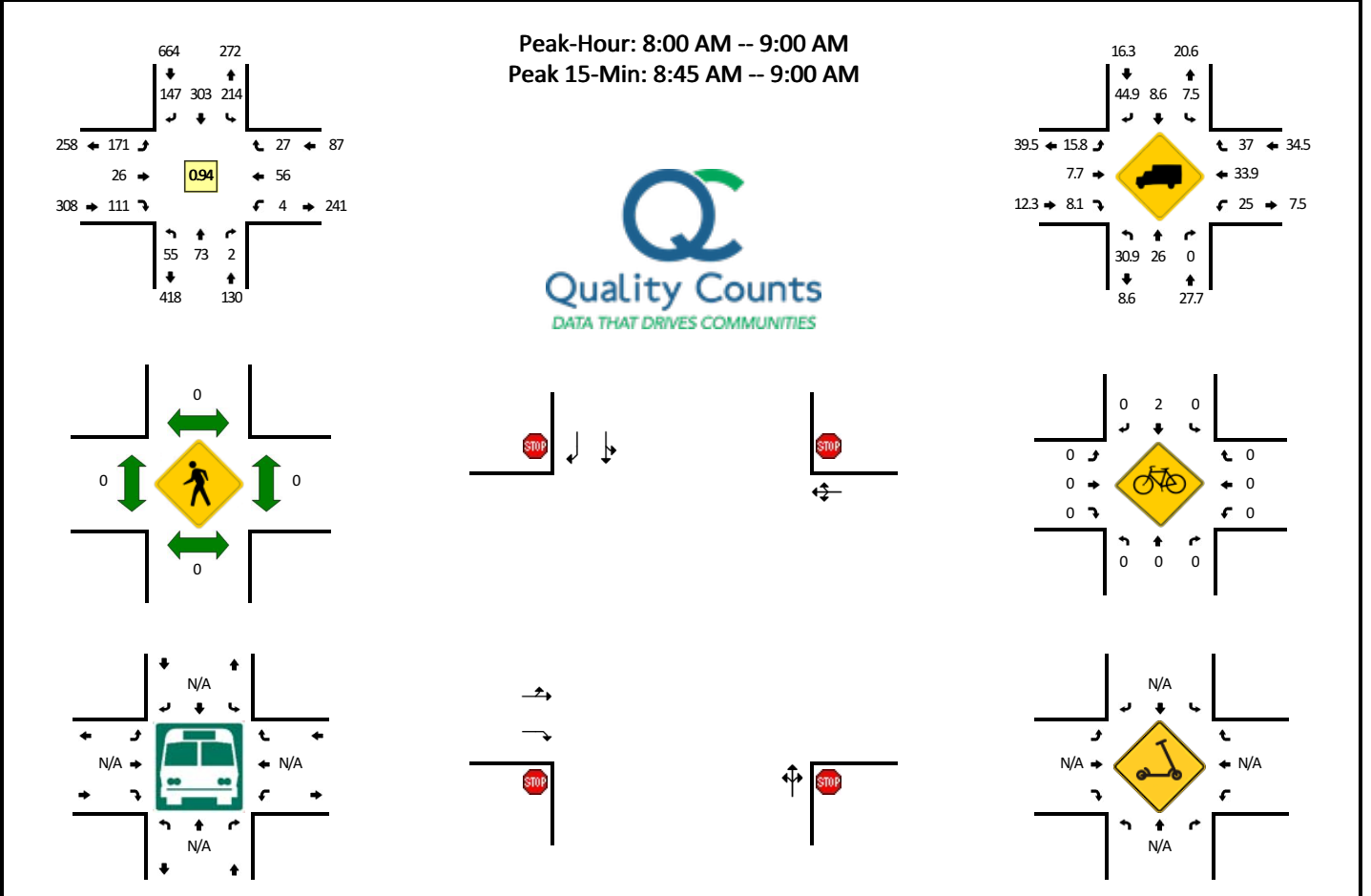


5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				Breakwater Ave/SR 92 WB Ramps (Eastbound)				Breakwater Ave/SR 92 WB Ramps (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	23	7	0	19	27	1	0	2	6	8	0	8	9	7	0	121	
4:05 PM	4	12	7	0	7	21	6	0	4	7	16	0	6	11	12	0	113	
4:10 PM	7	18	10	0	18	19	0	0	0	6	9	0	6	7	15	0	115	
4:15 PM	8	19	5	0	6	8	2	0	4	7	10	0	15	10	11	0	105	
4:20 PM	8	9	13	0	14	14	0	0	5	4	6	0	11	6	11	0	101	
4:25 PM	6	13	5	0	9	19	2	0	2	4	14	0	11	7	8	0	100	
4:30 PM	4	19	3	0	7	17	0	0	2	6	12	0	9	6	6	0	91	
4:35 PM	6	28	14	0	7	18	2	0	2	3	17	0	8	6	6	0	117	
4:40 PM	1	25	8	0	10	22	2	0	3	6	15	0	8	7	10	0	117	
4:45 PM	0	22	8	0	5	20	1	0	1	9	7	0	7	4	12	0	96	
4:50 PM	3	30	5	0	7	15	4	0	2	8	15	0	12	7	4	0	112	
4:55 PM	4	10	5	0	12	9	0	0	3	13	13	0	8	5	8	0	90	1278
5:00 PM	5	19	12	0	11	15	1	0	6	7	19	0	10	3	4	0	112	1269
5:05 PM	5	23	14	0	15	25	1	0	3	6	13	0	7	2	4	0	118	1274
5:10 PM	3	22	19	0	12	16	2	0	0	8	17	0	1	4	5	0	109	1268
5:15 PM	2	16	12	0	14	13	0	0	3	7	9	0	5	1	8	0	90	1253
5:20 PM	7	12	15	0	9	16	0	0	5	2	20	0	5	1	5	1	98	1250
5:25 PM	4	22	15	0	17	18	2	0	1	4	9	0	3	5	3	0	103	1253
5:30 PM	2	26	18	0	10	9	1	0	2	9	7	0	4	2	7	0	97	1259
5:35 PM	0	27	10	0	12	22	2	0	4	4	12	0	6	3	4	0	106	1248
5:40 PM	6	18	5	0	5	10	2	0	4	13	13	0	5	3	2	0	86	1217
5:45 PM	2	13	9	0	12	11	1	0	4	4	7	0	7	5	6	0	81	1202
5:50 PM	1	15	10	0	8	13	0	0	1	5	6	0	5	6	6	0	76	1166
5:55 PM	3	12	9	0	7	5	1	0	0	4	12	0	7	4	6	0	70	1146
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	60	212	96	0	176	268	28	0	24	76	132	0	80	108	136	0	1396	
Heavy Trucks	24	64	4		8	32	4		0	4	36		24	76	40		316	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

*Comments:*

**LOCATION:** Clawiter Rd -- SR 92 EB Ramps/Eden Landing Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606423  
**DATE:** Thu, Dec 2 2021



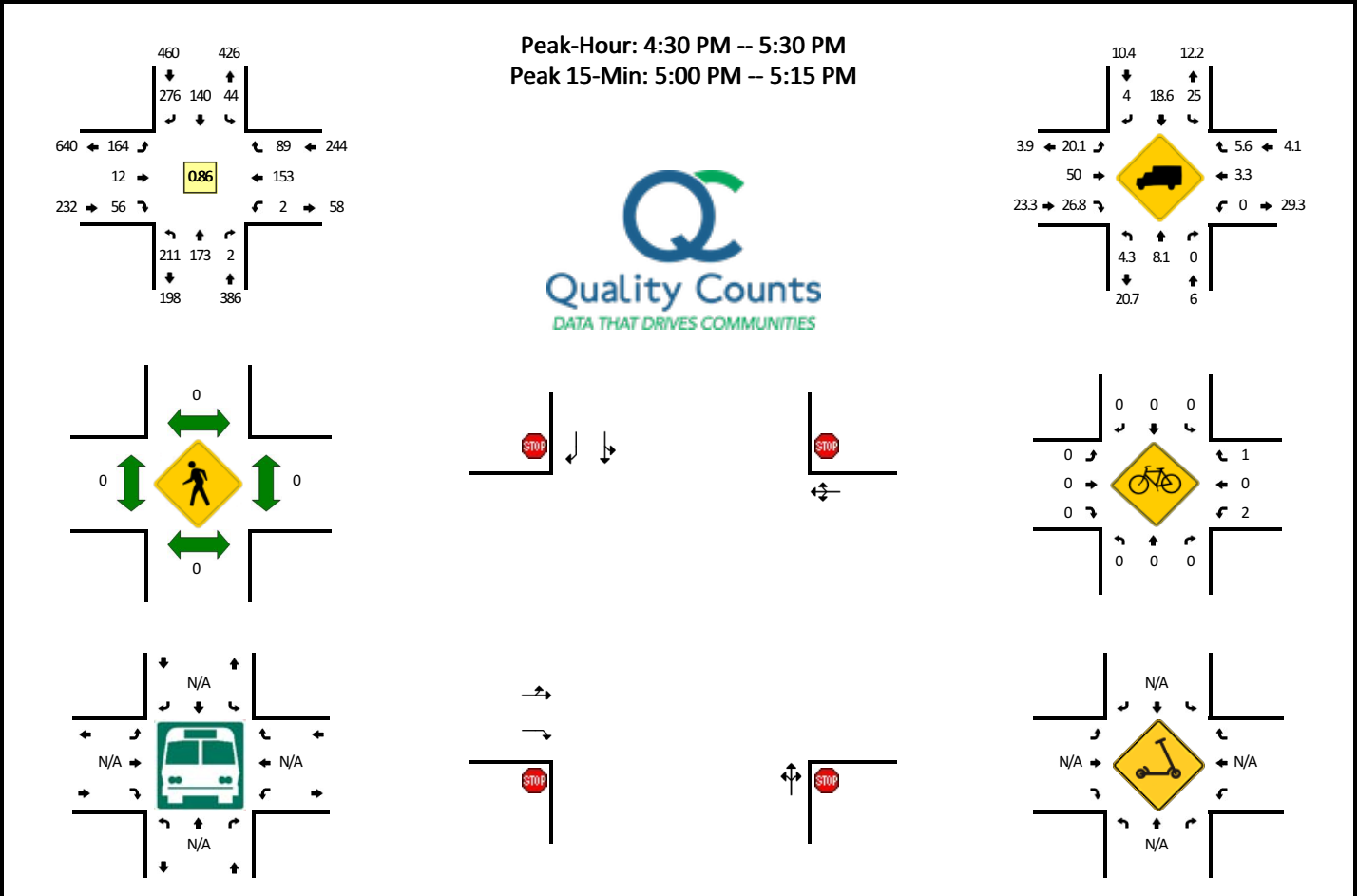
5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				SR 92 EB Ramps/Eden Landing Rd (Eastbound)				SR 92 EB Ramps/Eden Landing Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	5	0	0	17	23	8	0	8	1	8	0	1	1	0	0	79	
7:05 AM	7	4	0	0	11	27	14	0	12	0	4	0	0	7	0	0	86	
7:10 AM	9	3	0	0	13	16	8	0	7	0	12	0	0	3	0	0	71	
7:15 AM	7	7	0	0	10	19	11	0	9	1	7	0	0	6	2	0	79	
7:20 AM	3	5	0	0	15	22	9	0	12	1	9	0	0	4	0	0	80	
7:25 AM	5	1	1	0	12	15	12	0	15	0	8	0	0	3	3	0	75	
7:30 AM	4	5	0	0	10	17	7	0	11	4	7	0	0	2	4	0	71	
7:35 AM	1	4	1	0	9	13	12	0	13	2	7	0	0	2	4	0	68	
7:40 AM	5	5	0	0	7	12	16	0	9	1	3	0	0	3	3	0	64	
7:45 AM	4	10	0	0	18	22	10	0	11	3	5	0	0	2	5	0	90	
7:50 AM	7	9	0	0	17	27	9	0	14	1	8	0	0	2	0	0	94	
7:55 AM	5	3	0	0	17	18	6	0	21	1	6	0	1	1	2	0	81	938
8:00 AM	4	4	0	0	20	30	19	0	9	3	15	0	0	5	2	0	111	970
8:05 AM	5	8	0	0	17	27	6	0	10	2	6	0	0	5	2	0	88	972
8:10 AM	2	5	0	0	23	28	8	0	13	1	8	0	0	1	2	0	91	992
8:15 AM	2	7	0	0	16	24	15	0	14	3	9	0	0	6	3	0	99	1012
8:20 AM	8	8	0	0	22	16	12	0	13	2	12	0	0	7	3	0	103	1035
8:25 AM	0	9	1	0	24	29	14	0	18	0	8	0	0	3	2	0	108	1068
8:30 AM	8	6	0	0	17	21	19	0	13	1	11	0	0	4	3	0	103	1100
8:35 AM	5	3	1	0	13	22	7	1	14	2	9	0	1	3	0	0	81	1113
8:40 AM	4	2	0	0	18	22	11	0	12	2	6	0	1	8	4	0	90	1139
8:45 AM	8	9	0	0	11	26	11	0	17	2	8	0	1	4	2	0	99	1148
8:50 AM	1	7	0	0	16	29	7	0	25	4	12	0	1	3	0	0	105	1159
8:55 AM	8	5	0	0	16	29	18	0	13	4	7	0	0	7	4	0	111	1189
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	68	84	0	0	172	336	144	0	220	40	108	0	8	56	24	0	1260	
Heavy Trucks	20	20	0	0	12	24	68	0	8	8	20	0	0	16	4	0	200	
Buses																		
Pedestrians	0	0			0	0			0	0			0	0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

*Comments:*



**LOCATION:** Clawiter Rd -- SR 92 EB Ramps/Eden Landing Rd  
**CITY/STATE:** Hayward, CA

**QC JOB #:** 15606424  
**DATE:** Thu, Dec 2 2021



5-Min Count Period Beginning At	Clawiter Rd (Northbound)				Clawiter Rd (Southbound)				SR 92 EB Ramps/Eden Landing Rd (Eastbound)				SR 92 EB Ramps/Eden Landing Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	23	6	0	0	3	13	20	0	13	2	2	0	0	14	10	0	106	
4:05 PM	22	11	1	0	3	15	33	0	11	1	9	0	0	19	14	0	139	
4:10 PM	14	10	0	0	6	8	17	0	15	1	3	0	0	27	7	0	108	
4:15 PM	20	7	0	0	7	15	14	0	13	0	7	0	0	20	6	0	109	
4:20 PM	12	13	1	0	7	12	12	0	10	2	5	0	0	12	6	0	92	
4:25 PM	12	7	0	0	13	9	14	0	14	2	2	0	1	14	4	0	92	
4:30 PM	18	16	0	0	3	6	31	0	13	3	3	0	1	10	8	0	112	
4:35 PM	24	14	0	0	7	13	22	0	11	0	5	0	0	15	13	0	124	
4:40 PM	14	14	0	0	4	15	25	0	13	2	6	0	0	16	6	0	115	
4:45 PM	12	6	0	0	3	8	24	0	22	0	3	0	0	10	3	0	91	
4:50 PM	18	14	1	0	5	20	20	0	18	0	3	0	0	9	5	0	113	
4:55 PM	13	3	0	0	5	6	21	0	15	1	8	0	0	9	3	0	84	1285
5:00 PM	20	16	0	0	3	17	24	0	14	3	5	0	0	12	10	0	124	1303
5:05 PM	24	17	0	0	2	12	30	0	10	0	7	0	0	25	14	0	141	1305
5:10 PM	19	18	0	0	3	14	19	0	8	0	3	0	1	23	12	0	120	1317
5:15 PM	21	18	1	0	4	6	16	0	10	2	6	0	0	10	5	0	99	1307
5:20 PM	13	15	0	0	3	10	25	0	12	1	1	0	0	8	5	0	93	1308
5:25 PM	15	22	0	0	2	13	19	0	18	0	6	0	0	6	5	0	106	1322
5:30 PM	18	19	1	0	2	10	9	0	17	1	6	0	0	13	9	0	105	1315
5:35 PM	20	11	0	0	2	14	25	0	14	1	3	0	0	3	8	0	101	1292
5:40 PM	9	10	0	0	1	10	15	0	16	0	3	0	0	4	3	0	71	1248
5:45 PM	14	8	0	0	2	9	12	0	9	1	5	0	0	6	7	0	73	1230
5:50 PM	12	11	0	0	1	11	11	0	13	0	5	0	0	9	6	0	79	1196
5:55 PM	15	4	2	0	4	16	19	0	10	2	4	0	0	5	2	0	83	1195
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	252	204	0	0	32	172	292	0	128	12	60	0	4	240	144	0	1540	
Heavy Trucks	8	4	0		0	24	24		36	0	20		0	8	16		140	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

Intersection	Movement	Weekday AM			Weekday PM		
		Nov 2021	Historical	Growth Rate	Nov 2021	Historical	Growth Rate
Clawiter Rd and Winton Ave	NBL	152	149	-2%	77	100	30%
	NBT	3	0	-100%	1	0	-100%
	NBR	251	222	-12%	555	612	10%
	SBL	3	0	-100%	4	3	-25%
	SBT	0	0	#DIV/0!	1	2	100%
	SBR	2	0	-100%	1	0	-100%
	EBL	1	1	0%	0	1	#DIV/0!
	EBT	361	343	-5%	1020	1,026	1%
	EBR	115	154	34%	125	177	42%
	WBL	482	967	101%	200	266	33%
	WBT	972	1,086	12%	302	286	-5%
	WBR	13	1	-92%	2	0	-100%
	Total Entering Vehicles	2355	2,923	24%	2,288	2,473	8%
	Clawiter Rd and Industrial Blvd (east)	NBL	0	6	#DIV/0!	27	34
NBT		439	296	-33%	412	502	22%
NBR		0	7	#DIV/0!	0	2	#DIV/0!
SBL		0	5	#DIV/0!	1	1	0%
SBT		336	542	61%	324	395	22%
SBR		388	764	97%	135	135	0%
EBL		0	68	#DIV/0!	337	548	63%
EBT		0	4	#DIV/0!	0	0	#DIV/0!
EBR		0	1	#DIV/0!	8	8	0%
WBL		0	4	#DIV/0!	4	40	900%
WBT		0	1	#DIV/0!	0	1	#DIV/0!
WBR		0	0	#DIV/0!	0	6	#DIV/0!
Total Entering Vehicles		1163	1,698	46%	1,248	1,672	34%
Clawiter Rd and Depot Rd		NBL	42	17	-60%	30	21
	NBT	46	40	-13%	200	375	88%
	NBR	35	23	-34%	84	173	106%
	SBL	7	13	86%	12	12	0%
	SBT	202	544	169%	74	99	34%
	SBR	160	201	26%	50	12	-76%
	EBL	40	34	-15%	134	166	24%
	EBT	129	123	-5%	252	364	44%
	EBR	34	39	15%	27	16	-41%
	WBL	59	116	97%	10	18	80%
	WBT	200	253	27%	79	91	15%
	WBR	4	4	0%	6	12	100%
	Total Entering Vehicles	958	1,407	47%	958	1,359	42%
		NBL	92	108	17%	48	35
NBT		130	214	65%	178	323	81%
NBR		45	101	124%	80	153	91%
SBL		120	327	173%	93	171	84%
SBT		162	218	35%	210	260	24%
SBR		36	70	94%	14	36	157%

Clawiter Rd and SR-92 WB	EBL	15	16	7%	31	36	16%
	EBT	56	76	36%	73	87	19%
	EBR	62	72	16%	167	130	-22%
	WBL	428	236	-45%	99	110	11%
	WBT	165	122	-26%	83	48	-42%
	WBR	263	134	-49%	102	146	43%
	Total Entering Vehicles	1574	1,694	8%	1,178	1,535	30%
Clawiter Rd and SR-92 EB	NBL	55	79	44%	238	267	12%
	NBT	73	130	78%	117	247	111%
	NBR	2	7	250%	3	6	100%
	SBL	214	162	-24%	56	66	18%
	SBT	303	328	8%	129	135	5%
	SBR	147	132	-10%	290	289	0%
	EBL	171	185	8%	119	185	55%
	EBT	26	50	92%	12	12	0%
	EBR	111	126	14%	38	79	108%
	WBL	4	5	25%	1	2	100%
	WBT	56	64	14%	165	165	0%
	WBR	27	36	33%	73	119	63%
	Total Entering Vehicles	1189	1,304	10%	1,241	1,572	27%
Cabot Blvd and Winton Ave	NBL	17	24	41%	10	19	90%
	NBT	15	23	53%	17	21	24%
	NBR	28	18	-36%	82	104	27%
	SBL	62	77	24%	142	169	19%
	SBT	14	17	21%	24	28	17%
	SBR	1	2	100%	1	5	400%
	EBL	0	3	#DIV/0!	1	2	100%
	EBT	46	42	-9%	76	127	67%
	EBR	12	17	42%	15	20	33%
	WBL	256	320	25%	90	57	-37%
	WBT	103	79	-23%	29	57	97%
	WBR	149	179	20%	53	54	2%
	Total Entering Vehicles	703	801	14%	540	663	23%
Overall Total		7,942	9,827	24%	7,453	9,274	24%

Intersection Averages:

AM:

25%

PM:

27%

**FINAL GROWTH FACTORS:**

**AM:**

**25%**

**PM:**

**25%**

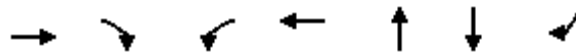
Appendix B: Existing Level of Service,  
Queue, And Peak Hour Traffic Signal  
Warrants Worksheets

Queues

1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

EX\_AM

04/12/2022



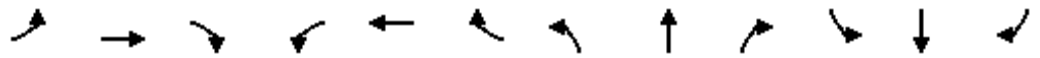
Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	100	92	305	279	460	633	76
v/c Ratio	0.53	0.17	0.89	0.75	1.06	0.99dl	0.20
Control Delay	54.0	3.4	63.4	41.6	96.9	53.5	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	3.4	63.4	41.6	96.9	53.5	7.0
Queue Length 50th (ft)	62	0	185	134	~345	202	0
Queue Length 95th (ft)	119	16	#330	236	#584	#327	30
Internal Link Dist (ft)	128			403	1161	1231	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	228	549	454	476	433	819	440
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.17	0.67	0.59	1.06	0.77	0.17

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

EX\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	16	76	85	281	122	134	108	214	101	327	256	70
Future Volume (veh/h)	16	76	85	281	122	134	108	214	101	327	256	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1604	1604	1604	1604	1604	1604	1604	1604	1604
Adj Flow Rate, veh/h	17	83	92	305	133	146	117	233	0	355	278	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	20	20	20	20	20	20	20	20	20	20	20	20
Cap, veh/h	30	147	479	336	154	169	127	253		386	385	343
Arrive On Green	0.11	0.11	0.11	0.22	0.22	0.22	0.24	0.24	0.00	0.25	0.25	0.25
Sat Flow, veh/h	270	1320	1359	1527	699	767	527	1050	0	1527	1523	1359
Grp Volume(v), veh/h	100	0	92	305	0	279	350	0	0	355	278	76
Grp Sat Flow(s),veh/h/ln	1590	0	1359	1527	0	1466	1577	0	0	1527	1523	1359
Q Serve(g_s), s	5.3	0.0	4.2	17.3	0.0	16.3	19.3	0.0	0.0	20.1	14.9	3.9
Cycle Q Clear(g_c), s	5.3	0.0	4.2	17.3	0.0	16.3	19.3	0.0	0.0	20.1	14.9	3.9
Prop In Lane	0.17		1.00	1.00		0.52	0.33		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	0	479	336	0	322	380	0		386	385	343
V/C Ratio(X)	0.56	0.00	0.19	0.91	0.00	0.87	0.92	0.00		0.92	0.72	0.22
Avail Cap(c_a), veh/h	232	0	526	463	0	445	443	0		429	428	382
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.5	0.0	20.0	33.9	0.0	33.5	33.0	0.0	0.0	32.4	30.4	26.3
Incr Delay (d2), s/veh	1.0	0.0	0.1	14.6	0.0	9.8	21.2	0.0	0.0	22.5	4.2	0.1
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	2.1	0.0	1.9	7.6	0.0	6.5	9.4	0.0	0.0	9.6	5.8	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.0	20.1	48.5	0.0	43.3	54.1	0.0	0.0	54.9	34.6	26.5
LnGrp LOS	D	A	C	D	A	D	D	A		D	C	C
Approach Vol, veh/h		192			584			350	A		709	
Approach Delay, s/veh		29.7			46.0			54.1			43.9	
Approach LOS		C			D			D			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.6		13.6		26.6		23.3				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		21.3		7.3		22.1		19.3				
Green Ext Time (p_c), s		0.2		0.1		0.3		0.2				

Intersection Summary

HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

Notes

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

Intersection	
Intersection Delay, s/veh	52
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↕			↖	↗		↖	↗
Traffic Vol, veh/h	221	50	126	5	64	43	79	159	7	162	328	132
Future Vol, veh/h	221	50	126	5	64	43	79	159	7	162	328	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	16	8	8	25	34	37	31	26	0	7	9	45
Mvmt Flow	240	54	137	5	70	47	86	173	8	176	357	143
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	23.4	16.3	24	87.7
HCM LOS	C	C	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	33%	0%	82%	0%	4%	33%	0%
Vol Thru, %	67%	0%	18%	0%	57%	67%	0%
Vol Right, %	0%	100%	0%	100%	38%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	238	7	271	126	112	490	132
LT Vol	79	0	221	0	5	162	0
Through Vol	159	0	50	0	64	328	0
RT Vol	0	7	0	126	43	0	132
Lane Flow Rate	259	8	295	137	122	533	143
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.611	0.016	0.682	0.27	0.3	1.129	0.27
Departure Headway (Hd)	8.827	7.84	8.758	7.477	9.328	7.632	6.777
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	411	459	415	483	388	479	532
Service Time	6.527	5.54	6.458	5.177	7.328	5.347	4.492
HCM Lane V/C Ratio	0.63	0.017	0.711	0.284	0.314	1.113	0.269
HCM Control Delay	24.4	10.7	28.3	12.9	16.3	108.1	12
HCM Lane LOS	C	B	D	B	C	F	B
HCM 95th-tile Q	3.9	0	4.9	1.1	1.2	18.4	1.1

Queues  
3: Clawiter Rd. & Enterprise Ave.

EX\_AM  
04/12/2022



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	147	1	116	386	585
v/c Ratio	0.66	0.01	0.62	0.30	0.61
Control Delay	21.1	48.0	57.2	4.0	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	48.0	57.2	4.0	15.3
Queue Length 50th (ft)	0	1	76	30	81
Queue Length 95th (ft)	52	7	126	148	#258
Internal Link Dist (ft)	2621	76		1231	1843
Turn Bay Length (ft)			155		
Base Capacity (vph)	305	306	239	1308	954
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.00	0.49	0.30	0.61

Intersection Summary

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



HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

EX\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (veh/h)	14	0	117	1	0	0	103	343	1	0	448	73
Future Volume (veh/h)	14	0	117	1	0	0	103	343	1	0	448	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1233	1900	1055	1900	1900	1900	1544	1618	1900	1900	1500	1574
Adj Flow Rate, veh/h	16	0	131	1	0	0	116	385	1	0	503	82
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	45	0	57	0	0	0	24	19	0	0	27	22
Cap, veh/h	19	0	158	2	0	0	139	1230	3	2	784	128
Arrive On Green	0.11	0.00	0.11	0.00	0.00	0.00	0.09	0.76	0.76	0.00	0.63	0.63
Sat Flow, veh/h	177	0	1452	1809	0	0	1471	1613	4	1810	1253	204
Grp Volume(v), veh/h	147	0	0	1	0	0	116	0	386	0	0	585
Grp Sat Flow(s),veh/h/ln	1630	0	0	1810	0	0	1471	0	1618	1810	0	1458
Q Serve(g_s), s	9.4	0.0	0.0	0.1	0.0	0.0	8.2	0.0	7.9	0.0	0.0	26.6
Cycle Q Clear(g_c), s	9.4	0.0	0.0	0.1	0.0	0.0	8.2	0.0	7.9	0.0	0.0	26.6
Prop In Lane	0.11		0.89	1.00		0.00	1.00		0.00	1.00		0.14
Lane Grp Cap(c), veh/h	178	0	0	2	0	0	139	0	1233	2	0	911
V/C Ratio(X)	0.83	0.00	0.00	0.40	0.00	0.00	0.83	0.00	0.31	0.00	0.00	0.64
Avail Cap(c_a), veh/h	269	0	0	307	0	0	234	0	1233	87	0	911
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.93
Uniform Delay (d), s/veh	46.2	0.0	0.0	52.9	0.0	0.0	47.2	0.0	3.9	0.0	0.0	12.4
Incr Delay (d2), s/veh	12.1	0.0	0.0	81.6	0.0	0.0	1.2	0.0	0.1	0.0	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	0.1	0.0	0.0	3.0	0.0	2.1	0.0	0.0	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.3	0.0	0.0	134.4	0.0	0.0	48.4	0.0	4.0	0.0	0.0	15.7
LnGrp LOS	E	A	A	F	A	A	D	A	A	A	A	B
Approach Vol, veh/h		147			1			502				585
Approach Delay, s/veh		58.3			134.4			14.3				15.7
Approach LOS		E			F			B				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	85.3		16.1	14.5	70.8		4.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	47.4		17.5	16.9	35.6		18.0				
Max Q Clear Time (g_c+I1), s	0.0	9.9		11.4	10.2	28.6		2.1				
Green Ext Time (p_c), s	0.0	2.7		0.4	0.1	2.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Queues

4: Clawiter Rd. & Depot Rd.

EX\_AM

04/12/2022



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	208	392	4	85	593	214
v/c Ratio	0.64	0.74	0.01	0.07	0.39	0.22
Control Delay	47.9	48.6	0.0	12.7	15.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	48.6	0.0	12.7	15.0	1.4
Queue Length 50th (ft)	62	133	0	8	110	0
Queue Length 95th (ft)	96	173	0	34	190	24
Internal Link Dist (ft)	3714	725		1843	714	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	664	726	383	1300	1530	975
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.54	0.01	0.07	0.39	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

EX\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕	↗		↕↕			↕↕	↗
Traffic Volume (veh/h)	34	123	39	116	253	4	17	40	23	13	544	201
Future Volume (veh/h)	34	123	39	116	253	4	17	40	23	13	544	201
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Adj Flow Rate, veh/h	36	131	41	123	269	4	18	43	24	14	579	214
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, %	27	27	27	27	27	27	27	27	27	27	27	27
Cap, veh/h	47	176	57	149	351	220	231	602	396	54	1630	877
Arrive On Green	0.10	0.10	0.10	0.17	0.17	0.17	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	483	1804	584	860	2022	1271	307	1016	668	31	2753	1271
Grp Volume(v), veh/h	110	0	98	208	184	4	40	0	45	317	276	214
Grp Sat Flow(s),veh/h/ln	1476	0	1395	1457	1425	1271	747	0	1245	1487	1297	1271
Q Serve(g_s), s	7.7	0.0	7.2	14.6	13.0	0.3	0.5	0.0	1.6	0.0	11.7	6.7
Cycle Q Clear(g_c), s	7.7	0.0	7.2	14.6	13.0	0.3	12.1	0.0	1.6	11.6	11.7	6.7
Prop In Lane	0.33		0.42	0.59		1.00	0.45		0.54	0.04		1.00
Lane Grp Cap(c), veh/h	144	0	136	253	247	220	491	0	737	916	768	877
V/C Ratio(X)	0.76	0.00	0.72	0.82	0.74	0.02	0.08	0.00	0.06	0.35	0.36	0.24
Avail Cap(c_a), veh/h	348	0	329	378	370	330	491	0	737	916	768	877
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	0.00	1.00	0.09	0.09	0.09	0.97	0.00	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.6	0.0	46.4	42.3	41.6	36.3	9.5	0.0	9.1	11.2	11.2	6.1
Incr Delay (d2), s/veh	3.2	0.0	2.7	0.9	0.4	0.0	0.3	0.0	0.2	0.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	2.6	5.3	4.6	0.1	0.4	0.0	0.5	3.8	3.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	0.0	49.1	43.1	42.0	36.3	9.8	0.0	9.3	11.5	11.6	6.3
LnGrp LOS	D	A	D	D	D	D	A	A	A	B	B	A
Approach Vol, veh/h		208			396			85			807	
Approach Delay, s/veh		49.5			42.5			9.5			10.2	
Approach LOS		D			D			A			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.8		22.9		67.8		15.3				
Change Period (Y+Rc), s		5.0		4.5		* 5		5.0				
Max Green Setting (Gmax), s		39.0		27.5		* 40		25.0				
Max Q Clear Time (g_c+I1), s		14.1		16.6		13.7		9.7				
Green Ext Time (p_c), s		0.7		1.8		7.0		0.7				

Intersection Summary

HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

5: Industrial Blvd. & Clawiter Rd.

EX\_AM

04/12/2022



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	41	6	7	360	6	645
v/c Ratio	0.30	0.29	0.05	0.06	0.14	0.05	0.26
Control Delay	45.7	44.6	42.2	42.7	4.1	42.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	44.6	42.2	42.7	4.1	42.4	4.2
Queue Length 50th (ft)	25	24	4	4	15	4	27
Queue Length 95th (ft)	54	53	15	17	69	m8	105
Internal Link Dist (ft)		83	86		940		354
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	478	481	140	133	2535	133	2469
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.09	0.04	0.05	0.14	0.05	0.26

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

EX\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↔			↔		↖	↕		↖	↕	
Traffic Volume (veh/h)	65	4	1	4	1	0	6	296	7	5	542	0
Future Volume (veh/h)	65	4	1	4	1	0	6	296	7	5	542	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1678	1900	1900	1633	0
Adj Flow Rate, veh/h	82	0	0	5	1	0	7	352	8	6	645	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	0	0	0	0	0	0	0	15	0	0	18	0
Cap, veh/h	169	89	0	12	2	0	16	2418	55	14	2352	0
Arrive On Green	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.76	0.76	0.02	1.00	0.00
Sat Flow, veh/h	3619	1900	0	1520	304	0	1810	3186	72	1810	3185	0
Grp Volume(v), veh/h	82	0	0	6	0	0	7	176	184	6	645	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1824	0	0	1810	1594	1665	1810	1552	0
Q Serve(g_s), s	2.1	0.0	0.0	0.3	0.0	0.0	0.4	2.8	2.8	0.3	0.0	0.0
Cycle Q Clear(g_c), s	2.1	0.0	0.0	0.3	0.0	0.0	0.4	2.8	2.8	0.3	0.0	0.0
Prop In Lane	1.00		0.00	0.83		0.00	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	169	89	0	14	0	0	16	1210	1264	14	2352	0
V/C Ratio(X)	0.49	0.00	0.00	0.43	0.00	0.00	0.44	0.15	0.15	0.43	0.27	0.00
Avail Cap(c_a), veh/h	1010	530	0	134	0	0	133	1210	1264	133	2352	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	0.00	0.82	0.82	0.82	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	46.9	0.0	0.0	46.8	3.1	3.1	46.6	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	0.0	19.2	0.0	0.0	14.5	0.2	0.2	19.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.2	0.0	0.0	0.2	0.8	0.8	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	0.0	0.0	66.1	0.0	0.0	61.3	3.3	3.3	66.1	0.3	0.0
LnGrp LOS	D	A	A	E	A	A	E	A	A	E	A	A
Approach Vol, veh/h		82			6			367			651	
Approach Delay, s/veh		46.3			66.1			4.4			0.9	
Approach LOS		D			E			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	76.6		8.9	4.8	76.5		4.7				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	7.0	37.5		26.5	7.0	37.5		7.0				
Max Q Clear Time (g_c+I1), s	2.3	4.8		4.1	2.4	2.0		2.3				
Green Ext Time (p_c), s	0.0	2.3		0.2	0.0	5.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	5.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	4	1	0	0	1	0	70	0	764	0
Future Vol, veh/h	0	0	4	1	0	0	1	0	70	0	764	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	50	0	0	0	0	0	0	0	16	0
Mvmt Flow	0	0	5	1	0	0	1	0	93	0	1019	0

Major/Minor	Minor2		Minor1			Major2			
Conflicting Flow All	-	-	1019	1022	1019	-	-	-	0
Stage 1	-	-	-	0	0	-	-	-	-
Stage 2	-	-	-	1022	1019	-	-	-	-
Critical Hdwy	-	-	6.7	7.1	6.5	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	-	-	3.75	3.5	4	-	-	-	-
Pot Cap-1 Maneuver	0	0	234	216	239	0	0	-	0
Stage 1	0	0	-	-	-	0	0	-	0
Stage 2	0	0	-	287	317	0	0	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	234	211	239	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	211	239	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	280	317	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	20.7		22.2		0	
HCM LOS	C		C			

Minor Lane/Major Mvmt	EBLn1WBLn1		SBT
Capacity (veh/h)	234	211	-
HCM Lane V/C Ratio	0.023	0.006	-
HCM Control Delay (s)	20.7	22.2	-
HCM Lane LOS	C	C	-
HCM 95th %tile Q(veh)	0.1	0	-

Queues

7: Clawiter Rd. & West St.

EX\_AM

04/12/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	204	581	5	1229
v/c Ratio	0.68	0.26	0.05	0.52
Control Delay	47.4	5.7	42.5	7.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.4	5.7	42.5	7.1
Queue Length 50th (ft)	116	43	3	141
Queue Length 95th (ft)	167	100	14	221
Internal Link Dist (ft)	322	809		3146
Turn Bay Length (ft)			45	
Base Capacity (vph)	595	2201	142	2357
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.26	0.04	0.52

Intersection Summary

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

EX\_AM  
04/12/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	175	1	499	1	4	1057
Future Volume (veh/h)	175	1	499	1	4	1057
Initial Q (Qb), veh	0	0	0	0	0	0
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	1900	1648	1856	1900	1722
Adj Flow Rate, veh/h	203	1	580	1	5	1229
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	0	17	3	0	12
Cap, veh/h	243	1	2282	4	12	2504
Arrive On Green	0.14	0.14	1.00	1.00	0.01	0.77
Sat Flow, veh/h	1735	9	3290	6	1810	3358
Grp Volume(v), veh/h	205	0	283	298	5	1229
Grp Sat Flow(s),veh/h/ln	1752	0	1566	1647	1810	1636
Q Serve(g_s), s	10.8	0.0	0.0	0.0	0.3	13.4
Cycle Q Clear(g_c), s	10.8	0.0	0.0	0.0	0.3	13.4
Prop In Lane	0.99	0.00		0.00	1.00	
Lane Grp Cap(c), veh/h	245	0	1114	1172	12	2504
V/C Ratio(X)	0.84	0.00	0.25	0.25	0.42	0.49
Avail Cap(c_a), veh/h	600	0	1114	1172	143	2504
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.22	0.22
Uniform Delay (d), s/veh	39.8	0.0	0.0	0.0	47.0	4.2
Incr Delay (d2), s/veh	7.3	0.0	0.5	0.5	5.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	0.2	0.2	0.1	3.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.1	0.0	0.5	0.5	52.3	4.3
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	205		581			1234
Approach Delay, s/veh	47.1		0.5			4.5
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.1	72.1			77.2	17.8
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	7.5	* 42			53.5	32.5
Max Q Clear Time (g_c+I1), s	2.3	2.0			15.4	12.8
Green Ext Time (p_c), s	0.0	4.0			12.3	0.5

Intersection Summary

HCM 6th Ctrl Delay			7.7			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

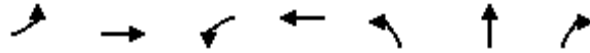


## Queues

## 8: Clawiter Rd./Tuskegee Airmen Dr. &amp; Winton Ave.

EX\_AM

04/12/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	1	578	1124	1264	86	87	258
v/c Ratio	0.01	0.55	0.94	0.54	0.62	0.63	0.66
Control Delay	51.0	28.4	48.1	6.9	64.4	64.9	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	28.4	48.1	6.9	64.4	64.9	13.9
Queue Length 50th (ft)	1	154	376	128	62	63	0
Queue Length 95th (ft)	6	211	#503	300	105	106	60
Internal Link Dist (ft)		5260		2336		3146	
Turn Bay Length (ft)	210		205		85		
Base Capacity (vph)	82	1059	1194	2356	282	282	528
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.55	0.94	0.54	0.30	0.31	0.49

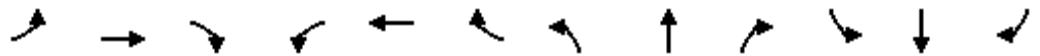
## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

EX\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗↘	↗↘		↗	↖	↗	↗	↘	↘
Traffic Volume (veh/h)	1	343	154	967	1086	1	149	0	222	0	0	0
Future Volume (veh/h)	1	343	154	967	1086	1	149	0	222	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1618	1618	1618	1618	1618	1618	1618	1618	1618	1618	1618	1618
Adj Flow Rate, veh/h	1	399	0	1124	1263	1	173	0	258	0	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	19	19	19	19	19	19	19	19	19	19	19	19
Cap, veh/h	2	509		1496	2112	2	766	0	283	65	334	0
Arrive On Green	0.00	0.17	0.00	0.50	0.67	0.67	0.21	0.00	0.21	0.00	0.00	0.00
Sat Flow, veh/h	1541	3156	0	2990	3153	2	3083	0	1372	970	1618	0
Grp Volume(v), veh/h	1	399	0	1124	616	648	173	0	258	0	0	0
Grp Sat Flow(s),veh/h/ln	1541	1537	0	1495	1537	1618	1541	0	1372	970	1618	0
Q Serve(g_s), s	0.1	13.7	0.0	33.1	24.3	24.3	5.2	0.0	20.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	13.7	0.0	33.1	24.3	24.3	5.2	0.0	20.2	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	509		1496	1030	1084	766	0	283	65	334	0
V/C Ratio(X)	0.47	0.78		0.75	0.60	0.60	0.23	0.00	0.91	0.00	0.00	0.00
Avail Cap(c_a), veh/h	84	738		1496	1030	1084	890	0	338	105	399	0
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(l)	1.00	1.00	0.00	1.00	1.00	1.00	0.97	0.00	0.97	0.00	0.00	0.00
Uniform Delay (d), s/veh	54.9	44.0	0.0	22.0	10.0	10.0	36.7	0.0	42.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	50.9	11.5	0.0	1.9	2.6	2.4	0.1	0.0	23.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	6.0	0.0	11.5	8.1	8.5	2.0	0.0	8.6	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	105.7	55.5	0.0	23.9	12.6	12.4	36.8	0.0	65.7	0.0	0.0	0.0
LnGrp LOS	F	E		C	B	B	D	A	E	A	A	A
Approach Vol, veh/h		400	A		2388			431				0
Approach Delay, s/veh		55.6			17.9			54.1				0.0
Approach LOS		E			B			D				
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	59.6	22.8		27.6	4.2	78.3		27.6				
Change Period (Y+Rc), s	4.6	* 4.6		4.9	4.0	4.6		4.9				
Max Green Setting (Gmax), s	43.0	* 26		27.1	6.0	63.4		27.1				
Max Q Clear Time (g_c+I1), s	35.1	15.7		22.2	2.1	26.3		0.0				
Green Ext Time (p_c), s	2.0	2.5		0.4	0.0	16.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Queues  
9: Industrial Blvd. & Depot Rd.

EX\_AM  
04/12/2022



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	43	224	292	326	601	160	39	458	10
v/c Ratio	0.04	0.08	0.44	0.62	2.22	0.56	0.10	0.24	0.46	0.01
Control Delay	13.0	13.2	5.5	21.2	589.4	17.4	0.1	26.8	16.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	13.2	5.5	21.2	589.4	17.4	0.1	26.8	16.2	0.0
Queue Length 50th (ft)	2	9	0	73	~177	82	0	12	60	0
Queue Length 95th (ft)	9	24	27	120	#267	107	0	31	82	0
Internal Link Dist (ft)		725		1517		890			940	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	282	514	514	474	147	1074	1553	165	1002	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.08	0.44	0.62	2.22	0.56	0.10	0.24	0.46	0.01

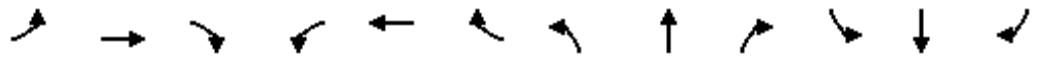
Intersection Summary

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

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

HCM 6th Signalized Intersection Summary  
 9: Industrial Blvd. & Depot Rd.

EX\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	34	179	134	69	30	261	481	128	31	366	8
Future Volume (veh/h)	8	34	179	134	69	30	261	481	128	31	366	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1574	1248	1870	1737	1781	1722	1737	1841	1900	1618	1648
Adj Flow Rate, veh/h	10	42	224	168	86	38	326	601	0	39	458	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	33	22	44	2	11	8	12	11	4	0	19	17
Cap, veh/h	432	520	348	317	149	54	150	1090		166	1016	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	953	1574	1055	646	451	164	1640	3300	1560	1810	3075	1397
Grp Volume(v), veh/h	10	42	224	292	0	0	326	601	0	39	458	0
Grp Sat Flow(s),veh/h/ln	953	1574	1055	1261	0	0	1640	1650	1560	1810	1537	1397
Q Serve(g_s), s	0.0	1.0	9.8	9.2	0.0	0.0	5.0	8.1	0.0	1.1	6.4	0.0
Cycle Q Clear(g_c), s	0.4	1.0	9.8	10.7	0.0	0.0	5.0	8.1	0.0	1.1	6.4	0.0
Prop In Lane	1.00		1.00	0.58		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	432	520	348	521	0	0	150	1090		166	1016	
V/C Ratio(X)	0.02	0.08	0.64	0.56	0.00	0.00	2.17	0.55		0.23	0.45	
Avail Cap(c_a), veh/h	432	520	348	521	0	0	150	1090		166	1016	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.4	12.6	15.5	15.6	0.0	0.0	24.8	14.9	0.0	23.0	14.4	0.0
Incr Delay (d2), s/veh	0.1	0.3	8.8	4.3	0.0	0.0	546.3	2.0	0.0	3.3	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	2.9	3.3	0.0	0.0	24.6	3.0	0.0	0.6	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	12.9	24.3	19.9	0.0	0.0	571.0	17.0	0.0	26.3	15.8	0.0
LnGrp LOS	B	B	C	B	A	A	F	B		C	B	
Approach Vol, veh/h		276			292			927	A		497	A
Approach Delay, s/veh		22.2			19.9			211.8			16.6	
Approach LOS		C			B			F			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	10.1		11.8	7.0	8.4		12.7				
Green Ext Time (p_c), s	0.0	2.5		0.6	0.0	2.1		0.9				

Intersection Summary

HCM 6th Ctrl Delay	108.7
HCM 6th LOS	F

Notes

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

**Intersection**

Intersection Delay, s/veh 9.4

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	5	5	10	6	28	6	150	29	10	83	0
Future Vol, veh/h	1	5	5	10	6	28	6	150	29	10	83	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	100	75	50	38	40	14	20	16	83	50	44	0
Mvmt Flow	1	6	6	12	7	33	7	179	35	12	99	0
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.5	8.5	9.7	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	9%	23%	100%	0%
Vol Thru, %	0%	84%	45%	14%	0%	100%
Vol Right, %	0%	16%	45%	64%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	179	11	44	10	83
LT Vol	6	0	1	10	10	0
Through Vol	0	150	5	6	0	83
RT Vol	0	29	5	28	0	0
Lane Flow Rate	7	213	13	52	12	99
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.011	0.292	0.023	0.074	0.021	0.154
Departure Headway (Hd)	5.624	4.941	6.28	5.086	6.212	5.608
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	638	729	571	706	578	641
Service Time	3.34	2.656	4.305	3.106	3.929	3.325
HCM Lane V/C Ratio	0.011	0.292	0.023	0.074	0.021	0.154
HCM Control Delay	8.4	9.7	9.5	8.5	9.1	9.3
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0	1.2	0.1	0.2	0.1	0.5

Intersection

Intersection Delay, s/veh 10.9

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↖	↗
Traffic Vol, veh/h	6	9	10	18	23	150	15	139	28	75	78	8
Future Vol, veh/h	6	9	10	18	23	150	15	139	28	75	78	8
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	20	29	25	43	11	18	0	23	41	45	52	50
Mvmt Flow	6	10	11	19	25	161	16	149	30	81	84	9
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	9.1	11.4	11.1	10.3
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	24%	9%	100%	0%	0%
Vol Thru, %	0%	83%	36%	12%	0%	100%	0%
Vol Right, %	0%	17%	40%	79%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	167	25	191	75	78	8
LT Vol	15	0	6	18	75	0	0
Through Vol	0	139	9	23	0	78	0
RT Vol	0	28	10	150	0	0	8
Lane Flow Rate	16	180	27	205	81	84	9
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.028	0.297	0.046	0.33	0.15	0.147	0.013
Departure Headway (Hd)	6.189	5.961	6.105	5.782	6.686	6.301	5.56
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	573	596	590	616	532	564	637
Service Time	3.987	3.758	3.805	3.564	4.478	4.093	3.351
HCM Lane V/C Ratio	0.028	0.302	0.046	0.333	0.152	0.149	0.014
HCM Control Delay	9.2	11.3	9.1	11.4	10.7	10.2	8.4
HCM Lane LOS	A	B	A	B	B	B	A
HCM 95th-tile Q	0.1	1.2	0.1	1.4	0.5	0.5	0

Intersection

Intersection Delay, s/veh 13.1

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑	↗	↘	↑	↗
Traffic Vol, veh/h	3	42	17	320	79	179	24	23	18	77	17	2
Future Vol, veh/h	3	42	17	320	79	179	24	23	18	77	17	2
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
Heavy Vehicles, %	0	43	50	14	18	9	29	7	57	39	0	0
Mvmt Flow	3	47	19	356	88	199	27	26	20	86	19	2
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	10.4	14	10.3	11.6
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	23	18	3	42	17	320	79	179	77	17	2
LT Vol	24	0	0	3	0	0	320	0	0	77	0	0
Through Vol	0	23	0	0	42	0	0	79	0	0	17	0
RT Vol	0	0	18	0	0	17	0	0	179	0	0	2
Lane Flow Rate	27	26	20	3	47	19	356	88	199	86	19	2
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.057	0.048	0.039	0.006	0.093	0.035	0.606	0.139	0.268	0.184	0.034	0.004
Departure Headway (Hd)	7.675	6.801	6.951	6.954	7.185	6.604	6.136	5.704	4.851	7.738	6.575	5.875
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	467	527	516	516	500	543	594	633	746	465	545	609
Service Time	5.407	4.533	4.683	4.684	4.915	4.334	3.836	3.404	2.551	5.47	4.307	3.607
HCM Lane V/C Ratio	0.058	0.049	0.039	0.006	0.094	0.035	0.599	0.139	0.267	0.185	0.035	0.003
HCM Control Delay	10.9	9.9	10	9.7	10.7	9.6	17.8	9.3	9.3	12.2	9.5	8.6
HCM Lane LOS	B	A	A	A	B	A	C	A	A	B	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0	0.3	0.1	4	0.5	1.1	0.7	0.1	0



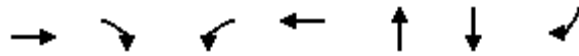


## Queues

EX\_PM

04/12/2022

## 1: Clawiter Rd. &amp; Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	138	146	124	218	619	484	40
v/c Ratio	0.60	0.20	0.62	0.71	1.18	0.81	0.12
Control Delay	44.8	2.2	47.2	26.8	125.4	41.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	2.2	47.2	26.8	125.4	41.5	1.1
Queue Length 50th (ft)	61	0	56	35	~339	112	0
Queue Length 95th (ft)	#139	17	119	112	#687	186	2
Internal Link Dist (ft)	128			403	144	1216	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	275	726	550	604	526	1000	515
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.20	0.23	0.36	1.18	0.48	0.08

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

EX\_PM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	36	87	130	110	48	146	39	347	165	171	260	36
Future Volume (veh/h)	36	87	130	110	48	146	39	347	165	171	260	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
Adj Flow Rate, veh/h	40	98	146	124	54	164	44	390	0	192	292	40
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	16	16	16	16	16	16	16	16	16	16	16	16
Cap, veh/h	62	151	582	274	63	191	48	422		334	333	297
Arrive On Green	0.13	0.13	0.13	0.17	0.17	0.17	0.28	0.28	0.00	0.21	0.21	0.21
Sat Flow, veh/h	475	1164	1409	1584	363	1102	168	1487	0	1584	1580	1409
Grp Volume(v), veh/h	138	0	146	124	0	218	434	0	0	192	292	40
Grp Sat Flow(s),veh/h/ln	1639	0	1409	1584	0	1465	1654	0	0	1584	1580	1409
Q Serve(g_s), s	6.2	0.0	5.2	5.4	0.0	11.1	19.6	0.0	0.0	8.4	13.8	1.8
Cycle Q Clear(g_c), s	6.2	0.0	5.2	5.4	0.0	11.1	19.6	0.0	0.0	8.4	13.8	1.8
Prop In Lane	0.29		1.00	1.00		0.75	0.10		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	212	0	582	274	0	254	469	0		334	333	297
V/C Ratio(X)	0.65	0.00	0.25	0.45	0.00	0.86	0.92	0.00		0.58	0.88	0.13
Avail Cap(c_a), veh/h	277	0	638	556	0	514	537	0		514	513	458
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	0.0	14.8	28.5	0.0	30.9	26.8	0.0	0.0	27.3	29.4	24.7
Incr Delay (d2), s/veh	1.2	0.0	0.1	0.4	0.0	3.3	19.4	0.0	0.0	0.6	7.1	0.1
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	2.4	0.0	2.6	2.0	0.0	4.0	9.8	0.0	0.0	3.1	5.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	0.0	14.9	29.0	0.0	34.2	46.1	0.0	0.0	27.9	36.5	24.7
LnGrp LOS	C	A	B	C	A	C	D	A		C	D	C
Approach Vol, veh/h		284			342			434	A		524	
Approach Delay, s/veh		23.7			32.3			46.1			32.4	
Approach LOS		C			C			D			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.9		13.7		20.3		17.0				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		21.6		8.2		15.8		13.1				
Green Ext Time (p_c), s		0.2		0.1		0.4		0.2				

Intersection Summary

HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

Notes

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

**Intersection**

Intersection Delay, s/veh 137.9  
 Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕			↕	↕		↕	↕
Traffic Vol, veh/h	185	12	79	2	165	119	267	247	6	67	138	295
Future Vol, veh/h	185	12	79	2	165	119	267	247	6	67	138	295
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	226	15	96	2	201	145	326	301	7	82	168	360
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	29.6	62.3	330.3	40.8
HCM LOS	D	F	F	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	52%	0%	94%	0%	1%	33%	0%
Vol Thru, %	48%	0%	6%	0%	58%	67%	0%
Vol Right, %	0%	100%	0%	100%	42%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	514	6	197	79	286	205	295
LT Vol	267	0	185	0	2	67	0
Through Vol	247	0	12	0	165	138	0
RT Vol	0	6	0	79	119	0	295
Lane Flow Rate	627	7	240	96	349	250	360
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	1.665	0.017	0.668	0.237	0.9	0.645	0.841
Departure Headway (Hd)	9.561	8.556	11.652	10.411	11.105	10.785	9.868
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	382	417	312	347	328	338	371
Service Time	7.339	6.333	9.352	8.111	9.105	8.485	7.568
HCM Lane V/C Ratio	1.641	0.017	0.769	0.277	1.064	0.74	0.97
HCM Control Delay	334	11.5	35	16.3	62.3	31.1	47.6
HCM Lane LOS	F	B	D	C	F	D	E
HCM 95th-tile Q	37.3	0.1	4.5	0.9	8.6	4.2	7.7

Queues  
3: Clawiter Rd. & Enterprise Ave.

EX\_PM  
04/12/2022



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	238	1	83	504	297
v/c Ratio	0.77	0.01	0.58	0.42	0.29
Control Delay	39.6	48.0	59.0	7.3	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	48.0	59.0	7.3	16.9
Queue Length 50th (ft)	85	1	54	89	104
Queue Length 95th (ft)	161	7	100	265	238
Internal Link Dist (ft)	2619	76		1216	1497
Turn Bay Length (ft)			155		
Base Capacity (vph)	412	383	215	1205	1033
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.00	0.39	0.42	0.29

Intersection Summary

HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

EX\_PM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	98	0	116	1	0	0	75	453	1	0	239	28
Future Volume (veh/h)	98	0	116	1	0	0	75	453	1	0	239	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1811	1900	1781	1900	1900	1900	1218	1604	1900	1900	1767	1263
Adj Flow Rate, veh/h	109	0	129	1	0	0	83	503	1	0	266	31
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, %	6	0	8	0	0	0	46	20	0	0	9	43
Cap, veh/h	125	0	148	2	0	0	96	1136	2	2	906	106
Arrive On Green	0.16	0.00	0.16	0.00	0.00	0.00	0.08	0.71	0.71	0.00	0.58	0.58
Sat Flow, veh/h	777	0	919	1809	0	0	1160	1600	3	1810	1549	181
Grp Volume(v), veh/h	238	0	0	1	0	0	83	0	504	0	0	297
Grp Sat Flow(s),veh/h/ln	1696	0	0	1810	0	0	1160	0	1603	1810	0	1729
Q Serve(g_s), s	14.5	0.0	0.0	0.1	0.0	0.0	7.5	0.0	14.1	0.0	0.0	9.1
Cycle Q Clear(g_c), s	14.5	0.0	0.0	0.1	0.0	0.0	7.5	0.0	14.1	0.0	0.0	9.1
Prop In Lane	0.46		0.54	1.00		0.00	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	273	0	0	2	0	0	96	0	1138	2	0	1012
V/C Ratio(X)	0.87	0.00	0.00	0.40	0.00	0.00	0.86	0.00	0.44	0.00	0.00	0.29
Avail Cap(c_a), veh/h	344	0	0	384	0	0	202	0	1138	316	0	1012
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	1.00
Uniform Delay (d), s/veh	43.4	0.0	0.0	52.9	0.0	0.0	48.0	0.0	6.5	0.0	0.0	11.0
Incr Delay (d2), s/veh	17.6	0.0	0.0	81.6	0.0	0.0	2.2	0.0	0.1	0.0	0.0	0.7
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(50%),veh/ln	7.4	0.0	0.0	0.1	0.0	0.0	2.2	0.0	4.2	0.0	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	0.0	0.0	134.4	0.0	0.0	50.3	0.0	6.6	0.0	0.0	11.8
LnGrp LOS	E	A	A	F	A	A	D	A	A	A	A	B
Approach Vol, veh/h		238			1			587				297
Approach Delay, s/veh		61.0			134.4			12.8				11.8
Approach LOS		E			F			B				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	79.8		21.6	13.3	66.5		4.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	25.5		21.5	18.5	25.5		22.5				
Max Q Clear Time (g_c+I1), s	0.0	16.1		16.5	9.5	11.1		2.1				
Green Ext Time (p_c), s	0.0	2.3		0.6	0.1	1.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Queues

4: Clawiter Rd. & Depot Rd.

EX\_PM

04/12/2022



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	575	115	13	599	117	13
v/c Ratio	0.78	0.44	0.07	0.35	0.08	0.01
Control Delay	46.3	50.6	0.8	9.9	12.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	50.6	0.8	9.9	12.6	0.9
Queue Length 50th (ft)	193	39	0	112	18	0
Queue Length 95th (ft)	236	67	0	68	39	3
Internal Link Dist (ft)	3711	564		280	717	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	1041	712	386	1736	1544	1056
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.16	0.03	0.35	0.08	0.01

Intersection Summary

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

EX\_PM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕	↗		↕↕			↕↕	↗
Traffic Volume (veh/h)	166	364	16	18	91	12	21	375	173	12	99	12
Future Volume (veh/h)	166	364	16	18	91	12	21	375	173	12	99	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1781	1500	1767	1470	1604	1352	1841	1826	1796	1633	1515
Adj Flow Rate, veh/h	175	383	17	19	96	13	22	395	182	13	104	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	8	27	9	29	20	37	4	5	7	18	26
Cap, veh/h	207	484	22	29	154	87	80	1337	598	183	1475	1032
Arrive On Green	0.20	0.20	0.20	0.06	0.06	0.06	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	1013	2371	108	447	2398	1359	74	2231	997	236	2460	1284
Grp Volume(v), veh/h	299	0	276	62	53	13	326	0	273	60	57	13
Grp Sat Flow(s),veh/h/ln	1731	0	1762	1448	1397	1359	1806	0	1496	1285	1412	1284
Q Serve(g_s), s	17.6	0.0	15.7	4.4	3.9	1.0	0.0	0.0	9.5	0.1	1.8	0.2
Cycle Q Clear(g_c), s	17.6	0.0	15.7	4.4	3.9	1.0	9.1	0.0	9.5	9.6	1.8	0.2
Prop In Lane	0.59		0.06	0.31		1.00	0.07		0.67	0.22		1.00
Lane Grp Cap(c), veh/h	353	0	360	93	90	87	1119	0	897	812	846	1032
V/C Ratio(X)	0.85	0.00	0.77	0.66	0.59	0.15	0.29	0.00	0.30	0.07	0.07	0.01
Avail Cap(c_a), veh/h	547	0	557	362	349	340	1119	0	897	812	846	1032
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	0.00	1.00	0.81	0.81	0.81	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	0.0	39.8	48.5	48.2	46.8	10.3	0.0	10.4	8.9	8.9	2.1
Incr Delay (d2), s/veh	4.4	0.0	1.3	6.3	5.0	0.6	0.7	0.0	0.9	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	6.9	1.7	1.5	0.3	3.7	0.0	3.2	0.6	0.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	0.0	41.1	54.8	53.3	47.5	11.0	0.0	11.3	9.0	9.0	2.1
LnGrp LOS	D	A	D	D	D	D	B	A	B	A	A	A
Approach Vol, veh/h		575			128			599				130
Approach Delay, s/veh		43.1			53.4			11.1				8.3
Approach LOS		D			D			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		68.6		11.3		68.6		26.1				
Change Period (Y+Rc), s		5.0		4.5		* 5		4.5				
Max Green Setting (Gmax), s		32.0		26.5		* 33		33.5				
Max Q Clear Time (g_c+I1), s		11.5		6.4		11.6		19.6				
Green Ext Time (p_c), s		5.2		0.6		0.9		2.0				

Intersection Summary

HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

5: Industrial Blvd. & Clawiter Rd.

EX\_PM

04/12/2022



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	304	301	51	37	548	1	429
v/c Ratio	0.76	0.63	0.51	0.30	0.31	0.01	0.27
Control Delay	47.9	28.1	57.0	51.4	18.6	47.0	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	28.1	57.0	51.4	18.6	47.0	22.5
Queue Length 50th (ft)	198	126	29	24	104	1	99
Queue Length 95th (ft)	268	196	66	56	219	7	181
Internal Link Dist (ft)		32	86		915		218
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	567	630	123	138	1770	89	1597
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.48	0.41	0.27	0.31	0.01	0.27

Intersection Summary



HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

EX\_PM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	0	8	40	1	6	34	502	2	1	395	0
Future Volume (veh/h)	548	0	8	40	1	6	34	502	2	1	395	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	604	0	0	43	1	7	37	546	2	1	429	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	8	8	8	8	8	8	8	8	8	8	0
Cap, veh/h	715	375	0	55	1	9	53	2032	7	2	1886	0
Arrive On Green	0.21	0.00	0.00	0.04	0.04	0.04	0.03	0.59	0.59	0.00	0.56	0.00
Sat Flow, veh/h	3393	1781	0	1408	33	229	1697	3459	13	1697	3474	0
Grp Volume(v), veh/h	604	0	0	51	0	0	37	267	281	1	429	0
Grp Sat Flow(s),veh/h/ln	1697	1781	0	1670	0	0	1697	1692	1779	1697	1692	0
Q Serve(g_s), s	17.9	0.0	0.0	3.2	0.0	0.0	2.3	8.1	8.1	0.1	6.7	0.0
Cycle Q Clear(g_c), s	17.9	0.0	0.0	3.2	0.0	0.0	2.3	8.1	8.1	0.1	6.7	0.0
Prop In Lane	1.00		0.00	0.84		0.14	1.00		0.01	1.00		0.00
Lane Grp Cap(c), veh/h	715	375	0	65	0	0	53	994	1045	2	1886	0
V/C Ratio(X)	0.85	0.00	0.00	0.79	0.00	0.00	0.69	0.27	0.27	0.43	0.23	0.00
Avail Cap(c_a), veh/h	1212	636	0	191	0	0	129	994	1045	81	1886	0
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(l)	1.00	0.00	0.00	1.00	0.00	0.00	0.77	0.77	0.77	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.8	0.0	0.0	50.0	0.0	0.0	50.3	10.6	10.6	52.4	11.8	0.0
Incr Delay (d2), s/veh	2.9	0.0	0.0	18.7	0.0	0.0	11.7	0.5	0.5	92.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	0.0	0.0	1.7	0.0	0.0	1.1	3.0	3.2	0.1	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	0.0	68.7	0.0	0.0	62.1	11.1	11.1	145.3	12.1	0.0
LnGrp LOS	D	A	A	E	A	A	E	B	B	F	B	A
Approach Vol, veh/h		604			51			585			430	
Approach Delay, s/veh		42.7			68.7			14.3			12.4	
Approach LOS		D			E			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	66.2		26.6	7.3	63.0		8.1				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	5.0	33.5		37.5	8.0	30.5		12.0				
Max Q Clear Time (g_c+I1), s	2.1	10.1		19.9	4.3	8.7		5.2				
Green Ext Time (p_c), s	0.0	3.4		2.2	0.0	2.8		0.1				

Intersection Summary

HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	9	5	3	0	0	0	556	0	135	0
Future Vol, veh/h	0	0	9	5	3	0	0	0	556	0	135	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	0	0	11	6	4	0	0	0	662	0	161	0

Major/Minor	Minor2		Minor1			Major2		
Conflicting Flow All	-	-	161	167	161	-	-	0
Stage 1	-	-	-	0	0	-	-	-
Stage 2	-	-	-	167	161	-	-	-
Critical Hdwy	-	-	6.28	7.18	6.58	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.18	5.58	-	-	-
Follow-up Hdwy	-	-	3.372	3.572	4.072	-	-	-
Pot Cap-1 Maneuver	0	0	869	784	721	0	0	0
Stage 1	0	0	-	-	-	0	0	0
Stage 2	0	0	-	821	753	0	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	869	775	721	-	-	-
Mov Cap-2 Maneuver	-	-	-	775	721	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	811	753	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	9.2		9.8		0	
HCM LOS	A		A			

Minor Lane/Major Mvmt	EBLn1WBLn1		SBT
Capacity (veh/h)	869	754	-
HCM Lane V/C Ratio	0.012	0.013	-
HCM Control Delay (s)	9.2	9.8	-
HCM Lane LOS	A	A	-
HCM 95th %tile Q(veh)	0	0	-

Queues  
7: Clawiter Rd. & West St.

EX\_PM  
04/12/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	1447	26	649
v/c Ratio	0.36	0.61	0.17	0.25
Control Delay	28.5	9.3	31.1	2.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.5	9.3	31.1	2.9
Queue Length 50th (ft)	23	93	11	32
Queue Length 95th (ft)	54	327	31	58
Internal Link Dist (ft)	322	867		3164
Turn Bay Length (ft)			45	
Base Capacity (vph)	557	2354	150	2549
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.13	0.61	0.17	0.25

Intersection Summary

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

EX\_PM  
04/12/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↕
Traffic Volume (veh/h)	49	12	995	278	23	571
Future Volume (veh/h)	49	12	995	278	23	571
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1722	1752	1737	1885	1663	1707
Adj Flow Rate, veh/h	56	14	1131	316	26	649
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	10	11	1	16	13
Cap, veh/h	70	18	1838	507	45	2646
Arrive On Green	0.06	0.06	0.72	0.72	0.03	0.82
Sat Flow, veh/h	1264	316	2629	701	1584	3329
Grp Volume(v), veh/h	71	0	729	718	26	649
Grp Sat Flow(s),veh/h/ln	1602	0	1650	1593	1584	1622
Q Serve(g_s), s	3.1	0.0	15.3	15.9	1.1	3.2
Cycle Q Clear(g_c), s	3.1	0.0	15.3	15.9	1.1	3.2
Prop In Lane	0.79	0.20		0.44	1.00	
Lane Grp Cap(c), veh/h	89	0	1193	1152	45	2646
V/C Ratio(X)	0.80	0.00	0.61	0.62	0.58	0.25
Avail Cap(c_a), veh/h	552	0	1193	1152	115	2646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.45	0.45
Uniform Delay (d), s/veh	32.7	0.0	4.8	4.9	33.6	1.5
Incr Delay (d2), s/veh	14.7	0.0	2.3	2.5	5.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	4.0	4.1	0.5	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.3	0.0	7.1	7.4	38.8	1.6
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	71		1447			675
Approach Delay, s/veh	47.3		7.3			3.0
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.5	55.1			61.6	8.4
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	5.1	* 28			36.9	24.1
Max Q Clear Time (g_c+I1), s	3.1	17.9			5.2	5.1
Green Ext Time (p_c), s	0.0	6.7			5.1	0.1

Intersection Summary

HCM 6th Ctrl Delay			7.3			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

EX\_PM  
04/12/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1449	320	345	60	60	737	4	2
v/c Ratio	0.01	0.97	0.83	0.21	0.21	0.21	1.17	0.01	0.00
Control Delay	46.0	44.0	60.7	9.2	31.6	31.6	116.1	27.7	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	44.0	60.7	9.2	31.6	31.6	116.1	27.7	27.5
Queue Length 50th (ft)	1	453	102	43	31	31	~421	2	1
Queue Length 95th (ft)	6	#505	#140	74	63	63	#554	10	6
Internal Link Dist (ft)		5245		2336		3164			278
Turn Bay Length (ft)	210		205		85			50	
Base Capacity (vph)	144	1497	407	1679	280	280	628	364	509
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.97	0.79	0.21	0.21	0.21	1.17	0.01	0.00

Intersection Summary

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

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

HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

EX\_PM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕		↖	↕		↗	↖	↗	↖	↕	↘
Traffic Volume (veh/h)	1	1026	177	266	286	0	100	0	612	3	2	0
Future Volume (veh/h)	1	1026	177	266	286	0	100	0	612	3	2	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1811	1737	1470	1426	1648	1455	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	1	1236	0	320	345	0	120	0	737	4	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	6	11	29	32	17	30	0	5	0	0	0
Cap, veh/h	2	1442		464	1622	0	713	0	401	262	494	0
Arrive On Green	0.00	0.42	0.00	0.17	0.60	0.00	0.26	0.00	0.26	0.26	0.26	0.00
Sat Flow, veh/h	1810	3532	0	2716	2780	0	2194	0	1544	732	1900	0
Grp Volume(v), veh/h	1	1236	0	320	345	0	120	0	737	4	2	0
Grp Sat Flow(s),veh/h/ln	1810	1721	0	1358	1354	0	1097	0	1544	732	1900	0
Q Serve(g_s), s	0.1	32.6	0.0	11.1	5.9	0.0	4.3	0.0	26.0	0.4	0.1	0.0
Cycle Q Clear(g_c), s	0.1	32.6	0.0	11.1	5.9	0.0	4.4	0.0	26.0	0.4	0.1	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	1442		464	1622	0	713	0	401	262	494	0
V/C Ratio(X)	0.40	0.86		0.69	0.21	0.00	0.17	0.00	1.84	0.02	0.00	0.00
Avail Cap(c_a), veh/h	145	1548		464	1622	0	713	0	401	262	494	0
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	0.00	0.75	0.00	0.75	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.9	26.3	0.0	39.0	9.2	0.0	29.0	0.0	37.0	27.5	27.4	0.0
Incr Delay (d2), s/veh	34.9	6.8	0.0	3.6	0.3	0.0	0.0	0.0	383.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.1	0.0	3.9	1.7	0.0	1.1	0.0	52.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.8	33.1	0.0	42.6	9.5	0.0	29.1	0.0	420.5	27.5	27.4	0.0
LnGrp LOS	F	C		D	A	A	C	A	F	C	C	A
Approach Vol, veh/h		1237	A		665			857			6	
Approach Delay, s/veh		33.1			25.4			365.7			27.5	
Approach LOS		C			C			F			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.1	46.9		31.0	4.1	64.9		31.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	15.0	* 45		26.0	8.0	52.0		26.0				
Max Q Clear Time (g_c+I1), s	13.1	34.6		28.0	2.1	7.9		2.4				
Green Ext Time (p_c), s	0.2	7.3		0.0	0.0	3.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay	134.3
HCM 6th LOS	F

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

## Queues

## 9: Industrial Blvd. &amp; Depot Rd.

EX\_PM

04/12/2022



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	241	347	98	118	675	211	49	493	9
v/c Ratio	0.17	0.39	0.49	0.23	0.88	0.64	0.14	0.31	0.44	0.01
Control Delay	14.5	16.4	4.6	13.3	83.0	18.9	0.2	28.9	15.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	16.4	4.6	13.3	83.0	18.9	0.2	28.9	15.9	0.0
Queue Length 50th (ft)	14	59	0	19	39	95	0	15	64	0
Queue Length 95th (ft)	35	106	43	46	#115	139	0	41	97	0
Internal Link Dist (ft)		564		1810		890			915	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	362	615	714	430	134	1055	1493	156	1114	1226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.39	0.49	0.23	0.88	0.64	0.14	0.31	0.44	0.01

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 9: Industrial Blvd. & Depot Rd.

EX\_PM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗		↔		↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (veh/h)	53	212	305	48	25	13	104	594	186	43	434	8
Future Volume (veh/h)	53	212	305	48	25	13	104	594	186	43	434	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1767	1781	1618	1767	1559	1707	1811	1811	1796	1470
Adj Flow Rate, veh/h	60	241	347	55	28	15	118	675	0	49	493	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	20	2	9	8	19	9	23	13	6	6	7	29
Cap, veh/h	509	618	487	224	100	40	136	1071		158	1127	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	1168	1870	1475	367	302	121	1485	3244	1535	1725	3413	1246
Grp Volume(v), veh/h	60	241	347	98	0	0	118	675	0	49	493	0
Grp Sat Flow(s),veh/h/ln	1168	1870	1475	790	0	0	1485	1622	1535	1725	1706	1246
Q Serve(g_s), s	0.0	5.4	11.2	2.0	0.0	0.0	4.3	9.6	0.0	1.4	6.2	0.0
Cycle Q Clear(g_c), s	2.1	5.4	11.2	7.4	0.0	0.0	4.3	9.6	0.0	1.4	6.2	0.0
Prop In Lane	1.00		1.00	0.56		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	509	618	487	364	0	0	136	1071		158	1127	
V/C Ratio(X)	0.12	0.39	0.71	0.27	0.00	0.00	0.87	0.63		0.31	0.44	
Avail Cap(c_a), veh/h	509	618	487	364	0	0	136	1071		158	1127	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.9	14.0	16.0	14.3	0.0	0.0	24.4	15.4	0.0	23.1	14.3	0.0
Incr Delay (d2), s/veh	0.5	1.9	8.6	1.8	0.0	0.0	47.7	2.8	0.0	5.0	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.3	4.4	1.1	0.0	0.0	3.2	3.5	0.0	0.8	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	15.9	24.6	16.1	0.0	0.0	72.1	18.2	0.0	28.2	15.5	0.0
LnGrp LOS	B	B	C	B	A	A	E	B		C	B	
Approach Vol, veh/h		648			98			793	A		542	A
Approach Delay, s/veh		20.3			16.1			26.3			16.7	
Approach LOS		C			B			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.4	11.6		13.2	6.3	8.2		9.4				
Green Ext Time (p_c), s	0.0	2.4		1.4	0.0	2.3		0.3				

Intersection Summary

HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Notes

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



Intersection

Intersection Delay, s/veh 8.9  
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	2	0	8	0	24	4	73	37	42	122	1
Future Vol, veh/h	2	2	0	8	0	24	4	73	37	42	122	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	100	0	0	57	0	40	67	44	94	11	16	100
Mvmt Flow	2	2	0	9	0	28	5	84	43	48	140	1
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.6	8.6	9.2	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	50%	25%	100%	0%
Vol Thru, %	0%	66%	50%	0%	0%	99%
Vol Right, %	0%	34%	0%	75%	0%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	110	4	32	42	123
LT Vol	4	0	2	8	42	0
Through Vol	0	73	2	0	0	122
RT Vol	0	37	0	24	0	1
Lane Flow Rate	5	126	5	37	48	141
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.008	0.186	0.008	0.054	0.071	0.193
Departure Headway (Hd)	6.418	5.288	6.574	5.29	5.325	4.904
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	560	681	547	680	665	722
Service Time	4.125	2.995	4.585	3.297	3.123	2.701
HCM Lane V/C Ratio	0.009	0.185	0.009	0.054	0.072	0.195
HCM Control Delay	9.2	9.2	9.6	8.6	8.5	8.9
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0	0.7	0	0.2	0.2	0.7

Intersection

Intersection Delay, s/veh 10.7

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	13	35	13	19	12	89	16	58	23	166	97	14
Future Vol, veh/h	13	35	13	19	12	89	16	58	23	166	97	14
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	18	10	0	31	10	34	54	40	26	11	16	42
Mvmt Flow	16	43	16	23	15	110	20	72	28	205	120	17
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10	10.7	10.8	10.9
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	21%	16%	100%	0%	0%
Vol Thru, %	0%	72%	57%	10%	0%	100%	0%
Vol Right, %	0%	28%	21%	74%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	81	61	120	166	97	14
LT Vol	16	0	13	19	166	0	0
Through Vol	0	58	35	12	0	97	0
RT Vol	0	23	13	89	0	0	14
Lane Flow Rate	20	100	75	148	205	120	17
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.041	0.183	0.132	0.248	0.342	0.186	0.026
Departure Headway (Hd)	7.537	6.588	6.308	6.017	6.108	5.689	5.429
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	477	547	571	600	592	635	663
Service Time	5.253	4.304	4.019	3.717	3.808	3.389	3.129
HCM Lane V/C Ratio	0.042	0.183	0.131	0.247	0.346	0.189	0.026
HCM Control Delay	10.6	10.8	10	10.7	11.9	9.7	8.3
HCM Lane LOS	B	B	A	B	B	A	A
HCM 95th-tile Q	0.1	0.7	0.5	1	1.5	0.7	0.1

**Intersection**

Intersection Delay, s/veh 11.2

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Vol, veh/h	2	127	20	57	57	54	19	21	104	169	28	5
Future Vol, veh/h	2	127	20	57	57	54	19	21	104	169	28	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	100	9	27	34	45	17	50	41	9	8	33	0
Mvmt Flow	2	148	23	66	66	63	22	24	121	197	33	6
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	11.2	10.4	10	12.7
HCM LOS	B	B	A	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	21	104	2	127	20	57	57	54	169	28	5
LT Vol	19	0	0	2	0	0	57	0	0	169	0	0
Through Vol	0	21	0	0	127	0	0	57	0	0	28	0
RT Vol	0	0	104	0	0	20	0	0	54	0	0	5
Lane Flow Rate	22	24	121	2	148	23	66	66	63	197	33	6
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.047	0.047	0.193	0.005	0.264	0.039	0.134	0.129	0.101	0.367	0.06	0.009
Departure Headway (Hd)	7.647	6.994	5.75	8.489	6.442	6.048	7.305	6.992	5.816	6.729	6.654	5.393
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	469	512	624	422	558	592	491	513	616	535	539	663
Service Time	5.386	4.733	3.489	6.226	4.179	3.785	5.045	4.732	3.556	4.463	4.388	3.127
HCM Lane V/C Ratio	0.047	0.047	0.194	0.005	0.265	0.039	0.134	0.129	0.102	0.368	0.061	0.009
HCM Control Delay	10.8	10.1	9.9	11.3	11.5	9	11.2	10.8	9.2	13.3	9.8	8.2
HCM Lane LOS	B	B	A	B	B	A	B	B	A	B	A	A
HCM 95th-tile Q	0.1	0.1	0.7	0	1.1	0.1	0.5	0.4	0.3	1.7	0.2	0







**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Ave Industrial TIA  
**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection 2 AM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/Eden Land  
**Scenario:** Existing AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:30 AM	8:30 AM		245	622	397	112
2nd Highest Hour			232	589	376	106
3rd Highest Hour			229	581	371	105
4th Highest Hour			219	556	355	100
5th Highest Hour			216	547	349	99
6th Highest Hour			216	547	349	99
7th Highest Hour			206	522	333	94
8th Highest Hour			203	514	328	93
9th Highest Hour			196	498	318	90
10th Highest Hour			183	464	296	84
11th Highest Hour			176	448	286	81
12th Highest Hour			173	440	281	79
13th Highest Hour			167	423	270	76
14th Highest Hour			144	365	233	66
15th Highest Hour			114	290	185	52
16th Highest Hour			108	274	175	49
17th Highest Hour			75	191	122	34
18th Highest Hour			62	158	101	28
19th Highest Hour			33	83	53	15
20th Highest Hour			23	58	37	10
21st Highest Hour			20	50	32	9
22nd Highest Hour			13	33	21	6
23rd Highest Hour			7	17	11	3
24th Highest Hour			7	17	11	3

**Warrant Summary**

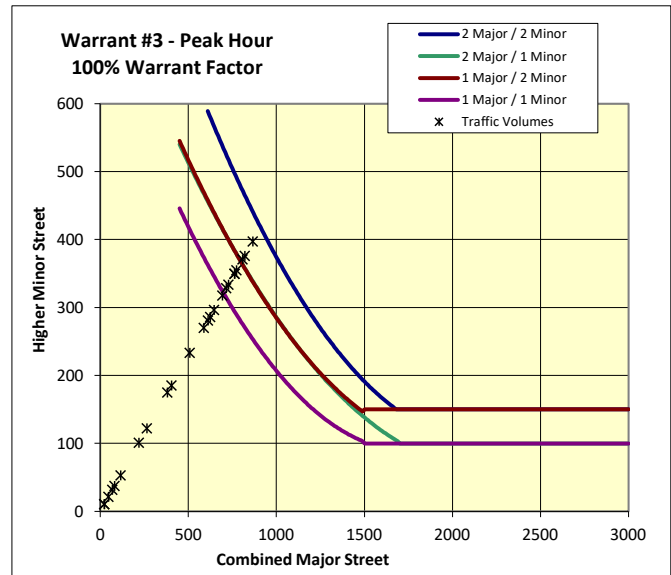
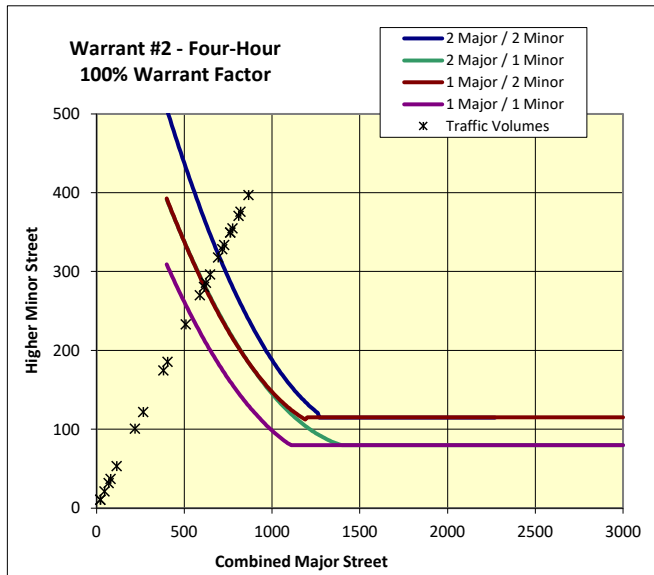
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	6	No	
80%	A	400	120	15	Yes	Yes
	B	600	60	12	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	13	Yes	Yes
56%	A	280	84	16	Yes	Yes
	B	420	42	14	Yes	Yes





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**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection 2 PM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/ Eden Land  
**Scenario:** Existing PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:30 PM	5:30 PM		520	490	276	286
2nd Highest Hour			492	464	261	271
3rd Highest Hour			485	457	258	267
4th Highest Hour			465	438	247	255
5th Highest Hour			458	431	243	252
6th Highest Hour			458	431	243	252
7th Highest Hour			437	412	232	240
8th Highest Hour			430	405	228	236
9th Highest Hour			416	392	221	229
10th Highest Hour			388	366	206	214
11th Highest Hour			374	353	199	206
12th Highest Hour			367	346	195	202
13th Highest Hour			354	333	188	194
14th Highest Hour			305	287	162	168
15th Highest Hour			243	229	129	133
16th Highest Hour			229	216	121	126
17th Highest Hour			159	150	85	88
18th Highest Hour			132	124	70	72
19th Highest Hour			69	65	37	38
20th Highest Hour			49	46	26	27
21st Highest Hour			42	39	22	23
22nd Highest Hour			28	26	15	15
23rd Highest Hour			14	13	7	8
24th Highest Hour			14	13	7	8

**Warrant Summary**

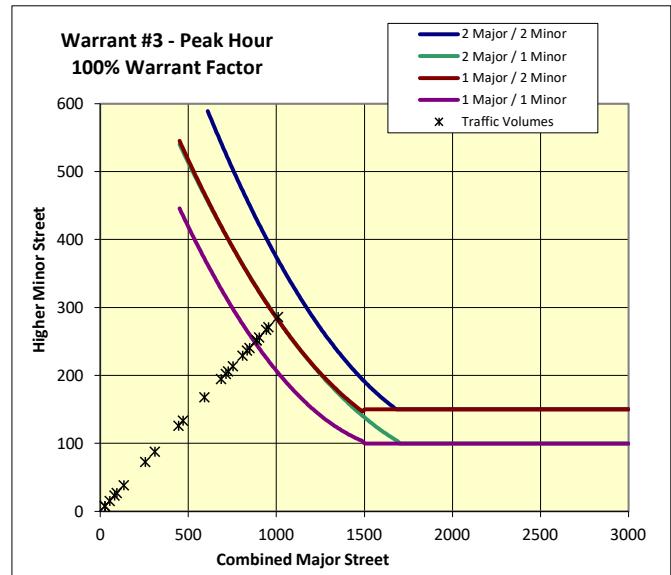
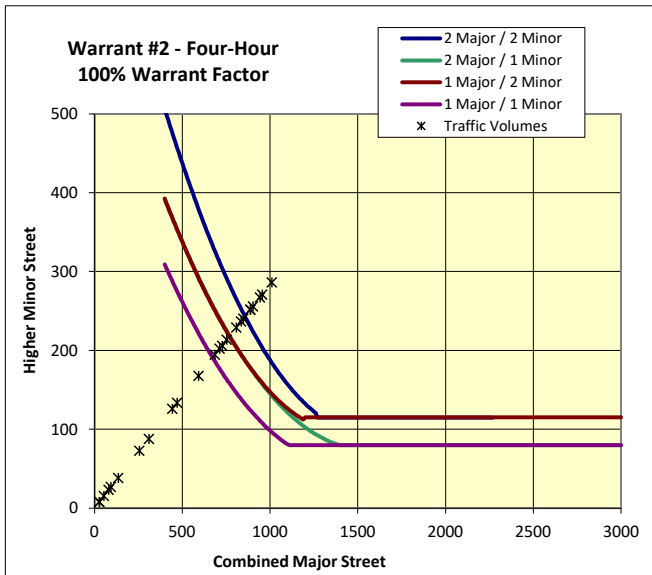
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	10	Yes	Yes
80%	A	400	120	16	Yes	Yes
	B	600	60	13	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	17	Yes	Yes
	B	420	42	16	Yes	Yes





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**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection 6 AM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** Existing AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:35 AM	8:35 AM		71	765	4	1
2nd Highest Hour			67	724	4	1
3rd Highest Hour			66	714	4	1
4th Highest Hour			63	683	4	1
5th Highest Hour			62	673	4	1
6th Highest Hour			62	673	4	1
7th Highest Hour			60	643	3	1
8th Highest Hour			59	632	3	1
9th Highest Hour			57	612	3	1
10th Highest Hour			53	571	3	1
11th Highest Hour			51	551	3	1
12th Highest Hour			50	541	3	1
13th Highest Hour			48	520	3	1
14th Highest Hour			42	449	2	1
15th Highest Hour			33	357	2	0
16th Highest Hour			31	337	2	0
17th Highest Hour			22	235	1	0
18th Highest Hour			18	194	1	0
19th Highest Hour			9	102	1	0
20th Highest Hour			7	71	0	0
21st Highest Hour			6	61	0	0
22nd Highest Hour			4	41	0	0
23rd Highest Hour			2	20	0	0
24th Highest Hour			2	20	0	0

**Warrant Summary**

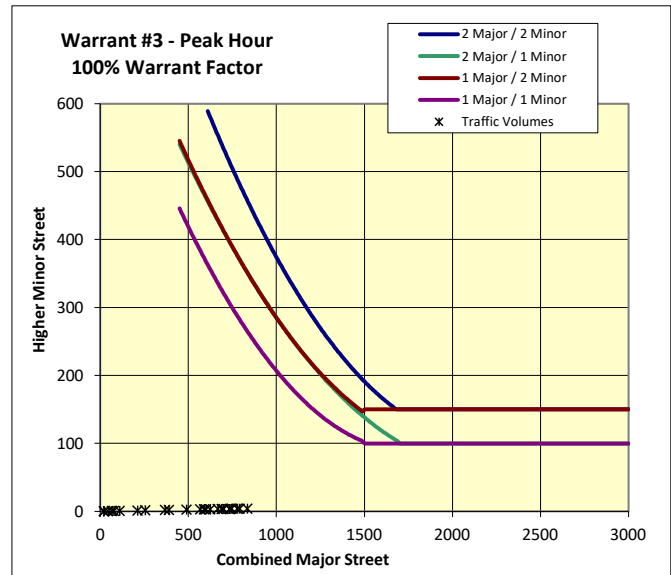
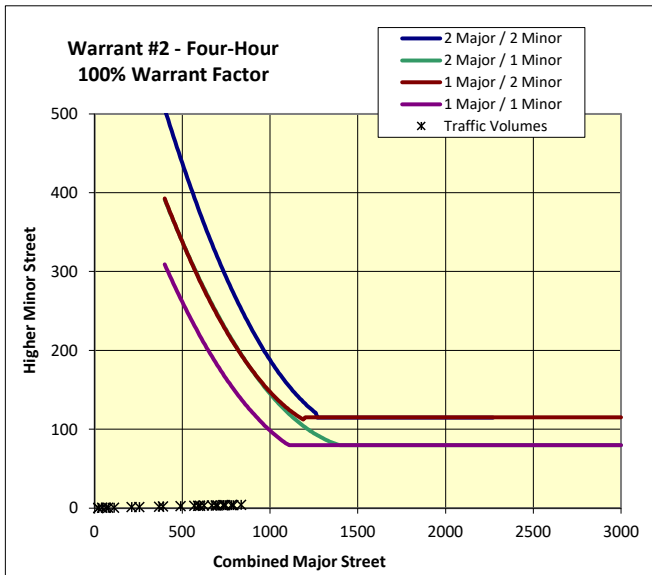
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No







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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection 6 PM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** Existing PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		556	135	9	8
2nd Highest Hour			526	128	9	8
3rd Highest Hour			519	126	8	7
4th Highest Hour			497	121	8	7
5th Highest Hour			489	119	8	7
6th Highest Hour			489	119	8	7
7th Highest Hour			467	113	8	7
8th Highest Hour			460	112	7	7
9th Highest Hour			445	108	7	6
10th Highest Hour			415	101	7	6
11th Highest Hour			400	97	6	6
12th Highest Hour			393	95	6	6
13th Highest Hour			378	92	6	5
14th Highest Hour			326	79	5	5
15th Highest Hour			259	63	4	4
16th Highest Hour			245	59	4	4
17th Highest Hour			171	41	3	2
18th Highest Hour			141	34	2	2
19th Highest Hour			74	18	1	1
20th Highest Hour			52	13	1	1
21st Highest Hour			44	11	1	1
22nd Highest Hour			30	7	0	0
23rd Highest Hour			15	4	0	0
24th Highest Hour			15	4	0	0

**Warrant Summary**

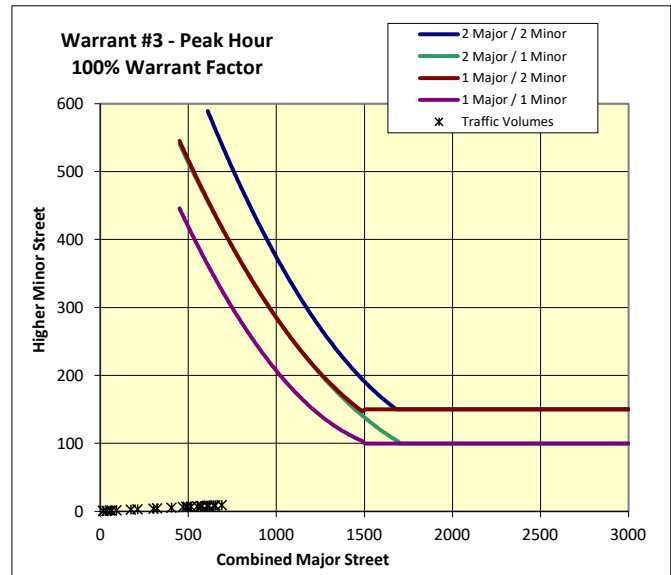
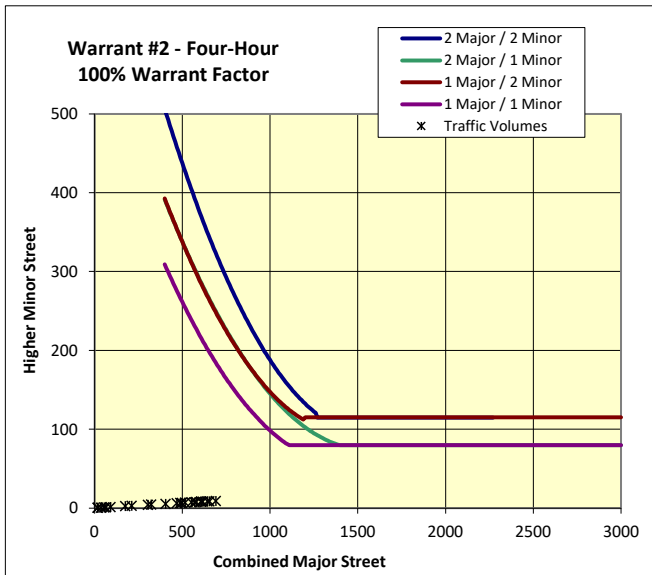
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection\_10\_AM.xlsm\Data Input  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** Existing AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
8:00 AM	9:00 AM		185	93	11	44
2nd Highest Hour			175	88	11	43
3rd Highest Hour			173	87	9	38
4th Highest Hour			165	83	9	36
5th Highest Hour			163	82	8	33
6th Highest Hour			163	82	7	28
7th Highest Hour			155	78	7	28
8th Highest Hour			153	77	6	26
9th Highest Hour			148	74	6	24
10th Highest Hour			138	69	6	22
11th Highest Hour			133	67	6	22
12th Highest Hour			131	66	5	21
13th Highest Hour			126	63	5	20
14th Highest Hour			109	55	5	18
15th Highest Hour			86	43	5	18
16th Highest Hour			81	41	5	18
17th Highest Hour			57	29	4	14
18th Highest Hour			47	24	3	12
19th Highest Hour			25	12	2	9
20th Highest Hour			17	9	1	5
21st Highest Hour			15	7	1	3
22nd Highest Hour			10	5	1	3
23rd Highest Hour			5	2	0	2
24th Highest Hour			5	2	0	2

**Warrant Summary**

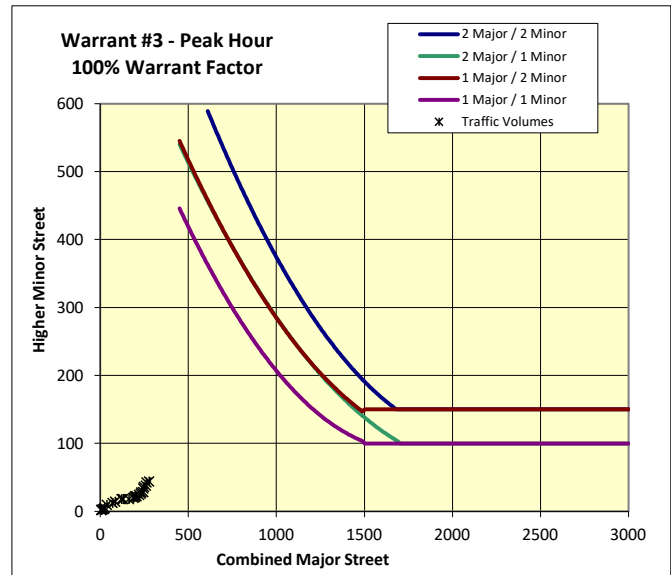
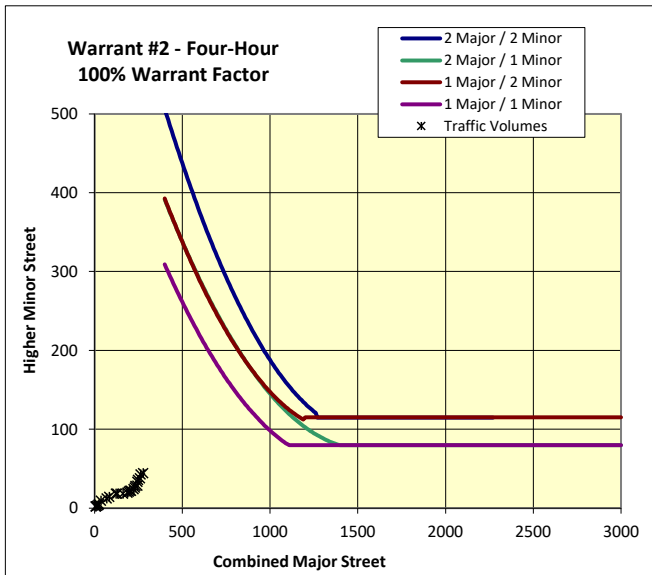
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





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**Project #:** 26915  
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**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection\_10\_PM.xlsm\Data Input  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** Existing PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		114	166	5	32
2nd Highest Hour			108	157	5	31
3rd Highest Hour			106	155	4	27
4th Highest Hour			102	148	4	26
5th Highest Hour			100	146	4	24
6th Highest Hour			100	146	3	21
7th Highest Hour			96	139	3	20
8th Highest Hour			94	137	3	19
9th Highest Hour			91	133	3	17
10th Highest Hour			85	124	3	16
11th Highest Hour			82	120	3	16
12th Highest Hour			81	117	2	15
13th Highest Hour			78	113	2	14
14th Highest Hour			67	97	2	13
15th Highest Hour			53	77	2	13
16th Highest Hour			50	73	2	13
17th Highest Hour			35	51	2	10
18th Highest Hour			29	42	1	9
19th Highest Hour			15	22	1	7
20th Highest Hour			11	15	1	4
21st Highest Hour			9	13	0	2
22nd Highest Hour			6	9	0	2
23rd Highest Hour			3	4	0	1
24th Highest Hour			3	4	0	1

**Warrant Summary**

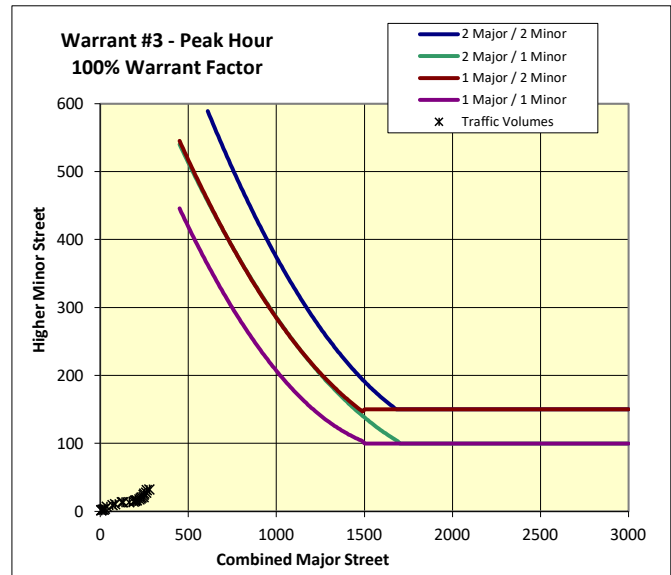
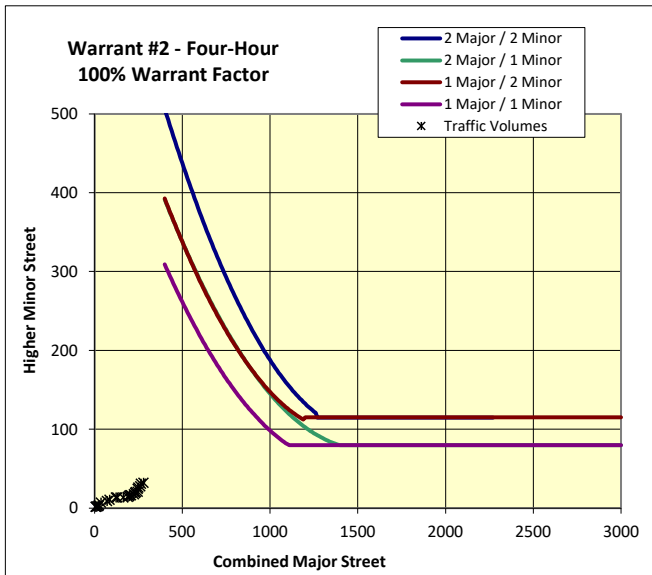
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection 11 AM.xlsm\Data Input  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** Existing AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:55 AM	8:55 AM		181	160	25	190
2nd Highest Hour			171	151	24	184
3rd Highest Hour			169	149	21	163
4th Highest Hour			162	143	20	154
5th Highest Hour			159	141	19	144
6th Highest Hour			159	141	16	122
7th Highest Hour			152	134	16	120
8th Highest Hour			150	132	15	112
9th Highest Hour			145	128	14	103
10th Highest Hour			135	119	13	95
11th Highest Hour			130	115	13	95
12th Highest Hour			128	113	12	89
13th Highest Hour			123	109	11	84
14th Highest Hour			106	94	10	78
15th Highest Hour			84	75	10	78
16th Highest Hour			80	70	10	78
17th Highest Hour			56	49	8	61
18th Highest Hour			46	41	7	53
19th Highest Hour			24	21	5	40
20th Highest Hour			17	15	3	21
21st Highest Hour			14	13	2	15
22nd Highest Hour			10	9	2	13
23rd Highest Hour			5	4	1	8
24th Highest Hour			5	4	1	8

**Warrant Summary**

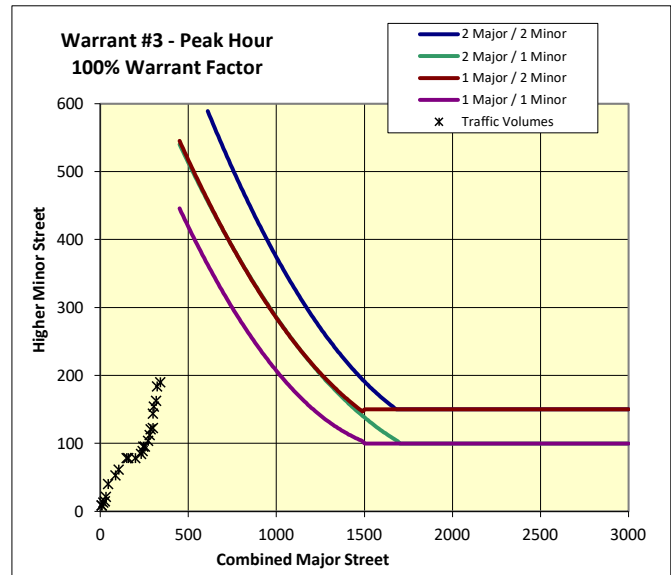
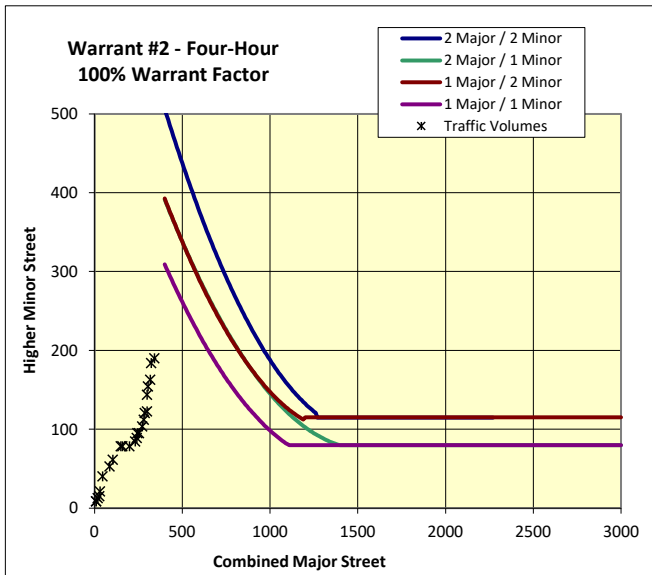
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	8	Yes	Yes
	B	420	42	0	No	No





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**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX\Intersection 11 PM.xlsm\Data Input  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** Existing PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:05 PM	5:05 PM		96	277	61	120
2nd Highest Hour			91	262	59	116
3rd Highest Hour			90	259	52	103
4th Highest Hour			86	247	49	97
5th Highest Hour			84	244	46	91
6th Highest Hour			84	244	39	77
7th Highest Hour			81	233	39	76
8th Highest Hour			79	229	36	71
9th Highest Hour			77	222	33	65
10th Highest Hour			72	207	31	60
11th Highest Hour			69	199	31	60
12th Highest Hour			68	196	28	56
13th Highest Hour			65	188	27	53
14th Highest Hour			56	163	25	49
15th Highest Hour			45	129	25	49
16th Highest Hour			42	122	25	49
17th Highest Hour			29	85	20	39
18th Highest Hour			24	70	17	33
19th Highest Hour			13	37	13	25
20th Highest Hour			9	26	7	13
21st Highest Hour			8	22	5	9
22nd Highest Hour			5	15	4	8
23rd Highest Hour			3	7	3	5
24th Highest Hour			3	7	3	5

**Warrant Summary**

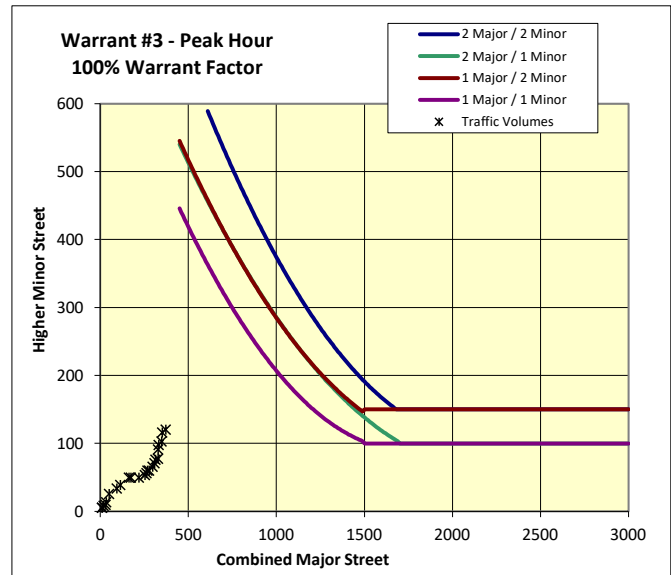
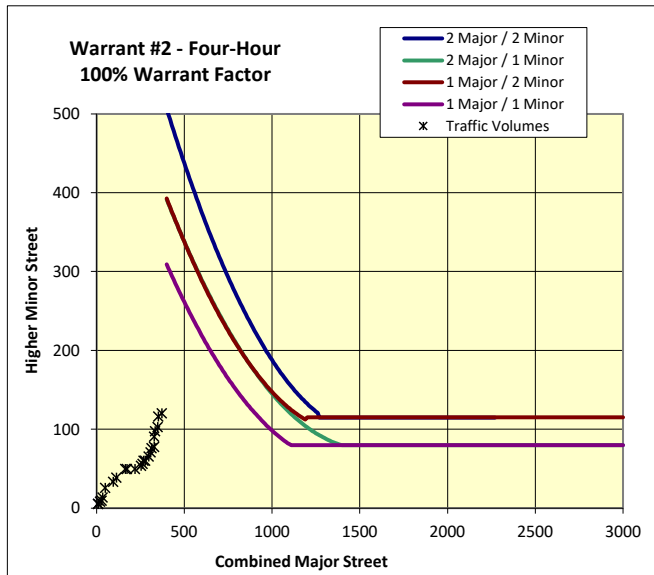
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	2	No	No
	B	525	53	0	No	No
56%	A	280	84	5	No	No
	B	420	42	0	No	No





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**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX\Intersection 12 AM.xlsm\Data Input  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** Existing AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:50 AM	8:50 AM		65	96	62	578
2nd Highest Hour			62	91	60	559
3rd Highest Hour			61	90	53	495
4th Highest Hour			58	86	50	469
5th Highest Hour			57	84	47	437
6th Highest Hour			57	84	40	372
7th Highest Hour			55	81	39	366
8th Highest Hour			54	79	37	340
9th Highest Hour			52	77	34	315
10th Highest Hour			49	72	31	289
11th Highest Hour			47	69	31	289
12th Highest Hour			46	68	29	270
13th Highest Hour			44	65	28	257
14th Highest Hour			38	56	25	238
15th Highest Hour			30	45	25	238
16th Highest Hour			29	42	25	238
17th Highest Hour			20	29	20	186
18th Highest Hour			16	24	17	161
19th Highest Hour			9	13	13	122
20th Highest Hour			6	9	7	64
21st Highest Hour			5	8	5	45
22nd Highest Hour			3	5	4	39
23rd Highest Hour			2	3	3	26
24th Highest Hour			2	3	3	26

**Warrant Summary**

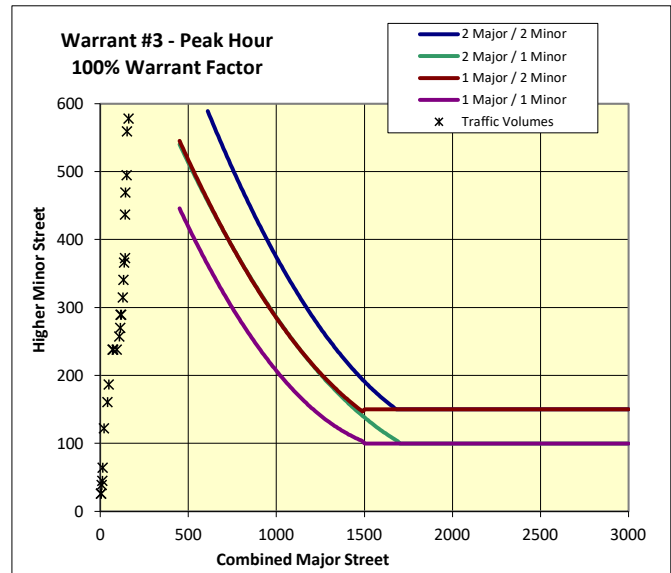
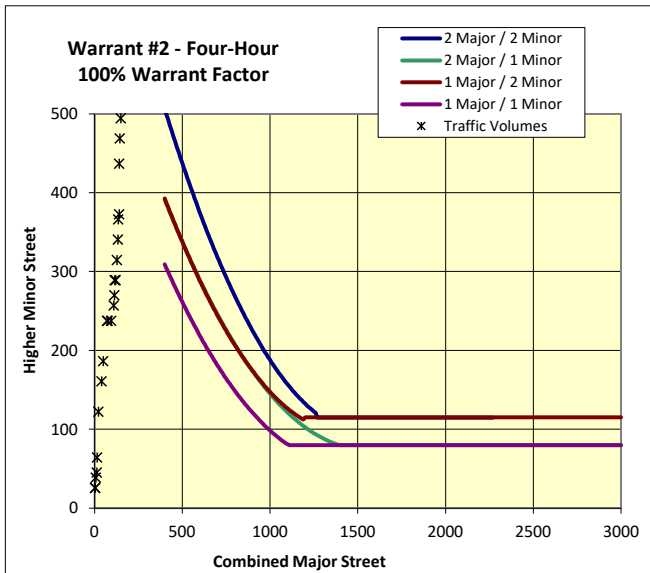
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





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**Analyst:** MAR  
**Date:** 1/31/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX\Intersection 12 PM.xlsm\Data Input  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** Existing PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:10 PM	5:10 PM		144	202	149	168
2nd Highest Hour			136	191	144	162
3rd Highest Hour			134	189	127	144
4th Highest Hour			129	180	121	136
5th Highest Hour			127	178	113	127
6th Highest Hour			127	178	96	108
7th Highest Hour			121	170	94	106
8th Highest Hour			119	167	88	99
9th Highest Hour			115	162	81	91
10th Highest Hour			108	151	75	84
11th Highest Hour			104	145	75	84
12th Highest Hour			102	143	70	78
13th Highest Hour			98	137	66	75
14th Highest Hour			84	119	61	69
15th Highest Hour			67	94	61	69
16th Highest Hour			63	89	61	69
17th Highest Hour			44	62	48	54
18th Highest Hour			36	51	41	47
19th Highest Hour			19	27	31	35
20th Highest Hour			13	19	17	19
21st Highest Hour			12	16	12	13
22nd Highest Hour			8	11	10	11
23rd Highest Hour			4	5	7	7
24th Highest Hour			4	5	7	7

**Warrant Summary**

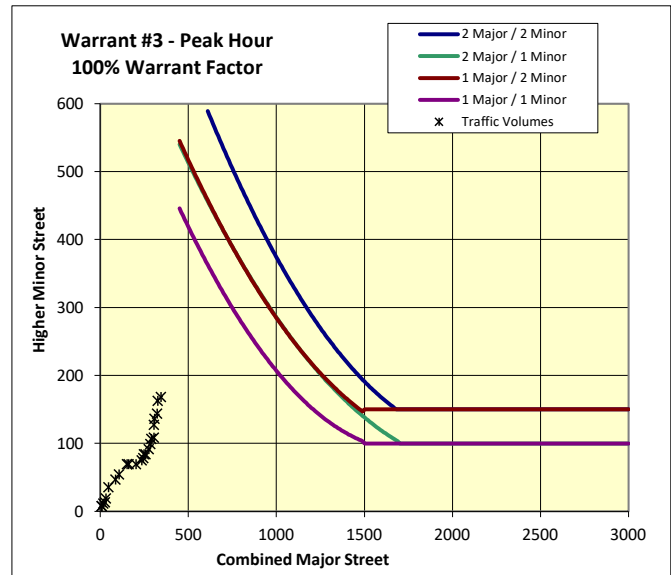
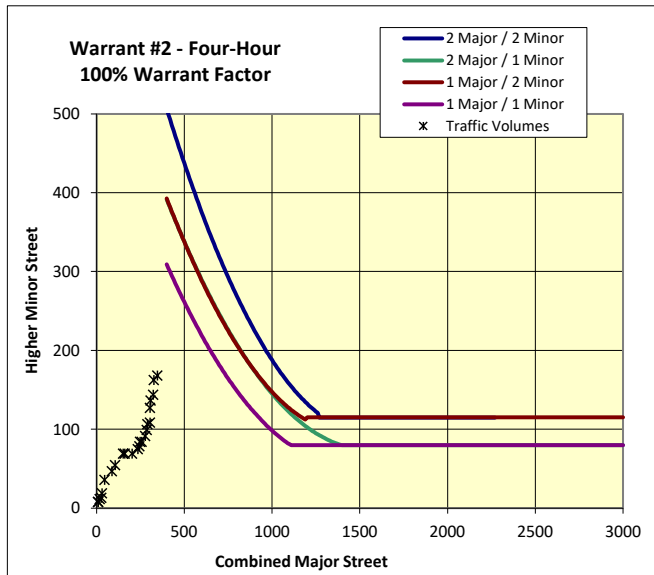
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	8	Yes	Yes
	B	420	42	0	No	No

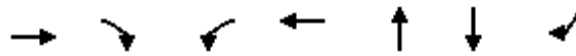


Appendix C: Existing Plus Project Level of  
Service, Queue, And Peak Hour Traffic  
Signal Warrants Worksheets



Queues

1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	99	91	302	353	473	640	75
v/c Ratio	0.64	0.18	0.81	0.90	1.21	0.97dl	0.20
Control Delay	62.4	3.4	53.6	55.9	147.8	55.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	3.4	53.6	55.9	147.8	55.3	7.0
Queue Length 50th (ft)	61	0	178	170	~370	207	0
Queue Length 95th (ft)	#135	16	282	#320	#620	#360	29
Internal Link Dist (ft)	128			403	1161	1231	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	182	504	496	495	392	701	374
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.18	0.61	0.71	1.21	0.91	0.20

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

EX+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	16	76	85	281	122	206	108	231	101	329	266	70
Future Volume (veh/h)	16	76	85	281	122	206	108	231	101	329	266	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	907	1322	1470	1826	1633	1752	1722	1455	1366	1426	1366	1366
Adj Flow Rate, veh/h	17	82	91	302	131	222	116	248	0	354	286	75
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	67	39	29	5	18	10	12	30	36	32	36	36
Cap, veh/h	22	106	429	446	139	236	112	240		320	319	278
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.25	0.25	0.00	0.25	0.25	0.25
Sat Flow, veh/h	225	1086	1246	1739	544	923	457	976	0	1301	1298	1130
Grp Volume(v), veh/h	99	0	91	302	0	353	364	0	0	354	286	75
Grp Sat Flow(s),veh/h/ln	1311	0	1246	1739	0	1467	1433	0	0	1301	1298	1130
Q Serve(g_s), s	7.5	0.0	5.2	15.9	0.0	23.9	25.0	0.0	0.0	25.0	21.6	5.4
Cycle Q Clear(g_c), s	7.5	0.0	5.2	15.9	0.0	23.9	25.0	0.0	0.0	25.0	21.6	5.4
Prop In Lane	0.17		1.00	1.00		0.63	0.32		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	128	0	429	446	0	376	353	0		320	319	278
V/C Ratio(X)	0.77	0.00	0.21	0.68	0.00	0.94	1.03	0.00		1.11	0.90	0.27
Avail Cap(c_a), veh/h	168	0	466	462	0	390	353	0		320	319	278
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	0.0	23.6	34.0	0.0	37.0	38.3	0.0	0.0	38.3	37.0	30.9
Incr Delay (d2), s/veh	10.5	0.0	0.1	3.0	0.0	29.4	56.5	0.0	0.0	81.6	25.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	2.2	7.0	0.0	11.5	14.1	0.0	0.0	15.1	9.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	0.0	23.7	37.0	0.0	66.4	94.8	0.0	0.0	119.9	62.3	31.1
LnGrp LOS	E	A	C	D	A	E	F	A		F	E	C
Approach Vol, veh/h		190			655			364	A		715	
Approach Delay, s/veh		40.1			52.9			94.8			87.5	
Approach LOS		D			D			F			F	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.1		13.7		29.1		29.7				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		27.0		9.5		27.0		25.9				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	72.4
HCM 6th LOS	E

Notes

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

Intersection

Intersection Delay, s/veh 54.1

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↕			↖	↗		↖	↗
Traffic Vol, veh/h	235	50	126	5	64	43	79	162	7	162	328	142
Future Vol, veh/h	235	50	126	5	64	43	79	162	7	162	328	142
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	16	8	8	25	34	37	31	26	0	7	9	45
Mvmt Flow	255	54	137	5	70	47	86	176	8	176	357	154
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	25.6	16.5	25	90.7
HCM LOS	D	C	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	33%	0%	82%	0%	4%	33%	0%
Vol Thru, %	67%	0%	18%	0%	57%	67%	0%
Vol Right, %	0%	100%	0%	100%	38%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	241	7	285	126	112	490	142
LT Vol	79	0	235	0	5	162	0
Through Vol	162	0	50	0	64	328	0
RT Vol	0	7	0	126	43	0	142
Lane Flow Rate	262	8	310	137	122	533	154
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.625	0.016	0.72	0.271	0.303	1.143	0.294
Departure Headway (Hd)	8.926	7.941	8.81	7.523	9.442	7.723	6.867
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	406	453	412	481	383	474	525
Service Time	6.626	5.641	6.51	5.223	7.442	5.438	4.582
HCM Lane V/C Ratio	0.645	0.018	0.752	0.285	0.319	1.124	0.293
HCM Control Delay	25.4	10.8	31.1	13	16.5	113.4	12.4
HCM Lane LOS	D	B	D	B	C	F	B
HCM 95th-tile Q	4.1	0	5.6	1.1	1.3	18.9	1.2

Queues  
3: Clawiter Rd. & Enterprise Ave.

EX+P\_AM  
04/12/2022



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	165	1	216	386	614
v/c Ratio	0.71	0.01	0.68	0.30	0.76
Control Delay	25.3	48.0	49.0	4.5	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	48.0	49.0	4.5	23.8
Queue Length 50th (ft)	7	1	135	34	164
Queue Length 95th (ft)	68	7	202	161	#687
Internal Link Dist (ft)	2621	76		1231	1843
Turn Bay Length (ft)			155		
Base Capacity (vph)	305	306	317	1290	804
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.00	0.68	0.30	0.76

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 3: Clawiter Rd. & Enterprise Ave.

EX+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	18	0	129	1	0	0	192	343	1	0	448	99
Future Volume (veh/h)	18	0	129	1	0	0	192	343	1	0	448	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1233	1900	1055	1900	1900	1900	1544	1618	1900	1900	1500	1574
Adj Flow Rate, veh/h	20	0	145	1	0	0	216	385	1	0	503	111
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	45	0	57	0	0	0	24	19	0	0	27	22
Cap, veh/h	24	0	172	2	0	0	234	1212	3	2	650	144
Arrive On Green	0.12	0.00	0.12	0.00	0.00	0.00	0.16	0.75	0.75	0.00	0.55	0.55
Sat Flow, veh/h	198	0	1434	1809	0	0	1471	1613	4	1810	1184	261
Grp Volume(v), veh/h	165	0	0	1	0	0	216	0	386	0	0	614
Grp Sat Flow(s),veh/h/ln	1632	0	0	1810	0	0	1471	0	1618	1810	0	1446
Q Serve(g_s), s	10.5	0.0	0.0	0.1	0.0	0.0	15.3	0.0	8.3	0.0	0.0	35.3
Cycle Q Clear(g_c), s	10.5	0.0	0.0	0.1	0.0	0.0	15.3	0.0	8.3	0.0	0.0	35.3
Prop In Lane	0.12		0.88	1.00		0.00	1.00		0.00	1.00		0.18
Lane Grp Cap(c), veh/h	196	0	0	2	0	0	234	0	1215	2	0	794
V/C Ratio(X)	0.84	0.00	0.00	0.40	0.00	0.00	0.92	0.00	0.32	0.00	0.00	0.77
Avail Cap(c_a), veh/h	269	0	0	307	0	0	234	0	1215	87	0	794
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.94
Uniform Delay (d), s/veh	45.6	0.0	0.0	52.9	0.0	0.0	43.9	0.0	4.3	0.0	0.0	18.7
Incr Delay (d2), s/veh	15.6	0.0	0.0	81.6	0.0	0.0	6.0	0.0	0.1	0.0	0.0	6.8
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	5.1	0.0	0.0	0.1	0.0	0.0	5.9	0.0	2.3	0.0	0.0	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.2	0.0	0.0	134.4	0.0	0.0	49.9	0.0	4.4	0.0	0.0	25.5
LnGrp LOS	E	A	A	F	A	A	D	A	A	A	A	C
Approach Vol, veh/h		165			1			602				614
Approach Delay, s/veh		61.2			134.4			20.7				25.5
Approach LOS		E			F			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	84.1		17.2	21.4	62.7		4.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	47.4		17.5	16.9	35.6		18.0				
Max Q Clear Time (g_c+I1), s	0.0	10.3		12.5	17.3	37.3		2.1				
Green Ext Time (p_c), s	0.0	2.7		0.4	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Queues

4: Clawiter Rd. & Depot Rd.



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	215	436	4	91	617	218
v/c Ratio	0.69	0.73	0.01	0.07	0.36	0.21
Control Delay	49.8	47.3	0.0	14.5	15.6	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	47.3	0.0	14.5	15.6	1.3
Queue Length 50th (ft)	65	147	0	10	115	0
Queue Length 95th (ft)	100	190	0	41	198	23
Internal Link Dist (ft)	3714	725		1843	714	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	564	817	466	1348	1693	1093
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.53	0.01	0.07	0.36	0.20

Intersection Summary

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

EX+P\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↕↕	↗		↕↔			↕↕	↗
Traffic Volume (veh/h)	34	125	39	132	270	4	17	42	25	13	555	201
Future Volume (veh/h)	34	125	39	132	270	4	17	42	25	13	555	201
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1381	1159	937	1693	1722	1900	1618	1604	1648	1900	1722	1737
Adj Flow Rate, veh/h	37	136	42	143	293	4	18	46	27	14	603	218
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	35	50	65	14	12	0	19	20	17	0	12	11
Cap, veh/h	45	171	55	177	389	269	226	620	428	54	1804	1008
Arrive On Green	0.12	0.12	0.12	0.17	0.17	0.17	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	371	1401	447	1032	2275	1571	312	1088	750	33	3165	1453
Grp Volume(v), veh/h	114	0	101	232	204	4	43	0	48	330	287	218
Grp Sat Flow(s),veh/h/ln	1140	0	1078	1671	1636	1571	826	0	1324	1709	1489	1453
Q Serve(g_s), s	10.3	0.0	9.6	14.1	12.6	0.2	0.4	0.0	1.7	0.0	10.9	5.8
Cycle Q Clear(g_c), s	10.3	0.0	9.6	14.1	12.6	0.2	11.3	0.0	1.7	10.8	10.9	5.8
Prop In Lane	0.33		0.41	0.62		1.00	0.42		0.57	0.04		1.00
Lane Grp Cap(c), veh/h	139	0	132	286	280	269	519	0	755	1009	849	1008
V/C Ratio(X)	0.82	0.00	0.77	0.81	0.73	0.01	0.08	0.00	0.06	0.33	0.34	0.22
Avail Cap(c_a), veh/h	269	0	254	433	424	408	519	0	755	1009	849	1008
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	0.00	1.00	0.09	0.09	0.09	0.96	0.00	0.96	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	0.0	45.1	42.3	41.6	36.5	10.4	0.0	10.2	12.1	12.1	5.9
Incr Delay (d2), s/veh	4.4	0.0	3.5	0.6	0.3	0.0	0.3	0.0	0.2	0.3	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	2.7	5.8	5.1	0.1	0.5	0.0	0.5	4.1	3.6	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	0.0	48.6	42.9	42.0	36.5	10.7	0.0	10.3	12.4	12.5	6.1
LnGrp LOS	D	A	D	D	D	D	B	A	B	B	B	A
Approach Vol, veh/h		215			440			91			835	
Approach Delay, s/veh		49.2			42.4			10.5			10.8	
Approach LOS		D			D			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		65.4		22.6		65.4		17.9				
Change Period (Y+Rc), s		5.0		4.5		* 5		5.0				
Max Green Setting (Gmax), s		39.0		27.5		* 40		25.0				
Max Q Clear Time (g_c+I1), s		13.3		16.1		12.9		12.3				
Green Ext Time (p_c), s		0.7		2.0		7.3		0.7				

Intersection Summary

HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

## Queues

EX+P\_AM

04/12/2022

## 5: Industrial Blvd. &amp; Clawiter Rd.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	43	7	7	360	6	645
v/c Ratio	0.30	0.30	0.06	0.06	0.14	0.05	0.26
Control Delay	45.8	44.9	40.0	42.7	4.2	40.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	44.9	40.0	42.7	4.2	40.2	4.5
Queue Length 50th (ft)	26	25	4	4	15	4	27
Queue Length 95th (ft)	55	54	16	17	70	m8	113
Internal Link Dist (ft)		83	86		940		354
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	478	482	138	133	2532	133	2467
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.09	0.05	0.05	0.14	0.05	0.26

## Intersection Summary

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



HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

EX+P\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	4	1	4	1	1	6	296	7	5	542	0
Future Volume (veh/h)	67	4	1	4	1	1	6	296	7	5	542	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1678	1900	1900	1633	0
Adj Flow Rate, veh/h	85	0	0	5	1	1	7	352	8	6	645	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	0	0	0	0	0	0	0	15	0	0	18	0
Cap, veh/h	170	89	0	11	2	2	16	2413	55	14	2347	0
Arrive On Green	0.05	0.00	0.00	0.01	0.01	0.01	0.01	0.76	0.76	0.02	1.00	0.00
Sat Flow, veh/h	3619	1900	0	1279	256	256	1810	3186	72	1810	3185	0
Grp Volume(v), veh/h	85	0	0	7	0	0	7	176	184	6	645	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1790	0	0	1810	1594	1665	1810	1552	0
Q Serve(g_s), s	2.2	0.0	0.0	0.4	0.0	0.0	0.4	2.9	2.9	0.3	0.0	0.0
Cycle Q Clear(g_c), s	2.2	0.0	0.0	0.4	0.0	0.0	0.4	2.9	2.9	0.3	0.0	0.0
Prop In Lane	1.00		0.00	0.71		0.14	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	170	89	0	16	0	0	16	1207	1261	14	2347	0
V/C Ratio(X)	0.50	0.00	0.00	0.44	0.00	0.00	0.44	0.15	0.15	0.43	0.27	0.00
Avail Cap(c_a), veh/h	1010	530	0	132	0	0	133	1207	1261	133	2347	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.82	0.82	0.82	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	46.8	0.0	0.0	46.8	3.1	3.1	46.6	0.0	0.0
Incr Delay (d2), s/veh	2.3	0.0	0.0	18.0	0.0	0.0	14.5	0.2	0.2	19.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.2	0.0	0.0	0.2	0.8	0.8	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	0.0	0.0	64.8	0.0	0.0	61.3	3.3	3.3	66.1	0.3	0.0
LnGrp LOS	D	A	A	E	A	A	E	A	A	E	A	A
Approach Vol, veh/h		85			7			367			651	
Approach Delay, s/veh		46.4			64.8			4.5			0.9	
Approach LOS		D			E			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	76.5		9.0	4.8	76.3		4.8				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	7.0	37.5		26.5	7.0	37.5		7.0				
Max Q Clear Time (g_c+I1), s	2.3	4.9		4.2	2.4	2.0		2.4				
Green Ext Time (p_c), s	0.0	2.3		0.2	0.0	5.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	4	1	0	0	1	0	72	1	775	0
Future Vol, veh/h	0	0	4	1	0	0	1	0	72	1	775	0
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	6	6	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	26	0	50	0	0	0	28	12	0	0	16	0
Mvmt Flow	0	0	5	1	0	0	1	0	96	1	1033	0

Major/Minor	Minor2		Minor1			Major2				
Conflicting Flow All	-	-	1033	1044	1041	-	-	6	0	0
Stage 1	-	-	-	6	6	-	-	-	-	-
Stage 2	-	-	-	1038	1035	-	-	-	-	-
Critical Hdwy	-	-	6.7	7.1	6.5	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-
Follow-up Hdwy	-	-	3.75	3.5	4	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	229	209	232	0	-	1628	-	0
Stage 1	0	0	-	-	-	0	-	-	-	0
Stage 2	0	0	-	281	312	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	229	203	230	-	-	1619	-	-
Mov Cap-2 Maneuver	-	-	-	203	230	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	274	312	-	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	21.1		22.9		0	
HCM LOS	C		C			

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	229	203	1619	-
HCM Lane V/C Ratio	0.023	0.007	0.001	-
HCM Control Delay (s)	21.1	22.9	7.2	-
HCM Lane LOS	C	C	A	-
HCM 95th %tile Q(veh)	0.1	0	0	-

Queues

7: Clawiter Rd. & West St.



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	212	627	5	1242
v/c Ratio	0.68	0.29	0.05	0.53
Control Delay	46.8	5.9	42.5	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.8	5.9	42.5	7.4
Queue Length 50th (ft)	119	47	3	147
Queue Length 95th (ft)	170	107	14	230
Internal Link Dist (ft)	322	809		3146
Turn Bay Length (ft)			45	
Base Capacity (vph)	595	2185	142	2345
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.29	0.04	0.53

Intersection Summary

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

EX+P\_AM  
04/12/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↔	↕↕
Traffic Volume (veh/h)	175	8	501	38	4	1068
Future Volume (veh/h)	175	8	501	38	4	1068
Initial Q (Qb), veh	0	0	0	0	0	0
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	1900	1648	1856	1900	1722
Adj Flow Rate, veh/h	203	9	583	44	5	1242
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	0	17	3	0	12
Cap, veh/h	242	11	2084	157	12	2487
Arrive On Green	0.15	0.15	1.00	1.00	0.01	0.76
Sat Flow, veh/h	1662	74	3034	222	1810	3358
Grp Volume(v), veh/h	213	0	309	318	5	1242
Grp Sat Flow(s),veh/h/ln	1744	0	1566	1608	1810	1636
Q Serve(g_s), s	11.3	0.0	0.0	0.0	0.3	14.0
Cycle Q Clear(g_c), s	11.3	0.0	0.0	0.0	0.3	14.0
Prop In Lane	0.95	0.04		0.14	1.00	
Lane Grp Cap(c), veh/h	253	0	1105	1135	12	2487
V/C Ratio(X)	0.84	0.00	0.28	0.28	0.42	0.50
Avail Cap(c_a), veh/h	597	0	1105	1135	143	2487
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.25	0.25
Uniform Delay (d), s/veh	39.5	0.0	0.0	0.0	47.0	4.4
Incr Delay (d2), s/veh	7.3	0.0	0.6	0.6	6.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	0.2	0.2	0.1	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.8	0.0	0.6	0.6	53.0	4.6
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	213		627			1247
Approach Delay, s/veh	46.8		0.6			4.8
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.1	71.6			76.7	18.3
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	7.5	* 42			53.5	32.5
Max Q Clear Time (g_c+I1), s	2.3	2.0			16.0	13.3
Green Ext Time (p_c), s	0.0	4.5			12.5	0.6

Intersection Summary

HCM 6th Ctrl Delay			7.8			
HCM 6th LOS			A			

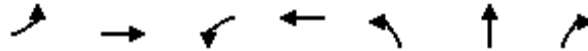
Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	1	580	1137	1277	86	87	260
v/c Ratio	0.01	0.59	0.93	0.51	0.62	0.63	0.67
Control Delay	51.0	28.4	46.7	6.5	64.0	64.6	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	28.4	46.7	6.5	64.0	64.6	14.4
Queue Length 50th (ft)	1	154	380	125	62	63	0
Queue Length 95th (ft)	6	224	441	289	105	106	60
Internal Link Dist (ft)		5260		2336		3146	
Turn Bay Length (ft)	210		205		85		
Base Capacity (vph)	98	986	1279	2505	285	285	519
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.59	0.89	0.51	0.30	0.31	0.50

Intersection Summary

HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

EX+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	↗
Traffic Volume (veh/h)	1	345	154	978	1097	1	149	0	224	0	0	0
Future Volume (veh/h)	1	345	154	978	1097	1	149	0	224	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1900	1322	1352	1796	1722	1781	1633	1411	1559	907	1900	1159
Adj Flow Rate, veh/h	1	401	0	1137	1276	1	173	0	260	0	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	39	37	7	12	8	18	33	23	67	0	50
Cap, veh/h	2	483		1544	2220	2	797	0	283	65	407	0
Arrive On Green	0.00	0.19	0.00	0.47	0.66	0.66	0.21	0.00	0.21	0.00	0.00	0.00
Sat Flow, veh/h	1810	2578	0	3319	3355	3	3111	0	1321	543	1900	0
Grp Volume(v), veh/h	1	401	0	1137	622	655	173	0	260	0	0	0
Grp Sat Flow(s),veh/h/ln	1810	1256	0	1659	1636	1722	1555	0	1321	543	1900	0
Q Serve(g_s), s	0.1	16.9	0.0	30.7	22.8	22.8	5.1	0.0	21.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	16.9	0.0	30.7	22.8	22.8	5.1	0.0	21.2	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	483		1544	1083	1139	797	0	283	65	407	0
V/C Ratio(X)	0.40	0.83		0.74	0.57	0.57	0.22	0.00	0.92	0.00	0.00	0.00
Avail Cap(c_a), veh/h	99	603		1544	1083	1139	897	0	326	83	468	0
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(l)	1.00	1.00	0.00	1.00	1.00	1.00	0.97	0.00	0.97	0.00	0.00	0.00
Uniform Delay (d), s/veh	54.9	42.7	0.0	23.9	10.2	10.2	36.0	0.0	42.3	0.0	0.0	0.0
Incr Delay (d2), s/veh	35.0	15.1	0.0	1.7	2.2	2.1	0.0	0.0	25.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	6.2	0.0	12.0	8.2	8.6	1.9	0.0	8.9	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.9	57.8	0.0	25.6	12.4	12.3	36.0	0.0	68.1	0.0	0.0	0.0
LnGrp LOS	F	E		C	B	B	D	A	E	A	A	A
Approach Vol, veh/h		402	A		2414			433				0
Approach Delay, s/veh		57.9			18.6			55.3				0.0
Approach LOS		E			B			E				
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	55.8	25.8		28.5	4.2	77.4		28.5				
Change Period (Y+Rc), s	4.6	* 4.6		4.9	4.0	4.6		4.9				
Max Green Setting (Gmax), s	43.0	* 26		27.1	6.0	63.4		27.1				
Max Q Clear Time (g_c+I1), s	32.7	18.9		23.2	2.1	24.8		0.0				
Green Ext Time (p_c), s	2.2	2.0		0.4	0.0	17.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

## Queues

EX+P\_AM

## 9: Industrial Blvd. &amp; Depot Rd.

04/12/2022



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	45	226	314	346	601	160	39	458	10
v/c Ratio	0.04	0.09	0.44	0.66	2.35	0.56	0.10	0.24	0.46	0.01
Control Delay	13.0	13.2	5.5	23.0	648.9	17.4	0.1	26.8	16.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	13.2	5.5	23.0	648.9	17.4	0.1	26.8	16.2	0.0
Queue Length 50th (ft)	2	10	0	81	~191	82	0	12	60	0
Queue Length 95th (ft)	9	25	28	130	#282	107	0	31	82	0
Internal Link Dist (ft)		725		1517		890			940	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	272	514	516	479	147	1074	1553	165	1002	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.09	0.44	0.66	2.35	0.56	0.10	0.24	0.46	0.01

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 9: Industrial Blvd. & Depot Rd.

EX+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	36	181	134	86	30	277	481	128	31	366	8
Future Volume (veh/h)	8	36	181	134	86	30	277	481	128	31	366	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1574	1248	1870	1737	1781	1722	1737	1841	1900	1618	1648
Adj Flow Rate, veh/h	10	45	226	168	108	38	346	601	0	39	458	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	33	22	44	2	11	8	12	11	4	0	19	17
Cap, veh/h	418	520	348	300	175	51	150	1090		166	1016	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	935	1574	1055	602	530	156	1640	3300	1560	1810	3075	1397
Grp Volume(v), veh/h	10	45	226	314	0	0	346	601	0	39	458	0
Grp Sat Flow(s),veh/h/ln	935	1574	1055	1288	0	0	1640	1650	1560	1810	1537	1397
Q Serve(g_s), s	0.0	1.1	10.0	9.7	0.0	0.0	5.0	8.1	0.0	1.1	6.4	0.0
Cycle Q Clear(g_c), s	0.4	1.1	10.0	11.5	0.0	0.0	5.0	8.1	0.0	1.1	6.4	0.0
Prop In Lane	1.00		1.00	0.54		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	418	520	348	527	0	0	150	1090		166	1016	
V/C Ratio(X)	0.02	0.09	0.65	0.60	0.00	0.00	2.30	0.55		0.23	0.45	
Avail Cap(c_a), veh/h	418	520	348	527	0	0	150	1090		166	1016	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.4	12.6	15.6	15.8	0.0	0.0	24.8	14.9	0.0	23.0	14.4	0.0
Incr Delay (d2), s/veh	0.1	0.3	9.0	4.9	0.0	0.0	605.2	2.0	0.0	3.3	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	3.0	3.7	0.0	0.0	27.1	3.0	0.0	0.6	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	12.9	24.6	20.8	0.0	0.0	629.9	17.0	0.0	26.3	15.8	0.0
LnGrp LOS	B	B	C	C	A	A	F	B		C	B	
Approach Vol, veh/h		281			314			947	A		497	A
Approach Delay, s/veh		22.3			20.8			240.9			16.6	
Approach LOS		C			C			F			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	10.1		12.0	7.0	8.4		13.5				
Green Ext Time (p_c), s	0.0	2.5		0.6	0.0	2.1		0.8				

Intersection Summary

HCM 6th Ctrl Delay	122.2
HCM 6th LOS	F

Notes

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



Intersection

Intersection Delay, s/veh 10.7

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	21	5	10	122	28	6	150	29	10	83	28
Future Vol, veh/h	5	21	5	10	122	28	6	150	29	10	83	28
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	100	75	50	38	40	14	20	16	83	50	44	0
Mvmt Flow	6	25	6	12	145	33	7	179	35	12	99	33
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.5	10.9	10.8	10.3
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	16%	6%	100%	0%
Vol Thru, %	0%	84%	68%	76%	0%	75%
Vol Right, %	0%	16%	16%	17%	0%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	179	31	160	10	111
LT Vol	6	0	5	10	10	0
Through Vol	0	150	21	122	0	83
RT Vol	0	29	5	28	0	28
Lane Flow Rate	7	213	37	190	12	132
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.012	0.325	0.07	0.292	0.022	0.219
Departure Headway (Hd)	6.175	5.488	6.84	5.511	6.76	5.974
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	576	650	520	648	527	597
Service Time	3.946	3.258	4.934	3.579	4.538	3.752
HCM Lane V/C Ratio	0.012	0.328	0.071	0.293	0.023	0.221
HCM Control Delay	9	10.9	10.5	10.9	9.7	10.4
HCM Lane LOS	A	B	B	B	A	B
HCM 95th-tile Q	0	1.4	0.2	1.2	0.1	0.8

**Intersection**

Intersection Delay, s/veh 11.4  
 Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	6	9	10	34	23	150	15	141	30	75	89	8
Future Vol, veh/h	6	9	10	34	23	150	15	141	30	75	89	8
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	20	29	25	43	11	18	0	23	41	45	52	50
Mvmt Flow	6	10	11	37	25	161	16	152	32	81	96	9
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	9.2	12.2	11.5	10.5
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	24%	16%	100%	0%	0%
Vol Thru, %	0%	82%	36%	11%	0%	100%	0%
Vol Right, %	0%	18%	40%	72%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	171	25	207	75	89	8
LT Vol	15	0	6	34	75	0	0
Through Vol	0	141	9	23	0	89	0
RT Vol	0	30	10	150	0	0	8
Lane Flow Rate	16	184	27	223	81	96	9
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.029	0.315	0.046	0.372	0.154	0.172	0.014
Departure Headway (Hd)	6.399	6.164	6.208	6.012	6.872	6.486	5.744
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	561	585	578	601	524	555	625
Service Time	4.124	3.889	3.937	3.72	4.587	4.202	3.459
HCM Lane V/C Ratio	0.029	0.315	0.047	0.371	0.155	0.173	0.014
HCM Control Delay	9.3	11.7	9.2	12.2	10.8	10.5	8.5
HCM Lane LOS	A	B	A	B	B	B	A
HCM 95th-tile Q	0.1	1.3	0.1	1.7	0.5	0.6	0

Intersection

Intersection Delay, s/veh 13.6

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑	↗	↘	↑	↗
Traffic Vol, veh/h	3	42	17	331	79	179	24	23	20	77	17	2
Future Vol, veh/h	3	42	17	331	79	179	24	23	20	77	17	2
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
Heavy Vehicles, %	0	43	50	14	18	9	29	7	57	39	0	0
Mvmt Flow	3	47	19	368	88	199	27	26	22	86	19	2
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	10.4	14.6	10.3	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	23	20	3	42	17	331	79	179	77	17	2
LT Vol	24	0	0	3	0	0	331	0	0	77	0	0
Through Vol	0	23	0	0	42	0	0	79	0	0	17	0
RT Vol	0	0	20	0	0	17	0	0	179	0	0	2
Lane Flow Rate	27	26	22	3	47	19	368	88	199	86	19	2
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.057	0.049	0.043	0.006	0.094	0.035	0.628	0.139	0.269	0.185	0.035	0.004
Departure Headway (Hd)	7.71	6.836	6.986	6.989	7.22	6.639	6.15	5.718	4.865	7.777	6.614	5.914
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	465	524	513	513	497	540	592	631	744	462	542	605
Service Time	5.445	4.571	4.721	4.723	4.954	4.373	3.85	3.418	2.565	5.511	4.348	3.648
HCM Lane V/C Ratio	0.058	0.05	0.043	0.006	0.095	0.035	0.622	0.139	0.267	0.186	0.035	0.003
HCM Control Delay	10.9	9.9	10	9.8	10.7	9.6	18.7	9.3	9.3	12.3	9.6	8.7
HCM Lane LOS	B	A	A	A	B	A	C	A	A	B	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0	0.3	0.1	4.4	0.5	1.1	0.7	0.1	0

**Intersection**

Int Delay, s/veh 4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	0	36	13	0	5
Future Vol, veh/h	11	0	36	13	0	5
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	0	39	14	0	5

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	12	0	104
Stage 1	-	-	-	-	12
Stage 2	-	-	-	-	92
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1607	-	894
Stage 1	-	-	-	-	1011
Stage 2	-	-	-	-	932
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1607	-	873
Mov Cap-2 Maneuver	-	-	-	-	873
Stage 1	-	-	-	-	1011
Stage 2	-	-	-	-	910

Approach	EB	WB	NB
HCM Control Delay, s	0	5.4	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1069	-	-	1607	-
HCM Lane V/C Ratio	0.005	-	-	0.024	-
HCM Control Delay (s)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

**Intersection**

Int Delay, s/veh 4.9

**Movement** EBT EBR WBL WBT NBL NBR

Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	16	0	107	49	0	15
Future Vol, veh/h	16	0	107	49	0	15
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	116	53	0	16

**Major/Minor** Major1 Major2 Minor1

Conflicting Flow All	0	0	17	0	302	17
Stage 1	-	-	-	-	17	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1600	-	690	1062
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1600	-	638	1062
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	706	-

**Approach** EB WB NB

HCM Control Delay, s	0	5.1	8.4
HCM LOS			A

**Minor Lane/Major Mvmt** NBLn1 EBT EBR WBL WBT

Capacity (veh/h)	1062	-	-	1600	-
HCM Lane V/C Ratio	0.015	-	-	0.073	-
HCM Control Delay (s)	8.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.2	-

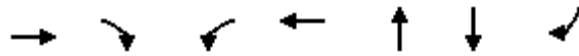


## Queues

EX+P\_PM

04/14/2022

## 1: Clawiter Rd. &amp; Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	134	141	120	222	600	551	39
v/c Ratio	0.56	0.19	0.61	0.76	1.15	0.83	0.10
Control Delay	44.1	2.4	46.5	29.6	114.4	41.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	2.4	46.5	29.6	114.4	41.7	0.5
Queue Length 50th (ft)	60	0	55	32	~323	130	0
Queue Length 95th (ft)	141	18	120	118	#716	222	1
Internal Link Dist (ft)	128			403	144	1216	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	291	726	510	518	524	1052	554
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.19	0.24	0.43	1.15	0.52	0.07

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

EX+P\_PM  
 04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↖	↗		↕			↕	↗
Traffic Volume (veh/h)	36	87	130	110	48	156	39	349	165	183	324	36
Future Volume (veh/h)	36	87	130	110	48	156	39	349	165	183	324	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1826	1707	1559	1174	1366	1411	1633	1885	1841	1737	1826
Adj Flow Rate, veh/h	39	95	141	120	52	170	42	379	0	199	352	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	5	13	23	49	36	33	18	1	4	11	5
Cap, veh/h	60	145	565	349	57	185	45	405		226	430	305
Arrive On Green	0.11	0.11	0.11	0.23	0.23	0.23	0.28	0.28	0.00	0.20	0.20	0.20
Sat Flow, veh/h	524	1276	1447	1485	242	790	162	1463	0	1146	2184	1547
Grp Volume(v), veh/h	134	0	141	120	0	222	421	0	0	292	259	39
Grp Sat Flow(s),veh/h/ln	1800	0	1447	1485	0	1032	1625	0	0	1680	1650	1547
Q Serve(g_s), s	6.3	0.0	5.8	5.9	0.0	18.4	22.2	0.0	0.0	14.8	13.1	1.8
Cycle Q Clear(g_c), s	6.3	0.0	5.8	5.9	0.0	18.4	22.2	0.0	0.0	14.8	13.1	1.8
Prop In Lane	0.29		1.00	1.00		0.77	0.10		0.00	0.68		1.00
Lane Grp Cap(c), veh/h	205	0	565	349	0	242	449	0		331	325	305
V/C Ratio(X)	0.65	0.00	0.25	0.34	0.00	0.92	0.94	0.00		0.88	0.80	0.13
Avail Cap(c_a), veh/h	267	0	615	457	0	318	463	0		479	470	441
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	0.0	18.1	27.9	0.0	32.7	31.0	0.0	0.0	34.2	33.5	29.0
Incr Delay (d2), s/veh	1.4	0.0	0.1	0.2	0.0	22.7	25.9	0.0	0.0	9.6	3.7	0.1
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	2.8	0.0	2.9	2.1	0.0	6.0	11.6	0.0	0.0	6.8	5.5	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.0	18.1	28.2	0.0	55.5	56.9	0.0	0.0	43.8	37.2	29.1
LnGrp LOS	D	A	B	C	A	E	E	A		D	D	C
Approach Vol, veh/h		275			342			421	A		590	
Approach Delay, s/veh		28.1			45.9			56.9			39.9	
Approach LOS		C			D			E			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		28.4		13.7		21.4		24.3				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		24.2		8.3		16.8		20.4				
Green Ext Time (p_c), s		0.1		0.1		0.5		0.2				

Intersection Summary

HCM 6th Ctrl Delay	43.6
HCM 6th LOS	D

Notes

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



Intersection												
Intersection Delay, s/veh	139.8											
Intersection LOS	F											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕			↕	↕		↕	↕
Traffic Vol, veh/h	187	12	79	2	165	119	267	247	6	67	140	357
Future Vol, veh/h	187	12	79	2	165	119	267	247	6	67	140	357
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	20	50	27	0	3	6	4	8	0	25	19	4
Mvmt Flow	228	15	96	2	201	145	326	301	7	82	171	435
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	31.9	62.6	316	69.7
HCM LOS	D	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	52%	0%	94%	0%	1%	32%	0%
Vol Thru, %	48%	0%	6%	0%	58%	68%	0%
Vol Right, %	0%	100%	0%	100%	42%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	514	6	199	79	286	207	357
LT Vol	267	0	187	0	2	67	0
Through Vol	247	0	12	0	165	140	0
RT Vol	0	6	0	79	119	0	357
Lane Flow Rate	627	7	243	96	349	252	435
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	1.631	0.017	0.693	0.257	0.902	0.671	1.04
Departure Headway (Hd)	9.711	8.775	11.843	11.142	11.068	11.031	10.007
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	382	410	308	325	331	331	366
Service Time	7.411	6.475	9.543	8.842	9.068	8.731	7.707
HCM Lane V/C Ratio	1.641	0.017	0.789	0.295	1.054	0.761	1.189
HCM Control Delay	319.6	11.6	37.5	17.7	62.6	33.6	90.7
HCM Lane LOS	F	B	E	C	F	D	F
HCM 95th-tile Q	35.6	0.1	4.8	1	8.7	4.6	12.8

Queues  
3: Clawiter Rd. & Enterprise Ave.

EX+P\_PM  
04/14/2022



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	349	1	97	604	302
v/c Ratio	0.91	0.01	0.61	0.54	0.33
Control Delay	56.9	48.0	59.2	10.6	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	48.0	59.2	10.6	20.3
Queue Length 50th (ft)	162	1	63	166	124
Queue Length 95th (ft)	#321	7	111	351	256
Internal Link Dist (ft)	2619	76		1216	1497
Turn Bay Length (ft)			155		
Base Capacity (vph)	409	383	218	1122	925
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.00	0.44	0.54	0.33

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

EX+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	122	0	192	1	0	0	87	543	1	0	239	32
Future Volume (veh/h)	122	0	192	1	0	0	87	543	1	0	239	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1811	1900	1781	1900	1900	1900	1218	1604	1900	1900	1767	1263
Adj Flow Rate, veh/h	136	0	213	1	0	0	97	603	1	0	266	36
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, %	6	0	8	0	0	0	46	20	0	0	9	43
Cap, veh/h	133	0	208	2	0	0	112	1070	2	2	804	109
Arrive On Green	0.20	0.00	0.20	0.00	0.00	0.00	0.10	0.67	0.67	0.00	0.53	0.53
Sat Flow, veh/h	656	0	1027	1809	0	0	1160	1600	3	1810	1519	206
Grp Volume(v), veh/h	349	0	0	1	0	0	97	0	604	0	0	302
Grp Sat Flow(s),veh/h/ln	1682	0	0	1810	0	0	1160	0	1603	1810	0	1724
Q Serve(g_s), s	21.5	0.0	0.0	0.1	0.0	0.0	8.7	0.0	21.2	0.0	0.0	10.6
Cycle Q Clear(g_c), s	21.5	0.0	0.0	0.1	0.0	0.0	8.7	0.0	21.2	0.0	0.0	10.6
Prop In Lane	0.39		0.61	1.00		0.00	1.00		0.00	1.00		0.12
Lane Grp Cap(c), veh/h	341	0	0	2	0	0	112	0	1072	2	0	913
V/C Ratio(X)	1.02	0.00	0.00	0.40	0.00	0.00	0.87	0.00	0.56	0.00	0.00	0.33
Avail Cap(c_a), veh/h	341	0	0	384	0	0	202	0	1072	316	0	913
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	0.0	0.0	52.9	0.0	0.0	47.2	0.0	9.3	0.0	0.0	14.2
Incr Delay (d2), s/veh	54.7	0.0	0.0	81.6	0.0	0.0	1.9	0.0	0.2	0.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	0.0	0.0	0.1	0.0	0.0	2.6	0.0	6.7	0.0	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.9	0.0	0.0	134.4	0.0	0.0	49.2	0.0	9.5	0.0	0.0	15.2
LnGrp LOS	F	A	A	F	A	A	D	A	A	A	A	B
Approach Vol, veh/h		349			1			701				302
Approach Delay, s/veh		96.9			134.4			15.0				15.2
Approach LOS		F			F			B				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	75.4		26.0	14.7	60.6		4.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	25.5		21.5	18.5	25.5		22.5				
Max Q Clear Time (g_c+I1), s	0.0	23.2		23.5	10.7	12.6		2.1				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.1	1.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	36.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Queues

4: Clawiter Rd. & Depot Rd.



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	590	118	13	624	120	13
v/c Ratio	0.79	0.45	0.07	0.36	0.08	0.01
Control Delay	46.1	50.7	0.8	8.8	12.9	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	50.7	0.8	8.8	12.9	1.0
Queue Length 50th (ft)	197	40	0	55	18	0
Queue Length 95th (ft)	241	68	0	m72	40	3
Internal Link Dist (ft)	3711	564		280	717	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	1041	712	382	1712	1526	1036
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.17	0.03	0.36	0.08	0.01

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

EX+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕	↗		↕↕			↕↕	↗
Traffic Volume (veh/h)	166	378	16	19	93	12	21	384	188	12	102	12
Future Volume (veh/h)	166	378	16	19	93	12	21	384	188	12	102	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1781	1500	1767	1470	1604	1352	1841	1826	1796	1633	1515
Adj Flow Rate, veh/h	175	398	17	20	98	13	22	404	198	13	107	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	8	27	9	29	20	37	4	5	7	18	26
Cap, veh/h	206	501	22	31	160	91	76	1285	610	175	1452	1027
Arrive On Green	0.21	0.21	0.21	0.07	0.07	0.07	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	988	2399	106	458	2386	1353	68	2170	1030	227	2452	1282
Grp Volume(v), veh/h	307	0	283	63	55	13	343	0	281	62	58	13
Grp Sat Flow(s),veh/h/ln	1732	0	1761	1447	1397	1353	1809	0	1459	1267	1412	1282
Q Serve(g_s), s	18.1	0.0	16.1	4.5	4.0	1.0	0.0	0.0	10.3	0.1	1.9	0.2
Cycle Q Clear(g_c), s	18.1	0.0	16.1	4.5	4.0	1.0	9.9	0.0	10.3	10.4	1.9	0.2
Prop In Lane	0.57		0.06	0.32		1.00	0.06		0.71	0.21		1.00
Lane Grp Cap(c), veh/h	362	0	368	97	94	91	1107	0	864	791	836	1027
V/C Ratio(X)	0.85	0.00	0.77	0.65	0.58	0.14	0.31	0.00	0.32	0.08	0.07	0.01
Avail Cap(c_a), veh/h	547	0	556	362	349	338	1107	0	864	791	836	1027
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	0.00	1.00	0.80	0.80	0.80	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	0.0	39.5	48.2	48.0	46.6	10.8	0.0	10.9	9.2	9.2	2.1
Incr Delay (d2), s/veh	5.0	0.0	1.6	5.7	4.6	0.6	0.7	0.0	1.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	7.0	1.8	1.5	0.3	4.1	0.0	3.4	0.6	0.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	0.0	41.1	54.0	52.6	47.1	11.6	0.0	11.9	9.4	9.4	2.1
LnGrp LOS	D	A	D	D	D	D	B	A	B	A	A	A
Approach Vol, veh/h		590			131			624				133
Approach Delay, s/veh		43.3			52.7			11.7				8.7
Approach LOS		D			D			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.8		11.6		67.8		26.6				
Change Period (Y+Rc), s		5.0		4.5		* 5		4.5				
Max Green Setting (Gmax), s		32.0		26.5		* 33		33.5				
Max Q Clear Time (g_c+I1), s		12.3		6.5		12.4		20.1				
Green Ext Time (p_c), s		5.4		0.6		0.9		2.1				

Intersection Summary

HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

## Queues

EX+P\_PM

## 5: Industrial Blvd. &amp; Clawiter Rd.

04/14/2022



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	323	319	53	39	572	1	449
v/c Ratio	0.75	0.63	0.50	0.49	0.33	0.01	0.29
Control Delay	46.2	28.3	56.1	65.1	18.7	47.0	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	28.3	56.1	65.1	18.7	47.0	23.5
Queue Length 50th (ft)	209	136	30	25	111	1	110
Queue Length 95th (ft)	269	200	66	#62	223	7	182
Internal Link Dist (ft)		32	86		915		218
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	612	675	130	84	1755	96	1572
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.47	0.41	0.46	0.33	0.01	0.29

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

EX+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	557	0	8	40	1	6	34	502	2	1	395	0
Future Volume (veh/h)	557	0	8	40	1	6	34	502	2	1	395	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	418	1767	1900	1900	1796	0
Adj Flow Rate, veh/h	641	0	0	45	1	7	39	570	2	1	449	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	100	9	0	0	7	0
Cap, veh/h	764	401	0	59	1	9	16	2013	7	2	1869	0
Arrive On Green	0.21	0.00	0.00	0.04	0.04	0.04	0.04	0.59	0.59	0.00	0.55	0.00
Sat Flow, veh/h	3619	1900	0	1512	34	235	398	3430	12	1810	3503	0
Grp Volume(v), veh/h	641	0	0	53	0	0	39	279	293	1	449	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1780	0	0	398	1678	1764	1810	1706	0
Q Serve(g_s), s	17.8	0.0	0.0	3.1	0.0	0.0	4.3	8.6	8.6	0.1	7.2	0.0
Cycle Q Clear(g_c), s	17.8	0.0	0.0	3.1	0.0	0.0	4.3	8.6	8.6	0.1	7.2	0.0
Prop In Lane	1.00		0.00	0.85		0.13	1.00		0.01	1.00		0.00
Lane Grp Cap(c), veh/h	764	401	0	69	0	0	16	985	1035	2	1869	0
V/C Ratio(X)	0.84	0.00	0.00	0.77	0.00	0.00	2.41	0.28	0.28	0.40	0.24	0.00
Avail Cap(c_a), veh/h	1293	679	0	203	0	0	30	985	1035	86	1869	0
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(l)	1.00	0.00	0.00	1.00	0.00	0.00	0.77	0.77	0.77	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.7	0.0	0.0	50.0	0.0	0.0	50.4	10.7	10.7	52.4	12.4	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.0	16.1	0.0	0.0	758.0	0.6	0.5	81.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	0.0	1.7	0.0	0.0	3.8	3.2	3.4	0.1	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	0.0	0.0	66.1	0.0	0.0	808.4	11.3	11.3	133.9	12.7	0.0
LnGrp LOS	D	A	A	E	A	A	F	B	B	F	B	A
Approach Vol, veh/h		641			53			611			450	
Approach Delay, s/veh		42.3			66.1			62.2			12.9	
Approach LOS		D			E			E			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	66.1		26.7	8.3	62.0		8.1				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	5.0	33.5		37.5	8.0	30.5		12.0				
Max Q Clear Time (g_c+I1), s	2.1	10.6		19.8	6.3	9.2		5.1				
Green Ext Time (p_c), s	0.0	3.6		2.3	0.0	3.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	9	5	3	0	0	0	565	1	138	0
Future Vol, veh/h	0	0	9	5	3	0	0	0	565	1	138	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	4	0	36	0	0	50	8	12	0	0	7	0
Mvmt Flow	0	0	11	6	4	0	0	0	673	1	164	0

Major/Minor	Minor2		Minor1			Major2				
Conflicting Flow All	-	-	164	173	167	-	-	1	0	0
Stage 1	-	-	-	1	1	-	-	-	-	-
Stage 2	-	-	-	172	166	-	-	-	-	-
Critical Hdwy	-	-	6.56	7.1	6.5	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-
Follow-up Hdwy	-	-	3.624	3.5	4	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	799	794	729	0	-	1635	-	0
Stage 1	0	0	-	-	-	0	-	-	-	0
Stage 2	0	0	-	835	765	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	799	782	728	-	-	1633	-	-
Mov Cap-2 Maneuver	-	-	-	782	728	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	823	764	-	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	9.6		9.8		0.1	
HCM LOS	A		A			

Minor Lane/Major Mvmt	EBLn1WBLn1		SBL	SBT
Capacity (veh/h)	799	761	1633	-
HCM Lane V/C Ratio	0.013	0.013	0.001	-
HCM Control Delay (s)	9.6	9.8	7.2	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0	0	0	-



Queues

7: Clawiter Rd. & West St.



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	1457	26	652
v/c Ratio	0.36	0.62	0.17	0.26
Control Delay	28.5	9.4	31.1	2.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.5	9.4	31.1	2.9
Queue Length 50th (ft)	23	94	11	32
Queue Length 95th (ft)	54	331	31	58
Internal Link Dist (ft)	322	867		3164
Turn Bay Length (ft)			45	
Base Capacity (vph)	557	2353	150	2549
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.13	0.62	0.17	0.26

Intersection Summary

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

EX+P\_PM  
04/14/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	49	12	1004	278	23	574
Future Volume (veh/h)	49	12	1004	278	23	574
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1722	1752	1737	1885	1663	1707
Adj Flow Rate, veh/h	56	14	1141	316	26	652
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	10	11	1	16	13
Cap, veh/h	70	18	1842	504	45	2646
Arrive On Green	0.06	0.06	0.72	0.72	0.03	0.82
Sat Flow, veh/h	1264	316	2635	696	1584	3329
Grp Volume(v), veh/h	71	0	734	723	26	652
Grp Sat Flow(s),veh/h/ln	1602	0	1650	1594	1584	1622
Q Serve(g_s), s	3.1	0.0	15.5	16.1	1.1	3.2
Cycle Q Clear(g_c), s	3.1	0.0	15.5	16.1	1.1	3.2
Prop In Lane	0.79	0.20		0.44	1.00	
Lane Grp Cap(c), veh/h	89	0	1193	1153	45	2646
V/C Ratio(X)	0.80	0.00	0.61	0.63	0.58	0.25
Avail Cap(c_a), veh/h	552	0	1193	1153	115	2646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.44	0.44
Uniform Delay (d), s/veh	32.7	0.0	4.8	4.9	33.6	1.5
Incr Delay (d2), s/veh	14.7	0.0	2.4	2.6	5.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	4.1	4.1	0.5	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.3	0.0	7.2	7.5	38.7	1.6
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	71		1457			678
Approach Delay, s/veh	47.3		7.4			3.0
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.5	55.1			61.6	8.4
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	5.1	* 28			36.9	24.1
Max Q Clear Time (g_c+I1), s	3.1	18.1			5.2	5.1
Green Ext Time (p_c), s	0.0	6.6			5.1	0.1

Intersection Summary

HCM 6th Ctrl Delay			7.3			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

EX+P\_PM  
04/14/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1460	324	347	60	60	748	4	2
v/c Ratio	0.01	0.98	0.84	0.21	0.21	0.21	1.19	0.01	0.00
Control Delay	46.0	45.4	61.3	9.2	31.6	31.6	123.9	27.7	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	45.4	61.3	9.2	31.6	31.6	123.9	27.7	27.5
Queue Length 50th (ft)	1	460	104	43	31	31	~436	2	1
Queue Length 95th (ft)	6	#517	#146	75	63	63	#569	10	6
Internal Link Dist (ft)		5245		2336		3164			278
Turn Bay Length (ft)	210		205		85			50	
Base Capacity (vph)	144	1497	407	1681	280	280	627	363	508
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.98	0.80	0.21	0.21	0.21	1.19	0.01	0.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

EX+P\_PM  
 04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	↗
Traffic Volume (veh/h)	1	1035	177	269	288	0	100	0	621	3	2	0
Future Volume (veh/h)	1	1035	177	269	288	0	100	0	621	3	2	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1811	1737	1470	1426	1648	1455	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	1	1247	0	324	347	0	120	0	748	4	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	6	11	29	32	17	30	0	5	0	0	0
Cap, veh/h	2	1449		459	1622	0	713	0	401	260	494	0
Arrive On Green	0.00	0.42	0.00	0.17	0.60	0.00	0.26	0.00	0.26	0.26	0.26	0.00
Sat Flow, veh/h	1810	3532	0	2716	2780	0	2194	0	1544	724	1900	0
Grp Volume(v), veh/h	1	1247	0	324	347	0	120	0	748	4	2	0
Grp Sat Flow(s),veh/h/ln	1810	1721	0	1358	1354	0	1097	0	1544	724	1900	0
Q Serve(g_s), s	0.1	32.9	0.0	11.3	5.9	0.0	4.3	0.0	26.0	0.4	0.1	0.0
Cycle Q Clear(g_c), s	0.1	32.9	0.0	11.3	5.9	0.0	4.4	0.0	26.0	0.4	0.1	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	1449		459	1622	0	713	0	401	260	494	0
V/C Ratio(X)	0.40	0.86		0.71	0.21	0.00	0.17	0.00	1.86	0.02	0.00	0.00
Avail Cap(c_a), veh/h	145	1548		459	1622	0	713	0	401	260	494	0
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	0.00	0.75	0.00	0.75	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.9	26.3	0.0	39.2	9.2	0.0	29.0	0.0	37.0	27.5	27.4	0.0
Incr Delay (d2), s/veh	34.9	6.9	0.0	4.2	0.3	0.0	0.0	0.0	395.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.3	0.0	4.0	1.7	0.0	1.1	0.0	53.7	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.8	33.2	0.0	43.4	9.5	0.0	29.1	0.0	432.7	27.5	27.4	0.0
LnGrp LOS	F	C		D	A	A	C	A	F	C	C	A
Approach Vol, veh/h		1248	A		671			868			6	
Approach Delay, s/veh		33.2			25.9			376.9			27.5	
Approach LOS		C			C			F			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.9	47.1		31.0	4.1	64.9		31.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	15.0	* 45		26.0	8.0	52.0		26.0				
Max Q Clear Time (g_c+I1), s	13.3	34.9		28.0	2.1	7.9		2.4				
Green Ext Time (p_c), s	0.1	7.2		0.0	0.0	3.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	138.3
HCM 6th LOS	F

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

## Queues

EX+P\_PM

## 9: Industrial Blvd. &amp; Depot Rd.

04/14/2022



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	257	363	101	120	675	211	49	493	9
v/c Ratio	0.17	0.42	0.50	0.24	0.90	0.64	0.14	0.31	0.44	0.01
Control Delay	14.5	16.8	4.9	13.4	86.1	18.9	0.2	28.9	15.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	16.8	4.9	13.4	86.1	18.9	0.2	28.9	15.9	0.0
Queue Length 50th (ft)	14	63	1	20	40	95	0	15	64	0
Queue Length 95th (ft)	35	113	46	48	#117	139	0	41	97	0
Internal Link Dist (ft)		564		1810		890			915	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	361	615	721	429	134	1055	1493	156	1114	1226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.42	0.50	0.24	0.90	0.64	0.14	0.31	0.44	0.01

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
9: Industrial Blvd. & Depot Rd.

EX+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	226	319	48	27	13	106	594	186	43	434	8
Future Volume (veh/h)	53	226	319	48	27	13	106	594	186	43	434	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1767	1781	1618	1767	1559	1707	1811	1811	1796	1470
Adj Flow Rate, veh/h	60	257	362	55	31	15	120	675	0	49	493	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	20	2	9	8	19	9	23	13	6	6	7	29
Cap, veh/h	503	618	487	215	105	38	136	1071		158	1127	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	1165	1870	1475	341	317	115	1485	3244	1535	1725	3413	1246
Grp Volume(v), veh/h	60	257	362	101	0	0	120	675	0	49	493	0
Grp Sat Flow(s),veh/h/ln	1165	1870	1475	773	0	0	1485	1622	1535	1725	1706	1246
Q Serve(g_s), s	0.0	5.8	11.9	2.0	0.0	0.0	4.4	9.6	0.0	1.4	6.2	0.0
Cycle Q Clear(g_c), s	2.2	5.8	11.9	7.8	0.0	0.0	4.4	9.6	0.0	1.4	6.2	0.0
Prop In Lane	1.00		1.00	0.54		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	503	618	487	357	0	0	136	1071		158	1127	
V/C Ratio(X)	0.12	0.42	0.74	0.28	0.00	0.00	0.88	0.63		0.31	0.44	
Avail Cap(c_a), veh/h	503	618	487	357	0	0	136	1071		158	1127	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.0	14.2	16.2	14.3	0.0	0.0	24.5	15.4	0.0	23.1	14.3	0.0
Incr Delay (d2), s/veh	0.5	2.1	9.9	2.0	0.0	0.0	50.4	2.8	0.0	5.0	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.5	4.8	1.1	0.0	0.0	3.3	3.5	0.0	0.8	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	16.2	26.1	16.3	0.0	0.0	74.8	18.2	0.0	28.2	15.5	0.0
LnGrp LOS	B	B	C	B	A	A	E	B		C	B	
Approach Vol, veh/h		679			101			795	A		542	A
Approach Delay, s/veh		21.2			16.3			26.8			16.7	
Approach LOS		C			B			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.4	11.6		13.9	6.4	8.2		9.8				
Green Ext Time (p_c), s	0.0	2.4		1.3	0.0	2.3		0.3				

Intersection Summary

HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

Notes

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

**Intersection**

Intersection Delay, s/veh 10.5

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	102	0	8	16	24	4	73	37	42	122	5
Future Vol, veh/h	25	102	0	8	16	24	4	73	37	42	122	5
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	100	0	0	57	0	40	67	44	94	11	16	100
Mvmt Flow	29	117	0	9	18	28	5	84	43	48	140	6
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.1	9.4	10.2	9.8
HCM LOS	B	A	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	20%	17%	100%	0%
Vol Thru, %	0%	66%	80%	33%	0%	96%
Vol Right, %	0%	34%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	110	127	48	42	127
LT Vol	4	0	25	8	42	0
Through Vol	0	73	102	16	0	122
RT Vol	0	37	0	24	0	5
Lane Flow Rate	5	126	146	55	48	146
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.009	0.207	0.268	0.088	0.08	0.225
Departure Headway (Hd)	7.024	5.888	6.602	5.749	5.996	5.55
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	508	607	542	618	595	644
Service Time	4.789	3.652	4.669	3.83	3.756	3.309
HCM Lane V/C Ratio	0.01	0.208	0.269	0.089	0.081	0.227
HCM Control Delay	9.9	10.2	12.1	9.4	9.3	9.9
HCM Lane LOS	A	B	B	A	A	A
HCM 95th-tile Q	0	0.8	1.1	0.3	0.3	0.9

Intersection

Intersection Delay, s/veh 11  
 Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	13	35	13	21	12	89	16	67	37	166	99	14
Future Vol, veh/h	13	35	13	21	12	89	16	67	37	166	99	14
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	18	10	0	31	10	34	54	40	26	11	16	42
Mvmt Flow	16	43	16	26	15	110	20	83	46	205	122	17
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10.1	10.9	11.2	11.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	21%	17%	100%	0%	0%
Vol Thru, %	0%	64%	57%	10%	0%	100%	0%
Vol Right, %	0%	36%	21%	73%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	104	61	122	166	99	14
LT Vol	16	0	13	21	166	0	0
Through Vol	0	67	35	12	0	99	0
RT Vol	0	37	13	89	0	0	14
Lane Flow Rate	20	128	75	151	205	122	17
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.042	0.234	0.134	0.256	0.351	0.195	0.026
Departure Headway (Hd)	7.57	6.57	6.416	6.121	6.172	5.753	5.492
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	474	547	560	587	586	627	656
Service Time	5.299	4.299	4.145	3.846	3.872	3.453	3.192
HCM Lane V/C Ratio	0.042	0.234	0.134	0.257	0.35	0.195	0.026
HCM Control Delay	10.6	11.3	10.1	10.9	12.2	9.8	8.3
HCM Lane LOS	B	B	B	B	B	A	A
HCM 95th-tile Q	0.1	0.9	0.5	1	1.6	0.7	0.1



Intersection

Intersection Delay, s/veh 11.3

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Vol, veh/h	2	127	20	59	57	54	19	21	113	169	28	5
Future Vol, veh/h	2	127	20	59	57	54	19	21	113	169	28	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	100	9	27	34	45	17	50	41	9	8	33	0
Mvmt Flow	2	148	23	69	66	63	22	24	131	197	33	6
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	11.3	10.5	10.1	12.8
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	21	113	2	127	20	59	57	54	169	28	5
LT Vol	19	0	0	2	0	0	59	0	0	169	0	0
Through Vol	0	21	0	0	127	0	0	57	0	0	28	0
RT Vol	0	0	113	0	0	20	0	0	54	0	0	5
Lane Flow Rate	22	24	131	2	148	23	69	66	63	197	33	6
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.047	0.048	0.21	0.006	0.266	0.039	0.14	0.129	0.102	0.369	0.06	0.009
Departure Headway (Hd)	7.661	7.008	5.764	8.525	6.478	6.084	7.338	7.025	5.849	6.762	6.687	5.426
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	468	511	622	420	554	588	488	510	612	533	536	659
Service Time	5.404	4.751	3.507	6.268	4.221	3.827	5.082	4.769	3.593	4.503	4.428	3.167
HCM Lane V/C Ratio	0.047	0.047	0.211	0.005	0.267	0.039	0.141	0.129	0.103	0.37	0.062	0.009
HCM Control Delay	10.8	10.1	10	11.3	11.6	9.1	11.3	10.8	9.3	13.4	9.9	8.2
HCM Lane LOS	B	B	A	B	B	A	B	B	A	B	A	A
HCM 95th-tile Q	0.1	0.2	0.8	0	1.1	0.1	0.5	0.4	0.3	1.7	0.2	0

Intersection						
Int Delay, s/veh	6.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	0	5	5	0	31
Future Vol, veh/h	5	0	5	5	0	31
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	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	0	20	20	0	124

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	20	0	80
Stage 1	-	-	-	-	20
Stage 2	-	-	-	-	60
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1609	-	927
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	968
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1609	-	915
Mov Cap-2 Maneuver	-	-	-	-	915
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	955

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1064	-	-	1609	-
HCM Lane V/C Ratio	0.117	-	-	0.012	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	36	0	15	10	0	92
Future Vol, veh/h	36	0	15	10	0	92
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	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	144	0	60	40	0	368

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	144	0	304
Stage 1	-	-	-	-	144
Stage 2	-	-	-	-	160
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1451	-	692
Stage 1	-	-	-	-	888
Stage 2	-	-	-	-	874
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1451	-	663
Mov Cap-2 Maneuver	-	-	-	-	663
Stage 1	-	-	-	-	888
Stage 2	-	-	-	-	837

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	909	-	-	1451	-
HCM Lane V/C Ratio	0.405	-	-	0.041	-
HCM Control Delay (s)	11.6	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0.1	-



Queues

9: Industrial Blvd. & Depot Rd.



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	45	226	314	346	601	160	39	458	10
v/c Ratio	0.05	0.11	0.49	0.82	0.81	0.33	0.10	0.28	0.46	0.01
Control Delay	28.4	28.6	7.9	52.2	50.0	14.7	0.1	52.8	31.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	28.6	7.9	52.2	50.0	14.7	0.1	52.8	31.9	0.0
Queue Length 50th (ft)	5	22	0	191	214	114	0	25	121	0
Queue Length 95th (ft)	16	46	35	263	285	174	0	57	199	0
Internal Link Dist (ft)		725		1517		890			940	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	322	637	584	584	663	1845	1553	233	998	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.07	0.39	0.54	0.52	0.33	0.10	0.17	0.46	0.01

Intersection Summary

HCM 6th Signalized Intersection Summary  
 9: Industrial Blvd. & Depot Rd.

EX+P\_AM  
 04/15/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	36	181	134	86	30	277	481	128	31	366	8
Future Volume (veh/h)	8	36	181	134	86	30	277	481	128	31	366	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1574	1248	1870	1737	1781	1722	1737	1841	1900	1618	1648
Adj Flow Rate, veh/h	10	45	226	168	108	38	346	601	0	39	458	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	33	22	44	2	11	8	12	11	4	0	19	17
Cap, veh/h	297	452	303	233	129	42	385	1797		60	1055	
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.23	0.54	0.00	0.03	0.34	0.00
Sat Flow, veh/h	937	1574	1054	617	448	147	1640	3300	1560	1810	3075	1397
Grp Volume(v), veh/h	10	45	226	314	0	0	346	601	0	39	458	0
Grp Sat Flow(s),veh/h/ln	937	1574	1054	1212	0	0	1640	1650	1560	1810	1537	1397
Q Serve(g_s), s	0.0	2.1	19.5	23.0	0.0	0.0	20.5	10.1	0.0	2.1	11.5	0.0
Cycle Q Clear(g_c), s	1.0	2.1	19.5	25.1	0.0	0.0	20.5	10.1	0.0	2.1	11.5	0.0
Prop In Lane	1.00		1.00	0.54		0.12	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	452	303	403	0	0	385	1797		60	1055	
V/C Ratio(X)	0.03	0.10	0.75	0.78	0.00	0.00	0.90	0.33		0.65	0.43	
Avail Cap(c_a), veh/h	397	621	416	537	0	0	651	1797		226	1055	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.7	26.2	32.3	34.7	0.0	0.0	37.2	12.7	0.0	47.8	25.4	0.0
Incr Delay (d2), s/veh	0.0	0.1	4.7	5.2	0.0	0.0	9.2	0.5	0.0	11.3	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.8	5.3	7.8	0.0	0.0	9.0	3.7	0.0	1.1	4.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	26.2	37.1	39.9	0.0	0.0	46.4	13.2	0.0	59.2	26.7	0.0
LnGrp LOS	C	C	D	D	A	A	D	B		E	C	
Approach Vol, veh/h		281			314			947	A		497	A
Approach Delay, s/veh		35.0			39.9			25.3			29.2	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	59.0		33.3	28.0	38.8		33.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	12.5	54.5		39.5	39.7	27.3		39.5				
Max Q Clear Time (g_c+I1), s	4.1	12.1		21.5	22.5	13.5		27.1				
Green Ext Time (p_c), s	0.0	4.8		1.0	1.0	2.6		1.7				

Intersection Summary

HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

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





**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Ave Industrial TIA  
**Analyst:** MAR  
**Date:** 2/7/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 2 AM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/Eden Landi  
**Scenario:** Existing AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:30 AM	8:30 AM		248	632	411	112
2nd Highest Hour			235	598	389	106
3rd Highest Hour			231	590	384	105
4th Highest Hour			222	565	367	100
5th Highest Hour			218	556	362	99
6th Highest Hour			218	556	362	99
7th Highest Hour			208	531	345	94
8th Highest Hour			205	522	340	93
9th Highest Hour			198	506	329	90
10th Highest Hour			185	472	307	84
11th Highest Hour			179	455	296	81
12th Highest Hour			175	447	290	79
13th Highest Hour			169	430	279	76
14th Highest Hour			145	371	241	66
15th Highest Hour			116	295	192	52
16th Highest Hour			109	278	181	49
17th Highest Hour			76	194	126	34
18th Highest Hour			63	160	104	28
19th Highest Hour			33	84	55	15
20th Highest Hour			23	59	38	10
21st Highest Hour			20	51	33	9
22nd Highest Hour			13	34	22	6
23rd Highest Hour			7	17	11	3
24th Highest Hour			7	17	11	3

**Warrant Summary**

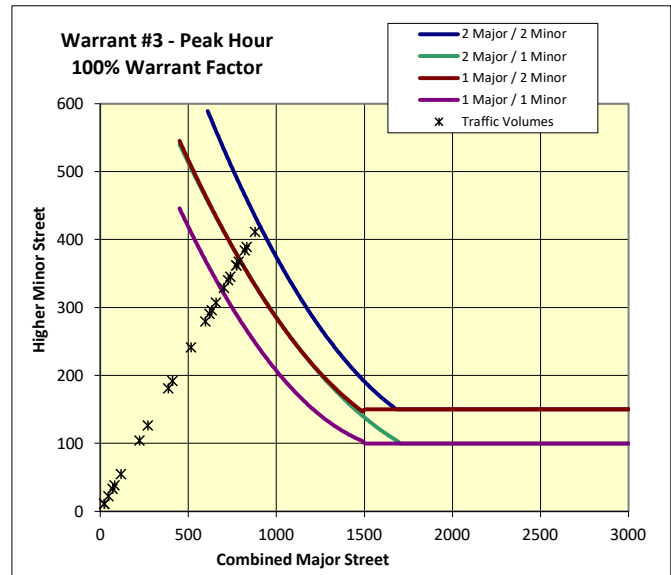
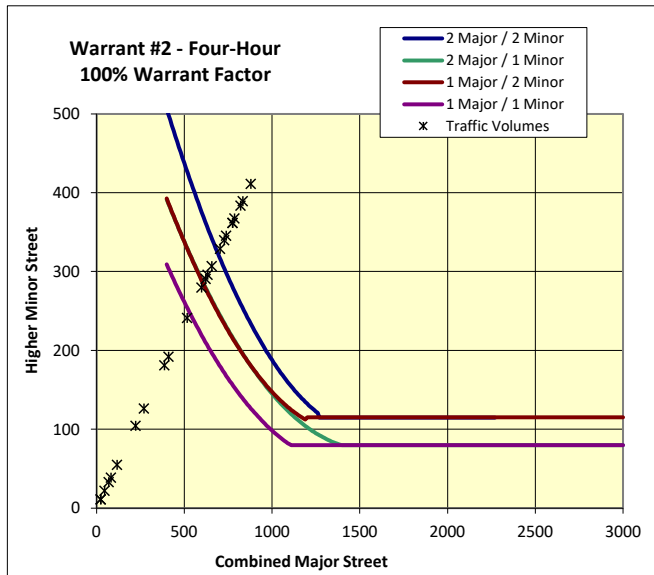
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	6	No	
80%	A	400	120	15	Yes	Yes
	B	600	60	12	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	13	Yes	Yes
56%	A	280	84	16	Yes	Yes
	B	420	42	14	Yes	Yes







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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\EX P\Intersection 2 PM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/ Eden Land  
**Scenario:** Existing PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:30 PM	5:30 PM		520	554	278	286
2nd Highest Hour			492	524	263	271
3rd Highest Hour			485	517	259	267
4th Highest Hour			465	495	248	255
5th Highest Hour			458	488	245	252
6th Highest Hour			458	488	245	252
7th Highest Hour			437	465	234	240
8th Highest Hour			430	458	230	236
9th Highest Hour			416	443	222	229
10th Highest Hour			388	414	208	214
11th Highest Hour			374	399	200	206
12th Highest Hour			367	391	196	202
13th Highest Hour			354	377	189	194
14th Highest Hour			305	325	163	168
15th Highest Hour			243	259	130	133
16th Highest Hour			229	244	122	126
17th Highest Hour			159	170	85	88
18th Highest Hour			132	140	70	72
19th Highest Hour			69	74	37	38
20th Highest Hour			49	52	26	27
21st Highest Hour			42	44	22	23
22nd Highest Hour			28	30	15	15
23rd Highest Hour			14	15	7	8
24th Highest Hour			14	15	7	8

**Warrant Summary**

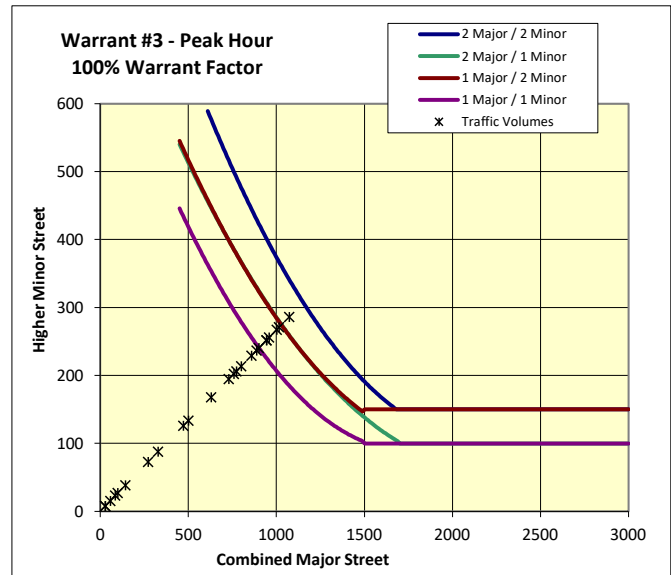
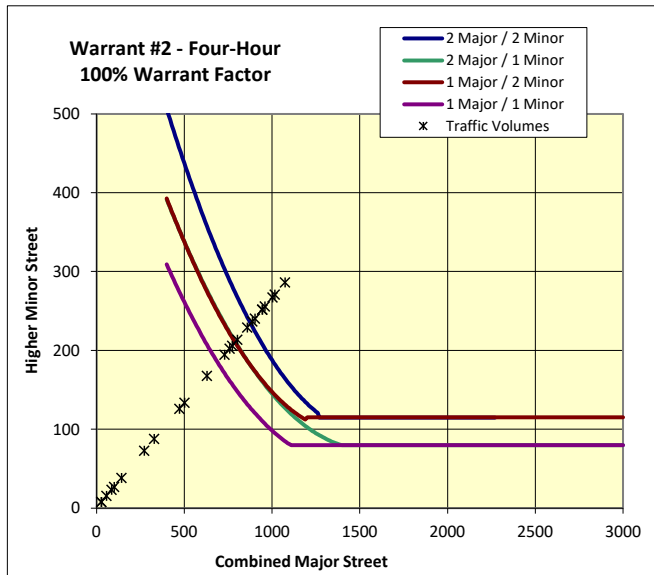
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	12	Yes	Yes
80%	A	400	120	16	Yes	Yes
	B	600	60	14	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	17	Yes	Yes
	B	420	42	16	Yes	Yes





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/7/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 6 AM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** Existing AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:35 AM	8:35 AM		72	775	4	1
2nd Highest Hour			68	734	4	1
3rd Highest Hour			67	723	4	1
4th Highest Hour			64	692	4	1
5th Highest Hour			63	682	4	1
6th Highest Hour			63	682	4	1
7th Highest Hour			60	651	3	1
8th Highest Hour			60	641	3	1
9th Highest Hour			58	620	3	1
10th Highest Hour			54	579	3	1
11th Highest Hour			52	558	3	1
12th Highest Hour			51	548	3	1
13th Highest Hour			49	527	3	1
14th Highest Hour			42	455	2	1
15th Highest Hour			34	362	2	0
16th Highest Hour			32	341	2	0
17th Highest Hour			22	238	1	0
18th Highest Hour			18	196	1	0
19th Highest Hour			10	103	1	0
20th Highest Hour			7	72	0	0
21st Highest Hour			6	62	0	0
22nd Highest Hour			4	41	0	0
23rd Highest Hour			2	21	0	0
24th Highest Hour			2	21	0	0

**Warrant Summary**

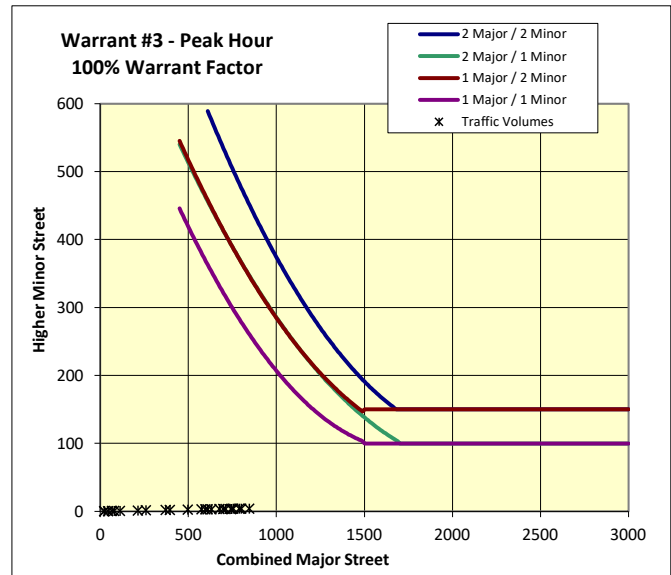
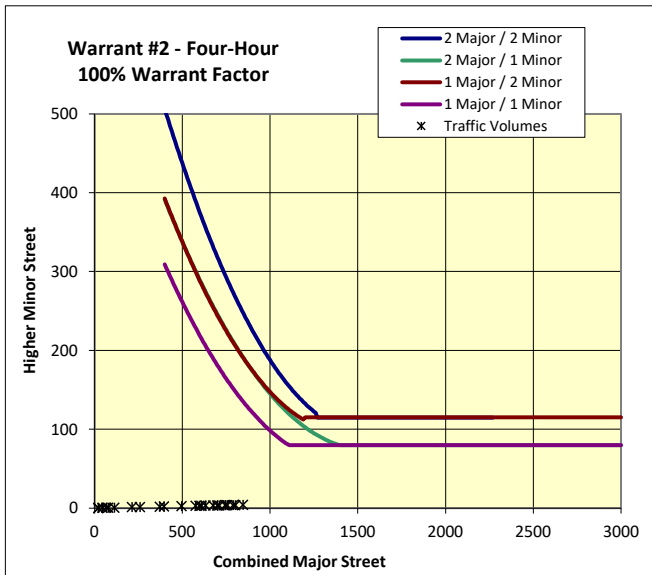
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 6 PM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** Existing PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		565	139	13	8
2nd Highest Hour			535	132	12	8
3rd Highest Hour			527	130	12	7
4th Highest Hour			505	124	12	7
5th Highest Hour			497	122	11	7
6th Highest Hour			497	122	11	7
7th Highest Hour			475	117	11	7
8th Highest Hour			467	115	11	7
9th Highest Hour			452	111	10	6
10th Highest Hour			422	104	10	6
11th Highest Hour			407	100	9	6
12th Highest Hour			399	98	9	6
13th Highest Hour			384	95	9	5
14th Highest Hour			331	82	8	5
15th Highest Hour			264	65	6	4
16th Highest Hour			249	61	6	4
17th Highest Hour			173	43	4	2
18th Highest Hour			143	35	3	2
19th Highest Hour			75	19	2	1
20th Highest Hour			53	13	1	1
21st Highest Hour			45	11	1	1
22nd Highest Hour			30	7	1	0
23rd Highest Hour			15	4	0	0
24th Highest Hour			15	4	0	0

**Warrant Summary**

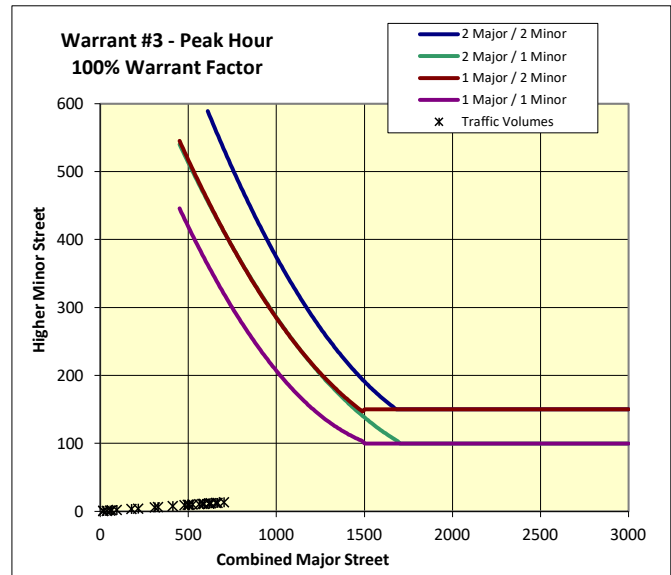
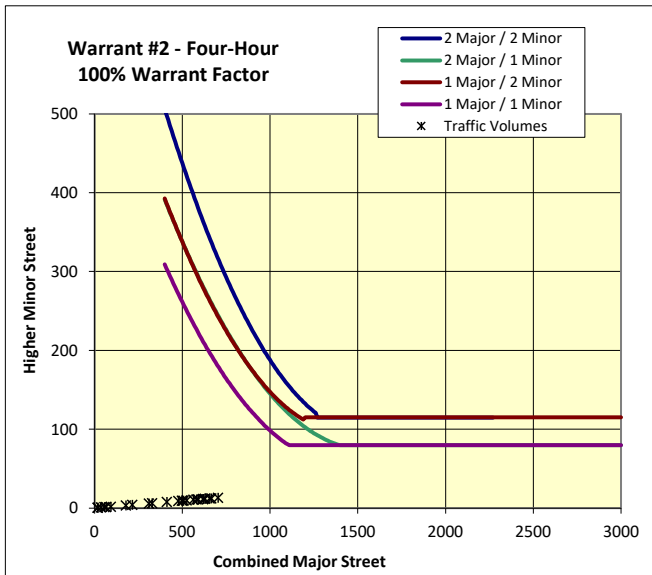
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/7/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 10 AM.xlsm\Data Input  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** Existing AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
8:00 AM	9:00 AM		185	121	31	160
2nd Highest Hour			175	115	30	155
3rd Highest Hour			173	113	27	137
4th Highest Hour			165	108	25	130
5th Highest Hour			163	106	23	121
6th Highest Hour			163	106	20	103
7th Highest Hour			155	102	20	101
8th Highest Hour			153	100	18	94
9th Highest Hour			148	97	17	87
10th Highest Hour			138	90	16	80
11th Highest Hour			133	87	16	80
12th Highest Hour			131	86	14	75
13th Highest Hour			126	82	14	71
14th Highest Hour			109	71	13	66
15th Highest Hour			86	56	13	66
16th Highest Hour			81	53	13	66
17th Highest Hour			57	37	10	52
18th Highest Hour			47	31	9	44
19th Highest Hour			25	16	7	34
20th Highest Hour			17	11	3	18
21st Highest Hour			15	10	2	12
22nd Highest Hour			10	6	2	11
23rd Highest Hour			5	3	1	7
24th Highest Hour			5	3	1	7

**Warrant Summary**

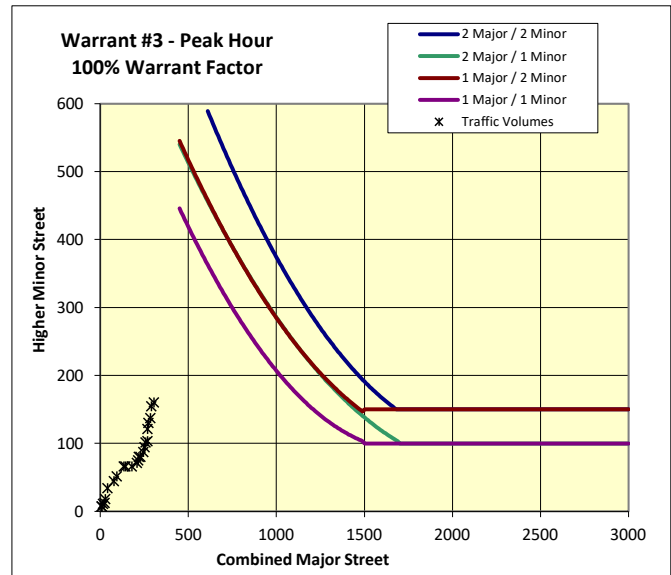
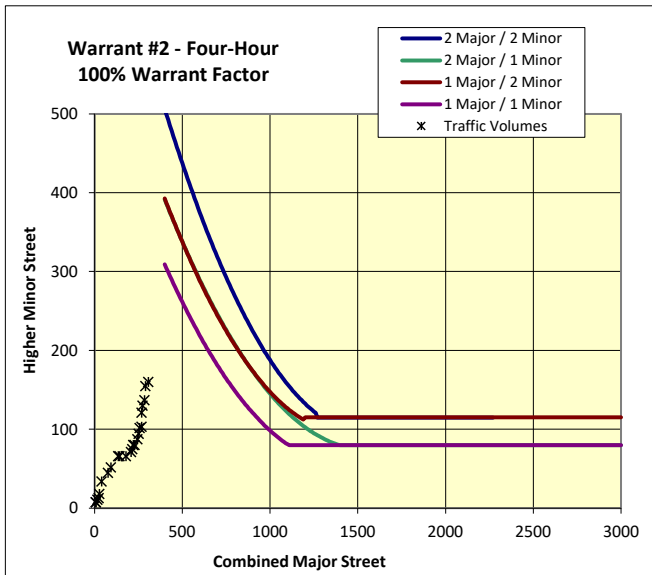
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	3	No	No
	B	420	42	0	No	No





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 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 10 PM.xlsm\Data Input  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** Existing PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		113	169	126	48
2nd Highest Hour			107	160	122	46
3rd Highest Hour			105	158	108	41
4th Highest Hour			101	151	102	39
5th Highest Hour			99	149	95	36
6th Highest Hour			99	149	81	31
7th Highest Hour			95	142	80	30
8th Highest Hour			93	140	74	28
9th Highest Hour			90	135	69	26
10th Highest Hour			84	126	63	24
11th Highest Hour			81	122	63	24
12th Highest Hour			80	119	59	22
13th Highest Hour			77	115	56	21
14th Highest Hour			66	99	52	20
15th Highest Hour			53	79	52	20
16th Highest Hour			50	74	52	20
17th Highest Hour			35	52	41	15
18th Highest Hour			29	43	35	13
19th Highest Hour			15	23	27	10
20th Highest Hour			11	16	14	5
21st Highest Hour			9	14	10	4
22nd Highest Hour			6	9	8	3
23rd Highest Hour			3	5	6	2
24th Highest Hour			3	5	6	2

**Warrant Summary**

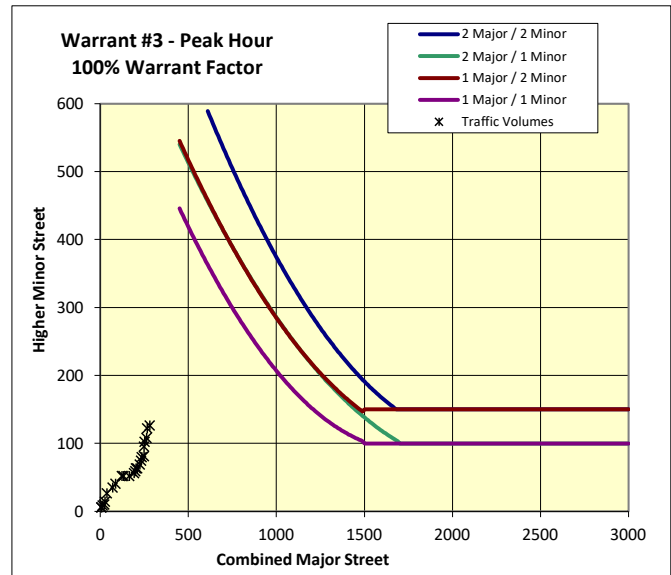
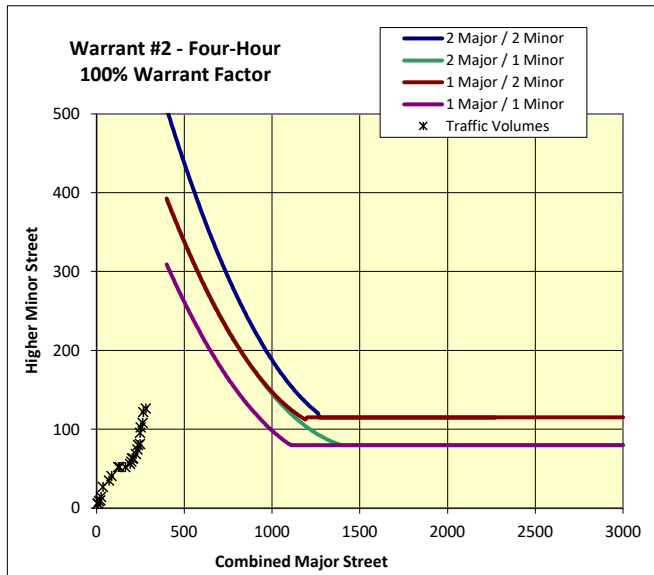
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	1	No	No
	B	420	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 11 AM.xlsm\Data Input  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** Existing AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:55 AM	8:55 AM		157	77	25	185
2nd Highest Hour			149	73	24	179
3rd Highest Hour			147	72	21	158
4th Highest Hour			140	69	20	150
5th Highest Hour			138	68	19	140
6th Highest Hour			138	68	16	119
7th Highest Hour			132	65	16	117
8th Highest Hour			130	64	15	109
9th Highest Hour			126	62	14	101
10th Highest Hour			117	57	13	93
11th Highest Hour			113	55	13	93
12th Highest Hour			111	54	12	86
13th Highest Hour			107	52	11	82
14th Highest Hour			92	45	10	76
15th Highest Hour			73	36	10	76
16th Highest Hour			69	34	10	76
17th Highest Hour			48	24	8	60
18th Highest Hour			40	20	7	51
19th Highest Hour			21	10	5	39
20th Highest Hour			15	7	3	21
21st Highest Hour			13	6	2	14
22nd Highest Hour			8	4	2	12
23rd Highest Hour			4	2	1	8
24th Highest Hour			4	2	1	8

**Warrant Summary**

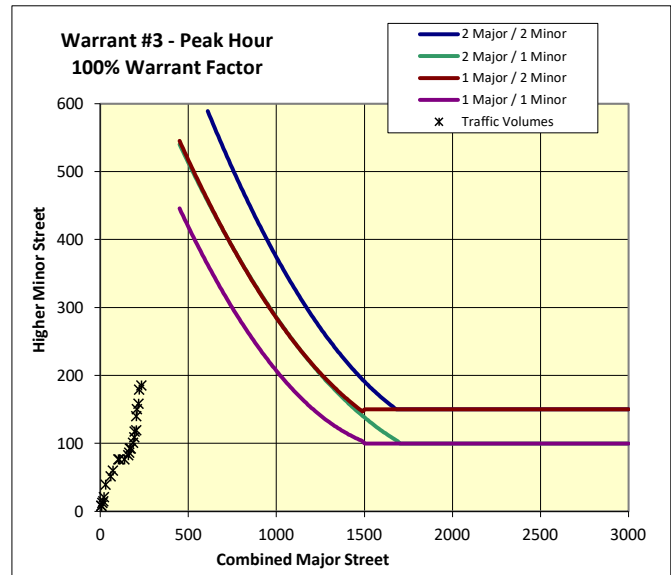
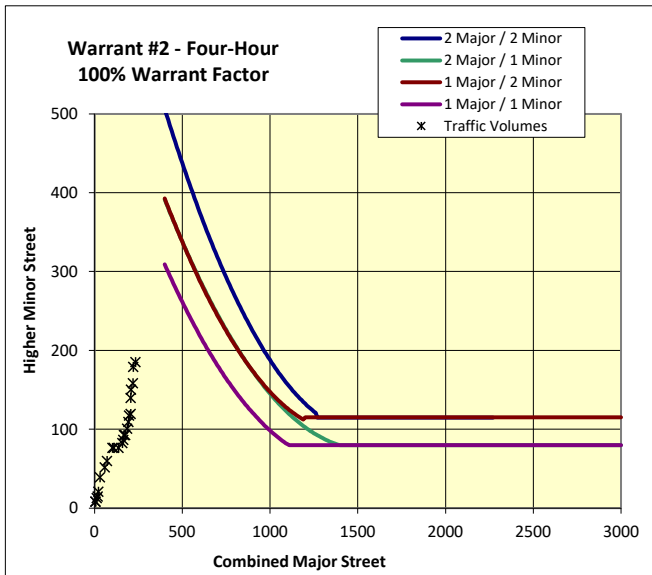
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





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**Analyst:** MAR  
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**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 11 PM.xlsm\Data Input  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** Existing PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:05 PM	5:05 PM		120	279	61	122
2nd Highest Hour			114	264	59	118
3rd Highest Hour			112	260	52	104
4th Highest Hour			107	249	49	99
5th Highest Hour			106	246	46	92
6th Highest Hour			106	246	39	79
7th Highest Hour			101	234	39	77
8th Highest Hour			99	231	36	72
9th Highest Hour			96	223	33	66
10th Highest Hour			90	208	31	61
11th Highest Hour			86	201	31	61
12th Highest Hour			85	197	28	57
13th Highest Hour			82	190	27	54
14th Highest Hour			70	164	25	50
15th Highest Hour			56	130	25	50
16th Highest Hour			53	123	25	50
17th Highest Hour			37	86	20	39
18th Highest Hour			30	71	17	34
19th Highest Hour			16	37	13	26
20th Highest Hour			11	26	7	14
21st Highest Hour			10	22	5	9
22nd Highest Hour			6	15	4	8
23rd Highest Hour			3	7	3	5
24th Highest Hour			3	7	3	5

**Warrant Summary**

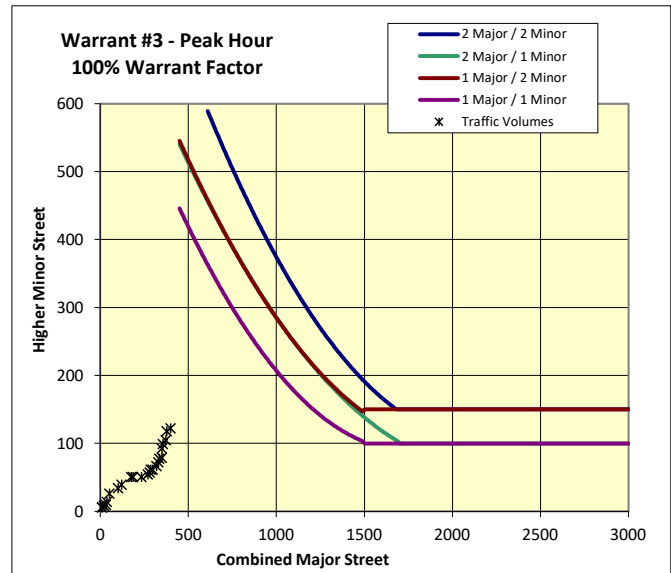
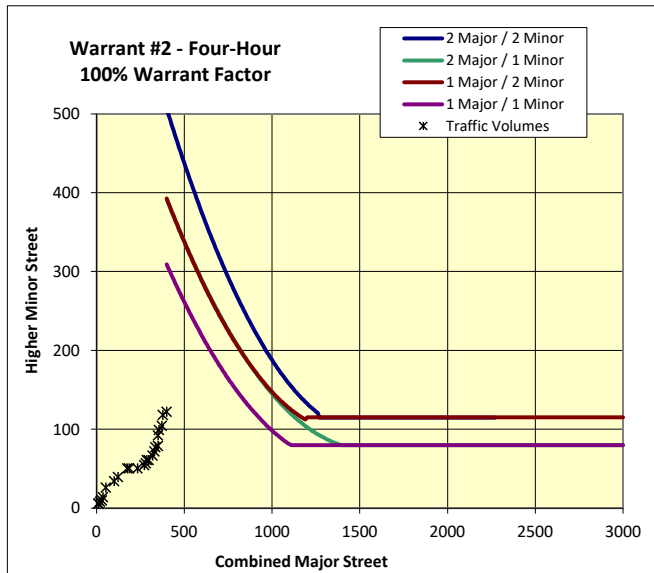
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	3	No	No
	B	525	53	0	No	No
56%	A	280	84	5	No	No
	B	420	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 12 AM.xlsm\Data Input  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** Existing AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:50 AM	8:50 AM		67	96	62	589
2nd Highest Hour			63	91	60	569
3rd Highest Hour			63	90	53	504
4th Highest Hour			60	86	50	478
5th Highest Hour			59	84	47	445
6th Highest Hour			59	84	40	380
7th Highest Hour			56	81	39	373
8th Highest Hour			55	79	37	347
9th Highest Hour			54	77	34	321
10th Highest Hour			50	72	31	295
11th Highest Hour			48	69	31	295
12th Highest Hour			47	68	29	275
13th Highest Hour			46	65	28	262
14th Highest Hour			39	56	25	242
15th Highest Hour			31	45	25	242
16th Highest Hour			29	42	25	242
17th Highest Hour			21	29	20	190
18th Highest Hour			17	24	17	164
19th Highest Hour			9	13	13	124
20th Highest Hour			6	9	7	65
21st Highest Hour			5	8	5	46
22nd Highest Hour			4	5	4	39
23rd Highest Hour			2	3	3	26
24th Highest Hour			2	3	3	26

**Warrant Summary**

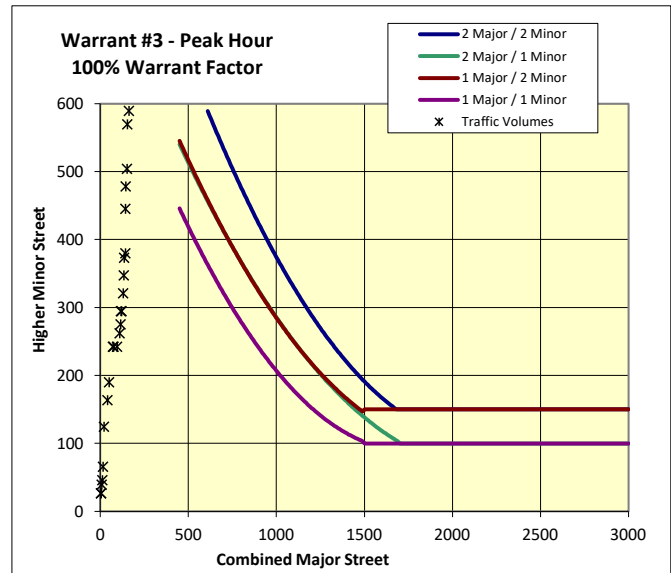
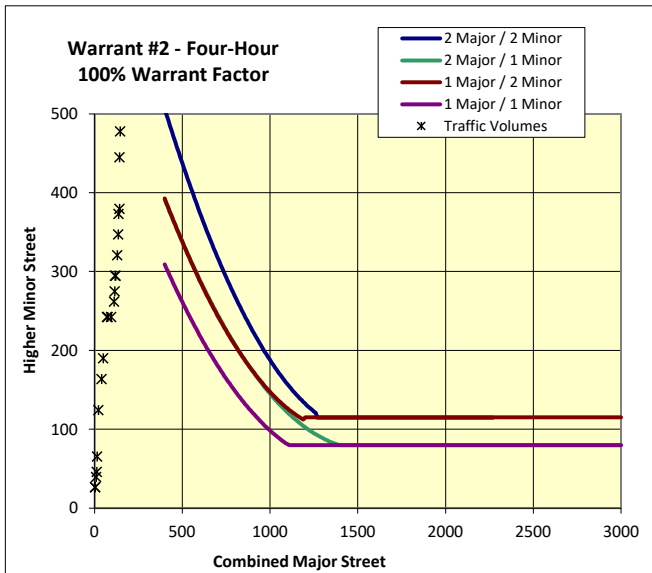
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No







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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\EX P\Intersection 12 PM.xlsm\Data Inout  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** Existing PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:10 PM	5:10 PM		153	202	149	170
2nd Highest Hour			145	191	144	164
3rd Highest Hour			143	189	127	145
4th Highest Hour			137	180	121	138
5th Highest Hour			135	178	113	128
6th Highest Hour			135	178	96	110
7th Highest Hour			129	170	94	108
8th Highest Hour			126	167	88	100
9th Highest Hour			122	162	81	93
10th Highest Hour			114	151	75	85
11th Highest Hour			110	145	75	85
12th Highest Hour			108	143	70	79
13th Highest Hour			104	137	66	76
14th Highest Hour			90	119	61	70
15th Highest Hour			71	94	61	70
16th Highest Hour			67	89	61	70
17th Highest Hour			47	62	48	55
18th Highest Hour			39	51	41	47
19th Highest Hour			20	27	31	36
20th Highest Hour			14	19	17	19
21st Highest Hour			12	16	12	13
22nd Highest Hour			8	11	10	11
23rd Highest Hour			4	5	7	8
24th Highest Hour			4	5	7	8

**Warrant Summary**

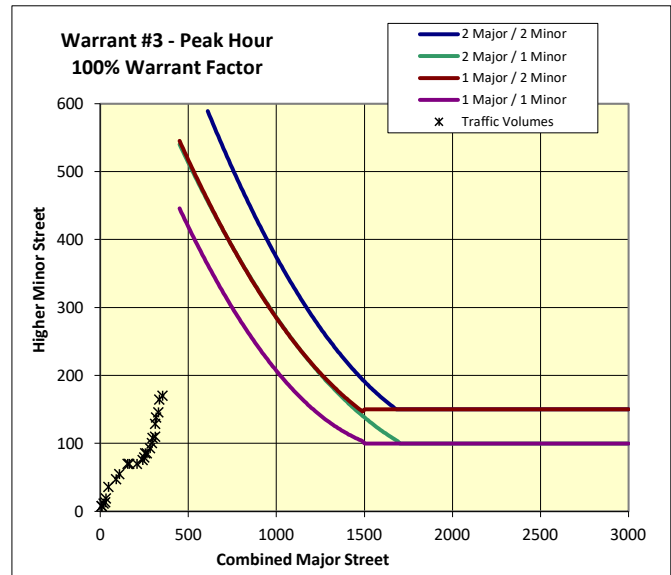
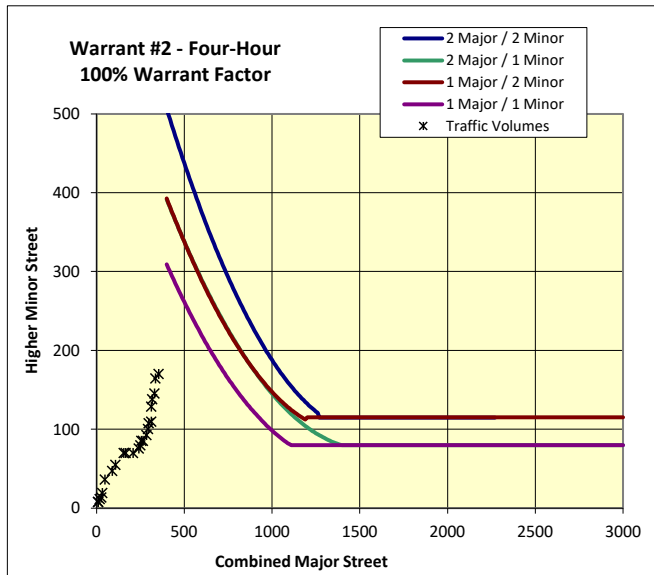
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	1	No	No
	B	525	53	0	No	No
56%	A	280	84	9	Yes	Yes
	B	420	42	0	No	No



## Appendix D: Intersection Queue Spreadsheets



14

East Dwy. & Enterprise Ave.

Signal	Lanes	Volume	95th Percentile		Queue Length		Delay	
			Exceeds Capacity	Queue May Be Longer	Exceeds Capacity	Queue May Be Longer	Exceeds Capacity	Queue May Be Longer
EB	Thru/Right	50	0	0	0	0	0	0
	Left	180	0	0	0	0	0	0
WB	Thru/Right	625	0	0	0	0	0	0
	Left	210	0	0	25	25	0	0
	Thru/Right	340	0	0	0	0	0	0

0	0	0	0
0	0	0	0
0	0	0	0
25	1	25	1
0	0	0	0

Assume 1 car = 25 feet	
#	95th percentile volume exceeds capacity, queue may be longer.
m	Volume for 95th percentile queue is metered by upstream signal.

Highlight -Values were entered manually



14	East Dwy. & Enterprise Ave.	Signal	WB	Left	210	0	0	25	0
				Thru/Right	340	0	0	0	0
			NB	Left	90	0	0	0	0
				Thru	1,200	0	0	25	50
				Right	1,200	0	0	0	0
			SB	Left	450	0	0	0	0
				Thru/Right	50	0	0	0	0
			EB	Left	180	0	0	0	0
				Thru/Right	625	0	0	0	0
			WB	Left	210	0	0	50	25
				Thru/Right	340	0	0	0	0

25	1	0	0
----	---	---	---

0	0	0	0
25	1	50	2
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
50	2	25	1

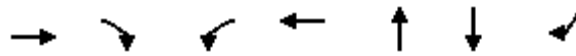
Appendix E: Background Level of Service,  
Queue, And Peak Hour Traffic Signal  
Warrants Worksheets

Queues

1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG\_AM

04/12/2022



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	103	95	314	515	527	715	78
v/c Ratio	0.72	0.19	0.70	1.06	1.49	1.13	0.23
Control Delay	72.2	3.4	45.0	88.3	266.3	116.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	3.4	45.0	88.3	266.3	116.2	7.6
Queue Length 50th (ft)	67	0	189	~311	~483	~291	0
Queue Length 95th (ft)	#140	16	295	#530	#705	#419	32
Internal Link Dist (ft)	128			403	1161	1231	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	163	495	446	484	353	630	345
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.19	0.70	1.06	1.49	1.13	0.23

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.



HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	17	79	88	292	127	352	112	273	105	350	315	73
Future Volume (veh/h)	17	79	88	292	127	352	112	273	105	350	315	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	907	1322	1470	1826	1633	1752	1722	1455	1366	1426	1366	1366
Adj Flow Rate, veh/h	18	85	95	314	137	378	120	294	0	376	339	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	67	39	29	5	18	10	12	30	36	32	36	36
Cap, veh/h	22	105	425	458	101	279	101	248		317	316	275
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.24	0.24	0.00	0.24	0.24	0.24
Sat Flow, veh/h	229	1082	1246	1739	384	1059	416	1019	0	1301	1298	1130
Grp Volume(v), veh/h	103	0	95	314	0	515	414	0	0	376	339	78
Grp Sat Flow(s),veh/h/ln	1311	0	1246	1739	0	1443	1435	0	0	1301	1298	1130
Q Serve(g_s), s	7.9	0.0	5.6	16.7	0.0	27.0	25.0	0.0	0.0	25.0	25.0	5.8
Cycle Q Clear(g_c), s	7.9	0.0	5.6	16.7	0.0	27.0	25.0	0.0	0.0	25.0	25.0	5.8
Prop In Lane	0.17		1.00	1.00		0.73	0.29		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	0	425	458	0	380	350	0		317	316	275
V/C Ratio(X)	0.81	0.00	0.22	0.69	0.00	1.36	1.18	0.00		1.19	1.07	0.28
Avail Cap(c_a), veh/h	166	0	462	458	0	380	350	0		317	316	275
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	0.0	24.1	34.0	0.0	37.8	38.8	0.0	0.0	38.8	38.8	31.5
Incr Delay (d2), s/veh	15.3	0.0	0.1	3.5	0.0	176.6	108.1	0.0	0.0	110.7	70.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	2.4	7.4	0.0	28.0	19.1	0.0	0.0	17.6	14.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	0.0	24.2	37.5	0.0	214.4	146.9	0.0	0.0	149.5	109.6	31.7
LnGrp LOS	E	A	C	D	A	F	F	A		F	F	C
Approach Vol, veh/h		198			829			414	A		793	
Approach Delay, s/veh		43.2			147.4			146.9			120.9	
Approach LOS		D			F			F			F	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.1		13.7		29.1		30.7				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		27.0		9.9		27.0		29.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	128.6
HCM 6th LOS	F

Notes

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

Intersection												
Intersection Delay, s/veh	69.4											
Intersection LOS	F											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕			↕	↕		↕	↕
Traffic Vol, veh/h	272	52	131	5	67	45	82	173	7	168	343	184
Future Vol, veh/h	272	52	131	5	67	45	82	173	7	168	343	184
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	16	8	8	25	34	37	31	26	0	7	9	45
Mvmt Flow	296	57	142	5	73	49	89	188	8	183	373	200
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	35	17.7	29.5	115.7
HCM LOS	D	C	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	32%	0%	84%	0%	4%	33%	0%
Vol Thru, %	68%	0%	16%	0%	57%	67%	0%
Vol Right, %	0%	100%	0%	100%	38%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	255	7	324	131	117	511	184
LT Vol	82	0	272	0	5	168	0
Through Vol	173	0	52	0	67	343	0
RT Vol	0	7	0	131	45	0	184
Lane Flow Rate	277	8	352	142	127	555	200
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.685	0.017	0.834	0.288	0.328	1.243	0.4
Departure Headway (Hd)	9.33	8.345	9.076	7.778	9.903	8.058	7.2
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	391	431	401	466	365	455	502
Service Time	7.03	6.045	6.776	5.478	7.903	5.777	4.919
HCM Lane V/C Ratio	0.708	0.019	0.878	0.305	0.348	1.22	0.398
HCM Control Delay	30	11.2	43.7	13.6	17.7	152.1	14.6
HCM Lane LOS	D	B	E	B	C	F	B
HCM 95th-tile Q	4.9	0.1	7.8	1.2	1.4	22.7	1.9

Queues  
3: Clawiter Rd. & Enterprise Ave.

BG\_AM  
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Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	152	44	120	605	669
v/c Ratio	0.68	0.32	0.63	0.50	0.78
Control Delay	22.3	51.9	57.2	8.3	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	51.9	57.2	8.3	24.7
Queue Length 50th (ft)	0	29	78	133	222
Queue Length 95th (ft)	57	63	129	316	#486
Internal Link Dist (ft)	2621	76		1231	1843
Turn Bay Length (ft)			155		
Base Capacity (vph)	304	306	240	1221	862
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.14	0.50	0.50	0.78

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

BG\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	14	0	121	39	0	0	107	368	171	0	521	75
Future Volume (veh/h)	14	0	121	39	0	0	107	368	171	0	521	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1233	1900	1055	1900	1900	1900	1544	1618	1900	1900	1500	1574
Adj Flow Rate, veh/h	16	0	136	44	0	0	120	413	192	0	585	84
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	45	0	57	0	0	0	24	19	0	0	27	22
Cap, veh/h	19	0	164	62	0	0	143	759	353	2	749	108
Arrive On Green	0.11	0.00	0.11	0.03	0.00	0.00	0.10	0.73	0.73	0.00	0.59	0.59
Sat Flow, veh/h	171	0	1458	1810	0	0	1471	1045	486	1810	1278	184
Grp Volume(v), veh/h	152	0	0	44	0	0	120	0	605	0	0	669
Grp Sat Flow(s),veh/h/ln	1629	0	0	1810	0	0	1471	0	1531	1810	0	1462
Q Serve(g_s), s	9.7	0.0	0.0	2.6	0.0	0.0	8.5	0.0	19.0	0.0	0.0	37.0
Cycle Q Clear(g_c), s	9.7	0.0	0.0	2.6	0.0	0.0	8.5	0.0	19.0	0.0	0.0	37.0
Prop In Lane	0.11		0.89	1.00		0.00	1.00		0.32	1.00		0.13
Lane Grp Cap(c), veh/h	183	0	0	62	0	0	143	0	1112	2	0	857
V/C Ratio(X)	0.83	0.00	0.00	0.71	0.00	0.00	0.84	0.00	0.54	0.00	0.00	0.78
Avail Cap(c_a), veh/h	269	0	0	307	0	0	234	0	1112	87	0	857
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.91
Uniform Delay (d), s/veh	46.1	0.0	0.0	50.7	0.0	0.0	47.0	0.0	6.6	0.0	0.0	16.7
Incr Delay (d2), s/veh	13.1	0.0	0.0	13.9	0.0	0.0	1.3	0.0	0.2	0.0	0.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.0	1.4	0.0	0.0	3.1	0.0	5.2	0.0	0.0	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	0.0	0.0	64.5	0.0	0.0	48.3	0.0	6.8	0.0	0.0	23.1
LnGrp LOS	E	A	A	E	A	A	D	A	A	A	A	C
Approach Vol, veh/h		152			44			725				669
Approach Delay, s/veh		59.2			64.5			13.6				23.1
Approach LOS		E			E			B				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	81.5		16.4	14.8	66.6		8.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	47.4		17.5	16.9	35.6		18.0				
Max Q Clear Time (g_c+I1), s	0.0	21.0		11.7	10.5	39.0		4.6				
Green Ext Time (p_c), s	0.0	4.7		0.4	0.1	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Queues

4: Clawiter Rd. & Depot Rd.

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04/12/2022



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	222	557	4	133	664	227
v/c Ratio	0.69	0.79	0.01	0.11	0.42	0.23
Control Delay	49.6	46.8	0.0	16.6	18.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	46.8	0.0	16.6	18.5	1.5
Queue Length 50th (ft)	67	186	0	13	143	0
Queue Length 95th (ft)	102	241	0	62	224	25
Internal Link Dist (ft)	3714	725		1843	714	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	565	809	466	1252	1571	1051
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.69	0.01	0.11	0.42	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

BG\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕	↗		↕↕			↕↕	↗
Traffic Volume (veh/h)	35	128	41	249	263	4	18	50	54	14	597	209
Future Volume (veh/h)	35	128	41	249	263	4	18	50	54	14	597	209
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1381	1159	937	1693	1722	1900	1618	1604	1648	1900	1722	1737
Adj Flow Rate, veh/h	38	139	45	271	286	4	20	54	59	15	649	227
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	35	50	65	14	12	0	19	20	17	0	12	11
Cap, veh/h	46	174	58	339	338	325	173	446	568	52	1681	956
Arrive On Green	0.13	0.13	0.13	0.21	0.21	0.21	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	369	1384	464	1640	1636	1572	241	840	1069	31	3166	1453
Grp Volume(v), veh/h	118	0	104	271	286	4	63	0	70	355	309	227
Grp Sat Flow(s),veh/h/ln	1141	0	1076	1640	1636	1572	884	0	1267	1708	1489	1453
Q Serve(g_s), s	10.7	0.0	10.0	16.6	17.8	0.2	0.6	0.0	2.9	0.0	13.0	6.7
Cycle Q Clear(g_c), s	10.7	0.0	10.0	16.6	17.8	0.2	13.6	0.0	2.9	12.9	13.0	6.7
Prop In Lane	0.32		0.43	1.00		1.00	0.32		0.84	0.04		1.00
Lane Grp Cap(c), veh/h	143	0	135	339	338	325	514	0	673	942	791	956
V/C Ratio(X)	0.82	0.00	0.77	0.80	0.85	0.01	0.12	0.00	0.10	0.38	0.39	0.24
Avail Cap(c_a), veh/h	269	0	254	426	424	408	514	0	673	942	791	956
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	0.00	1.00	0.09	0.09	0.09	0.86	0.00	0.86	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	44.9	40.0	40.4	33.4	12.5	0.0	12.3	14.7	14.7	7.4
Incr Delay (d2), s/veh	4.4	0.0	3.5	0.8	1.3	0.0	0.4	0.0	0.3	0.4	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.8	6.7	7.2	0.1	0.8	0.0	0.9	5.0	4.4	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	0.0	48.4	40.8	41.7	33.4	12.9	0.0	12.6	15.0	15.2	7.6
LnGrp LOS	D	A	D	D	D	C	B	A	B	B	B	A
Approach Vol, veh/h		222			561			133			891	
Approach Delay, s/veh		49.0			41.2			12.8			13.2	
Approach LOS		D			D			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		61.3		26.4		61.3		18.3				
Change Period (Y+Rc), s		5.0		4.5		* 5		5.0				
Max Green Setting (Gmax), s		39.0		27.5		* 40		25.0				
Max Q Clear Time (g_c+I1), s		15.6		19.8		15.0		12.7				
Green Ext Time (p_c), s		1.1		2.1		7.7		0.7				

Intersection Summary

HCM 6th Ctrl Delay	26.3
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	48	7	7	375	6	671
v/c Ratio	0.33	0.32	0.06	0.06	0.15	0.05	0.27
Control Delay	46.1	45.3	40.0	42.7	4.3	40.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	45.3	40.0	42.7	4.3	40.4	5.5
Queue Length 50th (ft)	29	28	4	4	16	4	30
Queue Length 95th (ft)	60	58	16	17	73	m8	143
Internal Link Dist (ft)		83	86		940		354
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	478	481	138	133	2524	133	2459
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.10	0.05	0.05	0.15	0.05	0.27

#### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

BG\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↔			↔		↖	↕		↖	↕	
Traffic Volume (veh/h)	76	4	1	4	1	1	6	308	7	5	564	0
Future Volume (veh/h)	76	4	1	4	1	1	6	308	7	5	564	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1678	1900	1900	1633	0
Adj Flow Rate, veh/h	95	0	0	5	1	1	7	367	8	6	671	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	0	0	0	0	0	0	0	15	0	0	18	0
Cap, veh/h	175	92	0	11	2	2	16	2412	52	14	2343	0
Arrive On Green	0.05	0.00	0.00	0.01	0.01	0.01	0.01	0.76	0.76	0.02	1.00	0.00
Sat Flow, veh/h	3619	1900	0	1279	256	256	1810	3189	69	1810	3185	0
Grp Volume(v), veh/h	95	0	0	7	0	0	7	183	192	6	671	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1790	0	0	1810	1594	1665	1810	1552	0
Q Serve(g_s), s	2.4	0.0	0.0	0.4	0.0	0.0	0.4	3.0	3.0	0.3	0.0	0.0
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.4	0.0	0.0	0.4	3.0	3.0	0.3	0.0	0.0
Prop In Lane	1.00		0.00	0.71		0.14	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	175	92	0	16	0	0	16	1205	1259	14	2343	0
V/C Ratio(X)	0.54	0.00	0.00	0.44	0.00	0.00	0.44	0.15	0.15	0.43	0.29	0.00
Avail Cap(c_a), veh/h	1010	530	0	132	0	0	133	1205	1259	133	2343	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.79	0.79	0.79	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	46.8	0.0	0.0	46.8	3.2	3.2	46.6	0.0	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.0	18.0	0.0	0.0	14.0	0.2	0.2	19.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	0.2	0.0	0.0	0.2	0.8	0.8	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	0.0	64.8	0.0	0.0	60.8	3.4	3.4	66.1	0.3	0.0
LnGrp LOS	D	A	A	E	A	A	E	A	A	E	A	A
Approach Vol, veh/h		95			7			382			677	
Approach Delay, s/veh		46.8			64.8			4.5			0.9	
Approach LOS		D			E			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	76.3		9.1	4.8	76.2		4.8				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	7.0	37.5		26.5	7.0	37.5		7.0				
Max Q Clear Time (g_c+I1), s	2.3	5.0		4.4	2.4	2.0		2.4				
Green Ext Time (p_c), s	0.0	2.4		0.3	0.0	5.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	6.2
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.



Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	4	1	0	0	1	0	81	1	826	0
Future Vol, veh/h	0	0	4	1	0	0	1	0	81	1	826	0
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	6	6	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	26	0	50	0	0	0	28	12	0	0	16	0
Mvmt Flow	0	0	5	1	0	0	1	0	108	1	1101	0

Major/Minor	Minor2		Minor1			Major2				
Conflicting Flow All	-	-	1101	1112	1109	-	-	6	0	0
Stage 1	-	-	-	6	6	-	-	-	-	-
Stage 2	-	-	-	1106	1103	-	-	-	-	-
Critical Hdwy	-	-	6.7	7.1	6.5	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-
Follow-up Hdwy	-	-	3.75	3.5	4	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	208	188	211	0	-	1628	-	0
Stage 1	0	0	-	-	-	0	-	-	-	0
Stage 2	0	0	-	258	290	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	208	182	209	-	-	1619	-	-
Mov Cap-2 Maneuver	-	-	-	182	209	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	251	289	-	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	22.8		24.9		0	
HCM LOS	C		C			

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	208	182	1619	-
HCM Lane V/C Ratio	0.026	0.007	0.001	-
HCM Control Delay (s)	22.8	24.9	7.2	-
HCM Lane LOS	C	C	A	-
HCM 95th %tile Q(veh)	0.1	0	0	-

## Queues

## 7: Clawiter Rd. &amp; West St.

BG\_AM

04/12/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	658	5	1314
v/c Ratio	0.69	0.30	0.05	0.56
Control Delay	47.0	6.2	42.5	8.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.0	6.2	42.5	8.0
Queue Length 50th (ft)	125	48	3	165
Queue Length 95th (ft)	176	109	14	257
Internal Link Dist (ft)	322	809		3146
Turn Bay Length (ft)			45	
Base Capacity (vph)	595	2172	142	2328
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.30	0.04	0.56

## Intersection Summary

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

BG\_AM  
04/12/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↔	↕↕
Traffic Volume (veh/h)	182	8	527	39	4	1130
Future Volume (veh/h)	182	8	527	39	4	1130
Initial Q (Qb), veh	0	0	0	0	0	0
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	1900	1648	1856	1900	1722
Adj Flow Rate, veh/h	212	9	613	45	5	1314
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	0	17	3	0	12
Cap, veh/h	251	11	2073	152	12	2469
Arrive On Green	0.15	0.15	1.00	1.00	0.01	0.75
Sat Flow, veh/h	1666	71	3040	217	1810	3358
Grp Volume(v), veh/h	222	0	324	334	5	1314
Grp Sat Flow(s),veh/h/ln	1745	0	1566	1609	1810	1636
Q Serve(g_s), s	11.8	0.0	0.0	0.0	0.3	15.6
Cycle Q Clear(g_c), s	11.8	0.0	0.0	0.0	0.3	15.6
Prop In Lane	0.95	0.04		0.13	1.00	
Lane Grp Cap(c), veh/h	263	0	1097	1128	12	2469
V/C Ratio(X)	0.84	0.00	0.30	0.30	0.42	0.53
Avail Cap(c_a), veh/h	597	0	1097	1128	143	2469
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.18	0.18
Uniform Delay (d), s/veh	39.3	0.0	0.0	0.0	47.0	4.8
Incr Delay (d2), s/veh	7.3	0.0	0.7	0.7	4.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.2	0.2	0.1	4.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.6	0.0	0.7	0.7	51.3	4.9
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	222		658			1319
Approach Delay, s/veh	46.6		0.7			5.1
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.1	71.1			76.2	18.8
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	7.5	* 42			53.5	32.5
Max Q Clear Time (g_c+I1), s	2.3	2.0			17.6	13.8
Green Ext Time (p_c), s	0.0	4.7			13.4	0.6

Intersection Summary

HCM 6th Ctrl Delay			8.0			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

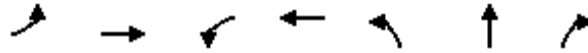
\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

## Queues

## 8: Clawiter Rd./Tuskegee Airmen Dr. &amp; Winton Ave.

BG\_AM

04/12/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	1	601	1206	1314	90	90	278
v/c Ratio	0.01	0.63	0.96	0.53	0.64	0.64	0.69
Control Delay	51.0	30.0	51.1	6.8	64.8	64.8	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	30.0	51.1	6.8	64.8	64.8	14.4
Queue Length 50th (ft)	1	163	417	133	65	65	0
Queue Length 95th (ft)	6	236	#514	306	108	108	62
Internal Link Dist (ft)		5260		2336		3146	
Turn Bay Length (ft)	210		205		85		
Base Capacity (vph)	98	958	1279	2497	285	285	532
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.63	0.94	0.53	0.32	0.32	0.52

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

BG\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕		↖	↕		↗	↖	↗	↖	↕	↘
Traffic Volume (veh/h)	1	357	160	1037	1129	1	155	0	239	0	0	0
Future Volume (veh/h)	1	357	160	1037	1129	1	155	0	239	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1322	1352	1796	1722	1781	1633	1411	1559	907	1900	1159
Adj Flow Rate, veh/h	1	415	0	1206	1313	1	180	0	278	0	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	39	37	7	12	8	18	33	23	67	0	50
Cap, veh/h	2	495		1487	2178	2	836	0	300	65	431	0
Arrive On Green	0.00	0.20	0.00	0.45	0.65	0.65	0.23	0.00	0.23	0.00	0.00	0.00
Sat Flow, veh/h	1810	2578	0	3319	3355	3	3111	0	1321	534	1900	0
Grp Volume(v), veh/h	1	415	0	1206	640	674	180	0	278	0	0	0
Grp Sat Flow(s),veh/h/ln	1810	1256	0	1659	1636	1722	1555	0	1321	534	1900	0
Q Serve(g_s), s	0.1	17.5	0.0	34.7	24.8	24.8	5.2	0.0	22.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	17.5	0.0	34.7	24.8	24.8	5.2	0.0	22.7	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	495		1487	1062	1118	836	0	300	65	431	0
V/C Ratio(X)	0.40	0.84		0.81	0.60	0.60	0.22	0.00	0.93	0.00	0.00	0.00
Avail Cap(c_a), veh/h	99	603		1487	1062	1118	897	0	326	76	468	0
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	0.96	0.00	0.96	0.00	0.00	0.00
Uniform Delay (d), s/veh	54.9	42.5	0.0	26.3	11.1	11.1	34.9	0.0	41.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	35.0	15.6	0.0	3.3	2.5	2.4	0.0	0.0	28.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	6.5	0.0	13.9	9.0	9.4	2.0	0.0	9.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.9	58.0	0.0	29.6	13.7	13.5	34.9	0.0	70.4	0.0	0.0	0.0
LnGrp LOS	F	E		C	B	B	C	A	E	A	A	A
Approach Vol, veh/h		416	A		2520			458				0
Approach Delay, s/veh		58.1			21.3			56.5				0.0
Approach LOS		E			C			E				
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	53.9	26.3		29.8	4.2	76.0		29.8				
Change Period (Y+Rc), s	4.6	* 4.6		4.9	4.0	4.6		4.9				
Max Green Setting (Gmax), s	43.0	* 26		27.1	6.0	63.4		27.1				
Max Q Clear Time (g_c+I1), s	36.7	19.5		24.7	2.1	26.8		0.0				
Green Ext Time (p_c), s	1.9	2.0		0.3	0.0	17.6		0.0				

Intersection Summary

HCM 6th Ctrl Delay	30.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Queues  
9: Industrial Blvd. & Depot Rd.

BG\_AM  
04/12/2022



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	68	246	406	398	626	166	41	476	10
v/c Ratio	0.04	0.13	0.47	0.84	2.71	0.58	0.11	0.25	0.48	0.01
Control Delay	13.1	13.7	5.6	35.0	804.7	17.8	0.1	27.1	16.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	13.7	5.6	35.0	804.7	17.8	0.1	27.1	16.4	0.0
Queue Length 50th (ft)	2	15	0	116	~228	86	0	13	63	0
Queue Length 95th (ft)	9	33	28	#207	#322	112	0	33	85	0
Internal Link Dist (ft)		725		1517		890			940	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	235	514	529	486	147	1074	1553	165	1002	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.13	0.47	0.84	2.71	0.58	0.11	0.25	0.48	0.01

Intersection Summary

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

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

HCM 6th Signalized Intersection Summary  
9: Industrial Blvd. & Depot Rd.

BG\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	54	197	139	154	31	318	501	133	33	381	8
Future Volume (veh/h)	8	54	197	139	154	31	318	501	133	33	381	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1574	1248	1870	1737	1781	1722	1737	1841	1900	1618	1648
Adj Flow Rate, veh/h	10	68	246	174	192	39	398	626	0	41	476	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	33	22	44	2	11	8	12	11	4	0	19	17
Cap, veh/h	358	520	348	260	231	42	150	1090		166	1016	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	866	1574	1055	502	699	128	1640	3300	1560	1810	3075	1397
Grp Volume(v), veh/h	10	68	246	405	0	0	398	626	0	41	476	0
Grp Sat Flow(s),veh/h/ln	866	1574	1055	1329	0	0	1640	1650	1560	1810	1537	1397
Q Serve(g_s), s	0.0	1.6	11.1	14.2	0.0	0.0	5.0	8.5	0.0	1.1	6.7	0.0
Cycle Q Clear(g_c), s	0.6	1.6	11.1	15.9	0.0	0.0	5.0	8.5	0.0	1.1	6.7	0.0
Prop In Lane	1.00		1.00	0.43		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	358	520	348	533	0	0	150	1090		166	1016	
V/C Ratio(X)	0.03	0.13	0.71	0.76	0.00	0.00	2.64	0.57		0.25	0.47	
Avail Cap(c_a), veh/h	358	520	348	533	0	0	150	1090		166	1016	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.4	12.8	15.9	17.3	0.0	0.0	24.8	15.1	0.0	23.0	14.5	0.0
Incr Delay (d2), s/veh	0.1	0.5	11.4	9.8	0.0	0.0	759.0	2.2	0.0	3.5	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	3.4	5.6	0.0	0.0	33.5	3.1	0.0	0.6	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	13.3	27.4	27.1	0.0	0.0	783.8	17.3	0.0	26.5	16.0	0.0
LnGrp LOS	B	B	C	C	A	A	F	B		C	B	
Approach Vol, veh/h		324			405			1024	A		517	A
Approach Delay, s/veh		24.0			27.1			315.2			16.8	
Approach LOS		C			C			F			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	10.5		13.1	7.0	8.7		17.9				
Green Ext Time (p_c), s	0.0	2.5		0.6	0.0	2.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay 154.3  
HCM 6th LOS F

Notes

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

**Intersection**

Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	5	5	10	7	29	7	156	30	10	86	0
Future Vol, veh/h	1	5	5	10	7	29	7	156	30	10	86	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	100	75	50	38	40	14	20	16	83	50	44	0
Mvmt Flow	1	6	6	12	8	35	8	186	36	12	102	0
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.5	8.6	9.7	9.4
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	9%	22%	100%	0%
Vol Thru, %	0%	84%	45%	15%	0%	100%
Vol Right, %	0%	16%	45%	63%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	186	11	46	10	86
LT Vol	7	0	1	10	10	0
Through Vol	0	156	5	7	0	86
RT Vol	0	30	5	29	0	0
Lane Flow Rate	8	221	13	55	12	102
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.013	0.305	0.023	0.078	0.021	0.16
Departure Headway (Hd)	5.636	4.953	6.319	5.122	6.23	5.625
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	637	728	567	700	576	640
Service Time	3.352	2.669	4.347	3.144	3.947	3.343
HCM Lane V/C Ratio	0.013	0.304	0.023	0.079	0.021	0.159
HCM Control Delay	8.4	9.8	9.5	8.6	9.1	9.4
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0	1.3	0.1	0.3	0.1	0.6



**Intersection**

Intersection Delay, s/veh 11.1

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	7	9	10	18	23	156	16	144	29	78	81	8
Future Vol, veh/h	7	9	10	18	23	156	16	144	29	78	81	8
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	20	29	25	43	11	18	0	23	41	45	52	50
Mvmt Flow	8	10	11	19	25	168	17	155	31	84	87	9
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	9.2	11.7	11.4	10.4
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	27%	9%	100%	0%	0%
Vol Thru, %	0%	83%	35%	12%	0%	100%	0%
Vol Right, %	0%	17%	38%	79%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	173	26	197	78	81	8
LT Vol	16	0	7	18	78	0	0
Through Vol	0	144	9	23	0	81	0
RT Vol	0	29	10	156	0	0	8
Lane Flow Rate	17	186	28	212	84	87	9
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.03	0.316	0.048	0.342	0.157	0.153	0.013
Departure Headway (Hd)	6.337	6.107	6.194	5.818	6.826	6.441	5.699
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	568	592	581	612	528	560	632
Service Time	4.037	3.807	3.905	3.615	4.526	4.141	3.399
HCM Lane V/C Ratio	0.03	0.314	0.048	0.346	0.159	0.155	0.014
HCM Control Delay	9.2	11.6	9.2	11.7	10.8	10.3	8.5
HCM Lane LOS	A	B	A	B	B	B	A
HCM 95th-tile Q	0.1	1.3	0.2	1.5	0.6	0.5	0

**Intersection**

Intersection Delay, s/veh 13.7

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑	↗	↘	↑	↗
Traffic Vol, veh/h	3	44	18	333	82	186	25	24	19	80	18	2
Future Vol, veh/h	3	44	18	333	82	186	25	24	19	80	18	2
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
Heavy Vehicles, %	0	43	50	14	18	9	29	7	57	39	0	0
Mvmt Flow	3	49	20	370	91	207	28	27	21	89	20	2
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	10.4	14.8	10.4	11.8
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	24	19	3	44	18	333	82	186	80	18	2
LT Vol	25	0	0	3	0	0	333	0	0	80	0	0
Through Vol	0	24	0	0	44	0	0	82	0	0	18	0
RT Vol	0	0	19	0	0	18	0	0	186	0	0	2
Lane Flow Rate	28	27	21	3	49	20	370	91	207	89	20	2
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.06	0.051	0.041	0.007	0.099	0.037	0.636	0.146	0.281	0.193	0.037	0.004
Departure Headway (Hd)	7.764	6.89	7.04	7.039	7.27	6.689	6.185	5.753	4.9	7.822	6.659	5.959
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	520	509	509	494	536	588	627	738	460	538	601
Service Time	5.502	4.628	4.778	4.774	5.005	4.424	3.885	3.453	2.6	5.558	4.395	3.695
HCM Lane V/C Ratio	0.061	0.052	0.041	0.006	0.099	0.037	0.629	0.145	0.28	0.193	0.037	0.003
HCM Control Delay	11	10	10.1	9.8	10.8	9.7	19.1	9.4	9.5	12.4	9.7	8.7
HCM Lane LOS	B	A	B	A	B	A	C	A	A	B	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0	0.3	0.1	4.5	0.5	1.2	0.7	0.1	0

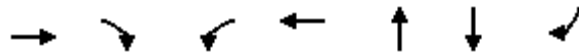


## Queues

BG\_PM

04/12/2022

## 1: Clawiter Rd. &amp; Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	138	147	124	331	653	772	40
v/c Ratio	0.65	0.22	0.56	0.87	1.44	0.86	0.08
Control Delay	54.8	2.8	45.1	34.9	235.5	44.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	2.8	45.1	34.9	235.5	44.0	0.3
Queue Length 50th (ft)	74	0	66	51	~480	206	0
Queue Length 95th (ft)	#167	19	122	163	#867	#407	2
Internal Link Dist (ft)	128			403	144	1216	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	252	655	442	526	455	911	492
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.22	0.28	0.63	1.44	0.85	0.08

## Intersection Summary

Description: ALL SPLIT, EB OVL

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG\_PM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	37	90	135	114	50	255	41	387	172	220	490	37
Future Volume (veh/h)	37	90	135	114	50	255	41	387	172	220	490	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1826	1707	1559	1174	1366	1411	1633	1885	1841	1737	1826
Adj Flow Rate, veh/h	40	98	147	124	54	277	45	421	0	239	533	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	5	13	23	49	36	33	18	1	4	11	5
Cap, veh/h	51	125	494	391	44	225	38	358		241	573	377
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.24	0.24	0.00	0.24	0.24	0.24
Sat Flow, veh/h	522	1278	1447	1485	166	854	157	1468	0	987	2351	1547
Grp Volume(v), veh/h	138	0	147	124	0	331	466	0	0	409	363	40
Grp Sat Flow(s),veh/h/ln	1800	0	1447	1485	0	1020	1625	0	0	1688	1650	1547
Q Serve(g_s), s	7.7	0.0	7.6	6.9	0.0	27.0	25.0	0.0	0.0	24.8	21.9	2.1
Cycle Q Clear(g_c), s	7.7	0.0	7.6	6.9	0.0	27.0	25.0	0.0	0.0	24.8	21.9	2.1
Prop In Lane	0.29		1.00	1.00		0.84	0.10		0.00	0.58		1.00
Lane Grp Cap(c), veh/h	175	0	494	391	0	268	396	0		411	402	377
V/C Ratio(X)	0.79	0.00	0.30	0.32	0.00	1.23	1.18	0.00		0.99	0.90	0.11
Avail Cap(c_a), veh/h	228	0	536	391	0	268	396	0		411	402	377
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	24.8	30.4	0.0	37.8	38.8	0.0	0.0	38.7	37.6	30.1
Incr Delay (d2), s/veh	9.4	0.0	0.1	0.2	0.0	132.8	102.9	0.0	0.0	42.6	22.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	3.7	2.5	0.0	16.5	21.1	0.0	0.0	14.9	11.2	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	24.9	30.6	0.0	170.6	141.7	0.0	0.0	81.3	60.3	30.2
LnGrp LOS	D	A	C	C	A	F	F	A		F	E	C
Approach Vol, veh/h		285			455			466	A		812	
Approach Delay, s/veh		39.3			132.4			141.7			69.4	
Approach LOS		D			F			F			E	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.1		13.7		29.1		30.7				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		27.0		9.7		26.8		29.0				
Green Ext Time (p_c), s		0.0		0.1		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	96.1
HCM 6th LOS	F

Notes

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

**Intersection**

Intersection Delay, s/veh 15.9  
 Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕			↕	↕		↕	↕
Traffic Vol, veh/h	213	12	82	2	172	124	278	262	6	70	151	521
Future Vol, veh/h	213	12	82	2	172	124	278	262	6	70	151	521
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	20	50	27	0	3	6	4	8	0	25	19	4
Mvmt Flow	260	15	100	2	210	151	339	320	7	85	184	635
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	41.2	77.4	381.1	222.3
HCM LOS	E	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	51%	0%	95%	0%	1%	32%	0%
Vol Thru, %	49%	0%	5%	0%	58%	68%	0%
Vol Right, %	0%	100%	0%	100%	42%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	540	6	225	82	298	221	521
LT Vol	278	0	213	0	2	70	0
Through Vol	262	0	12	0	172	151	0
RT Vol	0	6	0	82	124	0	521
Lane Flow Rate	659	7	274	100	363	270	635
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	1.778	0.018	0.789	0.269	0.954	0.741	1.576
Departure Headway (Hd)	10.3	9.361	12.462	11.753	12.048	11.669	10.643
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	362	385	294	308	305	313	349
Service Time	8	7.061	10.162	9.453	10.048	9.369	8.343
HCM Lane V/C Ratio	1.82	0.018	0.932	0.325	1.19	0.863	1.819
HCM Control Delay	385.2	12.2	49.4	18.7	77.4	41.5	299
HCM Lane LOS	F	B	E	C	F	E	F
HCM 95th-tile Q	39.8	0.1	6.2	1.1	9.5	5.5	30.8

Queues  
3: Clawiter Rd. & Enterprise Ave.

BG\_PM  
04/12/2022



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	247	196	87	808	321
v/c Ratio	0.78	0.69	0.59	0.88	0.44
Control Delay	40.9	54.5	59.1	35.2	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	54.5	59.1	35.2	28.2
Queue Length 50th (ft)	91	127	57	447	134
Queue Length 95th (ft)	170	191	103	#867	#349
Internal Link Dist (ft)	2619	76		1216	1497
Turn Bay Length (ft)			155		
Base Capacity (vph)	412	383	215	914	726
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.60	0.51	0.40	0.88	0.44

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

BG\_PM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	102	0	121	176	0	0	78	617	110	0	260	29
Future Volume (veh/h)	102	0	121	176	0	0	78	617	110	0	260	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1811	1900	1781	1900	1900	1900	1218	1604	1900	1900	1767	1263
Adj Flow Rate, veh/h	113	0	134	196	0	0	87	686	122	0	289	32
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, %	6	0	8	0	0	0	46	20	0	0	9	43
Cap, veh/h	129	0	153	236	0	0	101	760	135	2	696	77
Arrive On Green	0.17	0.00	0.17	0.13	0.00	0.00	0.09	0.58	0.58	0.00	0.45	0.45
Sat Flow, veh/h	776	0	920	1810	0	0	1160	1320	235	1810	1558	173
Grp Volume(v), veh/h	247	0	0	196	0	0	87	0	808	0	0	321
Grp Sat Flow(s),veh/h/ln	1696	0	0	1810	0	0	1160	0	1555	1810	0	1731
Q Serve(g_s), s	15.1	0.0	0.0	11.2	0.0	0.0	7.8	0.0	48.6	0.0	0.0	13.3
Cycle Q Clear(g_c), s	15.1	0.0	0.0	11.2	0.0	0.0	7.8	0.0	48.6	0.0	0.0	13.3
Prop In Lane	0.46		0.54	1.00		0.00	1.00		0.15	1.00		0.10
Lane Grp Cap(c), veh/h	282	0	0	236	0	0	101	0	896	2	0	773
V/C Ratio(X)	0.88	0.00	0.00	0.83	0.00	0.00	0.86	0.00	0.90	0.00	0.00	0.42
Avail Cap(c_a), veh/h	344	0	0	384	0	0	202	0	896	316	0	773
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	1.00
Uniform Delay (d), s/veh	43.1	0.0	0.0	44.9	0.0	0.0	47.8	0.0	19.8	0.0	0.0	19.9
Incr Delay (d2), s/veh	18.9	0.0	0.0	7.8	0.0	0.0	2.1	0.0	1.6	0.0	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	0.0	0.0	5.5	0.0	0.0	2.3	0.0	16.6	0.0	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	0.0	0.0	52.8	0.0	0.0	49.9	0.0	21.4	0.0	0.0	21.5
LnGrp LOS	E	A	A	D	A	A	D	A	C	A	A	C
Approach Vol, veh/h		247			196			895				321
Approach Delay, s/veh		62.1			52.8			24.2				21.5
Approach LOS		E			D			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	65.6		22.1	13.7	51.9		18.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	25.5		21.5	18.5	25.5		22.5				
Max Q Clear Time (g_c+I1), s	0.0	50.6		17.1	9.8	15.3		13.2				
Green Ext Time (p_c), s	0.0	0.0		0.6	0.1	1.3		0.7				

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.



Queues

4: Clawiter Rd. & Depot Rd.

BG\_PM

04/12/2022



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	599	189	13	791	139	13
v/c Ratio	0.79	0.56	0.06	0.48	0.10	0.01
Control Delay	46.0	50.6	0.6	10.9	14.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	50.6	0.6	10.9	14.5	1.2
Queue Length 50th (ft)	201	64	0	45	23	0
Queue Length 95th (ft)	244	98	0	m119	48	4
Internal Link Dist (ft)	3711	564		280	717	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	1040	737	382	1661	1443	1008
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.26	0.03	0.48	0.10	0.01

Intersection Summary

Description: E/W SPLIT

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

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

BG\_PM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕	↗		↕↕			↕↕	↗
Traffic Volume (veh/h)	173	379	17	85	95	12	22	422	308	12	120	12
Future Volume (veh/h)	173	379	17	85	95	12	22	422	308	12	120	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1781	1500	1767	1470	1604	1352	1841	1826	1796	1633	1515
Adj Flow Rate, veh/h	182	399	18	89	100	13	23	444	324	13	126	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	8	27	9	29	20	37	4	5	7	18	26
Cap, veh/h	214	501	23	138	137	133	63	1034	734	138	1332	987
Arrive On Green	0.21	0.21	0.21	0.10	0.10	0.10	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	1011	2369	110	1400	1397	1355	48	1853	1315	175	2388	1282
Grp Volume(v), veh/h	312	0	287	89	100	13	446	0	345	68	71	13
Grp Sat Flow(s),veh/h/ln	1731	0	1760	1400	1397	1355	1817	0	1399	1151	1412	1282
Q Serve(g_s), s	18.3	0.0	16.3	6.5	7.4	0.9	0.0	0.0	15.3	0.4	2.5	0.3
Cycle Q Clear(g_c), s	18.3	0.0	16.3	6.5	7.4	0.9	15.0	0.0	15.3	15.7	2.5	0.3
Prop In Lane	0.58		0.06	1.00		1.00	0.05		0.94	0.19		1.00
Lane Grp Cap(c), veh/h	366	0	372	138	137	133	1049	0	781	683	788	987
V/C Ratio(X)	0.85	0.00	0.77	0.65	0.73	0.10	0.43	0.00	0.44	0.10	0.09	0.01
Avail Cap(c_a), veh/h	547	0	556	350	349	339	1049	0	781	683	788	987
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	0.00	1.00	0.63	0.63	0.63	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	0.0	39.4	46.0	46.4	43.5	13.7	0.0	13.7	11.0	10.9	2.8
Incr Delay (d2), s/veh	5.4	0.0	1.8	3.2	4.6	0.2	1.3	0.0	1.8	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	7.2	2.4	2.7	0.3	6.3	0.0	5.0	0.8	0.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.6	0.0	41.2	49.2	51.0	43.7	14.9	0.0	15.5	11.3	11.1	2.9
LnGrp LOS	D	A	D	D	D	D	B	A	B	B	B	A
Approach Vol, veh/h		599			202			791				152
Approach Delay, s/veh		43.5			49.7			15.2				10.5
Approach LOS		D			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		64.2		14.9		64.2		26.9				
Change Period (Y+Rc), s		5.0		4.5		* 5		4.5				
Max Green Setting (Gmax), s		32.0		26.5		* 33		33.5				
Max Q Clear Time (g_c+I1), s		17.3		9.4		17.7		20.3				
Green Ext Time (p_c), s		6.1		1.0		0.9		2.1				

Intersection Summary

HCM 6th Ctrl Delay	28.5
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	349	344	56	40	595	1	467
v/c Ratio	0.76	0.65	0.55	0.51	0.35	0.01	0.33
Control Delay	45.5	28.6	60.3	69.1	19.5	48.0	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	28.6	60.3	69.1	19.5	48.0	25.5
Queue Length 50th (ft)	226	152	32	26	122	1	120
Queue Length 95th (ft)	288	215	71	#77	229	7	184
Internal Link Dist (ft)		32	86		915		218
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	612	675	125	81	1705	93	1442
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.51	0.45	0.49	0.35	0.01	0.32

#### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

BG\_PM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	602	0	8	42	1	6	35	522	2	1	411	0
Future Volume (veh/h)	602	0	8	42	1	6	35	522	2	1	411	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	418	1767	1900	1900	1796	0
Adj Flow Rate, veh/h	692	0	0	48	1	7	40	593	2	1	467	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	100	9	0	0	7	0
Cap, veh/h	817	429	0	63	1	9	17	1956	7	2	1806	0
Arrive On Green	0.23	0.00	0.00	0.04	0.04	0.04	0.04	0.57	0.57	0.00	0.53	0.00
Sat Flow, veh/h	3619	1900	0	1527	32	223	398	3431	12	1810	3503	0
Grp Volume(v), veh/h	692	0	0	56	0	0	40	290	305	1	467	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1782	0	0	398	1678	1764	1810	1706	0
Q Serve(g_s), s	19.2	0.0	0.0	3.3	0.0	0.0	4.5	9.4	9.4	0.1	7.8	0.0
Cycle Q Clear(g_c), s	19.2	0.0	0.0	3.3	0.0	0.0	4.5	9.4	9.4	0.1	7.8	0.0
Prop In Lane	1.00		0.00	0.86		0.12	1.00		0.01	1.00		0.00
Lane Grp Cap(c), veh/h	817	429	0	73	0	0	17	957	1006	2	1806	0
V/C Ratio(X)	0.85	0.00	0.00	0.77	0.00	0.00	2.37	0.30	0.30	0.40	0.26	0.00
Avail Cap(c_a), veh/h	1293	679	0	204	0	0	30	957	1006	86	1806	0
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	0.00	0.00	1.00	0.00	0.00	0.74	0.74	0.74	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.9	0.0	0.0	49.8	0.0	0.0	50.3	11.7	11.7	52.4	13.5	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.0	15.2	0.0	0.0	731.8	0.6	0.6	81.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	0.0	0.0	1.8	0.0	0.0	3.9	3.5	3.7	0.1	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	0.0	65.1	0.0	0.0	782.1	12.3	12.3	133.9	13.8	0.0
LnGrp LOS	D	A	A	E	A	A	F	B	B	F	B	A
Approach Vol, veh/h		692			56			635			468	
Approach Delay, s/veh		42.1			65.1			60.8			14.1	
Approach LOS		D			E			E			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	64.4		28.2	8.4	60.1		8.3				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	5.0	33.5		37.5	8.0	30.5		12.0				
Max Q Clear Time (g_c+I1), s	2.1	11.4		21.2	6.5	9.8		5.3				
Green Ext Time (p_c), s	0.0	3.7		2.4	0.0	3.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay	42.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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	0	0	9	5	3	0	0	0	610	1	157	0
Future Vol, veh/h	0	0	9	5	3	0	0	0	610	1	157	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	4	0	36	0	0	50	8	12	0	0	7	0
Mvmt Flow	0	0	11	6	4	0	0	0	726	1	187	0

Major/Minor	Minor2		Minor1			Major2				
Conflicting Flow All	-	-	187	196	190	-	-	1	0	0
Stage 1	-	-	-	1	1	-	-	-	-	-
Stage 2	-	-	-	195	189	-	-	-	-	-
Critical Hdwy	-	-	6.56	7.1	6.5	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-
Follow-up Hdwy	-	-	3.624	3.5	4	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	775	767	708	0	-	1635	-	0
Stage 1	0	0	-	-	-	0	-	-	-	0
Stage 2	0	0	-	811	748	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	775	755	707	-	-	1633	-	-
Mov Cap-2 Maneuver	-	-	-	755	707	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	799	747	-	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	9.7		10		0	
HCM LOS	A		B			

Minor Lane/Major Mvmt	EBLn1WBLn1		SBL	SBT
Capacity (veh/h)	775	736	1633	-
HCM Lane V/C Ratio	0.014	0.013	0.001	-
HCM Control Delay (s)	9.7	10	7.2	-
HCM Lane LOS	A	B	A	-
HCM 95th %tile Q(veh)	0	0	0	-

Queues  
7: Clawiter Rd. & West St.

BG\_PM  
04/12/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	1543	27	694
v/c Ratio	0.37	0.66	0.18	0.27
Control Delay	28.7	10.4	31.2	3.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.7	10.4	31.2	3.0
Queue Length 50th (ft)	24	106	11	35
Queue Length 95th (ft)	55	#402	31	63
Internal Link Dist (ft)	322	867		3164
Turn Bay Length (ft)			45	
Base Capacity (vph)	557	2350	151	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.13	0.66	0.18	0.27

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

BG\_PM  
04/12/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↔	↕↕
Traffic Volume (veh/h)	51	12	1067	290	24	611
Future Volume (veh/h)	51	12	1067	290	24	611
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1722	1752	1737	1885	1663	1707
Adj Flow Rate, veh/h	58	14	1212	330	27	694
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	10	11	1	16	13
Cap, veh/h	73	18	1846	494	46	2641
Arrive On Green	0.06	0.06	0.72	0.72	0.03	0.81
Sat Flow, veh/h	1274	307	2648	685	1584	3329
Grp Volume(v), veh/h	73	0	773	769	27	694
Grp Sat Flow(s),veh/h/ln	1603	0	1650	1596	1584	1622
Q Serve(g_s), s	3.1	0.0	17.2	18.2	1.2	3.5
Cycle Q Clear(g_c), s	3.1	0.0	17.2	18.2	1.2	3.5
Prop In Lane	0.79	0.19		0.43	1.00	
Lane Grp Cap(c), veh/h	92	0	1189	1150	46	2641
V/C Ratio(X)	0.79	0.00	0.65	0.67	0.58	0.26
Avail Cap(c_a), veh/h	552	0	1189	1150	115	2641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.34	0.34
Uniform Delay (d), s/veh	32.6	0.0	5.1	5.3	33.6	1.5
Incr Delay (d2), s/veh	14.2	0.0	2.8	3.1	3.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	4.6	4.8	0.5	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.7	0.0	7.9	8.4	37.5	1.6
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	73		1542			721
Approach Delay, s/veh	46.7		8.1			3.0
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.5	54.9			61.5	8.5
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	5.1	* 28			36.9	24.1
Max Q Clear Time (g_c+I1), s	3.2	20.2			5.5	5.1
Green Ext Time (p_c), s	0.0	5.7			5.5	0.1

Intersection Summary

HCM 6th Ctrl Delay			7.7			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

BG\_PM  
04/12/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1508	354	358	62	63	805	4	2
v/c Ratio	0.01	1.01	0.89	0.21	0.22	0.23	1.30	0.01	0.00
Control Delay	46.0	52.9	67.4	9.2	31.8	31.9	166.9	27.7	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	52.9	67.4	9.2	31.8	31.9	166.9	27.7	27.5
Queue Length 50th (ft)	1	~496	114	45	32	33	~516	2	1
Queue Length 95th (ft)	6	#572	#168	77	65	65	#647	10	6
Internal Link Dist (ft)		5245		2336		3164			278
Turn Bay Length (ft)	210		205		85			50	
Base Capacity (vph)	144	1497	407	1691	276	276	621	357	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	1.01	0.87	0.21	0.22	0.23	1.30	0.01	0.00

Intersection Summary

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

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



HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

BG\_PM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗↘	↗↘		↗	↖	↗	↗	↘	↘
Traffic Volume (veh/h)	1	1067	184	294	297	0	104	0	668	3	2	0
Future Volume (veh/h)	1	1067	184	294	297	0	104	0	668	3	2	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1811	1737	1470	1426	1648	1455	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	1	1286	0	354	358	0	125	0	805	4	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	6	11	29	32	17	30	0	5	0	0	0
Cap, veh/h	2	1471		442	1622	0	713	0	401	251	494	0
Arrive On Green	0.00	0.43	0.00	0.16	0.60	0.00	0.26	0.00	0.26	0.26	0.26	0.00
Sat Flow, veh/h	1810	3532	0	2716	2780	0	2194	0	1544	687	1900	0
Grp Volume(v), veh/h	1	1286	0	354	358	0	125	0	805	4	2	0
Grp Sat Flow(s),veh/h/ln	1810	1721	0	1358	1354	0	1097	0	1544	687	1900	0
Q Serve(g_s), s	0.1	34.2	0.0	12.5	6.1	0.0	4.5	0.0	26.0	0.4	0.1	0.0
Cycle Q Clear(g_c), s	0.1	34.2	0.0	12.5	6.1	0.0	4.6	0.0	26.0	0.4	0.1	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	1471		442	1622	0	713	0	401	251	494	0
V/C Ratio(X)	0.40	0.87		0.80	0.22	0.00	0.18	0.00	2.01	0.02	0.00	0.00
Avail Cap(c_a), veh/h	145	1548		442	1622	0	713	0	401	251	494	0
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	0.00	0.71	0.00	0.71	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.9	26.2	0.0	40.3	9.3	0.0	29.1	0.0	37.0	27.5	27.4	0.0
Incr Delay (d2), s/veh	34.9	7.5	0.0	9.4	0.3	0.0	0.0	0.0	458.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.9	0.0	4.7	1.8	0.0	1.2	0.0	60.7	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.8	33.7	0.0	49.8	9.6	0.0	29.1	0.0	495.8	27.5	27.4	0.0
LnGrp LOS	F	C		D	A	A	C	A	F	C	C	A
Approach Vol, veh/h		1287	A		712			930			6	
Approach Delay, s/veh		33.7			29.6			433.0			27.5	
Approach LOS		C			C			F			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.3	47.7		31.0	4.1	64.9		31.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	15.0	* 45		26.0	8.0	52.0		26.0				
Max Q Clear Time (g_c+I1), s	14.5	36.2		28.0	2.1	8.1		2.4				
Green Ext Time (p_c), s	0.0	6.6		0.0	0.0	3.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	159.2
HCM 6th LOS	F

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	344	413	151	150	702	219	51	514	10
v/c Ratio	0.17	0.56	0.58	0.35	1.12	0.67	0.15	0.33	0.46	0.01
Control Delay	14.5	19.2	7.1	15.6	144.9	19.4	0.2	29.2	16.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	19.2	7.1	15.6	144.9	19.4	0.2	29.2	16.1	0.0
Queue Length 50th (ft)	14	89	15	33	~58	100	0	16	67	0
Queue Length 95th (ft)	36	153	68	71	#147	146	0	42	102	0
Internal Link Dist (ft)		564		1810		890			915	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	370	615	714	426	134	1055	1493	156	1114	1226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.56	0.58	0.35	1.12	0.67	0.15	0.33	0.46	0.01

#### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 9: Industrial Blvd. & Depot Rd.

BG\_PM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	303	363	50	69	14	132	618	193	45	452	9
Future Volume (veh/h)	55	303	363	50	69	14	132	618	193	45	452	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1767	1781	1618	1767	1559	1707	1811	1811	1796	1470
Adj Flow Rate, veh/h	62	344	412	57	78	16	150	702	0	51	514	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	20	2	9	8	19	9	23	13	6	6	7	29
Cap, veh/h	446	618	487	158	176	29	136	1071		158	1127	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	1116	1870	1475	202	533	87	1485	3244	1535	1725	3413	1246
Grp Volume(v), veh/h	62	344	412	151	0	0	150	702	0	51	514	0
Grp Sat Flow(s),veh/h/ln	1116	1870	1475	823	0	0	1485	1622	1535	1725	1706	1246
Q Serve(g_s), s	0.0	8.2	14.1	1.9	0.0	0.0	5.0	10.1	0.0	1.5	6.5	0.0
Cycle Q Clear(g_c), s	3.0	8.2	14.1	10.1	0.0	0.0	5.0	10.1	0.0	1.5	6.5	0.0
Prop In Lane	1.00		1.00	0.38		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	446	618	487	363	0	0	136	1071		158	1127	
V/C Ratio(X)	0.14	0.56	0.85	0.42	0.00	0.00	1.10	0.66		0.32	0.46	
Avail Cap(c_a), veh/h	446	618	487	363	0	0	136	1071		158	1127	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.2	15.0	17.0	14.4	0.0	0.0	24.8	15.6	0.0	23.2	14.4	0.0
Incr Delay (d2), s/veh	0.7	3.6	16.4	3.5	0.0	0.0	106.8	3.1	0.0	5.3	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.7	6.4	1.6	0.0	0.0	5.7	3.7	0.0	0.8	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	18.6	33.4	17.9	0.0	0.0	131.5	18.7	0.0	28.5	15.7	0.0
LnGrp LOS	B	B	C	B	A	A	F	B		C	B	
Approach Vol, veh/h		818			151			852	A		565	A
Approach Delay, s/veh		25.7			17.9			38.6			16.9	
Approach LOS		C			B			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.5	12.1		16.1	7.0	8.5		12.1				
Green Ext Time (p_c), s	0.0	2.4		0.8	0.0	2.4		0.4				

Intersection Summary

HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

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

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	2	0	9	0	25	4	76	39	44	127	1
Future Vol, veh/h	2	2	0	9	0	25	4	76	39	44	127	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	100	0	0	57	0	40	67	44	94	11	16	100
Mvmt Flow	2	2	0	10	0	29	5	87	45	51	146	1
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.7	8.7	9.3	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	50%	26%	100%	0%
Vol Thru, %	0%	66%	50%	0%	0%	99%
Vol Right, %	0%	34%	0%	74%	0%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	115	4	34	44	128
LT Vol	4	0	2	9	44	0
Through Vol	0	76	2	0	0	127
RT Vol	0	39	0	25	0	1
Lane Flow Rate	5	132	5	39	51	147
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.008	0.195	0.008	0.058	0.076	0.205
Departure Headway (Hd)	6.434	5.303	6.614	5.337	5.437	5.015
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	559	679	543	673	663	719
Service Time	4.144	3.012	4.633	3.352	3.137	2.715
HCM Lane V/C Ratio	0.009	0.194	0.009	0.058	0.077	0.204
HCM Control Delay	9.2	9.3	9.7	8.7	8.6	9
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0	0.7	0	0.2	0.2	0.8

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	14	36	14	20	12	92	16	60	24	172	101	15
Future Vol, veh/h	14	36	14	20	12	92	16	60	24	172	101	15
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	18	10	0	31	10	34	54	40	26	11	16	42
Mvmt Flow	17	44	17	25	15	114	20	74	30	212	125	19
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10.1	10.9	11	11.3
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	22%	16%	100%	0%	0%
Vol Thru, %	0%	71%	56%	10%	0%	100%	0%
Vol Right, %	0%	29%	22%	74%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	84	64	124	172	101	15
LT Vol	16	0	14	20	172	0	0
Through Vol	0	60	36	12	0	101	0
RT Vol	0	24	14	92	0	0	15
Lane Flow Rate	20	104	79	153	212	125	19
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.042	0.192	0.14	0.258	0.363	0.199	0.028
Departure Headway (Hd)	7.61	6.66	6.372	6.069	6.153	5.734	5.473
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	472	539	563	592	588	630	658
Service Time	5.34	4.39	4.102	3.797	3.853	3.434	3.173
HCM Lane V/C Ratio	0.042	0.193	0.14	0.258	0.361	0.198	0.029
HCM Control Delay	10.7	11	10.1	10.9	12.3	9.9	8.3
HCM Lane LOS	B	B	B	B	B	A	A
HCM 95th-tile Q	0.1	0.7	0.5	1	1.7	0.7	0.1

**Intersection**

Intersection Delay, s/veh 11.5

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Vol, veh/h	2	132	21	59	59	56	20	22	108	176	29	5
Future Vol, veh/h	2	132	21	59	59	56	20	22	108	176	29	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	100	9	27	34	45	17	50	41	9	8	33	0
Mvmt Flow	2	153	24	69	69	65	23	26	126	205	34	6
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	11.4	10.6	10.2	13.1
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	22	108	2	132	21	59	59	56	176	29	5
LT Vol	20	0	0	2	0	0	59	0	0	176	0	0
Through Vol	0	22	0	0	132	0	0	59	0	0	29	0
RT Vol	0	0	108	0	0	21	0	0	56	0	0	5
Lane Flow Rate	23	26	126	2	153	24	69	69	65	205	34	6
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.05	0.05	0.203	0.006	0.278	0.042	0.141	0.135	0.107	0.386	0.063	0.009
Departure Headway (Hd)	7.725	7.072	5.828	8.567	6.52	6.126	7.386	7.073	5.897	6.798	6.723	5.462
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	463	506	614	418	551	584	486	507	607	530	532	654
Service Time	5.475	4.822	3.578	6.313	4.266	3.872	5.132	4.819	3.643	4.544	4.469	3.208
HCM Lane V/C Ratio	0.05	0.051	0.205	0.005	0.278	0.041	0.142	0.136	0.107	0.387	0.064	0.009
HCM Control Delay	10.9	10.2	10.1	11.4	11.8	9.1	11.3	10.9	9.4	13.8	9.9	8.3
HCM Lane LOS	B	B	B	B	B	A	B	B	A	B	A	A
HCM 95th-tile Q	0.2	0.2	0.8	0	1.1	0.1	0.5	0.5	0.4	1.8	0.2	0









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**Project #:** 26915  
**Project Name:** Hayward Enterprise Ave Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\BG\Intersection 2 AM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/Eden Land  
**Scenario:** BG AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:30 AM	8:30 AM		254	666	413	117
2nd Highest Hour			240	630	391	111
3rd Highest Hour			237	622	385	109
4th Highest Hour			227	595	369	105
5th Highest Hour			224	586	363	103
6th Highest Hour			224	586	363	103
7th Highest Hour			213	559	347	98
8th Highest Hour			210	551	341	97
9th Highest Hour			203	533	330	94
10th Highest Hour			190	497	308	87
11th Highest Hour			183	480	297	84
12th Highest Hour			179	471	292	83
13th Highest Hour			173	453	281	80
14th Highest Hour			149	391	242	69
15th Highest Hour			119	311	193	55
16th Highest Hour			112	293	182	51
17th Highest Hour			78	204	127	36
18th Highest Hour			64	169	105	30
19th Highest Hour			34	89	55	16
20th Highest Hour			24	62	39	11
21st Highest Hour			20	53	33	9
22nd Highest Hour			14	36	22	6
23rd Highest Hour			7	18	11	3
24th Highest Hour			7	18	11	3

**Warrant Summary**

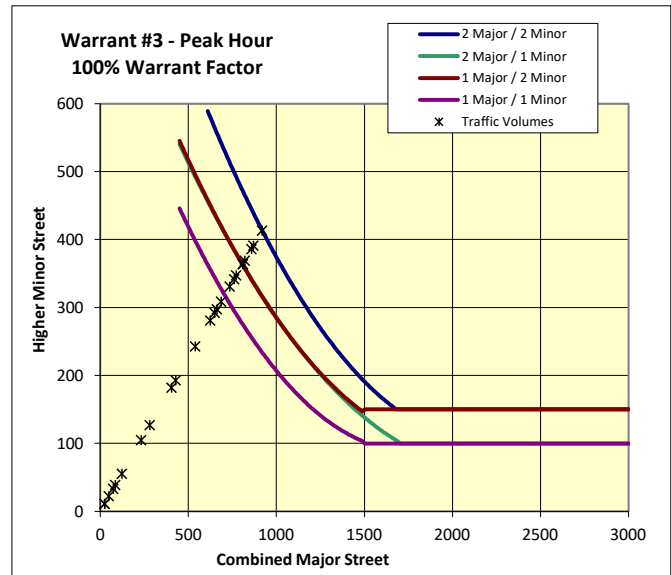
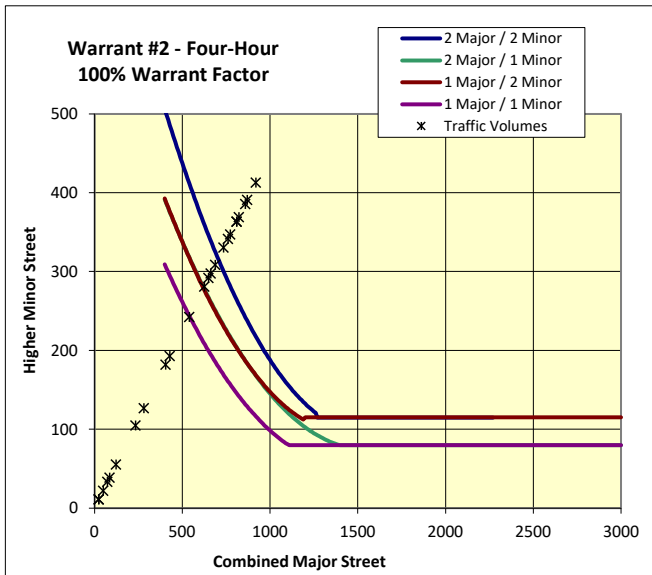
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	8	Yes	Yes
80%	A	400	120	16	Yes	Yes
	B	600	60	13	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	17	Yes	Yes
	B	420	42	15	Yes	Yes





**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Ave Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\BG\Intersection 2 PM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/ Eden Land  
**Scenario:** BG PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:30 PM	5:30 PM		541	510	286	298
2nd Highest Hour			512	483	271	282
3rd Highest Hour			505	476	267	278
4th Highest Hour			483	456	255	266
5th Highest Hour			476	449	252	262
6th Highest Hour			476	449	252	262
7th Highest Hour			454	428	240	250
8th Highest Hour			447	422	236	246
9th Highest Hour			433	408	229	238
10th Highest Hour			404	381	214	223
11th Highest Hour			390	367	206	215
12th Highest Hour			382	360	202	211
13th Highest Hour			368	347	194	203
14th Highest Hour			317	299	168	175
15th Highest Hour			252	238	133	139
16th Highest Hour			238	224	126	131
17th Highest Hour			166	156	88	91
18th Highest Hour			137	129	72	75
19th Highest Hour			72	68	38	40
20th Highest Hour			50	48	27	28
21st Highest Hour			43	41	23	24
22nd Highest Hour			29	27	15	16
23rd Highest Hour			14	14	8	8
24th Highest Hour			14	14	8	8

**Warrant Summary**

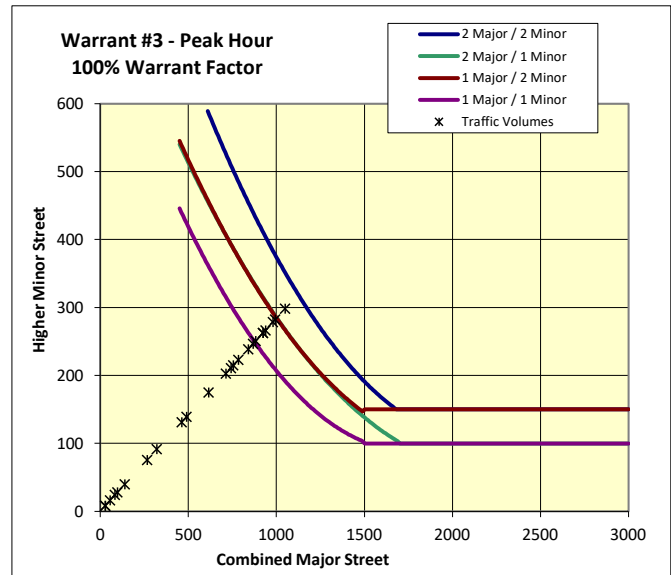
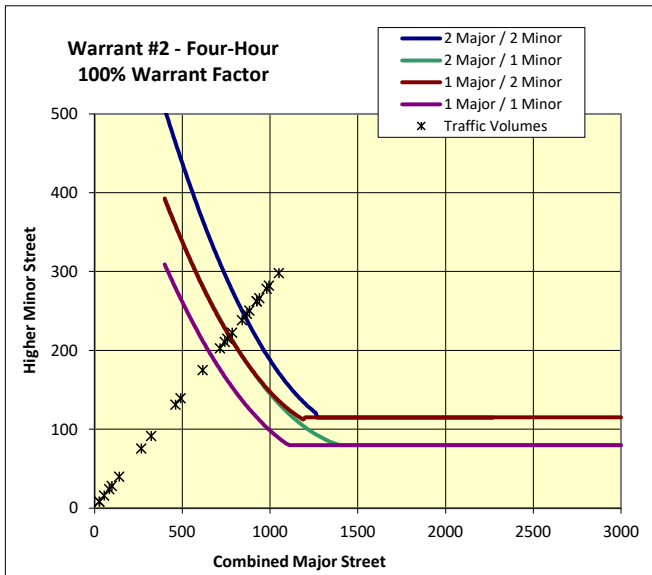
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	11	Yes	Yes
80%	A	400	120	16	Yes	Yes
	B	600	60	14	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	17	Yes	Yes
	B	420	42	16	Yes	Yes





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG\Intersection 6 AM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** BG AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:35 AM	8:35 AM		73	796	4	1
2nd Highest Hour			69	754	4	1
3rd Highest Hour			68	743	4	1
4th Highest Hour			65	711	4	1
5th Highest Hour			64	700	4	1
6th Highest Hour			64	700	4	1
7th Highest Hour			61	669	3	1
8th Highest Hour			60	658	3	1
9th Highest Hour			58	637	3	1
10th Highest Hour			55	594	3	1
11th Highest Hour			53	573	3	1
12th Highest Hour			52	563	3	1
13th Highest Hour			50	541	3	1
14th Highest Hour			43	467	2	1
15th Highest Hour			34	371	2	0
16th Highest Hour			32	350	2	0
17th Highest Hour			22	244	1	0
18th Highest Hour			18	202	1	0
19th Highest Hour			10	106	1	0
20th Highest Hour			7	74	0	0
21st Highest Hour			6	64	0	0
22nd Highest Hour			4	42	0	0
23rd Highest Hour			2	21	0	0
24th Highest Hour			2	21	0	0

**Warrant Summary**

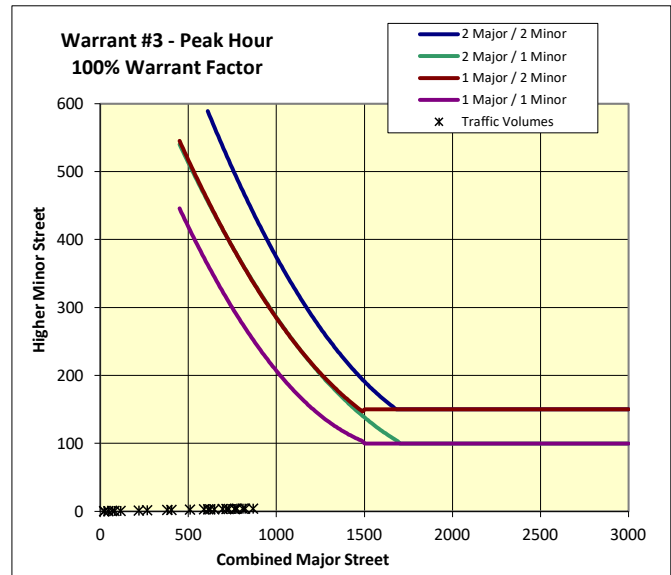
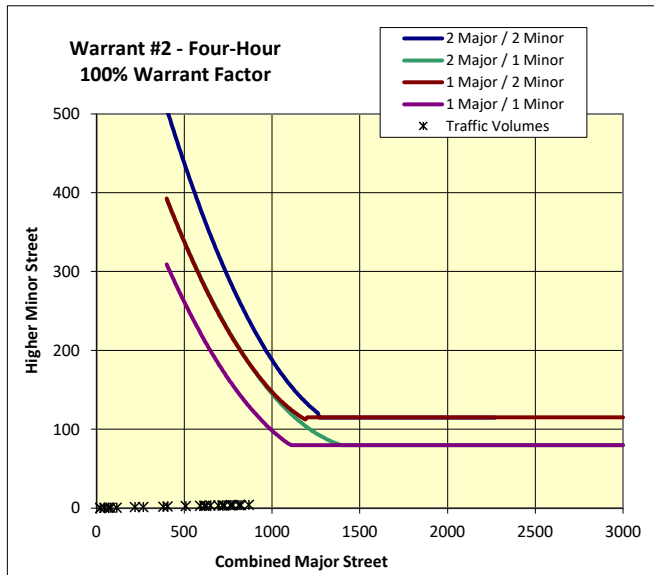
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG\Intersection 6 PM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** BG PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		578	141	9	8
2nd Highest Hour			547	133	9	8
3rd Highest Hour			539	132	8	7
4th Highest Hour			516	126	8	7
5th Highest Hour			509	124	8	7
6th Highest Hour			509	124	8	7
7th Highest Hour			486	118	8	7
8th Highest Hour			478	117	7	7
9th Highest Hour			462	113	7	6
10th Highest Hour			432	105	7	6
11th Highest Hour			416	102	6	6
12th Highest Hour			408	100	6	6
13th Highest Hour			393	96	6	5
14th Highest Hour			339	83	5	5
15th Highest Hour			270	66	4	4
16th Highest Hour			254	62	4	4
17th Highest Hour			177	43	3	2
18th Highest Hour			146	36	2	2
19th Highest Hour			77	19	1	1
20th Highest Hour			54	13	1	1
21st Highest Hour			46	11	1	1
22nd Highest Hour			31	8	0	0
23rd Highest Hour			15	4	0	0
24th Highest Hour			15	4	0	0

**Warrant Summary**

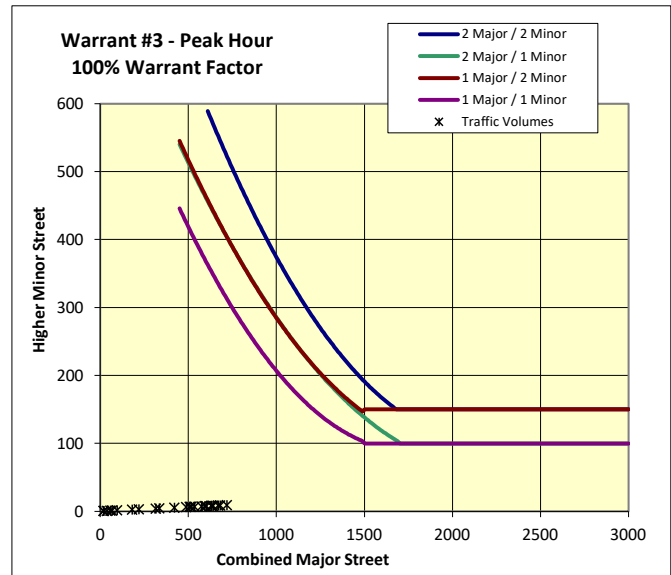
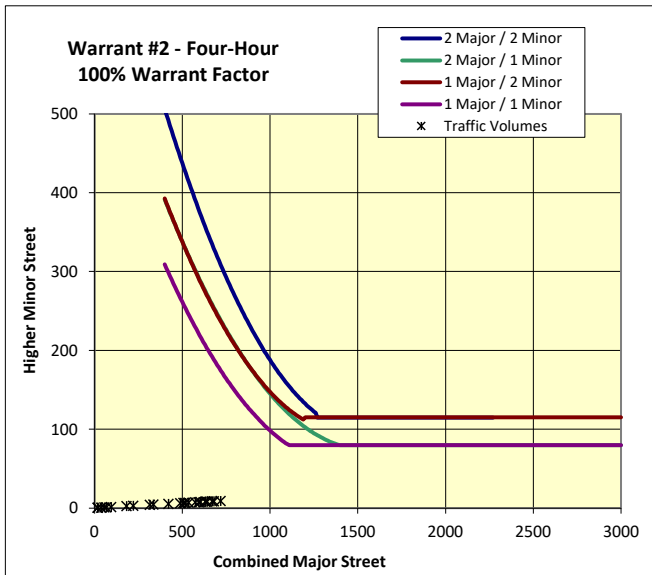
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG\Intersection 10 AM.xlsm\Data Input  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** BG AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
8:00 AM	9:00 AM		193	96	6	46
2nd Highest Hour			183	91	6	44
3rd Highest Hour			180	90	5	39
4th Highest Hour			172	86	5	37
5th Highest Hour			170	84	5	35
6th Highest Hour			170	84	4	30
7th Highest Hour			162	81	4	29
8th Highest Hour			160	79	4	27
9th Highest Hour			154	77	3	25
10th Highest Hour			144	72	3	23
11th Highest Hour			139	69	3	23
12th Highest Hour			136	68	3	21
13th Highest Hour			131	65	3	20
14th Highest Hour			113	56	2	19
15th Highest Hour			90	45	2	19
16th Highest Hour			85	42	2	19
17th Highest Hour			59	29	2	15
18th Highest Hour			49	24	2	13
19th Highest Hour			26	13	1	10
20th Highest Hour			18	9	1	5
21st Highest Hour			15	8	0	4
22nd Highest Hour			10	5	0	3
23rd Highest Hour			5	3	0	2
24th Highest Hour			5	3	0	2

**Warrant Summary**

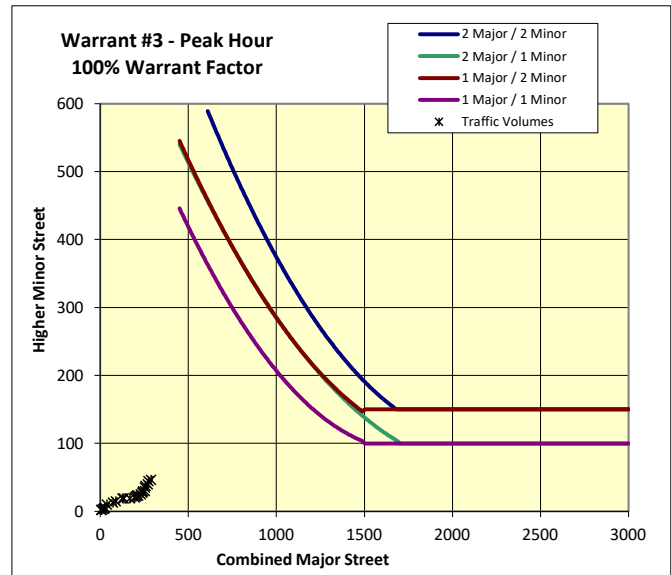
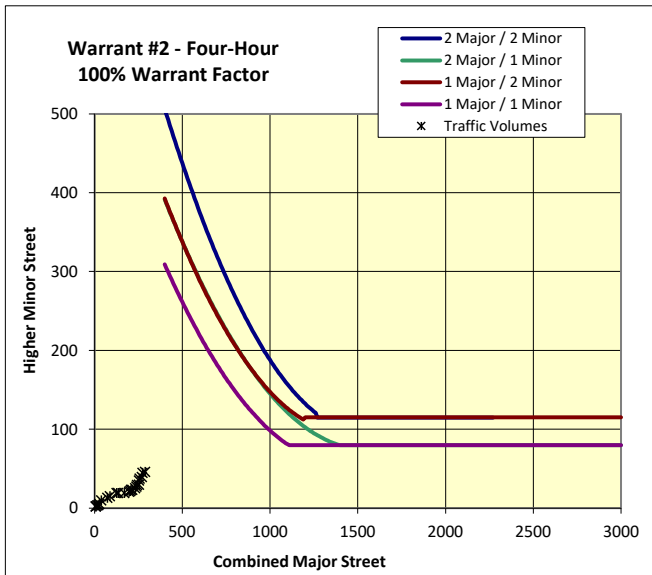
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





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 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG\Intersection 10 PM.xlsm\Data Inout  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** BG PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		119	172	4	34
2nd Highest Hour			113	163	4	33
3rd Highest Hour			111	161	3	29
4th Highest Hour			106	154	3	28
5th Highest Hour			105	151	3	26
6th Highest Hour			105	151	3	22
7th Highest Hour			100	144	3	22
8th Highest Hour			98	142	2	20
9th Highest Hour			95	138	2	19
10th Highest Hour			89	128	2	17
11th Highest Hour			86	124	2	17
12th Highest Hour			84	122	2	16
13th Highest Hour			81	117	2	15
14th Highest Hour			70	101	2	14
15th Highest Hour			56	80	2	14
16th Highest Hour			52	76	2	14
17th Highest Hour			36	53	1	11
18th Highest Hour			30	44	1	9
19th Highest Hour			16	23	1	7
20th Highest Hour			11	16	0	4
21st Highest Hour			10	14	0	3
22nd Highest Hour			6	9	0	2
23rd Highest Hour			3	5	0	2
24th Highest Hour			3	5	0	2

**Warrant Summary**

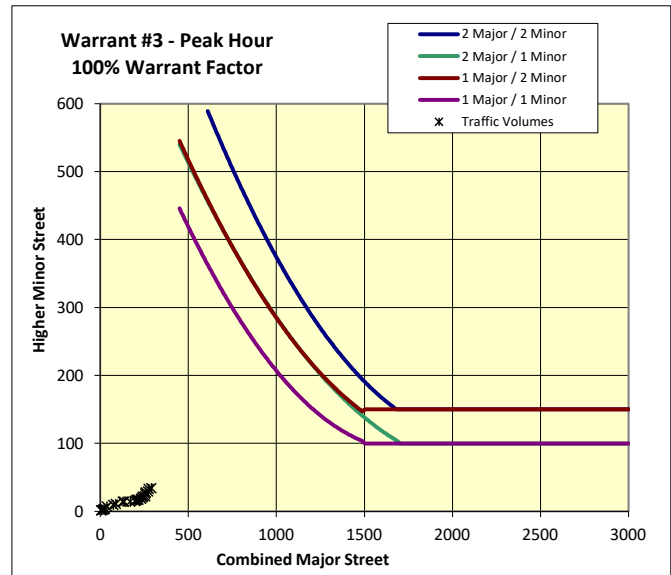
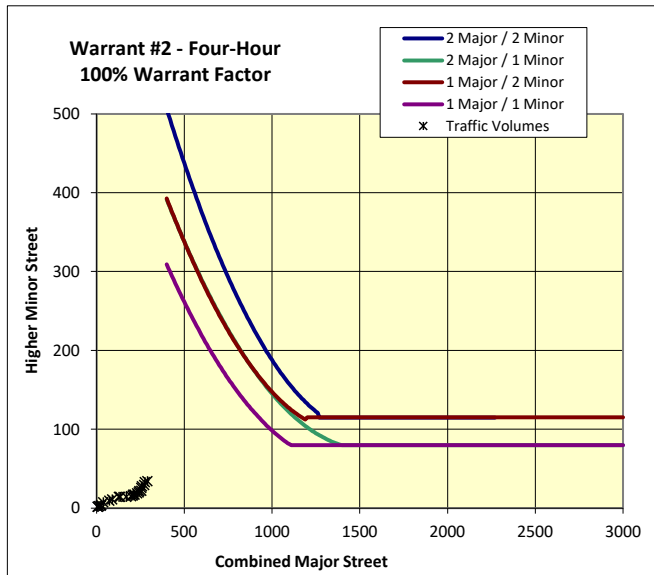
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG\Intersection 11 AM.xlsm\Data Inout  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** BG AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street		
	Begin	End	NB	SB	EB
7:55 AM	8:55 AM	160	167	26	197
2nd Highest Hour		151	158	25	190
3rd Highest Hour		149	156	22	169
4th Highest Hour		143	149	21	160
5th Highest Hour		141	147	20	149
6th Highest Hour		141	147	17	127
7th Highest Hour		134	140	16	125
8th Highest Hour		132	138	15	116
9th Highest Hour		128	134	14	107
10th Highest Hour		119	125	13	99
11th Highest Hour		115	120	13	99
12th Highest Hour		113	118	12	92
13th Highest Hour		109	114	12	88
14th Highest Hour		94	98	11	81
15th Highest Hour		75	78	11	81
16th Highest Hour		70	73	11	81
17th Highest Hour		49	51	8	63
18th Highest Hour		41	42	7	55
19th Highest Hour		21	22	5	42
20th Highest Hour		15	16	3	22
21st Highest Hour		13	13	2	15
22nd Highest Hour		9	9	2	13
23rd Highest Hour		4	4	1	9
24th Highest Hour		4	4	1	9

**Warrant Summary**

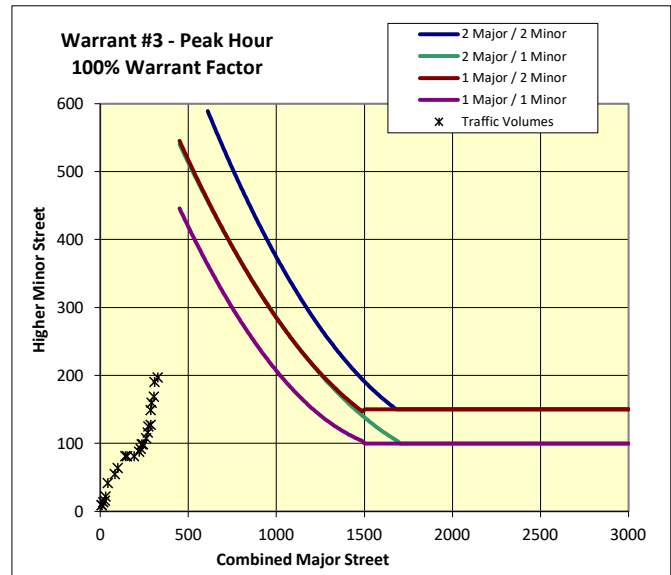
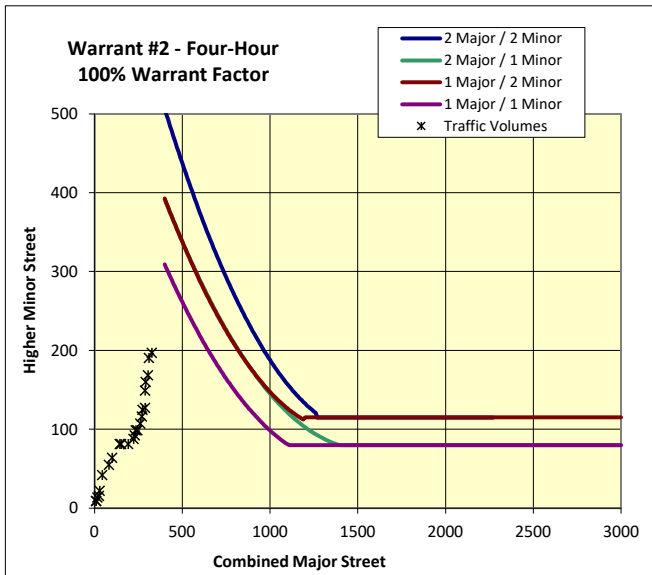
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	6	No	No
	B	420	42	0	No	No





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**Project #:** 26915  
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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG\Intersection 11 PM.xlsm\Data Inout  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** BG PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:05 PM	5:05 PM		100	288	64	124
2nd Highest Hour			95	273	62	120
3rd Highest Hour			93	269	55	106
4th Highest Hour			89	257	52	101
5th Highest Hour			88	253	48	94
6th Highest Hour			88	253	41	80
7th Highest Hour			84	242	41	79
8th Highest Hour			83	238	38	73
9th Highest Hour			80	230	35	68
10th Highest Hour			75	215	32	62
11th Highest Hour			72	207	32	62
12th Highest Hour			71	204	30	58
13th Highest Hour			68	196	28	55
14th Highest Hour			59	169	26	51
15th Highest Hour			47	134	26	51
16th Highest Hour			44	127	26	51
17th Highest Hour			31	88	21	40
18th Highest Hour			25	73	18	34
19th Highest Hour			13	38	14	26
20th Highest Hour			9	27	7	14
21st Highest Hour			8	23	5	10
22nd Highest Hour			5	15	4	8
23rd Highest Hour			3	8	3	6
24th Highest Hour			3	8	3	6

**Warrant Summary**

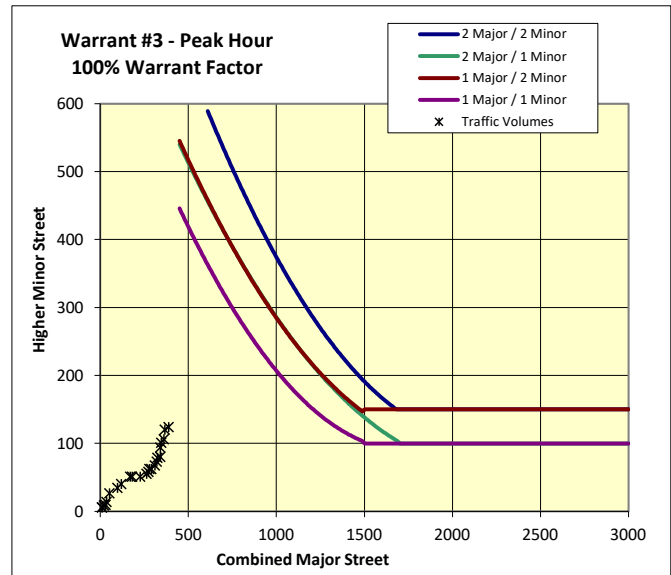
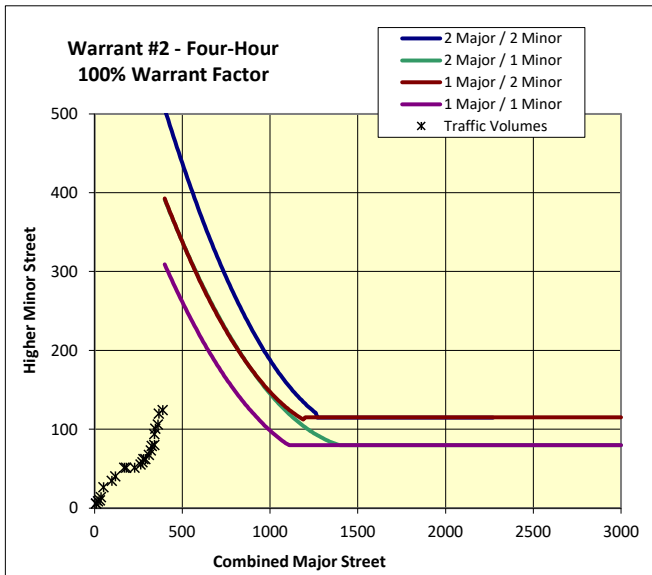
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	3	No	No
	B	525	53	0	No	No
56%	A	280	84	5	No	No
	B	420	42	0	No	No







**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\BG\Intersection 12 AM.xlsm\Data Inout  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** BG AM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:50 AM	8:50 AM		67	100	65	601
2nd Highest Hour			63	95	63	581
3rd Highest Hour			63	93	56	514
4th Highest Hour			60	89	53	487
5th Highest Hour			59	88	49	454
6th Highest Hour			59	88	42	387
7th Highest Hour			56	84	41	381
8th Highest Hour			55	83	38	354
9th Highest Hour			54	80	35	327
10th Highest Hour			50	75	33	301
11th Highest Hour			48	72	33	301
12th Highest Hour			47	71	30	280
13th Highest Hour			46	68	29	267
14th Highest Hour			39	59	27	247
15th Highest Hour			31	47	27	247
16th Highest Hour			29	44	27	247
17th Highest Hour			21	31	21	194
18th Highest Hour			17	25	18	167
19th Highest Hour			9	13	14	127
20th Highest Hour			6	9	7	67
21st Highest Hour			5	8	5	47
22nd Highest Hour			4	5	4	40
23rd Highest Hour			2	3	3	27
24th Highest Hour			2	3	3	27

**Warrant Summary**

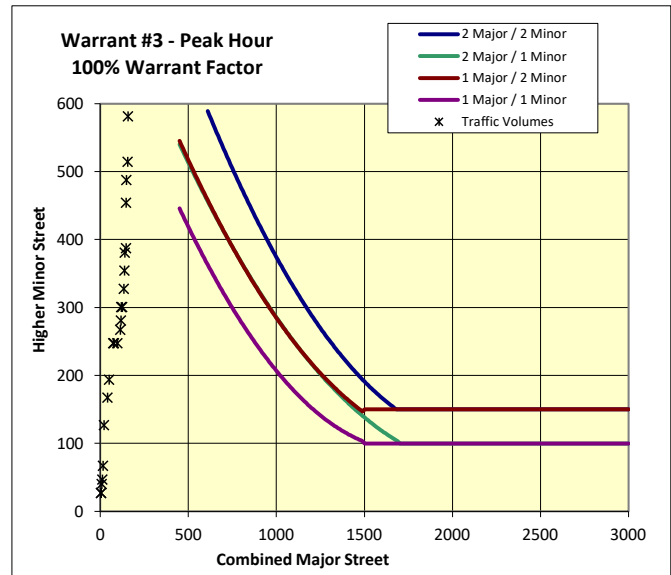
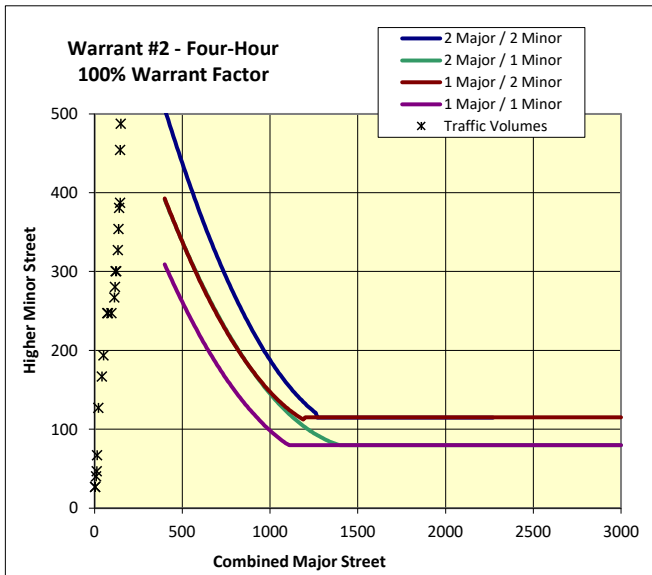
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial EIR\analysis\Signal Warrants\BG\Intersection 12 PM.xlsm\Data Inout  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** BG PM

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:10 PM	5:10 PM		150	210	155	174
2nd Highest Hour			142	199	150	168
3rd Highest Hour			140	196	133	149
4th Highest Hour			134	188	126	141
5th Highest Hour			132	185	117	131
6th Highest Hour			132	185	100	112
7th Highest Hour			126	176	98	110
8th Highest Hour			124	174	91	102
9th Highest Hour			120	168	84	95
10th Highest Hour			112	157	78	87
11th Highest Hour			108	151	78	87
12th Highest Hour			106	148	72	81
13th Highest Hour			102	143	69	77
14th Highest Hour			88	123	64	72
15th Highest Hour			70	98	64	72
16th Highest Hour			66	92	64	72
17th Highest Hour			46	64	50	56
18th Highest Hour			38	53	43	48
19th Highest Hour			20	28	33	37
20th Highest Hour			14	20	17	19
21st Highest Hour			12	17	12	14
22nd Highest Hour			8	11	10	12
23rd Highest Hour			4	6	7	8
24th Highest Hour			4	6	7	8

**Warrant Summary**

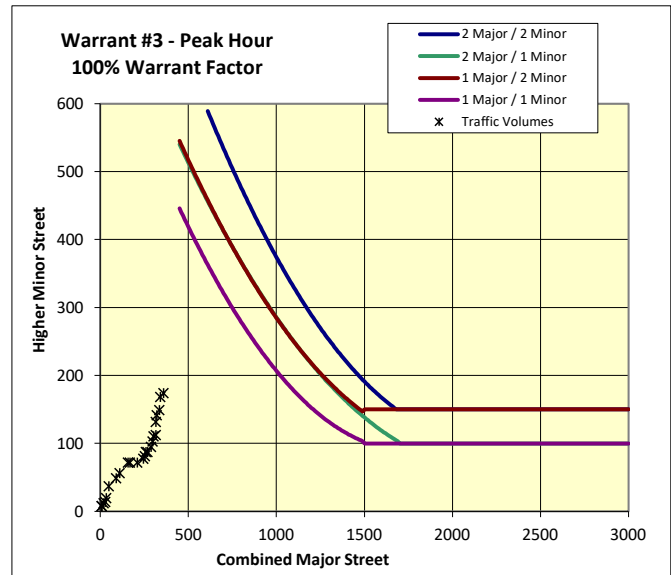
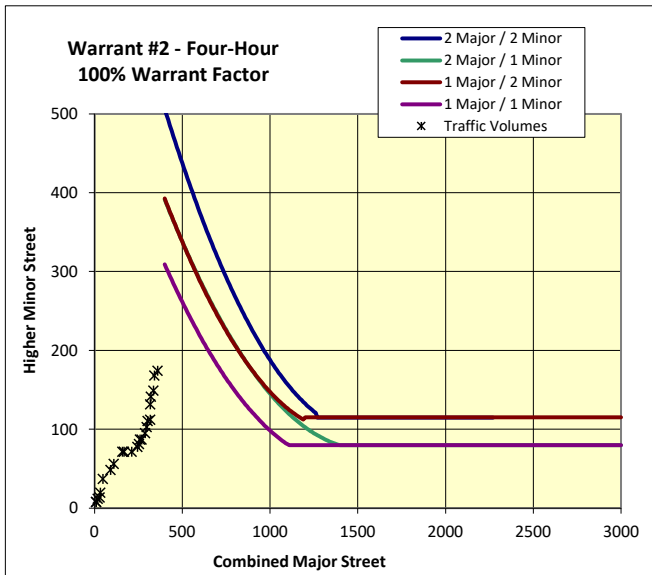
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
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Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
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**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	1	No	No
	B	525	53	0	No	No
56%	A	280	84	9	Yes	Yes
	B	420	42	0	No	No



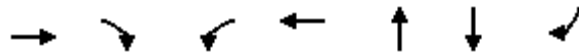
Appendix F: Background Plus Project  
Alternative Level of Service, Queue, And  
Peak Hour Traffic Signal Warrants  
Worksheets

## Queues

BG+P\_AM

04/12/2022

## 1: Clawiter Rd. &amp; Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	103	95	314	593	545	727	78
v/c Ratio	0.72	0.19	0.70	1.18	1.54	1.15	0.23
Control Delay	72.2	3.4	45.0	127.7	287.8	122.5	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	3.4	45.0	127.7	287.8	122.5	7.6
Queue Length 50th (ft)	67	0	189	~395	~509	~299	0
Queue Length 95th (ft)	#140	16	295	#623	#733	#427	32
Internal Link Dist (ft)	128			403	1161	1231	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	163	495	446	502	353	631	345
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.19	0.70	1.18	1.54	1.15	0.23

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	17	79	88	292	127	424	112	290	105	352	325	73
Future Volume (veh/h)	17	79	88	292	127	424	112	290	105	352	325	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	907	1322	1470	1826	1633	1752	1722	1455	1366	1426	1366	1366
Adj Flow Rate, veh/h	18	85	95	314	137	456	120	312	0	378	349	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	67	39	29	5	18	10	12	30	36	32	36	36
Cap, veh/h	22	105	425	458	87	290	97	253		317	316	275
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.24	0.24	0.00	0.24	0.24	0.24
Sat Flow, veh/h	229	1082	1246	1739	331	1103	399	1037	0	1301	1298	1130
Grp Volume(v), veh/h	103	0	95	314	0	593	432	0	0	378	349	78
Grp Sat Flow(s),veh/h/ln	1311	0	1246	1739	0	1435	1435	0	0	1301	1298	1130
Q Serve(g_s), s	7.9	0.0	5.6	16.7	0.0	27.0	25.0	0.0	0.0	25.0	25.0	5.8
Cycle Q Clear(g_c), s	7.9	0.0	5.6	16.7	0.0	27.0	25.0	0.0	0.0	25.0	25.0	5.8
Prop In Lane	0.17		1.00	1.00		0.77	0.28		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	0	425	458	0	378	350	0		317	316	275
V/C Ratio(X)	0.81	0.00	0.22	0.69	0.00	1.57	1.23	0.00		1.19	1.10	0.28
Avail Cap(c_a), veh/h	166	0	462	458	0	378	350	0		317	316	275
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.4	0.0	24.1	34.0	0.0	37.8	38.8	0.0	0.0	38.8	38.8	31.5
Incr Delay (d2), s/veh	15.3	0.0	0.1	3.5	0.0	269.1	127.9	0.0	0.0	113.1	81.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	2.4	7.4	0.0	37.5	21.1	0.0	0.0	17.8	14.9	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	0.0	24.2	37.5	0.0	306.9	166.7	0.0	0.0	151.9	119.9	31.7
LnGrp LOS	E	A	C	D	A	F	F	A		F	F	C
Approach Vol, veh/h		198			907			432	A			805
Approach Delay, s/veh		43.2			213.6			166.7				126.4
Approach LOS		D			F			F				F
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.1		13.7		29.1		30.7				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		27.0		9.9		27.0		29.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	160.6
HCM 6th LOS	F

Notes

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

Intersection

Intersection Delay, s/veh 72.4

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↕			↖	↗		↖	↗
Traffic Vol, veh/h	286	52	131	5	67	45	82	176	7	168	343	194
Future Vol, veh/h	286	52	131	5	67	45	82	176	7	168	343	194
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	16	8	8	25	34	37	31	26	0	7	9	45
Mvmt Flow	311	57	142	5	73	49	89	191	8	183	373	211
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	39.6	17.9	30.8	119
HCM LOS	E	C	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	32%	0%	85%	0%	4%	33%	0%
Vol Thru, %	68%	0%	15%	0%	57%	67%	0%
Vol Right, %	0%	100%	0%	100%	38%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	258	7	338	131	117	511	194
LT Vol	82	0	286	0	5	168	0
Through Vol	176	0	52	0	67	343	0
RT Vol	0	7	0	131	45	0	194
Lane Flow Rate	280	8	367	142	127	555	211
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.699	0.017	0.873	0.289	0.332	1.258	0.427
Departure Headway (Hd)	9.426	8.442	9.12	7.818	10.012	8.153	7.294
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	387	427	400	463	361	450	496
Service Time	7.126	6.142	6.82	5.518	8.012	5.872	5.013
HCM Lane V/C Ratio	0.724	0.019	0.917	0.307	0.352	1.233	0.425
HCM Control Delay	31.3	11.3	49.6	13.7	17.9	158.3	15.4
HCM Lane LOS	D	B	E	B	C	F	C
HCM 95th-tile Q	5.1	0.1	8.7	1.2	1.4	23.2	2.1

Queues  
3: Clawiter Rd. & Enterprise Ave.



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	169	44	220	605	700
v/c Ratio	0.72	0.32	0.71	0.50	0.97
Control Delay	26.5	51.9	51.4	9.1	49.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	51.9	51.4	9.1	49.3
Queue Length 50th (ft)	10	29	137	144	~514
Queue Length 95th (ft)	74	63	218	334	#613
Internal Link Dist (ft)	2621	76		1231	1843
Turn Bay Length (ft)			155		
Base Capacity (vph)	305	306	311	1204	723
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.55	0.14	0.71	0.50	0.97

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

BG+P\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	18	0	133	39	0	0	196	368	171	0	521	102
Future Volume (veh/h)	18	0	133	39	0	0	196	368	171	0	521	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1233	1900	1055	1900	1900	1900	1544	1618	1900	1900	1500	1574
Adj Flow Rate, veh/h	20	0	149	44	0	0	220	413	192	0	585	115
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	45	0	57	0	0	0	24	19	0	0	27	22
Cap, veh/h	24	0	177	62	0	0	234	748	348	2	623	122
Arrive On Green	0.12	0.00	0.12	0.03	0.00	0.00	0.16	0.72	0.72	0.00	0.51	0.51
Sat Flow, veh/h	193	0	1438	1810	0	0	1471	1045	486	1810	1212	238
Grp Volume(v), veh/h	169	0	0	44	0	0	220	0	605	0	0	700
Grp Sat Flow(s),veh/h/ln	1631	0	0	1810	0	0	1471	0	1531	1810	0	1451
Q Serve(g_s), s	10.7	0.0	0.0	2.6	0.0	0.0	15.7	0.0	19.7	0.0	0.0	48.1
Cycle Q Clear(g_c), s	10.7	0.0	0.0	2.6	0.0	0.0	15.7	0.0	19.7	0.0	0.0	48.1
Prop In Lane	0.12		0.88	1.00		0.00	1.00		0.32	1.00		0.16
Lane Grp Cap(c), veh/h	200	0	0	62	0	0	234	0	1096	2	0	745
V/C Ratio(X)	0.84	0.00	0.00	0.71	0.00	0.00	0.94	0.00	0.55	0.00	0.00	0.94
Avail Cap(c_a), veh/h	269	0	0	307	0	0	234	0	1096	87	0	745
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.90
Uniform Delay (d), s/veh	45.5	0.0	0.0	50.7	0.0	0.0	44.0	0.0	7.1	0.0	0.0	24.2
Incr Delay (d2), s/veh	16.4	0.0	0.0	13.9	0.0	0.0	7.5	0.0	0.2	0.0	0.0	19.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	0.0	1.4	0.0	0.0	6.1	0.0	5.6	0.0	0.0	19.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	0.0	0.0	64.5	0.0	0.0	51.5	0.0	7.3	0.0	0.0	43.8
LnGrp LOS	E	A	A	E	A	A	D	A	A	A	A	D
Approach Vol, veh/h		169			44			825				700
Approach Delay, s/veh		61.9			64.5			19.1				43.8
Approach LOS		E			E			B				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	80.4		17.5	21.4	59.0		8.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	47.4		17.5	16.9	35.6		18.0				
Max Q Clear Time (g_c+I1), s	0.0	21.7		12.7	17.7	50.1		4.6				
Green Ext Time (p_c), s	0.0	4.7		0.4	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	34.3
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.



Queues

4: Clawiter Rd. & Depot Rd.



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	224	592	4	138	676	227
v/c Ratio	0.70	0.81	0.01	0.11	0.44	0.23
Control Delay	49.9	48.0	0.0	17.8	19.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	48.0	0.0	17.8	19.1	1.5
Queue Length 50th (ft)	68	197	0	15	150	0
Queue Length 95th (ft)	103	258	0	66	230	25
Internal Link Dist (ft)	3714	725		1843	714	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	565	809	466	1239	1549	1044
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.73	0.01	0.11	0.44	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

BG+P\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↕↕	↗		↕↔			↕↕	↗
Traffic Volume (veh/h)	35	130	41	265	280	4	18	52	56	14	608	209
Future Volume (veh/h)	35	130	41	265	280	4	18	52	56	14	608	209
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1381	1159	937	1693	1722	1900	1618	1604	1648	1900	1722	1737
Adj Flow Rate, veh/h	38	141	45	288	304	4	20	57	61	15	661	227
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	35	50	65	14	12	0	19	20	17	0	12	11
Cap, veh/h	46	176	58	355	354	340	164	446	553	51	1648	942
Arrive On Green	0.13	0.13	0.13	0.22	0.22	0.22	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	365	1392	460	1640	1636	1572	230	857	1063	30	3167	1453
Grp Volume(v), veh/h	119	0	105	288	304	4	65	0	73	361	315	227
Grp Sat Flow(s),veh/h/ln	1141	0	1076	1640	1636	1572	882	0	1268	1708	1489	1453
Q Serve(g_s), s	10.7	0.0	10.0	17.7	19.0	0.2	0.6	0.0	3.1	0.0	13.6	6.9
Cycle Q Clear(g_c), s	10.7	0.0	10.0	17.7	19.0	0.2	14.3	0.0	3.1	13.5	13.6	6.9
Prop In Lane	0.32		0.43	1.00		1.00	0.31		0.84	0.04		1.00
Lane Grp Cap(c), veh/h	144	0	136	355	354	340	503	0	660	924	774	942
V/C Ratio(X)	0.82	0.00	0.77	0.81	0.86	0.01	0.13	0.00	0.11	0.39	0.41	0.24
Avail Cap(c_a), veh/h	269	0	254	426	424	408	503	0	660	924	774	942
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	0.00	1.00	0.09	0.09	0.09	0.86	0.00	0.86	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	0.0	44.8	39.5	40.0	32.6	13.1	0.0	12.9	15.4	15.5	7.8
Incr Delay (d2), s/veh	4.4	0.0	3.5	1.0	1.5	0.0	0.5	0.0	0.3	0.4	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	2.8	7.1	7.7	0.1	0.8	0.0	0.9	5.2	4.6	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	0.0	48.3	40.4	41.5	32.6	13.6	0.0	13.2	15.8	16.0	8.0
LnGrp LOS	D	A	D	D	D	C	B	A	B	B	B	A
Approach Vol, veh/h		224			596			138			903	
Approach Delay, s/veh		49.0			40.9			13.4			13.9	
Approach LOS		D			D			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.1		27.5		60.1		18.4				
Change Period (Y+Rc), s		5.0		4.5		* 5		5.0				
Max Green Setting (Gmax), s		39.0		27.5		* 40		25.0				
Max Q Clear Time (g_c+I1), s		16.3		21.0		15.6		12.7				
Green Ext Time (p_c), s		1.2		2.0		7.7		0.7				

Intersection Summary

HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

## Queues

BG+P\_AM

## 5: Industrial Blvd. &amp; Clawiter Rd.

04/12/2022



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	50	7	7	375	6	671
v/c Ratio	0.33	0.34	0.06	0.06	0.15	0.05	0.27
Control Delay	46.2	45.5	40.0	42.7	4.3	40.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	45.5	40.0	42.7	4.3	40.0	5.7
Queue Length 50th (ft)	29	29	4	4	17	3	30
Queue Length 95th (ft)	61	61	16	17	73	m8	150
Internal Link Dist (ft)		83	86		940		354
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	478	481	138	133	2522	133	2457
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.10	0.05	0.05	0.15	0.05	0.27

## Intersection Summary

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

HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

BG+P\_AM  
04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↔			↔		↗	↕		↗	↕	
Traffic Volume (veh/h)	78	4	1	4	1	1	6	308	7	5	564	0
Future Volume (veh/h)	78	4	1	4	1	1	6	308	7	5	564	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1678	1900	1900	1633	0
Adj Flow Rate, veh/h	98	0	0	5	1	1	7	367	8	6	671	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	0	0	0	0	0	0	0	15	0	0	18	0
Cap, veh/h	176	92	0	11	2	2	16	2411	52	14	2342	0
Arrive On Green	0.05	0.00	0.00	0.01	0.01	0.01	0.01	0.76	0.76	0.02	1.00	0.00
Sat Flow, veh/h	3619	1900	0	1279	256	256	1810	3189	69	1810	3185	0
Grp Volume(v), veh/h	98	0	0	7	0	0	7	183	192	6	671	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1790	0	0	1810	1594	1665	1810	1552	0
Q Serve(g_s), s	2.5	0.0	0.0	0.4	0.0	0.0	0.4	3.0	3.0	0.3	0.0	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.4	0.0	0.0	0.4	3.0	3.0	0.3	0.0	0.0
Prop In Lane	1.00		0.00	0.71		0.14	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	176	92	0	16	0	0	16	1205	1258	14	2342	0
V/C Ratio(X)	0.56	0.00	0.00	0.44	0.00	0.00	0.44	0.15	0.15	0.43	0.29	0.00
Avail Cap(c_a), veh/h	1010	530	0	132	0	0	133	1205	1258	133	2342	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.79	0.79	0.79	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.2	0.0	0.0	46.8	0.0	0.0	46.8	3.2	3.2	46.6	0.0	0.0
Incr Delay (d2), s/veh	2.7	0.0	0.0	18.0	0.0	0.0	14.0	0.2	0.2	19.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.2	0.0	0.0	0.2	0.8	0.8	0.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.9	0.0	0.0	64.8	0.0	0.0	60.8	3.4	3.4	66.1	0.3	0.0
LnGrp LOS	D	A	A	E	A	A	E	A	A	E	A	A
Approach Vol, veh/h		98			7			382			677	
Approach Delay, s/veh		46.9			64.8			4.5			0.9	
Approach LOS		D			E			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	76.3		9.1	4.8	76.2		4.8				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	7.0	37.5		26.5	7.0	37.5		7.0				
Max Q Clear Time (g_c+I1), s	2.3	5.0		4.5	2.4	2.0		2.4				
Green Ext Time (p_c), s	0.0	2.4		0.3	0.0	5.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	6.3
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	4	1	0	0	1	0	83	1	837	0
Future Vol, veh/h	0	0	4	1	0	0	1	0	83	1	837	0
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	6	6	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	26	0	50	0	0	0	28	12	0	0	16	0
Mvmt Flow	0	0	5	1	0	0	1	0	111	1	1116	0

Major/Minor	Minor2		Minor1			Major2				
Conflicting Flow All	-	-	1116	1127	1124	-	-	6	0	0
Stage 1	-	-	-	6	6	-	-	-	-	-
Stage 2	-	-	-	1121	1118	-	-	-	-	-
Critical Hdwy	-	-	6.7	7.1	6.5	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-
Follow-up Hdwy	-	-	3.75	3.5	4	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	203	183	207	0	0	1628	-	0
Stage 1	0	0	-	-	-	0	0	-	-	0
Stage 2	0	0	-	253	285	0	0	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	203	177	205	-	-	1619	-	-
Mov Cap-2 Maneuver	-	-	-	177	205	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	246	284	-	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	23.2		25.5		0	
HCM LOS	C		D			

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	203	177	1619	-
HCM Lane V/C Ratio	0.026	0.008	0.001	-
HCM Control Delay (s)	23.2	25.5	7.2	-
HCM Lane LOS	C	D	A	-
HCM 95th %tile Q(veh)	0.1	0	0	-

## Queues

BG+P\_AM

## 7: Clawiter Rd. &amp; West St.

04/12/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	221	660	5	1327
v/c Ratio	0.69	0.30	0.05	0.57
Control Delay	47.0	6.2	42.5	8.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.0	6.2	42.5	8.1
Queue Length 50th (ft)	125	48	3	168
Queue Length 95th (ft)	176	107	14	261
Internal Link Dist (ft)	322	809		3146
Turn Bay Length (ft)			45	
Base Capacity (vph)	595	2172	142	2328
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.30	0.04	0.57

## Intersection Summary

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

BG+P\_AM  
04/12/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑↘		↙	↑↑
Traffic Volume (veh/h)	182	8	529	39	4	1141
Future Volume (veh/h)	182	8	529	39	4	1141
Initial Q (Qb), veh	0	0	0	0	0	0
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	1900	1648	1856	1900	1722
Adj Flow Rate, veh/h	212	9	615	45	5	1327
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	4	0	17	3	0	12
Cap, veh/h	251	11	2073	152	12	2469
Arrive On Green	0.15	0.15	1.00	1.00	0.01	0.75
Sat Flow, veh/h	1666	71	3041	216	1810	3358
Grp Volume(v), veh/h	222	0	325	335	5	1327
Grp Sat Flow(s),veh/h/ln	1745	0	1566	1609	1810	1636
Q Serve(g_s), s	11.8	0.0	0.0	0.0	0.3	15.9
Cycle Q Clear(g_c), s	11.8	0.0	0.0	0.0	0.3	15.9
Prop In Lane	0.95	0.04		0.13	1.00	
Lane Grp Cap(c), veh/h	263	0	1097	1128	12	2469
V/C Ratio(X)	0.84	0.00	0.30	0.30	0.42	0.54
Avail Cap(c_a), veh/h	597	0	1097	1128	143	2469
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.17	0.17
Uniform Delay (d), s/veh	39.3	0.0	0.0	0.0	47.0	4.8
Incr Delay (d2), s/veh	7.3	0.0	0.7	0.7	4.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	0.2	0.2	0.1	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.6	0.0	0.7	0.7	51.1	5.0
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	222		660			1332
Approach Delay, s/veh	46.6		0.7			5.1
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	5.1	71.1			76.2	18.8
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	7.5	* 42			53.5	32.5
Max Q Clear Time (g_c+I1), s	2.3	2.0			17.9	13.8
Green Ext Time (p_c), s	0.0	4.8			13.5	0.6

Intersection Summary

HCM 6th Ctrl Delay	8.0
HCM 6th LOS	A

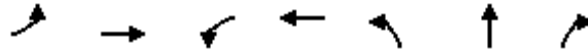
Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	1	603	1219	1327	90	90	280
v/c Ratio	0.01	0.63	0.97	0.53	0.64	0.64	0.69
Control Delay	51.0	30.2	52.2	6.8	64.8	64.8	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	30.2	52.2	6.8	64.8	64.8	14.4
Queue Length 50th (ft)	1	164	424	136	65	65	0
Queue Length 95th (ft)	6	237	#524	311	108	108	62
Internal Link Dist (ft)		5260		2336		3146	
Turn Bay Length (ft)	210		205		85		
Base Capacity (vph)	98	953	1279	2497	285	285	534
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.63	0.95	0.53	0.32	0.32	0.52

Intersection Summary

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



HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

BG+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕		↖	↕		↗	↖	↗	↖	↕	↖
Traffic Volume (veh/h)	1	359	160	1048	1140	1	155	0	241	0	0	0
Future Volume (veh/h)	1	359	160	1048	1140	1	155	0	241	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1322	1352	1796	1722	1781	1633	1411	1559	907	1900	1159
Adj Flow Rate, veh/h	1	417	0	1219	1326	1	180	0	280	0	0	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	39	37	7	12	8	18	33	23	67	0	50
Cap, veh/h	2	497		1480	2173	2	841	0	301	65	433	0
Arrive On Green	0.00	0.20	0.00	0.45	0.65	0.65	0.23	0.00	0.23	0.00	0.00	0.00
Sat Flow, veh/h	1810	2578	0	3319	3355	3	3111	0	1321	533	1900	0
Grp Volume(v), veh/h	1	417	0	1219	647	680	180	0	280	0	0	0
Grp Sat Flow(s),veh/h/ln	1810	1256	0	1659	1636	1722	1555	0	1321	533	1900	0
Q Serve(g_s), s	0.1	17.6	0.0	35.4	25.3	25.3	5.2	0.0	22.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	17.6	0.0	35.4	25.3	25.3	5.2	0.0	22.8	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	497		1480	1060	1115	841	0	301	65	433	0
V/C Ratio(X)	0.40	0.84		0.82	0.61	0.61	0.21	0.00	0.93	0.00	0.00	0.00
Avail Cap(c_a), veh/h	99	603		1480	1060	1115	897	0	326	75	468	0
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	0.96	0.00	0.96	0.00	0.00	0.00
Uniform Delay (d), s/veh	54.9	42.5	0.0	26.7	11.3	11.3	34.8	0.0	41.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	35.0	15.6	0.0	3.7	2.6	2.5	0.0	0.0	29.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	6.5	0.0	14.3	9.2	9.6	2.0	0.0	9.8	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.9	58.1	0.0	30.3	13.9	13.8	34.8	0.0	70.7	0.0	0.0	0.0
LnGrp LOS	F	E		C	B	B	C	A	E	A	A	A
Approach Vol, veh/h		418	A		2546			460				0
Approach Delay, s/veh		58.1			21.7			56.6				0.0
Approach LOS		E			C			E				
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	53.7	26.3		30.0	4.2	75.9		30.0				
Change Period (Y+Rc), s	4.6	* 4.6		4.9	4.0	4.6		4.9				
Max Green Setting (Gmax), s	43.0	* 26		27.1	6.0	63.4		27.1				
Max Q Clear Time (g_c+I1), s	37.4	19.6		24.8	2.1	27.3		0.0				
Green Ext Time (p_c), s	1.8	2.0		0.3	0.0	17.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay	30.9
HCM 6th LOS	C

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Queues

9: Industrial Blvd. & Depot Rd.



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	70	249	427	418	626	166	41	476	10
v/c Ratio	0.04	0.14	0.47	0.87	2.84	0.58	0.11	0.25	0.48	0.01
Control Delay	13.1	13.7	5.7	39.3	864.8	17.8	0.1	27.1	16.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	13.7	5.7	39.3	864.8	17.8	0.1	27.1	16.4	0.0
Queue Length 50th (ft)	2	16	0	124	~242	86	0	13	63	0
Queue Length 95th (ft)	10	34	28	#222	#336	112	0	33	85	0
Internal Link Dist (ft)		725		1517		890			940	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	227	514	531	489	147	1074	1553	165	1002	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.14	0.47	0.87	2.84	0.58	0.11	0.25	0.48	0.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 9: Industrial Blvd. & Depot Rd.

BG+P\_AM  
 04/12/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	56	199	139	171	31	334	501	133	33	381	8
Future Volume (veh/h)	8	56	199	139	171	31	334	501	133	33	381	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1574	1248	1870	1737	1781	1722	1737	1841	1900	1618	1648
Adj Flow Rate, veh/h	10	70	249	174	214	39	418	626	0	41	476	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	33	22	44	2	11	8	12	11	4	0	19	17
Cap, veh/h	343	520	348	252	244	40	150	1090		166	1016	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	848	1574	1055	481	738	123	1640	3300	1560	1810	3075	1397
Grp Volume(v), veh/h	10	70	249	427	0	0	418	626	0	41	476	0
Grp Sat Flow(s),veh/h/ln	848	1574	1055	1342	0	0	1640	1650	1560	1810	1537	1397
Q Serve(g_s), s	0.0	1.7	11.3	15.3	0.0	0.0	5.0	8.5	0.0	1.1	6.7	0.0
Cycle Q Clear(g_c), s	0.6	1.7	11.3	17.0	0.0	0.0	5.0	8.5	0.0	1.1	6.7	0.0
Prop In Lane	1.00		1.00	0.41		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	343	520	348	536	0	0	150	1090		166	1016	
V/C Ratio(X)	0.03	0.13	0.71	0.80	0.00	0.00	2.78	0.57		0.25	0.47	
Avail Cap(c_a), veh/h	343	520	348	536	0	0	150	1090		166	1016	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.4	12.8	16.0	17.7	0.0	0.0	24.8	15.1	0.0	23.0	14.5	0.0
Incr Delay (d2), s/veh	0.2	0.5	11.9	11.6	0.0	0.0	818.3	2.2	0.0	3.5	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	3.5	6.2	0.0	0.0	36.0	3.1	0.0	0.6	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	13.3	27.9	29.3	0.0	0.0	843.1	17.3	0.0	26.5	16.0	0.0
LnGrp LOS	B	B	C	C	A	A	F	B		C	B	
Approach Vol, veh/h		329			427			1044	A		517	A
Approach Delay, s/veh		24.3			29.3			347.9			16.8	
Approach LOS		C			C			F			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.1	10.5		13.3	7.0	8.7		19.0				
Green Ext Time (p_c), s	0.0	2.5		0.6	0.0	2.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	169.4
HCM 6th LOS	F

Notes

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

Intersection

Intersection Delay, s/veh 10.8

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	21	5	10	123	29	7	156	30	10	86	28
Future Vol, veh/h	5	21	5	10	123	29	7	156	30	10	86	28
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	100	75	50	38	40	14	20	16	83	50	44	0
Mvmt Flow	6	25	6	12	146	35	8	186	36	12	102	33
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.5	11	11	10.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	16%	6%	100%	0%
Vol Thru, %	0%	84%	68%	76%	0%	75%
Vol Right, %	0%	16%	16%	18%	0%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	186	31	162	10	114
LT Vol	7	0	5	10	10	0
Through Vol	0	156	21	123	0	86
RT Vol	0	30	5	29	0	28
Lane Flow Rate	8	221	37	193	12	136
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.014	0.339	0.071	0.297	0.022	0.226
Departure Headway (Hd)	6.191	5.504	6.885	5.545	6.783	6.002
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	575	649	516	644	525	594
Service Time	3.964	3.276	4.984	3.617	4.565	3.783
HCM Lane V/C Ratio	0.014	0.341	0.072	0.3	0.023	0.229
HCM Control Delay	9.1	11.1	10.5	11	9.7	10.6
HCM Lane LOS	A	B	B	B	A	B
HCM 95th-tile Q	0	1.5	0.2	1.2	0.1	0.9

**Intersection**

Intersection Delay, s/veh 11.7

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	7	9	10	35	23	156	16	146	31	78	92	8
Future Vol, veh/h	7	9	10	35	23	156	16	146	31	78	92	8
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	20	29	25	43	11	18	0	23	41	45	52	50
Mvmt Flow	8	10	11	38	25	168	17	157	33	84	99	9
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	9.4	12.6	11.8	10.7
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	27%	16%	100%	0%	0%
Vol Thru, %	0%	82%	35%	11%	0%	100%	0%
Vol Right, %	0%	18%	38%	73%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	177	26	214	78	92	8
LT Vol	16	0	7	35	78	0	0
Through Vol	0	146	9	23	0	92	0
RT Vol	0	31	10	156	0	0	8
Lane Flow Rate	17	190	28	230	84	99	9
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.031	0.329	0.049	0.388	0.161	0.179	0.014
Departure Headway (Hd)	6.46	6.225	6.305	6.067	6.917	6.531	5.788
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	555	579	569	596	520	550	619
Service Time	4.185	3.951	4.034	3.767	4.643	4.257	3.514
HCM Lane V/C Ratio	0.031	0.328	0.049	0.386	0.162	0.18	0.015
HCM Control Delay	9.4	12	9.4	12.6	11	10.7	8.6
HCM Lane LOS	A	B	A	B	B	B	A
HCM 95th-tile Q	0.1	1.4	0.2	1.8	0.6	0.6	0

**Intersection**

Intersection Delay, s/veh 14.2

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑	↗	↘	↑	↗
Traffic Vol, veh/h	3	44	18	344	82	186	25	24	21	80	18	2
Future Vol, veh/h	3	44	18	344	82	186	25	24	21	80	18	2
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
Heavy Vehicles, %	0	43	50	14	18	9	29	7	57	39	0	0
Mvmt Flow	3	49	20	382	91	207	28	27	23	89	20	2
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	10.5	15.4	10.4	11.9
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	24	21	3	44	18	344	82	186	80	18	2
LT Vol	25	0	0	3	0	0	344	0	0	80	0	0
Through Vol	0	24	0	0	44	0	0	82	0	0	18	0
RT Vol	0	0	21	0	0	18	0	0	186	0	0	2
Lane Flow Rate	28	27	23	3	49	20	382	91	207	89	20	2
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.06	0.051	0.046	0.007	0.099	0.037	0.658	0.146	0.282	0.194	0.037	0.004
Departure Headway (Hd)	7.797	6.923	7.073	7.075	7.306	6.725	6.195	5.763	4.91	7.86	6.697	5.997
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	460	518	507	506	491	533	589	626	736	457	535	597
Service Time	5.536	4.662	4.812	4.811	5.042	4.461	3.895	3.463	2.61	5.598	4.435	3.735
HCM Lane V/C Ratio	0.061	0.052	0.045	0.006	0.1	0.038	0.649	0.145	0.281	0.195	0.037	0.003
HCM Control Delay	11	10	10.2	9.9	10.8	9.7	20	9.4	9.5	12.5	9.7	8.8
HCM Lane LOS	B	A	B	A	B	A	C	A	A	B	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0	0.3	0.1	4.8	0.5	1.2	0.7	0.1	0

Intersection						
Int Delay, s/veh	4.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	12	0	36	13	0	5
Future Vol, veh/h	12	0	36	13	0	5
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	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	0	144	52	0	20

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	48	0	388
Stage 1	-	-	-	-	48
Stage 2	-	-	-	-	340
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1572	-	619
Stage 1	-	-	-	-	980
Stage 2	-	-	-	-	725
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1572	-	561
Mov Cap-2 Maneuver	-	-	-	-	561
Stage 1	-	-	-	-	980
Stage 2	-	-	-	-	657

Approach	EB	WB	NB
HCM Control Delay, s	0	5.5	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1027	-	-	1572	-
HCM Lane V/C Ratio	0.019	-	-	0.092	-
HCM Control Delay (s)	8.6	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.3	-

Intersection						
Int Delay, s/veh	5.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	17	0	107	49	0	15
Future Vol, veh/h	17	0	107	49	0	15
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	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	68	0	428	196	0	60

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	68	0	1120
Stage 1	-	-	-	-	68
Stage 2	-	-	-	-	1052
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1546	-	231
Stage 1	-	-	-	-	960
Stage 2	-	-	-	-	339
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1546	-	159
Mov Cap-2 Maneuver	-	-	-	-	159
Stage 1	-	-	-	-	960
Stage 2	-	-	-	-	234

Approach	EB	WB	NB
HCM Control Delay, s	0	5.6	8.8
HCM LOS			A

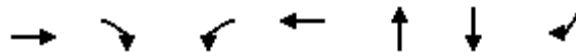
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1001	-	-	1546	-
HCM Lane V/C Ratio	0.06	-	-	0.277	-
HCM Control Delay (s)	8.8	-	-	8.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	1.1	-





Queues

1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	138	147	124	342	655	854	40
v/c Ratio	0.65	0.23	0.56	0.88	1.45	0.94	0.08
Control Delay	55.3	2.8	44.9	35.3	241.5	53.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	2.8	44.9	35.3	241.5	53.7	0.3
Queue Length 50th (ft)	74	0	66	52	~485	237	0
Queue Length 95th (ft)	#167	19	122	168	#871	#472	2
Internal Link Dist (ft)	128			403	144	1216	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	251	652	438	530	452	904	489
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.23	0.28	0.65	1.45	0.94	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG+P\_PM  
 04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↘			↕			↕	↗
Traffic Volume (veh/h)	37	90	135	114	50	265	41	389	172	232	554	37
Future Volume (veh/h)	37	90	135	114	50	265	41	389	172	232	554	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1826	1707	1559	1174	1366	1411	1633	1885	1841	1737	1826
Adj Flow Rate, veh/h	40	98	147	124	54	288	45	423	0	252	602	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	5	13	23	49	36	33	18	1	4	11	5
Cap, veh/h	51	125	494	391	42	226	38	358		229	584	377
Arrive On Green	0.10	0.10	0.10	0.26	0.26	0.26	0.24	0.24	0.00	0.24	0.24	0.24
Sat Flow, veh/h	522	1278	1447	1485	161	858	156	1469	0	942	2398	1547
Grp Volume(v), veh/h	138	0	147	124	0	342	468	0	0	452	402	40
Grp Sat Flow(s),veh/h/ln	1800	0	1447	1485	0	1019	1625	0	0	1690	1650	1547
Q Serve(g_s), s	7.7	0.0	7.6	6.9	0.0	27.0	25.0	0.0	0.0	25.0	25.0	2.1
Cycle Q Clear(g_c), s	7.7	0.0	7.6	6.9	0.0	27.0	25.0	0.0	0.0	25.0	25.0	2.1
Prop In Lane	0.29		1.00	1.00		0.84	0.10		0.00	0.56		1.00
Lane Grp Cap(c), veh/h	175	0	494	391	0	268	396	0		412	402	377
V/C Ratio(X)	0.79	0.00	0.30	0.32	0.00	1.27	1.18	0.00		1.10	1.00	0.11
Avail Cap(c_a), veh/h	228	0	536	391	0	268	396	0		412	402	377
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(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	0.0	24.8	30.4	0.0	37.8	38.8	0.0	0.0	38.8	38.8	30.1
Incr Delay (d2), s/veh	9.4	0.0	0.1	0.2	0.0	149.5	104.8	0.0	0.0	73.6	44.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	3.7	2.5	0.0	17.7	21.3	0.0	0.0	18.6	14.9	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	24.9	30.6	0.0	187.3	143.6	0.0	0.0	112.4	83.4	30.2
LnGrp LOS	D	A	C	C	A	F	F	A		F	F	C
Approach Vol, veh/h		285			466			468	A		894	
Approach Delay, s/veh		39.3			145.6			143.6			95.7	
Approach LOS		D			F			F			F	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.1		13.7		29.1		30.7				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		25.0		13.0		25.0		27.0				
Max Q Clear Time (g_c+I1), s		27.0		9.7		27.0		29.0				
Green Ext Time (p_c), s		0.0		0.1		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	109.7
HCM 6th LOS	F

Notes

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

Intersection												
Intersection Delay, s/veh	243.7											
Intersection LOS	F											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕	↕		↕	↕
Traffic Vol, veh/h	215	12	82	2	172	124	278	262	6	70	153	583
Future Vol, veh/h	215	12	82	2	172	124	278	262	6	70	153	583
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	20	50	27	0	3	6	4	8	0	25	19	4
Mvmt Flow	262	15	100	2	210	151	339	320	7	85	187	711
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	42.1	78.4	382.8	287.8
HCM LOS	E	F	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	51%	0%	95%	0%	1%	31%	0%
Vol Thru, %	49%	0%	5%	0%	58%	69%	0%
Vol Right, %	0%	100%	0%	100%	42%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	540	6	227	82	298	223	583
LT Vol	278	0	215	0	2	70	0
Through Vol	262	0	12	0	172	153	0
RT Vol	0	6	0	82	124	0	583
Lane Flow Rate	659	7	277	100	363	272	711
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	1.781	0.018	0.796	0.269	0.956	0.749	1.767
Departure Headway (Hd)	10.419	9.479	12.529	11.819	12.19	11.695	10.669
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	356	380	291	306	302	313	348
Service Time	8.119	7.179	10.229	9.519	10.19	9.395	8.369
HCM Lane V/C Ratio	1.851	0.018	0.952	0.327	1.202	0.869	2.043
HCM Control Delay	386.9	12.4	50.5	18.8	78.4	42.4	381.6
HCM Lane LOS	F	B	F	C	F	E	F
HCM 95th-tile Q	39.6	0.1	6.3	1.1	9.5	5.6	38.2

Queues  
3: Clawiter Rd. & Enterprise Ave.



Lane Group	EBT	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	359	196	100	808	326
v/c Ratio	0.92	0.69	0.64	0.97	0.52
Control Delay	58.7	54.5	61.3	51.7	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	54.5	61.3	51.7	32.8
Queue Length 50th (ft)	171	127	65	519	151
Queue Length 95th (ft)	#339	191	116	#867	#355
Internal Link Dist (ft)	2619	76		1216	1497
Turn Bay Length (ft)			155		
Base Capacity (vph)	409	383	215	832	626
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.51	0.47	0.97	0.52

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
3: Clawiter Rd. & Enterprise Ave.

BG+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (veh/h)	126	0	197	176	0	0	90	617	110	0	260	33
Future Volume (veh/h)	126	0	197	176	0	0	90	617	110	0	260	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1811	1900	1781	1900	1900	1900	1218	1604	1900	1900	1767	1263
Adj Flow Rate, veh/h	140	0	219	196	0	0	100	686	122	0	289	37
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, %	6	0	8	0	0	0	46	20	0	0	9	43
Cap, veh/h	133	0	208	236	0	0	115	712	127	2	608	78
Arrive On Green	0.20	0.00	0.20	0.13	0.00	0.00	0.10	0.54	0.54	0.00	0.40	0.40
Sat Flow, veh/h	656	0	1026	1810	0	0	1160	1320	235	1810	1530	196
Grp Volume(v), veh/h	359	0	0	196	0	0	100	0	808	0	0	326
Grp Sat Flow(s),veh/h/ln	1682	0	0	1810	0	0	1160	0	1555	1810	0	1726
Q Serve(g_s), s	21.5	0.0	0.0	11.2	0.0	0.0	9.0	0.0	52.8	0.0	0.0	14.9
Cycle Q Clear(g_c), s	21.5	0.0	0.0	11.2	0.0	0.0	9.0	0.0	52.8	0.0	0.0	14.9
Prop In Lane	0.39		0.61	1.00		0.00	1.00		0.15	1.00		0.11
Lane Grp Cap(c), veh/h	341	0	0	236	0	0	115	0	838	2	0	686
V/C Ratio(X)	1.05	0.00	0.00	0.83	0.00	0.00	0.87	0.00	0.96	0.00	0.00	0.48
Avail Cap(c_a), veh/h	341	0	0	384	0	0	202	0	838	316	0	686
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	0.00	0.00	1.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	0.0	0.0	44.9	0.0	0.0	47.0	0.0	23.4	0.0	0.0	23.7
Incr Delay (d2), s/veh	63.0	0.0	0.0	7.8	0.0	0.0	1.9	0.0	4.1	0.0	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	0.0	0.0	5.5	0.0	0.0	2.6	0.0	18.9	0.0	0.0	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	105.3	0.0	0.0	52.8	0.0	0.0	48.9	0.0	27.5	0.0	0.0	26.1
LnGrp LOS	F	A	A	D	A	A	D	A	C	A	A	C
Approach Vol, veh/h		359			196			908				326
Approach Delay, s/veh		105.3			52.8			29.9				26.1
Approach LOS		F			D			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	61.7		26.0	15.0	46.6		18.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	25.5		21.5	18.5	25.5		22.5				
Max Q Clear Time (g_c+I1), s	0.0	54.8		23.5	11.0	16.9		13.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.1	1.2		0.7				

Intersection Summary

HCM 6th Ctrl Delay	46.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Queues

4: Clawiter Rd. & Depot Rd.



Lane Group	EBT	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	614	193	13	816	142	13
v/c Ratio	0.80	0.57	0.06	0.50	0.10	0.01
Control Delay	45.7	50.5	0.6	12.4	14.9	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	50.5	0.6	12.4	14.9	1.3
Queue Length 50th (ft)	205	66	0	97	24	0
Queue Length 95th (ft)	250	100	0	m115	50	4
Internal Link Dist (ft)	3711	564		280	717	
Turn Bay Length (ft)			70			170
Base Capacity (vph)	1041	737	382	1647	1425	1005
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.26	0.03	0.50	0.10	0.01

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
4: Clawiter Rd. & Depot Rd.

BG+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕	↗		↕↕			↕↕	↗
Traffic Volume (veh/h)	173	393	17	86	97	12	22	431	322	12	123	12
Future Volume (veh/h)	173	393	17	86	97	12	22	431	322	12	123	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1781	1500	1767	1470	1604	1352	1841	1826	1796	1633	1515
Adj Flow Rate, veh/h	182	414	18	91	102	13	23	454	339	13	129	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	8	27	9	29	20	37	4	5	7	18	26
Cap, veh/h	213	518	23	140	140	135	61	1012	736	133	1310	985
Arrive On Green	0.22	0.22	0.22	0.10	0.10	0.10	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	987	2398	108	1400	1397	1355	47	1833	1333	168	2374	1282
Grp Volume(v), veh/h	319	0	295	91	102	13	461	0	355	69	73	13
Grp Sat Flow(s),veh/h/ln	1732	0	1760	1400	1397	1355	1817	0	1395	1130	1412	1282
Q Serve(g_s), s	18.8	0.0	16.7	6.6	7.5	0.9	0.0	0.0	16.2	0.5	2.6	0.3
Cycle Q Clear(g_c), s	18.8	0.0	16.7	6.6	7.5	0.9	15.9	0.0	16.2	16.6	2.6	0.3
Prop In Lane	0.57		0.06	1.00		1.00	0.05		0.96	0.19		1.00
Lane Grp Cap(c), veh/h	374	0	380	140	140	135	1039	0	770	664	779	985
V/C Ratio(X)	0.85	0.00	0.78	0.65	0.73	0.10	0.44	0.00	0.46	0.10	0.09	0.01
Avail Cap(c_a), veh/h	547	0	556	350	349	339	1039	0	770	664	779	985
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	0.00	1.00	0.61	0.61	0.61	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	0.0	39.1	45.9	46.3	43.4	14.2	0.0	14.3	11.4	11.2	2.9
Incr Delay (d2), s/veh	6.0	0.0	2.2	3.1	4.5	0.2	1.4	0.0	2.0	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	0.0	7.4	2.4	2.8	0.3	6.7	0.0	5.3	0.8	0.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	0.0	41.3	49.0	50.8	43.5	15.6	0.0	16.2	11.7	11.5	2.9
LnGrp LOS	D	A	D	D	D	D	B	A	B	B	B	A
Approach Vol, veh/h		614			206			816				155
Approach Delay, s/veh		43.7			49.5			15.9				10.8
Approach LOS		D			D			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		63.5		15.1		63.5		27.4				
Change Period (Y+Rc), s		5.0		4.5		* 5		4.5				
Max Green Setting (Gmax), s		32.0		26.5		* 33		33.5				
Max Q Clear Time (g_c+I1), s		18.2		9.5		18.6		20.8				
Green Ext Time (p_c), s		6.1		1.0		0.9		2.1				

Intersection Summary

HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



## Queues

BG+P\_PM

04/14/2022

## 5: Industrial Blvd. &amp; Clawiter Rd.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	354	349	56	40	595	1	467
v/c Ratio	0.76	0.65	0.55	0.51	0.35	0.01	0.33
Control Delay	45.5	28.8	60.9	69.1	19.7	48.0	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	28.8	60.9	69.1	19.7	48.0	25.6
Queue Length 50th (ft)	229	155	32	26	122	1	120
Queue Length 95th (ft)	291	220	71	#77	229	7	184
Internal Link Dist (ft)		32	86		915		218
Turn Bay Length (ft)				215		95	
Base Capacity (vph)	613	676	123	81	1697	93	1437
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.52	0.46	0.49	0.35	0.01	0.32

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
5: Industrial Blvd. & Clawiter Rd.

BG+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	611	0	8	42	1	6	35	522	2	1	411	0
Future Volume (veh/h)	611	0	8	42	1	6	35	522	2	1	411	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	418	1767	1900	1900	1796	0
Adj Flow Rate, veh/h	702	0	0	48	1	7	40	593	2	1	467	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	100	9	0	0	7	0
Cap, veh/h	827	434	0	63	1	9	17	1946	7	2	1796	0
Arrive On Green	0.23	0.00	0.00	0.04	0.04	0.04	0.04	0.57	0.57	0.00	0.53	0.00
Sat Flow, veh/h	3619	1900	0	1527	32	223	398	3431	12	1810	3503	0
Grp Volume(v), veh/h	702	0	0	56	0	0	40	290	305	1	467	0
Grp Sat Flow(s),veh/h/ln	1810	1900	0	1782	0	0	398	1678	1764	1810	1706	0
Q Serve(g_s), s	19.5	0.0	0.0	3.3	0.0	0.0	4.5	9.5	9.5	0.1	7.9	0.0
Cycle Q Clear(g_c), s	19.5	0.0	0.0	3.3	0.0	0.0	4.5	9.5	9.5	0.1	7.9	0.0
Prop In Lane	1.00		0.00	0.86		0.12	1.00		0.01	1.00		0.00
Lane Grp Cap(c), veh/h	827	434	0	73	0	0	17	952	1001	2	1796	0
V/C Ratio(X)	0.85	0.00	0.00	0.77	0.00	0.00	2.37	0.30	0.30	0.40	0.26	0.00
Avail Cap(c_a), veh/h	1293	679	0	204	0	0	30	952	1001	86	1796	0
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(l)	1.00	0.00	0.00	1.00	0.00	0.00	0.74	0.74	0.74	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.8	0.0	0.0	49.8	0.0	0.0	50.3	11.9	11.9	52.4	13.7	0.0
Incr Delay (d2), s/veh	3.3	0.0	0.0	15.2	0.0	0.0	731.8	0.6	0.6	81.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	0.0	0.0	1.8	0.0	0.0	3.9	3.6	3.8	0.1	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	0.0	65.1	0.0	0.0	782.1	12.5	12.5	133.9	14.0	0.0
LnGrp LOS	D	A	A	E	A	A	F	B	B	F	B	A
Approach Vol, veh/h		702			56			635			468	
Approach Delay, s/veh		42.1			65.1			61.0			14.3	
Approach LOS		D			E			E			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.1	64.1		28.5	8.4	59.8		8.3				
Change Period (Y+Rc), s	4.0	4.5		4.5	4.0	4.5		4.0				
Max Green Setting (Gmax), s	5.0	33.5		37.5	8.0	30.5		12.0				
Max Q Clear Time (g_c+I1), s	2.1	11.5		21.5	6.5	9.9		5.3				
Green Ext Time (p_c), s	0.0	3.7		2.5	0.0	3.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay	42.2
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗		↖				↗↖		↖	
Traffic Vol, veh/h	0	0	9	5	3	0	0	0	619	1	160	0
Future Vol, veh/h	0	0	9	5	3	0	0	0	619	1	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	4	0	36	0	0	50	8	12	0	0	7	0
Mvmt Flow	0	0	11	6	4	0	0	0	737	1	190	0

Major/Minor	Minor2		Minor1			Major2				
Conflicting Flow All	-	-	190	199	193	-	-	1	0	0
Stage 1	-	-	-	1	1	-	-	-	-	-
Stage 2	-	-	-	198	192	-	-	-	-	-
Critical Hdwy	-	-	6.56	7.1	6.5	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-	-	-	-	-
Follow-up Hdwy	-	-	3.624	3.5	4	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	772	764	706	0	-	1635	-	0
Stage 1	0	0	-	-	-	0	-	-	-	0
Stage 2	0	0	-	808	745	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	772	752	705	-	-	1633	-	-
Mov Cap-2 Maneuver	-	-	-	752	705	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	796	744	-	-	-	-	-

Approach	EB		WB		SB	
HCM Control Delay, s	9.7		10		0	
HCM LOS	A		B			

Minor Lane/Major Mvmt	EBLn1WBLn1		SBL	SBT
Capacity (veh/h)	772	734	1633	-
HCM Lane V/C Ratio	0.014	0.013	0.001	-
HCM Control Delay (s)	9.7	10	7.2	-
HCM Lane LOS	A	B	A	-
HCM 95th %tile Q(veh)	0	0	0	-

Queues

7: Clawiter Rd. & West St.



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	1553	27	698
v/c Ratio	0.37	0.66	0.18	0.27
Control Delay	28.7	10.6	31.2	3.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.7	10.6	31.2	3.0
Queue Length 50th (ft)	24	108	11	35
Queue Length 95th (ft)	55	#436	31	64
Internal Link Dist (ft)	322	867		3164
Turn Bay Length (ft)			45	
Base Capacity (vph)	557	2350	151	2545
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.13	0.66	0.18	0.27

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
7: Clawiter Rd. & West St.

BG+P\_PM  
04/14/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↔	↕↕
Traffic Volume (veh/h)	51	12	1076	290	24	614
Future Volume (veh/h)	51	12	1076	290	24	614
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1722	1752	1737	1885	1663	1707
Adj Flow Rate, veh/h	58	14	1223	330	27	698
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	12	10	11	1	16	13
Cap, veh/h	73	18	1850	490	46	2641
Arrive On Green	0.06	0.06	0.72	0.72	0.03	0.81
Sat Flow, veh/h	1274	307	2654	680	1584	3329
Grp Volume(v), veh/h	73	0	778	775	27	698
Grp Sat Flow(s),veh/h/ln	1603	0	1650	1597	1584	1622
Q Serve(g_s), s	3.1	0.0	17.4	18.4	1.2	3.6
Cycle Q Clear(g_c), s	3.1	0.0	17.4	18.4	1.2	3.6
Prop In Lane	0.79	0.19		0.43	1.00	
Lane Grp Cap(c), veh/h	92	0	1189	1151	46	2641
V/C Ratio(X)	0.79	0.00	0.65	0.67	0.58	0.26
Avail Cap(c_a), veh/h	552	0	1189	1151	115	2641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.32	0.32
Uniform Delay (d), s/veh	32.6	0.0	5.2	5.3	33.6	1.5
Incr Delay (d2), s/veh	14.2	0.0	2.8	3.2	3.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	4.7	4.8	0.5	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.7	0.0	8.0	8.5	37.3	1.6
LnGrp LOS	D	A	A	A	D	A
Approach Vol, veh/h	73		1553			725
Approach Delay, s/veh	46.7		8.2			2.9
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.5	54.9			61.5	8.5
Change Period (Y+Rc), s	4.5	* 4.5			4.5	4.5
Max Green Setting (Gmax), s	5.1	* 28			36.9	24.1
Max Q Clear Time (g_c+I1), s	3.2	20.4			5.6	5.1
Green Ext Time (p_c), s	0.0	5.5			5.5	0.1

Intersection Summary

HCM 6th Ctrl Delay			7.8			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

BG+P\_PM  
04/14/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	1518	358	360	62	63	816	4	2
v/c Ratio	0.01	1.01	0.90	0.21	0.23	0.23	1.32	0.01	0.00
Control Delay	46.0	54.7	68.5	9.2	31.8	31.9	175.7	27.7	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	54.7	68.5	9.2	31.8	31.9	175.7	27.7	27.5
Queue Length 50th (ft)	1	~508	116	45	32	33	~532	2	1
Queue Length 95th (ft)	6	#578	#170	77	65	65	#662	10	6
Internal Link Dist (ft)		5245		2336		3164			278
Turn Bay Length (ft)	210		205		85			50	
Base Capacity (vph)	144	1497	407	1692	275	275	620	356	500
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	1.01	0.88	0.21	0.23	0.23	1.32	0.01	0.00

Intersection Summary

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

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

HCM 6th Signalized Intersection Summary  
 8: Clawiter Rd./Tuskegee Airmen Dr. & Winton Ave.

BG+P\_PM  
 04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗↘	↗↘		↗	↖	↗	↗	↘	↘
Traffic Volume (veh/h)	1	1076	184	297	299	0	104	0	677	3	2	0
Future Volume (veh/h)	1	1076	184	297	299	0	104	0	677	3	2	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1811	1737	1470	1426	1648	1455	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	1	1296	0	358	360	0	125	0	816	4	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	6	11	29	32	17	30	0	5	0	0	0
Cap, veh/h	2	1476		438	1622	0	713	0	401	249	494	0
Arrive On Green	0.00	0.43	0.00	0.16	0.60	0.00	0.26	0.00	0.26	0.26	0.26	0.00
Sat Flow, veh/h	1810	3532	0	2716	2780	0	2194	0	1544	680	1900	0
Grp Volume(v), veh/h	1	1296	0	358	360	0	125	0	816	4	2	0
Grp Sat Flow(s),veh/h/ln	1810	1721	0	1358	1354	0	1097	0	1544	680	1900	0
Q Serve(g_s), s	0.1	34.5	0.0	12.7	6.2	0.0	4.5	0.0	26.0	0.4	0.1	0.0
Cycle Q Clear(g_c), s	0.1	34.5	0.0	12.7	6.2	0.0	4.6	0.0	26.0	0.4	0.1	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	2	1476		438	1622	0	713	0	401	249	494	0
V/C Ratio(X)	0.40	0.88		0.82	0.22	0.00	0.18	0.00	2.03	0.02	0.00	0.00
Avail Cap(c_a), veh/h	145	1548		438	1622	0	713	0	401	249	494	0
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	0.00	0.70	0.00	0.70	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.9	26.2	0.0	40.5	9.3	0.0	29.1	0.0	37.0	27.5	27.4	0.0
Incr Delay (d2), s/veh	34.9	7.7	0.0	10.9	0.3	0.0	0.0	0.0	470.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.1	0.0	4.9	1.8	0.0	1.2	0.0	62.1	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.8	33.9	0.0	51.4	9.6	0.0	29.1	0.0	507.9	27.6	27.4	0.0
LnGrp LOS	F	C		D	A	A	C	A	F	C	C	A
Approach Vol, veh/h		1297	A		718			941				6
Approach Delay, s/veh		33.9			30.4			444.3				27.5
Approach LOS		C			C			F				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.1	47.9		31.0	4.1	64.9		31.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	15.0	* 45		26.0	8.0	52.0		26.0				
Max Q Clear Time (g_c+I1), s	14.7	36.5		28.0	2.1	8.2		2.4				
Green Ext Time (p_c), s	0.0	6.4		0.0	0.0	3.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	163.4
HCM 6th LOS	F

Notes

- User approved volume balancing among the lanes for turning movement.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

## Queues

BG+P\_PM

## 9: Industrial Blvd. &amp; Depot Rd.

04/14/2022



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	361	428	154	152	702	219	51	514	10
v/c Ratio	0.17	0.59	0.60	0.37	1.13	0.67	0.15	0.33	0.46	0.01
Control Delay	14.5	19.9	7.6	16.2	149.6	19.4	0.2	29.2	16.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	19.9	7.6	16.2	149.6	19.4	0.2	29.2	16.1	0.0
Queue Length 50th (ft)	14	95	18	34	~60	100	0	16	67	0
Queue Length 95th (ft)	36	162	75	74	#149	146	0	42	102	0
Internal Link Dist (ft)		564		1810		890			915	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	368	615	714	412	134	1055	1493	156	1114	1226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.59	0.60	0.37	1.13	0.67	0.15	0.33	0.46	0.01

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



HCM 6th Signalized Intersection Summary  
9: Industrial Blvd. & Depot Rd.

BG+P\_PM  
04/14/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	318	377	50	71	14	134	618	193	45	452	9
Future Volume (veh/h)	55	318	377	50	71	14	134	618	193	45	452	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1767	1781	1618	1767	1559	1707	1811	1811	1796	1470
Adj Flow Rate, veh/h	62	361	428	57	81	16	152	702	0	51	514	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	20	2	9	8	19	9	23	13	6	6	7	29
Cap, veh/h	437	618	487	152	175	27	136	1071		158	1127	
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.09	0.33	0.00	0.09	0.33	0.00
Sat Flow, veh/h	1113	1870	1475	186	530	83	1485	3244	1535	1725	3413	1246
Grp Volume(v), veh/h	62	361	428	154	0	0	152	702	0	51	514	0
Grp Sat Flow(s),veh/h/ln	1113	1870	1475	799	0	0	1485	1622	1535	1725	1706	1246
Q Serve(g_s), s	0.0	8.7	14.9	2.0	0.0	0.0	5.0	10.1	0.0	1.5	6.5	0.0
Cycle Q Clear(g_c), s	3.1	8.7	14.9	10.7	0.0	0.0	5.0	10.1	0.0	1.5	6.5	0.0
Prop In Lane	1.00		1.00	0.37		0.10	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	437	618	487	354	0	0	136	1071		158	1127	
V/C Ratio(X)	0.14	0.58	0.88	0.43	0.00	0.00	1.12	0.66		0.32	0.46	
Avail Cap(c_a), veh/h	437	618	487	354	0	0	136	1071		158	1127	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.3	15.1	17.2	14.5	0.0	0.0	24.8	15.6	0.0	23.2	14.4	0.0
Incr Delay (d2), s/veh	0.7	4.0	19.7	3.8	0.0	0.0	111.6	3.1	0.0	5.3	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.9	7.0	1.6	0.0	0.0	5.8	3.7	0.0	0.8	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	19.2	36.9	18.3	0.0	0.0	136.3	18.7	0.0	28.5	15.7	0.0
LnGrp LOS	B	B	D	B	A	A	F	B		C	B	
Approach Vol, veh/h		851			154			854	A		565	A
Approach Delay, s/veh		27.7			18.3			39.7			16.9	
Approach LOS		C			B			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	22.5		22.5	9.5	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	18.0		18.0	5.0	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.5	12.1		16.9	7.0	8.5		12.7				
Green Ext Time (p_c), s	0.0	2.4		0.5	0.0	2.4		0.4				

Intersection Summary

HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

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

Intersection

Intersection Delay, s/veh 10.5

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	102	0	9	16	25	4	76	39	44	127	5
Future Vol, veh/h	25	102	0	9	16	25	4	76	39	44	127	5
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	100	0	0	57	0	40	67	44	94	11	16	100
Mvmt Flow	29	117	0	10	18	29	5	87	45	51	146	6
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.2	9.5	10.3	9.8
HCM LOS	B	A	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	20%	18%	100%	0%
Vol Thru, %	0%	66%	80%	32%	0%	96%
Vol Right, %	0%	34%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	115	127	50	44	132
LT Vol	4	0	25	9	44	0
Through Vol	0	76	102	16	0	127
RT Vol	0	39	0	25	0	5
Lane Flow Rate	5	132	146	57	51	152
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.009	0.217	0.269	0.092	0.084	0.235
Departure Headway (Hd)	7.042	5.903	6.641	5.79	6.011	5.566
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	506	605	539	613	593	642
Service Time	4.811	3.672	4.715	3.877	3.774	3.328
HCM Lane V/C Ratio	0.01	0.218	0.271	0.093	0.086	0.237
HCM Control Delay	9.9	10.3	12.2	9.5	9.3	10
HCM Lane LOS	A	B	B	A	A	A
HCM 95th-tile Q	0	0.8	1.1	0.3	0.3	0.9

Intersection

Intersection Delay, s/veh 11.2

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	14	36	14	22	12	92	16	69	38	172	103	15
Future Vol, veh/h	14	36	14	22	12	92	16	69	38	172	103	15
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	18	10	0	31	10	34	54	40	26	11	16	42
Mvmt Flow	17	44	17	27	15	114	20	85	47	212	127	19
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	1	1
HCM Control Delay	10.3	11.2	11.4	11.4
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	22%	17%	100%	0%	0%
Vol Thru, %	0%	64%	56%	10%	0%	100%	0%
Vol Right, %	0%	36%	22%	73%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	16	107	64	126	172	103	15
LT Vol	16	0	14	22	172	0	0
Through Vol	0	69	36	12	0	103	0
RT Vol	0	38	14	92	0	0	15
Lane Flow Rate	20	132	79	156	212	127	19
Geometry Grp	8	8	7	7	7	7	7
Degree of Util (X)	0.042	0.244	0.142	0.267	0.366	0.204	0.028
Departure Headway (Hd)	7.643	6.643	6.481	6.181	6.198	5.779	5.518
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	469	542	554	582	582	623	650
Service Time	5.376	4.375	4.213	3.91	3.92	3.5	3.239
HCM Lane V/C Ratio	0.043	0.244	0.143	0.268	0.364	0.204	0.029
HCM Control Delay	10.7	11.5	10.3	11.2	12.5	10	8.4
HCM Lane LOS	B	B	B	B	B	A	A
HCM 95th-tile Q	0.1	1	0.5	1.1	1.7	0.8	0.1

**Intersection**

Intersection Delay, s/veh 11.5

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑	↗	↘	↑	↗
Traffic Vol, veh/h	2	132	21	61	59	56	20	22	117	176	29	5
Future Vol, veh/h	2	132	21	61	59	56	20	22	117	176	29	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	100	9	27	34	45	17	50	41	9	8	33	0
Mvmt Flow	2	153	24	71	69	65	23	26	136	205	34	6
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	11.5	10.6	10.4	13.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	22	117	2	132	21	61	59	56	176	29	5
LT Vol	20	0	0	2	0	0	61	0	0	176	0	0
Through Vol	0	22	0	0	132	0	0	59	0	0	29	0
RT Vol	0	0	117	0	0	21	0	0	56	0	0	5
Lane Flow Rate	23	26	136	2	153	24	71	69	65	205	34	6
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.05	0.05	0.221	0.006	0.28	0.042	0.146	0.135	0.107	0.389	0.063	0.009
Departure Headway (Hd)	7.745	7.092	5.848	8.609	6.562	6.168	7.423	7.11	5.934	6.837	6.762	5.501
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	462	505	612	416	546	580	483	504	603	526	529	649
Service Time	5.491	4.838	3.594	6.354	4.307	3.913	5.17	4.857	3.681	4.58	4.505	3.244
HCM Lane V/C Ratio	0.05	0.051	0.222	0.005	0.28	0.041	0.147	0.137	0.108	0.39	0.064	0.009
HCM Control Delay	10.9	10.2	10.3	11.4	11.9	9.2	11.4	11	9.4	13.9	10	8.3
HCM Lane LOS	B	B	B	B	B	A	B	B	A	B	A	A
HCM 95th-tile Q	0.2	0.2	0.8	0	1.1	0.1	0.5	0.5	0.4	1.8	0.2	0

Intersection						
Int Delay, s/veh	6.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	5	0	5	5	0	31
Future Vol, veh/h	5	0	5	5	0	31
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	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	0	20	20	0	124

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	20	0	80
Stage 1	-	-	-	-	20
Stage 2	-	-	-	-	60
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1609	-	927
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	968
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1609	-	915
Mov Cap-2 Maneuver	-	-	-	-	915
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	955

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1064	-	-	1609	-
HCM Lane V/C Ratio	0.117	-	-	0.012	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	36	0	15	10	0	92
Future Vol, veh/h	36	0	15	10	0	92
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	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	144	0	60	40	0	368

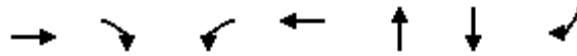
Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	144	0	304
Stage 1	-	-	-	-	144
Stage 2	-	-	-	-	160
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1451	-	692
Stage 1	-	-	-	-	888
Stage 2	-	-	-	-	874
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1451	-	663
Mov Cap-2 Maneuver	-	-	-	-	663
Stage 1	-	-	-	-	888
Stage 2	-	-	-	-	837

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	11.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	909	-	-	1451	-
HCM Lane V/C Ratio	0.405	-	-	0.041	-
HCM Control Delay (s)	11.6	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0.1	-



## 1: Clawiter Rd. &amp; Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	103	95	314	593	545	727	78
v/c Ratio	0.93	0.20	0.64	1.12	1.54	1.08	0.22
Control Delay	121.9	3.9	44.4	107.7	290.3	99.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	121.9	3.9	44.4	107.7	290.3	99.0	9.4
Queue Length 50th (ft)	81	0	213	~447	~593	~329	1
Queue Length 95th (ft)	#192	19	314	#674	#814	#453	40
Internal Link Dist (ft)	128			403	1161	1231	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	112	469	491	529	353	676	355
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.20	0.64	1.12	1.54	1.08	0.22

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG+P\_AM  
 04/18/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	17	79	88	292	127	424	112	290	105	352	325	73
Future Volume (veh/h)	17	79	88	292	127	424	112	290	105	352	325	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	907	1322	1470	1826	1633	1752	1722	1455	1366	1426	1366	1366
Adj Flow Rate, veh/h	18	85	95	314	137	456	120	312	0	378	349	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	67	39	29	5	18	10	12	30	36	32	36	36
Cap, veh/h	20	93	407	497	95	315	96	250		335	334	291
Arrive On Green	0.09	0.09	0.09	0.29	0.29	0.29	0.24	0.24	0.00	0.26	0.26	0.26
Sat Flow, veh/h	229	1082	1246	1739	331	1103	399	1037	0	1301	1298	1130
Grp Volume(v), veh/h	103	0	95	314	0	593	432	0	0	378	349	78
Grp Sat Flow(s),veh/h/ln	1311	0	1246	1739	0	1435	1435	0	0	1301	1298	1130
Q Serve(g_s), s	9.4	0.0	6.7	18.9	0.0	34.3	28.9	0.0	0.0	30.9	30.9	6.6
Cycle Q Clear(g_c), s	9.4	0.0	6.7	18.9	0.0	34.3	28.9	0.0	0.0	30.9	30.9	6.6
Prop In Lane	0.17		1.00	1.00		0.77	0.28		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	112	0	407	497	0	410	346	0		335	334	291
V/C Ratio(X)	0.92	0.00	0.23	0.63	0.00	1.45	1.25	0.00		1.13	1.04	0.27
Avail Cap(c_a), veh/h	112	0	407	497	0	410	346	0		335	334	291
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	29.4	37.3	0.0	42.9	45.6	0.0	0.0	44.6	44.5	35.5
Incr Delay (d2), s/veh	58.0	0.0	0.1	2.0	0.0	214.1	134.2	0.0	0.0	88.4	61.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	2.8	8.3	0.0	36.4	23.1	0.0	0.0	18.1	15.5	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.4	0.0	29.6	39.3	0.0	256.9	179.7	0.0	0.0	133.0	105.7	35.7
LnGrp LOS	F	A	C	D	A	F	F	A		F	F	D
Approach Vol, veh/h		198			907			432	A		805	
Approach Delay, s/veh		72.7			181.6			179.7			111.7	
Approach LOS		E			F			F			F	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		33.0		14.0		35.0		38.0				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		28.9		10.3		30.9		34.3				
Max Q Clear Time (g_c+I1), s		30.9		11.4		32.9		36.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	148.0
HCM 6th LOS	F

Notes

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



Lane Group	EBT	EBR	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	368	142	127	280	8	556	211
v/c Ratio	0.87	0.22	0.24	0.78	0.01	0.99	0.36
Control Delay	37.5	3.2	7.4	31.8	0.4	55.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	3.2	7.4	31.8	0.4	55.0	3.9
Queue Length 50th (ft)	80	0	12	60	0	~145	0
Queue Length 95th (ft)	#207	23	38	#171	1	#309	30
Internal Link Dist (ft)	168		176	324		1161	
Turn Bay Length (ft)		140			75		100
Base Capacity (vph)	451	690	562	361	693	563	581
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.21	0.23	0.78	0.01	0.99	0.36

#### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 2: Eden Landing Rd. & SR-92 EB Ramps & Clawiter Rd.

BG+P\_AM  
 04/18/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔			↖	↗		↖	↗
Traffic Volume (veh/h)	286	52	131	5	67	45	82	176	7	168	343	194
Future Volume (veh/h)	286	52	131	5	67	45	82	176	7	168	343	194
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1663	1781	1781	1530	1396	1352	1441	1515	1900	1796	1767	1233
Adj Flow Rate, veh/h	311	57	142	5	73	49	89	191	8	183	373	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	16	8	8	25	34	37	31	26	0	7	9	45
Cap, veh/h	296	27	604	83	240	151	208	361	644	222	301	
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	371	68	1510	0	601	377	257	902	1610	290	753	1045
Grp Volume(v), veh/h	368	0	142	127	0	0	280	0	8	556	0	0
Grp Sat Flow(s),veh/h/ln	439	0	1510	978	0	0	1159	0	1610	1043	0	1045
Q Serve(g_s), s	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.1	10.7	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	2.8	18.0	0.0	0.0	7.3	0.0	0.1	18.0	0.0	0.0
Prop In Lane	0.85		1.00	0.04		0.39	0.32		1.00	0.33		1.00
Lane Grp Cap(c), veh/h	323	0	604	474	0	0	569	0	644	524	0	
V/C Ratio(X)	1.14	0.00	0.24	0.27	0.00	0.00	0.49	0.00	0.01	1.06	0.00	
Avail Cap(c_a), veh/h	323	0	604	474	0	0	569	0	644	524	0	
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.6	0.0	8.9	9.2	0.0	0.0	10.1	0.0	8.1	16.8	0.0	0.0
Incr Delay (d2), s/veh	93.2	0.0	0.2	0.3	0.0	0.0	3.0	0.0	0.0	56.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	0.0	0.8	0.7	0.0	0.0	2.1	0.0	0.0	13.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	110.8	0.0	9.1	9.5	0.0	0.0	13.1	0.0	8.2	73.6	0.0	0.0
LnGrp LOS	F	A	A	A	A	A	B	A	A	F	A	
Approach Vol, veh/h		510			127			288			556	A
Approach Delay, s/veh		82.5			9.5			12.9			73.6	
Approach LOS		F			A			B			E	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		9.3		20.0		20.0		20.0				
Green Ext Time (p_c), s		1.2		0.0		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	59.4
HCM 6th LOS	E

Notes

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

Queues

9: Industrial Blvd. & Depot Rd.



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	70	249	427	418	626	166	41	476	10
v/c Ratio	0.05	0.14	0.47	0.88	0.74	0.38	0.11	0.29	0.53	0.01
Control Delay	25.1	25.2	6.5	51.8	21.9	19.0	0.1	53.9	36.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	25.2	6.5	51.8	21.9	19.0	0.1	53.9	36.0	0.0
Queue Length 50th (ft)	5	33	0	264	155	147	0	27	138	0
Queue Length 95th (ft)	16	62	34	362	217	192	0	59	211	0
Internal Link Dist (ft)		725		1517		890			940	
Turn Bay Length (ft)	170				165		185	205		120
Base Capacity (vph)	286	675	618	636	736	1635	1553	285	897	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.10	0.40	0.67	0.57	0.38	0.11	0.14	0.53	0.01

Intersection Summary

HCM 6th Signalized Intersection Summary  
9: Industrial Blvd. & Depot Rd.

BG+P\_AM  
04/18/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	56	199	139	171	31	334	501	133	33	381	8
Future Volume (veh/h)	8	56	199	139	171	31	334	501	133	33	381	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1574	1248	1870	1737	1781	1722	1737	1841	1900	1618	1648
Adj Flow Rate, veh/h	10	70	249	174	214	39	418	626	0	41	476	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	33	22	44	2	11	8	12	11	4	0	19	17
Cap, veh/h	290	569	382	226	240	42	546	1561		61	960	
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.19	0.47	0.00	0.03	0.31	0.00
Sat Flow, veh/h	850	1574	1055	488	664	116	1640	3300	1560	1810	3075	1397
Grp Volume(v), veh/h	10	70	249	427	0	0	418	626	0	41	476	0
Grp Sat Flow(s),veh/h/ln	850	1574	1055	1268	0	0	1640	1650	1560	1810	1537	1397
Q Serve(g_s), s	0.0	3.0	20.2	30.4	0.0	0.0	16.6	12.7	0.0	2.3	12.9	0.0
Cycle Q Clear(g_c), s	1.1	3.0	20.2	33.4	0.0	0.0	16.6	12.7	0.0	2.3	12.9	0.0
Prop In Lane	1.00		1.00	0.41		0.09	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	569	382	508	0	0	546	1561		61	960	
V/C Ratio(X)	0.03	0.12	0.65	0.84	0.00	0.00	0.77	0.40		0.67	0.50	
Avail Cap(c_a), veh/h	334	652	437	577	0	0	844	1561		274	960	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.3	21.9	27.3	32.0	0.0	0.0	17.6	17.6	0.0	49.0	28.7	0.0
Incr Delay (d2), s/veh	0.0	0.1	2.8	9.8	0.0	0.0	2.3	0.8	0.0	12.2	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.1	5.3	11.3	0.0	0.0	6.3	4.9	0.0	1.2	5.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	22.0	30.2	41.7	0.0	0.0	19.9	18.3	0.0	61.2	30.5	0.0
LnGrp LOS	C	C	C	D	A	A	B	B		E	C	
Approach Vol, veh/h		329			427			1044	A		517	A
Approach Delay, s/veh		28.1			41.7			19.0			33.0	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	53.0		41.6	24.4	36.5		41.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	15.5	48.5		42.5	38.5	25.5		42.5				
Max Q Clear Time (g_c+I1), s	4.3	14.7		22.2	18.6	14.9		35.4				
Green Ext Time (p_c), s	0.0	4.9		1.3	1.3	2.3		1.7				

Intersection Summary

HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Notes

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

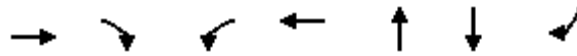


## Queues

BG+P\_PM

04/15/2022

## 1: Clawiter Rd. &amp; Breakwater Ave./SR-92 WB Ramps



Lane Group	EBT	EBR	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	138	147	124	342	655	854	40
v/c Ratio	0.79	0.23	0.50	0.91	1.44	0.90	0.08
Control Delay	79.2	3.5	46.3	47.2	238.6	48.1	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	3.5	46.3	47.2	238.6	48.1	1.4
Queue Length 50th (ft)	89	0	72	91	~579	277	0
Queue Length 95th (ft)	#241	26	143	#261	#996	398	6
Internal Link Dist (ft)	128			403	144	1216	
Turn Bay Length (ft)		85					65
Base Capacity (vph)	175	630	408	482	456	1329	671
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.23	0.30	0.71	1.44	0.64	0.06

## Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 1: Clawiter Rd. & Breakwater Ave./SR-92 WB Ramps

BG+P\_PM  
 04/15/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↕			↖	↗
Traffic Volume (veh/h)	37	90	135	114	50	265	41	389	172	232	554	37
Future Volume (veh/h)	37	90	135	114	50	265	41	389	172	232	554	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1826	1707	1559	1174	1366	1411	1633	1885	1841	1737	1826
Adj Flow Rate, veh/h	40	98	147	124	54	288	45	423	0	252	602	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	13	5	13	23	49	36	33	18	1	4	11	5
Cap, veh/h	46	112	482	362	39	209	38	360		269	686	442
Arrive On Green	0.09	0.09	0.09	0.24	0.24	0.24	0.25	0.25	0.00	0.29	0.29	0.29
Sat Flow, veh/h	522	1278	1447	1485	161	858	156	1469	0	942	2398	1547
Grp Volume(v), veh/h	138	0	147	124	0	342	468	0	0	452	402	40
Grp Sat Flow(s),veh/h/ln	1800	0	1447	1485	0	1019	1625	0	0	1690	1650	1547
Q Serve(g_s), s	8.6	0.0	8.6	7.8	0.0	27.7	27.9	0.0	0.0	29.7	26.1	2.2
Cycle Q Clear(g_c), s	8.6	0.0	8.6	7.8	0.0	27.7	27.9	0.0	0.0	29.7	26.1	2.2
Prop In Lane	0.29		1.00	1.00		0.84	0.10		0.00	0.56		1.00
Lane Grp Cap(c), veh/h	158	0	482	362	0	248	399	0		483	472	442
V/C Ratio(X)	0.87	0.00	0.30	0.34	0.00	1.38	1.17	0.00		0.94	0.85	0.09
Avail Cap(c_a), veh/h	158	0	482	362	0	248	399	0		602	588	551
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.2	0.0	28.1	35.5	0.0	43.0	42.9	0.0	0.0	39.6	38.3	29.8
Incr Delay (d2), s/veh	36.3	0.0	0.1	0.2	0.0	193.0	101.5	0.0	0.0	18.2	8.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	4.2	2.9	0.0	20.2	22.3	0.0	0.0	14.6	11.5	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.5	0.0	28.3	35.7	0.0	236.0	144.4	0.0	0.0	57.7	46.5	29.8
LnGrp LOS	F	A	C	D	A	F	F	A		E	D	C
Approach Vol, veh/h		285			466			468	A		894	
Approach Delay, s/veh		56.9			182.7			144.4			51.4	
Approach LOS		E			F			F			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.0		13.7		36.6		31.4				
Change Period (Y+Rc), s		4.1		3.7		4.1		3.7				
Max Green Setting (Gmax), s		27.9		10.0		40.5		27.7				
Max Q Clear Time (g_c+I1), s		29.9		10.6		31.7		29.7				
Green Ext Time (p_c), s		0.0		0.0		0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	101.7
HCM 6th LOS	F

Notes

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





Lane Group	EBT	EBR	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	277	100	363	659	7	272	711
v/c Ratio	0.92	0.18	0.50	1.30	0.01	1.00	0.74
Control Delay	54.2	3.5	10.1	170.4	0.2	75.6	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	3.5	10.1	170.4	0.2	75.6	9.1
Queue Length 50th (ft)	63	0	46	~234	0	~68	25
Queue Length 95th (ft)	#156	16	86	#343	0	#164	67
Internal Link Dist (ft)	168		176	324		933	
Turn Bay Length (ft)		140			75		100
Base Capacity (vph)	314	575	753	506	677	273	960
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.17	0.48	1.30	0.01	1.00	0.74

#### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary  
 2: Eden Landing Rd. & SR-92 EB Ramps & Clawiter Rd.

BG+P\_PM  
 04/15/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔			↖	↗		↖	↗
Traffic Volume (veh/h)	215	12	82	2	172	124	278	262	6	70	153	583
Future Volume (veh/h)	215	12	82	2	172	124	278	262	6	70	153	583
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1159	1500	1900	1856	1811	1841	1781	1900	1530	1618	1841
Adj Flow Rate, veh/h	262	15	100	2	210	151	339	320	7	85	187	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	20	50	27	0	3	6	4	8	0	25	19	4
Cap, veh/h	248	8	508	80	326	232	316	184	644	105	153	
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00
Sat Flow, veh/h	232	21	1271	0	814	580	488	460	1610	0	382	1560
Grp Volume(v), veh/h	277	0	100	363	0	0	659	0	7	272	0	0
Grp Sat Flow(s),veh/h/ln	252	0	1271	1395	0	0	948	0	1610	382	0	1560
Q Serve(g_s), s	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	2.3	18.0	0.0	0.0	18.0	0.0	0.1	18.0	0.0	0.0
Prop In Lane	0.95		1.00	0.01		0.42	0.51		1.00	0.31		1.00
Lane Grp Cap(c), veh/h	257	0	508	638	0	0	500	0	644	258	0	
V/C Ratio(X)	1.08	0.00	0.20	0.57	0.00	0.00	1.32	0.00	0.01	1.06	0.00	
Avail Cap(c_a), veh/h	257	0	508	638	0	0	500	0	644	258	0	
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	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.9	0.0	8.8	10.4	0.0	0.0	15.7	0.0	8.1	13.1	0.0	0.0
Incr Delay (d2), s/veh	79.0	0.0	0.2	1.2	0.0	0.0	156.3	0.0	0.0	71.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	0.5	2.3	0.0	0.0	26.5	0.0	0.0	6.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.8	0.0	9.0	11.6	0.0	0.0	171.9	0.0	8.2	84.4	0.0	0.0
LnGrp LOS	F	A	A	B	A	A	F	A	A	F	A	
Approach Vol, veh/h		377			363			666			272	A
Approach Delay, s/veh		74.3			11.6			170.2			84.4	
Approach LOS		E			B			F			F	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		20.0		20.0		20.0		20.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	100.4
HCM 6th LOS	F

Notes

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





**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Ave Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG P\Intersection 2 AM.xlsm\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/Eden Landi  
**Scenario:** BG AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:30 AM	8:30 AM		257	656	427	117
2nd Highest Hour			243	621	404	111
3rd Highest Hour			240	612	399	109
4th Highest Hour			230	586	381	105
5th Highest Hour			226	577	376	103
6th Highest Hour			226	577	376	103
7th Highest Hour			216	551	359	98
8th Highest Hour			212	542	353	97
9th Highest Hour			206	525	342	94
10th Highest Hour			192	490	319	87
11th Highest Hour			185	472	307	84
12th Highest Hour			182	464	302	83
13th Highest Hour			175	446	290	80
14th Highest Hour			151	385	251	69
15th Highest Hour			120	306	199	55
16th Highest Hour			113	289	188	51
17th Highest Hour			79	201	131	36
18th Highest Hour			65	166	108	30
19th Highest Hour			34	87	57	16
20th Highest Hour			24	61	40	11
21st Highest Hour			21	52	34	9
22nd Highest Hour			14	35	23	6
23rd Highest Hour			7	17	11	3
24th Highest Hour			7	17	11	3

**Warrant Summary**

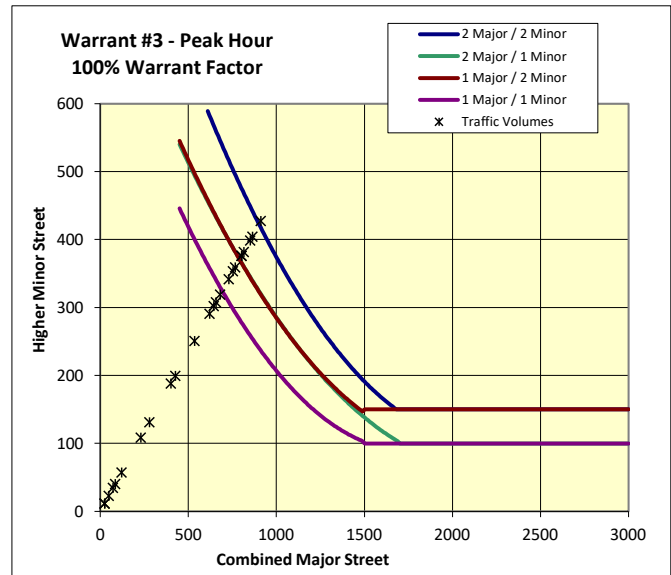
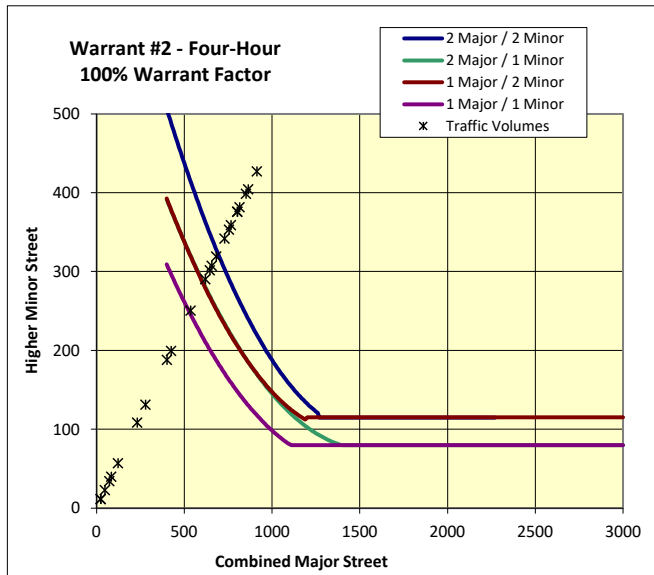
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	8	Yes	Yes
80%	A	400	120	16	Yes	Yes
	B	600	60	13	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	17	Yes	Yes
	B	420	42	15	Yes	Yes





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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG P\Intersection 2 PM.xml\Data Input  
**Intersection:** 2. Clawiter Rd. & SR-92 EB Ramps/ Eden Land  
**Scenario:** BG PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:30 PM	5:30 PM		541	574	288	298
2nd Highest Hour			512	543	273	282
3rd Highest Hour			505	536	269	278
4th Highest Hour			483	513	257	266
5th Highest Hour			476	505	253	262
6th Highest Hour			476	505	253	262
7th Highest Hour			454	482	242	250
8th Highest Hour			447	475	238	246
9th Highest Hour			433	459	230	238
10th Highest Hour			404	429	215	223
11th Highest Hour			390	413	207	215
12th Highest Hour			382	406	204	211
13th Highest Hour			368	390	196	203
14th Highest Hour			317	337	169	175
15th Highest Hour			252	268	134	139
16th Highest Hour			238	253	127	131
17th Highest Hour			166	176	88	91
18th Highest Hour			137	145	73	75
19th Highest Hour			72	77	38	40
20th Highest Hour			50	54	27	28
21st Highest Hour			43	46	23	24
22nd Highest Hour			29	31	15	16
23rd Highest Hour			14	15	8	8
24th Highest Hour			14	15	8	8

**Warrant Summary**

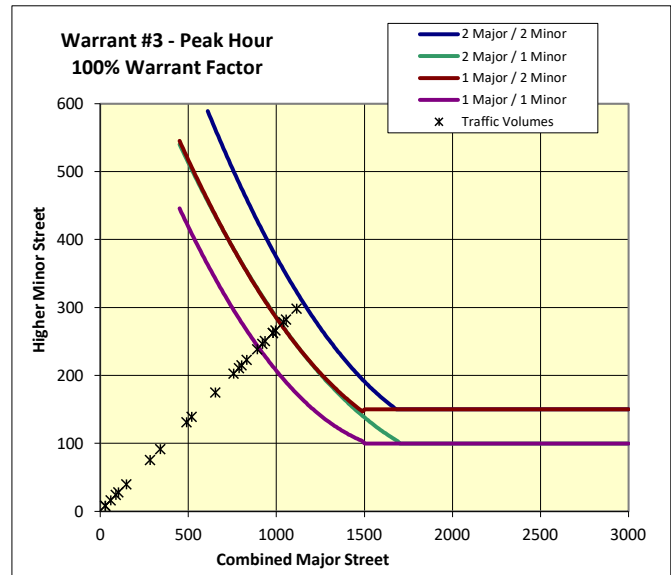
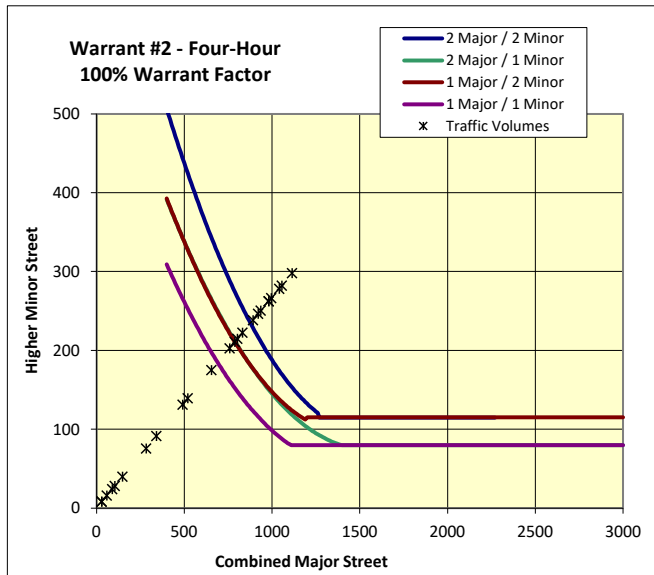
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	500	150	14	Yes	Yes
	B	750	75	13	Yes	Yes
80%	A	400	120	16	Yes	Yes
	B	600	60	14	Yes	Yes
70%	A	350	105	16	Yes	Yes
	B	525	53	14	Yes	Yes
56%	A	280	84	17	Yes	Yes
	B	420	42	16	Yes	Yes





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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG P\Intersection 6 AM.xlsm\Data Input  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** BG AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:35 AM	8:35 AM		75	807	4	1
2nd Highest Hour			71	764	4	1
3rd Highest Hour			70	753	4	1
4th Highest Hour			67	721	4	1
5th Highest Hour			66	710	4	1
6th Highest Hour			66	710	4	1
7th Highest Hour			63	678	3	1
8th Highest Hour			62	667	3	1
9th Highest Hour			60	646	3	1
10th Highest Hour			56	603	3	1
11th Highest Hour			54	581	3	1
12th Highest Hour			53	570	3	1
13th Highest Hour			51	549	3	1
14th Highest Hour			44	473	2	1
15th Highest Hour			35	377	2	0
16th Highest Hour			33	355	2	0
17th Highest Hour			23	247	1	0
18th Highest Hour			19	204	1	0
19th Highest Hour			10	108	1	0
20th Highest Hour			7	75	0	0
21st Highest Hour			6	65	0	0
22nd Highest Hour			4	43	0	0
23rd Highest Hour			2	22	0	0
24th Highest Hour			2	22	0	0

**Warrant Summary**

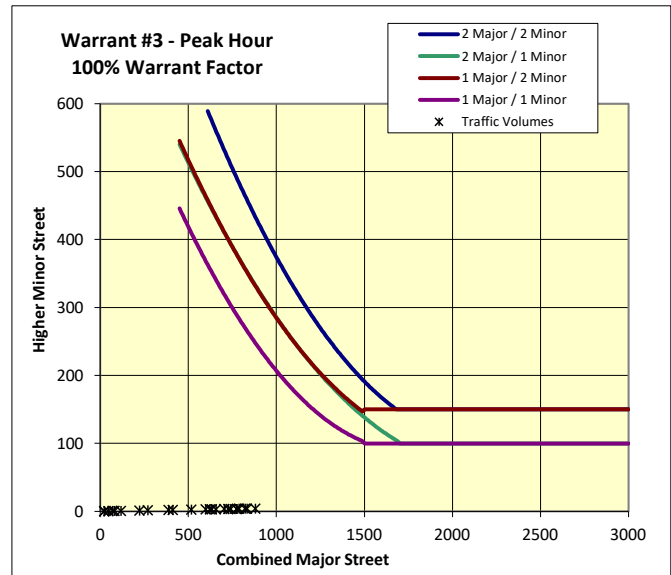
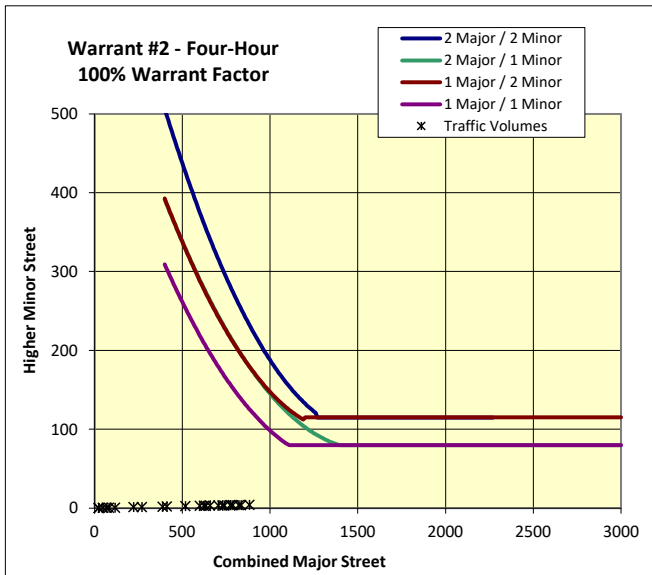
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG P\Intersection 6 PM.xml\Data Inout  
**Intersection:** 6. Clawiter Rd. & Industrial Blvd (west)  
**Scenario:** BG PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		587	144	9	8
2nd Highest Hour			556	136	9	8
3rd Highest Hour			548	134	8	7
4th Highest Hour			524	129	8	7
5th Highest Hour			517	127	8	7
6th Highest Hour			517	127	8	7
7th Highest Hour			493	121	8	7
8th Highest Hour			485	119	7	7
9th Highest Hour			470	115	7	6
10th Highest Hour			438	108	7	6
11th Highest Hour			423	104	6	6
12th Highest Hour			415	102	6	6
13th Highest Hour			399	98	6	5
14th Highest Hour			344	84	5	5
15th Highest Hour			274	67	4	4
16th Highest Hour			258	63	4	4
17th Highest Hour			180	44	3	2
18th Highest Hour			149	36	2	2
19th Highest Hour			78	19	1	1
20th Highest Hour			55	13	1	1
21st Highest Hour			47	12	1	1
22nd Highest Hour			31	8	0	0
23rd Highest Hour			16	4	0	0
24th Highest Hour			16	4	0	0

**Warrant Summary**

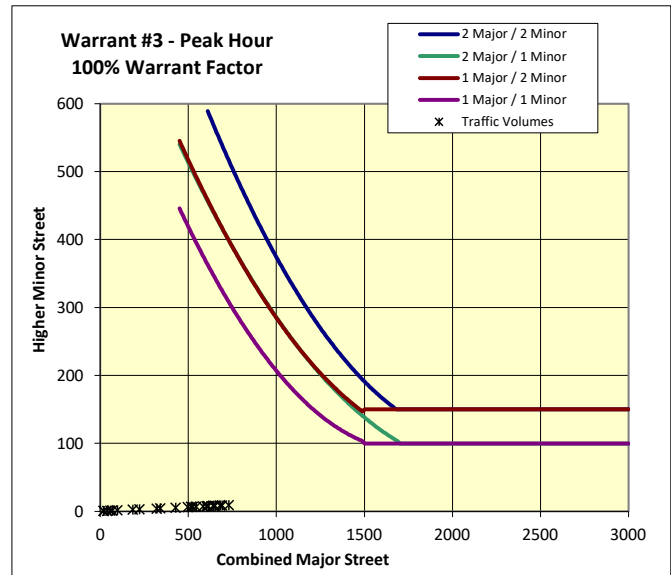
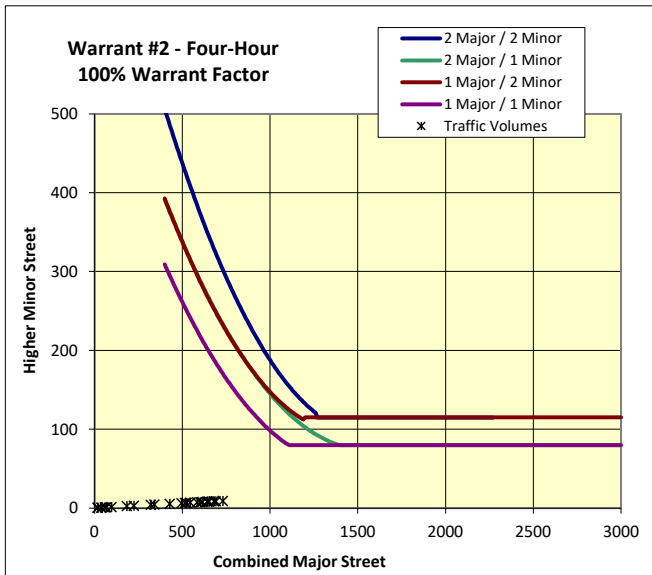
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	No
80%	A	480	120	0	No	No
	B	720	60	0	No	No
70%	A	420	105	0	No	No
	B	630	53	0	No	No
56%	A	336	84	0	No	No
	B	504	42	0	No	No





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**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG P\Intersection 10 AM.xlsm\Data Inout  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** BG AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
8:00 AM	9:00 AM		193	97	31	40
2nd Highest Hour			183	92	30	39
3rd Highest Hour			180	91	27	34
4th Highest Hour			172	87	25	32
5th Highest Hour			170	85	23	30
6th Highest Hour			170	85	20	26
7th Highest Hour			162	81	20	25
8th Highest Hour			160	80	18	24
9th Highest Hour			154	78	17	22
10th Highest Hour			144	72	16	20
11th Highest Hour			139	70	16	20
12th Highest Hour			136	69	14	19
13th Highest Hour			131	66	14	18
14th Highest Hour			113	57	13	16
15th Highest Hour			90	45	13	16
16th Highest Hour			85	43	13	16
17th Highest Hour			59	30	10	13
18th Highest Hour			49	25	9	11
19th Highest Hour			26	13	7	8
20th Highest Hour			18	9	3	4
21st Highest Hour			15	8	2	3
22nd Highest Hour			10	5	2	3
23rd Highest Hour			5	3	1	2
24th Highest Hour			5	3	1	2

**Warrant Summary**

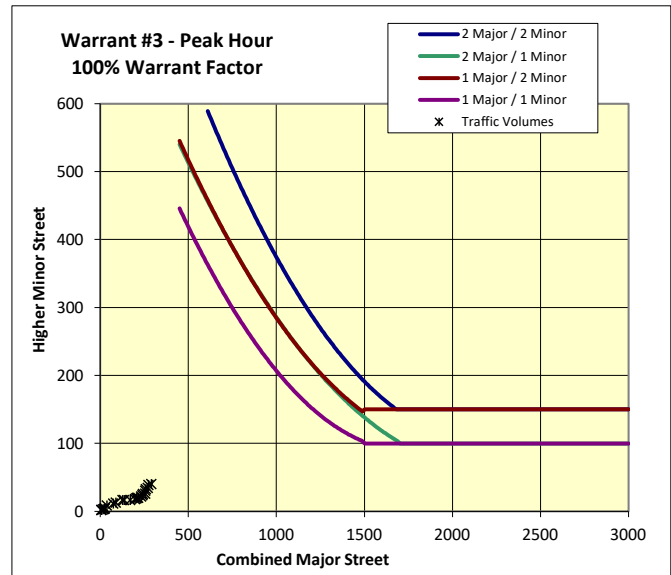
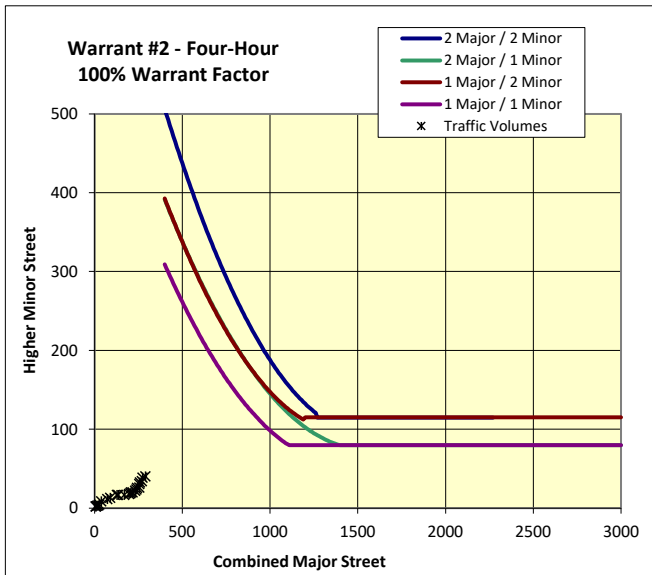
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	0	No	No
	B	420	42	0	No	No







**KITTELSON & ASSOCIATES, INC.**  
 610 SW Alder, Suite 700  
 Portland, Oregon 97205  
 (503) 228-5230

**Project #:** 26915  
**Project Name:** Hayward Enterprise Industrial TIA  
**Analyst:** MAR  
**Date:** 2/9/2022  
**File:** H:\26\26915 - Hayward Enterprise Ave Industrial  
 EIR\analysis\Signal  
 Warrants\BG P\Intersection 10 PM.xlsm\Data Inout  
**Intersection:** 10. Whitesell St. & Enterprise Ave.  
**Scenario:** BG PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM		119	176	128	50
2nd Highest Hour			113	167	124	48
3rd Highest Hour			111	164	110	43
4th Highest Hour			106	157	104	41
5th Highest Hour			105	155	97	38
6th Highest Hour			105	155	82	32
7th Highest Hour			100	148	81	32
8th Highest Hour			98	145	75	29
9th Highest Hour			95	141	70	27
10th Highest Hour			89	131	64	25
11th Highest Hour			86	127	64	25
12th Highest Hour			84	124	60	23
13th Highest Hour			81	120	57	22
14th Highest Hour			70	103	53	21
15th Highest Hour			56	82	53	21
16th Highest Hour			52	77	53	21
17th Highest Hour			36	54	41	16
18th Highest Hour			30	45	36	14
19th Highest Hour			16	23	27	11
20th Highest Hour			11	16	14	6
21st Highest Hour			10	14	10	4
22nd Highest Hour			6	9	9	3
23rd Highest Hour			3	5	6	2
24th Highest Hour			3	5	6	2

**Warrant Summary**

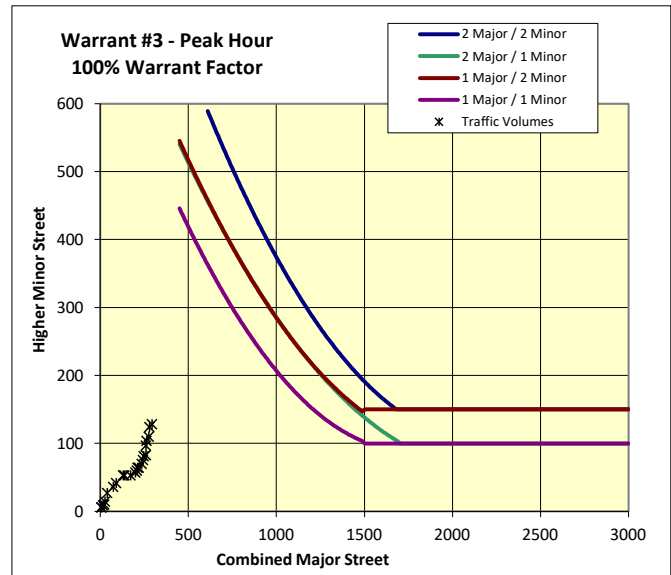
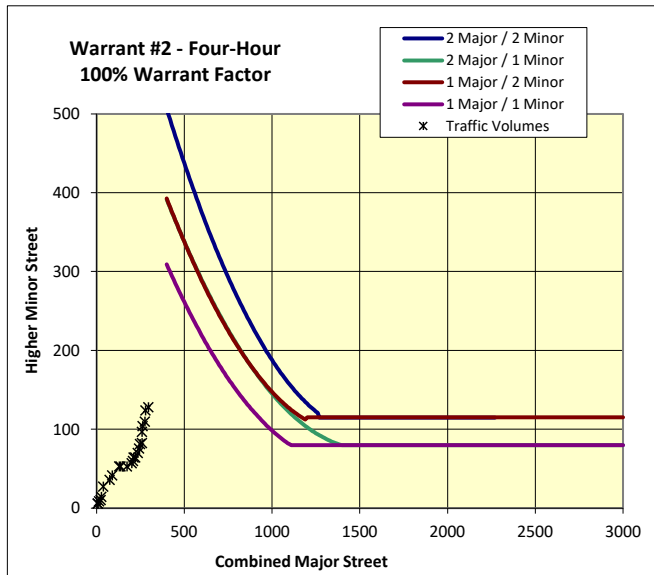
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	0	No	No
	B	525	53	0	No	No
56%	A	280	84	2	No	No
	B	420	42	0	No	No





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 EIR\analysis\Signal  
 Warrants\BG P\Intersection 11 AM.xlsm\Data Inout  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** BG AM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:55 AM	8:55 AM		193	178	26	180
2nd Highest Hour			183	169	25	174
3rd Highest Hour			180	166	22	154
4th Highest Hour			172	159	21	146
5th Highest Hour			170	157	20	136
6th Highest Hour			170	157	17	116
7th Highest Hour			162	150	16	114
8th Highest Hour			160	147	15	106
9th Highest Hour			154	142	14	98
10th Highest Hour			144	133	13	90
11th Highest Hour			139	128	13	90
12th Highest Hour			136	126	12	84
13th Highest Hour			131	121	12	80
14th Highest Hour			113	104	11	74
15th Highest Hour			90	83	11	74
16th Highest Hour			85	78	11	74
17th Highest Hour			59	55	8	58
18th Highest Hour			49	45	7	50
19th Highest Hour			26	24	5	38
20th Highest Hour			18	17	3	20
21st Highest Hour			15	14	2	14
22nd Highest Hour			10	9	2	12
23rd Highest Hour			5	5	1	8
24th Highest Hour			5	5	1	8

**Warrant Summary**

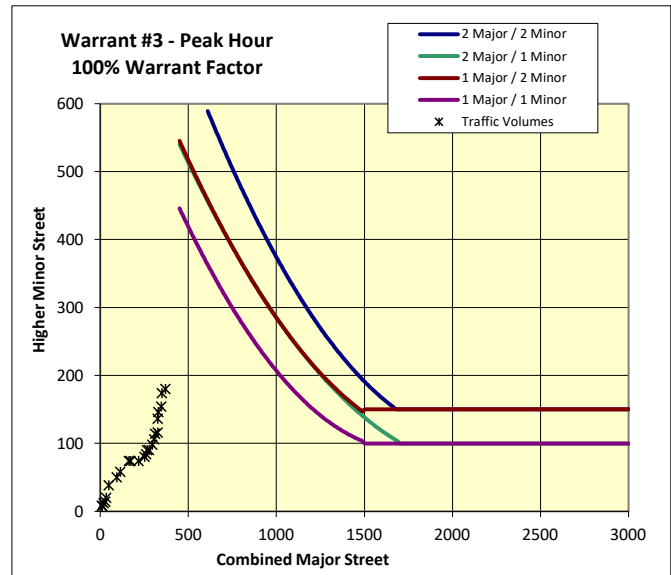
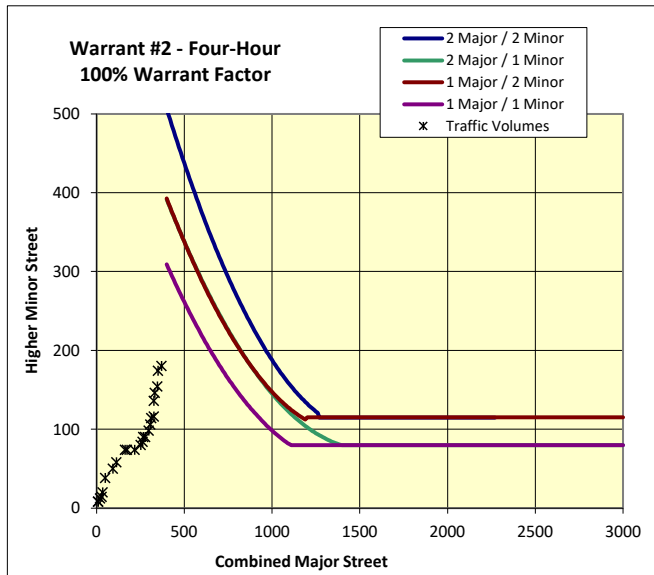
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	2	No	No
	B	525	53	0	No	No
56%	A	280	84	9	Yes	Yes
	B	420	42	0	No	No





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 EIR\analysis\Signal  
 Warrants\BG P\Intersection 11 PM.xlsm\Data Input  
**Intersection:** 11. Whitesell St. & Depot Rd.  
**Scenario:** BG PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:05 PM	5:05 PM		123	290	64	126
2nd Highest Hour			116	275	62	122
3rd Highest Hour			115	271	55	108
4th Highest Hour			110	259	52	102
5th Highest Hour			108	255	48	95
6th Highest Hour			108	255	41	81
7th Highest Hour			103	244	41	80
8th Highest Hour			102	240	38	74
9th Highest Hour			98	232	35	69
10th Highest Hour			92	217	32	63
11th Highest Hour			89	209	32	63
12th Highest Hour			87	205	30	59
13th Highest Hour			84	197	28	56
14th Highest Hour			72	170	26	52
15th Highest Hour			57	135	26	52
16th Highest Hour			54	128	26	52
17th Highest Hour			38	89	21	41
18th Highest Hour			31	73	18	35
19th Highest Hour			16	39	14	27
20th Highest Hour			11	27	7	14
21st Highest Hour			10	23	5	10
22nd Highest Hour			7	15	4	8
23rd Highest Hour			3	8	3	6
24th Highest Hour			3	8	3	6

**Warrant Summary**

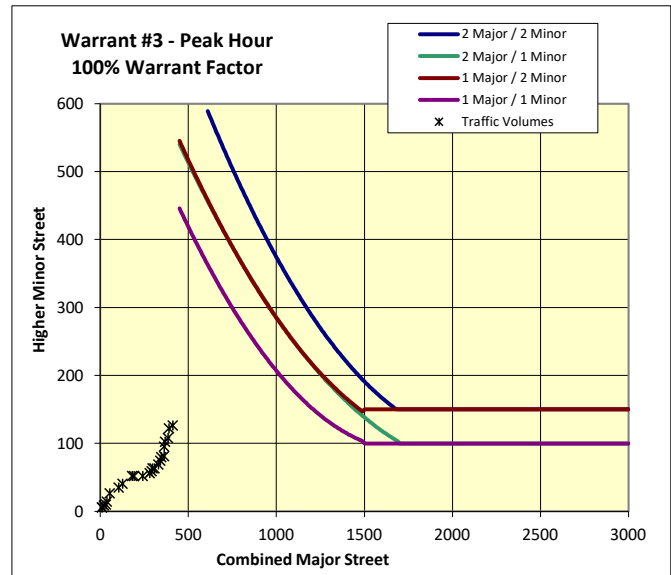
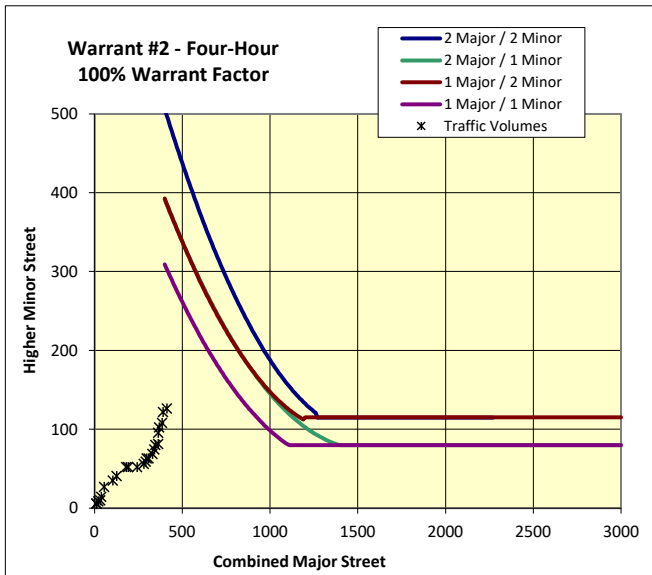
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
Minor Street: 8th-Highest Hour / Peak Hour	59%

**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	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	1	No	No
	B	600	60	0	No	No
70%	A	350	105	3	No	No
	B	525	53	0	No	No
56%	A	280	84	5	No	No
	B	420	42	0	No	No





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 EIR\analysis\Signal  
 Warrants\BG P\Intersection 12 AM.xlsm\Data Input  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** BG AM+p

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
7:50 AM	8:50 AM		70	100	65	612
2nd Highest Hour			66	95	63	592
3rd Highest Hour			65	93	56	524
4th Highest Hour			63	89	53	496
5th Highest Hour			62	88	49	462
6th Highest Hour			62	88	42	394
7th Highest Hour			59	84	41	388
8th Highest Hour			58	83	38	360
9th Highest Hour			56	80	35	333
10th Highest Hour			52	75	33	306
11th Highest Hour			50	72	33	306
12th Highest Hour			49	71	30	286
13th Highest Hour			48	68	29	272
14th Highest Hour			41	59	27	252
15th Highest Hour			33	47	27	252
16th Highest Hour			31	44	27	252
17th Highest Hour			21	31	21	197
18th Highest Hour			18	25	18	170
19th Highest Hour			9	13	14	129
20th Highest Hour			7	9	7	68
21st Highest Hour			6	8	5	48
22nd Highest Hour			4	5	4	41
23rd Highest Hour			2	3	3	27
24th Highest Hour			2	3	3	27

**Warrant Summary**

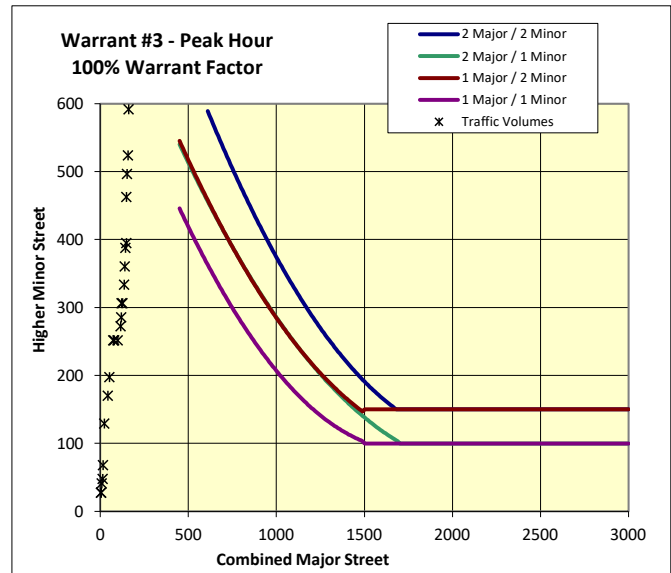
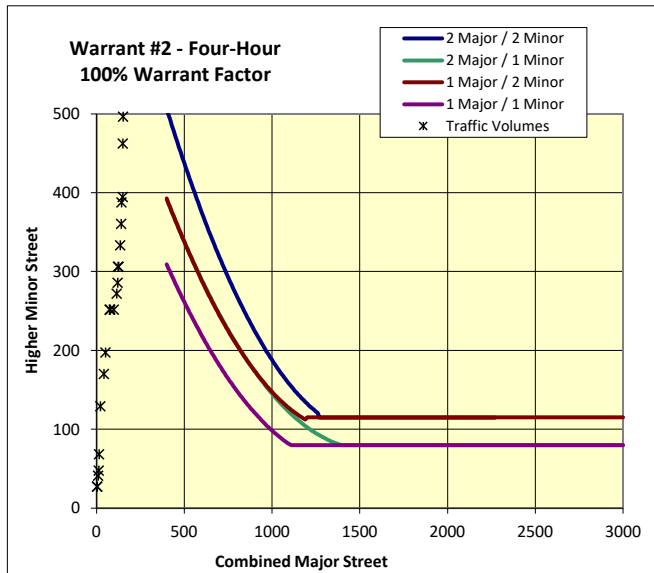
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
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Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
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 EIR\analysis\Sigal  
 Warrants\BG P\Intersection 12 PM.xlsm\Data Input  
**Intersection:** 12. Cabot Blvd. & Winton Ave.  
**Scenario:** BG PM+P

**Analysis Traffic Volumes**

Hour	Major Street		Minor Street			
	Begin	End	NB	SB	EB	WB
4:10 PM	5:10 PM		159	210	155	176
2nd Highest Hour			151	199	150	170
3rd Highest Hour			148	196	133	151
4th Highest Hour			142	188	126	143
5th Highest Hour			140	185	117	133
6th Highest Hour			140	185	100	113
7th Highest Hour			134	176	98	111
8th Highest Hour			131	174	91	104
9th Highest Hour			127	168	84	96
10th Highest Hour			119	157	78	88
11th Highest Hour			114	151	78	88
12th Highest Hour			112	148	72	82
13th Highest Hour			108	143	69	78
14th Highest Hour			93	123	64	72
15th Highest Hour			74	98	64	72
16th Highest Hour			70	92	64	72
17th Highest Hour			49	64	50	57
18th Highest Hour			40	53	43	49
19th Highest Hour			21	28	33	37
20th Highest Hour			15	20	17	20
21st Highest Hour			13	17	12	14
22nd Highest Hour			8	11	10	12
23rd Highest Hour			4	6	7	8
24th Highest Hour			4	6	7	8

**Warrant Summary**

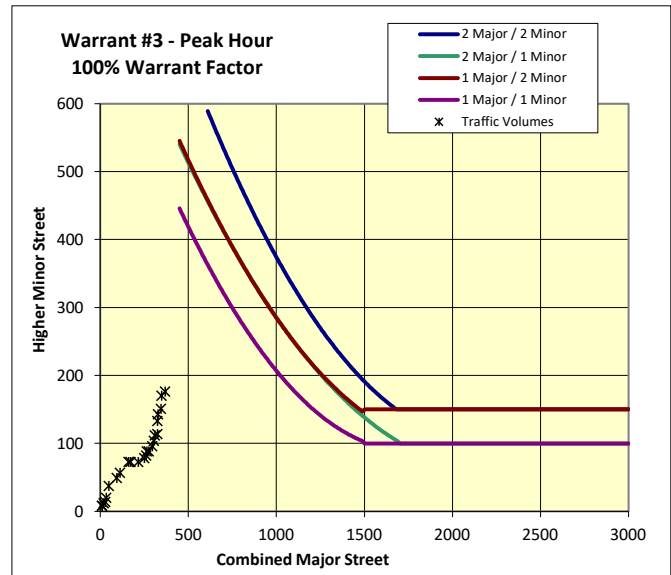
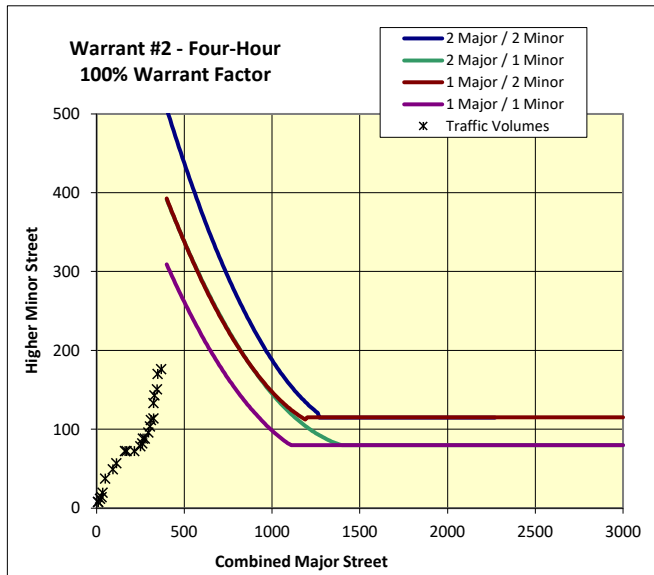
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

**Input Parameters**

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
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	81%
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100%	A	500	150	0	No	No
	B	750	75	0	No	No
80%	A	400	120	0	No	No
	B	600	60	0	No	No
70%	A	350	105	2	No	No
	B	525	53	0	No	No
56%	A	280	84	9	Yes	Yes
	B	420	42	0	No	No



Appendix G: ACTC Development Review  
Complete Streets Checklist

## Development Review Complete Streets Checklist

This checklist is designed to assist the applicant and jurisdiction staff identify and assess a range of Complete Streets-related needs in the vicinity of each development. These needs, if addressed, would better serve the multimodal transportation needs of those coming and going from the site and the surrounding area. The checklist is to be completed during the pre-application phase, but can be used as a reference throughout the development and design of the project. Following completion of the checklist, staff will identify and document project modifications for further evaluation and discussion.

Project Name: 3636 Enterprise Avenue Industrial Project Project Description / Project Type: Industrial Park  
Project Location: 3636 Enterprise Avenue, Hayward, CA  
Project Manager \_\_\_\_\_  
Anticipated construction date \_\_\_\_\_

### Pre-Application Phase

#### Project Description

- What are the proposed land uses (check all that apply)?
  - residential
  - commercial /mixed use
  - industrial
  - civic/institutional
  - other \_\_\_\_\_
- What are the major trip generators near the project site, if any? (existing and future)
  - Schools yes no
  - Major employers yes no
  - Civic/community destinations yes no
  - Medium to high-density residential yes no
  - Senior centers/healthcare facilities yes no
  - Daily needs (grocery, retail, etc.) yes no
  - Other \_\_\_\_\_
- Is the project site located on the path to/from nearby trip generators?  
yes no  
Explain: Located directly on Enterprise Ave. and adjacent to freeway ramps
- Based on the modal priority maps (available at <https://alameda-ctc.maps.arcgis.com/apps/View/index.html?appid=2040175145de4305>

[a5f59c6e82ca16c7](#)), list the modal priorities on adjacent streets (check all that apply):

Adjacent Street 1 Name: Enterprise Avenue

Auto	<input type="checkbox"/> First	<input type="checkbox"/> Second	<input checked="" type="checkbox"/> Other
Bicycle	<input checked="" type="checkbox"/> First	<input type="checkbox"/> Second	<input type="checkbox"/> Other
Pedestrian	<input type="checkbox"/> First	<input checked="" type="checkbox"/> Second	<input type="checkbox"/> Other
Transit	<input type="checkbox"/> First	<input type="checkbox"/> Second	<input checked="" type="checkbox"/> Other
Trucks	<input type="checkbox"/> First	<input type="checkbox"/> Second	<input checked="" type="checkbox"/> Other

Work with Transportation and Engineering Staff to fill out questions 5-8.

- Within the past five years, have there been any fatal or severe injury collisions within ¼ mile of the site? yes no  
*If yes, explain: From 2015 to 2019, six along SR-92 and one at the WB ramp intersection at Industrial Blvd.*
- Within the past five years, have there been any collisions within ¼ mile of the site involving pedestrians or bicyclists? yes no

If yes, explain: One bike collision on Clawiter between Diablo Ave. and Enterprise Ave. One bike collision at the SR-92 WB ramp intersection at Industrial blvd.

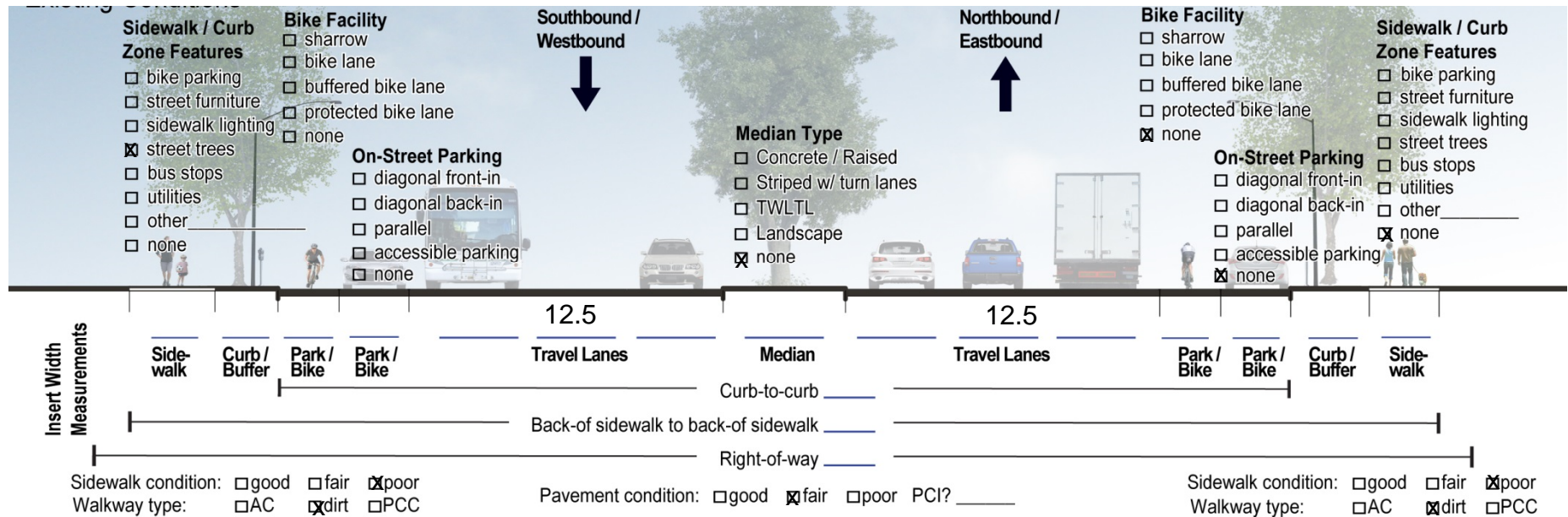
7. Have you observed other opportunities to improve safety performance? (based on field observation) yes no If yes, note:

If yes, explain: Improve sidewalks (e.g. Re-stripe crosswalks to be high-visibility); add sidewalks

### Existing Physical Conditions

8. What are the existing right-of-way elements adjacent to the project site? Use cross section graphic for each street adjacent to the site.

Adjacent Street 1: Street name Enterprise Avenue



TWLTL = two-way left turn lane | AC = asphalt concrete | PCC = poured cement concrete | PCI = pavement condition index



Plans, Policies, Guidelines, and Standards

9. What are **relevant ongoing or existing plans**?

Plan	Identified Needs (yes or no)				
	Ped	Bike	Transit	Vehicular	Other
Bicycle and Pedestrian Master Plan	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> yes <input type="checkbox"/> no

List any transportation improvement needs identified in the plan documents listed above:

The Hayward Bicycle and Pedestrian Master Plan (BPMP).

The BPMP includes a map of roadways with the top pedestrian prioritization scores, highlighting roads that are prime candidates for improvements. Within the study area these includes portions of Clawiter Road, Winton Avenue, Industrial Boulevard, Depot Road, and Breakwater Avenue (Parallel to SR 92).

Transportation Evaluation

10. Indicate whether the following elements have been evaluated for existing conditions at the site and surrounding area and list the result for each mode:

**Pedestrian**

- Internal site circulation and pedestrian routes  yes  no
- Site access and street frontage  yes  no
- Signage and wayfinding  yes  no
- Intersections and street crossings  yes  no
- Access to/from surrounding area  yes  no
- Lighting  yes  no
- ADA facilities  yes  no
- Other \_\_\_\_\_  yes  no

List any pedestrian deficiencies identified:

**Bicycle**

- Parking supply and ease of use  yes  no
- Site access  yes  no
- Signage and wayfinding  yes  no
- Intersections  yes  no
- Access to/from surrounding area  yes  no
- Other \_\_\_\_\_  yes  no

List any bicycle deficiencies identified:

**Auto**

- On-street parking  yes  no
- Off-street parking  yes  no
- Disabled parking  yes  no
- Green infrastructure  yes  no
- Driveway placement and ped/bike conflict points  yes  no
- Other \_\_\_\_\_  yes  no

List any auto deficiencies identified:

**Transit**

Bus stop placement

yes  no

Waiting area amenities and stop design parameters

yes  no

Other \_\_\_\_\_

yes  no

List any transit deficiencies identified:

**Trucks and Heavy Vehicles**

Curbside loading areas

yes  no

On-site loading areas

yes  no

Turning radii

yes  no

Emergency vehicle access

yes  no

Other \_\_\_\_\_

yes  no

List any truck/heavy vehicle deficiencies identified:

11. How does the proposed **site design** impact conditions for each mode? If negative or positive, note the impact. (Note: both negative and positive impacts could be found for one mode.)

Mode	Impacts	
Auto	<input type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	Potential for intersection delay, including at driveways.
Bicycle	<input checked="" type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	Improve on-site bike facilities.  Potential for increased traffic along bike routes at driveways.
Pedestrian	<input checked="" type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	Improve sidewalk facilities.  Potential for increased heavy vehicle-pedestrian conflicts at driveways and on-site.
Transit	<input type="checkbox"/> positive <input checked="" type="checkbox"/> neutral <input type="checkbox"/> negative	No transit routes in immediate vicinity of project.
Trucks	<input type="checkbox"/> positive <input type="checkbox"/> neutral <input checked="" type="checkbox"/> negative	Potential for intersection delay, including at driveways.

Other mode?	<input type="checkbox"/> positive <input type="checkbox"/> neutral <input type="checkbox"/> negative
-------------	--

### External Agency/Stakeholder Coordination

12. List agencies requiring coordination: N/A

Agency	Has coordination occurred? Note any issues that are outstanding.
	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no
	<input type="checkbox"/> yes <input type="checkbox"/> no

### Maintenance and Construction Phase Considerations

13. How will access for all modes be maintained during construction (check one box per mode)?

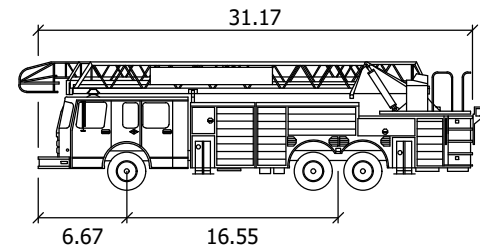
Agency	Auto	Bicycle	Pedestrian	Transit	Trucks
Detour for duration of project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Time-of-day closures only (e.g. nighttime)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Short-term closures (e.g. 24 hour) with detour route	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access maintained with reduced facilities*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full access maintained (work does not impact mode)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\*"Access maintained with reduced facilities" could mean some travel lanes closed for vehicles; could mean bicycle lane is closed, with signage for bicycles to share travel lane; could mean that sidewalk is closed with pedestrian space provided on shoulder; could mean that some transit stops are closed; etc.)

14. Will any transportation facilities or street elements be privately maintained?  yes  no If yes, explain:

15. Will Complete Streets design be applied on privately maintained facilities?  yes  no

## Appendix H: Truck Turning Template

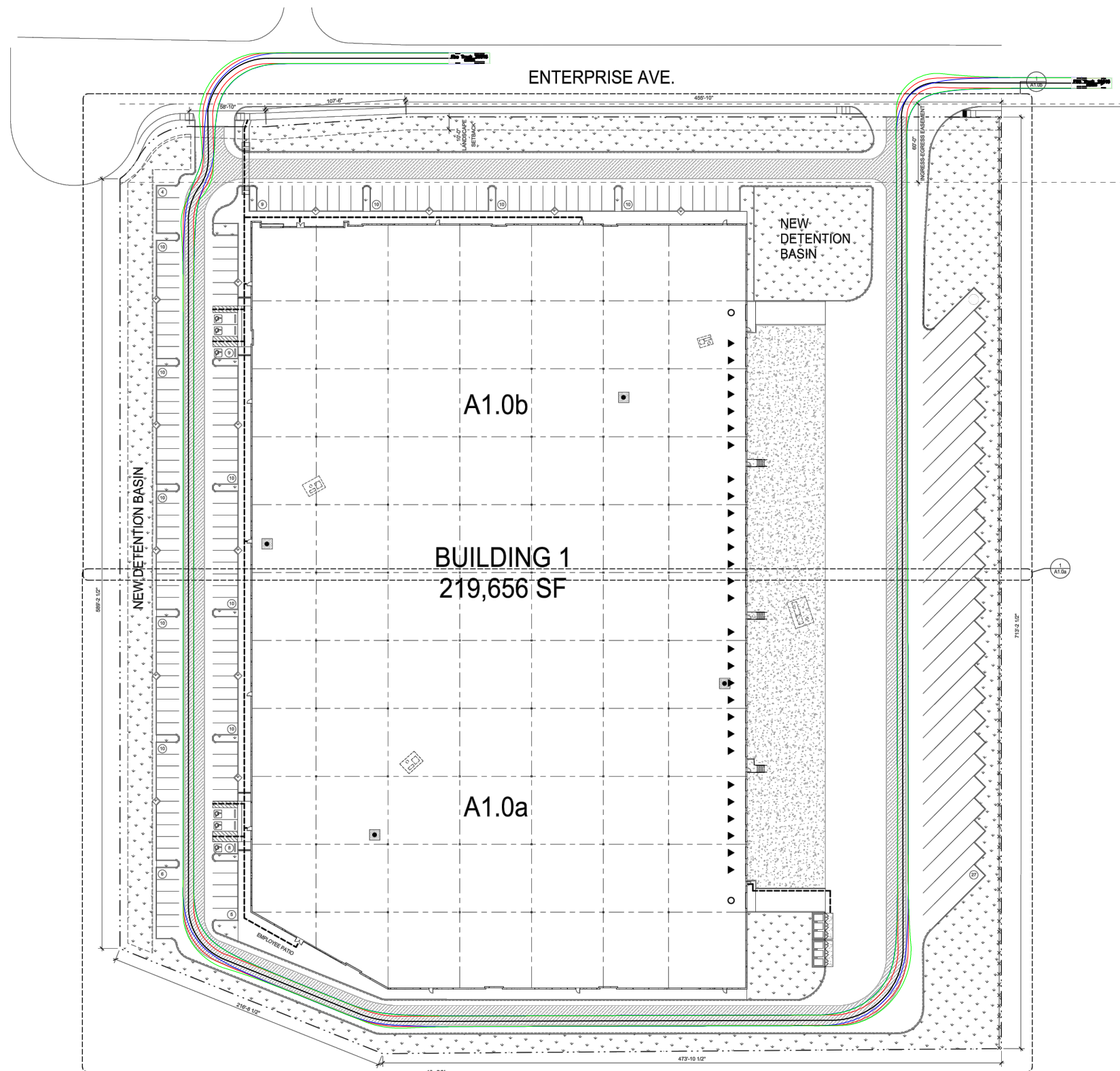


Fire Truck

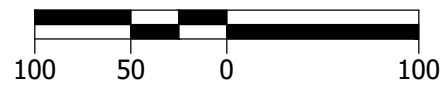
	feet
Width	: 7.99
Track	: 7.99
Lock to Lock Time	: 6.0
Steering Angle	: 41.7

**Vehicle Turning Settings**

Design Vehicle:	Fire Truck
Vehicle Speed:	5 MPH
Min. Turning Radius:	25 FEET
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



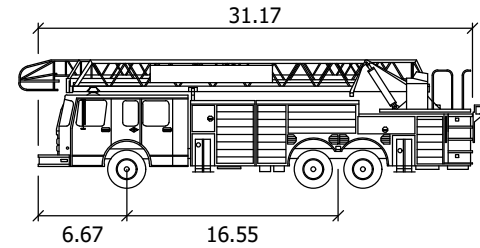
Scale: 1" = 100'



Fire Truck Turning  
Hayward, CA

Figure  
H-1

H:\26915 - Hayward Enterprise Ave Industrial EIR\design\Exhibits\26915\_AutoTURN\_1-20-2021.dwg Jan 21, 2022 - 4:08pm - aroot Layout Tab: Figure 1

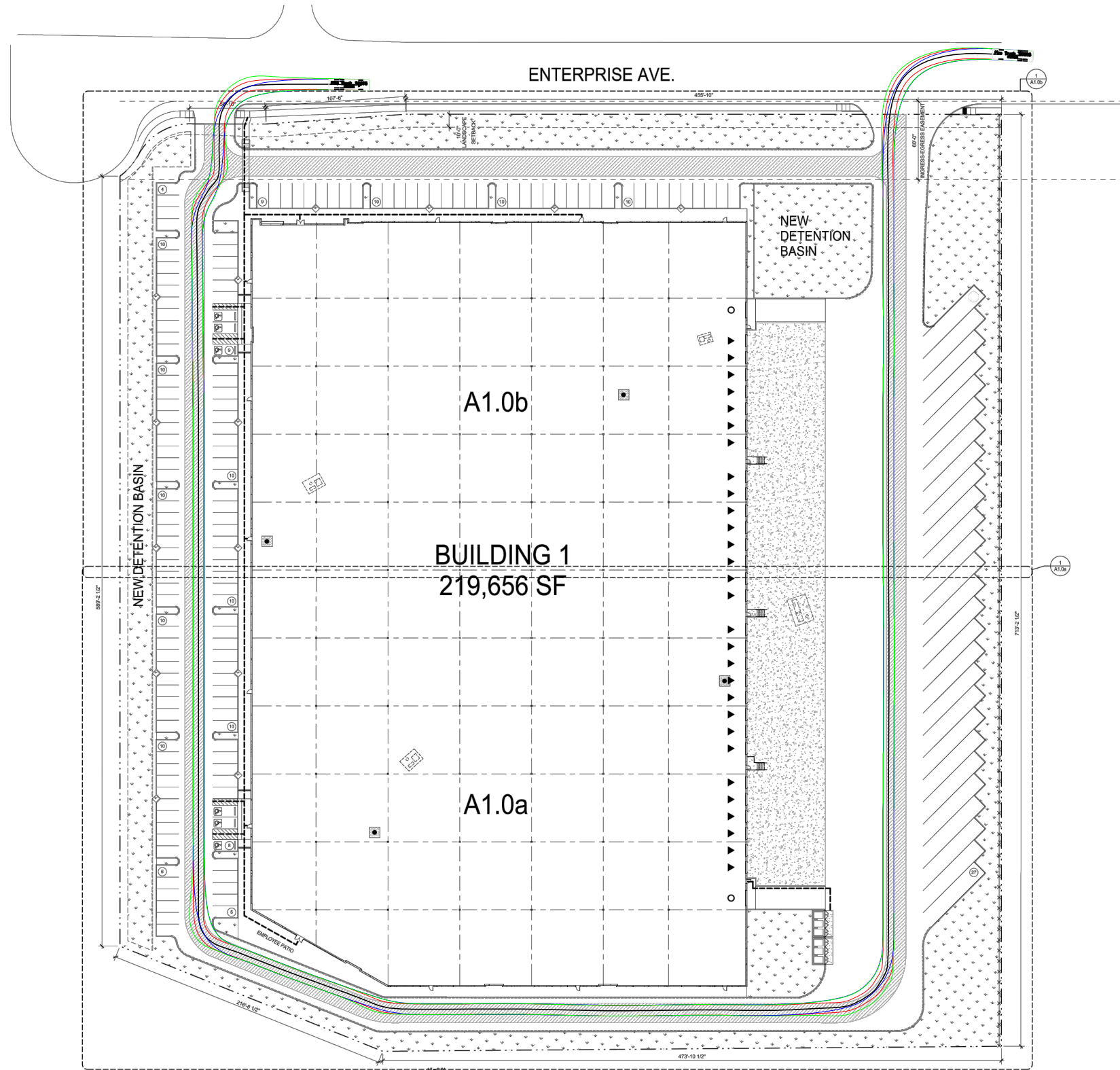


Fire Truck

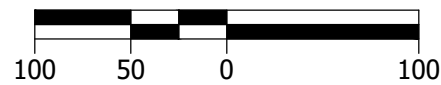
	feet
Width	: 7.99
Track	: 7.99
Lock to Lock Time	: 6.0
Steering Angle	: 41.7

**Vehicle Turning Settings**

Design Vehicle:	Fire Truck
Vehicle Speed:	5 MPH
Min. Turning Radius:	25 FEET
Turn from stop:	Off
Vehicle Envelope	<span style="color: green;">—</span>
Front Tire Track	<span style="color: red;">—</span>
Rear Tire Track	<span style="color: blue;">—</span>



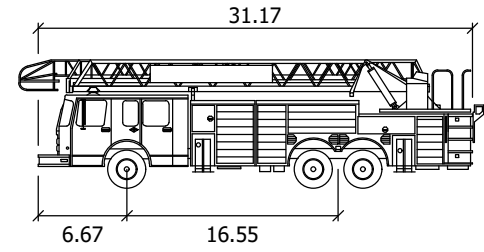
Scale: 1" = 100'



Fire Truck Turning  
Hayward, CA

Figure  
H-2

H:\26915 - Hayward Enterprise Ave Industrial EIR\design\Exhibits\26915\_AutoTURN\_1-20-2021.dwg Jan 21, 2022 - 4:05pm - aroot Layout Tab: Figure 2

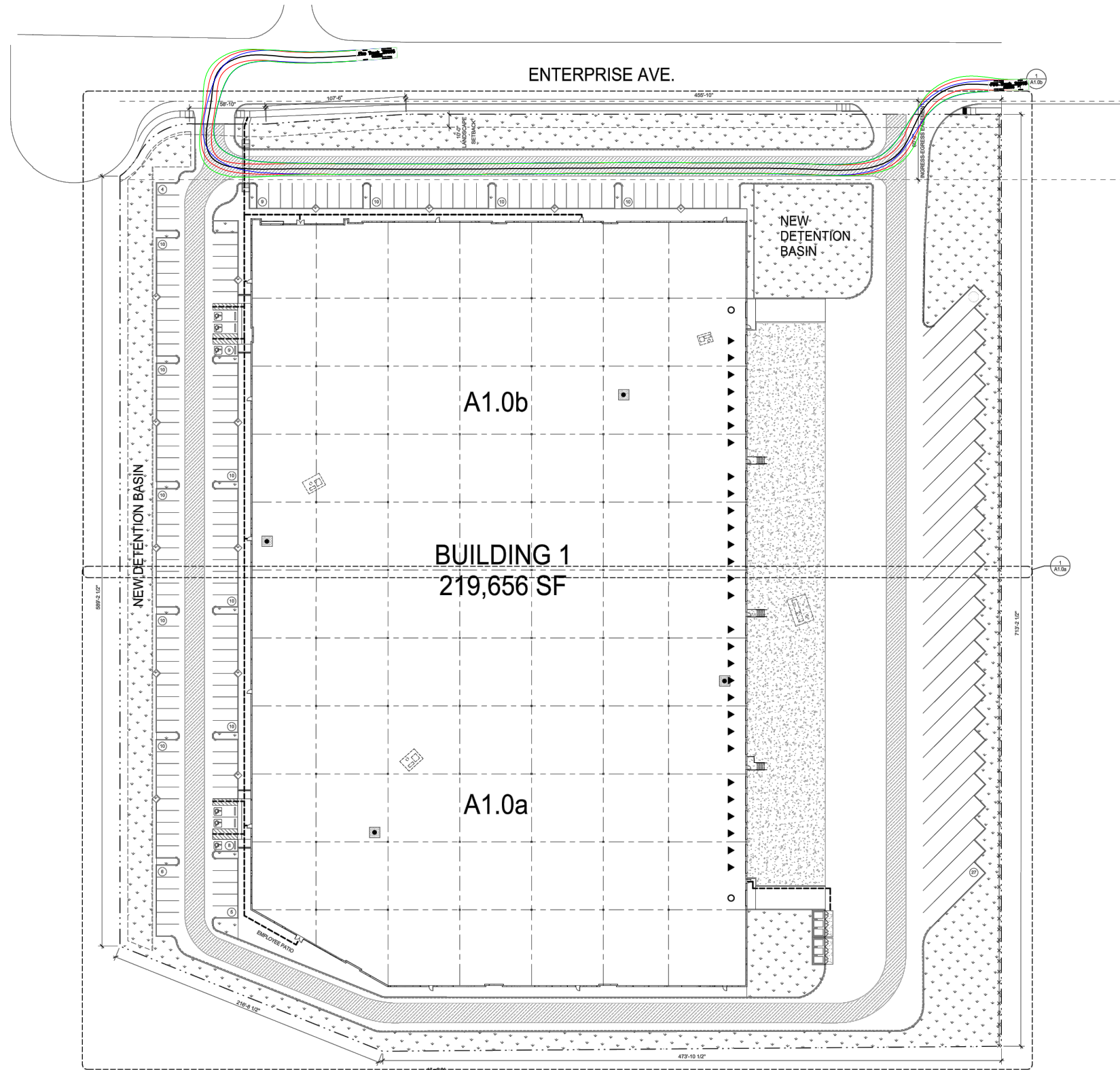


Fire Truck

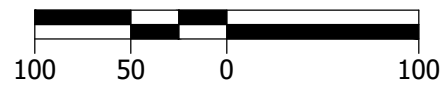
	feet
Width	: 7.99
Track	: 7.99
Lock to Lock Time	: 6.0
Steering Angle	: 41.7

**Vehicle Turning Settings**

Design Vehicle:	Fire Truck
Vehicle Speed:	5 MPH
Min. Turning Radius:	25 FEET
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



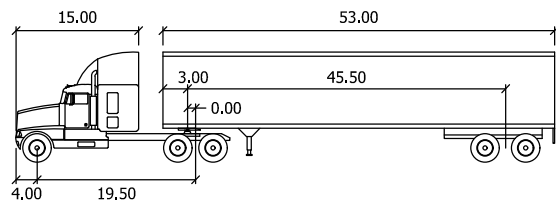
Scale: 1" = 100'



Fire Truck Turning  
Hayward, CA

Figure  
H-3

H:\26915 - Hayward Enterprise Ave Industrial EIR\design\Exhibits\26915\_AutoTURN\_1-20-2021.dwg Jan 21, 2022 - 4:04pm - arcot Layout Tab: Figure 3

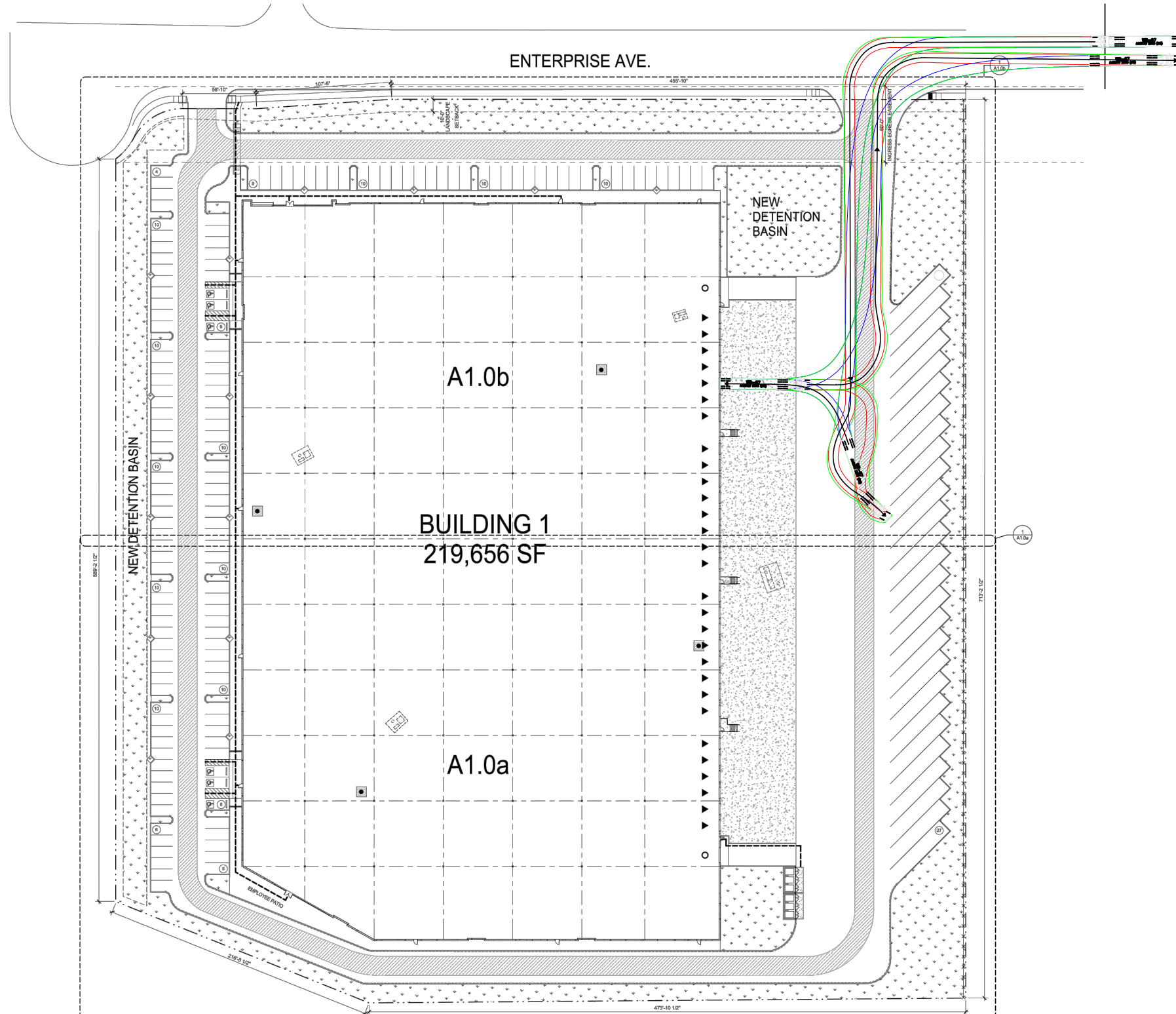


WB-67

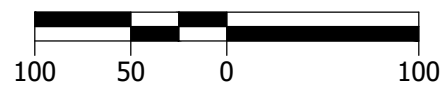
feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Tractor Track	: 8.00	Steering Angle	: 28.4
Trailer Width	: 8.50	Articulating Angle	: 75.0
Trailer Track	: 8.50		

**Vehicle Turning Settings**

Design Vehicle:	WB-67
Vehicle Speed:	5 MPH
Min. Turning Radius:	41 FEET
Turn from stop:	Off
Vehicle Envelope	<span style="color: green;">—</span>
Front Tire Track	<span style="color: red;">—</span>
Rear Tire Track	<span style="color: blue;">—</span>



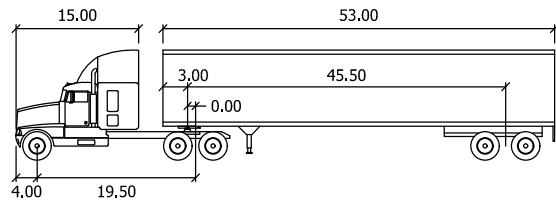
Scale: 1" = 100'



WB-67 Turning  
Hayward, CA

Figure  
H-4



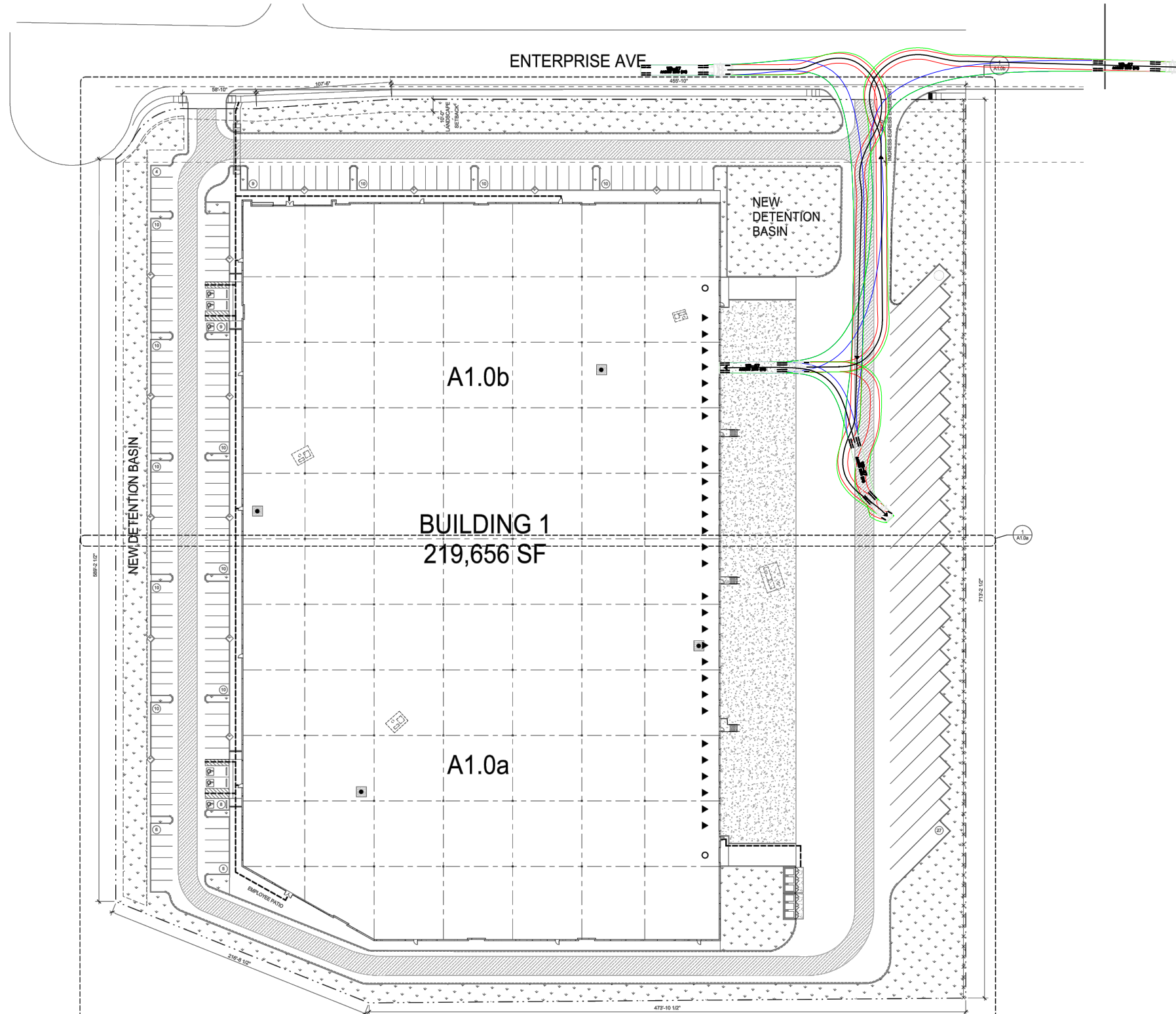


WB-67

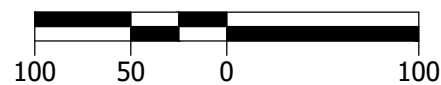
feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Tractor Track	: 8.00	Steering Angle	: 28.4
Trailer Track	: 8.50	Articulating Angle	: 75.0
Trailer Width	: 8.50		

**Vehicle Turning Settings**

Design Vehicle:	WB-67
Vehicle Speed:	5 MPH
Min. Turning Radius:	41 FEET
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



Scale: 1" = 100'



WB-67 Turning  
Hayward, CA

Figure  
H-5