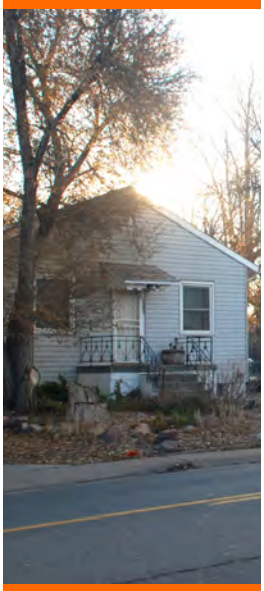
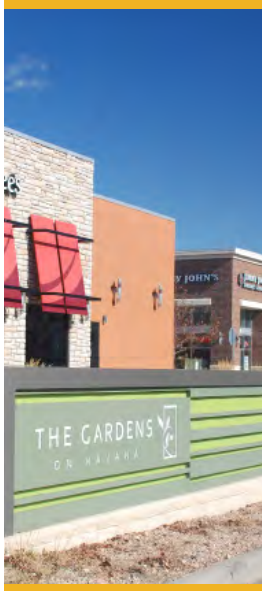
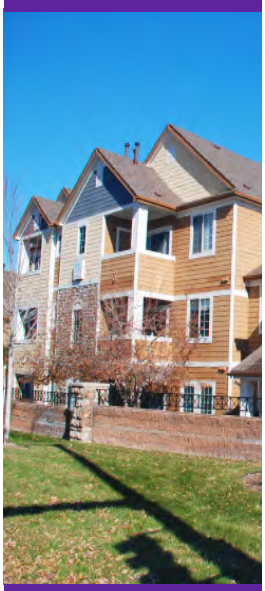
HAVANA STREET CORRIDOR STUDY

Existing Conditions Memo

August 9, 2020







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SECTION 1. PROJECT OVERVIEW

1.1 PURPOSE AND GOALS

The purpose of this project is to conduct a corridor-wide transportation, land use and visioning study that promotes active pedestrian, bicycle and transit friendly places along and across the Havana Street Corridor. The Havana Street corridor is a multimodal transportation corridor with regional significance and is critical to the fiscal and economic health of the City of Aurora. Multimodal enhancements for the Havana Street Corridor will make it safer, more interesting, convenient and attractive places for people to shop, walk and enjoy and for businesses to flourish and thrive. The corridor has a high concentration of vulnerable populations which can also greatly benefit from multimodal enhancements and place making.

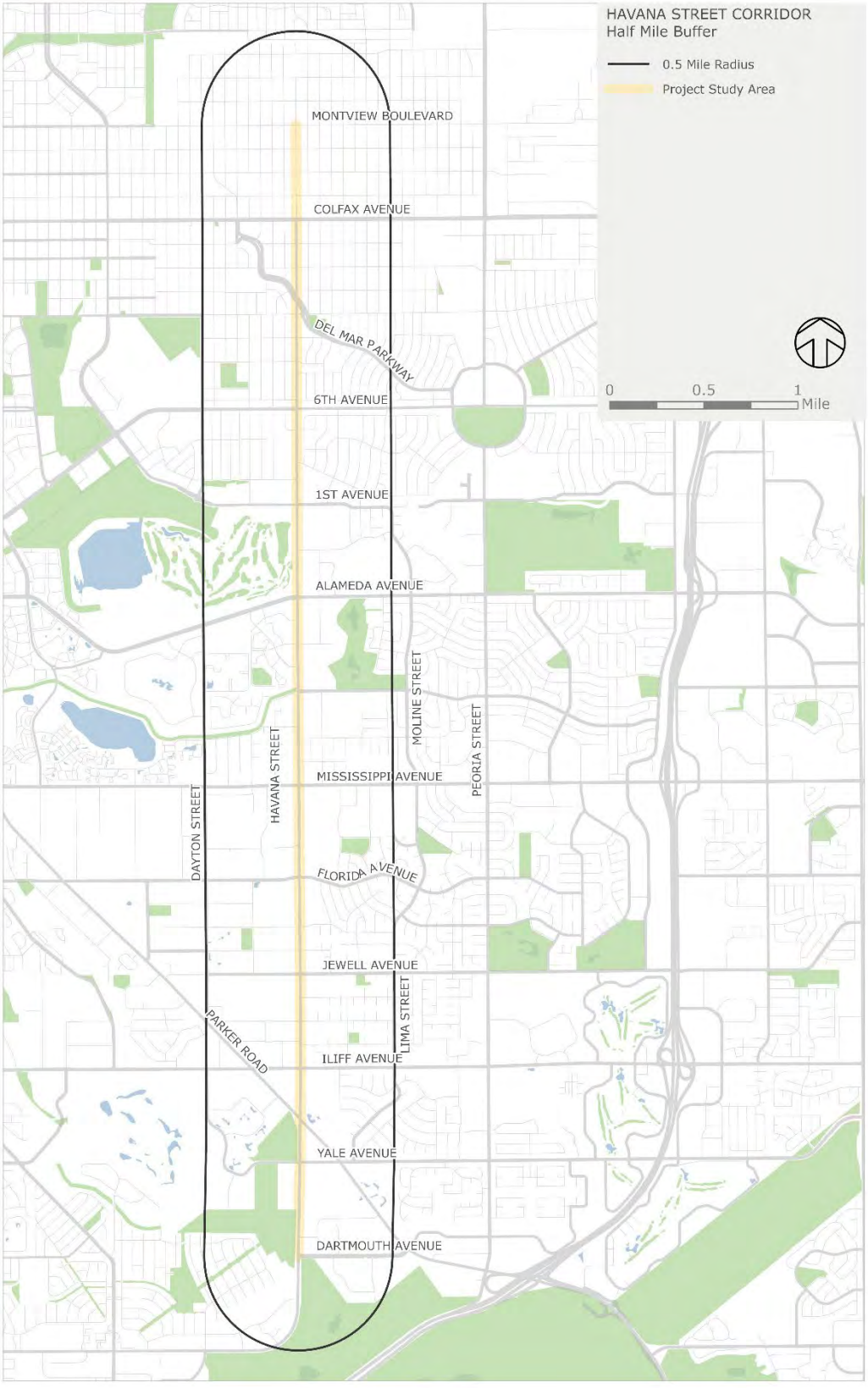
Goals for this project include:

- Working with stakeholders to develop a vision and land use framework for the corridor,
- Incorporating existing Havana Street Business Improvement District (On Havana) branding and public art,
- Evaluating the corridor's multimodal transportation system, travel needs and system performances, relative to all modes of travel, while considering existing and future land uses, economic development and business activities, and
- Providing safe, convenient and reliable mode choices to users of all ages, incomes and abilities as well as businesses that provide services and produce or sell goods.

1.2 STUDY AREA

Figure 1.2.1 shows the study area of influence which includes a half-mile buffer surrounding Havana Street between Montview Boulevard to the north and Dartmouth Avenue to the south. The area is generally bounded by Dayton Street to the west and Moline Street to the east, though the primary focus is on the immediate corridor and associated intersections.

Figure 1.2.1: Havana Street Corridor Study Area



SECTION 2. REVIEW OF STUDIES, REGULATIONS AND PROJECTS

2.1 OVERVIEW

Havana Street is an important north-south multimodal transportation corridor in the City of Aurora (City) that passes through numerous commercial areas and residential neighborhoods. The Havana Street Corridor is a vital mobility and connectivity corridor for residents as well as businesses, employees, commercial customers and commuters within the eastern part of the metropolitan area.

The Havana Street Corridor is also located within the "opportunity triangle", as identified by the Havana Street Business Improvement District, formed by Lowry, Stapleton and Fitzsimons Innovation Community & Anschutz Medical Campus. The corridor connects four Denver Regional Council of Governments (DRCOG) Metro Vision-designated Urban Centers; including, Iliff Avenue/Parker Road Triangle, Gardens on Havana – Former Buckingham Center, 1st Avenue and Colfax Avenue. Several catalytic parcels and developments with recent significant City investments, such as the retail development of Gardens on Havana and Argenta, the former Fanfare redevelopment site, are also within the study area.

This section provides an overview of past and ongoing studies and projects, as part of the existing and future background condition analysis. The studies listed below were identified as those that had the most relevance to this project and are listed in chronological order.

- Various documents associated with the Havana Business Improvement District including but not limited to the most recent Operating Plan & Budget and the Annual Report, etc.
- Havana District Design Concepts Plan, 2004
- DRCOG's Metro Vision 2035 Plan, 2011
- RTD Network Analysis of Potential Improvements to Bus Speed, Delay & Access, 2016
- DRCOG's Metro Vision 2040 Plan, 2017
- RTD Transit Priority Analysis of Select Corridors, 2018
- Aurora ITS Strategic Plan, 2018
- Aurora Places, the Aurora Comprehensive Plan (*Aurora Places*), 2018
- Aurora Unified Development Ordinance – Havana Street Overlay, 2019
- The Havana Street Transit Improvements - 2020 -2023 DRCOG TIP project Application
- Aurora Smart City Playbook, 2020
- RTD Regional BRT Feasibility Study, 2020

2.2 AURORA PLACES AND CORRIDOR VISION

Aurora Places, the City's recently adopted Comprehensive Plan, defines the vision for the City of Aurora and provides guidance for City actions and investments over the next 10 to 20 years. It emphasizes the importance of creating and improving the variety and types of places throughout the City and calls for an easy-to-use transportation network with multiple choices for travel to support a strong economy, healthy community and flourishing environment.

Mobility in Aurora has significantly improved with investments in new travel options for cyclists, pedestrians, drivers and public-transit users. Beginning in 2006, City staff-initiated planning for light rail stations in anticipation of transit service and interest from the private sector. These plans are intended to promote Transit-Oriented Development (TOD) by identifying opportunities for compact, mixed-use development that is transit-supportive and to develop public-private strategies to implement a shared vision. In accordance with the *Aurora Places*, the City strives to establish an efficient, safe and multimodal transportation system in the future, and emphasizes the following:

- First and Last Mile Solutions — improve access within areas surrounding transit stations. These "first and last mile" solutions may include enhanced bicycle or pedestrian connections, park-and-ride facilities, circulator shuttles, bikeshare and rideshare, and new technologies, like autonomous or connected vehicles.
- Priority Transit Corridors and Mobility Hubs — high frequency transit (HFT) network and service lines to provide efficient service at a relatively affordable cost, serve developable land and encourage transit-oriented development. Mobility hubs will be identified throughout the city located in high intensity, vibrant, mixed-use transit-oriented developments to support multimodal travel, reduce dependence on the automobile, and to create successful places.
- Complete streets — a critical feature in Urban Districts, Transit-Oriented Development areas, and other Placetypes. Complete streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.
- Bicycle and Pedestrian Network and Pedestrian Priority Areas — Priority areas include Urban Districts or other mixed-use Placetypes, and areas surrounding and within one-half mile of transit stations. Commercial centers and other activity centers should be designed pedestrian friendly as well.

Extending along Havana Street from 6th Avenue in the north to Dartmouth Avenue in the south, the Havana Street District is designated as an urban center in DRCOG's *Metro Vision 2035 Plan*, and as a designated strategic area in *Aurora Places*. DRCOG's *Metro Vision 2035 Plan* recognizes that the Havana Street District should serve as an area of concentrated mixed-use development that is pedestrian-friendly, and accessible to a wide variety of transportation modes.

DRCOG's *Metro Vision 2040 Plan* establishes a goal of having 25 percent of housing and 50 percent of employment located in urban centers by 2040. Improving and expanding the region's multimodal transportation system, services and connections is one of the regional objectives. The voluntary options to local organizations encourage exploring strategies to create multimodal connections between smaller scale suburban centers and the region's existing and emerging employment centers; expanding mobility options within urban centers and other locally defined activity centers.

The *Havana District Design Concept Plan, 2004*, establishes design concepts for the corridor and envisions a Havana Street District with:

- A mix of retail, employment, and residential uses along the corridor.
- Major mixed-use centers on the corridor.
- High quality and consistent streetscape along the corridor.
- Physical and signalization improvements to improve pedestrian and bicycle travel.
- Safe, comfortable, and attractive transit stops at appropriate intervals along the corridor.
- Established neighborhoods bordering the corridor to remain attractive.

T*he Havana District Design Concept Plan, 2004*, is based on a series of village centers, connected by enhanced automobile and pedestrian circulation systems. Improvements would include enhanced streetscape, public gathering places, signage, landscaping and intersection designs that would be distinctive for the Havana Street District, plus inclusion of the Aurora sunburst icon. The design palette would include a combination of elements from two design themes that were presented: “City Center” and “High Plains”. Opportunities to reflect cultural diversity using public art and landscape elements should be provided in gateways, public plazas and streetscape furnishings.

2.3 TRANSIT

The Havana Street corridor is served by RTD Bus Route 105, which provides important regional transit services. Route 105 spans the entire corridor segment from Dartmouth Avenue to Montview Boulevard and connects with 11 east-west bus routes, including Bus Routes 20, 15/15L, 10, 6, 3/3L, 11, 21 and 83L/83D. It has a 15-minute frequency during mid-day and peak hours and a 30-minute frequency during off-peak hours. The *Transit Priority Analysis of Select Corridors, 2018,* presents total average daily boardings for Route 105 at stops along the corridor segment to be approximately 1,582 passengers for northbound trips and 1,513 passengers for southbound trips. According to the *Havana Street Transit Improvements - 2020 -2023 DRCOG TIP project Application*, the bus stops at Colfax Avenue and Havana Street are one of the highest bus boarding locations in the region with approximately 1,800 daily riders boarding or transferring between routes. Bus Routes 15L and 15 at Colfax Avenue are the busiest and the only 24-hour bus routes in the RTD system

RTD conducted the *Network Analysis of Potential Improvements to Bus Speed, Delay & Access Study, 2016,* to identify corridors throughout the region where transit enhancement investments would have the greatest impact on operating performance and customer satisfaction. RTD utilized a multi-tier screening methodology based on passenger loads, travel speed, route and network performance, and network connectivity to establish the corridors with the highest potential to benefit from transit-priority treatments. As a result of the screening, Havana Street was identified as one of the nine corridors that is a high priority candidate.

The Transit Priority Analysis of Select Corridors study, 2018, identified transit-priority recommendations for selected corridors based on the analysis of existing planning work, existing transit conditions and traffic conditions. The identified improvements for the Havana Street Corridor include:

- Improving bus travel speed and reducing bus travel time - the speed analysis for Route 105 shows that both northbound and southbound trips experience very slow operating speeds during peak hours.
- Improving bus punctuality - Buses typically depart up to two minutes late in the PM peaks, and can depart as much as six minutes late.
- Improving bus stop amenities and integrating stops into the adjacent land use and urban form for better accessibility - Bus stops also do not have adequate amenities to provide riders with a safe, convenient and comfortable environment to wait prior to boarding buses.
- Reducing bus transfer distance - There are many transfer activities between Bus Route 105 and the many east-west bus routes. Some of the transfers require a lengthy walking distance.

Additional analysis to quantify benefits from improvements along the corridor show that in the southbound direction, the daily person delay along the corridor is expected to improve by 59 hours in total because of the improvements of Transit Signal Priority (TSP), bypass lane at Colfax Avenue, bus

bulb at 6th Avenue, and consolidated stops. In the northbound direction, the improvement of daily person delay is expected to be nearly 70 hours in total because of improvements of TSP, bypass lane at Mississippi Avenue, bus bulb at Alameda Avenue, bypass lanes and queue jumps at 6th Avenue and Colfax Avenue, and consolidated stops.

The Havana Street Transit Improvements - 2020 -2023 DRCOG TIP project will improve the existing network reliability and included the following improvements for the Havana Street corridor:

- Bus bypass lanes
- Relocation of bus stops
- Installation of bus bulbs
- Installation of queue jump signals
- Bus stop accessibility upgrades
- Implementation of Transit Signal Priority

As the metro area continues to experience rapid population and travel demand growth, RTD undertook the *Regional Bus Rapid Transit Feasibility Study, 2020,* to explore opportunities for new service and sustainable solutions for enhancing regional mobilities. Bus rapid transit (BRT) service is high-frequency bus service that emulates rail transit and provides fast and reliable service on a dedicated route. The *Regional Bus Rapid Transit Feasibility Study, 2020,* followed a data-driven evaluation process to develop an integrated network of BRT routes for the region and identified the most promising BRT projects for pursuing federal funds. The tiered evaluation identified and prioritized the corridors with potential to support BRT based on analysis of ridership demands, travel time and reliability improvements, community and policy support, physical viability, capital and operating cost, equity and safety.

Havana Street was identified as one of the top final candidate corridors in the region for BRT. Existing and future land use projections on Havana Street are transit supportive along most of the route, there is available right-of-way, and municipalities indicate support for bus bypass lanes/queue jumps. Travel lanes along Havana Street may have potential for repurposing based on existing and future traffic volumes and available space along the route. Ridership projections developed as a part of this study estimated over 9,000 daily boardings if BRT services were implemented. A set of infrastructure improvement recommendations along Havana street to implement BRT service were also proposed including dedicated transit lanes, transit signal priority, queue jumps, and mobility hubs.

Table 2.3.1 provides a summary of the relevant transit studies reviewed as a part of this study effort.

Table 2.3.1: Transit Study Summary

Transit Study	Relevant to This Study
RTD Network Analysis of Potential Improvements to Bus Speed, Delay & Access, 2016	Identified corridors throughout the region where transit enhancement investments would have the greatest impact on operating performance and customer satisfaction. As a result of the screening, nine corridors (including the Havana Street Corridor) were identified as high priority candidates.
RTD Transit Priority Analysis of Select Corridors, 2018	Evaluated selected high priority corridors and identified transit-priority recommendations. Havana Street is one of the transit priority corridors identified for a set of transit improvements.
Havana Street Transit Improvements - 2020 -2023 DRCOG TIP Project Application	Will provide the transit improvements along the Havana Street corridor to improve bus operations, stop area amenities, pedestrians safe access to the stops and crossing of intersections, and multimodal connections within and between urban centers.
RTD Regional BRT Feasibility Study, 2020	Developed an integrated network of BRT routes for the region and identified the most promising BRT projects/corridors for pursuing federal funds. Havana Street shows good potential to support BRT.

This project will align with the transit improvements that are ongoing through RTD and city efforts. The project team will further evaluate the existing transit facilities, operations, and multimodal connectivity for the corridor and develop recommended multimodal improvement alternatives for a well-connected, well-maintained, safe, convenient and reliable multimodal transportation network.

2.4 INTELLIGENT TRANSPORTATION SYSTEMS(ITS) AND NEW TECHNOLOGIES

Aurora Places emphasizes the innovations, emerging trends and technologies for the future transportation and mobility system. It encourages exploring partnership opportunities for potential pilot projects involving autonomous and connected vehicles, data sharing, and other related applied-technology initiatives.

The *Aurora Smart City Playbook, 2020*, emphasizes that investment in data driven real-time decision-making and incorporating new technologies can connect our communities in an era of rapid population growth, increasing diversity and development. It supports investment in civic infrastructure that thoughtfully connects Aurora's communities and generates data to improve city services. The recommended actions include:

- Invest in smart traffic signals and roadside infrastructure to improve traffic flow and safety, reduce greenhouse gas emissions and prepare for connected and autonomous vehicles.
- Build a city of Aurora Transportation Management Center to improve citywide and regional traffic flow and safety. Consider adopting data standards that allow for regional interoperability.

Leverage Google Waze data as an interim step toward building a Transportation Management Center.
- Use data from energy-efficient streetlights to monitor local air quality and traffic flow in order to improve public health, safety and the environment.
- Protect the authentic look and feel of Aurora by developing urban design guidelines that address the aesthetic implications of new technology.

The transportation concerns identified on Havana Street include recurring congestion, limited traveler information, and limited transit information. The intersection of S Havana Street & E Iliff Avenue is one of the locations with greatest motor vehicle crash frequency.

The *Aurora ITS Strategic Plan, 2018,* explores the possibilities of using available ITS as a solution to improve operations of the roadway network. The city identified the deployment of ITS packages for freeway, arterial, and transit networks and citywide and/or regional coordination using National ITS Architecture. The strategic deployment plan is segmented by "planned", "short term", "mid term", and "long term".

The ITS service packages currently planned for the Havana Street corridor include:

- Performance Monitoring
- Winter Maintenance
- Roadway Maintenance and Construction
- Work Zone Management
- Emergency Vehicle Preemption
- Incident Scene Safety Monitoring
- Disaster Traveler Information
- Traveler Device Maintenance
- Vehicle-Based Traffic Surveillance
- Traffic Signal Control
- Traffic Information Dissemination

Planned (near term with funding program) deployment on Havana Street includes:

- Infrastructure-Based Traffic Surveillance
- Connected Vehicle Traffic Signal System

The short term (less than five years) deployment on Havana Street includes:

- Transit Signal Priority

The mid term (between 5 to 10 years) deployment on Havana Street includes:

- Dynamic Roadway Warning Signs

The long term (more than 10 years) deployment on Havana Street includes:

- Roadway Automated Treatment
- Parking Electronic Payment
- Connected Vehicle System Monitoring and Management
- Traffic Incident Management System

The City of Aurora has been building upon its existing signal system and deploying ITS infrastructure. The *Aurora ITS Strategic Plan, 2018,* mentioned that Aurora received DRCOG funding to upgrade radio communications of 51 signals at major intersections and to implement a Citywide camera network and bicycle detection devices at 30 intersections. The City has Bluetooth sensors pending installation, an Automatic Vehicle Location (AVL) system for its street maintenance fleet and is moving towards implementing connected vehicle technology into the City's signal system. The following outlines additional ITS deployments that will be installed on Havana Street:

- The upgrade of radio communications for 51 signals at intersections along major corridors including Havana Street.
- 52 city cameras to be installed along major corridors (within 3 years), which involves 5 intersections with Havana Street —Colfax Avenue, Alameda Avenue, Mississippi Avenue, Iliff Avenue, and Parker Road.
- 25 CCTV digital cameras (Cannon VBH41, H42, and H43) at major intersections that are recording 24/7. These cameras are operated by Aurora Police Department, but traffic would be able to view and control these through a Milestone Account. Havana Street & Colfax Avenue is in the list of major intersections.
- Havana Street & Iliff Avenue will have Bluetooth based travel time sensors.
- Havana Street & Exposition Avenue will have bicycle detection devices as one of the 30 intersections using DRCOG funds. The FLIR TraffiSense 2 camera is the City's current standard for vehicle detection because it can identify and detect bicyclists mixed in motor vehicle traffic.

The Havana Street Corridor Study will explore and evaluate opportunities for improving transportation system efficiencies and mitigating congestion to the Havana Street corridor by applying various ITS technologies packages for consideration during the alternatives developments.

ONGOING TRAFFIC INFRASTRUCTURE PROJECTS

The City has obtained grant funding and is currently implementing improvements to the traffic signal network. As this is being written, the City is completing the installation of Bluetooth sensors that collect travel time data along the Havana Street corridor to monitor traffic operations. CCTV cameras are also being deployed at 6th Avenue, Alameda Avenue, and Mississippi Avenue with an anticipated completion in the next 12 months. The CCTV cameras can be used for monitoring traffic conditions when implementing timing changes remotely from a transportation management center. The City's current standard for vehicle detection, FLIR TraffiSense2, can identify and detect bicyclists mixed in motor vehicle traffic.

The City will be applying for FY 2020-2023 DRCOG funding for new radio communications and an upgraded traffic signal system. Additionally, they are looking at options to replace the signal system software. While no city fiber exists today, fiber will likely be installed with local funds to support the new network along Havana Street in the future.

As many of the improvements outlined in the *Aurora ITS Strategic Plan, 2018,* will require high-bandwidth data communications infrastructure to implement the proposed strategies, it will be critical to understand and evaluate communications needs for a scalable ITS network of devices and features.

2.5 UNIFIED DEVELOPMENT ORDINANCE

The *Aurora Unified Development Ordinance (UDO), 2019,* identifies the parameters and regulations for new development in the corridor. The focus of this memo is on mixed use zone districts and assumes existing residential areas will remain intact with minor changes, per the code. The primary mixed-use zone district in the Havana Street Corridor is MU-C (Mixed Use – Corridor), generally between 6th Avenue and Dartmouth Avenue. However, within the Original Aurora Placetype (E. 25th Avenue to E. 6th Avenue), there are two primary mixed use districts: MU-OA-G (Original Aurora General) is located along Colfax Avenue and MU-OA-MS (Original Aurora Main Street) is located at the intersection of Havana Street and 11th Avenue.

Havana Street is also part of an overlay district. The primary purpose of the overlay is to create a more consistent streetscape and image over time as properties redevelop or make minor improvements.

The most applicable standards are summarized below. This does not summarize *all* standards from the *UDO*, but the majority that will apply for the purposes of studying future land use scenarios.

Refer to Figures 4.1.1, 4.1.3, and 4.1.6 for a graphical depiction of zone districts and their summaries, as well as how they relate to *Aurora Places* Placetypes.

HAVANA STREET OVERLAY (HSO)

The Havana Street Overlay applies to all properties touching Havana Street from 6th Avenue to Dartmouth Avenue (or everything but Original Aurora). The purpose, as stated directly from the HSO section of the code state:

"The HSO is intended to encourage improvement in streetscape, landscaping, and the general aesthetics of the street edges along Havana Street from 6th Avenue to Dartmouth Avenue. The vision of Havana Street as a tree-lined boulevard with curbside landscape and detached sidewalks is the long-term goal for this district. Interim options are offered for the shorter term. These standards address the existing attached sidewalks and reduced property depths resulting from past street widening efforts. The standards are included to encourage improvements in those situations that do not include developing vacant land, redevelopment that involves clearing the land before adding new construction, or expansion of an existing building footprint by more than 25 percent or by more than 2,500 square feet[1], whichever is less. Street trees remain a requirement in all options. The goals of this overlay district are:

1. *Encourage high-quality street edges by requiring a flexible schedule of improvements proportionate to the level of development proposed on properties abutting Havana Street.*
2. *Provide landscape and streetscape options that respond flexibly to a variety of existing conditions on lots along the corridor.*
3. *Strive for consistency of appearance and materials so that the Havana Street Corridor builds a distinctive character over time.*
4. *Provide for readily identifiable amenities specific to Havana Street that are attractive and useful.*
5. *Enhance the appearance and safety of streets for pedestrians."*

[1] *There is a discrepancy in the City's planning code regarding when redevelopment would trigger implementation of overlay requirements. City staff is in the process of addressing the code discrepancy.*

The overlay rules apply to any property that is triggered by the following conditions:

1) ***Condition 1 (MAJOR MODIFICATIONS)*** – All development that occurs on vacant ground, a redevelopment site (where an existing property is cleared for new construction, or an expansion of an existing building footprint by more than 25% or 2,000 square feet[2], whichever is less.)
2) ***Condition 2 (MINOR MODIFICATIONS)*** – When properties with an existing five foot or wider attached sidewalk with an existing building make any of the following changes:
    a. Significant architectural alterations of architecture and signage requiring a permit;
    b. Access alterations from Havana Street;
    c. Signs within the landscape buffer requiring Hardship Variance;
    d. Proposed or unauthorized removal of a required street tree;
    e. New single use or changed conditional use;
    f. Redesign in landscape other than routine maintenance.
3) ***Condition 3 (MINOR MODIFICATIONS)*** – When existing buildings are close to the street and have no parking or paved access between buildings and right-of-way or street frontage property line and makes any of the same changes as Condition 2 (see above.)

Condition 1 Requirements:

1) Build curbside landscaping area – 10 feet wide with 1 street tree per 40 linear feet.
2) Build detached sidewalk – 10 feet wide
3) Build landscape buffer – minimum 9 foot wide buffer with 2 tree equivalents per 40 linear feet.
    a. Buffer may be reduced to 5 feet when either a 2.5 foot high masonry wall or continuous landscape hedge is provided.

Condition 2 Requirements:

1) Keep the existing attached sidewalk – 5 feet wide or greater
2) Add landscape buffer – minimum 9 foot wide buffer with at least 1 tree and 10 shrubs per 40 linear feet or 2 tree equivalents per 40 linear feet.
    a. Buffer may be reduced to 5 feet with 2.5 foot high masonry wall or continuous landscape hedge is provided.

Condition 3 Requirements:

1) This condition shall choose from one of the three options (refer to UDO Page 90 for graphic examples):
    a. Streetscape – provide 1 tree per 40 linear feet.
    b. Landscape buffer plaza option – provide 1.5 tree equivalents per 40 linear feet; or
    c. Landscape buffer xeric option – provide 2 tree equivalents per 40 linear feet

MU-OA-G and MU-OA-MS

Key form standards for MU-OA-G (properties along Havana Street from 16th to 14th Avenues) and MU-OA-MS (properties along Havana Street from 10th to 11th Avenues) for Multifamily, Mixed-Use and Commercial buildings are provided in Table 2.5.1.

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[2] *There is a discrepancy in the City's planning code regarding when redevelopment would trigger implementation of overlay requirements. City staff is in the process of addressing the code discrepancy.*

Table 2.5.1: MU-OA-G and MU-OA-MS Key Land Use Form Standards

	Min. Lot Area	Min. Lot Width	Setbacks	Building Height
MU-OA-MS	5,000 SF	50 FT	Front – 0-12 FT Side (street/alley) – 10 FT Side (interior) – 5 FT Rear – 5 FT	50 FT max.
MU-OA-G				No max.; 38 FT max. within 75 FT of MU-OA-R1 or MU-OA-R2

Parking

- If the new building has a Ground Floor Commercial Use, required off-street parking shall be met unless parking analysis documents lower parking demand will meet the need without negatively impacting surrounding properties.
- Parking shall be located behind building and screened along any street frontages.
- On-street parking shall count toward requirements, as well as any public parking lot within 300 feet.

Sidewalks/Streetscape

- For Multifamily, Mixed Use and Commercial buildings in MU-OA-G and MU-OA-MS:
    - New construction = 14-16 feet wide
    - Adaptive reuse = 5-16 feet

Outdoor Space

- Commercial and Mixed Use = 5% of building footprint plus 1% for each story greater than two stories.
- Multifamily or Mixed-Use Residential Buildings = 100 SF of on-site outdoor space per dwelling unit.
    - Up to 40% may be accommodated by outdoor balconies/decks.
    - Each SF of area included in rooftop or courtyard shall be weighted as 1.5 SF of requirement.
- Any residential uses must provide or pay in-lieu for neighborhood park land dedication requirement.

Building Design, Parking, Adaptive Reuse Standards

- Refer to pages 37-45 of UDO.

MU-C

Key form standards for MU-C (majority of properties along Havana Street from 6th Avenue to Dartmouth Avenue) for Multifamily, Mixed-Use and Commercial buildings are provided in Table 2.5.2.

Table 2.5.2: MU-C Key Land Use Form Standards

	Min. Lot Area	Min. Lot Width	Setbacks	Building Height
MU-C	N/A	N/A	Comply with Havana Street Overlay Standards for Streetscape	General = Aurora Infill Handbook Multifamily Affordable = 90 FT max. Within 50 FT of R-1 or R-2 = 38 FT max.

Neighborhood Protection Standards

- See height above in table.
- Exterior lighting shall not exceed 15 feet within 50 feet of R-1 or R-2 and any lighting in this area shall be turned off between 11:00pm and 7:00 am unless necessary.
- No service area containing outdoor garbage or recycling, or truck loading/unloading shall be located within 20 feet of R-1 or R-2.
- No drive-through lane may be located between a permitted primary structure and the boundary with any R-1 or R-2 lot.
- Setbacks on any lot abutting rear or side lot of R-1 or R-2 shall be setback a distance equal to the protected lot.

Vehicle Access and Connectivity Standards

- Orient access points at right angles to Havana Street (and other arterials)
- Curb cuts located a minimum of 200 feet from each other and no more than required number.
- Locate vehicular entrances at least 50 feet from intersecting street ROW.
- Locate vehicular entrances at least 10 feet from adjacent property or share access.
- Access circulation away from residential areas.
- Align access points with other access or street.
- Create internal blocks with a perimeter no greater than 2,640 feet.

Vehicle Access and Connectivity Guidelines

- Combine access points for adjoining properties to minimize curb cuts and traffic impacts.
- Provide internal, direct vehicular connections between adjoining properties to reduce traffic impacts on adjoining streets.
- Provide internal pedestrian connections that link adjoining properties and create an internal pedestrian circulation system within large development sites.
- Provide multiple pedestrian connections that link into existing or planned citywide open space and trail networks.

Parking

- Refer to table starting on p. 208 for requirements per use in the UDO.
- No more than 25% of lot frontage on arterial or collector streets to a depth of 60 feet shall be parking.

Building Design Standards

- Refer to pages 303-318 in the UDO.

2.6 BUSINESS IMPROVEMENT DISTRICT

The Havana Street Business Improvement District (Havana BID), also known as *On Havana Street*, was created in 2007 by business and neighborhood leaders and the City. It encompasses the 4.3-mile stretch of the corridor from 6th Avenue to Dartmouth Avenue. The Havana BID hosts over 20 events each year, provides programming benefits to businesses and commercial properties on the corridor and assists with economic development and establishing a unique district identity through branding and advocacy. The BID is a key partner in achieving the vision of the corridor.

The mill levy to create the BID in 2007 was 4.5 mills (or $4.50 per $1,000 of assessed value). Eighty percent of property owners assessed were supportive of the mill levy for the Havana BID creation. There are 209 real commercial properties and approximately 20 shopping centers with over 600 businesses. The sales tax revenue from properties encompassed in the Havana BID has increased from $12M in 2008 to $21M in 2019. Assessed valuations increased from $72M in 2008 to $114M in 2019. The district had a 2% vacancy rate in 2018, down from 8.6% a decade earlier – a testament to its success.

While the BID demonstrates measurable success since its formation, Colorado (and the world) was hit with the COVID-19 pandemic beginning in March of 2020. The forced closures of all non-essential businesses and restaurants shifting to solely takeout and delivery services will undoubtedly leave a lasting impact on Havana Street. At the time of this analysis, the dates and future for reopening were uncertain and the total impacts still unknown. Exploring opportunities to support businesses are, and will continue to be, critical. This project will look for the opportunities ahead, such as federal and state economic recovery funding assistance and other stimulus grants that are likely to come available, such as grants for "shovel-ready" projects that can help boost businesses in the future.

STREETSCAPE AND BRANDING

Havana BID has been active in encouraging property owners to implement streetscape improvements per the Havana Street Overlay Standards. The District Marker Project helps with branding the district by placing the BID logo on signage throughout the district. There are currently 42 logo panels in place at various locations *(refer to maps in Figure 4.1.3 thru 4.1.6)* The BID is currently working with the following owners and developers to enhance the District

- Village on the Park, a retail center undergoing a multi-million-dollar redevelopment, will be adding district gateway markers to the northwest corner of Parker Road and Havana Street.
- Argenta, a 10.5-acre mixed use development on the former Fan Fare site, will also be establishing district marker signs as part of the new development.
- ADI Auto Sport at 1960 South Havana Street and Kum & Go at Havana Street and Yale Avenue are two existing businesses also currently participating.

The BID contracts with a company to maintain 86 condominium news rack slots. However, after a two-phase replacement of news racks in 2017 and 2018, the BID would like to revisit the Memorandum of Agreement (MOA) with the City of Aurora and reduce the number of racks in the corridor due to less print media distribution.

The BID has worked to establish three connected, yet distinct, branding concepts: Havana Motor Mile, Eat on Havana and ART2C on Havana.

Havana Motor Mile

Part of the suite of co-brands for Havana Street BID is the "Havana Motor Mile." There are 25 auto dealerships and multiple other auto-service businesses, such as tire shops, auto body repair, car washes, and more. These businesses are inherently auto-orientated but can still provide safe pedestrian access along the corridor. These businesses are generally located on larger lots and therefore contribute most of the tax value to the BID - $5.9M in 2019. Car sales tax collected in 2019 was down 5.7% compared to 2018, however.

Eat on Havana

Food and dining are important contributors to Havana Street. In 2019, food and dining sales tax contribution was $3.8M – up 9.7% from 2018. Restaurants are highly promoted through the BID. The corridor is known for its very diverse restaurants, offering flavors from around the world. Many of these establishments are small, locally owned businesses.

Art2C on Havana

Art 2C on Havana is a public/private partnership between the BID and Aurora's Art in Public Places program. The BID has invested $24,000 annually toward this program as a tool for economic development and brand recognition. There are currently 14 sculptures in place along Havana Street.

SECTION 3. EXISTING CONDITIONS DATA COLLECTION AND ANALYSIS

3.1 DEMOGRAPHICS

POPULATION

The total population within one-half mile of the Havana Street corridor is approximately 89,505, which is projected to increase to 98,311 in 2040. Within this area, 46.7% of residents identified as minorities which is 10% higher than the City of Aurora. Children ages 5 to 17 years old account for 12.5% of the population, which is 6.6% lower than the City. Individuals over 65 years old account for 11.3% of the total population, and individuals with disabilities account for 6.4% of the total population. These population groups are more likely to rely on non-automobile travel, such as walking, bicycling, or using transit. Table 3.1.1 presents the major population statistics within one-half, one, three and five miles of the Havana Street corridor compared to the City of Aurora. Figure 3.1.1 shows the area encompassed by the one-half, one, three, and five-mile buffers. Figure 3.1.2 shows total population by census tract within the study area.

Table 3.1.1: Havana Street Corridor Population Demographics[3][4]

Population	½-Mile	1-Mile	3-Mile	5-Mile	City of Aurora
Total Population (2020)	89,505	144,102	430,949	735,690	379,286 (2019)
Total Population (2040)	98,311	154,634	484,179	825,322	738,784
Population older than 65 years	11.3%	11.8%	12.5%	11.9%	10.8%
Children ages 5-17 years	12.5%	16.0%	15.8%	16.1%	19.1%
Minority persons	46.7%	44.6%	40.4%	36.9%	36.8%
English as Second Language	5,797	10,403	26,597	39,155	29,712
Individuals with disabilities	6.4%	6.0%	5.5%	5.1%	9.8%

[3] *Source: DRCOG Vulnerable Population Dataset; ESRI Business Analyst; U.S. Census Bureau, ACS 2018 (5-Year Estimates)*

[4] *Some data is based on Census tracts or other geographies that may include multiple jurisdictions; data is Aurora specific to the greatest extent possible.*

Figure 3.1.1: One, Three, & Five Mile Buffer Zones

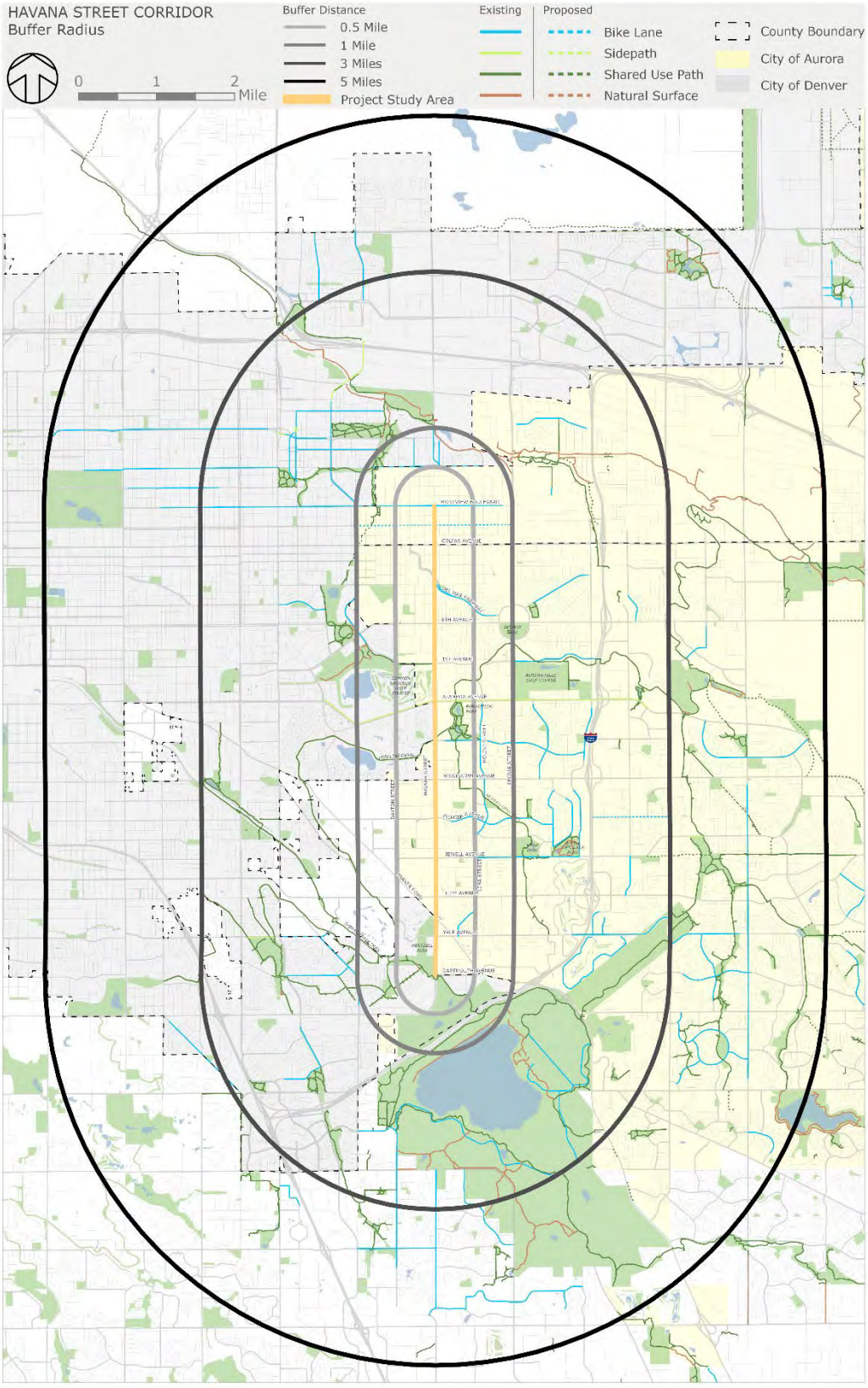
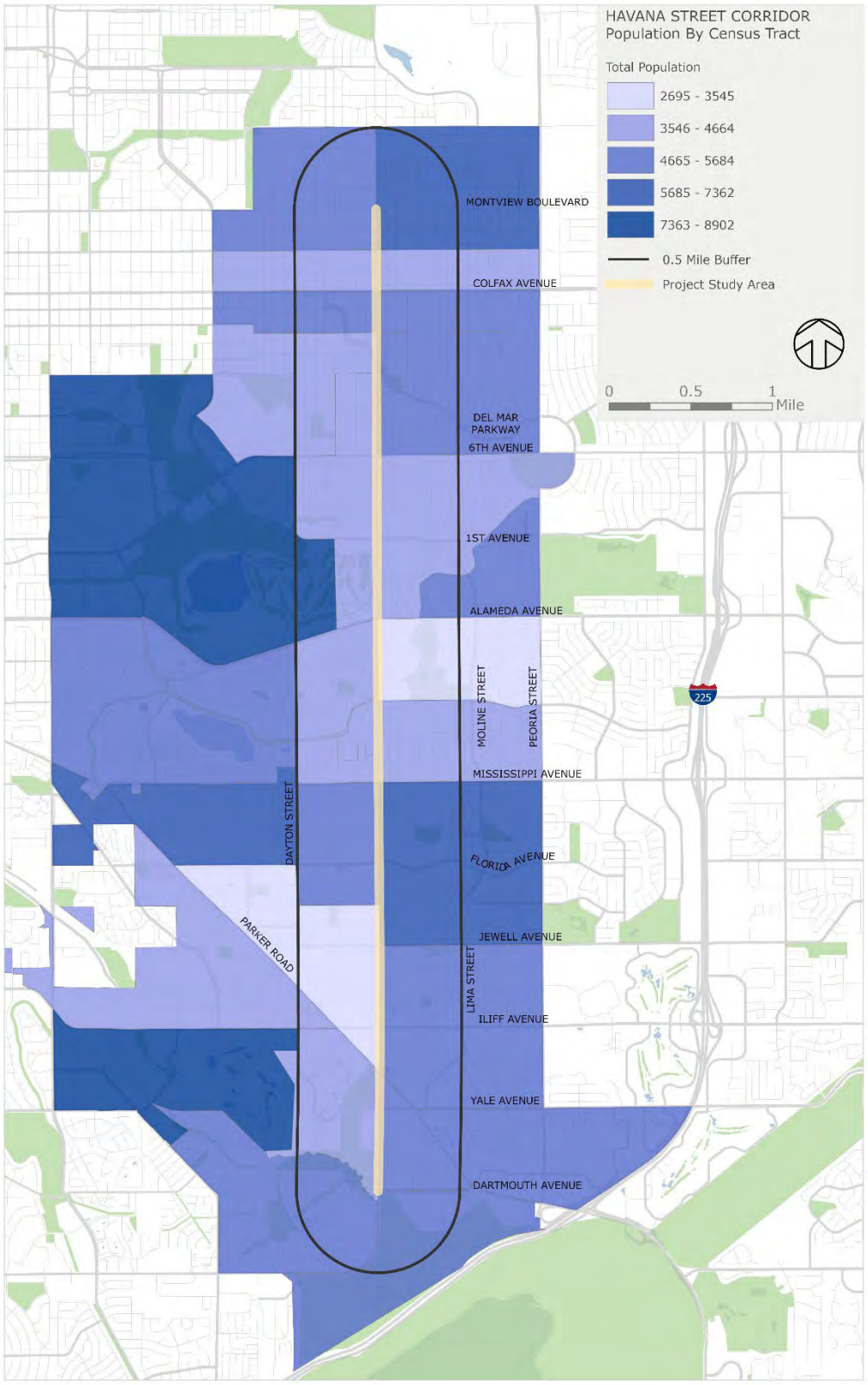


Figure 3.1.2: Population within the Study Area



HOUSEHOLDS

As shown in Table 3.1.2, there are approximately 21,343 households within one-half mile of the Havana Street corridor. The 2019 median household income is $48,783, which is 22% lower than the City, and low-income households (percent of households with income below the poverty line) comprise 21.0% of households in the area compared to 12% in the City. Households without a motor vehicle account for 16.0% of the total households in this area, or approximately 14,000 people.

Table 3.1.2: Havana Street Corridor Household Demographics[34]

Households	½--Mile	1-Mile	3-Mile	5-Mile	City of Aurora
Total Households (2020)	21,343	51,783	161,670	273,907	128,182
2019 Median household income	$48,783	$51,639	$58,200	$65,712	$62,541
Households without a motor vehicle	16.0%	10.3%	8.7%	7.8%	5.8%
Low income households	21.0%	14.3%	13.2%	12.3%	12.0%

EMPLOYMENT

As shown on Table 3.1.3, there are 35,133 jobs within one-half mile of the corridor, which is estimated to grow to 46,062 in 2040. Commercial and residential development between 2018 and 2019 includes 153,460 SF of commercial and 153 residential dwelling units. Within one-half mile of the corridor there are 162 health care facilities, approximately 40% of the facilities Citywide. Figure 3.1.3 shows total employment within the study area (half mile radius around Havana Street).

Table 3.1.3: Havana Street Corridor Jobs and Developments[56]

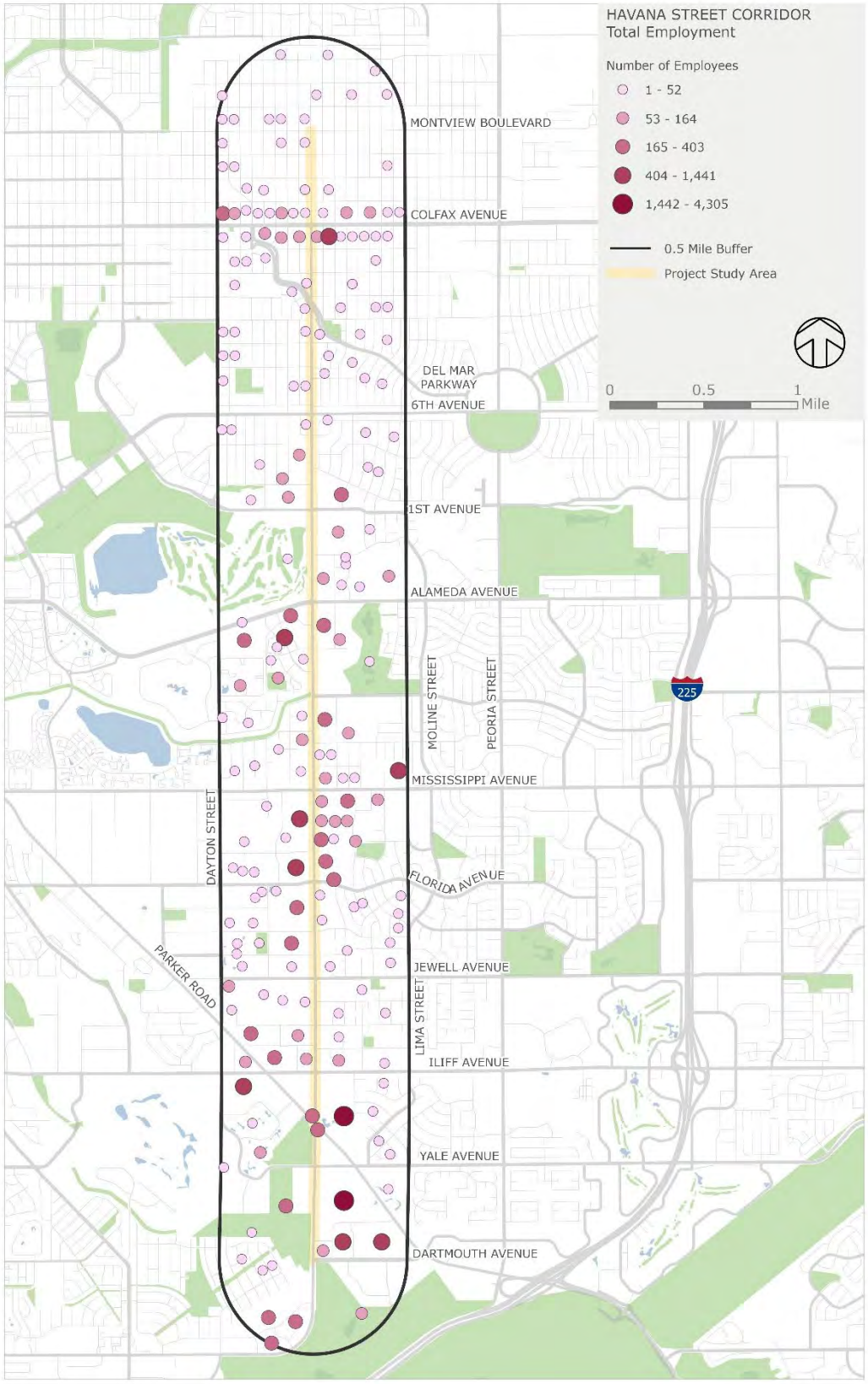
Businesses	½-Mile	1-Mile	3-Mile	5-Mile	City of Aurora
Jobs (2020)	35,133	48,245	192,523	460,788	183,514
Jobs (2040)	46,062	63,313	247,276	543,453	329,927
Commercial Development, in SF (2018-2019)[7]	153,460	159,198	1,146,779	1,760,758	11,011,563
Residential Units Developed in Last 2 years (2018-2019)[5]	153	164	1,349	1,349	6,648
Health Care Facilities	162	233	681	1,168	396

[5] *Source: DRCOG Vulnerable Population Dataset; ESRI Business Analyst; U.S. Census Bureau, ACS 2018 (5-Year Estimates)*

[6] *Some data is based on Census tracts or other geographies that may include multiple jurisdictions; data is Aurora specific to the greatest extent possible.*

[7] *City of Aurora permits only; does not include other municipality/county data*

Figure 3.1.3: Employment within the Study Area



3.2 EXISTING ROADWAY CHARACTERISTICS AND TRAFFIC OPERATIONS

ROADWAY CHARACTERISTICS

Within the study area Havana Street is a north-south arterial that is between two and eight lanes in width (both directions) and has posted speeds ranging from 30 to 45 mph. The study boundaries encompass six miles of the Havana Street corridor between Montview Boulevard and Dartmouth Avenue. As shown on Figure 3.2.1, from Montview Boulevard to Yale Avenue, parallel collector roads, one-half mile away, are generally provided on both sides of Havana Street, except between 6th Avenue and Alameda Avenue where the parallel collector roads only exist on one side or the other. These roads can provide relief to some sections of Havana Street for north/south travel.

Table 3.2.1 provides an overview of the six typical sections that can be seen within this area from north to south. More than half of the corridor consists of six travel lanes plus opposing left turn lanes parallel to one another and posted speeds between 40 and 45 mph. Figures 3.2.2 and 3.2.3 show the lane configuration and intersection control for each of the study intersections. Havana Street, north of 6th Avenue is a minor arterial roadway and falls within the Original Aurora neighborhood area. South of 6th Avenue, Havana Street is classified as a major arterial and falls within the City Corridor (6th Avenue to Iliff Avenue) and Urban District (Iliff Avenue to Dartmouth Avenue) neighborhood areas.

Table 3.2.1: Havana Street Typical Sections and Posted Speed Limits

Section	Approx. Length (mile)	Number of Travel Lanes (Both directions)	Other Lane(s)	Speed Limit (mph)	Functional Classification
Montview Boulevard to Colfax Avenue	0.5	2	On-street parking in both directions	30	Minor Arterial
Colfax Avenue to Del Mar Parkway	0.38	2	1 Two-way Left-turn Lane (TWLT)	30	Minor Arterial
Dar Mar Parkway to 6th Avenue	0.63	4	-	30	Minor Arterial
6th Avenue to 1st Avenue	0.5	4	Opposing left-turn lanes parallel to one another	40	Major Arterial
1st Avenue to Yale Avenue	3.5	6	Opposing left-turn lanes parallel to one another	40, 45	Major Arterial
Yale Avenue to Dartmouth Avenue	0.5	5	Opposing left-turn lanes parallel to one another	45	Major Arterial

AVERAGE DAILY TRAFFIC VOLUMES

Average daily traffic (ADT) volumes taken from DRCOG's traffic count data (Figure 3.2.4) show that north of 6th Avenue, the ADT on Havana Street is less than 25,000 ADT. The lower ADT is likely a result of the single-family residential land uses that occupy this area, the existing roadway geometry, and the fact that Havana Street is no longer continuous north of Montview Boulevard. The segment between 6th Avenue and Iliff Avenue is characterized by the highest traffic volumes along the corridor, reaching approximately 47,700 ADT in the busiest section. The southern portion of the corridor, between Iliff Avenue and Dartmouth Avenue experiences approximately 34,000 ADT on average.

Figure 3.2.1: Existing Functional Classification Map

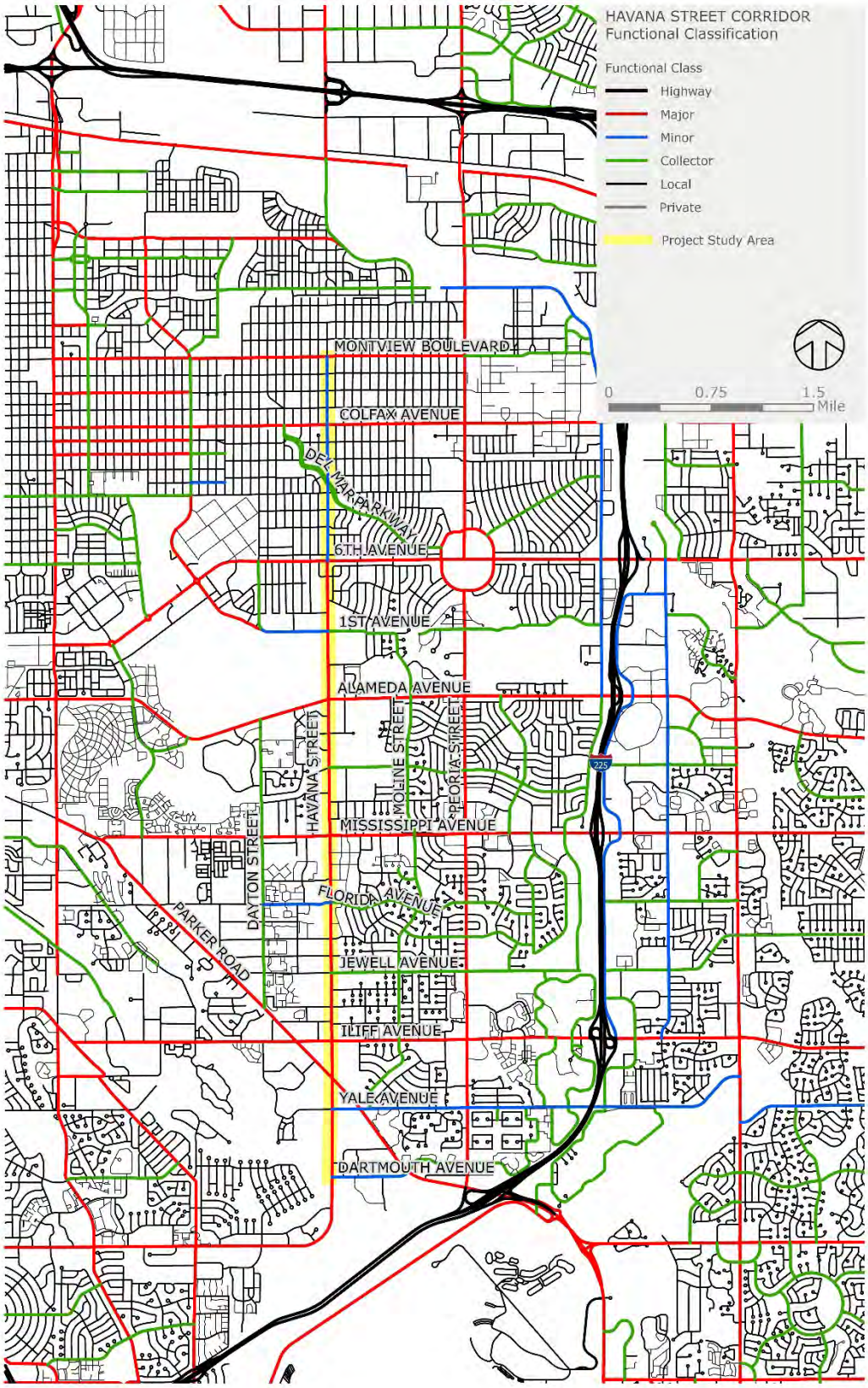


Figure 3.2.2: Existing Lane Configuration and Intersection Control (North Intersections)

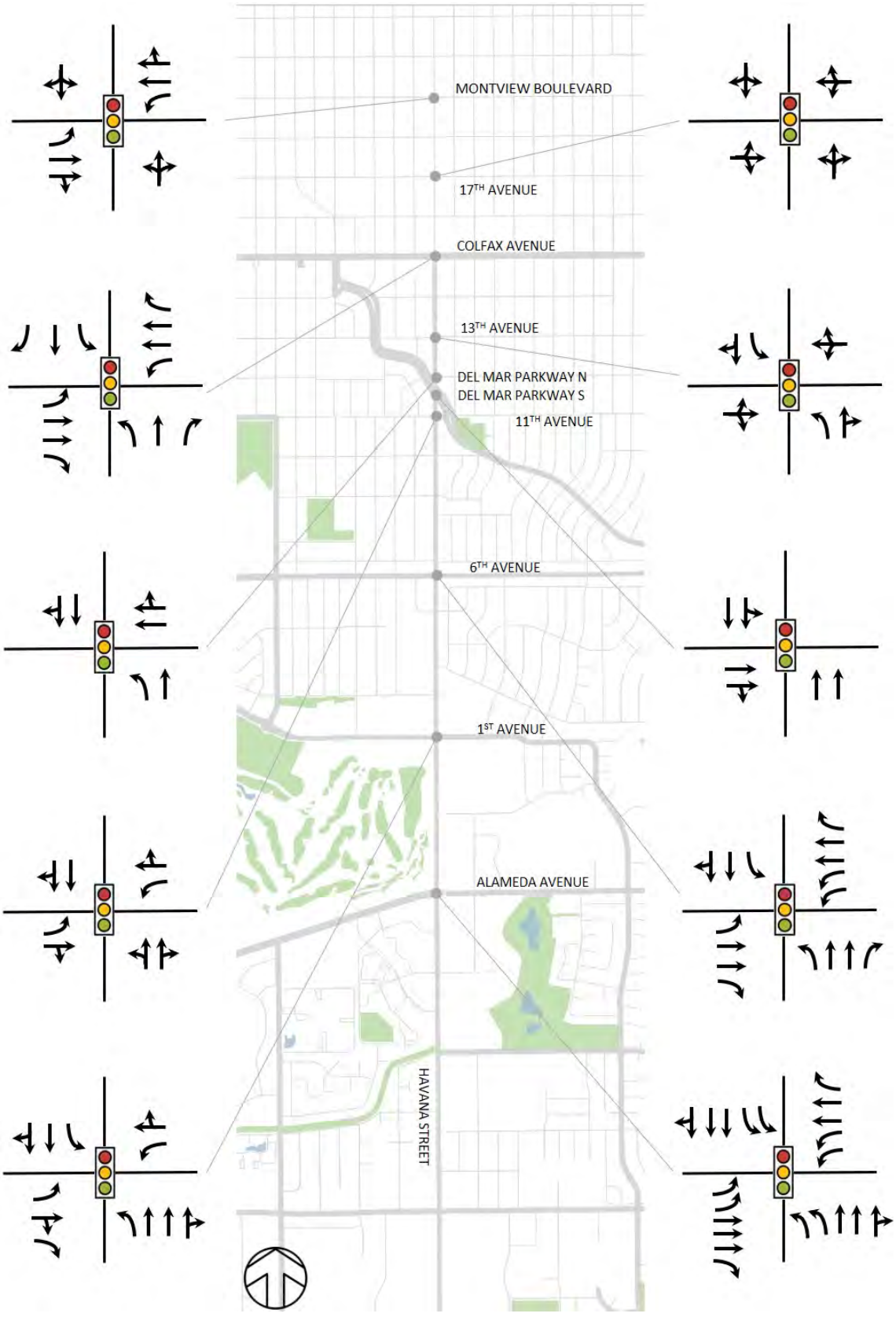


Figure 3.2.3: Existing Lane Configuration and Intersection Control (South Intersections)

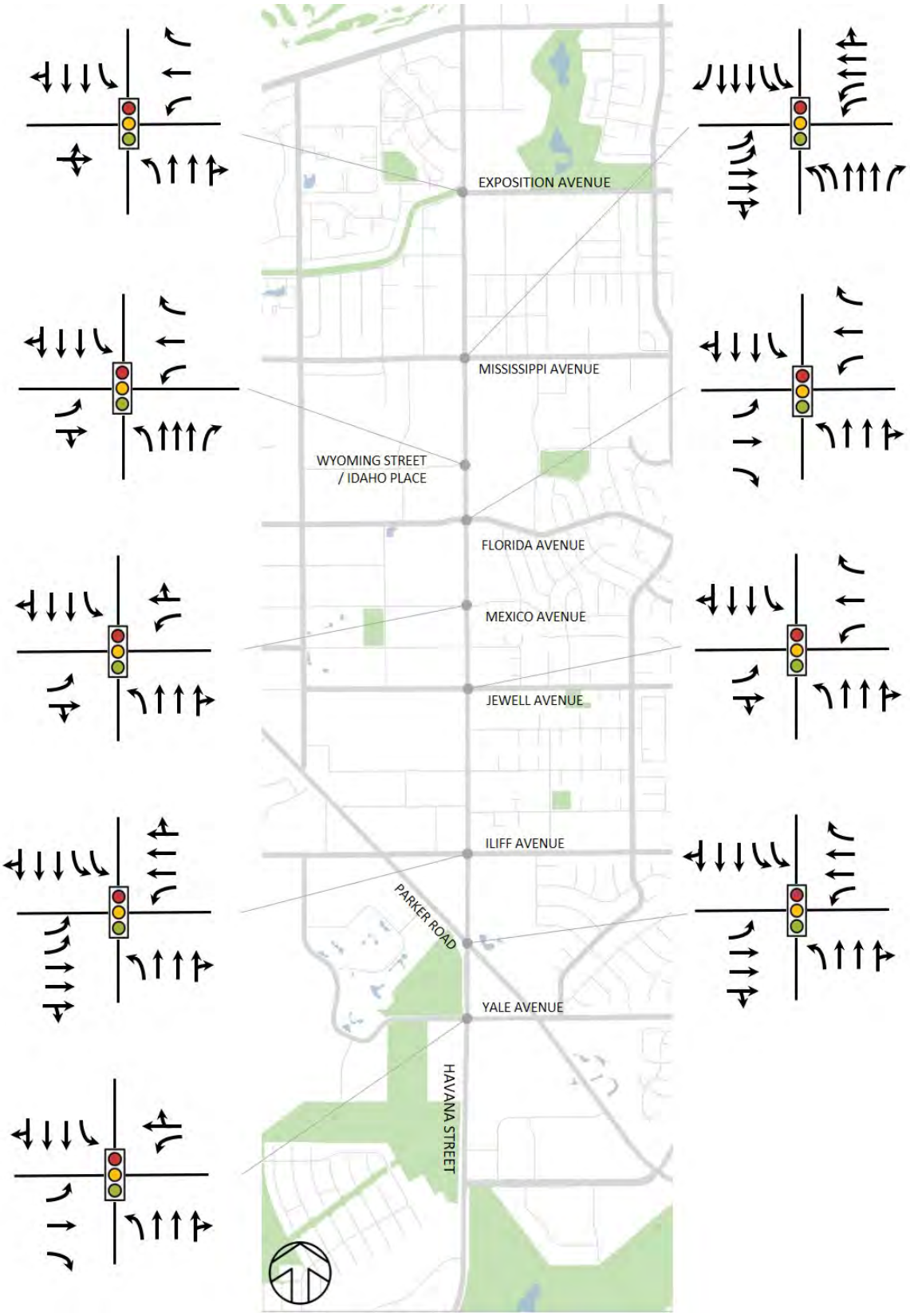
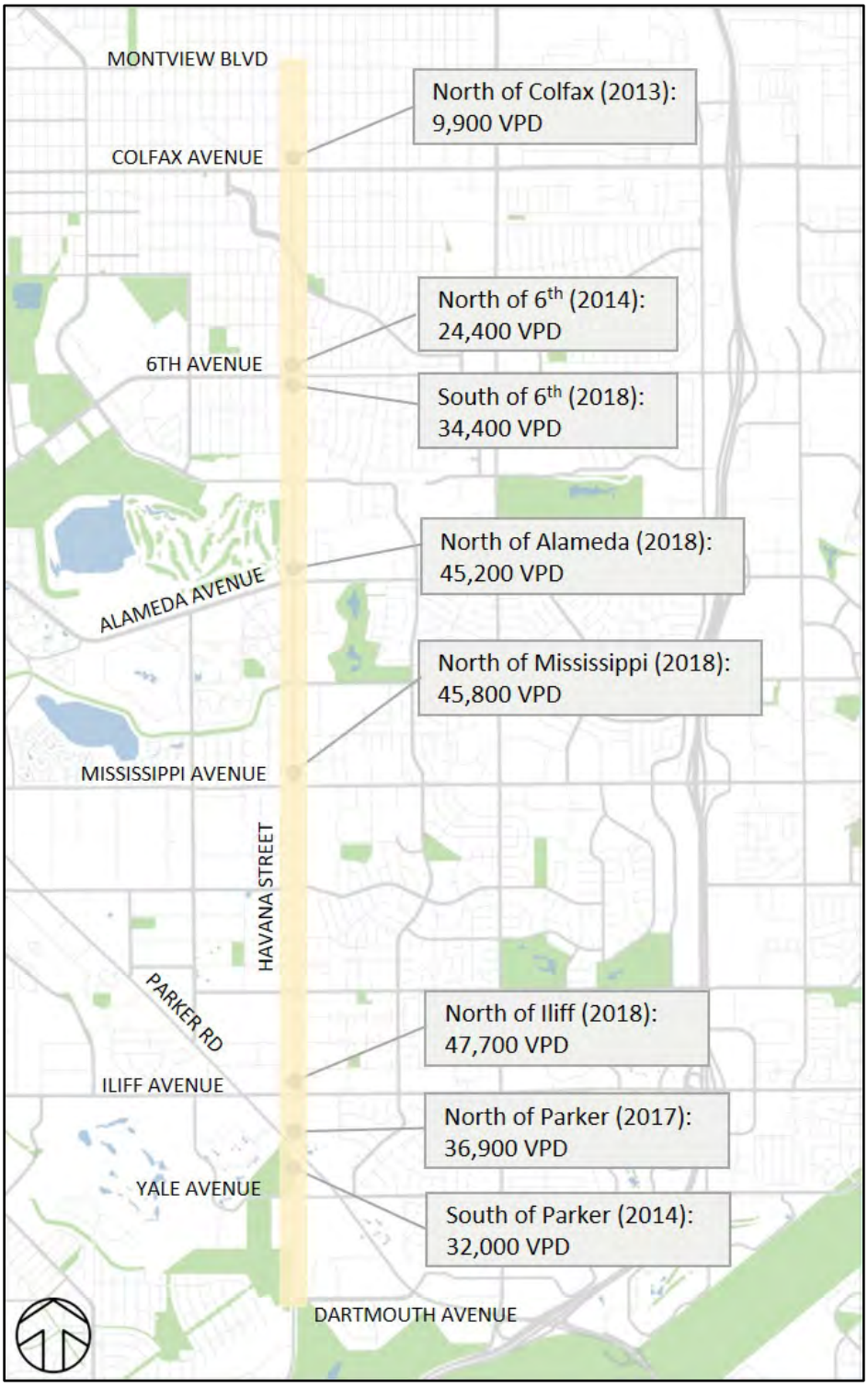


Figure 3.2.4: Existing Average Daily Traffic Volumes[8]



[8] *Source: DRCOG Regional Traffic Counts. https://gis.drcog.org/trafficcounts/. Data shown is the most recent available.*

TURNING MOVEMENTS AND GROWTH RATES

2020 turning movement counts (TMC)s were not collected as part of this project because travel patterns drastically changed before counts could be conducted as a result of stay at home orders issued in response to the COVID-19 pandemic. In place of new 2020 counts, 2018 traffic counts collected as part of the City's signal retiming project were used. These TMCs, provided by the City, were used to develop existing and future traffic volume estimates. To project the 2018 volumes to 2020, an estimated annual growth rate of 1.67% was uniformly applied across all 2018 turning movement volumes. This growth rate was based on a review of the 2015 and 2040 ADT's from the DRCOG regional model. It should be noted that the 2018 TMCs did not include data for two intersections on the corridor – Havana Street and Parker Road, and Havana Street and Dartmouth Avenue. For Havana Street and Parker Road, the volumes from the latest city-provided Synchro files were used to develop 2020 traffic volume estimates. The Denver intersection of Havana Street at Dartmouth Avenue was excluded from the traffic analysis due to insufficient available traffic data. Figures 3.2.5 and 3.2.6 provide the projected 2020 intersection turning movement volumes for both AM and PM peak periods, which were used to conduct intersection capacity analysis for the corridor intersections.

INTERSECTION OPERATIONS

Intersection operations for vehicle movements along the corridor were assessed using Synchro software (Version 10.3), which utilizes the latest Highway Capacity Manual (HCM) procedures for capacity and vehicular Level of Service (LOS) computations. The performance measures used to analyze the study intersections include average delay and LOS measurements for the intersection and each approach. The LOS criteria applied in this study are based on the HCM criteria for signalized intersections. No unsignalized intersections were evaluated. The relationship between average vehicle control delay and LOS are listed in Table 3.2.2. The City's current standards generally consider an intersection LOS of "D" or better as acceptable during peak periods, except that individual movements may be allowed to fall to LOS "E". This analysis identifies vehicular delays, congestion and potential improvement needs.

Table 3.2.2: HCM LOS Criteria for Signalized Intersections

LOS	Signalized Intersection (Avg Vehicle Control Delay)
A	≤ 10 sec
B	10-20 sec
C	20-35 sec
D	35-55 sec
E	55-80 sec
F	> 80 sec

It is important to note that successful corridors often experience congestion or delays for vehicles moving through and within the corridor. Vibrant streets with a high concentration of successful retail stores, restaurants, residential developments, as well as numerous employees, residents and visitors, and interesting, safe and attractive places for people to shop, walk and enjoy, would certainly attract more

Figure 3.2.5: 2020 Intersection Turning Movement Volumes (North Intersections)

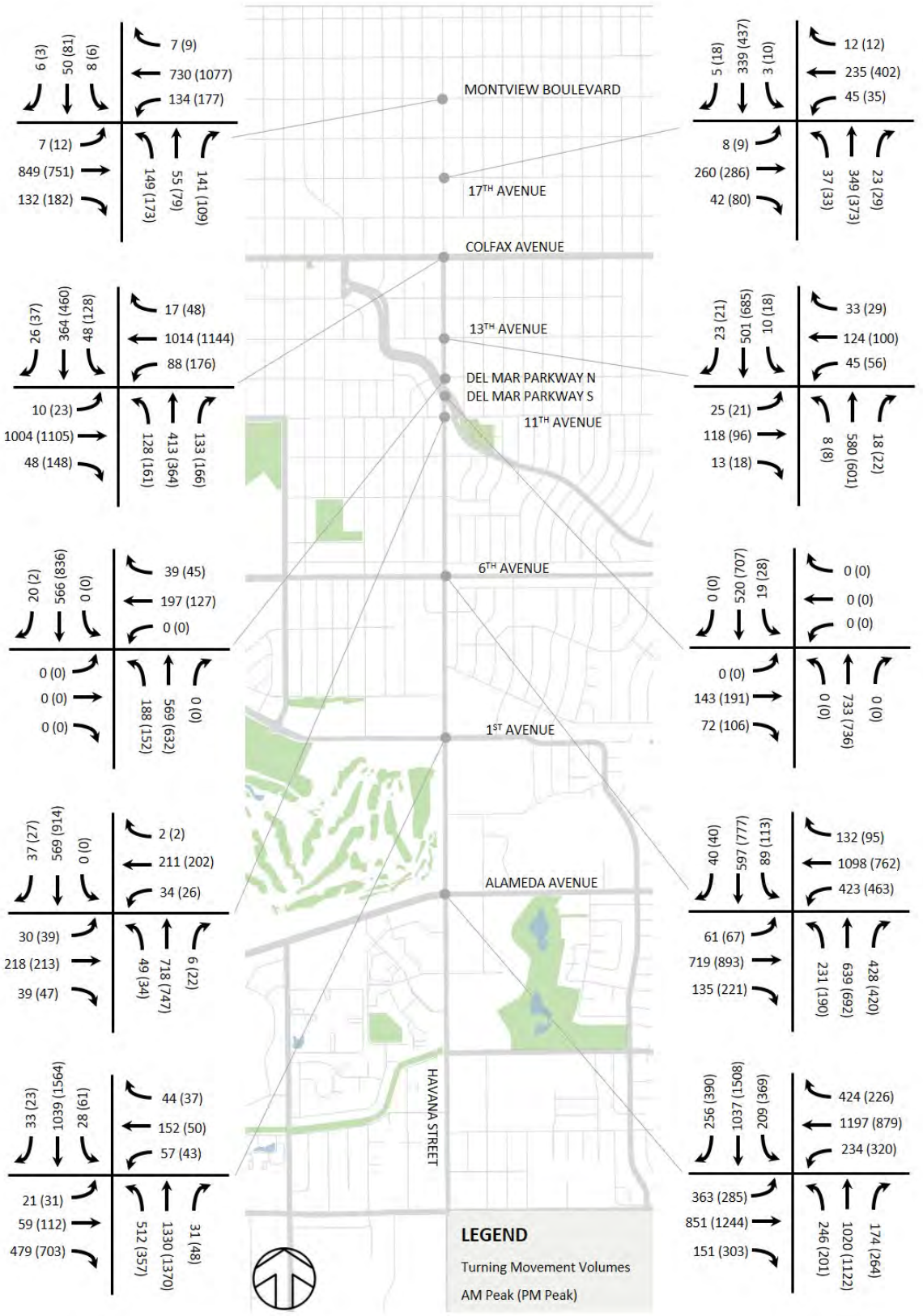
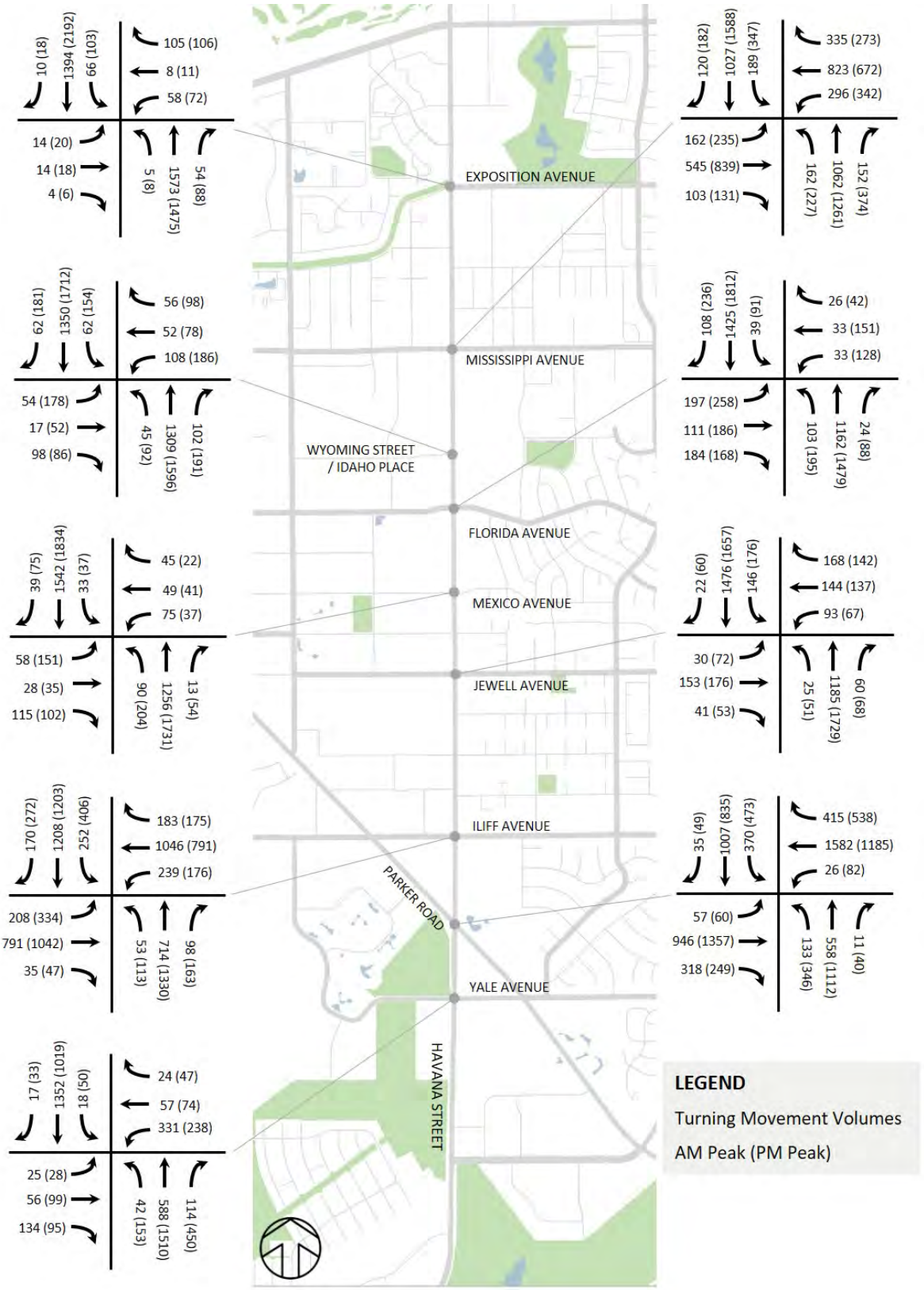


Figure 3.2.6: 2020 Intersection Turning Movement Volumes (South Intersections)



people and more cars. This will in turn cause some congestion or delays. As Robert Steuteville, in "Good Congestion, Bad Congestion"[9], stated, "places that are healthy economically, that attract a lot of people, are often crowded". Streets that prioritize vehicular speed and vehicle throughput, often do so to the detriment of economic activities and enjoyable places along the corridor. In other words, delays or traffic congestion in an urban area, are part of the economic success. A study[10] completed in 2018 by University of Colorado and Florida Atlantic University researchers Wes Marshall and Eric Dumbaugh also found that "a region's economy is not significantly impacted by traffic congestion. In fact, the results even suggest a positive association between traffic congestion and economic productivity as well as jobs". Another important consideration when analyzing cars and delays along a corridor is to distinguish trips that move through the corridor, which do not bring economic activities and benefits to the corridor, from those trips that have a destination or origination within the corridor, which are part of the economic activities of the corridor.

Strategies and improvements addressing delays and congestion should be balanced and context sensitive. Recommendations should first focus on those improvements and strategies that contribute to a corridor's economic vitality, the encouragement of more walking, biking and taking transit, and reduction in vehicle trips, especially cut-through traffic, before considering improvements that prioritize increased vehicle throughput. This approach of balancing travel modes and attentiveness to context is supported through the city of Aurora's commitment to incorporate Complete Streets into the City's updated "Roadway Design and Specifications Manual"[11].

Figures 3.2.7 and 3.2.8 summarize the overall intersection and approach vehicular LOS of the major intersections during the AM and PM peak periods. Tables summarizing the LOS by intersection, approach and movement, as well as the detailed evaluation results from Synchro are provided in Appendix A.

During the AM peak hour, all study intersections operate at an overall vehicular LOS "D" or better, although vehicles experience relatively longer delays and LOS "E" at some individual intersection approaches due to heavy peak hour volumes or heavy demand for left-turn or right-turn movements. Vehicles experience longer delays on one or more approaches at the intersections of Del Mar Parkway North, Alameda Avenue, Mississippi Avenue, Wyoming Street/Idaho Place, Florida Avenue, Parker Road, and Yale Avenue.

During the PM peak hour, all study intersections operate at an overall LOS "D" or better, except for Iliff Avenue which operates at LOS "E". All approaches at the Iliff Avenue intersection currently operate at LOS "E" with approach volumes exceeding 1200 vehicles per hour (VPH) and volume to capacity ratios for the eastbound and northbound approaches over 0.9. The heavy eastbound left-turn and southbound left-turn volumes (over 300 vph) also contribute to the long delays at this intersection. Additionally, for the intersections south of 6th Avenue, most of the intersections have at least one approach that operates with LOS "E" due to heavy traffic demand during the PM peak hour.

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[9] *"Good congestion, bad congestion" Public Square A CNU Journal Published February 6, 2019. https://www.cnu.org/publicsquare/2019/02/06/good-congestion-bad-congestion*

[10] *"Revisiting the relationship between traffic congestion and the economy: a longitudinal examination of U.S. metropolitan areas", Transportation, 2020, vol. 47, issue 1, No 11, 275-314*

[11] *Transportation, Airports and Public Works (TAPS) Policy Committee, November 2019*

Figure 3.2.7: 2020 Intersection LOS (North Intersections)

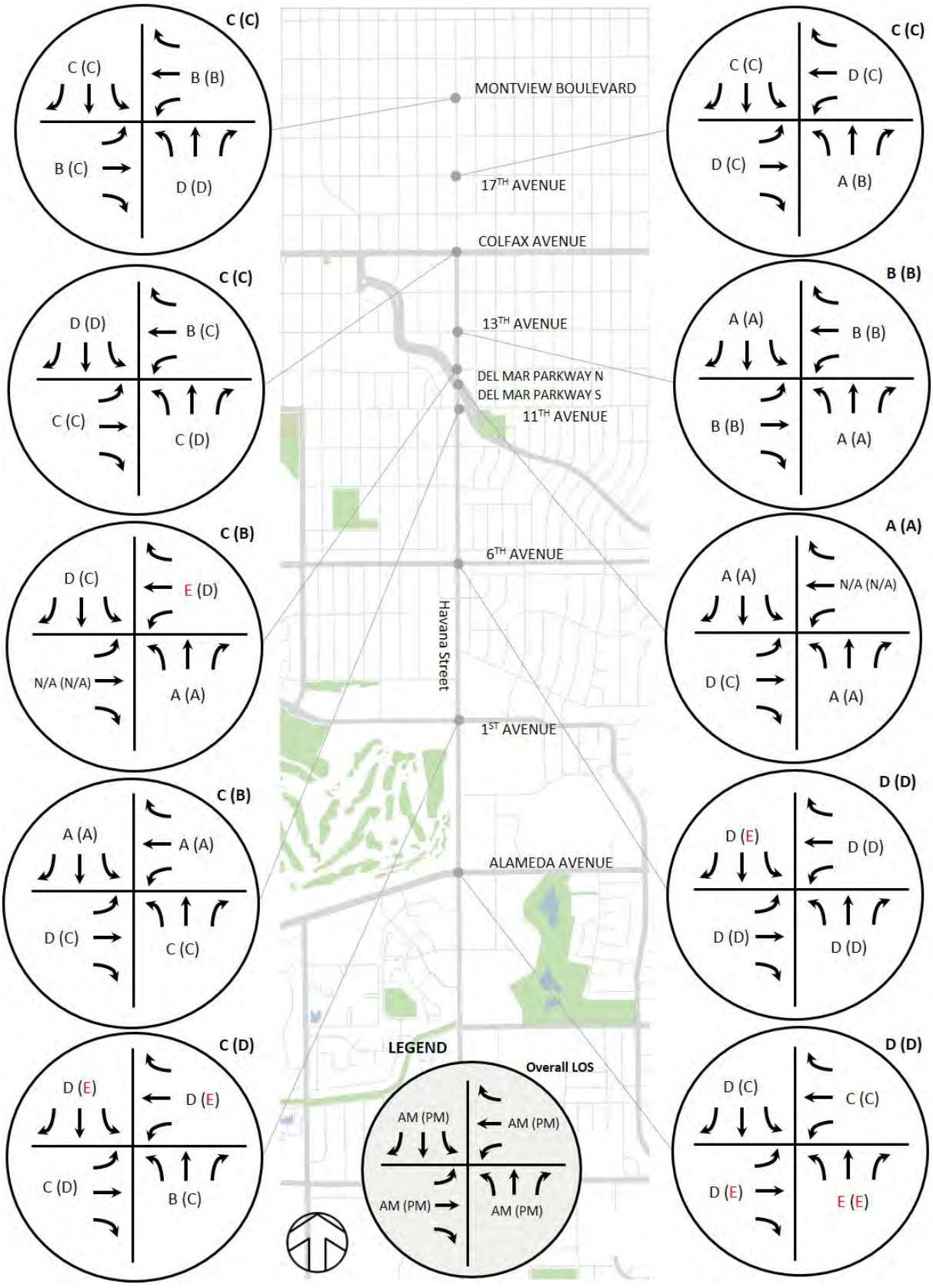
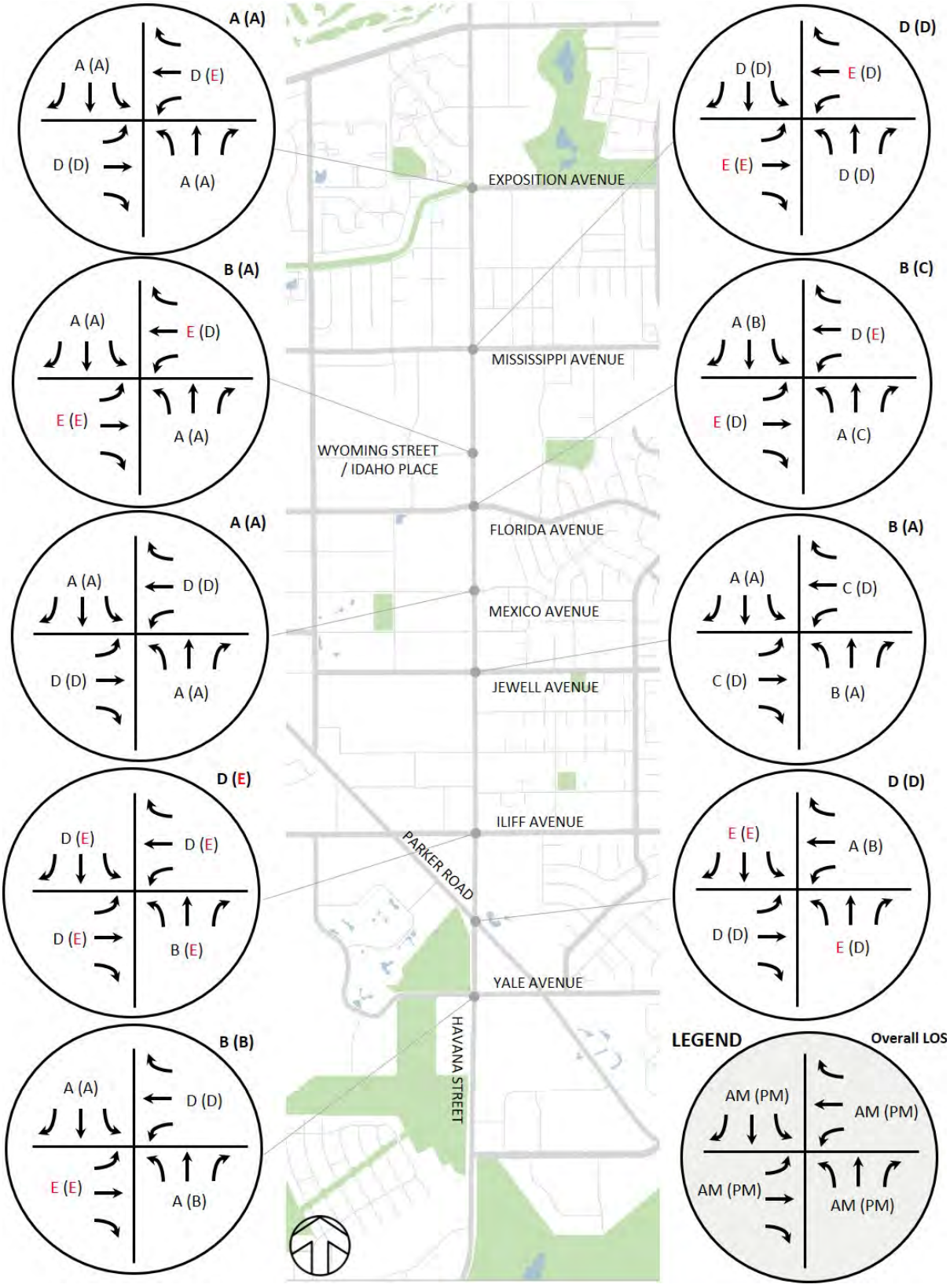


Figure 3.2.8: 2020 Intersection LOS (South Intersections)



During the 2018 signal retiming project, traffic signal timings between 6th Avenue and Dartmouth Avenue were revised to optimize signal coordination along the corridor. With limited right-of-way and already optimized signal timings, creative solutions and a Complete Streets approach should be explored for addressing the travel needs of all users. Specifically, multimodal improvements that reduce the forecasted high automobile traffic demand and have the potential to shift demand to alternative modes such as walking, biking and taking transit will need to be considered. The multimodal improvements will need to focus on the high demand intersections to maintain a balance between automobile movement and a safe and convenient pedestrian environment, which is also critical to the economic vitality of the corridor.

EXISTING VEHICLE TRAVEL SPEED AND DELAY

The vehicle travel speed and delay along the corridor were measured during the 2018 citywide signal re-timing project through floating car surveys. The field survey covered the segment from Yale Avenue to 6th Avenue. The detailed results for Havana Street have been included in Appendix B. The average travel speed, including stop delays, during the AM peak period is 24 mph and the PM peak period average travel speed is 21 mph, both are lower than the posted speed limit. However, this difference in posted versus actual speeds is common on similar types of arterials. Furthermore, posted speed limits are traditionally set based on free-flow speed conditions, not congested peak conditions.

During the AM peak hours, vehicles traveling northbound experienced lower speeds and longer delays than those traveling southbound (i.e., 221 seconds of total stop delay for northbound vs. 164 seconds of total stop delay for southbound). The PM peak hour shows a reverse trend, however, the differences on average speed and delay between northbound and southbound directions are marginal (i.e. 228 seconds of total stop delay for northbound vs. 249 seconds of total stop delay for southbound).

Figures 3.2.9 and 3.2.10 display the travel speed for each segment between Yale Avenue and 6th Avenue. Vehicles experience relatively low speeds and long delays at the segments of Yale Avenue to Parker Road, Parker Road to Iliff Avenue, Wyoming Street/Idaho Place to Mississippi Avenue, and Alameda Avenue to 1st Avenue. These are consistent with the results from the LOS analysis mentioned above. The average speed for these segments is generally less than 20 mph during the AM and PM peak hours.

3.3 EXISTING TRANSIT FACILITES AND OPERATIONS

TRANSIT FACILITIES

RTD route 105 provides northbound and southbound service, with 23 stops in the northbound and 25 stops in the southbound direction. Route 105 spans the entire study segment from Dartmouth Avenue to Montview Boulevard, connecting with 11 east-west bus routes. The closest parallel north/south route for riders is Peoria Street, located one mile east of Havana Street. To the west, the closest parallel route is Quebec Street, which is two miles away. For east/west travel, most of the arterial roadways crossing Havana Street provide bus service and on average are spaced one mile apart.

Based on August 2019 data provided by RTD, Route 105 currently serves 2,964 riders per day northbound and 3,077 riders per day southbound at the stops within the study area. A review of the studies, analysis, ridership levels and the availability of transit demonstrates this being a key transit corridor that would benefit from a level of amenities that mirrors the use and service. Table 3.3.1 shows that no amenities are provided at 31% of the stops, benches are provided at 42% of the stops, and the remaining 27% have a bench and shelter. In some of those cases the bench is located outside the shelter. While 31% of stops have no amenities, those stops only serve 13% of riders. The general proximity of streetlights to transit stops were also identified. Streetlights can increase the sense of security and comfort for persons accessing transit, while also illuminating transit customers to passing vehicles.

Figure 3.2.9: Northbound Direction Average Travel Speed

Figure 3.2.10: Southbound Direction Average Travel Speed

Generally, the streetlights installed in the corridor are up to 40 feet high, and configured to illuminate traveling conditions for vehicles. These street lights are not human scaled, and while they provide lighting for bicyclists, pedestrians, and transit customers, these street lights may not be orientated to maximize the safety and comfort of users traveling outside of vehicles. Tables 3.3.2 and 3.3.3 provide the ridership and available overhead lighting conditions by stop while Figure 3.3.1 shows the location of amenities in relation to each of the stops. By far, the highest ridership occurs at Colfax Avenue, where the northbound and southbound stops each serve 800 riders per day. Mississippi Avenue and Iliff Avenue serve the second highest number of riders per day, nearly 300 per stop. Boardings and alightings are typically highest at major intersections and decreases between intersections.

Table 3.3.1: Summary of Existing Transit Amenities

Amenities Provided	Bus Stops (#)	Bus Stops (%)	Riders Boarding (#)[12]	Riders Boarding (%)
None	15	31%	402	13%
Bench Only	20	42%	961	32%
Bench and Shelter	13	27%	1634	55%

TRANSIT LEVEL OF SERVICE

Transit level of service (LOS) is measured by RTD based on time between headways and unlike vehicle LOS, RTD's transit LOS is not tied to a letter-grade (i.e. A, B, C, etc.). The project team conducted a more detailed analysis using the Transit Capacity & Quality of Service Manual (TCQSM) to determine transit LOS on this corridor. The transit LOS is based on transit operations, transit amenities and the pedestrian environment. The data used to develop the inputs for the transit operations were calculated based on August 2019, PM peak (3pm to 6pm) data provided by RTD. While vehicle level of service is typically measured during a one-hour peak, a preliminary review of the RTD data showed that analysis of the three hour and one-hour peak data would generally provide the same results. The additional work required to pull out the one-hour peak data would not provide an equal value added and therefore was not conducted. The transit amenities and pedestrian environment parameters were collected using site visits, detailed aerials, 2018 peak hour traffic counts and Synchro software. Consistent with guidance in the TCQSM, the corridor was broken into segments based on direction of travel (northbound and southbound) and intersections where traffic may have to stop due to traffic control (i.e. signalized intersections and stop controlled intersections). The transit analysis worksheets are provided in Appendix C.

[12] *These numbers only include riders that are boarding. Alighting riders would not need a bench or shelter unless they were transferring to another bus.*

Table 3.3.2: Transit Amenities by Stop (NB)

NB BUS STOPS				Legend <30 60 - 80 250+ Boarding/Alighting Riders	
Stop	Lighting Conditions			Boardings	Alightings
	Within 50'	Further than 50'	Private lighting within 50'		
Havana Street & Montview Boulevard		●		12	40
Havana Street & 17th Avenue	●			7	13
Havana Street & Colfax Avenue		●		271	541
Havana Street & 13th Avenue		●		8	25
Havana Street & 11th Avenue		●		50	57
Havana Street & 8th Avenue		●		16	14
Havana Street & 6th Avenue	●			71	75
Havana Street & 4th Way		●		29	23
Havana Street & 1st Avenue			●	56	40
Havana Street & Bayaud Avenue			●	25	15
Havana Street & Alameda Avenue	●			99	59
Havana Street & Virginia Avenue	●		●	51	39
Havana Street & Exposition Avenue	●		●	74	50
Havana Street & Kentucky Avenue			●	39	24
Havana Street & Mississippi Avenue			●	201	95
Havana Street & Idaho Place			●	63	52
Havana Street & Florida Avenue	●			52	44
Havana Street & Mexico Avenue	●			39	34
Havana Street & Jewell Avenue	●			36	26
Havana Street & Evans Avenue		●		16	7
Havana Street & Iliff Avenue		●		210	70
Havana Street & Parker Road	●			37	24
Havana Street & Yale Avenue		●		47	36
Havana Street & Dartmouth Avenue			●	77	50

Table 3.3.3: Transit Amenities by Stop (SB)

SB BUS STOPS				Legend <30 60 - 80 250+ Boarding/Alighting Riders	
Stop	Lighting Conditions			Boardings	Alightings
	Within 50'	Further than 50'	Private lighting within 50'		
Havana Street & Montview Boulevard		●		32	17
Havana Street & 17th Avenue		●		18	17
Havana Street & Colfax Avenue		●		555	243
Havana Street & 13th Avenue		●		17	13
Havana Street & 11th Avenue		●		57	47
Havana Street & 8th Avenue		●		15	21
Havana Street & 6th Avenue	●			90	79
Havana Street & 4th Way	●			18	40
Havana Street & 1st Avenue	●			45	64
Havana Street & Bayaud Avenue	●			7	23
Havana Street & Alameda Avenue		●		76	89
Havana Street & Virginia Avenue	●			34	47
Havana Street & Exposition Avenue	●			49	70
Havana Street & Kentucky Avenue	●			27	67
Havana Street & Mississippi Avenue	●			109	208
Havana Street & Idaho Place	●			36	58
Havana Street & Florida Avenue		●		38	47
Havana Street & Mexico Avenue	●			29	49
Havana Street & Jewell Avenue		●		23	39
Havana Street & Evans Avenue		●		6	34
Havana Street & Iliff Avenue	●			69	211
Havana Street & Parker Road		●		18	29
Havana Street & Yale Avenue			●	28	42
Havana Street & Dartmouth Avenue	●			36	62

Figure 3.3.1: Transit Amenities by Stop

The transit operations data required the following parameters: headway, average excess wait time, average passenger load factor, average transit travel speed, and average passenger trip length. The average excess wait time is a measure of reliability and is determined by calculating the amount of time passengers must wait for the bus to arrive after the scheduled time. The average passenger load factor is a measure of how comfortable people are on the bus. It is determined by the number of people on the bus and the number of available seats. The average passenger load worsens the transit LOS when there are more people than the available seats and passengers must stand. For bus routes on the Havana Street Corridor, the average passenger load factor had no impact below an 80% seated load. The average transit speed was calculated using data provided from RTD. The average passenger trip length was calculated using the same methodology as RTD which is consistent with the TCQSM. The total passenger miles traveled were calculated and then divided by the total number of boardings to calculate the average passenger trip length.

The transit amenities data was based upon the percent of stops with a shelter and the percent of stops with a bench. The pedestrian environment is based upon the sidewalk width, bicycle lane width, buffer width to the adjacent road, perceived separation from vehicles and the speed and flow rate of vehicles. The pedestrian data is used to adjust the LOS - a high-quality walking environment will increase the LOS; while, a low-quality walking environment will produce a poor LOS.

The breakdown of LOS thresholds provided in the TCQSM, are shown in Table 3.3.4. Per the TCQSM, the A-F LOS letter produced by this method for transit service on the street can be directly compared to the LOS letters produced for the automobile, pedestrian and bicycle modes operating on the street. Since RTD does not have an established level of service standard, for purposes of this report, we will apply the City's LOS "D" standard for vehicle level of service to identify those locations where RTD and/or the City may want to focus additional consideration for transit improvements.

Table 3.3.4: TCQSM Transit LOS Thresholds

LOS	Transit LOS Thresholds
A	0 to 2
B	>2 to 2.75
C	>2.75 to 3.5
D	>3.5 to 4.25
E	>4.25 to 5
F	> 5

The results of the analysis are provided in Table 3.3.5. All of the segments operate at an acceptable LOS "C" or better. An excess wait time (additional time between scheduled transit arrival time and actual arrival time) averaging four minutes for each segment plus a lack of benches at 31% of the stops has an impact on the LOS. Consistent with the *Transit Priority Analysis of Select Corridors* study, improving the transit speed through the Implementation of transit signal priority, bus bulbs, queue jumps and/or consolidating low ridership stops would likely improve the transit speed, while the addition of benches and/or shelters would improve riders experience even if the excess wait time didn't change.

Table 3.3.5: Existing (2019) Transit LOS Summary

Segment	Direction	Transit LOS	
		Transit LOS Score	Transit LOS Grade
Between 17th Avenue and Montview Boulevard	NB	3.14	C
	SB	3.08	C
Between 16th Avenue and 17th Avenue	NB	No Stops	No Stops
	SB	2.96	C
Between Colfax Avenue and 16th Avenue	NB	3.13	C
	SB	No Stops	No Stops
Between 13th Avenue and Colfax Avenue	NB	3.33	C
	SB	3.09	C
Between Del Mar Parkway and 13th Avenue	NB	No Stops	No Stops
	SB	3.21	C
Between 11th Avenue and Del Mar Parkway	NB	3.23	C
	SB	3.08	C
Between 6th Avenue and 11th Avenue	NB	3.24	C
	SB	3.07	C
Between 1st Avenue and 6th Avenue	NB	3.26	C
	SB	3.18	C
Between Alameda Avenue and 1st Avenue	NB	3.04	C
	SB	3.08	C
Between Exposition Avenue and Alameda Avenue	NB	2.94	C
	SB	3.17	C
Between Mississippi Avenue and Exposition Avenue	NB	3.01	C
	SB	3.11	C
Between Idaho Place and Mississippi Avenue	NB	2.99	C
	SB	3.03	C
Between Florida Avenue and Idaho Place	NB	3.04	C
	SB	3.13	C
Between Mexico Avenue and Florida Avenue	NB	2.98	C
	SB	3.00	C
Between Jewell Avenue and Mexico Avenue	NB	3.04	C
	SB	2.88	C
Between Illiff Avenue and Jewell Avenue	NB	3.02	C
	SB	2.89	C
Between Parker Road and Illiff Avenue	NB	2.92	C
	SB	2.74	B
Between Yale and Parker	NB	2.88	C
	SB	2.82	C

3.4 EXISTING BICYCLE & PEDESTRIAN ACCOMMODATIONS

This section examines accommodations for bicyclists and pedestrians traveling along and across the six-mile Havana Street project corridor (Montview Boulevard to Dartmouth Avenue); analyzing existing infrastructure through the lens of user comfort and accessibility. While there are some existing facilities to accommodate walking and bicycling and some that meet current design standards, there are several areas where facilities are either not present or sub-standard, limiting mobility, safety and comfort for those walking and biking.

EXISTING BICYCLE FACILITIES

There are currently no designated bicycle facilities on Havana Street as shown on Figure 3.4.1 (*Existing Bicycle Facilities*). While bicyclists are permitted to use existing travel lanes and sidewalks in the project area, the high volume and speeds of automobile traffic would make using travel lanes extremely stressful for bicyclist, and the existing sidewalks have not been designed to optimize bicycle travel. Neither the existing travel lanes or sidewalks provides bicyclists with dedicated facilities such as a standard bike lane, a protected bike lane, or a cycle track.

Figure 3.4.1 illustrates existing bicycle facilities that are adjacent to the corridor. These routes provide some north-south connectivity, though not continuous throughout the length of this project's study area. For example, the continuous bike lane on Moline Street / Lima Street is approximately three miles long and is generally a half-mile to the east of Havana Street. It parallels the southern portion of the project area. Additional bike lanes intersect with Havana Street at Florida Avenue, and Del Mar Parkway in an east-west direction and bike lanes are provided on Exposition Avenue but end prior to reaching Havana Street. However, roads with bicycle facilities parallel to Havana Street in the northern half of the study area (north of Alameda Avenue) are lacking.

At three locations, Havana Street intersects with shared use (multi-use) paths including direct connections to the Westerly Creek Trail at Alameda, the High Line Canal Trail at Exposition Avenue and the Cherry Creek Trail at Dartmouth Avenue.

EXISTING PEDESTRIAN FACILITIES

Access Along the Corridor

An inventory of pedestrian access along the corridor reveals a significant variation in sidewalk width, with some sidewalks not meeting the 4-ft wide minimum required by current accessibility legislation while others are more than 15-ft wide. The majority of the sidewalks are curb adjacent and offer no separation from travel lanes. In addition, at several intersections, curb ramps do not meet current design standards in slope, landing size and detectable warning provision, or are lacking entirely; many of these intersections also lack marked crosswalks. Sidewalks cross dozens of driveways – both commercial and residential – in each block, presenting further safety concerns for those walking along the corridor. Many of these driveways have a maximum slope that exceeds design standards and can present a hazard to those walking or traveling by a mobility device. These conditions affect the access, safety, and comfort for pedestrians on the project corridor, but especially those that are more vulnerable such as children, the elderly, and those with disabilities. Figure 3.4.2 (*Existing Sidewalk Facilities*) and Figure 3.4.3 (*Accessibility & Sidewalk Inventory)* highlight the following observations:

Figure 3.4.1: Existing Bicycle Facilities

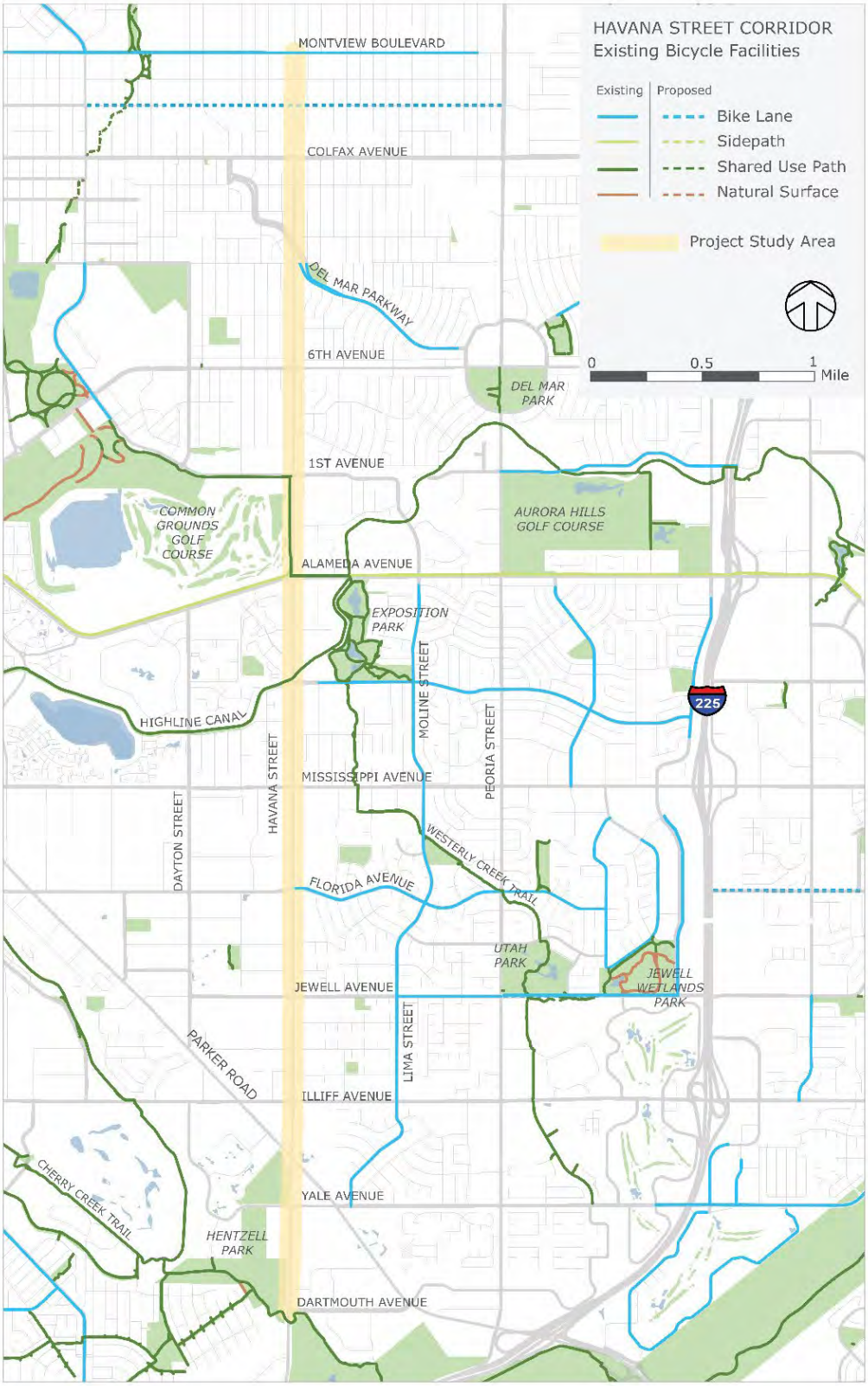


Figure 3.4.2: Existing Sidewalk Facilities

Figure 3.4.3: Accessibility & Sidewalk Inventory

- ***Narrow sidewalks*** - Many of the sidewalks in the northern portion of the study area are less than four feet wide, especially in the predominantly residential area north of Colfax Avenue. Some sidewalks are even less than three feet in width. Current ADA Accessibility Guidelines specify five feet as the minimum desirable width, but standards could also be met if four feet of clear width is provided as long as there is a five-foot-wide passing area provided every 200 feet for mobility assisted devices to pass each other.[13] Sidewalks five feet or less in width make it difficult to walk side-by-side or to pass other pedestrians without leaving the sidewalk. This increases the potential for conflict between pedestrians and motorized vehicles, decreases the overall comfort of those using the facility, and make use of the sidewalk by those who need mobility assistive devices difficult due to a shortage of maneuvering space.

- ***Non-compliant ramps and poor orientation*** - The two primary reasons pedestrian ramps were deemed "substandard" as show in Figure 3.4.3 are 1) lack of sufficient detectable warning (i.e. truncated domes) and 2) poor ramp orientation. Standards for detectable warning have likely changed since the construction of these ramps and they will require replacement to reach compliance with current standards. Ramp orientation, while not necessarily inconsistent with existing standards, is an important element of corner design – particularly for individuals with vision impairments and those in wheelchairs. Diagonal ramps, or those that do not have a matching ramp on the far side can direct pedestrians into harm's way by not aligning them with the crosswalk or the ramp on the opposite side of the street. Other issues not mapped but that are prevalent along the corridor include:

    - Ramp slopes that are too steep in relation to the cross slope of the street, creating an angle that is too difficult for people in wheelchairs or pushing strollers to traverse.
    - Upheaved concrete that creates tripping hazards and difficult bumps for small wheels, including front wheels of wheelchairs and strollers.
    - Cross-slopes that exceed two percent.
    - Lack of landings that allow people in wheelchairs to turn to orient for a crossing.

- ***Driveway barriers*** - Most driveways along the corridor simply introduce an extreme cross-slope for pedestrians to negotiate without providing a compliant pedestrian accessible route behind it or utilizing other driveway designs which do not impair the accessibility of the sidewalk.

- ***Sidewalk obstructions*** - For the purposes of this analysis, obstructions, as mapped in Figure 3.4.3 and described in Appendix D, were considered anything permanent in nature such as structures, utility poles, utility boxes, etc. If any vertical obstruction reduces the pedestrian travel zone to under 4 feet, not including the width of the curb, it is not ADA compliant.[14] Four feet is the minimum width required for people using a guide dog, crutches, or walkers. Wheelchair users need about 5 feet to turn around and 6 feet to pass other wheelchairs.[15] Other obstructions not mapped include overgrown vegetation, temporary items due to lack of storage space or maintenance (e.g. waste receptacles, homeowner possessions), and parked cars extending onto

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[13] *United States Access Board. ADA Accessibility Guidelines. https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/adaag*

[14] *https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/background/revised-draft-guidelines/chapter-3*

[15] *https://nacto.org/docs/usdg/accessible_sidewalks_and_street_crossings_boodlal.pdf*

sidewalks from residential driveways. The segment between 6th Avenue and 1st Avenues shows a cluster of obstructions.

- ***Curb-adjacent sidewalks*** - Curb-adjacent sidewalks are sidewalks that lack any kind of buffer between the pedestrian realm and the street. Most sidewalks along the project corridor are directly adjacent to the street, reducing pedestrian comfort and safety. Figure 3.4.3 indicates locations where no buffer is present. In some portions of the project area however, especially south of 6th Avenue where redevelopment has occurred, 3-10 feet of buffers are present.

- ***Lighting*** - Lighting is an important factor when considering access for and the safety of bicyclists and pedestrians. The adequacy of lighting can have a notable effect on the potential for crashes between modes both at intersections and on connecting segments of roadway. Generally, greater visibility in lower light or after dark conditions reduces the potential for crashes.

  As such, the project team examined the type of exterior lighting that exists at several locations on the corridor including the higher transit demand intersections of Havana with Colfax Avenue, 1st Avenue, Exposition Avenue, Mississippi Avenue, Florida Avenue, Iliff Avenue and Parker Road. Based on this review, exterior lighting consists exclusively of single-point overhead illumination with lights positioned 40 or 50-feet above the street. In most instances, it is a singular bulb over the leg of an intersection. There were no observations of pedestrian-scaled lighting which is generally lower in height and purposely placed to illuminate a pedestrian facility (i.e. crosswalk or path).

  With regard to bicycle and pedestrian safety, a single light placed directly over the crosswalk does not adequately illuminate the pedestrian (or bicyclist) for motorists and it's recommended that streetlights be positioned along both sides of arterial roadways to achieve a consistent level of lighting along a roadway.[16] The *CDOT Lighting Design Guidelines* include additional details for where lighting should be located, the height, and brightness of the lighting, among other factors, with specific consideration for pedestrian and bicyclist lighting. The guidelines, for example, state that for pedestrian lighting, a mounting height of 10 – 15 feet is typical and that 12 feet is the most common.[17] The frequency and adequacy of lighting within the specific focus areas will be examined more closely in the next phase of the project.

Crossing the Corridor

Havana Street is a key connection to retail and services, yet also acts as a barrier between neighborhoods west and east of the corridor due to high traffic speeds and volumes, width of the roadway (south of 11th Avenue), and limited opportunities for safe crossing. Figure 3.4.4 (*Existing Crosswalks*) identifies every designated crossing within the study area. While every street intersection constitutes legal pedestrian crossings even if they are unmarked, this map focused on those that have been provided a crosswalk marking and/or traffic control device. Existing crossing types that include marked crosswalks include:

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[16] *FHWA Pedestrian Safety Guide and Countermeasure Selection System available at http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=8*

[17] *Lighting Design Guidelines for the Colorado Department of Transportation, 2020, p. 19 , available at https://www.codot.gov/library/traffic/traffic-manuals-and-guidelines/fed-state-co-traffic-manuals/cdot-lighting-design-guideline-2019.pdf*

Figure 3.4.4: Existing Crosswalks

- Signal control at each leg of intersection with pedestrian interval; and
- Marked crosswalks

Many of these crossings require pedestrians or bicyclists to cross up to eight lanes of traffic, with no respite in the form of a pedestrian refuge or high visibility striping. In addition, as shown on Figure 3.4.4, there are several segments on the corridor where there is a half-mile distance (an approximately nine-minute walk) between designated crossing points. While there is no uniform standard for crosswalk spacing and placement depends on a variety of factors, the NACTO Urban Street Design Guide presents useful guidance of minimizing out of directional travel that would take more than three minutes to reach a cross-walk.[18] The corridor would benefit from the addition of several new and/or improved crossings to reduce these gaps and mitigate some of the need for jaywalking. For example, existing crossings could be enhanced with hybrid beacons, Rectangular Rapid Flashing Beacons (RRFBs), increased signage, or curb extensions, and new crossings could be added at the intersections of smaller local streets, shopping centers, and recreational destinations. The context of each location would be a contributing factor to determining which combination of improvements would be necessary to provide a safe and comfortable crossing.

3.5 BICYCLE & PEDESTRIAN VOLUME AND LEVEL OF TRAFFIC STRESS

BICYCLE & PEDESTRIAN VOLUME

Examining the average volume of bicyclists and pedestrians on Havana Street is critical to understanding active transportation demand. Figure 3.5.1 shows relative bicycle and pedestrian counts in relation to transit ridership along the corridor. Table 3.5.1 provides the bicycle and pedestrian counts at major intersections along the corridor. The totals shown are the sum of counts taken in April 2018 during four separate one-hour intervals. The sub-totals for the four intervals are shown on Table 3.5.1 and in Appendix E. The counts have been updated to reflect 2020 estimates based on an average annual growth factor of 0.88%.

As seen on Figure 3.5.1 (*Bicycle & Pedestrian Counts*[19]), the bicyclist volume is greatest at the intersections of Exposition Avenue and Alameda Avenue, with average peak hour volumes of five (5) bicyclists per hour. Pedestrian volume is significantly higher at all intersections along the corridor, with the greatest number at the intersections of Mississippi Avenue and 6th Avenue. The volume of pedestrians at every intersection was significantly greater than the volume of bicyclists. Overlapping the bicycle and pedestrian demand shows that the section between 6th Avenue and Jewell Avenue is the area of highest use.

The higher volume of active transportation users in the area between Mississippi Avenue and 6th Avenue shows that this is a high demand area and is well suited for investment in bicycle and pedestrian facilities.

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[18] *In general, if it takes a person more than three minutes to walk to a crosswalk, wait to cross the street, and then resume his or her journey, he or she may decide to cross along a more direct, but unsafe or unprotected, route. (https://nacto.org/publication/urban-street-design-guide/intersection-design-elements/crosswalks-and-crossings/)*

[19] *All Traffic Data Services, Inc. April 2018. www.alltrafficdata.net*

Figure 3.5.1: Bicycle & Pedestrian Counts

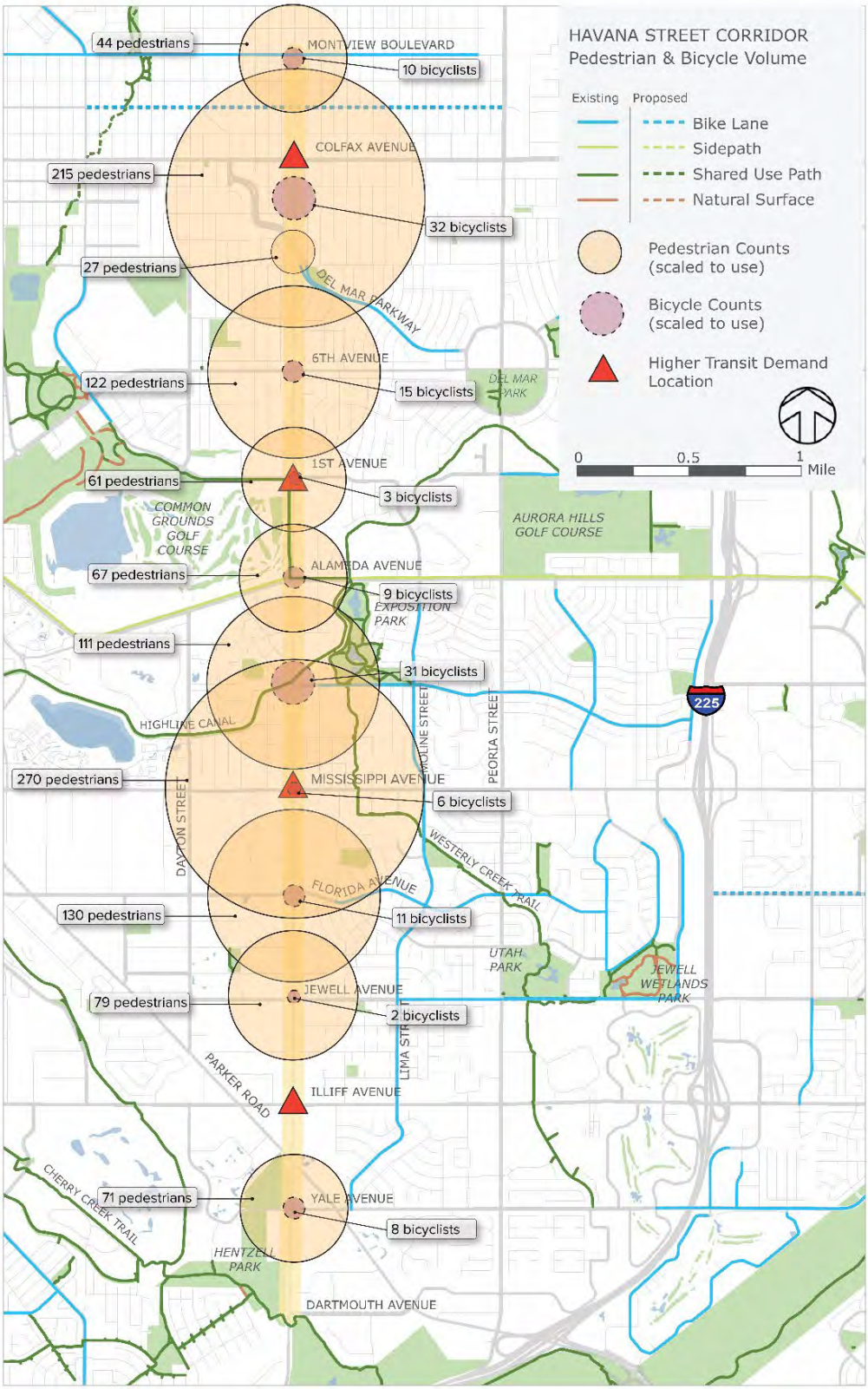


Table 3.5.1: Bicycle and Pedestrian Counts per Peak Hour[20]

Intersection	Total Volumes 0 125 250+
Montview Boulevard	
Bicycles	10
Pedestrians	44
17th Avenue	
Bicycles	2
Pedestrians	27
13th Avenue	
Bicycles	32
Pedestrians	215
Del Mar Parkway	
Bicycles	0
Pedestrians	27
6th Avenue	
Bicycles	15
Pedestrians	122
1st Avenue	
Bicycles	3
Pedestrians	61
Alameda Avenue	
Bicycles	9
Pedestrians	67
Exposition Avenue	
Bicycles	31
Pedestrians	111
Mississippi Avenue	
Bicycles	6
Pedestrians	270
Idaho Place	
Bicycles	7
Pedestrians	127
Florida Avenue	
Bicycles	11
Pedestrians	130
Mexico Avenue	
Bicycles	5
Pedestrians	73
Jewell Avenue	
Bicycles	2
Pedestrians	79
Yale Avenue	
Bicycles	8
Pedestrians	71
Total	
Bicycles	141
Pedestrians	1426

BICYCLE & PEDESTRIAN CONTEXT FOR DEMAND

In addition to pedestrian and bicycle counts, land uses and levels of transit use contributed to understanding areas of higher demand currently and areas likely to have higher demand in the future.

Transit Demand as a Factor to Bicycle and Pedestrian Demand

Transit trips also generate bicycle and pedestrian trips. The intersections in the project area with the highest number of bus boardings and alightings were identified. Generally speaking, bus passengers are more likely to walk or bicycle to and from their chosen stops, indicating a higher need for safe and accessible pedestrian and bicycle facilities in and near those locations. As shown on Figure 3.5.1, the intersections with highest (bus) transit demand are Iliff Avenue, Mississippi Avenue, 1st Avenue, and Colfax Avenue.

[20] *Projection is based on 0.88% user increase per year from 2018 counts. Counts by All Traffic Data Services, Inc. April 2018.*

Land Use Intensity and Type as a Factor to Bicycle and Pedestrian Demand

Areas in the project limits where higher levels of existing and envisioned residential density are in closer proximity to retail, employers, and community destinations (i.e. parks) tend to generate more bicycle and pedestrian trips. These areas were identified through examining a combination of:

- Existing land uses;
- Current zoning designations and permitted densities;
- What's envisioned (per the comprehensive plan, *Aurora Places*);
- Opportunities for change and improvement at specific sites or sub-areas.

As shown on Figures 4.1.3 and 4.1.4, the current zoning and land uses in the City Corridor segment (between 6th Avenue and Iliff Avenue) suggest a higher level of pedestrian and bicycle demand in comparison to the two other segments (Original Aurora and the Urban District). Land uses envisioned in the *Aurora Places* and the related opportunities for change suggest that City Corridor will present higher levels of pedestrian and bicycle demand in the years ahead. Demand can be expected to increase in all segments of the corridor; however, the greatest increase is anticipated in the City Corridor segment. In the far north area, Colfax Avenue to Montview Boulevard, the residential single-family neighborhoods are well established, and demand is more likely to remain consistent.

BICYCLE & PEDESTRIAN LEVEL OF STRESS

There are several factors that contribute to bicycle and pedestrian safety and comfort, including vehicle speeds and volumes, roadway width, number of travel lanes, bike lane or shoulder presence, the presence of on-street parking, the presence of a buffer, sidewalk width and quality, and street crossing design and treatments. To better understand the existing conditions for bicyclists and pedestrians in the corridor, the project team conducted a Bicycle and Pedestrian Level of Traffic Stress (LTS) analysis, which uses street and sidewalk characteristics to rate the roadway on a scale of one (most comfortable) to four (least comfortable).

Bicycle Level of Stress

The methods used for the LTS Analysis were adapted from the 2016 Oregon Department of Transportation (ODOT) Analysis Procedure Manual.[21] The approach outlined in the ODOT report uses roadway network data, including posted speed limit, the number of travel lanes, and the presence and character of bicycle lanes. Road segments are classified into one of four levels of traffic stress based on these factors, as outlined in Table 3.5.2.

[21] *Oregon Department of Transportation. Analysis Procedures Manual Version 2. Updated May 2020. https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf*

Table 3.5.2. Levels of Traffic Stress Definitions Source: ODOT Analysis Procedure Manual, Version 2

LTS 1	Represents little traffic stress and requires less attention, so is suitable for all ages and abilities. This includes children that are trained to safely cross intersections (around 10 yrs. old/5th grade) alone and supervising riding parents of younger children. Generally, the age of ten is the earliest age that children can adequately understand traffic and make safe decisions which is also the reason that many youth bike safety programs target this age level. Traffic speeds are low and there is no more than one lane in each direction. Intersections are easy to cross by children and adults. Typical street typologies include residential local streets and those with separated bike paths/cycle tracks.
LTS 2	Represents little traffic stress but requires more attention than young children can handle, so is suitable for teen and adult bicyclists with adequate bike handling skills. Traffic speeds are slightly higher but speed differentials are still low and roadways can be up to three lanes wide in total for both directions. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district.
LTS 3	Represents moderate stress and suitable for most observant adult bicyclists. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions (10 lanes total). Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with wide or buffered bike lanes or moderate speed non-multilane roadways.
LTS 4	Represents high stress and acceptable only for experienced and skilled bicyclists. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide in both directions. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high-speed or multilane roadways with narrow or no bike lanes.

Methodology

LTS categorization for the corridor was completed by analyzing three parts of every street link (a section of roadway). The three parts include:

- Street segments: the space of roadway between intersections
- Intersection approaches: the area leading up to an intersection that includes turn lanes
- Intersections/crossings: Locations where crossing the corridor is likely. For this metric, signalized or full-stop intersections are not included or segments that 'T' into the corridor. LTS analyses are focused on non-signalized or non-stop controlled intersections; intersections or likely crossing locations where pedestrians (or bicyclists) may try to cross the roadway at unmarked, non-controlled points. In these locations, crossing pedestrians, bicyclists, and motorists must apply a higher degree of subjectivity and reasoning to a situation (than if they were at a controlled location).

The overall LTS score a link received was based on a "weakest link" methodology. That is, if a link received a segment score of two and an approach score of four, the overall link score assigned was LTS four. Intersections were scored independently. Multiple street characteristics were considered in the evaluation including:

- Prevailing speed or speed limit
- Number of lanes
- Turning speeds
- Right-turn lane configuration
- Left-turn lane configuration
- Presence of pedestrian refuge islands

The Bicycle LTS methodology does not include explicit consideration of traffic volumes as the proximity stress is present regardless of how much traffic happens to be occurring at that time.[22]

Bicycle LTS Conclusion

Figure 3.5.2 (*Bicycle LTS Analysis*) illustrates Bicycle Level of Traffic Stress for the corridor based on the above methodology. Due to the lack of existing bicycle facilities on Havana Street and other factors considered, the entire project corridor has an LTS four and is likely to only feel safe and comfortable to a small percentage of potential bicyclists. While bicyclists are permitted to use any of the vehicular lanes in the study area, most would not feel comfortable using the Havana Street corridor as a bike route primarily due to number of lanes, traffic volumes and motorized vehicle speeds. Because of these stress factors, a vertically separated or fully detached bicycle facility is likely to be the preferred option for most bicyclists traveling on the corridor.

Bicyclists are permitted to ride on the sidewalks on either side of Havana for the full extent of the study area and as shown in Figure 3.5.3, there are portions of the corridor that provide sidewalks that are separated from the roadway by up to 25-feet. However, none of the sidewalks on Havana are designated bicycle facilities (intended solely for bicycle use) and bicyclists using them must share the facilities with pedestrians and other users (scooters, skateboarders, etc.). Bicyclists using sidewalks are likely to travel at higher speeds and a wider range of speeds than pedestrians. Motorists turning on to or off of Havana from side streets and commercial driveways are more likely to misjudge the speed of bicyclists, increasing the potential for conflict at turning movements. Furthermore, for most of the corridor, the sidewalks are either not continuous or consistent in form. For example, there is a section of sidewalk just north of East Mexico Avenue that is approximately eight feet wide and separated from the roadway by an eight to ten-foot landscape buffer. While the experience may be more pleasant for most bicyclists on this short link as a result of the separation, the sidewalk reverts back to a narrower attached facility on the south side of East Mexico. Finally, there are no existing treatments on Havana to signify or distinguish that sidewalks on the corridor are bicycle facilities such as intersection markings or signage.

Improvements to the corridor that would reduce the LTS and enhance comfort for people on bicycles include but aren't limited to decreased speeds, greater separation from motor vehicle traffic, consistency of facility type, and enhanced crossings where other bikeways intersect the corridor.

[22] *Oregon Department of Transportation. Analysis Procedures Manual Version 2. Updated May 2020. https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf, page 14-9.*

Figure 3.5.2: Bicycle LTS Analysis

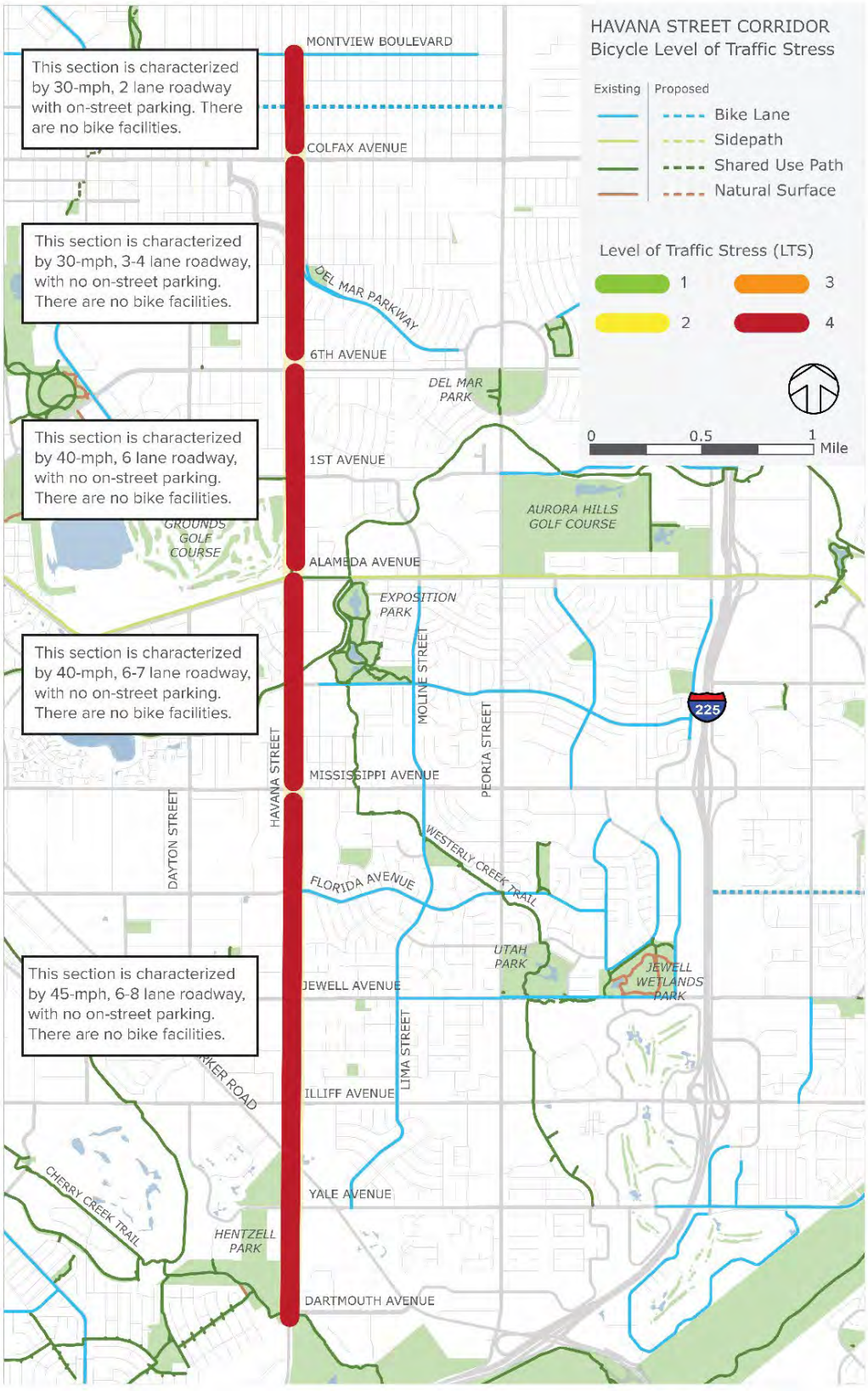
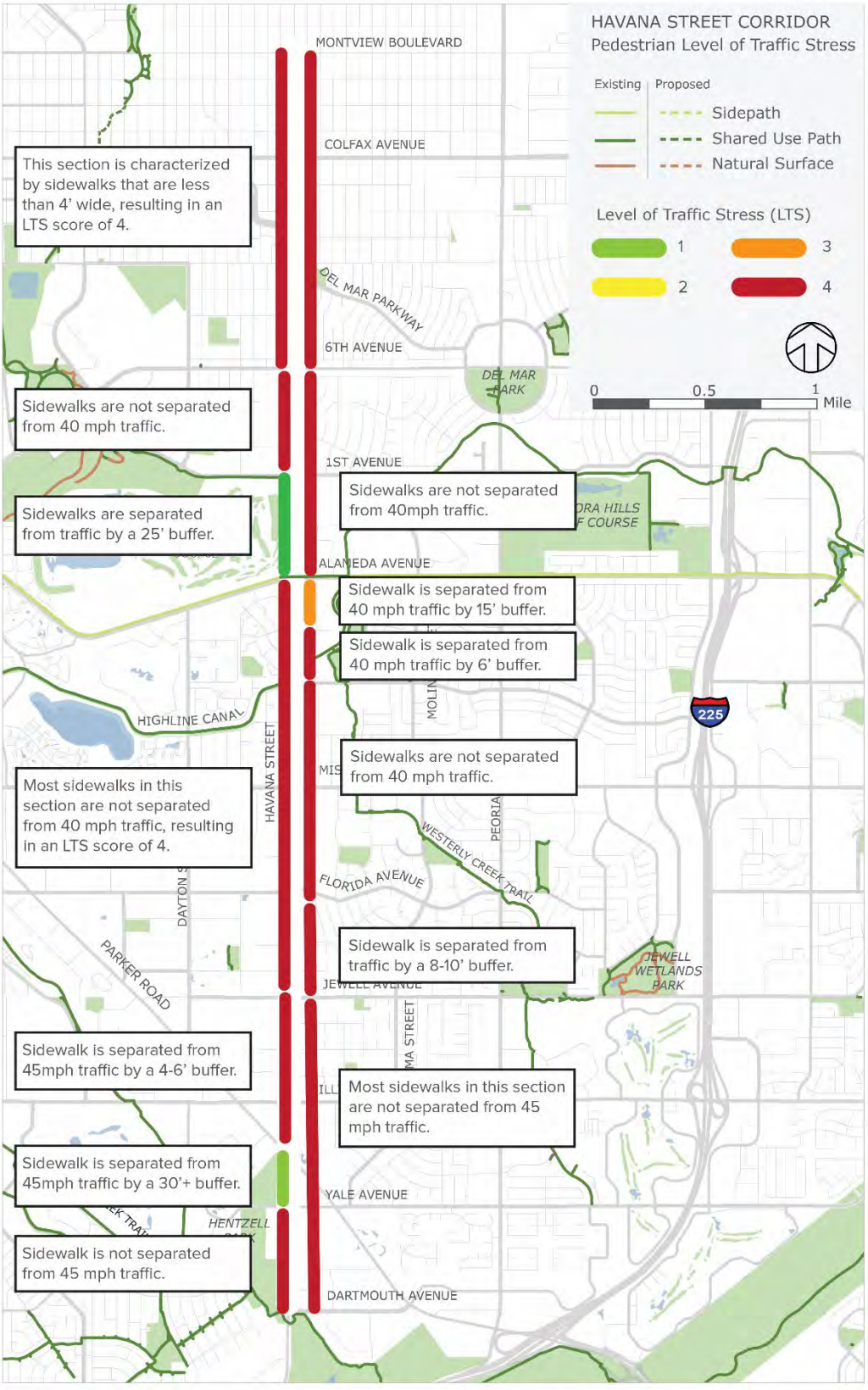


Figure 3.5.3: Pedestrian LTS Analysis



Pedestrian Level of Stress

The methods used for the Pedestrian LTS Analysis were also adapted from the 2016 Oregon Department of Transportation (ODOT) Analysis Procedure Manual.[23] The approach outlined by ODOT classifies roadway segments according to the level of stress experienced by pedestrians and other sidewalk users, such as those using scooters, wheelchairs, or other wheeled mobility devices. Using a similar scale to the Bicycle LTS methodology (see Table 3.5.2, above), the Pedestrian LTS analysis classifies roadway segments on a scale from 1-4, with one representing the lowest level of traffic stress and four representing high traffic stress.

Multiple street characteristics were considered in the evaluation including:

- Sidewalk condition and width
- Buffer type and width
- Bike lane width
- Parking width
- Number of lanes and posted speed
- Presence of streetlights
- General land use
- Functional class
- Sidewalk ramps
- Median refuge islands
- Intersection features

Pedestrian LTS Conclusion

Figure 3.5.3 (*Pedestrian LTS Analysis*) illustrates Pedestrian Level of Traffic Stress for the corridor based on the above methodology. Most sidewalks along the corridor are rated as an LTS four, meaning that only a small percentage of pedestrians would feel safe and comfortable walking along the sidewalks. Between 1st Avenue and Alameda Avenue on the western side of the road, the sidewalks achieved an LTS score of one due to the wide buffer separating pedestrians from traffic. Likewise, the section between Alameda Avenue and Exposition Avenue achieved an LTS score of three due to a 15-foot buffer separating pedestrians from traffic. Improvements to the corridor that would reduce pedestrian LTS and enhance comfort for people walking include wider sidewalks, increased buffers, and decreased vehicle speeds.

Pedestrian LTS at Intersections

In addition to roadway segments, the Pedestrian LTS was also assessed for intersections at several major cross streets. Following the methodology in the Oregon Department of Transportation Analysis Procedures manual, LTS scores were assigned based on a variety of factors. As the manual states, signalized crossings usually provide a protected way across a road and are typically rated at Pedestrian LTS 1, however there may be a higher level of stress in the following instances:

[23] *Oregon Department of Transportation. Analysis Procedures Manual Version 2. Updated May 2020. https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf*

- Where permissive left or right turns can occur, pedestrians will need to be more wary about the potential for increased conflicts, so Pedestrian LTS 2 is typically assigned;
- Missing basic features such as lighting or countdown pedestrian signal heads will increase the Pedestrian LTS to 2.

Furthermore, the presence of other elements that will increase the Pedestrian LTS to 3 include:

- Multiple or narrow (less than six feet) refuge islands;
- Corner ramps not meeting ADA standards;
- More than six total lanes that need to be crossed at once;
- Non-standard geometry (more than four legs, or highly skewed approaches);
- Closed or limited available crosswalks; and
- Free-flow or yield-controlled channelized right turns.[24]

As shown on Figure 3.5.4, eight of the twelve intersections have an LTS 3 on the basis of these factors. While the intersections generally have clearly marked crosswalks and signals, the majority include crossings of more than six lanes and lack countdown pedestrian signal heads.

Level of Traffic Stress on Cross Streets

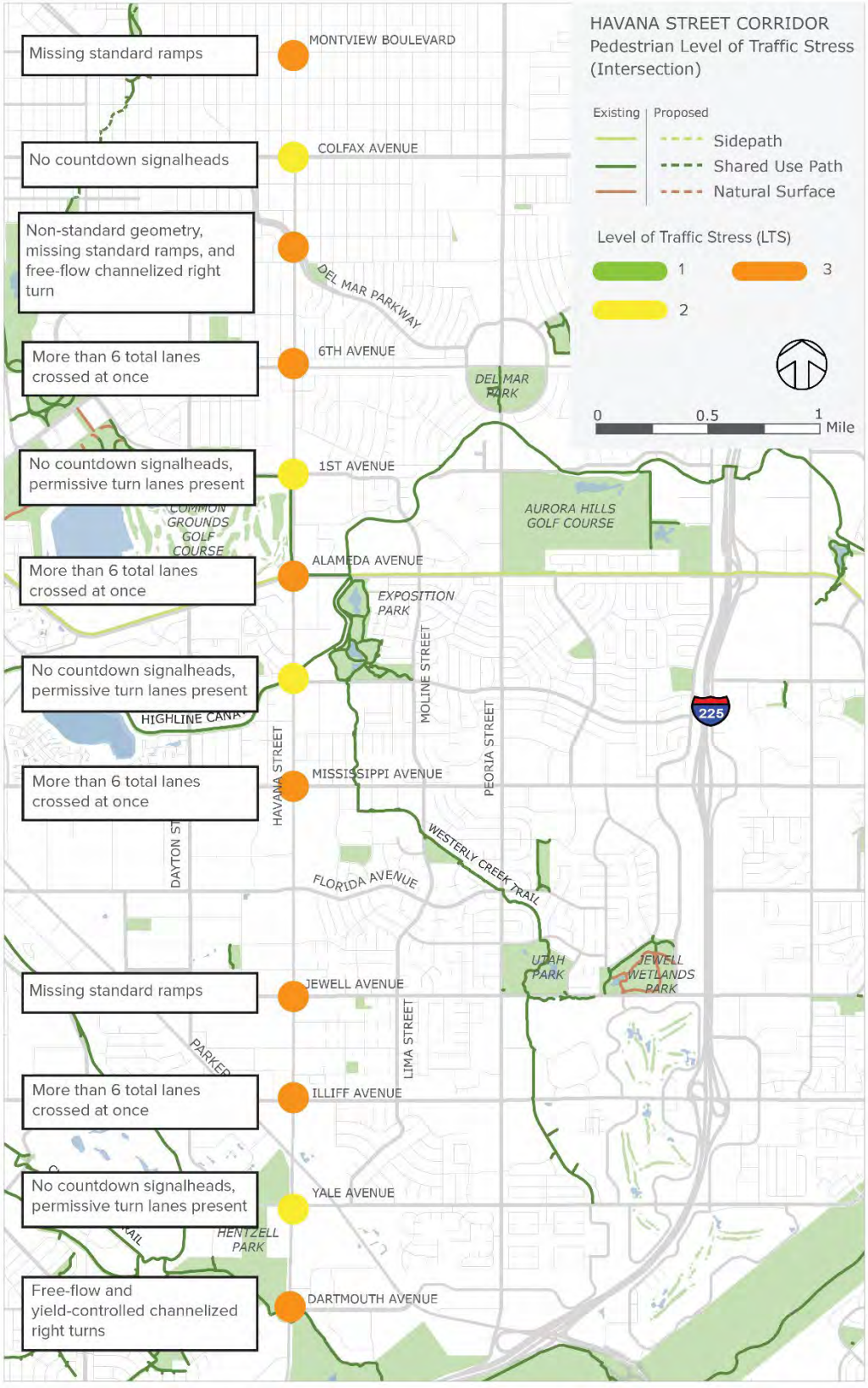
For this analysis, the project team focused on the LTS specifically on Havana. However, in considering how to improve pedestrian and bicycle access and safety on the corridor, the LTS (when discussing cross streets, LTS refers to both bicycle or pedestrian level of traffic stress) on streets that cross Havana is also an important factor because many pedestrians and bicyclists travel not only within the corridor (north to south) but also across it.

While not reviewed to the same level of detail, the LTS of cross streets is expected to range from LTS 2 – 4 depending on the variables identified earlier in this analysis. In general, connecting arterials such as Alameda Avenue or Parker Road will have an LTS 4 or in some cases LTS 3 because average speeds and the number of lanes are higher in comparison to collector or local streets. Collectors, such as East Kentucky Avenue, typically have fewer lanes and lower posted speeds. As such, the LTS on these facilities is likely to range from LTS 2 -3. Local roads would typically have an LTS 1-2 due to even lower volumes and speeds.

For the focus areas that will be examined in the next phase of the project, LTS on east-west streets that connect with Havana will be revisited to determine how lower stress routes could serve to enhance bicycle and pedestrian access and safety to, from and across the corridor.

[24] *Oregon Department of Transportation. Analysis Procedures Manual Version 2. Updated May 2020. https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf, pages 14-47 & 48.*

Figure 3.5.4: Pedestrian LTS Intersection Analysis



3.6 VEHICLE, BICYCLE & PEDESTRIAN CRASH DATA

OVERVIEW

The City provided reported crash data from 2012 thru 2019 which details crash occurrence by time of day/week, highest reported crash locations, crash types and crash severity. All data provided in this section is based on crashes that have occurred on Havana Street, between Montview Boulevard and Dartmouth Avenue.

Between 2012 and 2019 a total of 7,513 crashes were reported on the Havana Street Corridor, including 507 injuries and 12 fatalities (Table 3.6.1). Fifty-five of the crashes involved bicycles and 147 involved pedestrians. Figures 3.6.1 through 3.6.3 provide an overview of the crashes by mode and severity. Approximately half of the bicycle and pedestrian crashes were fatal or resulted in injury, while less than ten percent of motor vehicle crashes were fatal or resulted in injury. Additionally, 33% of fatal crashes involved pedestrians and nearly 20% of injury crashes involved a bicycle or pedestrian.

Table 3.6.1: Summary of 2012-2019 Reported Crashes[25]

Crashes	Fatal	Injury	Non-Injury	Total
Motor Vehicle	8	411	6,892	7,311
Bicycle	0	27	28	55
Pedestrian	4	69	74	147

When broken down by time of day and day of the week (Figure 3.6.4), we see that the highest number of crashes occur on Friday between 3:00 and 5:00 PM. Most weekday crashes peak between those same hours while crashes on the weekend have a peak that occurs mid-day, around 1:00 PM. The lowest number of crashes occur between 3:00 and 5:00 AM. This data indicates that the peak number of crashes coincides with peak travel times.

[25] *City of Aurora, Colorado. Crashes retrieved from 2012-2019.*

Figure 3.6.1: Percent of Reported Crashes by Mode and Severity

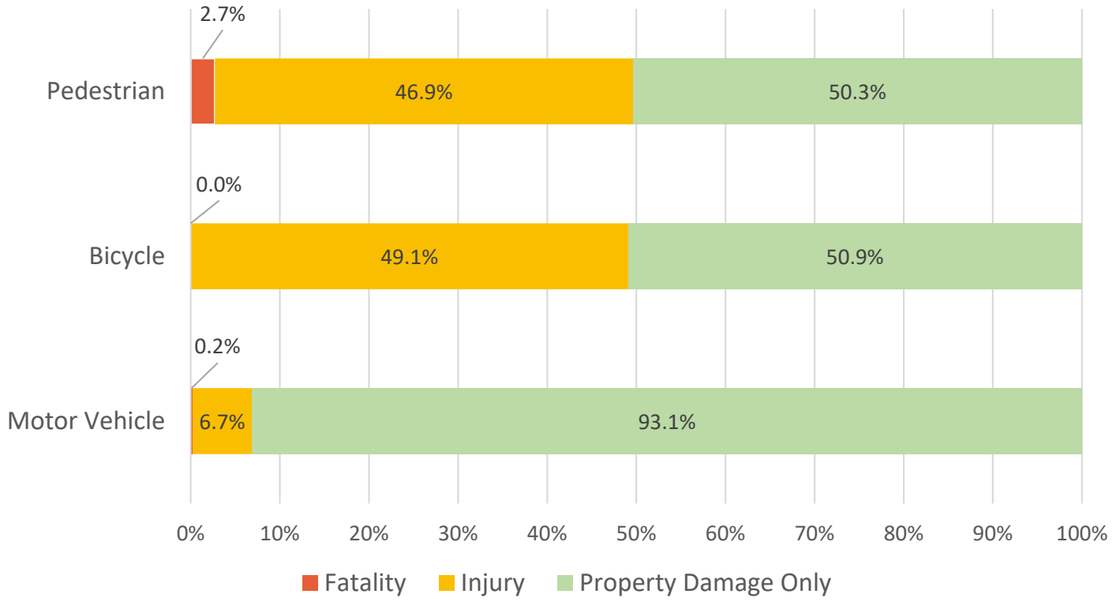


Figure 3.6.2: Percent of Reported Fatal Crashes by Mode

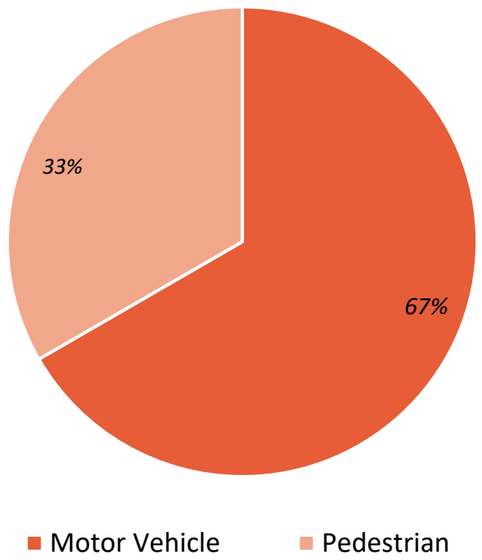


Figure 3.6.3: Percent of Reported Injury Crashes by Mode

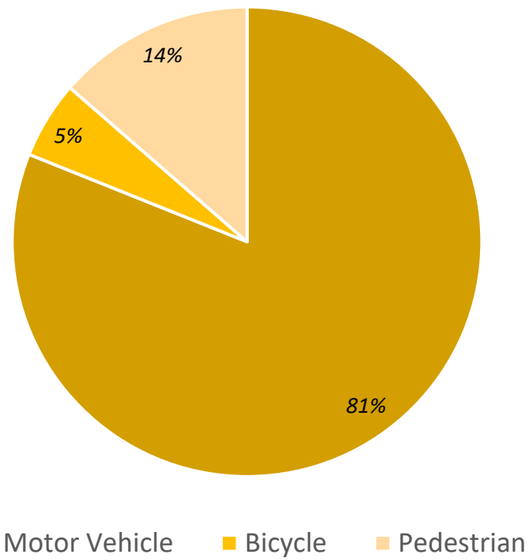
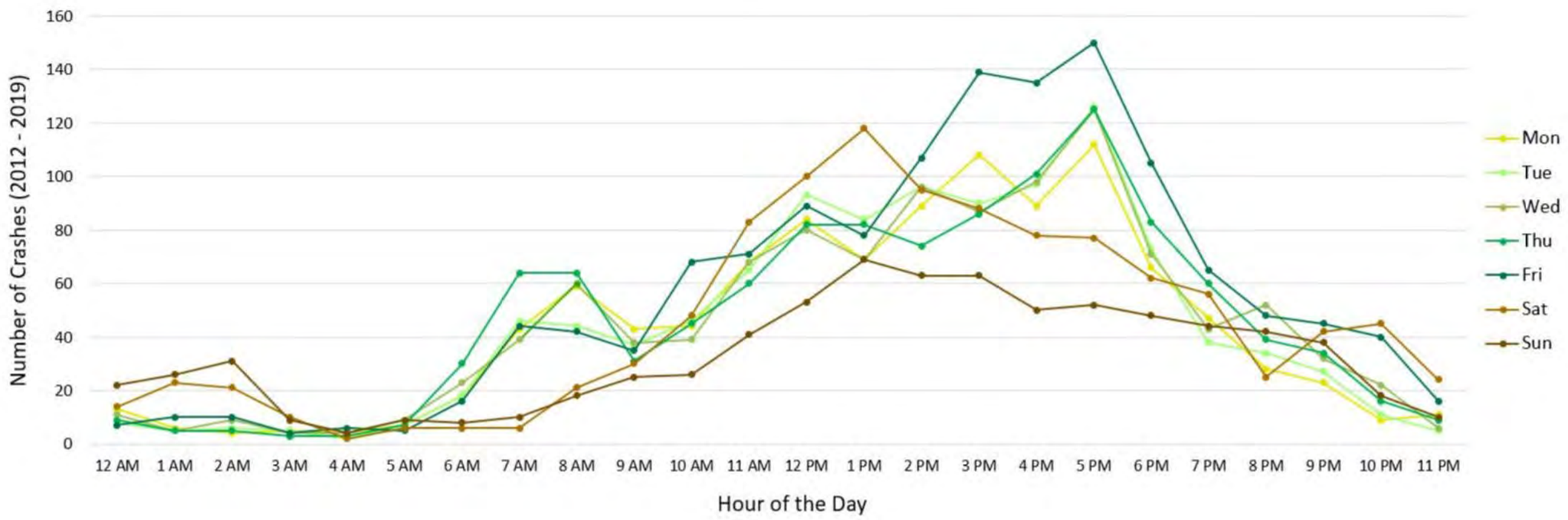
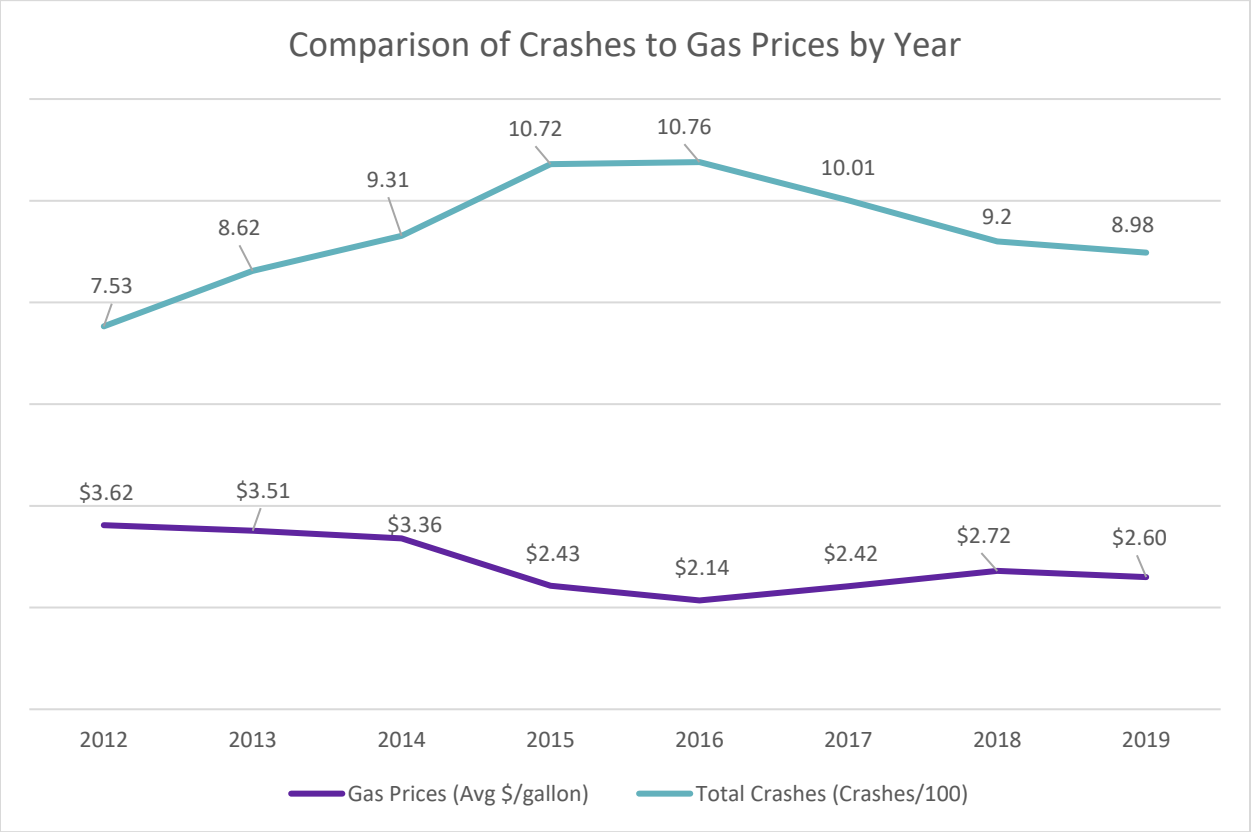


Figure 3.6.4: Reported Crash Occurrence by Time and Day of the Week



Data shows that there is a correlation between crashes and gas prices[26]. This data indicates that when gas prices increase, people drive less, and crashes go down. Conversely cheap gas prices are generally tied to an increase in crashes and fatalities. The crash data for the Havana Street corridor was compared to gas prices from 2012 thru 2019 to provide additional context to the data. Figure 3.6.5 shows that crashes along the corridor follow the trend, with the highest crashes (1,076) occurring in 2016 when gas prices were the lowest ($2.14).

Figure 3.6.5: Comparison of Crashes to Gas Prices (2012-2019)



[26] *NPR. The downside of Cheaper Gas: More Accident Fatalities. January, 6, 2015. https://www.npr.org/2015/01/06/375308884/the-downside-of-cheaper-gas-more-accident-fatalities*

CRASH DENSITY

Figure 3.6.6 shows locations of high and low reported crash occurrences along the corridor by mode. By far, the highest reported crashes for motor vehicles occur at Iliff Avenue, Florida Avenue and Mississippi Avenue. Reported crash densities for pedestrians are highest at Florida Avenue, Mississippi Avenue and Colfax Avenue, while bicycles experience their highest reported crashes north of Mississippi Avenue.

MOTOR VEHICLE CRASHES

A review of the motor vehicle crashes indicated that all fatal crashes occurred at signalized intersections and the injury crashes were primarily between Colfax Avenue and 1st Avenue, and between Mississippi Avenue and Iliff Avenue (Figure 3.6.7). Further evaluation of the types of crashes occurring at these locations could provide useful information in determining relevant improvements. Potential solutions at the signalized intersections could include adjusting all red or all yellow clearance times, converting to flashing yellow arrow signals, or restricting dual left turn movements to protected only phases. Many of the injury crashes between 6th Avenue and Parker Road, within the City Corridor character area, could be reduced by restricting vehicle turning movements through the installation of raised medians.

BICYCLE CRASHES

A review of the bicycle crashes, shown on Figure 3.6.8 indicated that those crashes causing more serious injury were generally around busy intersections, such as Colfax Avenue, Florida Avenue to Jewell Avenue, and Exposition Avenue near the High Line Canal Trail. The majority of these crashes occurred due to careless driving or drivers failing to yield the right-of-way to bicyclists. These causes will be focused on during the next phase of the project. The project team will examine how and why infrastructure at higher crash locations may be causing conflict and what improvements could guide motorists and bicyclists to practice safer behaviors.

PEDESTRIAN CRASHES

A review of the pedestrian crashes, shown on Figure 3.6.9, indicated that the reported crashes – and especially those causing injury – were around the intersections with Colfax Avenue, 6th Avenue, Mississippi Avenue, Florida Avenue, Jewell Avenue, and Iliff Avenue. The majority of these crashes occurred while pedestrians were entering intersections and drivers failed to yield the right-of-way. While there are not significant details for the four fatalities, one fatality occurred due to the pedestrian walking in a lane of travel, in the direction of travel.

As part of the next project phase, the project team will examine higher conflict intersections to better understand why motorists are failing to yield by encroaching into crosswalks and pedestrians are not holding in assigned areas (i.e. back of curb) or fully waiting for the assigned interval (i.e. 30 second cross walk). This information will help shape alternatives and specific recommendations within the identified focus areas.

Figure 3.6.6: Motor Vehicle/Pedestrian/Bicycle Crash Density Distributions (2012 – 2019)

Figure 3.6.7: Reported Fatal & Injury Motor Vehicle Crashes

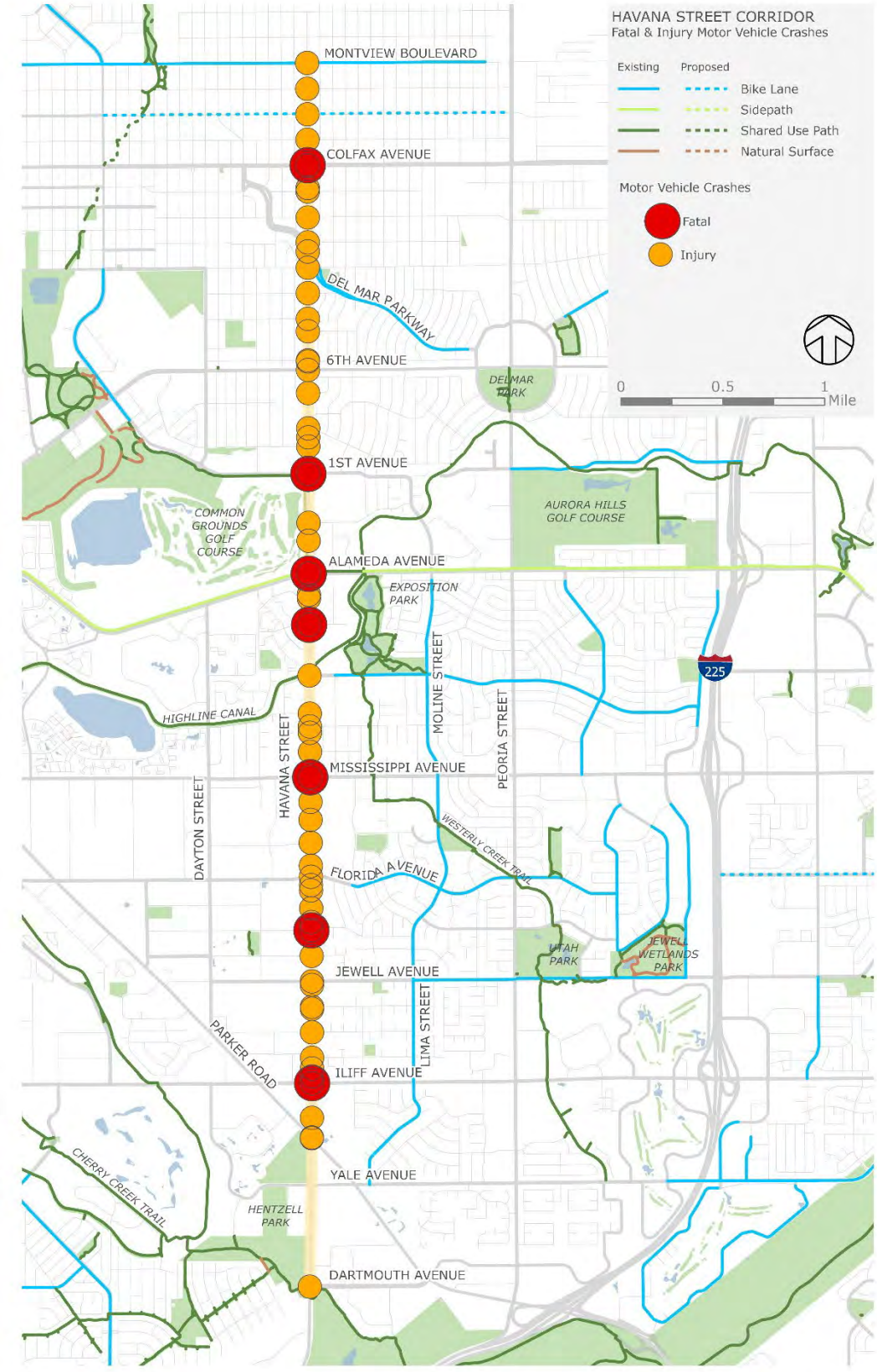


Figure 3.6.8: Reported Bicycle Crashes

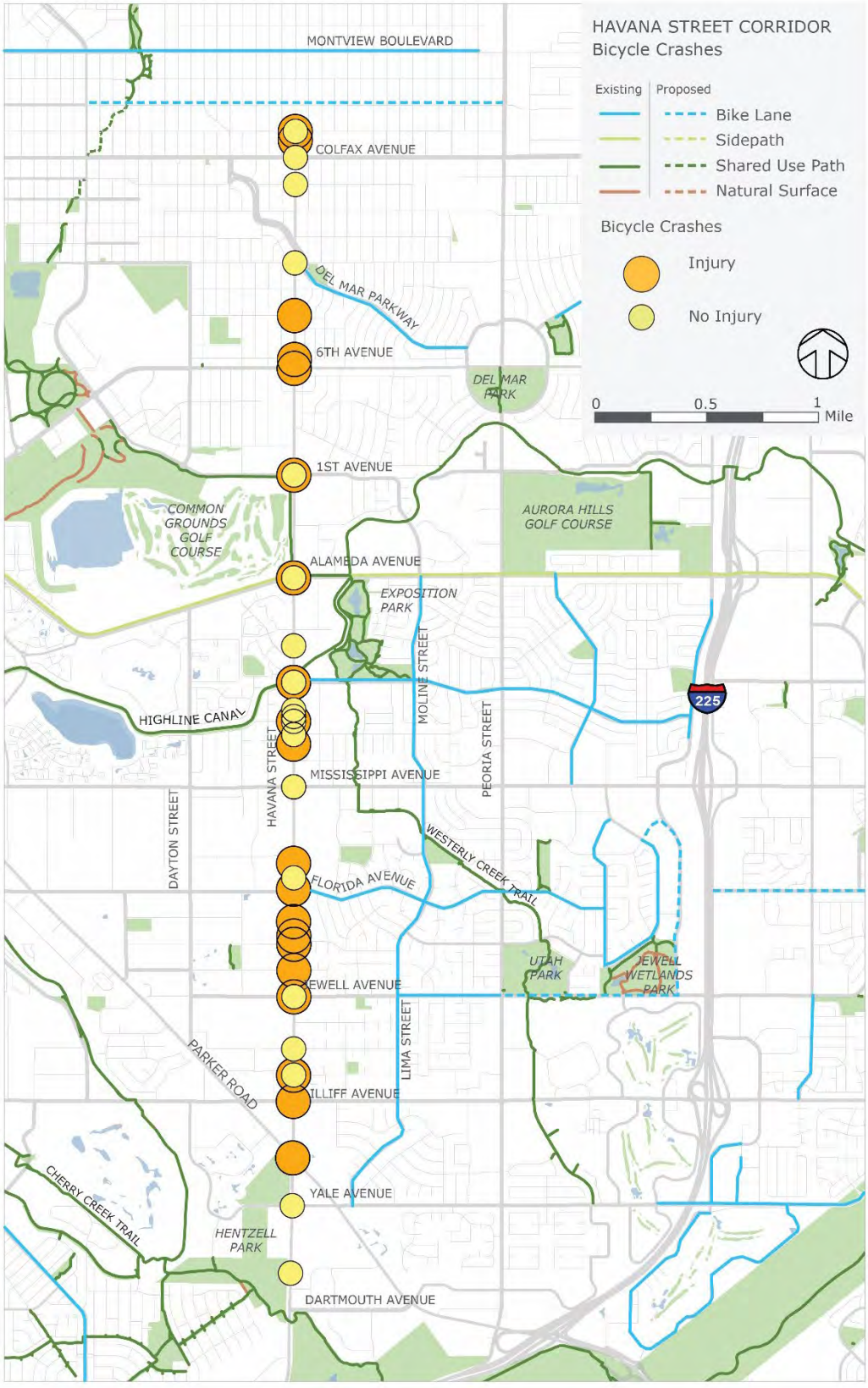
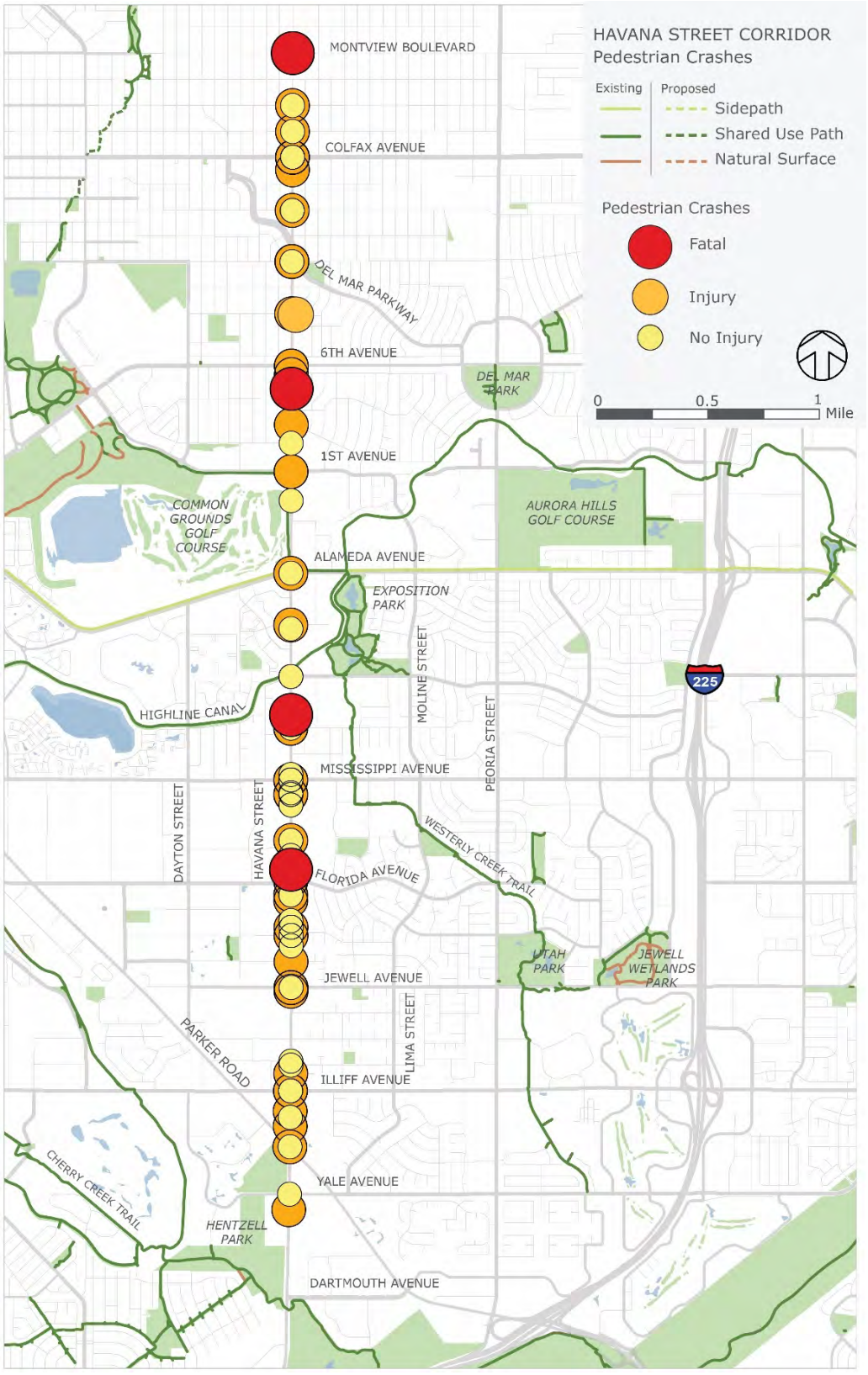


Figure 3.6.9: Reported Pedestrian Crashes



SECTION 4. EXISTING AND FUTURE LAND USES

4.1 ORGANIZING STRUCTURE

The organizing structure for the existing and future baseline land use analysis is based on the designated Future Placetypes from *Aurora Places*. There are three Placetypes within three distinct segments in the Havana Street Corridor study area:

1) ***Original Aurora*** – from E. 25th Avenue to E. 6th Avenue (about 2 miles)
2) ***City Corridor –*** from E. 6th Avenue to E. Iliff Avenue (about 3.5 miles)
3) ***Urban District*** – from E. Iliff Avenue to E. Dartmouth Avenue. (about 1 mile)

Original Aurora is generally the northern segment of the study area and Urban District is the southern segment with City Corridor making up the middle, and longest segment. Note that the middle area also includes a Placetype called Established Residential, but for the purposes of this study, it was assumed that those areas remain with limited changes and the study will focus on the more commercial and mixed-use areas and opportunities.

Figures 4.1.1 through 4.1.6 are designed so that they can be printed at a larger scale, 11x17, and are more graphical than the rest of this document. These figures include information that may be useful later on in the process, and therefore, are designed to be printed or viewed on their own. They are organized by the three Aurora Places Placetypes in the corridor and the colors are associated with that plan.

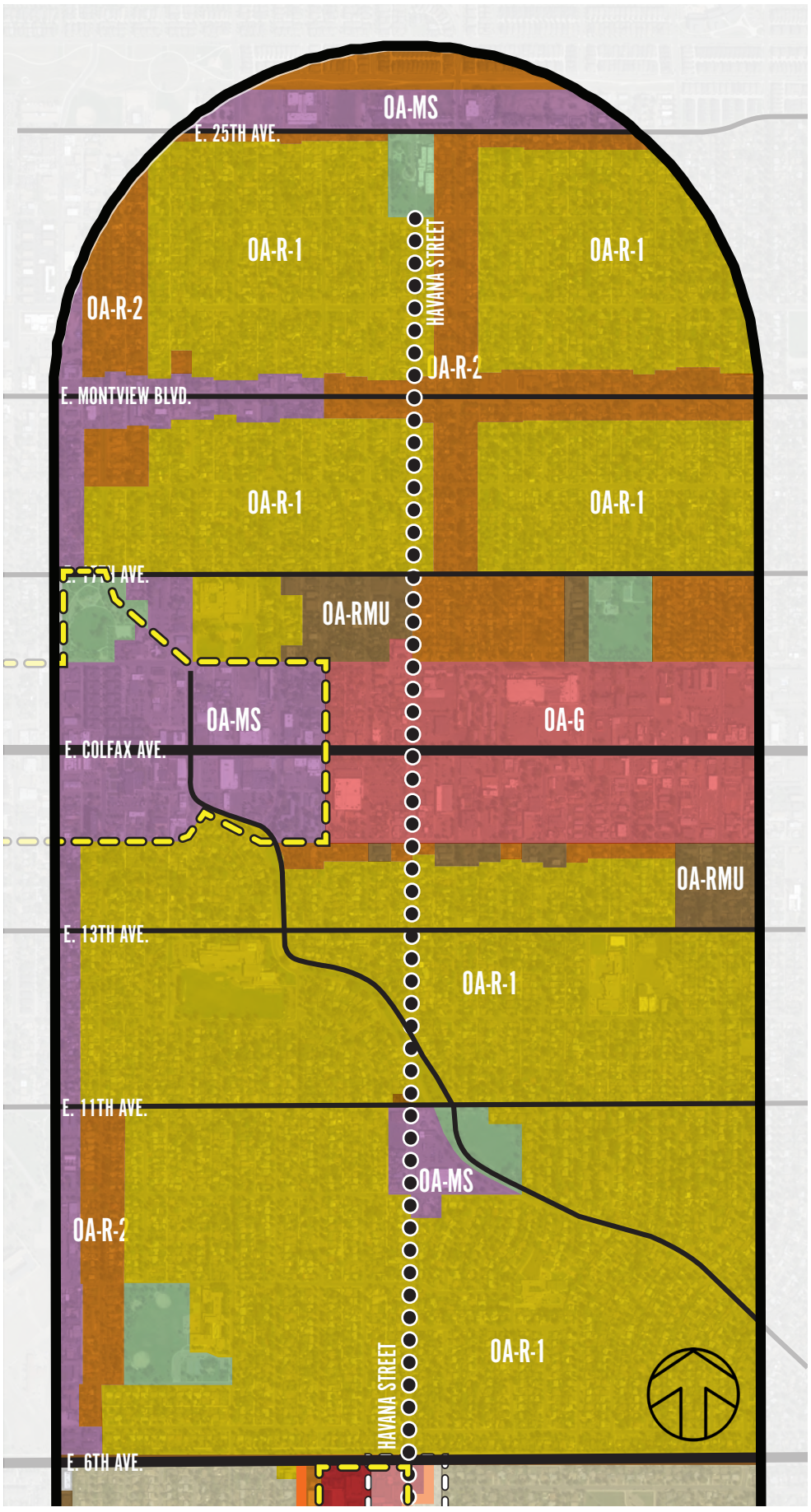
For each Placetype and segment in the study area, the following methodology was used:

1) ***What's Envisioned?*** *(Figures 4.1.1, 4.1.3, and 4.1.5)* – This portion offers a summary of *Aurora Places*' future vision, land uses and defining features for each Placetype.
2) ***What's Allowed?*** *(Figures 4.1.1, 4.1.3, and 4.1.5)* – This portion offers a summary of what the Unified Development Ordinance says about the intent of each zone district – these are the regulations that dictate new development patterns. More detailed information for the mixed use districts is provided in section 1.2.
3) ***What Exists?*** *(Figures 4.1.2, 4.1.4, and 4.1.6)* – This offers an evaluation of what is "on the ground." This section examines the existing land use patterns and character of each area, allowing us to compare what's there now to what's intended in the future. In this section, each of the three Placetype segments are further broken down into character areas, based on common characteristics in land use and character. There are a total of eight character areas throughout the corridor study area.
4) ***What are the Opportunities and Challenges?*** *(Figures 4.1.2, 4.1.4, and 4.1.6)* – This portion identifies opportunities to achieve the vision. This could include newly constructed or future planned developments that are anticipated in each area, vacant or underutilized land that could be redeveloped, enhanced connections and access to services and open space, and more.

FIGURE 4.1.1 ORIGINAL AURORA

E. 25th Ave. to E. 6th Ave.

ZONING



OA-G (ORIGINAL AURORA - GENERAL)

OA-MS (ORIGINAL AURORA - MAIN STREET)

OA-RMU (ORIGINAL AURORA - RESIDENTIAL MIXED USE)

OA-R2 (ORIGINAL AURORA - MEDIUM DENSITY RESIDENTIAL)

OA-R1 (ORIGINAL AURORA - LOW DENSITY RESIDENTIAL)

HAVANA STREET

WHAT'S ENVISIONED?

What does Aurora Places say about this area?

THE VISION

"Original Aurora is a traditional city neighborhood that retains its character, diversity and form, even as the neighborhood continues to evolve."

PRIMARY LAND USE

- Single-Family Detached Residential
- Single-Family Attached Residential
- Multifamily Residential

SUPPORTING LAND USE

- Restaurant
- Commercial Retail
- Commercial Service
- Entertainment and Arts District
- Office
- Institutional
- Parks and Open Space
- Community Garden

DEFINING FEATURES

- Blend new residential and mixed use developments with the mid-20th century commercial storefronts and residential areas.
- Preserve, improve and augment existing housing stock retaining community character while encouraging investment and upgrading homes to meet current household and homebuyer preferences.
- Support a thriving nightlife and restaurant scene by augmenting gathering places, like the Stanley Marketplace and Arts District, and developing places that serve residents, Anschutz employees, arts patrons and visitors.
- Use street trees and landscaping to outline Original Aurora's grid system to improve the appearance, air quality and general health.
- Improve walking and bicycling connections throughout the neighborhood, including widening sidewalks and upgrading street crossings.
- Protect and highlight Aurora's unique historic resources within the neighborhood.
- Incorporate low-impact development and water quality practices and use appropriate systems to direct rainwater onto green spaces.

WHAT'S ALLOWED?

What does the Zoning Code say about this area?

ZONE DISTRICTS

The following zone districts are located within the Original Aurora boundary, as defined in Aurora Places. Original Aurora is a large area that encompasses multiple commercial corridors as well as established residential neighborhoods. It is seen more of a mixed use place than other Placetypes, offering more variety in terms of building forms and densities.

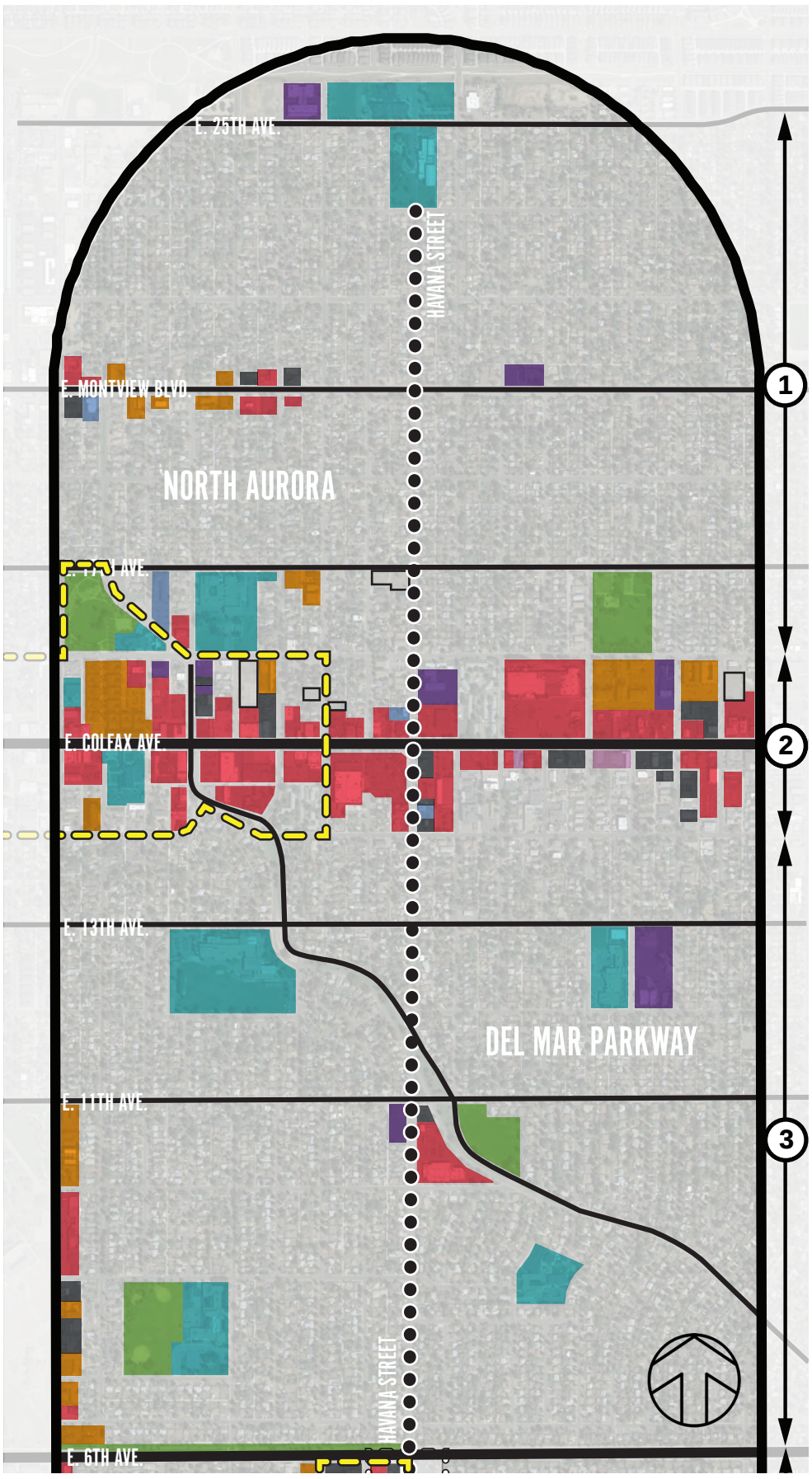
- **OA-R-1 (Original Aurora Low Density)** - To promote and protect residential neighborhoods and improve the overall image and character of Original Aurora. The building form standards and permitted uses work together to promote desirable residential areas. These regulations shall reinforce the existing development patterns while also encouraging reinvestment and new types of housing.
- **OA-R-2 (Original Aurora Medium Density)** - To promote active and pedestrian-oriented areas that have a mix of residential and small, neighborhood-scale commercial uses. The subdistrict shall permit a broad range of housing types that are compatible in scale with existing single-family homes while providing diverse housing choices for households of different ages, sizes and incomes.
- **OA-RMU (Original Aurora Residential Mixed Use)** - To promote active and pedestrian-oriented areas that have a mix of high-density residential uses with the option for neighborhood-scale commercial uses on the ground floor of multifamily buildings. The subdistrict shall permit a broad range of moderate- to high-density housing types that provide a diversity of choices for households of different age, size and income.
- **OA-G (Original Aurora General)** - To promote an urban, mixed-use environment along key corridors and retail streets within the neighborhood that contains entertainment, commercial, office and residential uses. The subdistrict supports attractive architectural design and promotes pedestrian activities while also allowing for higher density, vertical development that takes advantage of the significant mountain views.
- **OA-MS (Original Aurora Main Street)** - To promote safe, active, pedestrian-scale and diverse areas through the use of building forms that clearly define and activate the public realm. Development that engages the pedestrian is encouraged and will enhance the character of this mixed-use district. The subdistrict shall enhance the convenience, ease, and enjoyment of transit, walking, shopping and public gathering within the neighborhood and shall reflect its historic character.

FIGURE 4.1.2

ORIGINAL AURORA

E. 25th Ave. to E. 6th Ave.

LAND USE AND OPPORTUNITIES



- **RETAIL / RESTAURANT**
- **AUTO-RELATED** *(Sales, Parts, Car Wash, Gas Station)*
- **OFFICE / EMPLOYMENT**
- **HOTEL / HOSPITALITY**
- **SCHOOLS / PUBLIC BUILDINGS**
- **RELIGIOUS**
- **MEDIUM DENSITY RESIDENTIAL**
- **PARKS AND OPEN SPACE**
- **VACANT LAND / OPPORTUNITY**
- **AURORA CULTURAL ARTS DISTRICT**
- **ON HAVANA SIGN OR PUBLIC ART**
- **HAVANA STREET**

WHAT EXISTS?

What's the existing land use and character in this area?

CHARACTER AREA #1 - E. 25TH TO E. 16TH

The northern half of the "Original Aurora" area includes the neighborhood of North Aurora. This neighborhood is primarily single family homes. Havana Street terminates to the north at Moorhead Recreation Center and Park. This neighborhood is close to Denver's popular Stapleton neighborhood as well as Aurora's newest hip entertainment and dining destination, Stanley Marketplace.

The neighborhood is situated on a traditional grid with alleys running parallel to Havana. Further north, from 23rd to Montview, the alleys are used for auto access to properties and there is on-street parking on both sides of the street, allowing Havana Street to be more pedestrian friendly. South of Montview, however, there are more driveways onto Havana and on-street parking only on the west side of the street, which make it less pedestrian friendly. Still, this segment of Havana is the most narrow of anywhere on the corridor.

CHARACTER AREA #2 - E. 16TH TO E. 14TH

Havana Street from 16th Avenue to 14th Avenue takes on a transition from single family residential to commercial. This area includes the intersection with Aurora's original main street, Colfax Avenue. Colfax Avenue provides access to Downtown Denver and the Anschutz Medical Campus via the 15 and 15L buses and also includes the Aurora Cultural Arts District (yellow dashed line), also considered to be Original Aurora's "downtown."

This area includes large retailers such as Wal-Mart Neighborhood Market, 7-11 and Walgreens, surrounded by smaller commercial uses and a mix of residential types and densities.

CHARACTER AREA #3 - E. 14TH TO E. 6TH

The southern half of "Original Aurora" includes the neighborhood of Del Mar Parkway. This neighborhood is primarily single family homes with similar character as North Aurora - smaller single-family homes (800-1,500 SF) on traditional sized lots (5,000 - 7,500 SF).

The intersection of diagonal Del Mark Parkway interrupts the traditional grid. This intersection includes a small commercial node at 11th & Havana. Most blocks fronting Havana in this area include alleys, however they are rarely used for access. Instead, there are driveways onto Havana from most homes.

WHAT ARE THE OPPORTUNITIES AND CHALLENGES?

How can the vision be met?

COLFAX AVENUE / AURORA CULTURAL ARTS DISTRICT (ACAD)

Colfax Avenue corridor and Havana Street from 14th to 16th Avenues has more of an opportunity for land use changes than the rest of Havana Street, which is primarily low density residential through this section. There are plans to replace the 15 and 15L bus service with a bus rapid transit (BRT) service along Colfax Avenue from the State Capitol to the Anschutz campus, which could serve as a catalyst for transit oriented development, including higher densities and a mix of uses. Colfax Avenue has seen some recent investment in local business and is a walkable destination from both North Aurora and Del Mar Parkway neighborhoods. This area includes community amenities, such as the Aurora Cultural Arts District (yellow dashed line) which has multiple musical and theatrical-based arts programs. The Martin Luther King Jr. Library and City Park are also located in the area. Challenges to redevelopment include smaller lot sizes and potentially neighborhood opposition.

11TH AVENUE NODE

The triangular area (red) at the intersection of Havana with 11th Avenue and Del Mar Parkway includes a gas station and a small strip center that includes a liquor store, restaurants, Tae Kwon Do, and healthcare. Across the street is a church. With the proximity to a large green space and lower utilization of church parking, there could be opportunity for investment such as open space and beautification of the shopping center.

STAPLETON AND LOWRY

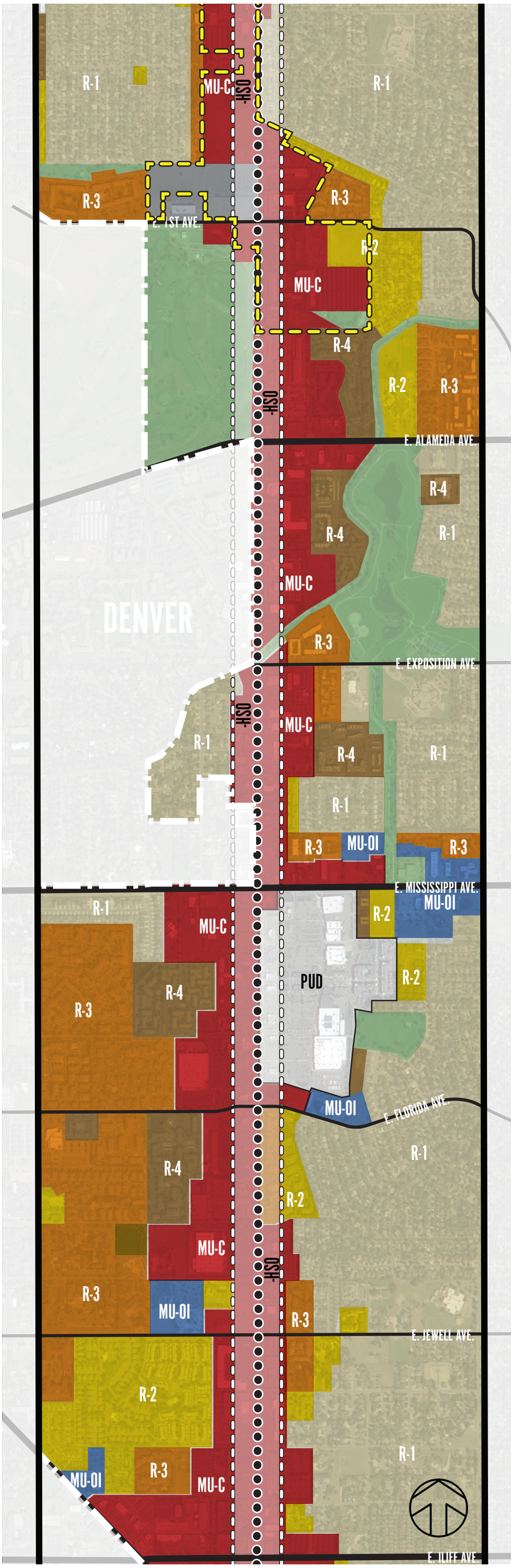
Original Aurora is located between Stapleton and Lowry, two very popular neighborhoods with newer improvements in retail and open space. These two areas likely serve as nearby destinations for the residents of this area. A challenge could be competing with these newer destinations.

STANLEY MARKETPLACE

Stanley Marketplace is located just northwest of the study area boundary. It includes multiple dining establishements and fitness and entertainment businesses. This is a recent addition to Original Aurora that serves as a popular destination for nearby residents.

FIGURE 4.1.3

ZONING



CITY CORRIDOR

E. 6th Ave. to E. Iliff Ave.

WHAT'S ENVISIONED?

What does Aurora Places say about this area?

THE VISION

"The focus of the City Corridor is commercial activity along the main street with connected mixed residential types supporting this vibrant district."

PRIMARY LAND USE

- Multifamily Residential
- Restaurant
- Commercial Retail
- Commercial Service

SUPPORTING LAND USE

- Single-Family Attached Residential
- Office
- Institutional

DEFINING FEATURES

- Wherever possible, front commercial buildings along primary streets to ensure visibility and accessibility. Avoid street frontages dominated by parking lots or buildings set back large distances from the street.
- Use single-family attached units where the City Corridor abuts a residential placetype to promote an appropriate transition between two placetypes.
- Develop a road network along the City Corridor to provide quick and easy access to businesses for drivers, cyclists, transit riders and pedestrians.
- Reposition or redevelop aging or obsolete shopping centers to more effectively compete in current and future retail markets, and deliver goods and services to the local community.
- Design centers around central organizing feature or gathering space, like a common green or plaza, promenade, natural feature, or other shared space. Programmed common spaces surrounded by active uses and buildings attract or retain customers and convey a sense of community.
- Incorporate drainage swales, rain gardens, xeriscaping and water-efficient streetscapes and medians.
- Size primary parking lots for typical and reasonable demand and provide for peak parking in overflow areas away from primary street frontages. Promote shared parking opportunities.

WHAT'S ALLOWED?

What does the Zoning Code say about this area?

ZONE DISTRICTS

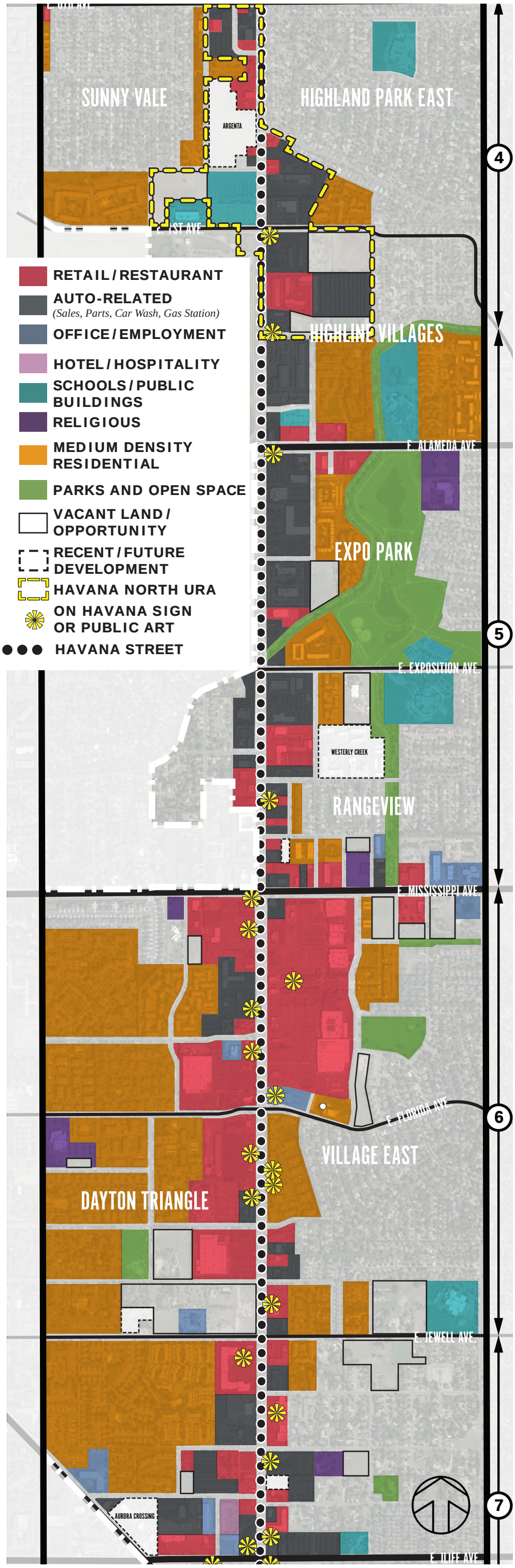
The following zone districts are located within the City Corridor boundary, as defined in Aurora Places.

- **HSO (Havana Street Overlay)** - All properties that touch Havana Street in this area, in addition to the base underlying zoning, have to follow the Havana Street Overlay standards. The HSO is intended to encourage improvement to streetscape, landscaping, and the general aesthetics of the street edges along Havana Street. The vision of a tree-lined boulevard with curbside landscape and detached sidewalks is the long-term goal for this district. Interim options are offered for the shorter term.
- **MU-C (Mixed Use - Corridor)** - The purpose of the MU-C district is to provide retail goods and services to satisfy the household and personal needs of the residents of nearby residential neighborhoods, those traveling on adjacent collector and arterial corridors, and to allow for higher intensity general business and service activities. The MU-C district should be located and designed to allow for access by pedestrians, bicyclists, and public transportation, in addition to automobiles.
- **MU-OI (Mixed Use Office/Institutional)** - The purpose of the MU-OI district is to accommodate office, institutional, and related low impact uses near residential areas. This district is intended to allow low- to medium-scale, low traffic generating office and residential uses in areas that can serve to buffer single-family residential areas from nearby more intensive commercial development.
- **R-3 (Medium Density Residential)** - The purpose of the R-3 district is to promote and preserve development of medium-density single-family and multifamily housing in close proximity to collector streets and public transit facilities.
- **R-4 (High Density Residential)** - The purpose of the R-4 district is to allow for high-density residential development to occur in close proximity to arterial or collector streets, public transit facilities, and other public amenities.
- **PUD (Planned Development)** - Applies to Gardens on Havana

MU-C (MIXED USE - CORRIDOR)
MU-OI (MIXED USE - OFFICE/ INSTITUTIONAL)
R-4 (HIGH DENSITY)
-HSO (HAVANA STREET OVERLAY)
R-3 (MEDIUM DENSITY MULTIFAMILY)
R-2 (MEDIUM DENSITY)
R-1 (LOW DENSITY SINGLE FAMILY)
HAVANA STREET

FIGURE 4.1.4

LAND USE AND OPPORTUNITIES



CITY CORRIDOR

E. 6th Ave. to E. Iliff Ave.

WHAT EXISTS?

What's the existing land use and character in this area?

CHARACTER AREA #4 - 6TH TO BAYAUD

Havana Street from E. 6th to E. 4th Way is one-sided due to the Highland Park East residential properties that orient away from Havana. In other words, on the east side of Havana, front doors face the street and on the west side, their backyards face the street.

The Argenta development on the former Fan Fare site is planned for this area and will offer mixed density residential types and neighborhood commercial services that will serve nearby residents and could serve as a catalyst for other redevelopment in this area.

The intersection of Havana and 1st Avenue includes education facilities, large auto dealers and Havana Square retail center. The street also starts to widen at the intersection of 1st and Havana. The Havana North Urban Renewal Area (pink dashed line) extends to E. Bayaud Avenue to the south.

CHARACTER AREA #5 - BAYAUD TO MISSISSIPPI

This 1.25 mile section of Havana includes multiple large auto dealerships on the east side of Havana. Pockets of smaller, non-auto commercial areas are mixed in.

This section intersects with the City and County of Denver (west of Havana) in multiple areas. The Common Ground Golf Course is adjacent to Havana (west side) from 1st to Alameda. From Alameda to Exposition is the large Expo Park and Recreation Center and the Highline Canal path and greenway.

CHARACTER AREA #6 - MISSISSIPPI TO JEWELL

This 1-mile section of Havana includes a lot of retail and service-oriented commercial. The Gardens on Havana is a popular destination and "lifestyle shopping center" on the east side of Havana. On the west side of Havana in this area, there are a lot of large retailers set back from the street with supplementary, smaller commercial uses near Havana.

CHARACTER AREA #7 - JEWELL TO PARKER

This section of Havana includes a mixture of auto dealerships and auto-service uses as well as multiple restaurants, including many of East Asian cuisine.

WHAT ARE THE OPPORTUNITIES AND CHALLENGES?

How can the vision be met?

HAVANA NORTH URA ACTIVITY CENTER

The Havana North Urban Renewal Area (yellow dashed line) was formed in 2010 to spur economic activity and development in this underutilized area of the corridor. The Argenta development is under construction, and should serve as a catalyst for other investments. The urban renewal plan calls for a gateway feature at the intersection of 6th and Havana, an activity center in the Argenta site, and an activated, high density mixed use intersection at 1st and Havana.

GARDENS ON HAVANA ACTIVITY CENTER

The area around Gardens on Havana (Havana and Mississippi) could present opportunities for redevelopment to support the "lifestyle center" concept that Gardens on Havana provides. There may be opportunity to expand this concept west of Havana and/or infill parking areas with more housing choices to create true live-work-play destination along the corridor and support a major bus transfer location. This area was listed as one of two activity centers in the Havana District Design Concepts Plan.

VACANT / UNDERUTILIZED LAND NEAR OPEN SPACE AND TRAILS

Vacant and underutilized parcels located west and south of Expo Park and along E. Mississippi Avenue are outlined in black on the map to the left. These properties have excellent access to regional trails and open space and would be ideal for residential uses. Current zoning could be a challenge to achieving higher densities to support a mix of incomes and nearby transit.

VACANT / UNDERUTILIZED LAND ALONG E. JEWELL AVENUE

There are quite a few vacant and underutilized properties along E. Jewell Avenue that could potentially convert to higher and better uses in the future. Current zoning could be a challenge to achieving higher densities to support a mix of incomes and nearby transit.

AUTO-ORIENTED USES

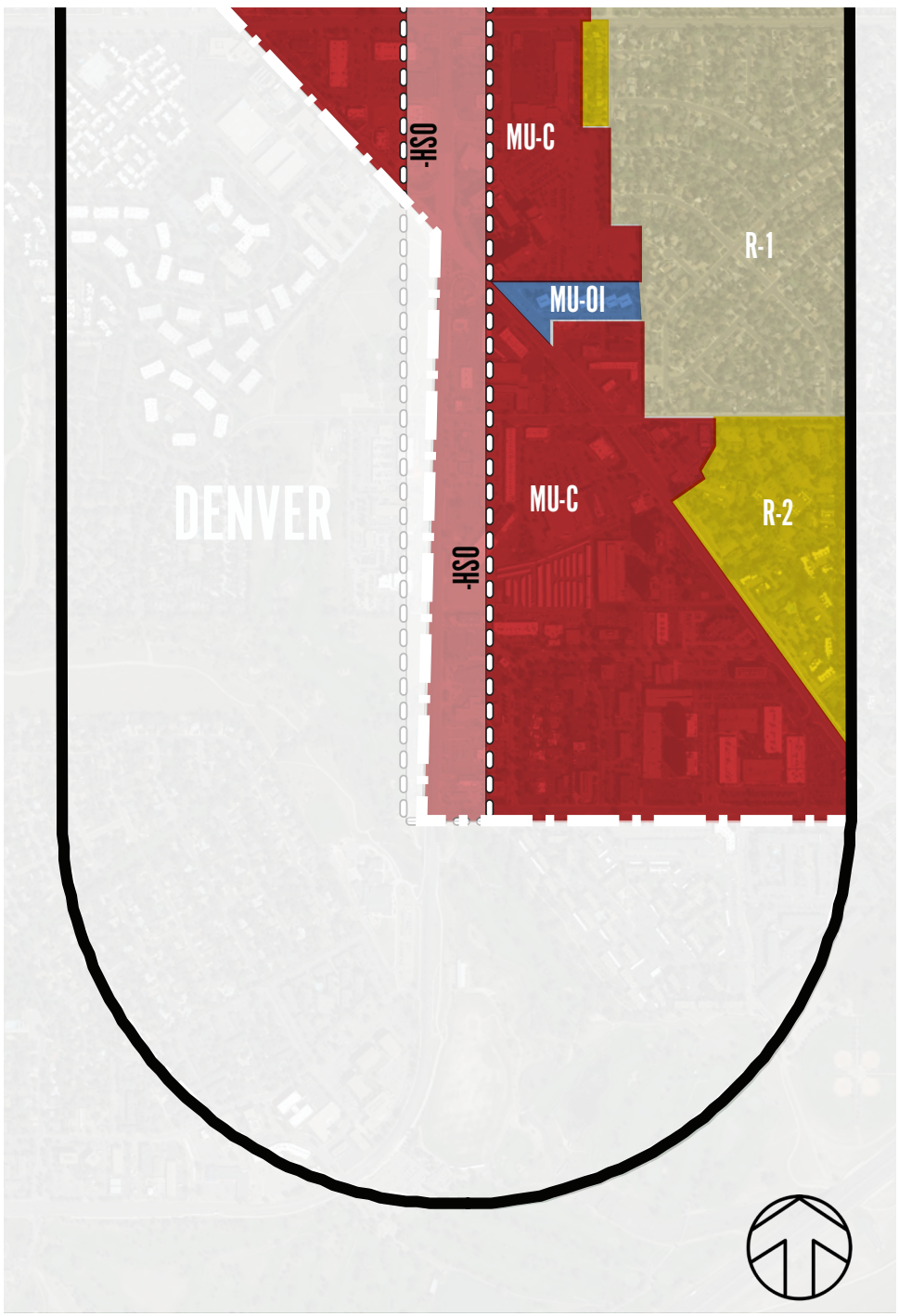
There are many auto-oriented uses throughout the corridor that can be challenging to creating an ideal walkable corridor. Finding "nodes" of opportunity, particularly around transit transfers and hubs, to create true mixed use destinations while encouraging beautification of auto-oriented uses through the Havana Street Overlay process is a worthwhile strategy.

FIGURE 4.1.5

URBAN DISTRICT

E. Iliff Ave. to E. Dartmouth Ave.

ZONING



MU-C (MIXED USE - CORRIDOR)

MU-OI (MIXED USE - OFFICE/ INSTITUTIONAL)

-HSO (HAVANA STREET OVERLAY)

R-2 (MEDIUM DENSITY)

R-1 (LOW DENSITY SINGLE FMAILY)

HAVANA STREET

WHAT'S ENVISIONED?

What does Aurora Places say about this area?

THE VISION

"Urban Districts are Aurora's signature destinations that offer a unique, vibrant urban experience."

PRIMARY LAND USE

- Multifamily Residential
- Restaurant
- Commercial Retail
- Commercial Service
- Entertainment and Arts District
- Office

SUPPORTING LAND USE

- Single-Family Attached Residential
- Institutional
- Parks and Open Space

DEFINING FEATURES

- Use Urban Districts as an opportunity to define Aurora's image and aesthetic through high-quality design and architecture supporting active places and distinctive destinations.
- Prioritize mixed-use buildings with ground-floor commercial and multistory residential housing above to bolster commercial and social activity.
- Use attractive, connected and well-designed urban streetscapes throughout the district. Place buildings at or near the sidewalk to maintain a traditional streetwall effect.
- Utilize civic plazas, courtyards, and parks and open space as gathering places for residents, employees and visitors.
- Provide easy, short pedestrian and bicycle connections to surrounding districts and neighborhoods.
- Integrate "water-wise" practices including water-efficient fixtures, native landscaping, water efficient streetscapes and medians and low-impact development BMPs.
- Incorporate an accessible, well-connected transit hub to connect Urban Districts to the rest of the city and region.
- Develop urban districts with a complete grid of streets and urban blocks.

WHAT'S ALLOWED?

What does the Zoning Code say about this area?

ZONE DISTRICTS

The following zone districts are located within the Urban District boundary, as defined in Aurora Places.

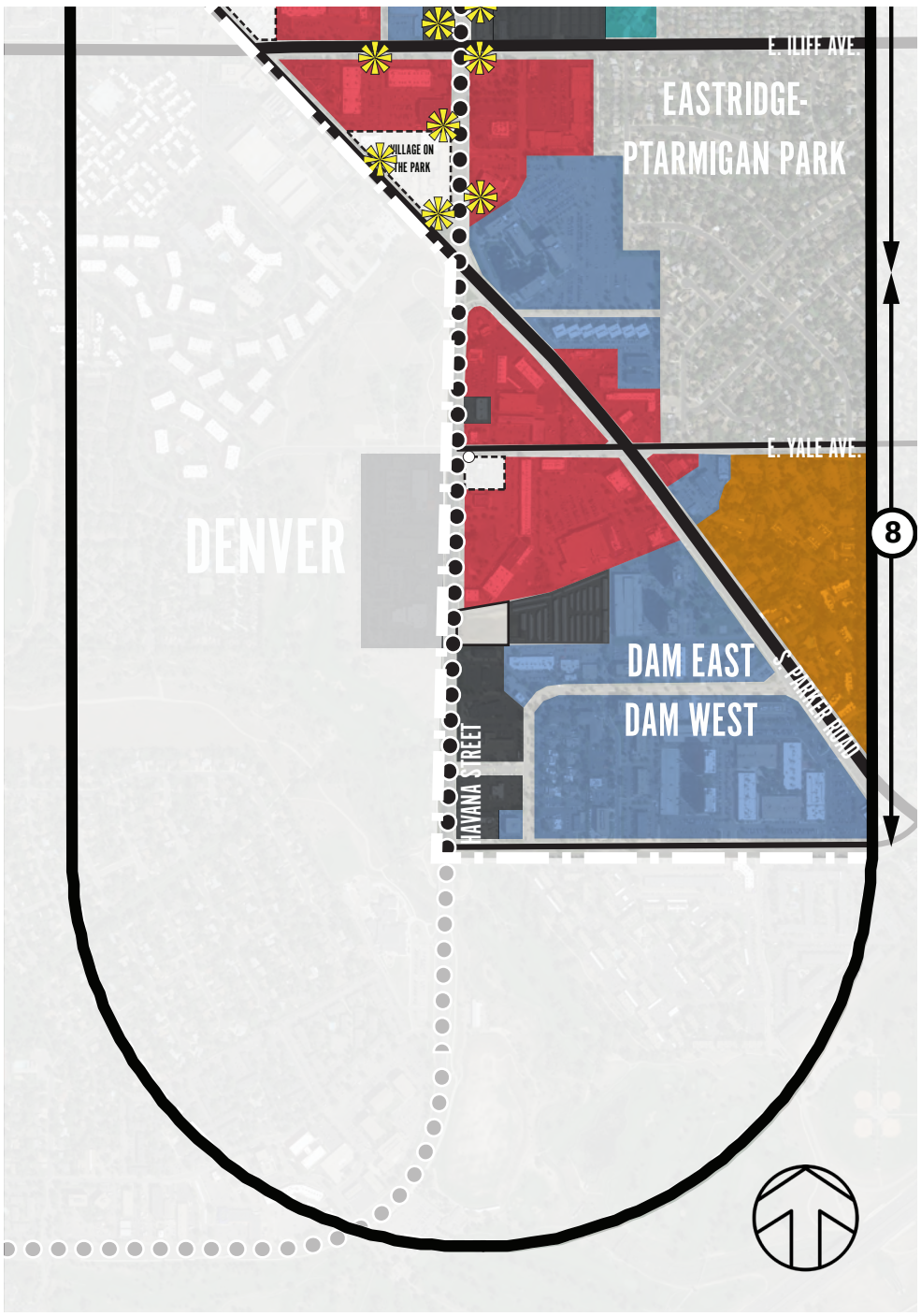
- **HSO (Havana Street Overlay)** - All properties that touch Havana Street in this area, in addition to the base underlying zoning, have to follow the Havana Street Overlay standards. The HSO is intended to encourage improvement to streetscape, landscaping, and the general aesthetics of the street edges along Havana Street. The vision of a tree-lined boulevard with curbside landscape and detached sidewalks is the long-term goal for this district. Interim options are offered for the shorter term.
- **MU-C (Mixed Use - Corridor)** - The purpose of the MU-C district is to provide retail goods and services to satisfy the household and personal needs of the residents of nearby residential neighborhoods, those traveling on adjacent collector and arterial corridors, and to allow for higher intensity general business and service activities. The MU-C district should be located and designed to allow for access by pedestrians, bicyclists, and public transportation, in addition to automobiles.
- **MU-OI (Mixed Use Office/Institutional)** - The purpose of the MU-OI district is to accommodate office, institutional, and related low impact uses near residential areas. This district is intended to allow low- to medium-scale, low traffic generating office and residential uses in areas that can serve to buffer single-family residential areas from nearby more intensive commercial development.

FIGURE 4.1.6

URBAN DISTRICT

E. Iliff Ave. to E. Dartmouth Ave.

LAND USE AND OPPORTUNITIES



- RETAIL / RESTAURANT
- AUTO-RELATED *(Sales, Parts, Car Wash, Gas Station)*
- OFFICE / EMPLOYMENT
- HOTEL / HOSPITALITY
- SCHOOLS / PUBLIC BUILDINGS
- RELIGIOUS
- MEDIUM DENSITY RESIDENTIAL
- PARKS AND OPEN SPACE
- VACANT LAND / OPPORTUNITY
- RECENT / FUTURE DEVELOPMENT
- ON HAVANA SIGN OR PUBLIC ART
- HAVANA STREET

WHAT EXISTS?

What's the existing land use and character in this area?

CHARACTER AREA #7 - JEWELL TO PARKER

This section of Havana includes the intersection with Parker Road at a diagonal, which results in multiple, trianglular-shaped areas. The new "Village on the Park" retail development and surrounding similar uses (retail/restaurant/service) is located at the intersection of Parker Road and Havana (west side). Suburban-style restaurants, strip retail center and a Kaiser Permanente campus are located on the east side of Havana in this subarea.

West of Havana and Parker Road is the City and County of Denver, including more multifamily developments and Babi Yar Park.

CHARACTER AREA #8 - PARKER TO DARTMOUTH

This section of Havana includes more large auto dealerships and suburban retail and restaurants. HMart, a Korean grocery store, is located near Yale and Parker Road, as well as another storage complex behind HMart.

Hentzel Park and Golf Course and the Cherry Creek Trail are nearby amenities for this area. The neighborhood is Dam East and Dam West, which includes a mixture of single-family and multifamily developments.

A new mixed use development called The Point will be located at the intersection of 225 and Parker Road, adjacent to Nine Mile Station (light rail), just southeast of the study area.

WHAT ARE THE OPPORTUNITIES AND CHALLENGES?

How can the vision be met?

VILLAGE ON THE PARK

Village on the Park redevelopment is a great addition to this area. However, the fact that it redeveloped as single-story commercial could show that the market may not be ready to deliver the higher intensity "urban district" uses, as envisioned in *Aurora Places*.

THE POINT AND ACCESS TO MASS TRANSIT

South Parker Road, southbound, leads to Nine Mile Station, the RTD light rail station at the intersection of Parker Road and I-225. This is about one-half mile from the study area, which is encouraging for more jobs and housing, as this is an acceptable distance to walk, bicycle or take micro-transit to and from high quality transit. A new high density, mixed use redevelopment called "The Point" is proposed for that area and could serve as a catalyst for similar redevelopment opportunities in the study area that does meet the "urban district" vision from *Aurora Places*.

MORE HOUSING AND HOSPITALITY NEAR JOBS

This area has the highest concentration of employment in the entire study area. However, there isn't much housing nearby, making this area more congested than anywhere else because most people drive to these jobs. The access to the light rail and other transit options should be a major consideration in this area to lessen congestion. Mixing in higher density housing and hotels and hospitality uses to create a true mixed use urban district as these large lots redevelop would be beneficial and help meet the vision. The majority of the area is zoned MU-C, which does not preclude uses and intensities, as envisioned. However, zoning or other tools may want to consider incentives for properties to redevelop as envisioned, as this area's proximity to the 225 corridor and light rail is a major opportunity.

4.2 LAND USE ANALYSIS KEY TAKEAWAYS

ORIGINAL AURORA

Havana Street

This section of Havana Street is primarily residential. For the most part, single family homes front onto Havana Street and most of them include driveways also fronting onto Havana Street. Single family homes here have access to alleys that could be a strongly preferred alternative to access and parking. The street is still quite busy, even though the street is narrower than other segments. This segment of Havana Street could benefit from beautification and landscaping, and policies to encourage (or enforce) use of the alleys for auto access. Doing so would allow more space for sidewalks along Havana Street, a buffer between pedestrians and vehicles, decrease conflicts between pedestrians and vehicles, reduce the impacts of heat islands and improve safe access for homeowners via the alley.

Colfax Avenue

The primary opportunity for reinvestment and redevelopment is Colfax Avenue. This area includes the Aurora Cultural Arts District and serves as Aurora's "downtown." It also is slated for major bus improvements, including an ongoing project to upgrade the existing 15L stations with improved shelters and real-time data and eventually building a bus rapid transit system that could include more major street configuration and bus stop changes, as well as a new bus fleet. Opportunities for safe connections to the Colfax Avenue corridor as well as adding in higher density housing could enhance the vibrancy and sustainability of the district and corridor in the future.

Sensitive Residential Density

The zoning code for Original Aurora encourages sensitive density additions to traditional single-family neighborhoods. Due to the higher traffic counts of Havana Street as opposed to other residential streets, this corridor could prove to be a key opportunity for adding in duplexes, triplexes and townhomes to provide a more continuous edge and upgraded sidewalk system while meeting the vision of *Aurora Places*.

CITY CORRIDOR

Auto -Oriented Uses

Auto-oriented uses along the corridor such as auto dealerships and parts and repair shops contribute a great deal of tax revenue to the BID and City of Aurora. They have made an identity for the street and district and should be embraced and enhanced in the future. There may be opportunities to become more walkable in the future with enhanced streetscape frontages, hosting festivals and events, and even becoming more urban as they redevelop by including new buildings at the street edge with indoor showrooms that can be seen from the street and sidewalk. These uses also usually include large signage which could be used to promote the "On Havana" brand.

On Havana Signage and Wayfinding

The existing "On Havana" markers are often covered up by landscaping (if located on the bottom of a stand-alone sign) or too small to be seen. The BID is continuously working with property owners when upgrading their signage. This program is beneficial and situating the brand logo so it is most visible should be a priority. In addition to the brand logos on private signage, the BID also has an opportunity to

add much larger monument and gateway signs to add to the district brand and promotion capabilities. This project will look at those opportunities.

Connections to Open Space and Trails

This segment of the corridor has amazing amenities such as: the High Line Canal (71 miles total length), Expo Park (57 acres), Westerly Creek Trail (4.1 miles) and multiple neighborhood parks. Stringing these amenities together and linking them to residential areas could open tremendous opportunities for new housing, economic development and other investment and beautification.

Havana North Urban Renewal Authority (URA)

The Havana North URA, located along Havana from 6th Avenue to Bayaud Avenue, is an area to pay attention to. With Argenta coming in as a major catalyst development, more development could follow. The URA serves to catalyze development and fund future public improvements.

Redevelopment Projects

A few redevelopment projects of various scales that have been constructed or are under construction that will make an impact on the corridor and could spur other investments include the following (listed from north to south):

- **Argenta** – this 10.5-acre redevelopment of the former Fan Fare site at 1st and Havana is currently under construction and will include 86 townhomes (under construction), 208 multifamily units and 20,000 square feet of small-scale retail space.
- **Gardens on Havana** - Toward the middle of the City Corridor area at Mississippi and Havana is the Gardens on Havana, a 500,000 square foot redevelopment that opened in 2013. It includes a 217-unit apartment building and a 10-unit townhome complex. This redevelopment was a major success for the district. In the future, Gardens on Havana could see the addition of more residential or mixed-use buildings replacing surface parking with integrated structured parking instead.
- **Aurora Crossing** – completed in 2018, this redevelopment includes 9,360 square feet of in-line retail on 1.5 acres located at Iliff and Parker Road. Although this project faces Parker Road, it is less than a quarter mile – within walking distance – from Havana Street.
- **Village on the Park** - toward the south of the City Corridor area is Village on the Park, a $14.5M redevelopment of a commercial center at Havana and Parker Road. This investment at a key gateway intersection to the district will hopefully spur other investment nearby.

Streetscape

This portion of the corridor lacks consistency in terms of streetscape. The Havana Street Overlay District provides tiered solutions for properties to convert over time and contribute to the vision of having a tree-lined boulevard with safe and comfortable sidewalks, but without redevelopment occurring, the streetscape could remain disconnected. Part of the Havana multimodal corridor study will focus on priority locations and phasing opportunities for transforming the streetscape.

URBAN DISTRICT

Strategic Investment

This area of the corridor lacks an identity and sense of cohesiveness in terms of connectivity and transition of form between large employment complexes and small-scale retail. Most of the area includes separated land uses of drastically different scales – large office complexes and small-scale, suburban retail. The southern end of the corridor is disorienting as Parker Road, oriented on a diagonal axis, becomes the primary connection to Interstate 225. An "urban district" strategy is needed for this area to envision key connections, future land use integration and placemaking and identity. This project will look at the district, working with stakeholders and property owners, to create a more defined transition from what exists today to the future "urban district" vision for the area.

Streetscape and Trail Connection

This roadway section is the widest area of the corridor, but due to Parker Road becoming the dominant street, Havana land uses fall off in the intensity and scale and the corridor intersects green space and the Cherry Creek Trail system. This project should look for opportunities for streetscape consistency and wayfinding for this area, in addition to linking the Cherry Creek Trail to Havana Street, and enhancing pedestrian, bicycle, and wayfinding linkages to the Nine Mile light rail station.

SECTION 5. FUTURE BACKGROUND CONDITIONS AND ANALYSIS

5.1 PLANNED AND PROGRAMMED MAJOR TRANSPORTATION IMPROVEMENTS

Two planned/programmed improvements were identified in the study area. The first is a reconstruction of the traffic signals by CDOT at the intersections of Havana Street at Yale Avenue and Jewell Avenue. As part of the reconstruction, flashing yellow arrow left turn signal indications will be added to provide flexibility to address safety issues when needed, but not at the expense of delay at other times. Northbound and southbound left turns can run protected by time-of-day during the peak hours to help mitigate approach turn crashes. Protected phasing for left turns is also safer for bicyclists and pedestrians as it provides a dedicated phase for the left turns and does not allow vehicles to turn during the "walk" phase for bicyclists and pedestrians. Flashing yellow arrow signals can also allow for the eastbound and westbound left turns to run a leading pedestrian phase which gives pedestrians a head start into the intersection where they are more visible, before allowing conflicting permissive turns, or run protected turns during a conflicting pedestrian phase. It is anticipated that construction would occur towards the end of this year or early next year.

The second set of planned/programmed improvements is tied to the *Havana Street Transit Improvements - 2020 -2023 DRCOG TIP project.* This grant was awarded to the City and RTD for a list of improvements along the corridor including relocation of bus stops, the addition of bypass lanes for buses, proposed bus bulbs, and TSP at up to ten signalized intersections. These improvements are intended to increase the reliability of the existing multimodal transportation network by improving bus running speed and punctuality.

The signal timing parameters associated with the flashing yellow arrow improvements have not been defined and the ten locations for future TSP have not yet been identified. As a result, neither of these set of planned/programmed improvements has been included in the future 2040 analysis.

5.2 2040 NO-BUILD VEHICULAR TRAFFIC ANALYSIS

FUTURE 2040 TRAFFIC VOLUMES

The 2015 and 2040 average daily traffic forecasts from the DRCOG regional model were used as a starting point to identify a growth rate by approach for each of the study intersections. The resulting 2040 forecasted volumes were then compared to the 2040 projected volumes and adjusted as necessary. Additionally, growth rates on the minor side streets and shopping center entrances were adjusted based on an expectation of limited growth. A more detailed summary of the growth rate methodology is provided in Appendix F. The review of the growth rates was performed by City staff and the study team to avoid the perception of over or under forecasting, and to develop a most appropriate future year traffic volume forecast. The resulting annual growth rates and growth factors for each intersection are presented in Table 5.2.1. The calculated annual growth rates resulted in an average rate of 0.88%, with a maximum value of 2.28% and a minimum value of 0.17%. The Havana Street corridor intersections north of 6th Avenue are expected to experience minimal growth, while those south of 6th Avenue are expected to see higher growth rates over the study period. Havana Street at Mississippi Avenue and Iliff Avenue are expected to see the most growth, followed by Florida Avenue, and Parker Road.

Table 5.2.1: 2040 Traffic Volume Growth Rates and Growth Factors[27]

No.	Intersection	Eastbound		Westbound		Northbound		Southbound	
		Annual Growth Rate	2018-2040 Growth Factor	Annual Growth Rate	2018-2040 Growth Factor	Annual Growth Rate	2018-2040 Growth Factor	Annual Growth Rate	2018-2040 Growth Factor
1	Havana Street & Montview Boulevard	0.57%	1.13	0.57%	1.13	0.57%	1.13	0.57%	1.13
2	Havana Street & 17th Avenue	0.57%	1.13	0.57%	1.13	0.57%	1.13	0.57%	1.13
3	Havana Street & Colfax Avenue	0.57%	1.13	0.57%	1.13	0.57%	1.13	0.57%	1.13
4	Havana Street & 13th Avenue	0.57%	1.13	0.57%	1.13	0.57%	1.13	0.57%	1.13
5	Havana Street & N Del Mar Parkway	0.26%	1.06	0.26%	1.06	0.26%	1.06	0.26%	1.06
6	Havana Street & S Del Mar Parkway	0.26%	1.06	0.26%	1.06	0.26%	1.06	0.26%	1.06
7	Havana Street & 11th Avenue & Del Mar Pkwy	0.26%	1.06	0.26%	1.06	1.09%	1.27	0.26%	1.06
8	Havana Street & 6th Avenue	0.86%	1.21	0.86%	1.21	0.86%	1.21	0.86%	1.21
9	Havana Street & 1st Avenue	0.90%	1.22	0.90%	1.22	0.90%	1.22	0.90%	1.22
10	Havana Street & Alameda Avenue	0.62%	1.15	1.16%	1.29	1.16%	1.29	1.16%	1.29
11	Havana Street & Exposition Avenue	0.99%	1.24	0.99%	1.24	0.59%	1.14	0.55%	1.13
12	Havana Street & Mississippi Avenue	2.28%	1.64	1.34%	1.34	1.05%	1.26	0.64%	1.15
13	Havana Street & Wyoming Street/Idaho Place	0.29%	1.07	0.17%	1.04	1.05%	1.26	1.05%	1.26
14	Havana Street & Florida Avenue	1.22%	1.31	1.22%	1.31	1.22%	1.31	1.65%	1.43
15	Havana Street & Mexico Avenue	0.32%	1.07	0.33%	1.08	1.18%	1.29	1.18%	1.29
16	Havana Street & Jewell Avenue	1.18%	1.29	1.18%	1.29	1.58%	1.41	1.44%	1.37
17	Havana Street & Iliff Avenue	2.06%	1.57	1.42%	1.36	2.25%	1.63	1.03%	1.25
18	Havana Street & Parker Road	1.37%	1.35	1.37%	1.35	1.37%	1.35	1.77%	1.47
19	Havana Street & Yale Avenue	1.37%	1.35	1.37%	1.35	1.37%	1.35	1.37%	1.35

[27] Note: The growth factor is the number by which a quantity multiplies over a period of time (i.e. 2018-2040 Growth Factor = (1+Annual Growth Rate) [22]). The annual growth rate is the percentage increase experienced every year. The 2040 Volume is calculated by multiplying the 2018 Volume by the growth factor. Since the annual growth rate is measured in a percentage while the growth factor is measured as a decimal it sometimes appears that the growth factor is less than the annual growth rate, but conversion of the annual growth rate to a decimal shows that the growth factor is actually much larger than the annual growth rate.[27]

Future year turning movement volumes were then estimated by applying the projected growth rates for each intersection approach to the 2018 traffic volumes. 2020 turning movement counts (TMC)s were not collected as part of this project because travel patterns drastically changed before counts could be conducted, as a result of stay at home orders issued in response to the COVID-19 pandemic. Figures 5.2.1 and 5.2.2 show the 2040 turning movement volumes for both the AM and PM peak periods, which were used to conduct future background intersection capacity analysis for the corridor intersections.

2040 NO-BUILD VEHICLE TRAFFIC OPERATIONS

The 2040 no-build traffic operations on Havana Street were evaluated using Synchro, version 10.3. This identifies the level of congestion anticipated in 2040. This analysis only included signalized intersections along Havana Street and did not propose and consider future modifications. Existing corridor geometry and signal timings, plus future forecasted traffic volumes shown in Figures 5.2.1 and 5.2.2 were used to conduct the analysis. These results, when compared to the existing analysis results, show how the increase in traffic volumes would impact the existing network.

Figures 5.2.3 and 5.2.4 present the estimated LOS for the signalized intersections during 2040 AM and PM peak periods. The City's current standards generally consider a LOS of "D" or better as acceptable, although individual movements may be allowed to fall to LOS "E". This analysis identifies vehicular delays, areas of congestion, and potential improvement needs.

During the 2040 AM peak hour, most of the major intersections south of 6th Avenue are expected to operate with additional delays. The intersections at 1st Avenue, Alameda Avenue, Mississippi Avenue, Iliff Avenue, and Parker Road are expected to operate with an overall intersection LOS "E", which exceeds the City's standard of LOS "D". At other intersections south of 6th Avenue, even though the overall intersection performance shows a LOS "D" or better, at least one approach per intersection is expected to operate with LOS "E" or LOS "F". The exceptions are intersections at Mexico Avenue and Jewell Avenue which are expected to operate with LOS "D" or better, which is considered acceptable.

The traffic conditions are expected to deteriorate further during the 2040 PM peak hour. As shown in Figures 5.2.3 and 5.2.4, half of the intersections from 6th Avenue to the south are expected to operate with an overall intersection performance of LOS "E" or "F". Those operating at LOS "F" are expected to fail as a result of demand exceeding capacity. All of the intersections, except for Exposition Avenue and Mexico Avenue will experience at least one approach that will operate at LOS "E" or "F".

Since much of the City right-of-way is very constrained, other, more creative solutions should be considered to help reduce delay along the corridor. Multimodal improvements that reduce the forecasted high automobile traffic demand and have the potential to shift demand to alternative modes such as walking, biking and taking transit will be considered to create a balance between automobile movement and a safe and convenient pedestrian environment. This balanced approach is critical to the economic vitality of the corridor. Improvements such as innovative intersection designs, Adaptive Signal Control Technologies (ASCT) that optimize signal timings every cycle, and the upgrade of turn signals to flashing yellow arrow operations by time of day also have the potential to improve vehicular LOS along the corridor.

Figure 5.2.1: 2040 No-Build Intersection Turning Movement Volumes (North Intersections)

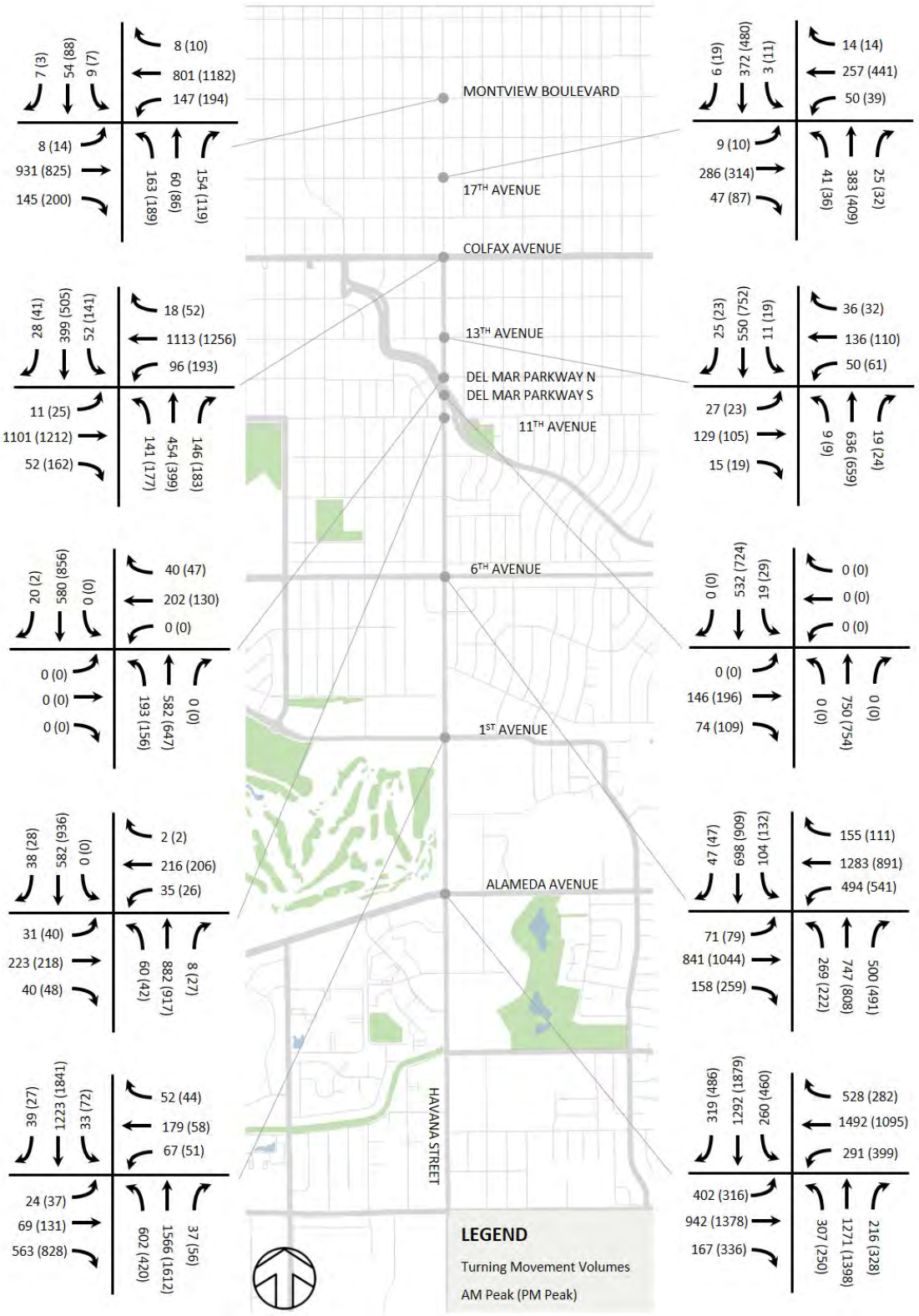


Figure 5.2.2: 2040 No-Build Intersection Turning Movement Volumes (South Intersections)

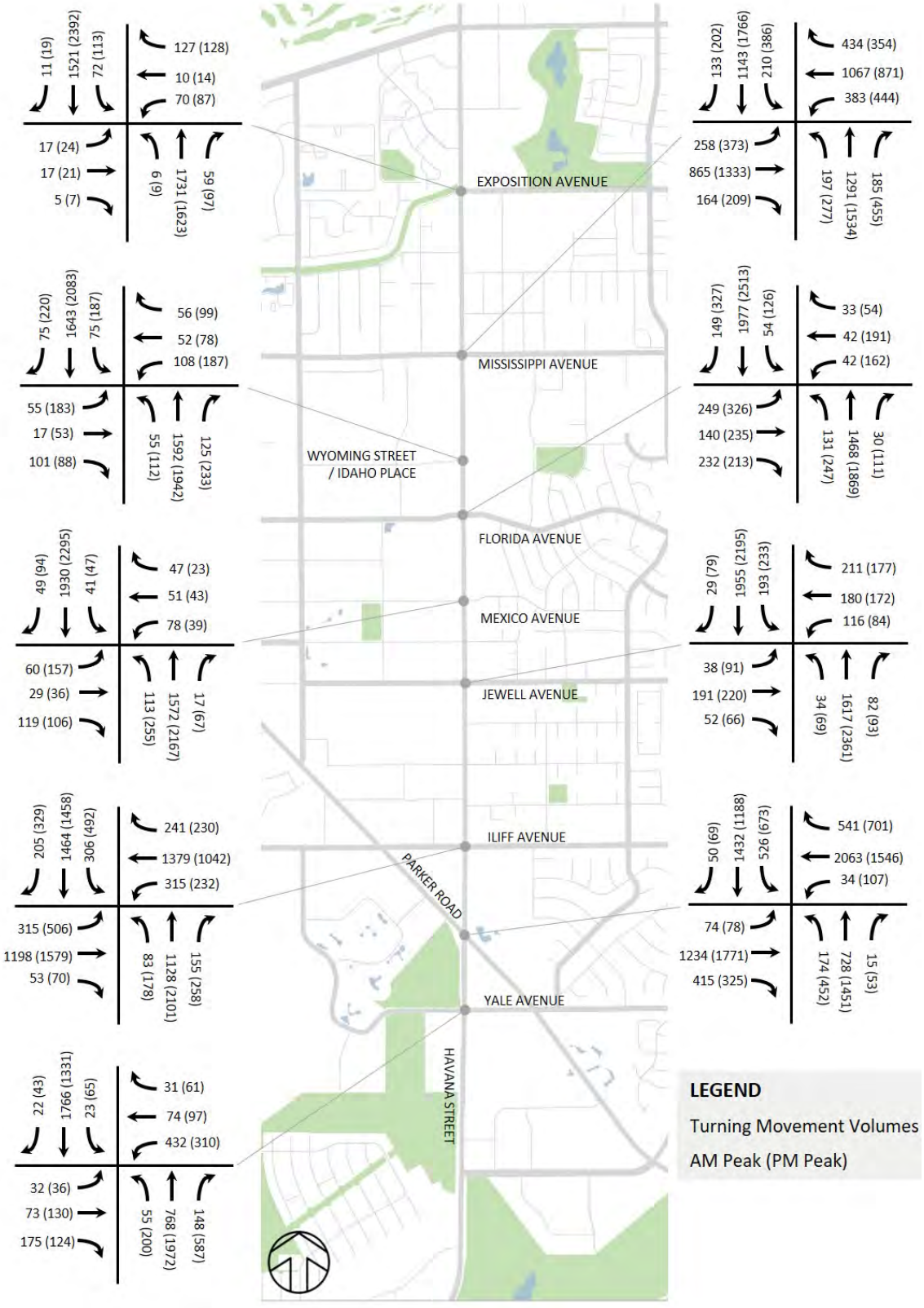
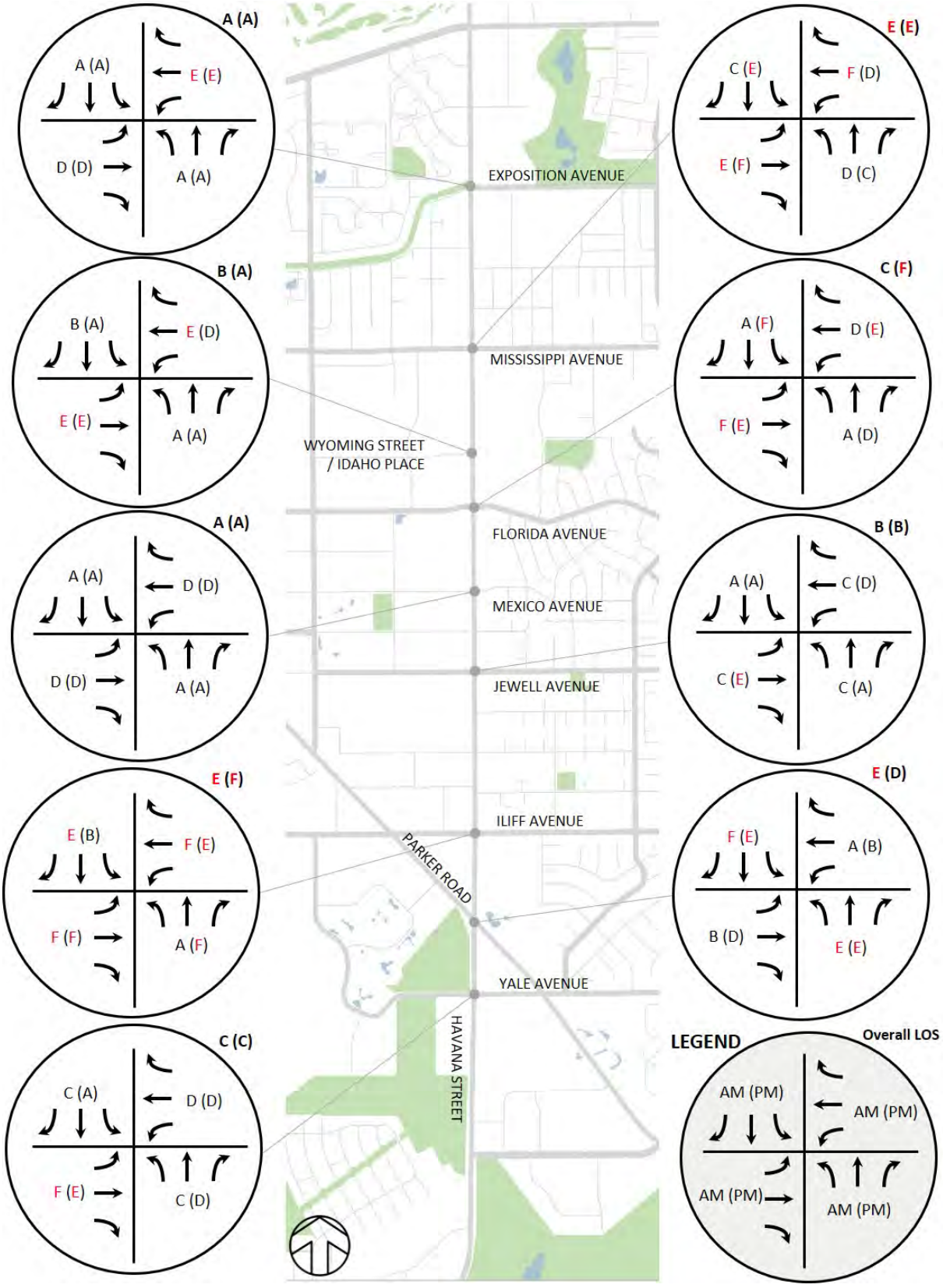


Figure 5.2.3: 2040 No-Build Vehicle LOS (North Intersections)

Figure 5.2.4: 2040 Vehicle LOS (South Intersections)



5.3 2040 TRANSIT ANALYSIS

To evaluate future transit LOS, the following parameters were updated in the TCQSM from the 2019 existing transit level of service analysis:

- Passenger load factor
- Outside lane demand flow rate
- Average vehicle running speed

Assuming that transit ridership would continue to increase into the future, a growth rate of 0.88% per year was applied to the passenger load factor to come up with a 2040 passenger load factor. The 0.88% growth rate is consistent with the average vehicle growth rate used to project future 2040 vehicle volumes. The outside lane demand flow rate was calculated by applying the respective 2040 growth rates by segment to the 2019 flow rates, and the average vehicle running speed was taken from the 2040 PM peak hour Synchro model. The remaining transit LOS parameters were assumed to remain the same. The transit analysis worksheets are provided in Appendix C and results of the 2040 transit analysis are provided in Table 5.3.1. The results indicate that an increase in ridership and vehicles traveling adjacent to riders on the sidewalk, along with a reduction in vehicle running speed due to increased congestion have a minimal impact on the transit LOS. Applying the 2040 assumptions, the transit LOS is very similar to existing conditions. The segments that are closest to LOS D operations in 2040 include the northbound segments of 1st Avenue to 6th Avenue, 6th Avenue to 11th Avenue, and 13th Avenue to Colfax Avenue.

The *Havana Street Transit Improvements - 2020 -2023 DRCOG TIP project Application*, will provide additional improvements to the Transit network such as proposed bus bypass lanes and TSP. Additional improvements that should be considered to further improve the LOS are the consolidation of low utilized bus stops, addition of benches at the 31% of stops that currently have no amenities. Other considerations that are not directly addressed in the TCQSM methodology for determining transit LOS are pedestrian scale lighting at stops and along the corridor, plus application of real time data showing riders when the next bus is planned to arrive.

Table 5.3.1: Future (2040) Transit LOS Summary

Segment	Direction	Transit LOS	
		Transit LOS Score	Transit LOS Grade
Between 17th Avenue and Montview Boulevard	NB	3.14	C
	SB	3.08	C
Between 16th Avenue and 17th Avenue	NB	No Stops	No Stops
	SB	2.97	C
Between Colfax Avenue and 16th Avenue	NB	3.14	C
	SB	No Stops	No Stops
Between 13th Avenue and Colfax Avenue	NB	3.35	C
	SB	3.11	C
Between Del Mar Parkway and 13th Avenue	NB	No Stops	No Stops
	SB	3.20	C
Between 11th Avenue and Del Mar Parkway	NB	3.22	C
	SB	3.08	C
Between 6th Avenue and 11th Avenue	NB	3.27	C
	SB	3.09	C
Between 1st Avenue and 6th Avenue	NB	3.26	C
	SB	3.22	C
Between Alameda Avenue and 1st Avenue	NB	3.03	C
	SB	3.16	C
Between Exposition Avenue and Alameda Avenue	NB	2.99	C
	SB	3.17	C
Between Mississippi Avenue and Exposition Avenue	NB	3.06	C
	SB	3.13	C
Between Idaho Place and Mississippi Avenue	NB	3.07	C
	SB	3.02	C
Between Florida Avenue and Idaho Place	NB	3.05	C
	SB	3.18	C
Between Mexico Avenue and Florida Avenue	NB	2.99	C
	SB	3.03	C
Between Jewell Avenue and Mexico Avenue	NB	3.05	C
	SB	2.93	C
Between Illiff Avenue and Jewell Avenue	NB	3.08	C
	SB	2.93	C
Between Parker Road and Illiff Avenue	NB	3.02	C
	SB	2.78	C
Between Yale and Parker	NB	2.89	C
	SB	2.87	C

Table 5.4.1: Projected Bicycle & Pedestrian Volumes in 2040[28]

Intersection	Total Volumes 0 150 300+
Montview Boulevard	
Bicycles	12
Pedestrians	52
17th Avenue	
Bicycles	2
Pedestrians	33
13th Avenue	
Bicycles	38
Pedestrians	256
Del Mar Parkway	
Bicycles	0
Pedestrians	33
6th Avenue	
Bicycles	18
Pedestrians	146
1st Avenue	
Bicycles	4
Pedestrians	73
Alameda Avenue	
Bicycles	11
Pedestrians	80

Intersection	Total Volumes
Exposition Avenue	
Bicycles	36
Pedestrians	132
Mississippi Avenue	
Bicycles	7
Pedestrians	321
Idaho Place	
Bicycles	8
Pedestrians	152
Florida Avenue	
Bicycles	13
Pedestrians	155
Mexico Avenue	
Bicycles	6
Pedestrians	87
Jewell Avenue	
Bicycles	2
Pedestrians	95
Yale Avenue	
Bicycles	10
Pedestrians	85
Total	
Bicycles	169
Pedestrians	1699

5.4 2040 BICYCLE & PEDESTRIAN ASSESSMENT

2040 BICYCLE AND PEDESTRIAN VOLUME

Calculating the likely volumes of bicyclists and pedestrians on the corridor in future years helps establish and predict the level of need for access and safety improvements. The annual growth rate corridor-wide average of 0.88% per year calculated for 2018-2040 vehicular and transit volumes was also applied uniformly to 2018 bike and ped total intersection crossing volumes, to estimate bicycle and pedestrian total crossing volumes for the year 2040, as shown in Table 5.4.1. Bicycle volume is predicted to increase at all intersections. Likewise, pedestrian volume is predicted to increase, with the sum of pedestrian crossings at Mississippi Avenue and 13th Avenue is forecasted to be 321 and 256 per day, respectively.

Without infrastructure improvements, the projected increase in volumes across all modes are likely to be accompanied by an increase in injuries and fatalities involving bicyclists and pedestrians. Absent any

[28] *Projection is based on 0.88% user increase per year from 2018 counts. Counts by All Traffic Data Services, Inc. April 2018.*

safety-focused improvements, the potential for conflict between modes will be roughly proportional to the increase in mode volumes.

2040 BICYCLE LEVEL OF TRAFFIC STRESS

The future bicycle LTS in the project area for horizon year 2040 will depend on several factors. Under a no-change scenario, the roadway profile would remain the same including the number and width of lanes as would intersection configurations. Traffic volumes would be expected to increase, and average speeds would remain relatively stable but possibly decrease in some segments due to greater congestion. In this future condition, it is not expected that bicycle LTS on any portion of the corridor would improve.

However, through some targeted changes to the built environment over the next 20 years, bicycle LTS could be improved. The overall change most likely to cause an improvement is the implementation of designated bicycle facilities. None currently exist and that's a primary reason for LTS 4 exists on the entire corridor. Moreover, facilities that would provide physical separation from motorized travel lanes (i.e. flex bollards, curb, planters) are those most likely to improve LTS. More standard on-street bike lanes could increase comfort for some users, but marginally given the lack of separation. Other elements that could complement these facility types and help further reduce LTS would be, for example, clear wayfinding signage directing users to parallel routes (i.e. the Moline and Lima Street bike lane), and improved markings at intersections or at driveways to signify a bicycle facility. The Moline/Lima bike lane, for example provides a designated facility for bicyclists on a lower stress roadway that parallels Havana and extends approximately three miles from north-south in parallel to Havana.

Therefore, the potential for LTS three, two, or even one on different segments of the corridor is possible in year 2040 but achieving these reductions will require some notable changes to the corridor's existing conditions. Specific consideration will need to be given to conversion of existing sidepath / sidewalks to multi-purpose, shared use facilities and associated treatments at intersections.

2040 PEDESTRIAN LEVEL OF TRAFFIC STRESS

Similar to the future bicycle LTS, the future pedestrian LTS for horizon year 2040 will depend on several factors over the next 20 years. Under the no-change scenario, the roadway profile would remain the same as it is today, including the number and width of lanes and intersection configurations. Traffic volumes would be expected to increase, and average speeds would generally decrease due to greater congestion. Under this condition, it's not expected that pedestrian LTS on any portion of the corridor would improve. In fact, the areas currently experiencing LTS 1 and 3 could worsen due to an increase in volumes.

However, through some targeted future changes to the corridor's pedestrian environment, LTS could be reduced. The overall change most likely to cause a reduction is the provision of sidewalks and curb ramps that uniformly meeting ADA design standards. In addition, the separation of sidewalks from the roadway through elements such as tree lawn increase the chance that LTS would be reduced. As noted above, the corridor currently contains sidewalks and curb ramps at many locations that don't meet standard and several sidewalks are attached in areas with posted speed limits up to 45 mph.

Therefore, the degree of change and reduction in pedestrian LTS in year 2040 will mostly depend on the provision of sidewalks and curb ramps that uniformly meet standards. To the degree that sidewalks can be separated from the roadway, further reductions can be realized. Pedestrian crossing enhancements that could improve LTS are curb extensions, median refuge islands, leading pedestrian (signal) phase, and mid-block crossings with the appropriate treatments (i.e. Rectangular Flashing Beacons).

SECTION 6. FOCUS AREAS

6.1 OVERVIEW

Havana Street is a long multimodal transportation corridor with varying travel and land use conditions, such as number of travel lanes, sidewalk conditions, transit usage, and land use types and densities, etc. Within the long corridor, proposed focus areas were determined through an evaluation of multimodal transportation and land use considerations. The project team identified the vehicle, bike, pedestrian, and transit locations that had the worst LOS, highest crash rates, highest transit demand or most need for amenities. These considerations in conjunction with the areas with higher land use densities or that were ripe for redevelopment were narrowed down to five focus areas that are summarized in Table 6.1.1.

These areas were chosen because an evaluation of multimodal transportation and land use criteria indicate that an investment in these areas has the highest potential for a strong return by increasing safety and comfort. In conjunction with City staff, one or more focus areas will be identified for further assessment and identification of proposed improvements. The selected focus areas will receive a more detailed assessment of conceptual design and cost estimate considerations. Opportunities will also be identified for improving multimodal travel along and across the entire length of the corridor, and other portions of the corridor will also be evaluated to determine feasibility or fatal flaws of recommended multimodal improvements.

Table 6.1.1: Focus Areas

		Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
		Segment					
		Montview to Colfax	**Colfax Ave to 6th Ave**	**N/A**	**N/A**	**Mississippi Ave to Iliff Ave**	**N/A**
		Focus Intersection(s)					
		N/A	**Havana Street/Colfax Avenue**	**Havana Street / 1st Avenue**	**Havana Street / Exposition Avenue**	**Havana Street / Mississippi Avenue Havana Street / Florida Avenue Havana Street / Iliff Avenue**	**Havana Street / Parker Road**
Multimodal Considerations	**Vehicle**	1) The number of crashes on this segment increase as you approach Colfax Avenue. 2) On street parking along this segment creates conflicts with through travel of vehicles.	1) The higher pedestrian volume contributes to vehicle congestion and delay. 2) The operations of several approaches at the 6th Avenue intersection are expected to worsen to LOS E or F by 2040.	1) The operations of this intersection are expected to worsen to LOS E by 2040. 2) This intersection has a moderately high crash rate and has experienced a fatality.	1) Despite a lower than average crash rate, there are several injury crashes that have occurred south of this intersection.	1) The operations of all three intersections are expected to worsen to LOS E or F during the PM peak hour by 2040. 2) These three intersections experience the highest auto crash density along the entire corridor.	1) The current intersection design results in poor levels of service and long green times needed to get vehicles through the intersection. 2) Long crosswalks due to the large skewed intersection reduce potential green time for vehicles. 3) The approach levels of service at this intersection are expected to worsen to LOS E or F by 2040.
	Transit	1) Two of the five bus stops along this segment do not have bus amenities. 2) The average sidewalk width for patrons walking on this segment or waiting at the bus stop is three feet. 3) Transit patrons on the west sidewalk experience approximately 650 vph passing by in the adjacent lane.	1) The bus stops at the intersection of Havana Street/Colfax Avenue each see 800 trips per day, which is the highest ridership along the corridor. 2) Five out of the six stops between Colfax Avenue and 6th Avenue do not have benches. 3) The average delay between the bus schedule and bus arrival for northbound riders is approximately five minutes. 4) Transit patrons on the east side, attached sidewalk experience an increase of 300 vph (from 400 to 700), passing by in the adjacent lane as they travel north within this segment.	1) Each of the bus stops at this intersection see approximately 150 riders per day. 2) The average delay between the bus schedule and bus arrival for northbound riders is approximately four and a half minutes. 3) Transit patrons on the west sidewalk, between 1st Avenue and Alameda Avenue, experience approximately 800 vph passing by in the adjacent lane. 4) Transit patrons on the east sidewalk, between 1st Avenue and 6th Avenue, experience approximately 800 vph passing by in the adjacent lane.	1) The southbound bus stops at Exposition Avenue and Virginia Avenue don't have benches despite each of them having approximately 100 riders per day. 2) The average delay between the bus schedule and bus arrival for southbound riders is approximately four and a half minutes. 3) The average delay between the bus schedule and bus arrival for northbound riders is approximately four minutes. 4) Transit patrons on the west sidewalk experience approximately 700 vph passing by in the adjacent lane.	1) Each of the bus stops at Mississippi Avenue and Iliff Avenue see nearly 300 riders per day. 2) Only 50% of these high ridership stops currently have shelters to protect riders from weather. 3) The average delay between the bus schedule and bus arrival for southbound riders is approximately four minutes. 4) Transit patrons on the east sidewalk experience 600-700 vph passing by in the adjacent lane. 5) Transit patrons on the west sidewalk, between Mississippi Avenue and Florida Avenue, experience approximately 800 vph passing by in the adjacent lane.	1) Three of the four bus stops are located nearly 500 feet away from the intersection due to its skewed geometry. This may encourage "jaywalking" away from the intersection to reduce time and distance to access the bus stop. 2) The average delay between the bus schedule and bus arrival for southbound riders is approximately four minutes.
	Bicycle	1) The distance to amenities, services and transit on Colfax Avenue are within a short bicycling distance (1/2 mile) from all locations along this segment. 2) There are no designated bicycling facilities in this segment and the substandard, narrow sidewalks (less than five feet) are not well-suited for use by bicyclists due to the high potential for user conflict (collisions). 3) This segment only has two lanes and a comparitively lower posted speed limit than most of the project corridor.	1) There is a concentration of crashes involving bicyclists at Colfax. 2) There is a connection to Del Mar Parkway bike lane on the east side of Havana Street.	1) There is a connection to the Westerly Creek Trail at the southwest corner of the intersection.	1) There is a connection to High Line Canal Trail. 2) The highest bicycle count recorded was at Exposition Avenue. 3) There is a high concentration of crashes involving bicyclists between Exposition Avenue and Mississippi Avenue.	1) There is a missing link on the east side of Havana Street, in the Florida Avenue on-street bike lane for westbound travel.	1) There is a connection to Babi Yar Park. 2) There is a higher level of complexity for crossing bicyclists as a result of the angle approaching lanes.
	Pedestrian	1) The distance to amenities, services and transit on Colfax Avenue (1/2 mile) is generally less than a 10 minute walk for most pedestrians along this segment. 2) There are substandard sidewalk widths (less than five feet) on this segment. 3) The distance between signalized crosswalks along this segment is approximately ¼ mile which exceeds the generally accepted three-minute threshold for walking to a protected crosswalk, crossing a roadway, and continuing a trip.	1) There is a concentration of crashes involving pedestrians at Colfax Avenue. 2) There are substandard sidewalk widths (less than five feet) on Havana Street for northbound and southbound segments approaching Colfax Avenue. 3) There are a cluster of sidewalk obstructions on Havana Street near Del Mar Parkway. 4) The distance between some of the siganlized crosswalks along this segment is approximately ¼ mile which exceeds the generally accepted three-minute threshold for walking to a protected crosswalk, crossing a roadway, and continuing a trip.	1) There is a connection to the Westerly Creek Trail at the southwest corner of the intersection.	1) There is a connection to the High Line Canal Trail.	1) The highest pedestrian counts recorded were at Mississippi Avenue. 2) The second highest pedestrian counts were recorded at Florida Avenue. 3) There is a high concentration of crashes involving pedestrians at Florida Avenue. 4) There are seven substandard pedestrian ramps identified between Mississippi Avenue and Iliff Avenue. 5) The distance between some of the signalized crosswalks along this segment is up to a 1/2 mile (i.e Jewell Avenue to Iliff Avenue) which exceeds the generally accepted three-minute threshold for walking to a protected crosswalk, crossing a roadway, and continuing a trip.	1) There is a connection to Babi Yar Park. 2) There is a higher level of complexity for crossing pedestrians as a result of the angle and number of approaching lanes.
	Land Use	1) This area includes primarily single-family homes fronting onto Havana. The homes are of modest scale and provide a similar rhythm to the street with similar setbacks, rooflines and heights. 2) Pedestrian access to the homes are provided by a narrow sidewalk from Havana, which is attached to the street. Vehicular access is provided from an alley behind the homes that runs parallel to Havana. 3)Aurora Places and new zoning encourage and allow for sensitive density infill, such as duplexes, triplexes and townhomes.	1) There are primarily single family homes fronting Havana Street in the neighborhood of Del Mar Parkway, which is a traditional neighborhood with orthagonal street grid of blocks with alleys. 2) The neighborhood is fairly dense even though it is primarily single family with multiple schools, parks and the commercial "main street" of Colfax Avenue is within walkable distance. 3) *Aurora Places* and new zoning encourage and allow for sensitive density infill, such as duplexes, triplexes and townhomes.	1) This intersection falls within the Havana North Urban Renewal Area (URA) boundary, which increases chances for future redevelopment and investment. There is a vocational school and elementary school on the northwest corner, a vacant parcel on the southwest corner and auto dealerships on the east corners. 2) The mixed use Argenta development on the 10.5 acre former Fan Fare site is currently underway and expected to add a sense of destination and vibrancy to this area.	1) This intersection includes auto-oriented uses as the primary land use, but there are also multiple medium-density apartment complexes nearby, a recreation center and school, as well as Expo Park and the High Line Canal. 2) There is an opportunity for redevelopment in this area, but the primary consideration is for safer access to the Kaiser clinic at Alameda and Havana as well as parks, open space and trails.	1) This area includes multiple popular commercial destinations such as the Gardens on Havana and large retailers (King Soopers, Safeway, Costco and Lowe's) as well as smaller retailers and restaurants and auto-oriented uses (gas stations, auto body shops). 2) The commercial areas are surrounded by medium density apartment complexes of lower income and some condominiums and townhomes to the west and a medium to high income single family neighborhood to the east. 3) The lower income apartment complexes may rely on transit and walking/biking to destinations, restaurants, and services. 4) There are multiple opportunities for redevelopment along Havana Street and especially along Jewell Avenue.	1) This intersection includes the new Village on the Park commercial development in the northwest corner, major medical employment campus to the northeast, a park to the southwest and a mix of commercial retail uses to the southeast. 2) The southeast corner, a triangular parcel due to the diagonal orientation of Parker Road, could be a major opportunity for redevelopment to serve as a gateway for this important intersection, and create a more sustainable mix of uses close to entertainment, retail, employment and parks.

APPENDIX A – SYNCHRO RESULTS

Havana St Existing Condition Performance Measures - 2020 AM Peak										
2020 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
1	Havana St & Montview Blvd	20.4	C	NB	52.9	D	NBL	0.81	52.9	D
							NBT	0	0	A
							NBR	0	0	A
				SB	28.2	C	SBL	0.16	28.2	C
							SBT	0	0	A
							SBR	0	0	A
				EB	17.5	B	EBL	0.04	11.8	B
							EBT	0.54	17.5	B
							EBR	0.54	17.6	B
				WB	10.1	B	WBL	0.47	12.5	B
							WBT	0.35	9.6	A
							WBR	0.35	9.6	A
2	Havana St & 17th Ave	23.8	C	NB	0.7	A	NBL	0.4	0.7	A
							NBT	0	0	A
							NBR	0	0	A
				SB	22.9	C	SBL	0.32	22.9	C
							SBT	0	0	A
							SBR	0	0	A
				EB	37.6	D	EBL	0.78	37.6	D
							EBT	0	0	A
							EBR	0	0	A
				WB	39.2	D	WBL	0.82	39.2	D
							WBT	0	0	A
							WBR	0	0	A
3	Havana St & Colfax Ave	27.5	C	NB	32.2	C	NBL	0.58	29	C
							NBT	0.74	36.1	D
							NBR	0.33	25.4	C
				SB	46.4	D	SBL	0.35	29.4	C
							SBT	0.79	50.4	D
							SBR	0.09	35.6	D
				EB	26.3	C	EBL	0.08	27.2	C
							EBT	0.71	26.8	C
							EBR	0.11	18	B
				WB	18.6	B	WBL	0.53	20.4	C
							WBT	0.61	18.6	B
							WBR	0.05	12.1	B
4	Havana St & 13th Ave	10.9	B	NB	7	A	NBL	0.03	8.6	A
							NBT	0	0	A
							NBR	0.54	6.9	A
				SB	7.3	A	SBL	0.03	9.4	A
							SBT	0	0	A
							SBR	0.49	7.3	A
				EB	19.3	B	EBL	0.57	19.3	B
							EBT	0	0	A
							EBR	0	0	A
				WB	19.2	B	WBL	0.55	19.2	B
							WBT	0	0	A
							WBR	0	0	A

Havana St Existing Condition Performance Measures - 2020 AM Peak										
2020 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
5	Havana St & N Del Mar Pkwy (NB)	27.6	C	NB	3.4	A	NBL	0.31	9.9	A
							NBT	0.47	0.8	A
				SB	39	D	SBT	0.54	39.4	D
							SBR	0.02	32.5	C
				EB	0	A				
				WB	72	E	WBTR	0.38	72	E
6	Havana St & S Del Mar Pkwy (SB)	7.5	A	NB	0.4	A	NBT	0.32	0.4	A
				SB	0.1	A	SBLT	0.24	0.1	A
				EB	46.3	D	EBTR	0.24	46.3	D
				WB	0	A				
7	Havana St & 11th Ave & Del Mar Pkwy	20.4	C	NB	30.8	C	NBTR	0.66	30.8	C
				SB	5.3	A	SBTR	0.41	5.3	A
				EB	38.3	D	EBL	0.15	33.2	C
							EBTR	0.54	38.9	D
				WB	1.4	A	WBL	0.19	1.5	A
							WBTR	0.41	1.4	A
8	Havana St & 6th Ave	43.1	D	NB	39.3	D	NBL	0.82	42.3	D
							NBT	0.65	43.7	D
							NBR	0.66	31.3	C
				SB	52.7	D	SBL	0.55	38	D
							SBT	0.7	55.4	E
							SBR	0.7	55.4	E
				EB	44.3	D	EBL	0.8	78.7	E
							EBT	0.7	44.6	D
							EBR	0.24	25.3	C
				WB	41.7	D	WBL	0.88	63.7	E
							WBT	0.71	34.1	C
							WBR	0.21	21	C

Havana St Existing Condition Performance Measures - 2020 AM Peak										
2020 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
9	Havana St & 1st Ave	30.6	C	NB	19.4	B	NBL	0.89	43.1	D
							NBTR	0.51	11.4	B
				SB	44.5	D	SBL	0.23	21.4	C
							SBTR	0.93	45.1	D
				EB	32.5	C	EBL	0.25	33.9	C
							EBTR	0.78	47.3	D
							EBR	0.43	16.6	B
				WB	48.8	D	WBL	0.85	93.8	F
							WBTR	0.62	38.5	D
10	Havana St & Alameda Ave	45.7	D	NB	60.7	E	NBL	0.73	65.8	E
							NBT	0.89	57.1	E
							NBR	0.89	64.9	E
				SB	51.9	D	SBL	0.79	67.4	E
							SBT	0.77	48.2	D
							SBR	-	0	A
				EB	47.6	D	EBL	0.89	79	E
							EBT	0.46	34.1	C
							EBR	-	0	A
				WB	28.6	C	WBL	0.66	51.5	D
							WBT	0.95	29.1	C
							WBR	0.63	12.5	B
11	Havana St & Exposition Ave	7.1	A	NB	5.5	A	NBL	0.03	4.1	A
							NBT	0.44	5.4	A
							NBR	0.44	5.7	A
				SB	2.9	A	SBL	0.27	4.2	A
							SBT	0.37	2.8	A
							SBR	0.37	2.9	A
				EB	43.4	D	EBL	0.2	43.4	D
							EBT	0	0	A
							EBR	0	0	A
				WB	50.4	D	WBL	0.3	44	D
							WBT	0.06	42.4	D
							WBR	0.69	54.9	D
12	Havana St & Mississippi Ave	51.1	D	NB	43.9	D	NBL	0.75	68.6	E
							NBT	0.7	42.5	D
							NBR	0.24	24	C
				SB	40	D	SBL	0.62	62.5	E
							SBT	0.6	37.5	D
							SBR	0.23	26.3	C
				EB	58.4	E	EBL	0.7	71.5	E
							EBT	0.53	55	D
							EBR	0.53	57.2	E
				WB	62.7	E	WBL	0.72	67.9	E
							WBT	0.78	60.1	E
							WBR	0.78	64.9	E

Havana St Existing Condition Performance Measures - 2020 AM Peak										
2020 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
13	Havana St & Wyoming St/Idaho Pl	13.2	B	NB	0.7	A	NBL	0.24	7.5	A
							NBT	0.44	0.4	A
							NBR	-	0	A
				SB	9.5	A	SBL	0.22	6.2	A
							SBT	0.46	9.5	A
							SBR	0.46	10	A
				EB	72.1	E	EBL	0.31	44.1	D
							EBT	0	0	A
							EBR	0.9	85.7	F
				WB	66.6	E	WBL	0.85	76.8	E
							WBT	0.5	47.2	D
							WBR	-	0	A
14	Havana St & Florida Ave	12.4	B	NB	1.6	A	NBL	0.32	11.6	B
							NBT	0.38	0.5	A
							NBR	0.38	0.8	A
				SB	1.8	A	SBL	0.15	7.1	A
							SBT	0.6	1.2	A
							SBR	0.6	2.3	A
				EB	56	E	EBL	0.74	48.6	D
							EBT	0.78	54.5	D
							EBR	0.95	64.9	E
				WB	42.8	D	WBL	0.38	42	D
							WBT	0.22	43.1	D
							WBR	0.28	43.5	D
15	Havana St & Mexico Ave	7	A	NB	0.8	A	NBL	0.37	5	A
							NBT	0.36	0.3	A
							NBR	0.36	0.6	A
				SB	0.8	A	SBL	0.16	0.9	A
							SBT	0.5	0.6	A
							SBR	0.5	1.1	A
				EB	45.5	D	EBL	0.43	47.7	D
							EBT	0	0	A
							EBR	0.63	44.6	D
				WB	50.2	D	WBL	0.71	62.3	E
							WBT	0	0	A
							WBR	0.57	42	D
16	Havana St & Jewell Ave	12.8	B	NB	16.3	B	NBL	0.16	14.2	B
							NBT	0.49	16.1	B
							NBR	0.49	16.9	B
				SB	1.9	A	SBL	0.59	12.2	B
							SBT	0.5	0.6	A
							SBR	0.5	1.2	A
				EB	33.3	C	EBL	0.12	34.8	C
							EBT	0	0	A
							EBR	0.52	33.1	C
				WB	32.6	C	WBL	0.49	43	D
							WBT	0.32	30.8	C
							WBR	0.42	28.5	C

Havana St Existing Condition Performance Measures - 2020 AM Peak										
2020 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
17	Havana St & Iliff Ave	45.6	D	NB	18	B	NBL	0.58	59.5	E
							NBT	0.44	13.5	B
							NBR	0.45	14.8	B
				SB	47.6	D	SBL	0.79	67.6	E
							SBT	0.78	42.9	D
							SBR	0.78	46.7	D
				EB	54.4	D	EBL	0.76	66.3	E
							EBT	0.72	50.7	D
							EBR	0.72	53.4	D
				WB	53.7	D	WBL	0.92	76.7	E
							WBT	0.79	47.3	D
							WBR	0.79	52.5	D
18	Havana St & Parker Rd	38.7	D	NB	64.4	E	NBL	0.86	85.5	F
							NBT	0.71	59.6	E
							NBR	-	0	A
				SB	67.5	E	SBL	0.84	69.9	E
							SBT	0.86	66.5	E
							SBR	-	0	A
				EB	35	D	EBL	0.38	16	B
							EBT	0.36	36.8	D
							EBR	-	0	A
				WB	5.5	A	WBL	0.14	18	B
							WBT	0.89	5.2	A
							WBR	-	0	A
19	Havana St & Yale Ave	12.9	B	NB	1.4	A	NBL	0.21	14.8	B
							NBT	0.3	0.4	A
							NBR	0.3	0.8	A
				SB	1	A	SBL	0.07	15.3	B
							SBT	0.52	0.6	A
							SBR	0.52	1	A
				EB	65.7	E	EBL	0.17	54.4	D
							EBT	0.31	55.1	E
							EBR	0.79	73.1	E
				WB	39.7	D	WBL	0.77	42.2	D
							WBT	0	0	A
							WBR	0.17	31.2	C

Havana St Existing Condition Performance Measures - 2020 PM Peak										
2020 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
1	Havana St & Montview Blvd	21.2	C	NB	44.8	D	NBL	0.81	44.8	D
							NBT	0	0	A
							NBR	0	0	A
				SB	22.1	C	SBL	0.2	22.1	C
							SBT	0	0	A
							SBR	0	0	A
				EB	21.6	C	EBL	0.07	16.7	B
							EBT	0.62	21.5	C
							EBR	0.62	21.8	C
				WB	12.9	B	WBL	0.6	15.1	B
							WBT	0.51	12.6	B
							WBR	0.51	12.5	B
2	Havana St & 17th Ave	25.9	C	NB	14.2	B	NBL	0.49	14.2	B
							NBT	0	0	A
							NBR	0	0	A
				SB	27.7	C	SBL	0.5	27.7	C
							SBT	0	0	A
							SBR	0	0	A
				EB	25.8	C	EBL	0.65	25.8	C
							EBT	0	0	A
							EBR	0	0	A
				WB	34.5	C	WBL	0.86	34.5	C
							WBT	0	0	A
							WBR	0	0	A
3	Havana St & Colfax Ave	33.4	C	NB	42	D	NBL	0.78	43.9	D
							NBT	0.73	45.3	D
							NBR	0.35	33..2	C
				SB	53.5	D	SBL	0.55	35.7	D
							SBT	0.91	60.3	E
							SBR	0.12	36.8	D
				EB	30.4	C	EBL	0.13	33.8	C
							EBT	0.68	31.3	C
							EBR	0.27	24.2	C
				WB	22.1	C	WBL	0.69	26.8	C
							WBT	0.6	21.8	C
							WBR	0.07	14.7	B
4	Havana St & 13th Ave	11.1	B	NB	8.3	A	NBL	0.03	11.7	B
							NBT	0	0	A
							NBR	0.62	8.2	A
				SB	9.7	A	SBL	0.06	11.6	B
							SBT	0	0	A
							SBR	0.65	9.6	A
				EB	18.2	B	EBL	0.42	18.2	B
							EBT	0	0	A
							EBR	0	0	A
				WB	18.5	B	WBL	0.48	18.5	B
							WBT	0	0	A
							WBR	0	0	A

Havana St Existing Condition Performance Measures - 2020 PM Peak

2020 PM Peak

No.	Intersection	Average Delay (sec./veh.)	LOS	Approach	Average Delay (sec./veh.)	LOS	Movement	V/C	Average Delay (sec./veh.)	LOS
5	Havana St & N Del Mar Pkwy	19.6	B	NB	3.6	A	NBL	0.38	11	B
							NBT	0.54	1.7	A
				SB	28.6	C	SBT	0.62	28.6	C
							SBR	0	21.1	C
				EB	0	A				
				WB	44.3	D	WBTR	0.2	44.3	D
6	Havana St & S Del Mar Pkwy	7.3	A	NB	1.7	A	NBT	0.38	1.7	A
				SB	1.3	A	SBLT	0.43	1.3	A
				EB	34.3	C	EBTR	0.33	34.3	C
				WB	0	A				
7	Havana St & 11th Ave & Del Mar Pkwy	14.2	B	NB	21.1	C	NBTR	0.6	21.1	C
				SB	5	A	SBTR	0.57	5	A
				EB	33.7	C	EBL	0.18	30	C
							EBTR	0.54	34.2	C
				WB	3.1	A	WBL	0.14	3.1	A
							WBTR	0.44	3.1	A
8	Havana St & 6th Ave	44.7	D	NB	36.9	D	NBL	0.84	51.1	D
							NBT	0.71	46.3	D
							NBR	0.59	14.4	B
				SB	61.9	E	SBL	0.65	37.6	D
							SBT	0.88	66.2	E
							SBR	0.88	65.9	E
				EB	49.5	D	EBL	0.79	69.5	E
							EBT	0.91	56.2	E
							EBR	0.37	12.9	B
				WB	36	D	WBL	0.72	53.2	D
							WBT	0.57	29.1	C
							WBR	0.15	18.2	B

Havana St Existing Condition Performance Measures - 2020 PM Peak										
2020 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
9	Havana St & 1st Ave	44.9	D	NB	27.9	C	NBL	0.96	89.3	F
							NBTR	0.45	10.6	B
				SB	60.9	E	SBL	0.46	35	C
							SBTR	0.95	62.7	E
				EB	47.5	D	EBL	0.16	39.5	D
							EBTR	0.88	66	E
							EBR	0.58	29	C
				WB	59	E	WBL	0.83	106.5	F
							WBTR	0.23	40.3	D
10	Havana St & Alameda Ave	44.3	D	NB	68.2	E	NBL	0.75	66.8	E
							NBT	0.92	65.2	E
							NBR	0.92	75	E
				SB	21.5	C	SBL	0.71	46.6	D
							SBT	0.79	15.4	B
							SBR	-	0	A
				EB	56.7	E	EBL	0.81	67.1	E
							EBT	0.89	54.2	D
							EBR	-	0	A
				WB	32.9	C	WBL	0.84	56.6	E
							WBT	0.81	27.9	C
							WBR	0.35	13.7	B
11	Havana St & Exposition Ave	4.7	A	NB	0.7	A	NBL	0.09	1	A
							NBT	0.4	0.6	A
							NBR	0.4	0.8	A
				SB	0.3	A	SBL	0.36	3.6	A
							SBT	0.52	0.1	A
							SBR	0.52	0.2	A
				EB	53.4	D	EBL	0.33	53.4	D
							EBT	0	0	A
							EBR	0	0	A
				WB	57.1	E	WBL	0.41	54.9	D
							WBT	0.06	51.1	D
							WBR	0.68	59.3	E
12	Havana St & Mississippi Ave	47.4	D	NB	40.4	D	NBL	0.57	59.6	E
							NBT	0.69	45.4	D
							NBR	0.55	13.7	B
				SB	50.6	D	SBL	0.82	68.2	E
							SBT	0.84	51.2	D
							SBR	0.26	12.1	B
				EB	55.6	E	EBL	0.78	65.9	E
							EBT	0.74	51	D
							EBR	0.75	56.8	E
				WB	45.3	D	WBL	0.8	60.1	E
							WBT	0.67	38.7	D
							WBR	0.68	43.7	D

Havana St Existing Condition Performance Measures - 2020 PM Peak										
2020 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
13	Havana St & Wyoming St/Idaho Pl	9.1	A	NB	1.3	A	NBL	0.51	11.3	B
							NBT	0.59	0.6	A
							NBR	-	0	A
				SB	1.8	A	SBL	0.59	10.6	B
							SBT	0.66	0.8	A
							SBR	0.66	1.5	A
				EB	57.3	E	EBL	0.52	44.5	D
							EBT	0	0	A
							EBR	0.77	72.6	E
				WB	53.1	D	WBL	0.78	53.7	D
							WBT	0.3	51.4	D
							WBR	-	0	A
14	Havana St & Florida Ave	25.8	C	NB	29.6	C	NBL	0.62	50.4	D
							NBT	0.65	26.5	C
							NBR	0.65	27.9	C
				SB	12	B	SBL	0.4	39.7	D
							SBT	0.88	8.4	A
							SBR	0.9	14.3	B
				EB	45.5	D	EBL	0.83	56.5	E
							EBT	0.54	47.9	D
							EBR	0.59	25.7	C
				WB	55.5	E	WBL	0.52	51	D
							WBT	0.73	66	E
							WBR	0.28	33.7	C
15	Havana St & Mexico Ave	9.3	A	NB	3	A	NBL	0.82	23	C
							NBT	0.5	0.6	A
							NBR	0.51	1.1	A
				SB	6.3	A	SBL	0.26	6.5	A
							SBT	0.58	6.1	A
							SBR	0.58	6.7	A
				EB	51.4	D	EBL	0.63	55.3	E
							EBT	0	0	A
							EBR	0.49	47.7	D
				WB	47.8	D	WBL	0.23	54.4	D
							WBT	0	0	A
							WBR	0.22	44.2	D
16	Havana St & Jewell Ave	8.8	A	NB	0.4	A	NBL	0.28	0.9	A
							NBT	0.56	0.3	A
							NBR	0.56	0.6	A
				SB	1.6	A	SBL	0.68	9.5	A
							SBT	0.46	0.5	A
							SBR	0.46	0.9	A
				EB	49.6	D	EBL	0.39	52.3	D
							EBT	0	0	A
							EBR	0.65	48.8	D
				WB	44.4	D	WBL	0.48	59.8	E
							WBT	0.39	43.3	D
							WBR	0.34	38.3	D

Havana St Existing Condition Performance Measures - 2020 PM Peak										
2020 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
17	Havana St & Iliff Ave	59.9	E	NB	69.5	E	NBL	0.83	75.1	E
							NBT	0.91	66.9	E
							NBR	0.91	73.2	E
				SB	57	E	SBL	0.74	65	E
							SBT	0.73	53.9	D
							SBR	0.73	56.8	E
				EB	55.6	E	EBL	0.83	59.3	E
							EBT	0.92	53.3	D
							EBR	0.92	56.5	E
				WB	56.7	E	WBL	0.89	79.8	E
							WBT	0.72	50.3	D
							WBR	0.73	55.9	E
18	Havana St & Parker Rd	38.7	D	NB	41.1	D	NBL	1.12	121.9	F
							NBT	0.62	15.7	B
							NBR	-	0	A
				SB	57.2	E	SBL	0.85	66.9	E
							SBT	0.55	52.1	D
							SBR	-	0	A
				EB	40.2	D	EBL	0.29	18.7	B
							EBT	0.52	41.3	D
							EBR	-	0	A
				WB	15.2	B	WBL	0.5	21.5	C
							WBT	0.64	14.7	B
							WBR	-	0	A
19	Havana St & Yale Ave	19.1	B	NB	19.4	B	NBL	0.43	10.8	B
							NBT	0.65	19.2	B
							NBR	0.66	22	C
				SB	1.6	A	SBL	0.43	18	B
							SBT	0.37	0.4	A
							SBR	0.37	0.7	A
				EB	57.2	E	EBL	0.23	53.9	D
							EBT	0.5	55.7	E
							EBR	0.68	59.6	E
				WB	43.3	D	WBL	0.7	46.4	D
							WBT	0	0	A
							WBR	0.29	38.2	D

Havana St Future Condition Performance Measures - 2040 AM Peak										
2040 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
1	Havana St & Montview Blvd	22.7	C	NB	54.6	D	NBL	0.83	54.6	D
							NBT	0	0	A
							NBR	0	0	A
				SB	26.8	C	SBL	0.17	26.8	C
							SBT	0	0	A
							SBR	0	0	A
				EB	20.9	C	EBL	0.05	14	B
							EBT	0.62	20.9	C
							EBR	0.62	21.1	C
				WB	11.8	B	WBL	0.57	15.6	B
							WBT	0.4	11.1	B
							WBR	0.4	11.1	B
2	Havana St & 17th Ave	24.3	C	NB	0.9	A	NBL	0.46	0.9	A
							NBT	0	0	A
							NBR	0	0	A
				SB	25.5	C	SBL	0.37	25.5	C
							SBT	0	0	A
							SBR	0	0	A
				EB	36.5	D	EBL	0.78	36.5	D
							EBT	0	0	A
							EBR	0	0	A
				WB	39.9.	D	WBL	0.84	39.9	D
							WBT	0	0	A
							WBR	0	0	A
3	Havana St & Colfax Ave	30.4	C	NB	33.3	C	NBL	0.65	30.9	C
							NBT	0.79	37.7	D
							NBR	0.35	24.6	C
				SB	49.5	D	SBL	0.39	29.3	C
							SBT	0.84	54.3	D
							SBR	0.09	35.2	D
				EB	30.7	C	EBL	0.1	32	C
							EBT	0.81	31.4	C
							EBR	0.12	19.2	B
				WB	21.1	C	WBL	0.64	24.6	C
							WBT	0.69	20.9	C
							WBR	0.06	12.8	B
4	Havana St & 13th Ave	11.8	B	NB	8	A	NBL	0.04	9.8	A
							NBT	0	0	A
							NBR	0.6	7.9	A
				SB	8.3	A	SBL	0.04	10.9	B
							SBT	0	0	A
							SBR	0.55	8.2	A
				EB	19.9	B	EBL	0.61	19.9	B
							EBT	0	0	A
							EBR	0	0	A
				WB	19.7	B	WBL	0.6	19.7	B
							WBT	0	0	A
							WBR	0	0	A

Havana St Future Condition Performance Measures - 2040 AM Peak										
2040 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
5	Havana St & N Del Mar Pkwy	27	C	NB	2.1	A	NBL	0.32	5.7	A
							NBT	0.48	0.7	A
				SB	39.3	D	SBT	0.55	39.7	D
							SBR	0.02	32.5	C
				EB	0	A				
				WB	71.6	E	WBTR	0.39	71.6	E
6	Havana St & S Del Mar Pkwy	7.5	A	NB	0.3	A	NBT	0.33	0.3	A
				SB	0.1	A	SBLT	0.25	0.1	A
				EB	46.4	D	EBTR	0.25	46.4	D
				WB	0	A				
7	Havana St & 11th Ave & Del Mar Pkwy	25	C	NB	39.3	D	NBTR	0.85	39.3	D
				SB	5.4	A	SBTR	0.42	5.4	A
				EB	38.5	D	EBL	0.16	33.4	C
							EBTR	0.56	39.2	D
				WB	2.3	A	WBL	0.21	2.4	A
							WBTR	0.43	2.2	A
8	Havana St & 6th Ave	51.9	D	NB	45.9	D	NBL	0.93	66.1	E
							NBT	0.76	47.4	D
							NBR	0.74	32.8	C
				SB	68.4	E	SBL	0.66	44.3	D
							SBT	0.88	72.8	E
							SBR	0.88	72.6	E
				EB	56.2	E	EBL	0.81	85.3	F
							EBT	0.91	59.3	E
							EBR	0.28	26.2	C
				WB	47.3	D	WBL	0.92	67.3	E
							WBT	0.88	41.3	D
							WBR	0.25	22.2	C

Havana St Future Condition Performance Measures - 2040 AM Peak										
2040 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
9	Havana St & 1st Ave	56	E	NB	47.3	D	NBL	1.21	140.5	F
							NBTR	0.64	15.9	B
				SB	86.3	F	SBL	0.29	21.5	C
							SBTR	1.09	88.1	F
										C
				EB	32.3	C	EBL	0.26	30.6	C
							EBTR	0.81	46.4	D
							EBR	0.51	17.5	B
				WB	55.4	E	WBL	1	143.8	F
							WBTR	0.61	35.3	D
10	Havana St & Alameda Ave	77.6	E	NB	106.5	F	NBL	0.91	83.3	F
							NBT	1.1	107.7	F
							NBR	1.1	118	F
				SB	58.6	E	SBL	0.98	79.1	E
							SBT	0.96	53.9	D
							SBR	-	0	A
				EB	54.1	D	EBL	0.98	98.9	F
							EBT	0.51	35	D
							EBR	-	0	A
				WB	80	F	WBL	0.82	59.3	E
							WBT	1.19	107.6	F
							WBR	0.78	16.1	B
11	Havana St & Exposition Ave	8.1	A	NB	5.7	A	NBL	0.05	4.5	A
							NBT	0.49	5.6	A
							NBR	0.49	5.8	A
				SB	3	A	SBL	0.33	5	A
							SBT	0.4	2.9	A
							SBR	0.4	2.9	A
				EB	43.7	D	EBL	0.24	43.7	D
							EBT	0	0	A
							EBR	0	0	A
				WB	62.3	E	WBL	0.36	44.4	D
							WBT	0.07	42.4	D
							WBR	0.84	74.6	E
12	Havana St & Mississippi Ave	59.6	E	NB	48.4	D	NBL	0.79	71.9	E
							NBT	0.85	47.8	D
							NBR	0.29	23.7	C
				SB	30.3	C	SBL	0.35	48	D
							SBT	0.53	28.4	C
							SBR	0.21	18.3	B
				EB	65.1	E	EBL	0.99	112.8	F
							EBT	0.84	52.9	D
							EBR	0.84	60.1	E
				WB	86.5	F	WBL	0.85	76.8	E
							WBT	0.99	83.4	F
							WBR	1.01	99.2	F

Havana St Future Condition Performance Measures - 2040 AM Peak										
2040 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
13	Havana St & Wyoming St/Idaho Pl	12.9	B	NB	0.9	A	NBL	0.37	9.5	A
							NBT	0.54	0.5	A
							NBR	-	0	A
				SB	10.7	B	SBL	0.32	6.3	A
							SBT	0.56	10.7	B
							SBR	0.56	11.4	B
				EB	75.9	E	EBL	0.32	44.1	D
							EBT	0	0	A
							EBR	0.92	91.4	F
				WB	66.6	E	WBL	0.85	76.8	E
							WBT	0.5	47.2	D
							WBR	-	0	A
14	Havana St & Florida Ave	21.5	C	NB	3.3	A	NBL	0.51	26.9	C
							NBT	0.49	0.7	A
							NBR	0.49	1.3	A
				SB	4.6	A	SBL	0.26	7.6	A
							SBT	0.82	3.3	A
							SBR	0.84	6.7	A
				EB	102.8	F	EBL	0.93	73.5	E
							EBT	0.98	91.7	F
							EBR	1.19	142.7	F
				WB	42	D	WBL	0.48	41	D
							WBT	0.25	42.4	D
							WBR	0.32	43	D
15	Havana St & Mexico Ave	8.1	A	NB	1.2	A	NBL	0.6	10.8	B
							NBT	0.45	0.4	A
							NBR	0.45	0.7	A
				SB	4	A	SBL	0.25	3.9	A
							SBT	0.63	3.7	A
							SBR	0.64	4.4	A
				EB	46.4	D	EBL	0.47	48.3	D
							EBT	0	0	A
							EBR	0.66	45.6	D
				WB	54	D	WBL	0.78	70.6	E
							WBT	0	0	A
							WBR	0.59	42.6	D
16	Havana St & Jewell Ave	16.9	B	NB	25.9	C	NBL	0.32	24.3	C
							NBT	0.78	25.3	C
							NBR	0.78	27	C
				SB	4.7	A	SBL	0.9	31.7	C
							SBT	0.71	1.4	A
							SBR	0.71	2.5	A
				EB	31.2	C	EBL	0.15	32.7	C
							EBT	0	0	A
							EBR	0.56	31	C
				WB	30	C	WBL	0.59	45	D
							WBT	0.35	27.8	C
							WBR	0.43	23.7	C

Havana St Future Condition Performance Measures - 2040 AM Peak										
2040 AM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
17	Havana St & Iliff Ave	79.8	E	NB	5.5	A	NBL	0.36	35.2	D
							NBT	0.54	2.2	A
							NBR	0.58	3.2	A
				SB	57.5	E	SBL	0.82	68.8	E
							SBT	0.94	52.8	D
							SBR	0.95	60.7	E
				EB	159.8	F	EBL	0.97	91.8	F
							EBT	1.25	173.6	F
							EBR	1.25	178.8	F
				WB	86	F	WBL	0.94	83.9	F
							WBT	1.04	82	F
							WBR	1.04	95	F
18	Havana St & Parker Rd	61.4	E	NB	75.7	E	NBL	0.95	105.5	F
							NBT	0.92	68.8	E
							NBR			
				SB	147.9	F	SBL	1.07	104.9	F
							SBT	1.22	165.3	F
							SBR			
				EB	17	B	EBL	0.57	7.7	A
							EBT	0.37	17.9	B
							EBR			
				WB	4.1	A	WBL	0.18	9..1	A
							WBT	0.89	4	A
							WBR			
19	Havana St & Yale Ave	31.2	C	NB	25.6	C	NBL	0.49	28.3	C
							NBT	0.44	25	C
							NBR	0.44	26.3	C
				SB	22.1	C	SBL	0.15	21.3	C
							SBT	0.78	21.9	C
							SBR	0.78	22.3	C
				EB	85.8	F	EBL	0.21	53.7	D
							EBT	0.37	54.6	D
							EBR	0.96	107.2	F
				WB	38.7	D	WBL	0.86	42.4	D
							WBT	0	0	A
							WBR	0.19	26.1	C

Havana St Future Condition Performance Measures - 2040 PM Peak										
2040 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
1	Havana St & Montview Blvd	24.1	C	NB	49.2	D	NBL	0.87	49.2	D
							NBT	0	0	A
							NBR	0	0	A
				SB	21.6	C	SBL	0.22	21.6	C
							SBT	0	0	A
							SBR	0	0	A
				EB	25.2	C	EBL	0.09	19.3	B
							EBT	0.71	25.1	C
							EBR	0.71	25.5	C
				WB	15	B	WBL	0.7	20.7	C
							WBT	0.56	14	B
							WBR	0.56	13.9	B
2	Havana St & 17th Ave	27.6	C	NB	17.6	B	NBL	0.59	17.6	B
							NBT	0	0	A
							NBR	0	0	A
				SB	31.1	C	SBL	0.59	31.1	C
							SBT	0	0	A
							SBR	0	0	A
				EB	24.2	C	EBL	0.65	24.2	C
							EBT	0	0	A
							EBR	0	0	A
				WB	35.6	D	WBL	0.88	35.6	D
							WBT	0	0	A
							WBR	0	0	A
3	Havana St & Colfax Ave	37.4	D	NB	41.6	D	NBL	0.84	47.3	D
							NBT	0.74	44.2	D
							NBR	0.35	30.5	C
				SB	53.9	D	SBL	0.59	34.8	C
							SBT	0.92	61.3	E
							SBR	0.12	34.8	C
				EB	37.3	D	EBL	0.18	42.9	D
							EBT	0.8	38.8	D
							EBR	0.33	28	C
				WB	27.5	C	WBL	0.84	41.4	D
							WBT	0.69	25.9	C
							WBR	0.08	16.4	B
4	Havana St & 13th Ave	12.3	B	NB	9.6	A	NBL	0.04	13.7	B
							NBT	0	0	A
							NBR	0.69	9.5	A
				SB	11.3	B	SBL	0.08	13.6	B
							SBT	0	0	A
							SBR	0.71	11.2	B
				EB	18.3	B	EBL	0.44	18.3	B
							EBT	0	0	A
							EBR	0	0	A
				WB	18.7	B	WBL	0.51	18.7	B
							WBT	0	0	A
							WBR	0	0	A

Havana St Future Condition Performance Measures - 2040 PM Peak										
2040 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
5	Havana St & N Del Mar Pkwy	19.3	B	NB	2.6	A	NBL	0.39	8.5	A
							NBT	0.55	1.1	A
				SB	28.9	C	SBT	0.64	28.9	C
							SBR	0	21.1	C
				EB	0	A				
				WB	43.9	D	WBTR	0.21	43.9	D
6	Havana St & S Del Mar Pkwy	7.2	A	NB	1.1	A	NBT	0.39	1.1	A
				SB	1.5	A	SBLT	0.45	1.5	A
				EB	34.4	C	EBTR	0.34	34.4	C
				WB	0	A				
7	Havana St & 11th Ave & Del Mar Pkwy	16.7	B	NB	26.2	C	NBTR	0.78	26.2	C
				SB	5	A	SBTR	0.58	5	A
				EB	33.9	C	EBL	0.19	30.1	C
							EBTR	0.56	34.5	C
				WB	3.5	A	WBL	0.15	3.5	A
							WBTR	0.45	3.5	A
8	Havana St & 6th Ave	57.5	E	NB	41.6	D	NBL	0.91	71.2	E
							NBT	0.8	48.8	D
							NBR	0.62	15.6	B
				SB	89.6	F	SBL	0.75	44.5	D
							SBT	1.03	97.2	F
							SBR	1.03	96.9	F
				EB	75.9	E	EBL	0.81	76.8	E
							EBT	1.06	89.8	F
							EBR	0.41	14.8	B
				WB	34.2	C	WBL	0.71	49.8	D
							WBT	0.63	28.3	C
							WBR	0.16	16	B

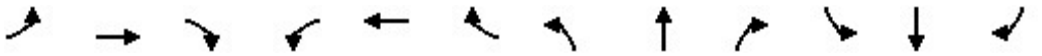
Havana St Future Condition Performance Measures - 2040 PM Peak										
2040 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
9	Havana St & 1st Ave	92.1	F	NB	34.5	C	NBL	1.03	99.3	F
							NBTR	0.58	16.2	B
				SB	182.4	F	SBL	0.69	39.2	D
							SBTR	1.29	192.1	F
				EB	46.3	D	EBL	0.17	35.6	D
							EBTR	0.92	68.1	E
							EBR	0.6	24.7	C
				WB	70.9	E	WBL	0.98	157.7	F
							WBTR	0.24	36.4	D
10	Havana St & Alameda Ave	66.5	E	NB	124.5	F	NBL	0.79	70.4	E
							NBT	1.14	128.9	F
							NBR	1.16	141.8	F
				SB	27.9	C	SBL	0.57	41.5	D
							SBT	0.83	24.6	C
								-	0	A
				EB	67.8	E	EBL	0.81	66.8	E
							EBT	0.99	68.1	E
								-	0	A
				WB	50	D	WBL	0.95	71.9	E
							WBT	1	51.4	F
							WBR	0.36	10.4	B
11	Havana St & Exposition Ave	5.4	A	NB	0.7	A	NBL	0.12	0.9	A
							NBT	0.44	0.6	A
							NBR	0.44	0.8	A
				SB	0.3	A	SBL	0.44	3.8	A
							SBT	0.57	0.1	A
							SBR	0.57	0.1	A
				EB	53.4	D	EBL	0.38	53.4	D
							EBT	0	0	A
							EBR	0	0	A
				WB	62.5	E	WBL	0.5	55.8	E
							WBT	0.07	50.6	D
							WBR	0.8	68.3	E
12	Havana St & Mississippi Ave	67.4	E	NB	32.6	C	NBL	0.32	44.8	D
							NBT	0.62	34.4	C
							NBR	0.5	19.9	B
				SB	56.2	E	SBL	0.84	69.5	E
							SBT	0.94	57.6	E
							SBR	0.28	18.7	B
				EB	135.6	F	EBL	1.05	115.9	F
							EBT	1.18	137.2	F
							EBR	1.19	147.9	F
				WB	53.4	D	WBL	0.87	66.6	E
							WBT	0.86	46.1	D
							WBR	0.86	55.2	E

Havana St Future Condition Performance Measures - 2040 PM Peak										
2040 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
13	Havana St & Wyoming St/Idaho Pl	8.5	A	NB	1.6	A	NBL	0.7	15.6	B
							NBT	0.74	0.7	A
								0	0	A
				SB	2.4	A	SBL	0.79	15.3	B
							SBT	0.8	0.9	A
							SBR	0.83	2.1	A
				EB	57.9	E	EBL	0.53	44.7	D
							EBT	0	0	A
							EBR	0.78	74	E
				WB	53.5	D	WBL	0.78	54.1	D
							WBT	0.3	51.6	D
							WBR	0	0	A
14	Havana St & Florida Ave	81.1	F	NB	48.9	D	NBL	0.96	93.5	F
							NBT	0.81	42.2	D
							NBR	0.82	45.4	D
				SB	110.3	F	SBL	0.72	55	E
							SBT	1.2	99.1	F
							SBR	1.29	139.3	F
				EB	72.4	E	EBL	1.08	115.2	F
							EBT	0.64	50.1	D
							EBR	0.7	30.5	C
				WB	67.7	E	WBL	0.72	60.1	E
							WBT	0.87	84.5	F
							WBR	0.33	34.5	C
15	Havana St & Mexico Ave	6.8	A	NB	4.8	A	NBL	0.93	40.7	D
							NBT	0.64	0.6	A
							NBR	0.64	1.1	A
				SB	0.4	A	SBL	0.48	1.1	A
							SBT	0.76	0.2	A
							SBR	0.78	0.5	A
				EB	51.5	D	EBL	0.65	56	E
							EBT	0	0	A
							EBR	0.49	47.1	D
				WB	47.4	D	WBL	0.24	54.2	D
							WBT	0	0	A
							WBR	0.23	43.8	D
16	Havana St & Jewell Ave	11	B	NB	0.5	A	NBL	0.58	1.6	A
							NBT	0.81	0.3	A
							NBR	0.82	0.7	A
				SB	5	A	SBL	0.93	40.6	D
							SBT	0.61	0.5	A
							SBR	0.62	1	A
				EB	57	E	EBL	0.57	58.5	E
							EBT	0	0	A
							EBR	0.79	56.5	E
				WB	51.2	D	WBL	0.83	100.5	F
							WBT	0.48	44	D
							WBR	0.37	35.2	D

Havana St Future Condition Performance Measures - 2040 PM Peak										
2040 PM Peak										
No.	**Intersection**	**Average Delay (sec./veh.)**	**LOS**	**Approach**	**Average Delay (sec./veh.)**	**LOS**	**Movement**	**V/C**	**Average Delay (sec./veh.)**	**LOS**
17	Havana St & Iliff Ave	142.4	F	NB	241.3	F	NBL	1	88.4	F
							NBT	1.43	245.3	F
							NBR	1.48	269.8	F
				SB	15.3	B	SBL	0.19	18.6	B
							SBT	0.37	14.2	B
							SBR	0.37	14.7	B
				EB	200.8	F	EBL	1.07	97.3	F
							EBT	1.4	230.5	F
							EBR	1.4	233.8	F
				WB	74.4	E	WBL	0.95	97.9	F
							WBT	0.94	65.9	E
							WBR	0.94	77.6	E
18	Havana St & Parker Rd	50.3	D	NB	78.6	E	NBL	1.46	256.1	F
							NBT	0.87	22.8	C
							NBR	-	0	A
				SB	66.2	E	SBL	1.03	84.9	F
							SBT	0.78	56.4	E
							SBR	-	0	A
				EB	35.2	D	EBL	0.44	16.3	B
							EBT	0.55	36.2	D
							EBR	-	0	A
				WB	16.9	B	WBL	0.71	27.9	C
							WBT	0.67	15.9	B
							WBR	-	0	A
19	Havana St & Yale Ave	30.4	C	NB	39.2	D	NBL	0.65	15.5	B
							NBT	0.89	33.2	C
							NBR	0.99	56.3	E
				SB	2.8	A	SBL	0.76	35.6	D
							SBT	0.53	0.5	A
							SBR	0.53	1	A
				EB	60	E	EBL	0.27	52.5	D
							EBT	0.57	55	E
							EBR	0.77	66.9	E
				WB	44.9	D	WBL	0.83	50.9	D
							WBT	0	0	A
							WBR	0.33	35.2	D

2020 Existing Condition AM Peak

Synchro Reports



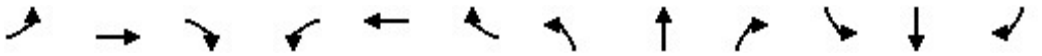
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	363	851	151	234	1197	424	246	1020	174	209	1037	256
Future Volume (veh/h)	363	851	151	234	1197	424	246	1020	174	209	1037	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	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	1984	1984	1953	1969	1984	1984	1984	1984	1984	1984	1969	1969
Adj Flow Rate, veh/h	395	925	0	308	1360	487	286	1229	187	268	1152	0
Peak Hour Factor	0.92	0.92	0.85	0.76	0.88	0.87	0.86	0.83	0.93	0.78	0.90	0.77
Percent Heavy Veh, %	1	1	3	2	1	1	1	1	1	1	2	2
Cap, veh/h	445	2012		468	1427	777	393	1388	211	340	1497	
Arrive On Green	0.12	0.37	0.00	0.26	0.76	0.74	0.11	0.29	0.28	0.09	0.28	0.00
Sat Flow, veh/h	3666	5417	1655	3638	3770	1672	3666	4738	721	3666	5552	0
Grp Volume(v), veh/h	395	925	0	308	1360	487	286	937	479	268	1152	0
Grp Sat Flow(s),veh/h/ln	1833	1806	1655	1819	1885	1672	1833	1806	1847	1833	1792	0
Q Serve(g_s), s	14.9	18.1	0.0	10.6	44.0	0.0	10.6	34.7	34.7	10.0	27.6	0.0
Cycle Q Clear(g_c), s	14.9	18.1	0.0	10.6	44.0	0.0	10.6	34.7	34.7	10.0	27.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		0.00
Lane Grp Cap(c), veh/h	445	2012		468	1427	777	393	1058	541	340	1497	
V/C Ratio(X)	0.89	0.46		0.66	0.95	0.63	0.73	0.89	0.89	0.79	0.77	
Avail Cap(c_a), veh/h	445	2012		468	1427	777	393	1058	541	340	1497	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.84	0.84	0.84	0.89	0.89	0.89	0.47	0.47	0.00
Uniform Delay (d), s/veh	60.6	33.4	0.0	49.3	15.9	9.3	60.5	47.3	47.7	62.1	46.4	0.0
Incr Delay (d2), s/veh	18.5	0.8	0.0	2.3	13.2	3.2	5.2	9.9	17.2	5.3	1.9	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	8.0	8.0	0.0	4.4	9.0	4.6	5.1	16.7	18.3	4.9	12.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.0	34.1	0.0	51.5	29.1	12.5	65.8	57.1	64.9	67.4	48.2	0.0
LnGrp LOS	E	C		D	C	B	E	E	E	E	D	
Approach Vol, veh/h		1320	A		2155			1702			1420	A
Approach Delay, s/veh		47.6			28.6			60.7			51.9	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	45.0	21.0	57.0	19.0	43.0	22.0	56.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	12.0	39.0	16.0	51.0	14.0	37.0	17.0	50.0
Max Q Clear Time (g_c+I1), s	12.0	36.7	16.9	46.0	12.6	29.6	12.6	20.1
Green Ext Time (p_c), s	0.0	1.7	0.0	3.2	0.1	4.2	0.2	4.4

Intersection Summary	
HCM 6th Ctrl Delay	45.7
HCM 6th LOS	D

Notes

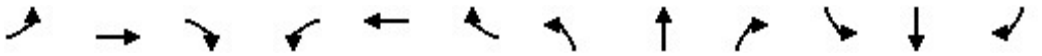
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1004	48	88	1014	17	128	413	133	48	364	26
Future Volume (veh/h)	10	1004	48	88	1014	17	128	413	133	48	364	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.94	0.99		0.96	0.99		0.96
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	2000	1953	1969	1969	1938	1906	2000	1953	1953	1969	1938	1938
Adj Flow Rate, veh/h	16	1141	71	133	1193	42	144	444	185	75	423	38
Peak Hour Factor	0.63	0.88	0.68	0.66	0.85	0.40	0.89	0.93	0.72	0.64	0.86	0.69
Percent Heavy Veh, %	0	3	2	2	4	6	0	3	3	2	4	4
Cap, veh/h	207	1608	670	252	1944	798	250	596	555	217	535	433
Arrive On Green	0.43	0.43	0.43	0.06	0.53	0.53	0.07	0.31	0.29	0.01	0.09	0.09
Sat Flow, veh/h	458	3711	1545	1875	3681	1512	1905	1953	1584	1875	1938	1569
Grp Volume(v), veh/h	16	1141	71	133	1193	42	144	444	185	75	423	38
Grp Sat Flow(s),veh/h/ln	458	1856	1545	1875	1841	1512	1905	1953	1584	1875	1938	1569
Q Serve(g_s), s	2.7	26.4	2.9	4.0	23.8	1.4	5.6	21.5	9.1	3.0	22.4	2.3
Cycle Q Clear(g_c), s	16.5	26.4	2.9	4.0	23.8	1.4	5.6	21.5	9.1	3.0	22.4	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	1608	670	252	1944	798	250	596	555	217	535	433
V/C Ratio(X)	0.08	0.71	0.11	0.53	0.61	0.05	0.58	0.74	0.33	0.35	0.79	0.09
Avail Cap(c_a), veh/h	207	1608	670	307	1944	798	259	623	577	244	581	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.92	0.92	0.92	0.88	0.88	0.88	0.82	0.82	0.82	0.95	0.95	0.95
Uniform Delay (d), s/veh	26.5	24.3	17.7	19.8	17.3	12.0	27.6	32.8	25.3	29.1	44.7	35.6
Incr Delay (d2), s/veh	0.7	2.5	0.3	0.6	1.3	0.1	1.5	3.3	0.1	0.3	5.7	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	0.3	11.8	1.1	1.7	9.8	0.5	2.6	10.5	3.4	1.4	12.5	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	26.8	18.0	20.4	18.6	12.1	29.0	36.1	25.4	29.4	50.4	35.6
LnGrp LOS	C	C	B	C	B	B	C	D	C	C	D	D
Approach Vol, veh/h		1228			1368			773			536	
Approach Delay, s/veh		26.3			18.6			32.2			46.4	
Approach LOS		C			B			C			D	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	10.0	50.0	8.5	36.6		60.0	11.5	33.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s	9.0	38.0	6.0	32.0		51.0	8.0	30.0				
Max Q Clear Time (g_c+I1), s	6.0	28.4	5.0	23.5		25.8	7.6	24.4				
Green Ext Time (p_c), s	0.0	5.6	0.0	1.5		9.9	0.0	0.9				

Intersection Summary												
HCM 6th Ctrl Delay			27.5									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	17	98	108	52	56	45	1309	102	62	1350	62
Future Volume (veh/h)	54	17	98	108	52	56	45	1309	102	62	1350	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	2000	2000	1984	1969	1969	1922	1953	1906	2000	1953	1953
Adj Flow Rate, veh/h	79	30	132	150	79	0	65	1522	0	78	1534	95
Peak Hour Factor	0.68	0.57	0.74	0.72	0.66	0.75	0.69	0.86	0.85	0.79	0.88	0.65
Percent Heavy Veh, %	2	0	0	1	2	2	5	3	6	0	3	3
Cap, veh/h	251	33	147	177	158		266	3471		347	3352	208
Arrive On Green	0.08	0.10	0.09	0.06	0.08	0.00	0.05	1.00	0.00	0.03	0.65	0.64
Sat Flow, veh/h	1875	319	1404	1890	1969	1668	1830	5332	1616	1905	5125	317
Grp Volume(v), veh/h	79	0	162	150	79	0	65	1522	0	78	1064	565
Grp Sat Flow(s),veh/h/ln	1875	0	1724	1890	1969	1668	1830	1777	1616	1905	1777	1888
Q Serve(g_s), s	0.0	0.0	9.8	4.4	4.0	0.0	1.3	0.0	0.0	1.5	15.5	15.6
Cycle Q Clear(g_c), s	0.0	0.0	9.8	4.4	4.0	0.0	1.3	0.0	0.0	1.5	15.5	15.6
Prop In Lane	1.00		0.81	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	251	0	181	177	158		266	3471		347	2325	1235
V/C Ratio(X)	0.31	0.00	0.90	0.85	0.50		0.24	0.44		0.22	0.46	0.46
Avail Cap(c_a), veh/h	251	0	181	177	206		391	3471		490	2325	1235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.90	0.90	0.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	43.8	0.0	47.3	47.7	46.3	0.0	7.4	0.0	0.0	6.1	9.0	9.0
Incr Delay (d2), s/veh	0.3	0.0	38.5	29.1	0.9	0.0	0.2	0.4	0.0	0.1	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	6.2	5.2	2.0	0.0	0.4	0.1	0.0	0.5	5.3	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	0.0	85.7	76.8	47.2	0.0	7.5	0.4	0.0	6.2	9.5	10.0
LnGrp LOS	D	A	F	E	D		A	A		A	A	A
Approach Vol, veh/h		241			229	A		1587	A		1707	
Approach Delay, s/veh		72.1			66.6			0.7			9.5	
Approach LOS		E			E			A			A	

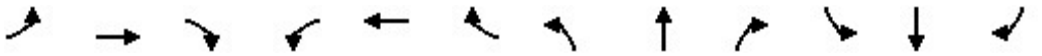
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	72.8	10.0	15.0	6.8	73.2	12.6	12.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	59.0	6.0	9.0	10.0	60.0	6.0	9.0
Max Q Clear Time (g_c+I1), s	3.5	2.0	6.4	11.8	3.3	17.6	2.0	6.0
Green Ext Time (p_c), s	0.0	15.3	0.0	0.0	0.0	15.5	0.0	0.0

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

Notes

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	14	4	58	8	105	5	1573	54	66	1394	10
Future Volume (veh/h)	14	14	4	58	8	105	5	1573	54	66	1394	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.93	0.97		0.94	1.00		0.97	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	2000	2000	2000	2000	2000	2000	2000	1984	1984	2000	1969	1969
Adj Flow Rate, veh/h	16	20	8	66	12	115	10	1748	79	75	1640	12
Peak Hour Factor	0.88	0.70	0.50	0.88	0.67	0.91	0.50	0.90	0.68	0.88	0.85	0.83
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	1	0	2	2
Cap, veh/h	89	101	32	222	210	167	292	3959	179	275	4455	33
Arrive On Green	0.10	0.10	0.09	0.10	0.10	0.10	0.75	0.75	0.74	0.03	0.81	0.80
Sat Flow, veh/h	406	962	304	1362	2000	1593	307	5306	240	1905	5503	40
Grp Volume(v), veh/h	44	0	0	66	12	115	10	1189	638	75	1068	584
Grp Sat Flow(s),veh/h/ln	1672	0	0	1362	2000	1593	307	1806	1934	1905	1792	1960
Q Serve(g_s), s	0.0	0.0	0.0	1.7	0.6	7.3	1.0	13.1	13.2	0.9	8.5	8.5
Cycle Q Clear(g_c), s	2.2	0.0	0.0	4.0	0.6	7.3	2.8	13.1	13.2	0.9	8.5	8.5
Prop In Lane	0.36		0.18	1.00		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	222	0	0	222	210	167	292	2694	1443	275	2901	1587
V/C Ratio(X)	0.20	0.00	0.00	0.30	0.06	0.69	0.03	0.44	0.44	0.27	0.37	0.37
Avail Cap(c_a), veh/h	222	0	0	222	210	167	292	2694	1443	426	2901	1587
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	1.00	1.00	0.65	0.65	0.65	0.35	0.35	0.35
Uniform Delay (d), s/veh	43.2	0.0	0.0	43.7	42.3	45.4	4.0	5.0	5.1	4.2	2.7	2.7
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	9.6	0.1	0.3	0.6	0.1	0.1	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	1.1	0.0	0.0	1.6	0.3	3.3	0.1	3.7	4.2	0.2	1.7	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	0.0	0.0	44.0	42.4	54.9	4.1	5.4	5.7	4.2	2.8	2.9
LnGrp LOS	D	A	A	D	D	D	A	A	A	A	A	A
Approach Vol, veh/h		44			193			1837			1727	
Approach Delay, s/veh		43.4			50.4			5.5			2.9	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.7	83.3		15.0		90.0		15.0				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+I1), s	2.9	15.2		9.3		10.5		4.2				
Green Ext Time (p_c), s	0.0	20.7		0.0		17.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		7.1	
HCM 6th LOS		A	

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	111	184	33	33	26	103	1162	24	39	1425	108
Future Volume (veh/h)	197	111	184	33	33	26	103	1162	24	39	1425	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.97	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	1969	1875	1953	2000	1953	1563	1984	1969	1969	1922	1969	1969
Adj Flow Rate, veh/h	235	222	233	62	45	38	129	1263	33	57	1601	124
Peak Hour Factor	0.84	0.50	0.79	0.53	0.73	0.69	0.80	0.92	0.72	0.68	0.89	0.87
Percent Heavy Veh, %	2	8	3	0	3	28	1	2	2	5	2	2
Cap, veh/h	316	285	246	164	209	138	409	3366	88	368	2684	208
Arrive On Green	0.09	0.15	0.15	0.04	0.11	0.11	0.21	1.00	1.00	0.05	1.00	1.00
Sat Flow, veh/h	1875	1875	1620	1905	1953	1292	1890	5382	141	1830	5077	393
Grp Volume(v), veh/h	235	222	233	62	45	38	129	841	455	57	1129	596
Grp Sat Flow(s),veh/h/ln	1875	1875	1620	1905	1953	1292	1890	1792	1940	1830	1792	1887
Q Serve(g_s), s	9.0	12.0	10.8	3.1	2.2	2.8	0.0	0.0	0.0	1.2	0.0	0.0
Cycle Q Clear(g_c), s	9.0	12.0	10.8	3.1	2.2	2.8	0.0	0.0	0.0	1.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.21
Lane Grp Cap(c), veh/h	316	285	246	164	209	138	409	2241	1213	368	1894	997
V/C Ratio(X)	0.74	0.78	0.95	0.38	0.22	0.28	0.32	0.38	0.38	0.15	0.60	0.60
Avail Cap(c_a), veh/h	316	286	247	250	298	197	409	2241	1213	427	1894	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94	0.87	0.87	0.87
Uniform Delay (d), s/veh	40.5	42.8	23.0	41.5	42.9	43.2	11.4	0.0	0.0	7.0	0.0	0.0
Incr Delay (d2), s/veh	8.1	11.7	42.0	0.5	0.2	0.4	0.2	0.5	0.8	0.1	1.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.4	7.0	1.5	1.1	0.9	1.5	0.1	0.3	0.4	0.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.6	54.5	64.9	42.0	43.1	43.5	11.6	0.5	0.8	7.1	1.2	2.3
LnGrp LOS	D	D	E	D	D	D	B	A	A	A	A	A
Approach Vol, veh/h		690			145			1425			1782	
Approach Delay, s/veh		56.0			42.8			1.6			1.8	
Approach LOS		E			D			A			A	

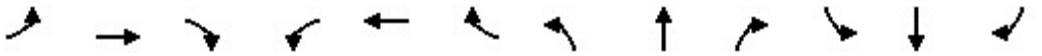
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.6	70.2	8.2	20.0	16.8	60.0	13.0	15.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	6.0	* 6	4.0	6.0
Max Green Setting (Gmax), s	6.0	56.0	9.0	14.0	8.0	* 54	9.0	14.0
Max Q Clear Time (g_c+I1), s	3.2	2.0	5.1	14.0	2.0	2.0	11.0	4.8
Green Ext Time (p_c), s	0.0	6.0	0.0	0.0	0.0	10.2	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

Notes

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

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



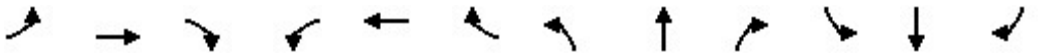
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	545	103	296	823	335	162	1062	152	189	1027	120
Future Volume (veh/h)	162	545	103	296	823	335	162	1062	152	189	1027	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1984	1969	1969	1906	1969	1969	1938	1969	1938	1969	1969	1938
Adj Flow Rate, veh/h	178	708	161	322	1112	409	216	1264	179	230	1167	158
Peak Hour Factor	0.91	0.77	0.64	0.92	0.74	0.82	0.75	0.84	0.85	0.82	0.88	0.76
Percent Heavy Veh, %	1	2	2	6	2	2	4	2	4	2	2	4
Cap, veh/h	256	1342	301	447	1429	526	289	1804	736	370	1955	688
Arrive On Green	0.02	0.10	0.10	0.04	0.12	0.12	0.08	0.34	0.33	0.10	0.36	0.36
Sat Flow, veh/h	3666	4370	980	3522	3848	1415	3580	5375	1607	3638	5375	1608
Grp Volume(v), veh/h	178	579	290	322	1035	486	216	1264	179	230	1167	158
Grp Sat Flow(s),veh/h/ln	1833	1792	1767	1761	1792	1680	1790	1792	1607	1819	1792	1608
Q Serve(g_s), s	6.7	21.5	21.9	12.6	39.2	39.3	8.3	28.6	0.0	8.5	24.7	8.8
Cycle Q Clear(g_c), s	6.7	21.5	21.9	12.6	39.2	39.3	8.3	28.6	0.0	8.5	24.7	8.8
Prop In Lane	1.00		0.55	1.00		0.84	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	1101	543	447	1331	624	289	1804	736	370	1955	688
V/C Ratio(X)	0.70	0.53	0.53	0.72	0.78	0.78	0.75	0.70	0.24	0.62	0.60	0.23
Avail Cap(c_a), veh/h	288	1101	543	503	1331	624	332	1804	736	370	1955	688
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.95	0.95	0.95	0.91	0.91	0.91	0.93	0.93	0.93
Uniform Delay (d), s/veh	66.9	53.2	53.6	64.6	55.8	56.1	62.9	40.4	23.3	60.3	36.2	25.5
Incr Delay (d2), s/veh	4.5	1.8	3.7	3.2	4.3	8.8	5.7	2.1	0.7	2.2	1.3	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	3.4	10.6	11.0	6.2	19.7	19.3	3.9	12.6	3.7	4.0	10.8	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	55.0	57.2	67.9	60.1	64.9	68.6	42.5	24.0	62.5	37.5	26.3
LnGrp LOS	E	D	E	E	E	E	E	D	C	E	D	C
Approach Vol, veh/h		1047			1843			1659			1555	
Approach Delay, s/veh		58.4			62.7			43.9			40.0	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.2	51.0	13.8	56.0	15.3	54.9	22.8	47.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	13.0	* 45	10.0	50.0	12.0	46.0	19.0	* 41
Max Q Clear Time (g_c+I1), s	10.5	30.6	8.7	41.3	10.3	26.7	14.6	23.9
Green Ext Time (p_c), s	0.1	7.5	0.0	4.6	0.0	8.4	0.2	3.4

Intersection Summary	
HCM 6th Ctrl Delay	51.1
HCM 6th LOS	D

Notes

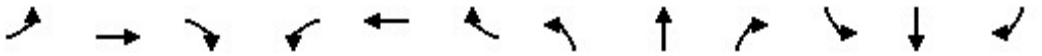
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	849	132	134	730	7	149	55	141	8	50	6
Future Volume (veh/h)	7	849	132	134	730	7	149	55	141	8	50	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	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	2000	1969	1969	1969	1953	1953	1969	1969	1969	2000	2000	2000
Adj Flow Rate, veh/h	16	943	148	165	839	12	166	71	166	12	67	12
Peak Hour Factor	0.44	0.90	0.89	0.81	0.87	0.58	0.90	0.78	0.85	0.67	0.75	0.50
Percent Heavy Veh, %	0	2	2	2	3	3	2	2	2	0	0	0
Cap, veh/h	419	1752	275	353	2391	34	227	85	185	79	411	69
Arrive On Green	0.54	0.54	0.53	0.06	0.64	0.63	0.09	0.09	0.09	0.29	0.29	0.29
Sat Flow, veh/h	656	3222	505	1875	3743	54	628	299	649	141	1442	240
Grp Volume(v), veh/h	16	547	544	165	416	435	403	0	0	91	0	0
Grp Sat Flow(s),veh/h/ln	656	1870	1857	1875	1856	1941	1576	0	0	1824	0	0
Q Serve(g_s), s	1.2	19.8	19.9	3.9	11.0	11.0	22.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.2	19.8	19.9	3.9	11.0	11.0	26.4	0.0	0.0	3.7	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.03	0.41		0.41	0.13		0.13
Lane Grp Cap(c), veh/h	419	1017	1010	353	1185	1240	498	0	0	559	0	0
V/C Ratio(X)	0.04	0.54	0.54	0.47	0.35	0.35	0.81	0.00	0.00	0.16	0.00	0.00
Avail Cap(c_a), veh/h	419	1017	1010	497	1185	1240	528	0	0	594	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.7	15.4	15.6	12.1	8.8	8.8	45.6	0.0	0.0	28.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	2.0	2.1	0.4	0.8	0.8	7.3	0.0	0.0	0.1	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	0.2	8.5	8.5	1.5	4.3	4.4	12.2	0.0	0.0	1.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	17.5	17.6	12.5	9.6	9.6	52.9	0.0	0.0	28.2	0.0	0.0
LnGrp LOS	B	B	B	B	A	A	D	A	A	C	A	A
Approach Vol, veh/h		1107			1016			403			91	
Approach Delay, s/veh		17.5			10.1			52.9			28.2	
Approach LOS		B			B			D			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	61.1		33.9		71.1		33.9				
Change Period (Y+Rc), s	4.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	14.0	46.0		31.0		64.0		31.0				
Max Q Clear Time (g_c+I1), s	5.9	21.9		5.7		13.0		28.4				
Green Ext Time (p_c), s	0.1	7.9		0.3		6.2		0.5				

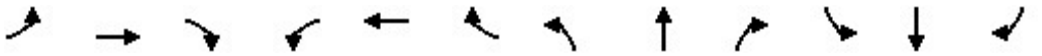
Intersection Summary			
HCM 6th Ctrl Delay		20.4	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	719	135	423	1098	132	231	639	428	89	597	40
Future Volume (veh/h)	61	719	135	423	1098	132	231	639	428	89	597	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1953	1969	1969	2000	1969	1984	1969	1969	1969
Adj Flow Rate, veh/h	87	856	173	549	1144	165	289	770	535	124	628	49
Peak Hour Factor	0.70	0.84	0.78	0.77	0.96	0.80	0.80	0.83	0.80	0.72	0.95	0.81
Percent Heavy Veh, %	2	2	2	3	2	2	0	2	1	2	2	2
Cap, veh/h	109	1218	725	621	1618	797	354	1189	815	224	897	70
Arrive On Green	0.06	0.33	0.31	0.17	0.43	0.42	0.13	0.32	0.31	0.06	0.26	0.24
Sat Flow, veh/h	1875	3741	1639	3609	3741	1641	1905	3741	1670	1875	3513	274
Grp Volume(v), veh/h	87	856	173	549	1144	165	289	770	535	124	334	343
Grp Sat Flow(s),veh/h/ln	1875	1870	1639	1804	1870	1641	1905	1870	1670	1875	1870	1917
Q Serve(g_s), s	6.4	28.0	9.2	20.8	35.0	8.1	15.4	24.8	33.9	6.9	22.7	22.7
Cycle Q Clear(g_c), s	6.4	28.0	9.2	20.8	35.0	8.1	15.4	24.8	33.9	6.9	22.7	22.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	109	1218	725	621	1618	797	354	1189	815	224	478	489
V/C Ratio(X)	0.80	0.70	0.24	0.88	0.71	0.21	0.82	0.65	0.66	0.55	0.70	0.70
Avail Cap(c_a), veh/h	147	1218	725	696	1618	797	442	1189	815	254	478	489
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)	0.97	0.97	0.97	0.60	0.60	0.60	1.00	1.00	1.00	0.99	0.99	0.99
Uniform Delay (d), s/veh	65.1	41.3	24.5	56.6	32.5	20.7	34.7	41.0	27.2	37.2	47.3	47.4
Incr Delay (d2), s/veh	13.6	3.3	0.8	7.1	1.6	0.4	7.5	2.7	4.1	0.8	8.2	8.1
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	3.4	13.3	3.7	9.9	15.8	3.1	7.8	11.7	14.0	3.2	11.5	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.7	44.6	25.3	63.7	34.1	21.0	42.3	43.7	31.3	38.0	55.4	55.4
LnGrp LOS	E	D	C	E	C	C	D	D	C	D	E	E
Approach Vol, veh/h		1116			1858			1594			801	
Approach Delay, s/veh		44.3			41.7			39.3			52.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.6	40.2	13.1	65.0	12.8	49.0	28.1	50.1
Change Period (Y+Rc), s	4.0	6.0	5.0	6.0	4.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	24.0	30.0	11.0	54.0	11.0	43.0	26.0	39.0
Max Q Clear Time (g_c+I1), s	17.4	24.7	8.4	37.0	8.9	35.9	22.8	30.0
Green Ext Time (p_c), s	0.1	1.8	0.0	5.3	0.0	3.9	0.3	2.9

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D



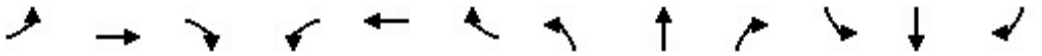
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	118	13	45	124	33	8	580	18	10	501	23
Future Volume (veh/h)	25	118	13	45	124	33	8	580	18	10	501	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.90	0.96		0.90	1.00		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	1984	1984	1984	2000	2000	2000	2000	1969	1969	2000	1953	1953
Adj Flow Rate, veh/h	58	215	20	57	175	49	16	624	25	16	545	42
Peak Hour Factor	0.43	0.55	0.65	0.79	0.71	0.67	0.50	0.93	0.71	0.63	0.92	0.55
Percent Heavy Veh, %	1	1	1	0	0	0	0	2	2	0	3	3
Cap, veh/h	140	343	30	141	291	75	509	1161	46	470	1105	85
Arrive On Green	0.24	0.24	0.22	0.24	0.24	0.22	0.62	0.62	0.60	0.62	0.62	0.60
Sat Flow, veh/h	262	1446	125	264	1227	315	841	1880	75	794	1790	138
Grp Volume(v), veh/h	293	0	0	281	0	0	16	0	649	16	0	587
Grp Sat Flow(s),veh/h/ln	1832	0	0	1806	0	0	841	0	1955	794	0	1928
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.6	0.0	10.5	0.6	0.0	9.2
Cycle Q Clear(g_c), s	7.5	0.0	0.0	7.2	0.0	0.0	9.8	0.0	10.5	11.1	0.0	9.2
Prop In Lane	0.20		0.07	0.20		0.17	1.00		0.04	1.00		0.07
Lane Grp Cap(c), veh/h	513	0	0	507	0	0	509	0	1207	470	0	1190
V/C Ratio(X)	0.57	0.00	0.00	0.55	0.00	0.00	0.03	0.00	0.54	0.03	0.00	0.49
Avail Cap(c_a), veh/h	603	0	0	595	0	0	509	0	1207	470	0	1190
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	0.0	18.9	0.0	0.0	8.5	0.0	6.0	9.2	0.0	5.8
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.9	0.1	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	3.0	0.0	0.0	0.1	0.0	3.2	0.1	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.3	0.0	0.0	19.2	0.0	0.0	8.6	0.0	6.9	9.4	0.0	7.3
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		293			281			665			603	
Approach Delay, s/veh		19.3			19.2			7.0			7.3	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		17.1		38.0		17.1				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		33.0		15.0		33.0		15.0				
Max Q Clear Time (g_c+I1), s		12.5		9.5		13.1		9.2				
Green Ext Time (p_c), s		8.2		0.6		7.2		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			10.9									
HCM 6th LOS			B									

Notes

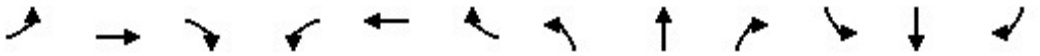
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	260	42	45	235	12	37	349	23	3	339	5
Future Volume (veh/h)	8	260	42	45	235	12	37	349	23	3	339	5
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	2000	2000	2000	1969	1969	1969	1953	1953	1953	1953	1953	1953
Adj Flow Rate, veh/h	12	361	49	62	270	24	54	388	33	8	381	16
Peak Hour Factor	0.67	0.72	0.85	0.73	0.87	0.50	0.69	0.90	0.69	0.38	0.89	0.31
Percent Heavy Veh, %	0	0	0	2	2	2	3	3	3	3	3	3
Cap, veh/h	41	442	59	89	317	26	136	967	80	43	1176	49
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	1.00	1.00	1.00	0.21	0.21	0.21
Sat Flow, veh/h	23	1698	226	188	1217	102	153	1512	124	12	1838	76
Grp Volume(v), veh/h	422	0	0	356	0	0	475	0	0	405	0	0
Grp Sat Flow(s),veh/h/ln	1948	0	0	1507	0	0	1789	0	0	1926	0	0
Q Serve(g_s), s	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	21.4	0.0	0.0	24.4	0.0	0.0	0.0	0.0	0.0	18.6	0.0	0.0
Prop In Lane	0.03		0.12	0.17		0.07	0.11		0.07	0.02		0.04
Lane Grp Cap(c), veh/h	542	0	0	432	0	0	1183	0	0	1267	0	0
V/C Ratio(X)	0.78	0.00	0.00	0.82	0.00	0.00	0.40	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	837	0	0	687	0	0	1183	0	0	1267	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.68	0.00	0.00	0.92	0.00	0.00
Uniform Delay (d), s/veh	36.6	0.0	0.0	37.1	0.0	0.0	0.0	0.0	0.0	22.2	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	2.1	0.0	0.0	0.7	0.0	0.0	0.6	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	10.2	0.0	0.0	9.0	0.0	0.0	0.2	0.0	0.0	9.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	0.0	0.0	39.2	0.0	0.0	0.7	0.0	0.0	22.9	0.0	0.0
LnGrp LOS	D	A	A	D	A	A	A	A	A	C	A	A
Approach Vol, veh/h		422			356			475			405	
Approach Delay, s/veh		37.6			39.2			0.7			22.9	
Approach LOS		D			D			A			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		72.2		32.8		72.2		32.8				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		50.0		44.0		50.0		44.0				
Max Q Clear Time (g_c+I1), s		2.0		23.4		20.6		26.4				
Green Ext Time (p_c), s		7.5		1.7		5.3		1.4				

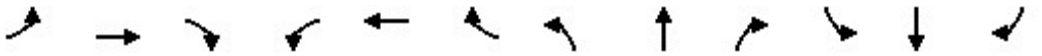
Intersection Summary												
HCM 6th Ctrl Delay			23.8									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	153	41	93	144	168	25	1185	60	146	1476	22
Future Volume (veh/h)	30	153	41	93	144	168	25	1185	60	146	1476	22
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		0.99	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	2000	1938	1938	1984	1984	1938	1938	1969	1969	1984	1969	1969
Adj Flow Rate, veh/h	33	201	61	116	173	218	33	1347	100	190	1736	29
Peak Hour Factor	0.91	0.76	0.67	0.80	0.83	0.77	0.75	0.88	0.60	0.77	0.85	0.75
Percent Heavy Veh, %	0	4	4	1	1	4	4	2	2	1	2	2
Cap, veh/h	270	384	117	236	535	517	211	2736	203	324	3484	58
Arrive On Green	0.27	0.27	0.25	0.27	0.27	0.25	0.54	0.54	0.52	0.13	1.00	1.00
Sat Flow, veh/h	1006	1424	432	1123	1984	1632	266	5103	379	1890	5444	91
Grp Volume(v), veh/h	33	0	262	116	173	218	33	946	501	190	1142	623
Grp Sat Flow(s),veh/h/ln	1006	0	1857	1123	1984	1632	266	1792	1898	1890	1792	1952
Q Serve(g_s), s	2.9	0.0	12.6	10.3	7.3	11.1	6.9	17.5	17.5	4.8	0.0	0.0
Cycle Q Clear(g_c), s	10.2	0.0	12.6	22.9	7.3	11.1	6.9	17.5	17.5	4.8	0.0	0.0
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.20	1.00		0.05
Lane Grp Cap(c), veh/h	270	0	500	236	535	517	211	1921	1018	324	2293	1249
V/C Ratio(X)	0.12	0.00	0.52	0.49	0.32	0.42	0.16	0.49	0.49	0.59	0.50	0.50
Avail Cap(c_a), veh/h	315	0	584	286	624	590	211	1921	1018	488	2293	1249
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.83	0.83	0.83	0.82	0.82	0.82
Uniform Delay (d), s/veh	34.8	0.0	32.8	42.4	30.7	28.3	12.9	15.3	15.5	11.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.6	0.1	0.2	1.3	0.8	1.4	0.5	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	5.7	2.9	3.5	4.3	0.5	6.6	7.3	1.6	0.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	0.0	33.1	43.0	30.8	28.5	14.2	16.1	16.9	12.2	0.6	1.2
LnGrp LOS	C	A	C	D	C	C	B	B	B	B	A	A
Approach Vol, veh/h		295			507			1480			1955	
Approach Delay, s/veh		33.3			32.6			16.3			1.9	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.9	61.8		32.3		72.7		32.3				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	16.0	41.0		31.0		61.0		31.0				
Max Q Clear Time (g_c+I1), s	6.8	19.5		14.6		2.0		24.9				
Green Ext Time (p_c), s	0.1	10.5		1.0		18.3		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		12.8	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	946	318	26	1582	415	133	558	11	370	1007	35
Future Volume (veh/h)	57	946	318	26	1582	415	133	558	11	370	1007	35
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	1969	1969	1984	1938	1984	1984	1953	1953	1953	1969	1969	1969
Adj Flow Rate, veh/h	100	1051	0	39	1738	0	145	634	0	430	1071	0
Peak Hour Factor	0.57	0.90	0.89	0.67	0.91	0.91	0.92	0.88	0.69	0.86	0.94	0.94
Percent Heavy Veh, %	2	2	1	4	1	1	3	3	3	2	2	2
Cap, veh/h	263	2887		271	1951		169	895		509	1243	
Arrive On Green	0.01	0.18	0.00	0.04	1.00	0.00	0.09	0.17	0.00	0.05	0.08	0.00
Sat Flow, veh/h	1875	5375	1682	1845	3770	1682	1860	5508	0	3638	5552	0
Grp Volume(v), veh/h	100	1051	0	39	1738	0	145	634	0	430	1071	0
Grp Sat Flow(s),veh/h/ln	1875	1792	1682	1845	1885	1682	1860	1777	0	1819	1792	0
Q Serve(g_s), s	3.6	24.1	0.0	1.5	0.0	0.0	10.8	15.7	0.0	16.4	27.6	0.0
Cycle Q Clear(g_c), s	3.6	24.1	0.0	1.5	0.0	0.0	10.8	15.7	0.0	16.4	27.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	263	2887		271	1951		169	895		509	1243	
V/C Ratio(X)	0.38	0.36		0.14	0.89		0.86	0.71		0.84	0.86	
Avail Cap(c_a), veh/h	284	2887		314	1951		199	895		572	1243	
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.69	0.69	0.00	0.76	0.76	0.00	0.97	0.97	0.00	0.48	0.48	0.00
Uniform Delay (d), s/veh	15.8	36.6	0.0	17.9	0.0	0.0	62.7	55.0	0.0	65.2	62.4	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.1	5.2	0.0	22.8	4.6	0.0	4.7	4.1	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	1.6	11.6	0.0	0.6	1.4	0.0	6.1	7.3	0.0	8.4	13.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	36.8	0.0	18.0	5.2	0.0	85.5	59.6	0.0	69.9	66.5	0.0
LnGrp LOS	B	D		B	A		F	E		E	E	
Approach Vol, veh/h		1151	A		1777	A		779	A		1501	A
Approach Delay, s/veh		35.0			5.5			64.4			67.5	
Approach LOS		D			A			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	79.7	16.7	36.9	9.5	76.9	25.6	28.0
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	7.0	* 7
Max Green Setting (Gmax), s	6.0	69.0	15.0	28.0	7.0	68.0	21.0	* 21
Max Q Clear Time (g_c+I1), s	3.5	26.1	12.8	29.6	5.6	2.0	18.4	17.7
Green Ext Time (p_c), s	0.0	8.3	0.0	0.0	0.0	21.9	0.2	1.2

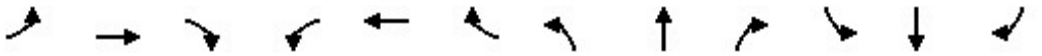
Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Notes

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

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

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



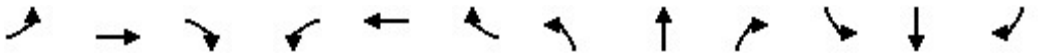
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	208	791	35	239	1046	183	53	714	98	252	1208	170
Future Volume (veh/h)	208	791	35	239	1046	183	53	714	98	252	1208	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	1969	1969	1953	1953	1953	1969	1953	1953	1969	1969	1969
Adj Flow Rate, veh/h	231	965	45	285	1189	223	87	776	111	274	1389	183
Peak Hour Factor	0.90	0.82	0.77	0.84	0.88	0.82	0.61	0.92	0.88	0.92	0.87	0.93
Percent Heavy Veh, %	3	2	2	3	3	3	2	3	3	2	2	2
Cap, veh/h	305	1335	62	309	1511	283	150	1742	247	348	1783	235
Arrive On Green	0.08	0.25	0.24	0.17	0.34	0.32	0.16	0.74	0.71	0.10	0.37	0.36
Sat Flow, veh/h	3609	5258	245	1860	4500	844	1875	4711	669	3638	4799	632
Grp Volume(v), veh/h	231	657	353	285	939	473	87	584	303	274	1037	535
Grp Sat Flow(s),veh/h/ln	1804	1792	1920	1860	1777	1789	1875	1777	1825	1819	1792	1848
Q Serve(g_s), s	8.8	23.5	23.5	21.1	33.4	33.5	6.0	8.9	9.4	10.3	35.8	35.9
Cycle Q Clear(g_c), s	8.8	23.5	23.5	21.1	33.4	33.5	6.0	8.9	9.4	10.3	35.8	35.9
Prop In Lane	1.00		0.13	1.00		0.47	1.00		0.37	1.00		0.34
Lane Grp Cap(c), veh/h	305	910	488	309	1193	601	150	1314	675	348	1331	686
V/C Ratio(X)	0.76	0.72	0.72	0.92	0.79	0.79	0.58	0.44	0.45	0.79	0.78	0.78
Avail Cap(c_a), veh/h	361	910	488	412	1193	601	150	1314	675	416	1331	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	1.00	1.00	1.00	0.74	0.74	0.74	0.86	0.86	0.86
Uniform Delay (d), s/veh	62.7	47.7	47.9	57.5	42.0	42.4	56.7	12.7	13.2	61.9	38.9	39.3
Incr Delay (d2), s/veh	3.6	3.0	5.6	19.2	5.3	10.0	2.8	0.8	1.6	5.8	3.9	7.4
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	4.1	10.6	11.8	11.4	15.1	16.1	2.8	2.9	3.2	5.0	16.0	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.3	50.7	53.4	76.7	47.3	52.5	59.5	13.5	14.8	67.6	42.9	46.7
LnGrp LOS	E	D	D	E	D	D	E	B	B	E	D	D
Approach Vol, veh/h		1241			1697			974			1846	
Approach Delay, s/veh		54.4			53.7			18.0			47.6	
Approach LOS		D			D			B			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.4	55.8	15.8	51.0	17.2	56.0	27.3	39.6
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	6.0	* 6	4.0	6.0
Max Green Setting (Gmax), s	15.0	45.0	13.0	45.0	11.0	* 50	31.0	28.0
Max Q Clear Time (g_c+I1), s	12.3	11.4	10.8	35.5	8.0	37.9	23.1	25.5
Green Ext Time (p_c), s	0.1	6.0	0.1	4.3	0.0	7.4	0.2	1.1

Intersection Summary	
HCM 6th Ctrl Delay	45.9
HCM 6th LOS	D

Notes

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



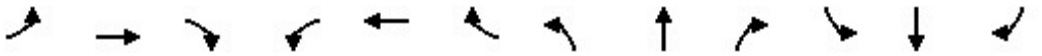
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	28	115	75	49	45	90	1256	13	33	1542	39
Future Volume (veh/h)	58	28	115	75	49	45	90	1256	13	33	1542	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	2000	1938	1938	2000	1828	1828	1969	1969	1969	1797	1969	1969
Adj Flow Rate, veh/h	74	41	140	110	88	74	111	1427	28	45	1752	78
Peak Hour Factor	0.78	0.68	0.82	0.68	0.56	0.61	0.81	0.88	0.46	0.73	0.88	0.50
Percent Heavy Veh, %	0	4	4	0	11	11	2	2	2	13	2	2
Cap, veh/h	170	65	222	154	156	131	303	4003	79	290	3493	155
Arrive On Green	0.17	0.17	0.15	0.17	0.17	0.15	0.07	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1239	379	1293	1218	908	764	1875	5423	106	333	5269	234
Grp Volume(v), veh/h	74	0	181	110	0	162	111	943	512	45	1191	639
Grp Sat Flow(s),veh/h/ln	1239	0	1672	1218	0	1671	1875	1792	1947	333	1792	1920
Q Serve(g_s), s	6.1	0.0	10.6	7.4	0.0	9.4	2.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.5	0.0	10.6	18.0	0.0	9.4	2.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.77	1.00		0.46	1.00		0.05	1.00		0.12
Lane Grp Cap(c), veh/h	170	0	287	154	0	287	303	2645	1437	290	2375	1273
V/C Ratio(X)	0.43	0.00	0.63	0.71	0.00	0.57	0.37	0.36	0.36	0.16	0.50	0.50
Avail Cap(c_a), veh/h	170	0	287	154	0	287	519	2645	1437	290	2375	1273
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.89	0.89	0.89	0.80	0.80	0.80
Uniform Delay (d), s/veh	47.0	0.0	41.2	49.6	0.0	40.3	4.7	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	3.4	12.6	0.0	1.6	0.2	0.3	0.6	0.9	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	4.7	3.5	0.0	4.0	0.6	0.1	0.2	0.1	0.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	0.0	44.6	62.3	0.0	42.0	5.0	0.3	0.6	0.9	0.6	1.1
LnGrp LOS	D	A	D	E	A	D	A	A	A	A	A	A
Approach Vol, veh/h		255			272			1566			1875	
Approach Delay, s/veh		45.5			50.2			0.8			0.8	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.9	75.1		22.0		83.0		22.0				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	16.0	56.0		16.0		76.0		16.0				
Max Q Clear Time (g_c+I1), s	4.0	2.0		17.5		2.0		20.0				
Green Ext Time (p_c), s	0.1	21.4		0.0		13.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		7.0	
HCM 6th LOS		A	

Notes

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



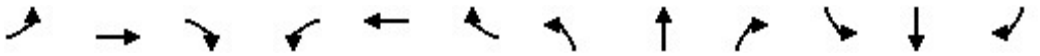
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	56	134	331	57	24	42	588	114	18	1352	17
Future Volume (veh/h)	25	56	134	331	57	24	42	588	114	18	1352	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		0.97	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	2000	1938	1922	2000	2000	2000	1750	1953	1953	2000	1969	1969
Adj Flow Rate, veh/h	37	79	170	399	90	29	53	735	133	30	1502	25
Peak Hour Factor	0.67	0.71	0.79	0.83	0.63	0.82	0.79	0.80	0.86	0.61	0.90	0.67
Percent Heavy Veh, %	0	4	5	0	0	0	16	3	3	0	2	2
Cap, veh/h	222	257	215	515	515	166	251	2461	440	416	2901	48
Arrive On Green	0.13	0.13	0.13	0.19	0.36	0.34	0.05	1.00	1.00	0.03	1.00	1.00
Sat Flow, veh/h	1286	1938	1618	1905	1448	467	1667	4528	810	1905	5443	91
Grp Volume(v), veh/h	37	79	170	399	0	119	53	575	293	30	989	538
Grp Sat Flow(s),veh/h/ln	1286	1938	1618	1905	0	1915	1667	1777	1783	1905	1792	1951
Q Serve(g_s), s	3.6	5.2	14.3	25.0	0.0	6.0	2.1	0.0	0.0	1.0	0.0	0.0
Cycle Q Clear(g_c), s	3.6	5.2	14.3	25.0	0.0	6.0	2.1	0.0	0.0	1.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.24	1.00		0.45	1.00		0.05
Lane Grp Cap(c), veh/h	222	257	215	515	0	681	251	1932	969	416	1909	1040
V/C Ratio(X)	0.17	0.31	0.79	0.77	0.00	0.17	0.21	0.30	0.30	0.07	0.52	0.52
Avail Cap(c_a), veh/h	235	277	231	648	0	834	316	1932	969	469	1909	1040
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	0.54	0.00	0.54	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	54.2	54.9	58.8	40.4	0.0	31.2	14.6	0.0	0.0	15.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.2	14.3	1.9	0.0	0.0	0.2	0.4	0.8	0.0	0.6	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	1.2	2.6	6.6	11.8	0.0	2.8	0.8	0.1	0.2	0.4	0.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	55.1	73.1	42.2	0.0	31.2	14.8	0.4	0.8	15.3	0.6	1.0
LnGrp LOS	D	E	E	D	A	C	B	A	A	B	A	A
Approach Vol, veh/h		286			518			921			1557	
Approach Delay, s/veh		65.7			39.7			1.4			1.0	
Approach LOS		E			D			A			A	

Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	78.6	31.2	22.6	6.1	80.1		53.8				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	56.0	37.0	18.0	6.0	59.0		59.0				
Max Q Clear Time (g_c+I1), s	4.1	2.0	27.0	16.3	3.0	2.0		8.0				
Green Ext Time (p_c), s	0.0	13.9	0.3	0.1	0.0	6.2		0.4				

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

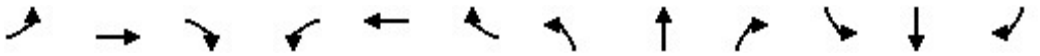
Notes

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



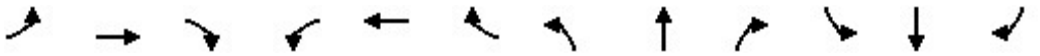
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	59	479	57	152	44	512	1330	31	28	1039	33
Future Volume (vph)	21	59	479	57	152	44	512	1330	31	28	1039	33
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89	0.85	1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1889	1661	1591	1827	1915		1900	5319		1900	3702	
Flt Permitted	0.34	1.00	1.00	0.17	1.00		0.10	1.00		0.13	1.00	
Satd. Flow (perm)	672	1661	1591	327	1915		200	5319		265	3702	
Peak-hour factor, PHF	0.56	0.53	0.76	0.92	0.69	0.83	0.90	0.81	0.68	0.84	0.88	0.67
Adj. Flow (vph)	38	111	630	62	220	53	569	1642	46	33	1181	49
RTOR Reduction (vph)	0	94	15	0	9	0	0	2	0	0	3	0
Lane Group Flow (vph)	38	288	344	62	264	0	569	1686	0	33	1227	0
Confl. Peds. (#/hr)	10					10	2		5	5		2
Confl. Bikes (#/hr)			1	1								
Heavy Vehicles (%)	0%	2%	1%	4%	0%	5%	0%	2%	7%	0%	2%	0%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	22.0	22.0	53.0	22.0	22.0		71.0	64.0		39.0	36.0	
Effective Green, g (s)	23.5	23.5	53.0	23.5	23.5		71.0	65.5		39.0	37.5	
Actuated g/C Ratio	0.22	0.22	0.50	0.22	0.22		0.68	0.62		0.37	0.36	
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0	1.5	2.0	2.0		1.5	3.0		1.5	3.0	
Lane Grp Cap (vph)	150	371	803	73	428		637	3318		145	1322	
v/s Ratio Prot		0.17	0.13		0.14		c0.26	0.32		0.01	c0.33	
v/s Ratio Perm	0.06		0.09	c0.19			0.34			0.08		
v/c Ratio	0.25	0.78	0.43	0.85	0.62		0.89	0.51		0.23	0.93	
Uniform Delay, d1	33.5	38.3	16.4	39.1	36.7		28.6	10.9		21.1	32.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	9.0	0.1	54.7	1.9		14.6	0.6		0.3	12.7	
Delay (s)	33.9	47.3	16.6	93.8	38.5		43.1	11.4		21.4	45.1	
Level of Service	C	D	B	F	D		D	B		C	D	
Approach Delay (s)		32.5			48.8			19.4			44.5	
Approach LOS		C			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	218	39	34	211	2	49	718	6	0	569	37
Future Volume (vph)	30	218	39	34	211	2	49	718	6	0	569	37
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			1.00			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1900	1904		1900	1937			3709			3669	
Flt Permitted	0.46	1.00		0.36	1.00			0.79			1.00	
Satd. Flow (perm)	929	1904		718	1937			2958			3669	
Peak-hour factor, PHF	0.66	0.73	0.86	0.75	0.81	0.50	0.84	0.87	0.50	0.25	0.88	0.75
Adj. Flow (vph)	45	299	45	45	260	4	58	825	12	0	647	49
RTOR Reduction (vph)	0	4	0	0	1	0	0	1	0	0	4	0
Lane Group Flow (vph)	45	340	0	45	263	0	0	894	0	0	692	0
Confl. Peds. (#/hr)	6		10	10		6	2		6	6		2
Confl. Bikes (#/hr)									1	1		
Heavy Vehicles (%)	0%	2%	3%	0%	3%	0%	0%	2%	0%	0%	2%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		3 4 5			3 4 5			1 2			1 2	
Permitted Phases	3 4 5			3 4 5			1 2					
Actuated Green, G (s)	46.0	46.0		46.0	46.0			64.0			64.0	
Effective Green, g (s)	46.0	46.0		46.0	46.0			64.0			64.0	
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.46			0.46	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	305	625		235	636			1352			1677	
v/s Ratio Prot		c0.18			0.14						0.19	
v/s Ratio Perm	0.05			0.06				c0.30				
v/c Ratio	0.15	0.54		0.19	0.41			0.66			0.41	
Uniform Delay, d1	33.2	38.4		33.7	36.5			29.6			25.4	
Progression Factor	1.00	1.00		0.04	0.03			1.00			0.20	
Incremental Delay, d2	0.1	0.5		0.1	0.1			1.2			0.2	
Delay (s)	33.2	38.9		1.5	1.4			30.8			5.3	
Level of Service	C	D		A	A			C			A	
Approach Delay (s)		38.3			1.4			30.8			5.3	
Approach LOS		D			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	143	72	0	0	0	0	733	0	19	520	0
Future Volume (vph)	0	143	72	0	0	0	0	733	0	19	520	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0						6.0			6.0	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.94						1.00			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		3539						3725			3711	
Flt Permitted		1.00						1.00			0.89	
Satd. Flow (perm)		3539						3725			3294	
Peak-hour factor, PHF	0.25	0.91	0.70	0.25	0.25	0.25	0.25	0.88	0.25	0.75	0.97	0.25
Adj. Flow (vph)	0	157	103	0	0	0	0	833	0	25	536	0
RTOR Reduction (vph)	0	78	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	182	0	0	0	0	0	833	0	0	561	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	2%	0%	6%	2%	0%
Turn Type		NA						NA		Perm	NA	
Protected Phases		4 5 6						1 2 3			1 2 3	
Permitted Phases										1 2 3		
Actuated Green, G (s)		30.0						98.0			98.0	
Effective Green, g (s)		30.0						98.0			98.0	
Actuated g/C Ratio		0.21						0.70			0.70	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		758						2607			2305	
v/s Ratio Prot		c0.05						c0.22				
v/s Ratio Perm											0.17	
v/c Ratio		0.24						0.32			0.24	
Uniform Delay, d1		45.6						8.1			7.6	
Progression Factor		1.00						0.04			0.00	
Incremental Delay, d2		0.7						0.1			0.0	
Delay (s)		46.3						0.4			0.1	
Level of Service		D						A			A	
Approach Delay (s)		46.3			0.0			0.4			0.1	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

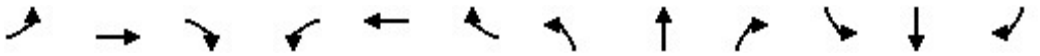
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	188	569	0	0	566	20	0	0	0	0	197	39
Future Volume (vph)	188	569	0	0	566	20	0	0	0	0	197	39
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0	6.0					6.0	
Lane Util. Factor	1.00	1.00			0.95	1.00					0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.98					1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00					1.00	
Frt	1.00	1.00			1.00	0.85					0.97	
Flt Protected	0.95	1.00			1.00	1.00					1.00	
Satd. Flow (prot)	1881	1961			3725	1673					3623	
Flt Permitted	0.26	1.00			1.00	1.00					1.00	
Satd. Flow (perm)	520	1961			3725	1673					3623	
Peak-hour factor, PHF	0.75	0.89	0.25	0.25	0.88	0.53	0.25	0.25	0.25	0.25	0.77	0.73
Adj. Flow (vph)	251	639	0	0	643	38	0	0	0	0	256	53
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	0	0	13	0
Lane Group Flow (vph)	251	639	0	0	643	12	0	0	0	0	296	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	0%	0%	0%	0%	1%	8%
Turn Type	D.P+P	NA			NA	Perm					NA	
Protected Phases	2 3	1 2 3			1						4 5 6	
Permitted Phases	1					1						
Actuated Green, G (s)	92.0	98.0			45.0	45.0					30.0	
Effective Green, g (s)	92.0	98.0			45.0	45.0					30.0	
Actuated g/C Ratio	0.66	0.70			0.32	0.32					0.21	
Clearance Time (s)					6.0	6.0						
Vehicle Extension (s)					3.0	3.0						
Lane Grp Cap (vph)	798	1372			1197	537					776	
v/s Ratio Prot	0.11	c0.33			c0.17						c0.08	
v/s Ratio Perm	0.10					0.01						
v/c Ratio	0.31	0.47			0.54	0.02					0.38	
Uniform Delay, d1	21.2	9.3			39.0	32.5					47.1	
Progression Factor	0.46	0.06			1.00	1.00					1.50	
Incremental Delay, d2	0.1	0.2			0.5	0.0					1.4	
Delay (s)	9.9	0.8			39.4	32.5					72.0	
Level of Service	A	A			D	C					E	
Approach Delay (s)		3.4			39.0			0.0			72.0	
Approach LOS		A			D			A			E	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2020 Existing Condition PM Peak

Synchro Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	285	1244	303	320	879	226	201	1122	264	369	1508	390
Future Volume (veh/h)	285	1244	303	320	879	226	201	1122	264	369	1508	390
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		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	1984	1984	2000	1969	1984	2000	1984	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	335	1398	0	410	945	260	239	1194	311	388	1587	0
Peak Hour Factor	0.85	0.89	0.87	0.78	0.93	0.87	0.84	0.94	0.85	0.95	0.95	0.87
Percent Heavy Veh, %	1	1	0	2	1	0	1	1	1	0	1	1
Cap, veh/h	412	1565		489	1173	753	319	1294	337	543	2011	
Arrive On Green	0.11	0.29	0.00	0.27	0.62	0.61	0.06	0.20	0.19	0.29	0.74	0.00
Sat Flow, veh/h	3666	5417	1695	3638	3770	1659	3666	4259	1109	3695	5596	0
Grp Volume(v), veh/h	335	1398	0	410	945	260	239	1012	493	388	1587	0
Grp Sat Flow(s),veh/h/ln	1833	1806	1695	1819	1885	1659	1833	1806	1757	1848	1806	0
Q Serve(g_s), s	12.1	33.4	0.0	14.4	25.6	0.0	8.7	37.1	37.1	12.7	24.6	0.0
Cycle Q Clear(g_c), s	12.1	33.4	0.0	14.4	25.6	0.0	8.7	37.1	37.1	12.7	24.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		0.00
Lane Grp Cap(c), veh/h	412	1565		489	1173	753	319	1097	534	543	2011	
V/C Ratio(X)	0.81	0.89		0.84	0.81	0.35	0.75	0.92	0.92	0.71	0.79	
Avail Cap(c_a), veh/h	462	1565		539	1173	753	380	1097	534	543	2011	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.00	0.91	0.91	0.91	0.91	0.91	0.91	0.39	0.39	0.00
Uniform Delay (d), s/veh	58.5	46.0	0.0	48.0	22.4	12.6	62.1	52.2	52.6	45.1	14.1	0.0
Incr Delay (d2), s/veh	8.6	8.2	0.0	8.7	5.4	1.1	4.7	13.0	22.4	1.5	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	6.0	15.8	0.0	6.1	7.6	3.0	4.3	19.2	20.1	5.1	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.1	54.2	0.0	56.6	27.9	13.7	66.8	65.2	75.0	46.6	15.4	0.0
LnGrp LOS	E	D		E	C	B	E	E	E	D	B	
Approach Vol, veh/h		1733	A		1615			1744			1975	A
Approach Delay, s/veh		56.7			32.9			68.2			21.5	
Approach LOS		E			C			E			C	

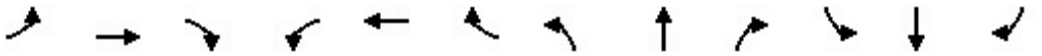
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.8	45.0	19.2	46.0	15.7	54.1	22.2	43.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	18.0	* 39	16.0	40.0	13.0	44.0	19.0	37.0
Max Q Clear Time (g_c+I1), s	14.7	39.1	14.1	27.6	10.7	26.6	16.4	35.4
Green Ext Time (p_c), s	0.2	0.0	0.1	3.8	0.1	10.2	0.2	1.1

Intersection Summary	
HCM 6th Ctrl Delay	44.3
HCM 6th LOS	D

Notes

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

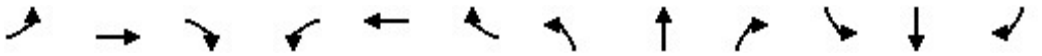
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1105	148	176	1144	48	161	364	166	128	460	37
Future Volume (veh/h)	23	1105	148	176	1144	48	161	364	166	128	460	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.84	1.00		0.87	1.00		0.91	0.99		0.91
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	1922	1953	1984	1984	1969	1938	1984	1938	1984	1984	1969	2000
Adj Flow Rate, veh/h	25	1128	174	181	1217	55	181	409	189	141	489	49
Peak Hour Factor	0.92	0.98	0.85	0.97	0.94	0.88	0.89	0.89	0.88	0.91	0.94	0.75
Percent Heavy Veh, %	5	3	1	1	2	4	1	4	1	1	2	0
Cap, veh/h	192	1669	638	263	2040	780	233	561	539	255	540	423
Arrive On Green	0.45	0.45	0.45	0.07	0.55	0.55	0.08	0.29	0.28	0.07	0.27	0.27
Sat Flow, veh/h	425	3711	1419	1890	3741	1430	1890	1938	1535	1890	1969	1545
Grp Volume(v), veh/h	25	1128	174	181	1217	55	181	409	189	141	489	49
Grp Sat Flow(s),veh/h/ln	425	1856	1419	1890	1870	1430	1890	1938	1535	1890	1969	1545
Q Serve(g_s), s	5.7	32.4	10.4	6.9	29.6	2.5	9.3	25.7	12.4	7.3	32.4	3.2
Cycle Q Clear(g_c), s	22.3	32.4	10.4	6.9	29.6	2.5	9.3	25.7	12.4	7.3	32.4	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	192	1669	638	263	2040	780	233	561	539	255	540	423
V/C Ratio(X)	0.13	0.68	0.27	0.69	0.60	0.07	0.78	0.73	0.35	0.55	0.91	0.12
Avail Cap(c_a), veh/h	192	1669	638	334	2040	780	270	639	600	280	605	475
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)	0.88	0.88	0.88	0.84	0.84	0.84	0.76	0.76	0.76	0.82	0.82	0.82
Uniform Delay (d), s/veh	32.6	29.4	23.3	24.9	20.7	14.5	36.3	43.2	33.0	35.1	47.3	36.7
Incr Delay (d2), s/veh	1.2	2.0	0.9	2.0	1.1	0.1	7.6	2.2	0.1	0.6	13.0	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	0.7	14.8	3.7	3.1	12.9	0.8	4.8	12.6	4.7	3.4	17.8	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	31.3	24.2	26.8	21.8	14.7	43.9	45.3	33.2	35.7	60.3	36.8
LnGrp LOS	C	C	C	C	C	B	D	D	C	D	E	D
Approach Vol, veh/h		1327			1453			779			679	
Approach Delay, s/veh		30.4			22.1			42.0			53.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	12.9	65.2	13.2	43.6		78.1	15.4	41.5				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s	14.0	47.0	11.0	43.0		65.0	14.0	40.0				
Max Q Clear Time (g_c+I1), s	8.9	34.4	9.3	27.7		31.6	11.3	34.4				
Green Ext Time (p_c), s	0.1	7.2	0.0	1.8		11.3	0.0	1.1				

Intersection Summary												
HCM 6th Ctrl Delay			33.4									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	178	52	86	186	78	98	92	1596	191	154	1712	181
Future Volume (veh/h)	178	52	86	186	78	98	92	1596	191	154	1712	181
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	0.98		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	2000	2000	2000	2000	2000	2000	1984	2000	2000	1984	1984
Adj Flow Rate, veh/h	191	63	96	251	88	0	126	1834	0	181	1902	206
Peak Hour Factor	0.93	0.83	0.90	0.74	0.89	0.91	0.73	0.87	0.83	0.85	0.90	0.88
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	0	0	1	1
Cap, veh/h	366	82	125	323	297		246	3091		307	2894	311
Arrive On Green	0.10	0.12	0.10	0.13	0.15	0.00	0.09	1.00	0.00	0.11	1.00	1.00
Sat Flow, veh/h	1890	696	1060	1905	2000	1695	1905	5417	1695	1905	4950	532
Grp Volume(v), veh/h	191	0	159	251	88	0	126	1834	0	181	1383	725
Grp Sat Flow(s),veh/h/ln	1890	0	1756	1905	2000	1695	1905	1806	1695	1905	1806	1870
Q Serve(g_s), s	11.6	0.0	11.9	15.7	5.3	0.0	3.9	0.0	0.0	5.7	0.0	0.0
Cycle Q Clear(g_c), s	11.6	0.0	11.9	15.7	5.3	0.0	3.9	0.0	0.0	5.7	0.0	0.0
Prop In Lane	1.00		0.60	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	366	0	207	323	297		246	3091		307	2111	1093
V/C Ratio(X)	0.52	0.00	0.77	0.78	0.30		0.51	0.59		0.59	0.66	0.66
Avail Cap(c_a), veh/h	385	0	208	368	326		304	3091		395	2111	1093
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.72	0.72	0.00	0.48	0.48	0.48
Uniform Delay (d), s/veh	44.1	0.0	58.3	46.2	51.2	0.0	10.9	0.0	0.0	10.3	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	14.2	7.5	0.2	0.0	0.4	0.6	0.0	0.3	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	6.2	8.2	2.7	0.0	1.5	0.2	0.0	2.1	0.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	0.0	72.6	53.7	51.4	0.0	11.3	0.6	0.0	10.6	0.8	1.5
LnGrp LOS	D	A	E	D	D		B	A		B	A	A
Approach Vol, veh/h		350			339	A		1960	A		2289	
Approach Delay, s/veh		57.3			53.1			1.3			1.8	
Approach LOS		E			D			A			A	

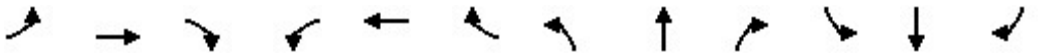
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	81.5	21.8	19.9	9.9	83.4	17.6	24.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	14.0	66.0	21.0	14.0	10.0	70.0	15.0	20.0
Max Q Clear Time (g_c+I1), s	7.7	2.0	17.7	13.9	5.9	2.0	13.6	7.3
Green Ext Time (p_c), s	0.1	21.9	0.1	0.0	0.0	28.8	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	9.1
HCM 6th LOS	A

Notes

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

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



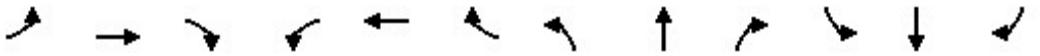
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	18	6	72	11	106	8	1475	88	103	2192	18
Future Volume (veh/h)	20	18	6	72	11	106	8	1475	88	103	2192	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.93	0.95		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	2000	2000	1984	2000	1969	1782	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	38	34	8	95	16	143	14	1521	96	123	2307	25
Peak Hour Factor	0.53	0.53	0.75	0.76	0.69	0.74	0.58	0.97	0.92	0.84	0.95	0.71
Percent Heavy Veh, %	0	0	0	1	0	2	14	1	1	1	1	1
Cap, veh/h	122	102	21	231	268	209	157	3841	242	339	4415	48
Arrive On Green	0.13	0.13	0.12	0.13	0.13	0.13	0.98	0.98	0.97	0.06	1.00	1.00
Sat Flow, veh/h	616	764	153	1305	2000	1560	140	5198	328	1890	5524	60
Grp Volume(v), veh/h	80	0	0	95	16	143	14	1057	560	123	1507	825
Grp Sat Flow(s),veh/h/ln	1533	0	0	1305	2000	1560	140	1806	1914	1890	1806	1972
Q Serve(g_s), s	3.8	0.0	0.0	2.9	0.9	11.8	0.3	1.1	1.2	2.2	0.0	0.0
Cycle Q Clear(g_c), s	6.0	0.0	0.0	8.9	0.9	11.8	0.3	1.1	1.2	2.2	0.0	0.0
Prop In Lane	0.47		0.10	1.00		1.00	1.00		0.17	1.00		0.03
Lane Grp Cap(c), veh/h	245	0	0	231	268	209	157	2668	1414	339	2887	1576
V/C Ratio(X)	0.33	0.00	0.00	0.41	0.06	0.68	0.09	0.40	0.40	0.36	0.52	0.52
Avail Cap(c_a), veh/h	288	0	0	269	326	254	157	2668	1414	393	2887	1576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.60	0.60	0.60	0.16	0.16	0.16
Uniform Delay (d), s/veh	53.1	0.0	0.0	54.4	51.0	55.7	0.3	0.3	0.3	3.5	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	3.5	0.7	0.3	0.5	0.0	0.1	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	2.5	0.0	0.0	3.1	0.5	4.9	0.0	0.3	0.5	0.6	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	0.0	0.0	54.9	51.1	59.3	1.0	0.6	0.8	3.6	0.1	0.2
LnGrp LOS	D	A	A	D	D	E	A	A	A	A	A	A
Approach Vol, veh/h		80			254			1631			2455	
Approach Delay, s/veh		53.4			57.1			0.7			0.3	
Approach LOS		D			E			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.2	104.7		22.1		112.9		22.1				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	4.2	3.2		13.8		2.0		8.0				
Green Ext Time (p_c), s	0.0	19.3		0.3		40.2		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		4.7	
HCM 6th LOS		A	

Notes

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



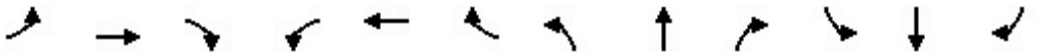
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	186	168	128	151	42	195	1479	88	91	1812	236
Future Volume (veh/h)	258	186	168	128	151	42	195	1479	88	91	1812	236
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.98		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	1984	2000	2000	1953	2000	2000	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	315	224	202	141	170	53	222	1681	107	125	1991	257
Peak Hour Factor	0.82	0.83	0.83	0.91	0.89	0.79	0.88	0.88	0.82	0.73	0.91	0.92
Percent Heavy Veh, %	0	1	0	0	3	0	0	1	1	1	1	1
Cap, veh/h	378	417	345	271	232	191	360	2597	165	310	2243	285
Arrive On Green	0.16	0.21	0.21	0.07	0.12	0.12	0.14	0.50	0.49	0.20	0.93	0.90
Sat Flow, veh/h	1905	1984	1639	1905	1953	1612	1905	5193	330	1890	4844	616
Grp Volume(v), veh/h	315	224	202	141	170	53	222	1168	620	125	1477	771
Grp Sat Flow(s),veh/h/ln	1905	1984	1639	1905	1953	1612	1905	1806	1912	1890	1806	1849
Q Serve(g_s), s	19.3	13.6	10.7	9.0	11.3	3.2	7.6	32.3	32.4	0.0	22.4	26.6
Cycle Q Clear(g_c), s	19.3	13.6	10.7	9.0	11.3	3.2	7.6	32.3	32.4	0.0	22.4	26.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.33
Lane Grp Cap(c), veh/h	378	417	345	271	232	191	360	1806	956	310	1672	856
V/C Ratio(X)	0.83	0.54	0.59	0.52	0.73	0.28	0.62	0.65	0.65	0.40	0.88	0.90
Avail Cap(c_a), veh/h	387	441	364	271	246	203	360	1806	956	310	1672	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.84	0.84	0.84	0.66	0.66	0.66
Uniform Delay (d), s/veh	43.1	47.5	24.4	50.2	57.4	33.4	48.4	24.9	25.1	39.5	3.5	4.0
Incr Delay (d2), s/veh	13.3	0.5	1.3	0.8	8.6	0.3	2.0	1.5	2.9	0.2	4.9	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	6.8	4.4	4.4	6.2	1.7	6.9	13.5	14.7	3.4	3.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.5	47.9	25.7	51.0	66.0	33.7	50.4	26.5	27.9	39.7	8.4	14.3
LnGrp LOS	E	D	C	D	E	C	D	C	C	D	A	B
Approach Vol, veh/h		741			364			2010			2373	
Approach Delay, s/veh		45.5			55.5			29.6			12.0	
Approach LOS		D			E			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	72.0	13.0	32.4	22.6	67.0	25.4	20.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	12.0	66.0	9.0	28.0	17.0	61.0	22.0	15.0
Max Q Clear Time (g_c+I1), s	2.0	34.4	11.0	15.6	9.6	28.6	21.3	13.3
Green Ext Time (p_c), s	0.0	9.4	0.0	0.9	0.0	14.7	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

Notes

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



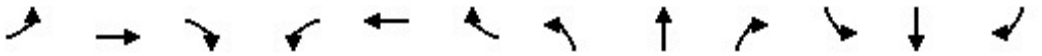
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	839	131	342	672	273	227	1261	374	347	1588	182
Future Volume (veh/h)	235	839	131	342	672	273	227	1261	374	347	1588	182
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	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	1984	1984	1984	1969	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	270	856	182	360	772	284	252	1386	440	365	1654	194
Peak Hour Factor	0.87	0.98	0.72	0.95	0.87	0.96	0.90	0.91	0.85	0.95	0.96	0.94
Percent Heavy Veh, %	1	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	348	1151	243	453	1147	417	440	2001	805	444	1966	744
Arrive On Green	0.09	0.26	0.24	0.17	0.39	0.37	0.08	0.25	0.24	0.08	0.24	0.24
Sat Flow, veh/h	3666	4441	937	3638	3871	1408	3666	5417	1645	3666	5417	1645
Grp Volume(v), veh/h	270	695	343	360	720	336	252	1386	440	365	1654	194
Grp Sat Flow(s),veh/h/ln	1833	1806	1766	1819	1806	1667	1833	1806	1645	1833	1806	1645
Q Serve(g_s), s	9.7	23.8	24.2	12.8	22.2	22.8	8.9	31.4	7.8	13.2	39.2	6.5
Cycle Q Clear(g_c), s	9.7	23.8	24.2	12.8	22.2	22.8	8.9	31.4	7.8	13.2	39.2	6.5
Prop In Lane	1.00		0.53	1.00		0.84	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	348	936	458	453	1070	494	440	2001	805	444	1966	744
V/C Ratio(X)	0.78	0.74	0.75	0.80	0.67	0.68	0.57	0.69	0.55	0.82	0.84	0.26
Avail Cap(c_a), veh/h	407	936	458	539	1070	494	440	2001	805	489	1966	744
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	0.67	0.67	0.67	0.67	0.67	0.67
Upstream Filter(I)	0.96	0.96	0.96	0.95	0.95	0.95	0.78	0.78	0.78	0.83	0.83	0.83
Uniform Delay (d), s/veh	59.7	45.9	46.5	54.7	35.5	36.7	58.7	43.8	11.7	60.6	47.4	11.4
Incr Delay (d2), s/veh	6.2	5.1	10.3	5.4	3.2	7.0	0.9	1.6	2.1	7.6	3.8	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	4.8	11.2	11.8	5.9	9.4	9.6	4.2	14.7	5.9	6.8	18.8	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	51.0	56.8	60.1	38.7	43.7	59.6	45.4	13.7	68.2	51.2	12.1
LnGrp LOS	E	D	E	E	D	D	E	D	B	E	D	B
Approach Vol, veh/h		1308			1416			2078			2213	
Approach Delay, s/veh		55.6			45.3			40.4			50.6	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.3	53.9	16.8	44.0	21.2	53.0	21.8	39.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	6.0	* 6	6.0	* 6
Max Green Setting (Gmax), s	17.0	44.0	14.0	38.0	14.0	* 47	19.0	* 33
Max Q Clear Time (g_c+I1), s	15.2	33.4	11.7	24.8	10.9	41.2	14.8	26.2
Green Ext Time (p_c), s	0.1	7.2	0.1	3.9	0.1	4.6	0.2	2.6

Intersection Summary	
HCM 6th Ctrl Delay	47.4
HCM 6th LOS	D

Notes

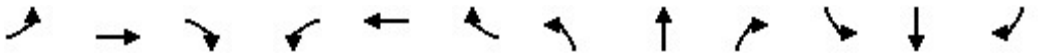
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	751	182	177	1077	9	173	79	109	6	81	3
Future Volume (veh/h)	12	751	182	177	1077	9	173	79	109	6	81	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	2000	1969	1969	1984	1984	1984	1953	1953	1953	2000	2000	2000
Adj Flow Rate, veh/h	20	834	225	211	1134	12	199	100	158	16	108	8
Peak Hour Factor	0.60	0.90	0.81	0.84	0.95	0.75	0.87	0.79	0.69	0.38	0.75	0.38
Percent Heavy Veh, %	0	2	2	1	1	1	3	3	3	0	0	0
Cap, veh/h	285	1342	362	354	2241	24	272	117	175	85	528	37
Arrive On Green	0.46	0.46	0.45	0.08	0.59	0.58	0.11	0.11	0.11	0.32	0.32	0.32
Sat Flow, veh/h	498	2895	781	1890	3821	40	660	359	539	125	1628	113
Grp Volume(v), veh/h	20	539	520	211	559	587	457	0	0	132	0	0
Grp Sat Flow(s),veh/h/ln	498	1870	1806	1890	1885	1976	1559	0	0	1866	0	0
Q Serve(g_s), s	2.2	19.5	19.6	5.1	15.7	15.7	21.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	19.5	19.6	5.1	15.7	15.7	26.0	0.0	0.0	4.3	0.0	0.0
Prop In Lane	1.00		0.43	1.00		0.02	0.44		0.35	0.12		0.06
Lane Grp Cap(c), veh/h	285	867	837	354	1106	1159	563	0	0	650	0	0
V/C Ratio(X)	0.07	0.62	0.62	0.60	0.51	0.51	0.81	0.00	0.00	0.20	0.00	0.00
Avail Cap(c_a), veh/h	285	867	837	416	1106	1159	576	0	0	666	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.2	18.2	18.4	14.4	10.9	10.9	38.3	0.0	0.0	22.0	0.0	0.0
Incr Delay (d2), s/veh	0.5	3.3	3.5	0.7	1.7	1.6	6.5	0.0	0.0	0.1	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	0.3	8.6	8.4	2.0	6.3	6.6	11.8	0.0	0.0	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7	21.5	21.8	15.1	12.6	12.5	44.8	0.0	0.0	22.1	0.0	0.0
LnGrp LOS	B	C	C	B	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1079			1357			457			132	
Approach Delay, s/veh		21.6			12.9			44.8			22.1	
Approach LOS		C			B			D			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.1	45.7		33.2		56.8		33.2				
Change Period (Y+Rc), s	4.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	10.0	37.0		29.0		51.0		29.0				
Max Q Clear Time (g_c+I1), s	7.1	21.6		6.3		17.7		28.0				
Green Ext Time (p_c), s	0.1	6.4		0.4		9.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		21.2	
HCM 6th LOS		C	



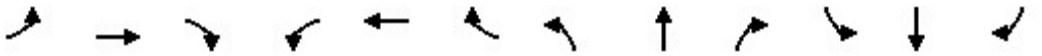
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	893	221	463	762	95	190	692	420	113	777	40
Future Volume (veh/h)	67	893	221	463	762	95	190	692	420	113	777	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1984	1984	1984	1984	1984	1984	1969	1969	1984	1984	1984
Adj Flow Rate, veh/h	87	1051	240	503	941	123	216	778	462	153	854	57
Peak Hour Factor	0.77	0.85	0.92	0.92	0.81	0.77	0.88	0.89	0.91	0.74	0.91	0.70
Percent Heavy Veh, %	2	1	1	1	1	1	1	2	2	1	1	1
Cap, veh/h	110	1159	657	703	1662	841	256	1099	789	236	967	65
Arrive On Green	0.06	0.31	0.30	0.19	0.44	0.43	0.10	0.29	0.29	0.07	0.27	0.26
Sat Flow, veh/h	1875	3770	1665	3666	3770	1670	1890	3741	1617	1890	3578	239
Grp Volume(v), veh/h	87	1051	240	503	941	123	216	778	462	153	450	461
Grp Sat Flow(s),veh/h/ln	1875	1885	1665	1833	1885	1670	1890	1870	1617	1890	1885	1932
Q Serve(g_s), s	6.2	36.1	6.9	17.3	25.1	5.3	11.1	25.0	5.2	7.9	30.9	30.9
Cycle Q Clear(g_c), s	6.2	36.1	6.9	17.3	25.1	5.3	11.1	25.0	5.2	7.9	30.9	30.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	110	1159	657	703	1662	841	256	1099	789	236	510	522
V/C Ratio(X)	0.79	0.91	0.37	0.72	0.57	0.15	0.84	0.71	0.59	0.65	0.88	0.88
Avail Cap(c_a), veh/h	167	1159	657	703	1662	841	296	1099	789	279	510	522
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)	0.95	0.95	0.95	0.70	0.70	0.70	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	62.8	44.9	11.4	51.1	28.1	18.0	35.4	42.5	11.2	35.4	47.2	47.3
Incr Delay (d2), s/veh	6.8	11.3	1.5	2.1	1.0	0.3	15.7	3.9	3.2	2.2	19.0	18.6
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	3.1	18.3	3.2	8.1	11.3	2.1	6.1	12.0	6.5	3.8	17.1	17.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	56.2	12.9	53.2	29.1	18.2	51.1	46.3	14.4	37.6	66.2	65.9
LnGrp LOS	E	E	B	D	C	B	D	D	B	D	E	E
Approach Vol, veh/h		1378			1567			1456			1064	
Approach Delay, s/veh		49.5			36.0			36.9			61.9	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	41.0	12.9	64.0	13.9	44.2	30.9	46.0
Change Period (Y+Rc), s	4.0	6.0	5.0	6.0	4.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	16.0	35.0	12.0	51.0	13.0	38.0	23.0	* 40
Max Q Clear Time (g_c+I1), s	13.1	32.9	8.2	27.1	9.9	27.0	19.3	38.1
Green Ext Time (p_c), s	0.1	1.2	0.0	4.5	0.0	5.1	0.3	1.1

Intersection Summary	
HCM 6th Ctrl Delay	44.7
HCM 6th LOS	D

Notes

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



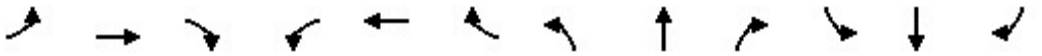
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	96	18	56	100	29	8	601	22	18	685	21
Future Volume (veh/h)	21	96	18	56	100	29	8	601	22	18	685	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.93		0.83	0.92		0.83	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	2000	2000	2000	2000	1953	1953	2000	1969	1969
Adj Flow Rate, veh/h	47	132	30	62	137	37	12	707	33	25	745	30
Peak Hour Factor	0.45	0.73	0.61	0.90	0.73	0.78	0.67	0.85	0.66	0.71	0.92	0.71
Percent Heavy Veh, %	1	1	1	0	0	0	0	3	3	0	2	2
Cap, veh/h	143	298	61	161	271	65	383	1133	53	402	1151	46
Arrive On Green	0.24	0.24	0.22	0.24	0.24	0.22	0.61	0.61	0.59	0.61	0.61	0.59
Sat Flow, veh/h	261	1229	250	324	1115	268	707	1849	86	730	1877	76
Grp Volume(v), veh/h	209	0	0	236	0	0	12	0	740	25	0	775
Grp Sat Flow(s),veh/h/ln	1740	0	0	1707	0	0	707	0	1935	730	0	1953
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	0.6	0.0	13.3	1.2	0.0	14.1
Cycle Q Clear(g_c), s	5.3	0.0	0.0	6.2	0.0	0.0	14.8	0.0	13.3	14.5	0.0	14.1
Prop In Lane	0.22		0.14	0.26		0.16	1.00		0.04	1.00		0.04
Lane Grp Cap(c), veh/h	502	0	0	496	0	0	383	0	1186	402	0	1197
V/C Ratio(X)	0.42	0.00	0.00	0.48	0.00	0.00	0.03	0.00	0.62	0.06	0.00	0.65
Avail Cap(c_a), veh/h	576	0	0	569	0	0	383	0	1186	402	0	1197
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	18.3	0.0	0.0	11.6	0.0	6.7	11.3	0.0	6.9
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	0.1	0.0	1.5	0.3	0.0	2.7
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	2.1	0.0	0.0	2.5	0.0	0.0	0.1	0.0	4.2	0.2	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	0.0	0.0	18.5	0.0	0.0	11.7	0.0	8.2	11.6	0.0	9.6
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		209			236			752			800	
Approach Delay, s/veh		18.2			18.5			8.3			9.7	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		17.5		38.0		17.5				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		33.0		15.0		33.0		15.0				
Max Q Clear Time (g_c+I1), s		16.8		7.3		16.5		8.2				
Green Ext Time (p_c), s		8.3		0.5		8.9		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			11.1									
HCM 6th LOS			B									

Notes

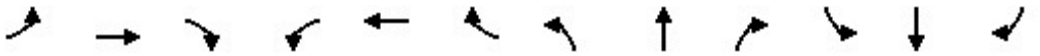
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	286	80	35	402	12	33	373	29	10	437	18
Future Volume (veh/h)	9	286	80	35	402	12	33	373	29	10	437	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	2000	2000	2000	1938	1938	1938	1969	1969	1969
Adj Flow Rate, veh/h	12	340	100	70	473	16	49	410	33	20	486	30
Peak Hour Factor	0.75	0.84	0.80	0.50	0.85	0.75	0.67	0.91	0.88	0.50	0.90	0.61
Percent Heavy Veh, %	1	1	1	0	0	0	4	4	4	2	2	2
Cap, veh/h	48	503	145	101	532	17	106	834	64	60	952	58
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.54	0.54	0.54	0.18	0.18	0.18
Sat Flow, veh/h	19	1458	420	161	1541	50	115	1550	120	33	1770	107
Grp Volume(v), veh/h	452	0	0	559	0	0	492	0	0	536	0	0
Grp Sat Flow(s),veh/h/ln	1897	0	0	1753	0	0	1785	0	0	1910	0	0
Q Serve(g_s), s	0.0	0.0	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.4	0.0	0.0	27.6	0.0	0.0	14.4	0.0	0.0	22.4	0.0	0.0
Prop In Lane	0.03		0.22	0.13		0.03	0.10		0.07	0.04		0.06
Lane Grp Cap(c), veh/h	696	0	0	650	0	0	1004	0	0	1069	0	0
V/C Ratio(X)	0.65	0.00	0.00	0.86	0.00	0.00	0.49	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	868	0	0	814	0	0	1004	0	0	1069	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.75	0.00	0.00	0.85	0.00	0.00
Uniform Delay (d), s/veh	25.3	0.0	0.0	28.0	0.0	0.0	12.9	0.0	0.0	26.3	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	6.5	0.0	0.0	1.3	0.0	0.0	1.4	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	0.0	12.2	0.0	0.0	6.1	0.0	0.0	12.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	0.0	34.5	0.0	0.0	14.2	0.0	0.0	27.7	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	B	A	A	C	A	A
Approach Vol, veh/h		452			559			492			536	
Approach Delay, s/veh		25.8			34.5			14.2			27.7	
Approach LOS		C			C			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		53.4		36.6		53.4		36.6				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		39.0		40.0		39.0		40.0				
Max Q Clear Time (g_c+I1), s		16.4		20.4		24.4		29.6				
Green Ext Time (p_c), s		6.2		1.9		5.3		2.0				

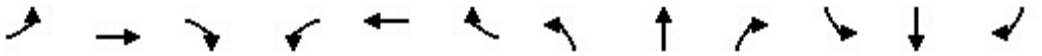
Intersection Summary												
HCM 6th Ctrl Delay			25.9									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	176	53	67	137	142	51	1729	68	176	1657	60
Future Volume (veh/h)	72	176	53	67	137	142	51	1729	68	176	1657	60
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		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1969	1969	2000	1922	1969	2000	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	87	232	62	78	180	161	61	1782	78	215	1691	74
Peak Hour Factor	0.83	0.76	0.85	0.86	0.76	0.88	0.84	0.97	0.87	0.82	0.98	0.81
Percent Heavy Veh, %	1	2	2	0	5	2	0	1	1	0	1	1
Cap, veh/h	221	358	96	162	460	474	218	3189	139	317	3672	161
Arrive On Green	0.24	0.24	0.22	0.24	0.24	0.22	1.00	1.00	1.00	0.12	1.00	1.00
Sat Flow, veh/h	1044	1494	399	1099	1922	1655	275	5320	233	1905	5320	233
Grp Volume(v), veh/h	87	0	294	78	180	161	61	1209	651	215	1148	617
Grp Sat Flow(s),veh/h/ln	1044	0	1893	1099	1922	1655	275	1806	1941	1905	1806	1941
Q Serve(g_s), s	10.3	0.0	18.9	9.3	10.6	10.4	0.0	0.0	0.0	6.2	0.0	0.0
Cycle Q Clear(g_c), s	20.9	0.0	18.9	28.2	10.6	10.4	0.0	0.0	0.0	6.2	0.0	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.12	1.00		0.12
Lane Grp Cap(c), veh/h	221	0	453	162	460	474	218	2165	1163	317	2493	1340
V/C Ratio(X)	0.39	0.00	0.65	0.48	0.39	0.34	0.28	0.56	0.56	0.68	0.46	0.46
Avail Cap(c_a), veh/h	226	0	463	168	470	482	218	2165	1163	398	2493	1340
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.29	0.29	0.29	0.76	0.76	0.76
Uniform Delay (d), s/veh	51.9	0.0	46.4	58.9	43.1	38.1	0.0	0.0	0.0	8.1	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	2.4	0.8	0.2	0.2	0.9	0.3	0.6	1.4	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	9.3	2.6	5.1	4.3	0.1	0.1	0.2	2.1	0.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	0.0	48.8	59.8	43.3	38.3	0.9	0.3	0.6	9.5	0.5	0.9
LnGrp LOS	D	A	D	E	D	D	A	A	A	A	A	A
Approach Vol, veh/h		381			419			1921			1980	
Approach Delay, s/veh		49.6			44.4			0.4			1.6	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.3	86.4		36.3		98.7		36.3				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	14.0	73.0		31.0		91.0		31.0				
Max Q Clear Time (g_c+I1), s	8.2	2.0		22.9		2.0		30.2				
Green Ext Time (p_c), s	0.1	25.5		0.9		19.5		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		8.8	
HCM 6th LOS		A	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	1357	249	82	1185	538	346	1112	40	473	835	49
Future Volume (veh/h)	60	1357	249	82	1185	538	346	1112	40	473	835	49
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	2000	1984	2000	1984	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	76	1459	0	114	1261	0	376	1196	0	493	938	0
Peak Hour Factor	0.79	0.93	0.76	0.72	0.94	0.88	0.92	0.93	0.89	0.96	0.89	0.69
Percent Heavy Veh, %	0	1	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	258	2788		228	1985		336	1934		579	1705	
Arrive On Green	0.01	0.17	0.00	0.06	0.70	0.00	0.36	0.71	0.00	0.05	0.10	0.00
Sat Flow, veh/h	1905	5417	1695	1890	3770	1682	1890	5596	0	3666	5596	0
Grp Volume(v), veh/h	76	1459	0	114	1261	0	376	1196	0	493	938	0
Grp Sat Flow(s),veh/h/ln	1905	1806	1695	1890	1885	1682	1890	1806	0	1833	1806	0
Q Serve(g_s), s	2.6	33.1	0.0	4.0	24.4	0.0	24.0	15.3	0.0	18.0	22.2	0.0
Cycle Q Clear(g_c), s	2.6	33.1	0.0	4.0	24.4	0.0	24.0	15.3	0.0	18.0	22.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	258	2788		228	1985		336	1934		579	1705	
V/C Ratio(X)	0.29	0.52		0.50	0.64		1.12	0.62		0.85	0.55	
Avail Cap(c_a), veh/h	295	2788		284	1985		336	1934		679	1705	
HCM Platoon Ratio	0.33	0.33	0.33	1.33	1.33	1.33	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.52	0.52	0.00	0.90	0.90	0.00	0.72	0.72	0.00	0.54	0.54	0.00
Uniform Delay (d), s/veh	18.6	41.0	0.0	20.9	13.2	0.0	43.5	14.6	0.0	62.4	51.4	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.0	0.6	1.4	0.0	78.4	1.1	0.0	4.5	0.7	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	1.1	16.1	0.0	1.7	7.8	0.0	16.2	4.2	0.0	9.2	10.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	41.3	0.0	21.5	14.7	0.0	121.9	15.7	0.0	66.9	52.1	0.0
LnGrp LOS	B	D		C	B		F	B		E	D	
Approach Vol, veh/h		1535	A		1375	A		1572	A		1431	A
Approach Delay, s/veh		40.2			15.2			41.1			57.2	
Approach LOS		D			B			D			E	

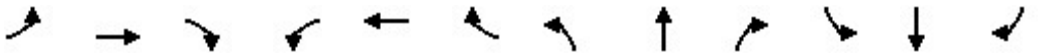
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	74.4	31.0	47.0	8.4	75.9	25.3	52.7
Change Period (Y+Rc), s	4.0	7.0	7.0	* 7	4.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	10.0	39.0	24.0	* 40	7.0	42.0	24.0	39.0
Max Q Clear Time (g_c+I1), s	6.0	35.1	26.0	24.2	4.6	26.4	20.0	17.3
Green Ext Time (p_c), s	0.0	2.8	0.0	5.4	0.0	7.5	0.3	8.2

Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Notes

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

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



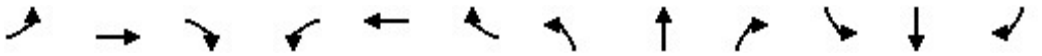
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	334	1042	47	176	791	175	113	1330	163	406	1203	272
Future Volume (veh/h)	334	1042	47	176	791	175	113	1330	163	406	1203	272
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1969	1969	2000	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	384	1226	63	202	833	182	135	1446	185	437	1322	286
Peak Hour Factor	0.87	0.85	0.75	0.87	0.95	0.96	0.84	0.92	0.88	0.93	0.91	0.95
Percent Heavy Veh, %	1	1	1	1	2	2	0	1	1	1	1	1
Cap, veh/h	461	1326	68	228	1148	249	162	1582	202	590	1821	394
Arrive On Green	0.13	0.25	0.24	0.12	0.26	0.25	0.03	0.11	0.10	0.05	0.14	0.13
Sat Flow, veh/h	3666	5267	271	1890	4394	953	1905	4853	621	3666	4448	962
Grp Volume(v), veh/h	384	841	448	202	678	337	135	1076	555	437	1073	535
Grp Sat Flow(s),veh/h/ln	1833	1806	1926	1890	1792	1764	1905	1806	1862	1833	1806	1798
Q Serve(g_s), s	13.8	30.6	30.7	14.2	23.3	23.6	9.5	39.8	39.8	15.9	38.5	38.5
Cycle Q Clear(g_c), s	13.8	30.6	30.7	14.2	23.3	23.6	9.5	39.8	39.8	15.9	38.5	38.5
Prop In Lane	1.00		0.14	1.00		0.54	1.00		0.33	1.00		0.53
Lane Grp Cap(c), veh/h	461	910	485	228	936	461	162	1177	607	590	1478	736
V/C Ratio(X)	0.83	0.92	0.92	0.89	0.72	0.73	0.83	0.91	0.91	0.74	0.73	0.73
Avail Cap(c_a), veh/h	543	910	485	280	936	461	212	1177	607	590	1478	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	0.33	0.33	0.33
Upstream Filter(I)	0.19	0.19	0.19	1.00	1.00	1.00	0.64	0.64	0.64	0.88	0.88	0.88
Uniform Delay (d), s/veh	57.6	49.2	49.4	58.5	45.4	46.1	64.7	58.4	58.5	61.1	51.1	51.3
Incr Delay (d2), s/veh	1.7	4.1	7.1	21.4	4.9	9.8	10.4	8.5	14.7	3.9	2.8	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	13.9	15.3	8.0	10.7	11.4	5.2	20.6	22.4	8.1	19.2	19.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.3	53.3	56.5	79.8	50.3	55.9	75.1	66.9	73.2	65.0	53.9	56.8
LnGrp LOS	E	D	E	E	D	E	E	E	E	E	D	E
Approach Vol, veh/h		1673			1217			1766			2045	
Approach Delay, s/veh		55.6			56.7			69.5			57.0	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	48.0	21.0	39.3	15.5	59.3	22.3	38.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	4.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	20.0	* 42	19.0	32.0	15.0	48.0	20.0	* 32
Max Q Clear Time (g_c+I1), s	17.9	41.8	15.8	25.6	11.5	40.5	16.2	32.7
Green Ext Time (p_c), s	0.2	0.1	0.2	2.4	0.0	5.2	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	59.9
HCM 6th LOS	E

Notes

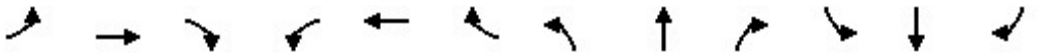
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	35	102	37	41	22	204	1731	54	37	1834	75
Future Volume (veh/h)	151	35	102	37	41	22	204	1731	54	37	1834	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	2000	2000	2000	1953	1953	1984	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	178	54	128	46	58	29	224	1945	67	49	1910	99
Peak Hour Factor	0.85	0.65	0.80	0.80	0.71	0.75	0.91	0.89	0.81	0.75	0.96	0.76
Percent Heavy Veh, %	1	0	0	0	3	3	1	1	1	0	1	1
Cap, veh/h	281	110	261	200	260	130	274	3850	132	189	3300	171
Arrive On Green	0.21	0.21	0.20	0.21	0.21	0.20	0.12	1.00	1.00	0.83	0.83	0.82
Sat Flow, veh/h	1307	516	1224	1212	1216	608	1890	5376	185	216	5272	273
Grp Volume(v), veh/h	178	0	182	46	0	87	224	1305	707	49	1307	702
Grp Sat Flow(s),veh/h/ln	1307	0	1740	1212	0	1824	1890	1806	1950	216	1806	1933
Q Serve(g_s), s	17.6	0.0	12.5	4.7	0.0	5.3	6.1	0.0	0.0	7.3	15.8	16.0
Cycle Q Clear(g_c), s	22.9	0.0	12.5	17.2	0.0	5.3	6.1	0.0	0.0	7.3	15.8	16.0
Prop In Lane	1.00		0.70	1.00		0.33	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	281	0	372	200	0	389	274	2586	1396	189	2261	1210
V/C Ratio(X)	0.63	0.00	0.49	0.23	0.00	0.22	0.82	0.50	0.51	0.26	0.58	0.58
Avail Cap(c_a), veh/h	321	0	425	237	0	446	356	2586	1396	189	2261	1210
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.82	0.82	0.82	0.51	0.51	0.51
Uniform Delay (d), s/veh	53.3	0.0	47.3	54.2	0.0	44.1	16.0	0.0	0.0	4.8	5.5	5.6
Incr Delay (d2), s/veh	2.0	0.0	0.4	0.2	0.0	0.1	7.0	0.6	1.1	1.7	0.6	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	6.0	0.0	5.6	1.5	0.0	2.5	4.7	0.2	0.4	0.3	3.8	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.3	0.0	47.7	54.4	0.0	44.2	23.0	0.6	1.1	6.5	6.1	6.7
LnGrp LOS	E	A	D	D	A	D	C	A	A	A	A	A
Approach Vol, veh/h		360			133			2236			2058	
Approach Delay, s/veh		51.4			47.8			3.0			6.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	12.2	90.0		32.8		102.2		32.8				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	14.0	73.0		31.0		91.0		31.0				
Max Q Clear Time (g_c+I1), s	8.1	18.0		24.9		2.0		19.2				
Green Ext Time (p_c), s	0.1	26.8		0.6		26.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		9.3	
HCM 6th LOS		A	



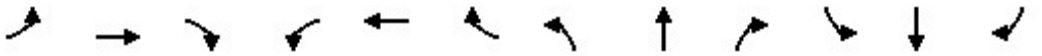
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	99	95	238	74	47	153	1510	450	50	1019	33
Future Volume (veh/h)	28	99	95	238	74	47	153	1510	450	50	1019	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.99		0.98	1.00		0.97	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	1938	1984	1953	2000	2000	2000	1984	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	46	124	136	248	103	50	182	1573	506	75	1132	41
Peak Hour Factor	0.61	0.80	0.70	0.96	0.72	0.94	0.84	0.96	0.89	0.67	0.90	0.80
Percent Heavy Veh, %	4	1	3	0	0	0	1	1	1	0	1	1
Cap, veh/h	203	248	200	354	356	173	427	2428	764	175	3078	111
Arrive On Green	0.13	0.13	0.13	0.13	0.28	0.27	0.06	0.60	0.58	0.06	1.00	1.00
Sat Flow, veh/h	1196	1984	1599	1905	1261	612	1890	4052	1275	1905	5363	194
Grp Volume(v), veh/h	46	124	136	248	0	153	182	1398	681	75	762	411
Grp Sat Flow(s),veh/h/ln	1196	1984	1599	1905	0	1873	1890	1806	1715	1905	1806	1946
Q Serve(g_s), s	4.7	7.9	11.0	15.1	0.0	8.7	5.4	34.2	36.1	2.3	0.0	0.0
Cycle Q Clear(g_c), s	4.7	7.9	11.0	15.1	0.0	8.7	5.4	34.2	36.1	2.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.74	1.00		0.10
Lane Grp Cap(c), veh/h	203	248	200	354	0	528	427	2164	1028	175	2073	1117
V/C Ratio(X)	0.23	0.50	0.68	0.70	0.00	0.29	0.43	0.65	0.66	0.43	0.37	0.37
Avail Cap(c_a), veh/h	239	309	249	394	0	624	491	2164	1028	230	2073	1117
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.00	0.68	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	53.7	55.1	56.5	43.8	0.0	38.2	10.5	17.7	18.6	17.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.6	3.1	2.5	0.0	0.1	0.3	1.5	3.4	0.5	0.4	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	1.5	4.0	4.6	7.3	0.0	4.0	2.1	13.6	14.3	0.9	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.9	55.7	59.6	46.4	0.0	38.2	10.8	19.2	22.0	18.0	0.4	0.7
LnGrp LOS	D	E	E	D	A	D	B	B	C	B	A	A
Approach Vol, veh/h		306			401			2261			1248	
Approach Delay, s/veh		57.2			43.3			19.4			1.6	
Approach LOS		E			D			B			A	

Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	81.5	21.2	20.9	8.1	84.9		42.1				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	12.0	64.0	20.0	19.0	8.0	68.0		43.0				
Max Q Clear Time (g_c+I1), s	7.4	2.0	17.1	13.0	4.3	38.1		10.7				
Green Ext Time (p_c), s	0.1	9.2	0.1	0.4	0.0	18.5		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		19.1	
HCM 6th LOS		B	

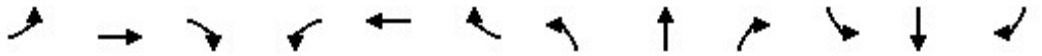
Notes

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



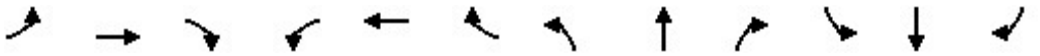
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	112	703	43	50	37	357	1370	48	61	1564	23
Future Volume (vph)	31	112	703	43	50	37	357	1370	48	61	1564	23
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89	0.85	1.00	0.95		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1886	1683	1599	1900	1877		1863	5370		1900	3747	
Flt Permitted	0.62	1.00	1.00	0.12	1.00		0.06	1.00		0.17	1.00	
Satd. Flow (perm)	1226	1683	1599	236	1877		124	5370		333	3747	
Peak-hour factor, PHF	0.63	0.90	0.95	0.88	0.63	0.82	0.86	0.97	0.77	0.56	1.00	0.61
Adj. Flow (vph)	49	124	740	49	79	45	415	1412	62	109	1564	38
RTOR Reduction (vph)	0	73	13	0	16	0	0	3	0	0	1	0
Lane Group Flow (vph)	49	369	409	49	108	0	415	1471	0	109	1601	0
Confl. Peds. (#/hr)	7					7	4					4
Confl. Bikes (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	2%	1%	2%	0%	1%	0%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	32.4	32.4	59.6	32.4	32.4		90.6	80.1		65.9	59.4	
Effective Green, g (s)	33.9	33.9	59.6	33.9	33.9		90.6	81.6		65.9	60.9	
Actuated g/C Ratio	0.25	0.25	0.44	0.25	0.25		0.67	0.60		0.49	0.45	
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0	1.5	2.0	2.0		1.5	3.0		1.5	3.0	
Lane Grp Cap (vph)	307	422	705	59	471		433	3245		238	1690	
v/s Ratio Prot		c0.22	0.12		0.06		c0.19	0.27		0.02	0.43	
v/s Ratio Perm	0.04		0.14	0.21			c0.45			0.20		
v/c Ratio	0.16	0.88	0.58	0.83	0.23		0.96	0.45		0.46	0.95	
Uniform Delay, d1	39.4	48.5	28.3	47.8	40.2		44.9	14.5		18.8	35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.44	0.71		1.85	1.49	
Incremental Delay, d2	0.1	17.5	0.7	58.6	0.1		24.6	0.3		0.4	9.6	
Delay (s)	39.5	66.0	29.0	106.5	40.3		89.3	10.6		35.0	62.7	
Level of Service	D	E	C	F	D		F	B		C	E	
Approach Delay (s)		47.5			59.0			27.9			60.9	
Approach LOS		D			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	213	47	26	202	2	34	747	22	0	914	27
Future Volume (vph)	39	213	47	26	202	2	34	747	22	0	914	27
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	1.00			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1878	1899		1900	1975			3697			3737	
Flt Permitted	0.47	1.00		0.39	1.00			0.80			1.00	
Satd. Flow (perm)	935	1899		781	1975			2958			3737	
Peak-hour factor, PHF	0.79	0.84	0.87	0.78	0.81	0.50	0.83	0.93	0.66	0.25	0.90	0.65
Adj. Flow (vph)	49	254	54	33	249	4	41	803	33	0	1016	42
RTOR Reduction (vph)	0	7	0	0	1	0	0	3	0	0	3	0
Lane Group Flow (vph)	49	301	0	33	252	0	0	874	0	0	1055	0
Confl. Peds. (#/hr)	7		9	9		7	3		6	6		3
Confl. Bikes (#/hr)							2					2
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		3 4 5			3 4 5			1 2			1 2	
Permitted Phases	3 4 5			3 4 5			1 2					
Actuated Green, G (s)	33.0	33.0		33.0	33.0			56.0			56.0	
Effective Green, g (s)	33.0	33.0		33.0	33.0			56.0			56.0	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.50			0.50	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	273	554		228	576			1465			1851	
v/s Ratio Prot		c0.16			0.13						0.28	
v/s Ratio Perm	0.05			0.04				c0.30				
v/c Ratio	0.18	0.54		0.14	0.44			0.60			0.57	
Uniform Delay, d1	29.9	33.7		29.6	32.5			20.4			20.0	
Progression Factor	1.00	1.00		0.10	0.09			1.00			0.23	
Incremental Delay, d2	0.1	0.6		0.0	0.1			0.7			0.4	
Delay (s)	30.0	34.2		3.1	3.1			21.1			5.0	
Level of Service	C	C		A	A			C			A	
Approach Delay (s)		33.7			3.1			21.1			5.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	191	106	0	0	0	0	736	0	28	707	0
Future Volume (vph)	0	191	106	0	0	0	0	736	0	28	707	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0						6.0			6.0	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		0.99						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.94						1.00			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		3514						3725			3711	
Flt Permitted		1.00						1.00			0.84	
Satd. Flow (perm)		3514						3725			3140	
Peak-hour factor, PHF	0.25	0.80	0.76	0.25	0.25	0.25	0.25	0.82	0.25	0.61	0.88	0.25
Adj. Flow (vph)	0	239	139	0	0	0	0	898	0	46	803	0
RTOR Reduction (vph)	0	73	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	305	0	0	0	0	0	898	0	0	849	0
Confl. Peds. (#/hr)	3		2	2		3	2		4	4		2
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%	0%	2%	0%	4%	2%	0%
Turn Type		NA						NA		Perm	NA	
Protected Phases		4 5 6						1 2 3			1 2 3	
Permitted Phases										1 2 3		
Actuated Green, G (s)		30.0						71.0			71.0	
Effective Green, g (s)		30.0						71.0			71.0	
Actuated g/C Ratio		0.27						0.63			0.63	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		932						2340			1972	
v/s Ratio Prot		c0.09						0.24				
v/s Ratio Perm											c0.27	
v/c Ratio		0.33						0.38			0.43	
Uniform Delay, d1		33.4						10.3			10.7	
Progression Factor		1.00						0.15			0.11	
Incremental Delay, d2		0.9						0.1			0.1	
Delay (s)		34.3						1.7			1.3	
Level of Service		C						A			A	
Approach Delay (s)		34.3			0.0			1.7			1.3	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

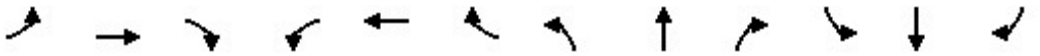
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	152	632	0	0	836	2	0	0	0	0	127	45
Future Volume (vph)	152	632	0	0	836	2	0	0	0	0	127	45
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0	6.0					6.0	
Lane Util. Factor	1.00	1.00			0.95	1.00					0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.98					0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00					1.00	
Frt	1.00	1.00			1.00	0.85					0.96	
Flt Protected	0.95	1.00			1.00	1.00					1.00	
Satd. Flow (prot)	1844	1980			3762	1666					3645	
Flt Permitted	0.18	1.00			1.00	1.00					1.00	
Satd. Flow (perm)	346	1980			3762	1666					3645	
Peak-hour factor, PHF	0.85	0.94	0.25	0.25	0.92	0.50	0.25	0.25	0.25	0.25	0.75	0.85
Adj. Flow (vph)	179	672	0	0	909	4	0	0	0	0	169	53
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	26	0
Lane Group Flow (vph)	179	672	0	0	909	2	0	0	0	0	196	0
Confl. Peds. (#/hr)	5		2	2		5				1		1
Heavy Vehicles (%)	3%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	D.P+P	NA			NA	Perm					NA	
Protected Phases	2 3	1 2 3			1						4 5 6	
Permitted Phases	1					1						
Actuated Green, G (s)	65.0	71.0			44.0	44.0					30.0	
Effective Green, g (s)	65.0	71.0			44.0	44.0					30.0	
Actuated g/C Ratio	0.58	0.63			0.39	0.39					0.27	
Clearance Time (s)					6.0	6.0						
Vehicle Extension (s)					3.0	3.0						
Lane Grp Cap (vph)	477	1244			1464	648					967	
v/s Ratio Prot	0.07	c0.34			c0.24						c0.05	
v/s Ratio Perm	0.15					0.00						
v/c Ratio	0.38	0.54			0.62	0.00					0.20	
Uniform Delay, d1	27.4	11.8			27.8	21.1					32.2	
Progression Factor	0.40	0.10			1.00	1.00					1.36	
Incremental Delay, d2	0.2	0.5			0.8	0.0					0.5	
Delay (s)	11.0	1.7			28.6	21.1					44.3	
Level of Service	B	A			C	C					D	
Approach Delay (s)		3.6			28.6			0.0			44.3	
Approach LOS		A			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2040 Base Condition AM Peak

Synchro Reports



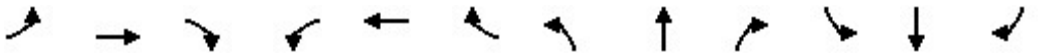
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	402	942	167	291	1492	528	307	1271	216	260	1292	319
Future Volume (veh/h)	402	942	167	291	1492	528	307	1271	216	260	1292	319
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	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	1984	1984	1953	1969	1984	1984	1984	1984	1984	1984	1969	1969
Adj Flow Rate, veh/h	437	1024	0	383	1695	607	357	1531	232	333	1436	0
Peak Hour Factor	0.92	0.92	0.85	0.76	0.88	0.87	0.86	0.83	0.93	0.78	0.90	0.77
Percent Heavy Veh, %	1	1	3	2	1	1	1	1	1	1	2	2
Cap, veh/h	445	2012		468	1427	777	393	1389	210	340	1497	
Arrive On Green	0.12	0.37	0.00	0.26	0.76	0.74	0.11	0.29	0.28	0.09	0.28	0.00
Sat Flow, veh/h	3666	5417	1655	3638	3770	1672	3666	4743	717	3666	5552	0
Grp Volume(v), veh/h	437	1024	0	383	1695	607	357	1165	598	333	1436	0
Grp Sat Flow(s),veh/h/ln	1833	1806	1655	1819	1885	1672	1833	1806	1848	1833	1792	0
Q Serve(g_s), s	16.6	20.5	0.0	13.9	53.0	0.0	13.5	41.0	41.0	12.7	36.8	0.0
Cycle Q Clear(g_c), s	16.6	20.5	0.0	13.9	53.0	0.0	13.5	41.0	41.0	12.7	36.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		0.00
Lane Grp Cap(c), veh/h	445	2012		468	1427	777	393	1058	541	340	1497	
V/C Ratio(X)	0.98	0.51		0.82	1.19	0.78	0.91	1.10	1.10	0.98	0.96	
Avail Cap(c_a), veh/h	445	2012		468	1427	777	393	1058	541	340	1497	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.84	0.84	0.84	0.86	0.86	0.86	0.18	0.18	0.00
Uniform Delay (d), s/veh	61.3	34.1	0.0	50.5	17.0	9.6	61.8	49.5	49.9	63.4	49.7	0.0
Incr Delay (d2), s/veh	37.6	0.9	0.0	8.8	90.6	6.5	21.5	58.2	68.1	15.7	4.1	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	10.0	9.0	0.0	6.0	24.8	6.5	7.4	26.6	28.8	6.6	16.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.9	35.0	0.0	59.3	107.6	16.1	83.3	107.7	118.0	79.1	53.9	0.0
LnGrp LOS	F	D		E	F	B	F	F	F	E	D	
Approach Vol, veh/h		1461	A		2685			2120			1769	A
Approach Delay, s/veh		54.1			80.0			106.5			58.6	
Approach LOS		D			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	45.0	21.0	57.0	19.0	43.0	22.0	56.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	12.0	39.0	16.0	51.0	14.0	37.0	17.0	50.0
Max Q Clear Time (g_c+I1), s	14.7	43.0	18.6	55.0	15.5	38.8	15.9	22.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	4.9

Intersection Summary	
HCM 6th Ctrl Delay	77.6
HCM 6th LOS	E

Notes

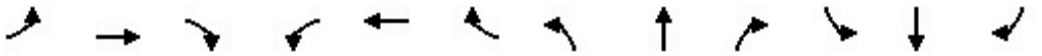
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1101	52	96	1113	18	141	454	146	52	399	28
Future Volume (veh/h)	11	1101	52	96	1113	18	141	454	146	52	399	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.93	0.99		0.96	0.99		0.96
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	2000	1953	1969	1969	1938	1906	2000	1953	1953	1969	1938	1938
Adj Flow Rate, veh/h	17	1251	76	145	1309	45	158	488	203	81	464	41
Peak Hour Factor	0.63	0.88	0.68	0.66	0.85	0.40	0.89	0.93	0.72	0.64	0.86	0.69
Percent Heavy Veh, %	0	3	2	2	4	6	0	3	3	2	4	4
Cap, veh/h	170	1543	641	228	1898	779	245	616	579	208	551	447
Arrive On Green	0.42	0.42	0.42	0.06	0.52	0.52	0.08	0.32	0.30	0.01	0.09	0.09
Sat Flow, veh/h	409	3711	1541	1875	3681	1510	1905	1953	1586	1875	1938	1570
Grp Volume(v), veh/h	17	1251	76	145	1309	45	158	488	203	81	464	41
Grp Sat Flow(s),veh/h/ln	409	1856	1541	1875	1841	1510	1905	1953	1586	1875	1938	1570
Q Serve(g_s), s	3.4	31.2	3.2	4.6	28.1	1.6	6.1	23.9	9.8	3.3	24.7	2.5
Cycle Q Clear(g_c), s	21.0	31.2	3.2	4.6	28.1	1.6	6.1	23.9	9.8	3.3	24.7	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	170	1543	641	228	1898	779	245	616	579	208	551	447
V/C Ratio(X)	0.10	0.81	0.12	0.64	0.69	0.06	0.65	0.79	0.35	0.39	0.84	0.09
Avail Cap(c_a), veh/h	170	1543	641	272	1898	779	245	623	586	230	581	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.92	0.92	0.92	0.88	0.88	0.88	0.76	0.76	0.76	0.93	0.93	0.93
Uniform Delay (d), s/veh	30.9	27.0	18.9	22.9	19.1	12.7	27.4	32.8	24.5	28.9	45.3	35.2
Incr Delay (d2), s/veh	1.1	4.4	0.3	1.7	1.8	0.1	3.5	4.9	0.1	0.4	9.0	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	0.4	14.3	1.2	2.0	11.7	0.5	3.0	12.0	3.7	1.5	14.2	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	31.4	19.2	24.6	20.9	12.8	30.9	37.7	24.6	29.3	54.3	35.2
LnGrp LOS	C	C	B	C	C	B	C	D	C	C	D	D
Approach Vol, veh/h		1344			1499			849			586	
Approach Delay, s/veh		30.7			21.1			33.3			49.5	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	10.5	48.2	8.8	37.6		58.6	12.0	34.4				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s	9.0	38.0	6.0	32.0		51.0	8.0	30.0				
Max Q Clear Time (g_c+I1), s	6.6	33.2	5.3	25.9		30.1	8.1	26.7				
Green Ext Time (p_c), s	0.0	3.4	0.0	1.4		10.1	0.0	0.7				

Intersection Summary												
HCM 6th Ctrl Delay			30.4									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	17	101	108	52	56	55	1592	125	75	1643	75
Future Volume (veh/h)	55	17	101	108	52	56	55	1592	125	75	1643	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	2000	2000	1984	1969	1969	1922	1953	1906	2000	1953	1953
Adj Flow Rate, veh/h	81	30	136	150	79	0	80	1851	0	95	1867	115
Peak Hour Factor	0.68	0.57	0.74	0.72	0.66	0.75	0.69	0.86	0.85	0.79	0.88	0.65
Percent Heavy Veh, %	2	0	0	1	2	2	5	3	6	0	3	3
Cap, veh/h	251	33	148	177	158		219	3447		294	3331	205
Arrive On Green	0.08	0.10	0.09	0.06	0.08	0.00	0.06	1.00	0.00	0.03	0.65	0.64
Sat Flow, veh/h	1875	311	1411	1890	1969	1668	1830	5332	1616	1905	5128	315
Grp Volume(v), veh/h	81	0	166	150	79	0	80	1851	0	95	1293	689
Grp Sat Flow(s),veh/h/ln	1875	0	1722	1890	1969	1668	1830	1777	1616	1905	1777	1888
Q Serve(g_s), s	0.0	0.0	10.0	4.4	4.0	0.0	1.6	0.0	0.0	1.8	21.0	21.3
Cycle Q Clear(g_c), s	0.0	0.0	10.0	4.4	4.0	0.0	1.6	0.0	0.0	1.8	21.0	21.3
Prop In Lane	1.00		0.82	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	251	0	180	177	158		219	3447		294	2309	1226
V/C Ratio(X)	0.32	0.00	0.92	0.85	0.50		0.37	0.54		0.32	0.56	0.56
Avail Cap(c_a), veh/h	251	0	180	177	206		335	3447		428	2309	1226
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.81	0.81	0.00	0.60	0.60	0.60
Uniform Delay (d), s/veh	43.8	0.0	47.4	47.7	46.3	0.0	9.2	0.0	0.0	6.1	10.1	10.2
Incr Delay (d2), s/veh	0.3	0.0	44.0	29.1	0.9	0.0	0.3	0.5	0.0	0.1	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	6.6	5.2	2.0	0.0	0.5	0.2	0.0	0.6	7.2	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	0.0	91.4	76.8	47.2	0.0	9.5	0.5	0.0	6.3	10.7	11.4
LnGrp LOS	D	A	F	E	D		A	A		A	B	B
Approach Vol, veh/h		247			229	A		1931	A		2077	
Approach Delay, s/veh		75.9			66.6			0.9			10.7	
Approach LOS		E			E			A			B	

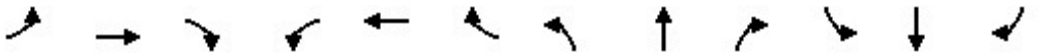
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	72.4	10.0	15.0	7.3	72.7	12.6	12.4
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	11.0	59.0	6.0	9.0	10.0	60.0	6.0	9.0
Max Q Clear Time (g_c+I1), s	3.8	2.0	6.4	12.0	3.6	23.3	2.0	6.0
Green Ext Time (p_c), s	0.0	21.7	0.0	0.0	0.0	19.8	0.0	0.0

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

Notes

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

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



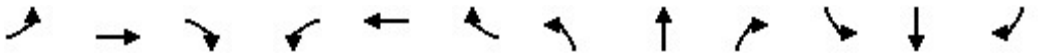
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	17	5	70	10	127	6	1731	59	72	1521	11
Future Volume (veh/h)	17	17	5	70	10	127	6	1731	59	72	1521	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.93	0.97		0.94	1.00		0.97	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	2000	2000	2000	2000	2000	2000	2000	1984	1984	2000	1969	1969
Adj Flow Rate, veh/h	19	24	10	80	15	140	12	1923	87	82	1789	13
Peak Hour Factor	0.88	0.70	0.50	0.88	0.67	0.91	0.50	0.90	0.68	0.88	0.85	0.83
Percent Heavy Veh, %	0	0	0	0	0	0	0	1	1	0	2	2
Cap, veh/h	89	98	33	223	210	167	259	3953	178	247	4455	32
Arrive On Green	0.10	0.10	0.09	0.10	0.10	0.10	0.74	0.74	0.74	0.03	0.81	0.80
Sat Flow, veh/h	408	933	312	1357	2000	1593	265	5306	239	1905	5504	40
Grp Volume(v), veh/h	53	0	0	80	15	140	12	1307	703	82	1165	637
Grp Sat Flow(s),veh/h/ln	1652	0	0	1357	2000	1593	265	1806	1934	1905	1792	1960
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.7	9.1	1.4	15.2	15.3	1.0	9.6	9.6
Cycle Q Clear(g_c), s	2.7	0.0	0.0	4.8	0.7	9.1	4.3	15.2	15.3	1.0	9.6	9.6
Prop In Lane	0.36		0.19	1.00		1.00	1.00		0.12	1.00		0.02
Lane Grp Cap(c), veh/h	220	0	0	223	210	167	259	2690	1441	247	2901	1587
V/C Ratio(X)	0.24	0.00	0.00	0.36	0.07	0.84	0.05	0.49	0.49	0.33	0.40	0.40
Avail Cap(c_a), veh/h	220	0	0	223	210	167	259	2690	1441	396	2901	1587
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	1.00	1.00	0.36	0.36	0.36	0.09	0.09	0.09
Uniform Delay (d), s/veh	43.5	0.0	0.0	44.1	42.4	46.1	4.4	5.4	5.4	4.9	2.8	2.8
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.1	28.5	0.1	0.2	0.4	0.0	0.0	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	1.3	0.0	0.0	2.0	0.4	4.9	0.1	4.3	4.7	0.3	1.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	0.0	0.0	44.4	42.4	74.6	4.5	5.6	5.8	5.0	2.9	2.9
LnGrp LOS	D	A	A	D	D	E	A	A	A	A	A	A
Approach Vol, veh/h		53			235			2022			1884	
Approach Delay, s/veh		43.7			62.3			5.7			3.0	
Approach LOS		D			E			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.8	83.2		15.0		90.0		15.0				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	11.0	69.0		9.0		84.0		9.0				
Max Q Clear Time (g_c+I1), s	3.0	17.3		11.1		11.6		4.7				
Green Ext Time (p_c), s	0.0	24.3		0.0		20.9		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		8.1
HCM 6th LOS		A

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	140	232	42	42	33	131	1468	30	54	1977	149
Future Volume (veh/h)	249	140	232	42	42	33	131	1468	30	54	1977	149
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.98	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	1969	1875	1953	2000	1953	1563	1984	1969	1969	1922	1969	1969
Adj Flow Rate, veh/h	296	280	294	79	58	48	164	1596	42	79	2221	171
Peak Hour Factor	0.84	0.50	0.79	0.53	0.73	0.69	0.80	0.92	0.72	0.68	0.89	0.87
Percent Heavy Veh, %	2	8	3	0	3	28	1	2	2	5	2	2
Cap, veh/h	320	286	247	164	229	151	319	3269	86	306	2688	204
Arrive On Green	0.09	0.15	0.15	0.05	0.12	0.12	0.19	1.00	1.00	0.07	1.00	1.00
Sat Flow, veh/h	1875	1875	1620	1905	1953	1293	1890	5381	142	1830	5085	387
Grp Volume(v), veh/h	296	280	294	79	58	48	164	1063	575	79	1557	835
Grp Sat Flow(s),veh/h/ln	1875	1875	1620	1905	1953	1293	1890	1792	1939	1830	1792	1888
Q Serve(g_s), s	9.0	15.6	11.7	3.9	2.8	3.6	0.0	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	9.0	15.6	11.7	3.9	2.8	3.6	0.0	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.20
Lane Grp Cap(c), veh/h	320	286	247	164	229	151	319	2177	1178	306	1894	998
V/C Ratio(X)	0.93	0.98	1.19	0.48	0.25	0.32	0.51	0.49	0.49	0.26	0.82	0.84
Avail Cap(c_a), veh/h	320	286	247	232	298	197	319	2177	1178	351	1894	998
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89	0.79	0.79	0.79
Uniform Delay (d), s/veh	42.4	44.3	23.9	40.2	42.2	42.5	26.4	0.0	0.0	7.4	0.0	0.0
Incr Delay (d2), s/veh	31.1	47.4	118.8	0.8	0.2	0.4	0.6	0.7	1.3	0.1	3.3	6.7
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	5.8	10.9	12.6	1.9	1.4	1.2	3.4	0.2	0.4	0.6	0.9	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	91.7	142.7	41.0	42.4	43.0	26.9	0.7	1.3	7.6	3.3	6.7
LnGrp LOS	E	F	F	D	D	D	C	A	A	A	A	A
Approach Vol, veh/h		870			185			1802			2471	
Approach Delay, s/veh		102.8			42.0			3.3			4.6	
Approach LOS		F			D			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	68.3	9.3	20.0	15.7	60.0	13.0	16.3
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	6.0	* 6	4.0	6.0
Max Green Setting (Gmax), s	6.0	56.0	9.0	14.0	8.0	* 54	9.0	14.0
Max Q Clear Time (g_c+I1), s	3.8	2.0	5.9	17.6	2.0	2.0	11.0	5.6
Green Ext Time (p_c), s	0.0	8.6	0.0	0.0	0.0	19.3	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

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

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

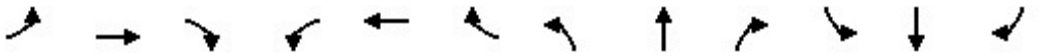
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	865	164	383	1067	434	197	1291	185	210	1143	133
Future Volume (veh/h)	258	865	164	383	1067	434	197	1291	185	210	1143	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	1984	1969	1969	1906	1969	1969	1938	1969	1938	1969	1969	1938
Adj Flow Rate, veh/h	284	1123	256	416	1442	529	263	1537	218	256	1299	175
Peak Hour Factor	0.91	0.77	0.64	0.92	0.74	0.82	0.75	0.84	0.85	0.82	0.88	0.76
Percent Heavy Veh, %	1	2	2	6	2	2	4	2	4	2	2	4
Cap, veh/h	288	1338	305	490	1450	523	332	1804	756	737	2432	846
Arrive On Green	0.08	0.31	0.29	0.05	0.12	0.12	0.09	0.34	0.33	0.20	0.45	0.45
Sat Flow, veh/h	3666	4355	992	3522	3871	1397	3580	5375	1607	3638	5375	1611
Grp Volume(v), veh/h	284	924	455	416	1333	638	263	1537	218	256	1299	175
Grp Sat Flow(s),veh/h/ln	1833	1792	1764	1761	1792	1684	1790	1792	1607	1819	1792	1611
Q Serve(g_s), s	10.8	33.7	33.8	16.4	52.0	52.5	10.1	37.2	0.0	8.5	24.4	8.1
Cycle Q Clear(g_c), s	10.8	33.7	33.8	16.4	52.0	52.5	10.1	37.2	0.0	8.5	24.4	8.1
Prop In Lane	1.00		0.56	1.00		0.83	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	288	1101	542	490	1343	631	332	1804	756	737	2432	846
V/C Ratio(X)	0.99	0.84	0.84	0.85	0.99	1.01	0.79	0.85	0.29	0.35	0.53	0.21
Avail Cap(c_a), veh/h	288	1101	542	503	1343	631	332	1804	756	737	2432	846
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.95	0.95	0.95	0.85	0.85	0.85	0.91	0.91	0.91
Uniform Delay (d), s/veh	64.4	45.3	45.8	65.3	61.2	61.6	62.2	43.3	22.9	47.9	27.7	17.8
Incr Delay (d2), s/veh	48.4	7.6	14.3	11.5	22.3	37.6	9.7	4.6	0.8	0.1	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	15.8	16.7	8.6	29.2	30.4	4.9	16.7	4.5	3.8	10.4	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.8	52.9	60.1	76.8	83.4	99.2	71.9	47.8	23.7	48.0	28.4	18.3
LnGrp LOS	F	D	E	E	F	F	E	D	C	D	C	B
Approach Vol, veh/h		1663			2387			2018			1730	
Approach Delay, s/veh		65.1			86.5			48.4			30.3	
Approach LOS		E			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.8	51.0	15.0	56.5	17.0	67.8	24.5	47.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	13.0	* 45	10.0	50.0	12.0	46.0	19.0	* 41
Max Q Clear Time (g_c+I1), s	10.5	39.2	12.8	54.5	12.1	26.4	18.4	35.8
Green Ext Time (p_c), s	0.1	4.4	0.0	0.0	0.0	9.5	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	59.6
HCM 6th LOS	E

Notes

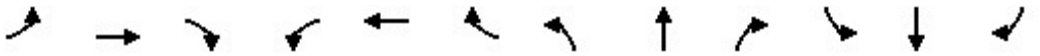
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	931	145	147	801	8	163	60	154	9	54	7
Future Volume (veh/h)	8	931	145	147	801	8	163	60	154	9	54	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	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	2000	1969	1969	1969	1953	1953	1969	1969	1969	2000	2000	2000
Adj Flow Rate, veh/h	18	1034	163	181	921	14	181	77	181	13	72	14
Peak Hour Factor	0.44	0.90	0.89	0.81	0.87	0.58	0.90	0.78	0.85	0.67	0.75	0.50
Percent Heavy Veh, %	0	2	2	2	3	3	2	2	2	0	0	0
Cap, veh/h	369	1668	263	318	2317	35	241	89	197	82	429	78
Arrive On Green	0.52	0.52	0.51	0.06	0.62	0.61	0.10	0.10	0.10	0.30	0.30	0.30
Sat Flow, veh/h	607	3220	507	1875	3739	57	633	292	649	143	1411	256
Grp Volume(v), veh/h	18	600	597	181	457	478	439	0	0	99	0	0
Grp Sat Flow(s),veh/h/ln	607	1870	1856	1875	1856	1941	1573	0	0	1809	0	0
Q Serve(g_s), s	1.6	23.9	24.1	4.6	13.1	13.1	25.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.0	23.9	24.1	4.6	13.1	13.1	28.9	0.0	0.0	3.9	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.03	0.41		0.41	0.13		0.14
Lane Grp Cap(c), veh/h	369	969	962	318	1150	1202	527	0	0	589	0	0
V/C Ratio(X)	0.05	0.62	0.62	0.57	0.40	0.40	0.83	0.00	0.00	0.17	0.00	0.00
Avail Cap(c_a), veh/h	369	969	962	449	1150	1202	528	0	0	590	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.8	17.9	18.1	15.0	10.1	10.1	45.5	0.0	0.0	26.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	3.0	3.0	0.6	1.0	1.0	9.1	0.0	0.0	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	0.2	10.5	10.5	1.8	5.2	5.4	13.6	0.0	0.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	20.9	21.1	15.6	11.1	11.1	54.6	0.0	0.0	26.8	0.0	0.0
LnGrp LOS	B	C	C	B	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1215			1116			439			99	
Approach Delay, s/veh		20.9			11.8			54.6			26.8	
Approach LOS		C			B			D			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.6	58.4		36.0		69.0		36.0				
Change Period (Y+Rc), s	4.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	14.0	46.0		31.0		64.0		31.0				
Max Q Clear Time (g_c+I1), s	6.6	26.1		5.9		15.1		30.9				
Green Ext Time (p_c), s	0.1	8.3		0.3		7.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		22.7	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	841	158	494	1283	155	269	747	500	104	698	47
Future Volume (veh/h)	71	841	158	494	1283	155	269	747	500	104	698	47
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1969	1969	1953	1969	1969	2000	1969	1984	1969	1969	1969
Adj Flow Rate, veh/h	101	1001	203	642	1336	194	336	900	625	144	735	58
Peak Hour Factor	0.70	0.84	0.78	0.77	0.96	0.80	0.80	0.83	0.80	0.72	0.95	0.81
Percent Heavy Veh, %	2	2	2	3	2	2	0	2	1	2	2	2
Cap, veh/h	124	1105	721	696	1552	784	360	1189	849	218	833	66
Arrive On Green	0.07	0.30	0.28	0.19	0.41	0.40	0.15	0.32	0.31	0.07	0.24	0.23
Sat Flow, veh/h	1875	3741	1638	3609	3741	1641	1905	3741	1670	1875	3509	277
Grp Volume(v), veh/h	101	1001	203	642	1336	194	336	900	625	144	392	401
Grp Sat Flow(s),veh/h/ln	1875	1870	1638	1804	1870	1641	1905	1870	1670	1875	1870	1916
Q Serve(g_s), s	7.4	36.0	11.1	24.5	45.5	9.8	19.3	30.3	41.2	8.2	28.3	28.3
Cycle Q Clear(g_c), s	7.4	36.0	11.1	24.5	45.5	9.8	19.3	30.3	41.2	8.2	28.3	28.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	124	1105	721	696	1552	784	360	1189	849	218	444	455
V/C Ratio(X)	0.81	0.91	0.28	0.92	0.86	0.25	0.93	0.76	0.74	0.66	0.88	0.88
Avail Cap(c_a), veh/h	147	1105	721	696	1552	784	395	1189	849	230	444	455
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)	0.97	0.97	0.97	0.60	0.60	0.60	1.00	1.00	1.00	0.99	0.99	0.99
Uniform Delay (d), s/veh	64.5	47.4	25.3	55.5	37.3	21.7	39.1	42.9	27.2	39.5	51.5	51.6
Incr Delay (d2), s/veh	20.8	11.9	0.9	11.8	4.0	0.5	27.0	4.5	5.6	4.8	21.3	21.0
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	4.2	18.3	4.5	12.1	21.0	3.8	11.6	14.5	17.1	4.0	15.7	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.3	59.3	26.2	67.3	41.3	22.2	66.1	47.4	32.8	44.3	72.8	72.6
LnGrp LOS	F	E	C	E	D	C	E	D	C	D	E	E
Approach Vol, veh/h		1305			2172			1861			937	
Approach Delay, s/veh		56.2			47.3			45.9			68.4	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.4	37.7	14.3	62.6	14.1	49.0	31.0	45.9
Change Period (Y+Rc), s	4.0	6.0	5.0	6.0	4.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	24.0	30.0	11.0	54.0	11.0	43.0	26.0	39.0
Max Q Clear Time (g_c+I1), s	21.3	30.3	9.4	47.5	10.2	43.2	26.5	38.0
Green Ext Time (p_c), s	0.1	0.0	0.0	3.6	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	51.9
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	129	15	50	136	36	9	636	19	11	550	25
Future Volume (veh/h)	27	129	15	50	136	36	9	636	19	11	550	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.90	0.97		0.90	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	1984	1984	1984	2000	2000	2000	2000	1969	1969	2000	1953	1953
Adj Flow Rate, veh/h	63	235	23	63	192	54	18	684	27	17	598	45
Peak Hour Factor	0.43	0.55	0.65	0.79	0.71	0.67	0.50	0.93	0.71	0.63	0.92	0.55
Percent Heavy Veh, %	1	1	1	0	0	0	0	2	2	0	3	3
Cap, veh/h	141	350	32	143	297	77	460	1147	45	419	1094	82
Arrive On Green	0.25	0.25	0.23	0.25	0.25	0.23	0.61	0.61	0.59	0.61	0.61	0.59
Sat Flow, veh/h	259	1422	130	266	1205	311	799	1881	74	750	1793	135
Grp Volume(v), veh/h	321	0	0	309	0	0	18	0	711	17	0	643
Grp Sat Flow(s),veh/h/ln	1811	0	0	1782	0	0	799	0	1955	750	0	1928
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.8	0.0	12.4	0.8	0.0	10.9
Cycle Q Clear(g_c), s	8.6	0.0	0.0	8.3	0.0	0.0	11.7	0.0	12.4	13.2	0.0	10.9
Prop In Lane	0.20		0.07	0.20		0.17	1.00		0.04	1.00		0.07
Lane Grp Cap(c), veh/h	524	0	0	517	0	0	460	0	1193	419	0	1176
V/C Ratio(X)	0.61	0.00	0.00	0.60	0.00	0.00	0.04	0.00	0.60	0.04	0.00	0.55
Avail Cap(c_a), veh/h	592	0	0	584	0	0	460	0	1193	419	0	1176
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	0.0	19.0	0.0	0.0	9.8	0.0	6.7	10.7	0.0	6.4
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.7	0.0	0.0	0.1	0.0	1.3	0.2	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	3.4	0.0	0.0	0.1	0.0	4.0	0.1	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	0.0	0.0	19.7	0.0	0.0	9.8	0.0	7.9	10.9	0.0	8.2
LnGrp LOS	B	A	A	B	A	A	A	A	A	B	A	A
Approach Vol, veh/h		321			309			729			660	
Approach Delay, s/veh		19.9			19.7			8.0			8.3	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		17.7		38.0		17.7				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		33.0		15.0		33.0		15.0				
Max Q Clear Time (g_c+I1), s		14.4		10.6		15.2		10.3				
Green Ext Time (p_c), s		8.7		0.6		7.5		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			11.8									
HCM 6th LOS			B									

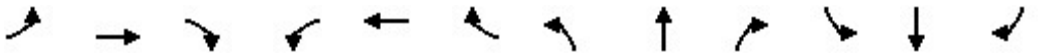
Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	9	286	47	50	257	14	41	383	25	3	372	6
Future Volume (veh/h)	9	286	47	50	257	14	41	383	25	3	372	6
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	2000	2000	2000	1969	1969	1969	1953	1953	1953	1953	1953	1953
Adj Flow Rate, veh/h	13	397	55	68	295	28	59	426	36	8	418	19
Peak Hour Factor	0.67	0.72	0.85	0.73	0.87	0.50	0.69	0.90	0.69	0.38	0.89	0.31
Percent Heavy Veh, %	0	0	0	2	2	2	3	3	3	3	3	3
Cap, veh/h	42	491	67	94	342	31	129	920	75	42	1116	50
Arrive On Green	0.29	0.29	0.30	0.29	0.29	0.30	1.00	1.00	1.00	0.20	0.20	0.20
Sat Flow, veh/h	23	1690	230	186	1177	105	150	1510	123	11	1832	82
Grp Volume(v), veh/h	465	0	0	391	0	0	521	0	0	445	0	0
Grp Sat Flow(s),veh/h/ln	1942	0	0	1468	0	0	1783	0	0	1925	0	0
Q Serve(g_s), s	0.0	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	23.3	0.0	0.0	27.5	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.0
Prop In Lane	0.03		0.12	0.17		0.07	0.11		0.07	0.02		0.04
Lane Grp Cap(c), veh/h	600	0	0	467	0	0	1125	0	0	1208	0	0
V/C Ratio(X)	0.78	0.00	0.00	0.84	0.00	0.00	0.46	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	836	0	0	669	0	0	1125	0	0	1208	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.62	0.00	0.00	0.88	0.00	0.00
Uniform Delay (d), s/veh	34.6	0.0	0.0	35.5	0.0	0.0	0.0	0.0	0.0	24.7	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	0.0	4.4	0.0	0.0	0.9	0.0	0.0	0.8	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	11.2	0.0	0.0	10.2	0.0	0.0	0.3	0.0	0.0	11.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	0.0	0.0	39.9	0.0	0.0	0.9	0.0	0.0	25.5	0.0	0.0
LnGrp LOS	D	A	A	D	A	A	A	A	A	C	A	A
Approach Vol, veh/h		465			391			521			445	
Approach Delay, s/veh		36.5			39.9			0.9			25.5	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	69.0	36.0	69.0	36.0
Change Period (Y+Rc), s	6.0	5.0	6.0	5.0
Max Green Setting (Gmax), s	50.0	44.0	50.0	44.0
Max Q Clear Time (g_c+I1), s	2.0	25.3	22.8	29.5
Green Ext Time (p_c), s	8.5	1.9	5.8	1.5

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	191	52	116	180	211	34	1617	82	193	1955	29
Future Volume (veh/h)	38	191	52	116	180	211	34	1617	82	193	1955	29
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		0.99	1.00		0.99	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	2000	1938	1938	1984	1984	1938	1938	1969	1969	1984	1969	1969
Adj Flow Rate, veh/h	42	251	78	145	217	274	45	1838	137	251	2300	39
Peak Hour Factor	0.91	0.76	0.67	0.80	0.83	0.77	0.75	0.88	0.60	0.77	0.85	0.75
Percent Heavy Veh, %	0	4	4	1	1	4	4	2	2	1	2	2
Cap, veh/h	280	445	138	244	624	637	139	2361	175	279	3240	55
Arrive On Green	0.31	0.31	0.30	0.31	0.31	0.30	0.46	0.46	0.45	0.19	1.00	1.00
Sat Flow, veh/h	918	1416	440	1057	1984	1634	152	5102	379	1890	5443	92
Grp Volume(v), veh/h	42	0	329	145	217	274	45	1289	686	251	1513	826
Grp Sat Flow(s),veh/h/ln	918	0	1856	1057	1984	1634	152	1792	1898	1890	1792	1952
Q Serve(g_s), s	3.9	0.0	15.6	13.9	8.8	12.9	23.8	31.7	32.0	7.8	0.0	0.0
Cycle Q Clear(g_c), s	12.7	0.0	15.6	29.5	8.8	12.9	23.8	31.7	32.0	7.8	0.0	0.0
Prop In Lane	1.00		0.24	1.00		1.00	1.00		0.20	1.00		0.05
Lane Grp Cap(c), veh/h	280	0	583	244	624	637	139	1658	878	279	2133	1162
V/C Ratio(X)	0.15	0.00	0.56	0.59	0.35	0.43	0.32	0.78	0.78	0.90	0.71	0.71
Avail Cap(c_a), veh/h	280	0	583	244	624	637	139	1658	878	389	2133	1162
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.45	0.45	0.45	0.67	0.67	0.67
Uniform Delay (d), s/veh	32.6	0.0	30.2	42.3	27.7	23.5	21.5	23.7	23.9	20.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.8	2.7	0.1	0.2	2.8	1.7	3.2	10.9	1.4	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	7.0	3.8	4.2	4.9	0.9	12.6	13.9	3.3	0.4	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	0.0	31.0	45.0	27.8	23.7	24.3	25.3	27.0	31.7	1.4	2.5
LnGrp LOS	C	A	C	D	C	C	C	C	C	C	A	A
Approach Vol, veh/h		371			636			2020			2590	
Approach Delay, s/veh		31.2			30.0			25.9			4.7	
Approach LOS		C			C			C			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	13.9	54.1		37.0		68.0		37.0				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	16.0	41.0		31.0		61.0		31.0				
Max Q Clear Time (g_c+I1), s	9.8	34.0		17.6		2.0		31.5				
Green Ext Time (p_c), s	0.1	6.0		1.2		31.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		16.9	
HCM 6th LOS		B	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	1234	415	34	2063	541	174	728	15	526	1432	50
Future Volume (veh/h)	74	1234	415	34	2063	541	174	728	15	526	1432	50
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	1969	1969	1984	1938	1984	1984	1953	1953	1953	1969	1969	1969
Adj Flow Rate, veh/h	130	1371	0	51	2267	0	189	827	0	612	1523	0
Peak Hour Factor	0.57	0.90	0.89	0.67	0.91	0.91	0.92	0.88	0.69	0.86	0.94	0.94
Percent Heavy Veh, %	2	2	1	4	1	1	3	3	3	2	2	2
Cap, veh/h	229	3722		287	2550		199	895		572	1248	
Arrive On Green	0.02	0.46	0.00	0.04	1.00	0.00	0.14	0.22	0.00	0.05	0.08	0.00
Sat Flow, veh/h	1875	5375	1682	1845	3770	1682	1860	5508	0	3638	5552	0
Grp Volume(v), veh/h	130	1371	0	51	2267	0	189	827	0	612	1523	0
Grp Sat Flow(s),veh/h/ln	1875	1792	1682	1845	1885	1682	1860	1777	0	1819	1792	0
Q Serve(g_s), s	3.1	23.1	0.0	1.3	0.0	0.0	14.1	21.2	0.0	22.0	32.5	0.0
Cycle Q Clear(g_c), s	3.1	23.1	0.0	1.3	0.0	0.0	14.1	21.2	0.0	22.0	32.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	229	3722		287	2550		199	895		572	1248	
V/C Ratio(X)	0.57	0.37		0.18	0.89		0.95	0.92		1.07	1.22	
Avail Cap(c_a), veh/h	254	3722		329	2550		199	895		572	1248	
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.33	1.33	1.33	0.33	0.33	0.33
Upstream Filter(I)	0.69	0.69	0.00	0.76	0.76	0.00	0.91	0.91	0.00	0.17	0.17	0.00
Uniform Delay (d), s/veh	7.0	17.7	0.0	9.0	0.0	0.0	59.6	53.5	0.0	66.4	64.6	0.0
Incr Delay (d2), s/veh	0.7	0.2	0.0	0.1	4.0	0.0	45.9	15.4	0.0	38.5	100.6	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	1.2	10.2	0.0	0.5	1.4	0.0	8.8	10.1	0.0	13.8	27.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	17.9	0.0	9.1	4.0	0.0	105.5	68.8	0.0	104.9	165.3	0.0
LnGrp LOS	A	B		A	A		F	E		F	F	
Approach Vol, veh/h		1501	A		2318	A		1016	A		2135	A
Approach Delay, s/veh		17.0			4.1			75.7			147.9	
Approach LOS		B			A			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	101.6	19.0	37.0	9.1	99.3	28.0	28.0
Change Period (Y+Rc), s	4.0	7.0	4.0	7.0	4.0	7.0	7.0	* 7
Max Green Setting (Gmax), s	6.0	69.0	15.0	28.0	7.0	68.0	21.0	* 21
Max Q Clear Time (g_c+I1), s	3.3	25.1	16.1	34.5	5.1	2.0	24.0	23.2
Green Ext Time (p_c), s	0.0	12.3	0.0	0.0	0.0	37.8	0.0	0.0

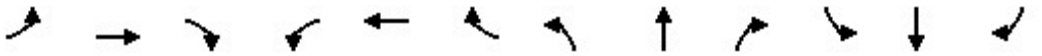
Intersection Summary	
HCM 6th Ctrl Delay	61.4
HCM 6th LOS	E

Notes

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

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

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



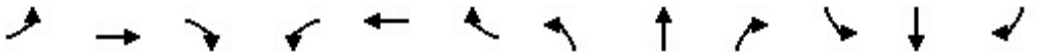
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	1198	53	315	1379	241	83	1128	155	306	1464	205
Future Volume (veh/h)	315	1198	53	315	1379	241	83	1128	155	306	1464	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1953	1969	1969	1953	1953	1953	1969	1953	1953	1969	1969	1969
Adj Flow Rate, veh/h	350	1461	69	375	1567	294	136	1226	176	333	1683	220
Peak Hour Factor	0.90	0.82	0.77	0.84	0.88	0.82	0.61	0.92	0.88	0.92	0.87	0.93
Percent Heavy Veh, %	3	2	2	3	3	3	2	3	3	2	2	2
Cap, veh/h	361	1168	55	397	1512	282	382	2251	323	404	1785	232
Arrive On Green	0.10	0.22	0.21	0.21	0.34	0.32	0.41	0.96	0.93	0.11	0.37	0.36
Sat Flow, veh/h	3609	5254	248	1860	4504	841	1875	4705	675	3638	4807	626
Grp Volume(v), veh/h	350	996	534	375	1235	626	136	926	476	333	1253	650
Grp Sat Flow(s),veh/h/ln	1804	1792	1919	1860	1777	1790	1875	1777	1826	1819	1792	1849
Q Serve(g_s), s	13.5	31.1	31.1	27.8	47.0	47.0	7.0	3.3	4.1	12.5	47.3	47.7
Cycle Q Clear(g_c), s	13.5	31.1	31.1	27.8	47.0	47.0	7.0	3.3	4.1	12.5	47.3	47.7
Prop In Lane	1.00		0.13	1.00		0.47	1.00		0.37	1.00		0.34
Lane Grp Cap(c), veh/h	361	797	427	397	1193	601	382	1701	873	404	1331	687
V/C Ratio(X)	0.97	1.25	1.25	0.94	1.04	1.04	0.36	0.54	0.54	0.82	0.94	0.95
Avail Cap(c_a), veh/h	361	797	427	412	1193	601	382	1701	873	416	1331	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	1.00	1.00	1.00	0.47	0.47	0.47	0.66	0.66	0.66
Uniform Delay (d), s/veh	62.8	54.4	54.6	54.3	46.5	47.0	35.1	1.7	2.1	60.9	42.5	43.0
Incr Delay (d2), s/veh	29.0	119.1	124.2	29.6	35.5	48.0	0.1	0.6	1.2	7.9	10.3	17.7
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	7.5	26.9	29.4	16.0	25.9	28.2	2.9	0.8	1.1	6.1	22.0	24.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.8	173.6	178.8	83.9	82.0	95.0	35.2	2.2	3.2	68.8	52.8	60.7
LnGrp LOS	F	F	F	F	F	F	D	A	A	E	D	E
Approach Vol, veh/h		1880			2236			1538			2236	
Approach Delay, s/veh		159.8			86.0			5.5			57.5	
Approach LOS		F			F			A			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.6	71.0	18.0	51.0	34.5	56.0	33.9	35.1
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	6.0	* 6	4.0	6.0
Max Green Setting (Gmax), s	15.0	45.0	13.0	45.0	11.0	* 50	31.0	28.0
Max Q Clear Time (g_c+I1), s	14.5	6.1	15.5	49.0	9.0	49.7	29.8	33.1
Green Ext Time (p_c), s	0.0	11.6	0.0	0.0	0.0	0.2	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	79.8
HCM 6th LOS	E

Notes

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



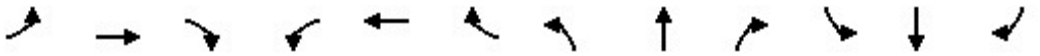
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	29	119	78	51	47	113	1572	17	41	1930	49
Future Volume (veh/h)	60	29	119	78	51	47	113	1572	17	41	1930	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	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	2000	1938	1938	2000	1828	1828	1969	1969	1969	1797	1969	1969
Adj Flow Rate, veh/h	77	43	145	115	91	77	140	1786	37	56	2193	98
Peak Hour Factor	0.78	0.68	0.82	0.68	0.56	0.61	0.81	0.88	0.46	0.73	0.88	0.50
Percent Heavy Veh, %	0	4	4	0	11	11	2	2	2	13	2	2
Cap, veh/h	165	66	221	148	155	131	235	3998	83	222	3458	154
Arrive On Green	0.17	0.17	0.15	0.17	0.17	0.15	0.09	1.00	1.00	0.87	0.87	0.85
Sat Flow, veh/h	1233	383	1290	1211	905	766	1875	5417	112	234	5269	234
Grp Volume(v), veh/h	77	0	188	115	0	168	140	1181	642	56	1487	804
Grp Sat Flow(s),veh/h/ln	1233	0	1673	1211	0	1671	1875	1792	1945	234	1792	1920
Q Serve(g_s), s	6.4	0.0	11.1	6.9	0.0	9.8	2.6	0.0	0.0	4.7	12.4	12.8
Cycle Q Clear(g_c), s	16.2	0.0	11.1	18.0	0.0	9.8	2.6	0.0	0.0	4.7	12.4	12.8
Prop In Lane	1.00		0.77	1.00		0.46	1.00		0.06	1.00		0.12
Lane Grp Cap(c), veh/h	165	0	287	148	0	286	235	2645	1436	222	2352	1260
V/C Ratio(X)	0.47	0.00	0.66	0.78	0.00	0.59	0.60	0.45	0.45	0.25	0.63	0.64
Avail Cap(c_a), veh/h	165	0	287	148	0	286	438	2645	1436	222	2352	1260
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.66	0.66	0.66	0.49	0.49	0.49
Uniform Delay (d), s/veh	47.6	0.0	41.4	50.1	0.0	40.5	10.2	0.0	0.0	2.6	3.1	3.2
Incr Delay (d2), s/veh	0.8	0.0	4.3	20.5	0.0	2.1	0.6	0.4	0.7	1.3	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	5.0	3.9	0.0	4.2	0.8	0.1	0.3	0.2	2.3	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.3	0.0	45.6	70.6	0.0	42.6	10.8	0.4	0.7	3.9	3.7	4.4
LnGrp LOS	D	A	D	E	A	D	B	A	A	A	A	A
Approach Vol, veh/h		265			283			1963			2347	
Approach Delay, s/veh		46.4			54.0			1.2			4.0	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.6	74.4		22.0		83.0		22.0				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	16.0	56.0		16.0		76.0		16.0				
Max Q Clear Time (g_c+I1), s	4.6	14.8		18.2		2.0		20.0				
Green Ext Time (p_c), s	0.1	27.6		0.0		20.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		8.1	
HCM 6th LOS		A	

Notes

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



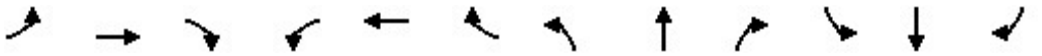
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	73	175	432	74	31	55	768	148	23	1766	22
Future Volume (veh/h)	32	73	175	432	74	31	55	768	148	23	1766	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	1.00		1.00	1.00		0.97	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	2000	1938	1922	2000	2000	2000	1750	1953	1953	2000	1969	1969
Adj Flow Rate, veh/h	48	103	222	520	117	38	70	960	172	38	1962	33
Peak Hour Factor	0.67	0.71	0.79	0.83	0.63	0.82	0.79	0.80	0.86	0.61	0.90	0.67
Percent Heavy Veh, %	0	4	5	0	0	0	16	3	3	0	2	2
Cap, veh/h	229	277	231	605	602	196	144	2165	387	251	2519	42
Arrive On Green	0.14	0.14	0.14	0.25	0.42	0.40	0.03	0.48	0.46	0.03	0.62	0.60
Sat Flow, veh/h	1245	1938	1619	1905	1445	469	1667	4529	809	1905	5442	91
Grp Volume(v), veh/h	48	103	222	520	0	155	70	753	379	38	1291	704
Grp Sat Flow(s),veh/h/ln	1245	1938	1619	1905	0	1914	1667	1777	1782	1905	1792	1951
Q Serve(g_s), s	4.8	6.7	19.1	32.2	0.0	7.2	3.2	19.6	19.9	1.5	37.2	37.4
Cycle Q Clear(g_c), s	4.8	6.7	19.1	32.2	0.0	7.2	3.2	19.6	19.9	1.5	37.2	37.4
Prop In Lane	1.00		1.00	1.00		0.25	1.00		0.45	1.00		0.05
Lane Grp Cap(c), veh/h	229	277	231	605	0	798	144	1699	852	251	1659	903
V/C Ratio(X)	0.21	0.37	0.96	0.86	0.00	0.19	0.49	0.44	0.44	0.15	0.78	0.78
Avail Cap(c_a), veh/h	229	277	231	641	0	834	194	1699	852	295	1659	903
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.54	0.00	0.54	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.5	54.3	59.6	36.6	0.0	26.1	27.3	24.2	24.6	21.3	21.6	21.7
Incr Delay (d2), s/veh	0.2	0.3	47.6	5.9	0.0	0.0	0.9	0.8	1.7	0.0	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.4	10.8	15.6	0.0	3.3	1.2	8.2	8.6	0.7	12.7	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	54.6	107.2	42.4	0.0	26.1	28.3	25.0	26.3	21.3	21.9	22.3
LnGrp LOS	D	D	F	D	A	C	C	C	C	C	C	C
Approach Vol, veh/h		373			675			1202			2033	
Approach Delay, s/veh		85.8			38.7			25.6			22.1	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	68.8	38.4	24.0	6.7	70.9		62.4				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	56.0	37.0	18.0	6.0	59.0		59.0				
Max Q Clear Time (g_c+I1), s	5.2	39.4	34.2	21.1	3.5	21.9		9.2				
Green Ext Time (p_c), s	0.0	11.6	0.2	0.0	0.0	8.5		0.5				

Intersection Summary	
HCM 6th Ctrl Delay	31.2
HCM 6th LOS	C

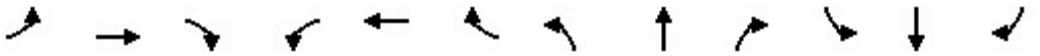
Notes

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



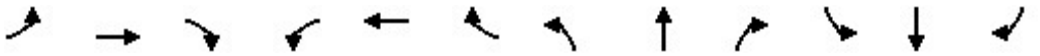
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	69	563	67	179	52	602	1566	37	33	1223	39
Future Volume (vph)	24	69	563	67	179	52	602	1566	37	33	1223	39
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	0.99	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89	0.85	1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1890	1661	1589	1827	1914		1900	5319		1900	3702	
Flt Permitted	0.32	1.00	1.00	0.14	1.00		0.10	1.00		0.11	1.00	
Satd. Flow (perm)	632	1661	1589	275	1914		200	5319		222	3702	
Peak-hour factor, PHF	0.56	0.53	0.76	0.92	0.69	0.83	0.90	0.81	0.68	0.84	0.88	0.67
Adj. Flow (vph)	43	130	741	73	259	63	669	1933	54	39	1390	58
RTOR Reduction (vph)	0	89	15	0	9	0	0	3	0	0	3	0
Lane Group Flow (vph)	43	360	407	73	313	0	669	1984	0	39	1445	0
Confl. Peds. (#/hr)	10					10	2		5	5		2
Confl. Bikes (#/hr)			1	1								
Heavy Vehicles (%)	0%	2%	1%	4%	0%	5%	0%	2%	7%	0%	2%	0%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	26.5	26.5	53.0	26.5	26.5		66.5	59.3		39.2	36.0	
Effective Green, g (s)	28.0	28.0	53.0	28.0	28.0		66.5	60.8		39.2	37.5	
Actuated g/C Ratio	0.27	0.27	0.50	0.27	0.27		0.63	0.58		0.37	0.36	
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0	1.5	2.0	2.0		1.5	3.0		1.5	3.0	
Lane Grp Cap (vph)	168	442	802	73	510		555	3079		134	1322	
v/s Ratio Prot		0.22	0.13		0.16		c0.30	0.37		0.01	0.39	
v/s Ratio Perm	0.07		0.13	c0.27			c0.46			0.10		
v/c Ratio	0.26	0.81	0.51	1.00	0.61		1.21	0.64		0.29	1.09	
Uniform Delay, d1	30.3	36.1	17.3	38.5	33.8		31.9	14.8		21.1	33.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	10.4	0.2	105.3	1.5		108.6	1.1		0.4	54.3	
Delay (s)	30.6	46.4	17.5	143.8	35.3		140.5	15.9		21.5	88.1	
Level of Service	C	D	B	F	D		F	B		C	F	
Approach Delay (s)		32.3			55.4			47.3			86.3	
Approach LOS		C			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	56.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	223	40	35	216	2	60	882	8	0	582	38
Future Volume (vph)	31	223	40	35	216	2	60	882	8	0	582	38
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			1.00			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1900	1903		1900	1937			3709			3668	
Flt Permitted	0.46	1.00		0.35	1.00			0.76			1.00	
Satd. Flow (perm)	910	1903		697	1937			2830			3668	
Peak-hour factor, PHF	0.66	0.73	0.86	0.75	0.81	0.50	0.84	0.87	0.50	0.25	0.88	0.75
Adj. Flow (vph)	47	305	47	47	267	4	71	1014	16	0	661	51
RTOR Reduction (vph)	0	4	0	0	1	0	0	1	0	0	4	0
Lane Group Flow (vph)	47	348	0	47	270	0	0	1100	0	0	708	0
Confl. Peds. (#/hr)	6		10	10		6	2		6	6		2
Confl. Bikes (#/hr)									1	1		
Heavy Vehicles (%)	0%	2%	3%	0%	3%	0%	0%	2%	0%	0%	2%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		3 4 5			3 4 5			1 2			1 2	
Permitted Phases	3 4 5			3 4 5			1 2					
Actuated Green, G (s)	46.0	46.0		46.0	46.0			64.0			64.0	
Effective Green, g (s)	46.0	46.0		46.0	46.0			64.0			64.0	
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.46			0.46	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	299	625		229	636			1293			1676	
v/s Ratio Prot		c0.18			0.14						0.19	
v/s Ratio Perm	0.05			0.07				c0.39				
v/c Ratio	0.16	0.56		0.21	0.43			0.85			0.42	
Uniform Delay, d1	33.3	38.6		33.8	36.7			33.8			25.6	
Progression Factor	1.00	1.00		0.07	0.06			1.00			0.20	
Incremental Delay, d2	0.1	0.6		0.1	0.1			5.6			0.2	
Delay (s)	33.4	39.2		2.4	2.2			39.3			5.4	
Level of Service	C	D		A	A			D			A	
Approach Delay (s)		38.5			2.3			39.3			5.4	
Approach LOS		D			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	146	74	0	0	0	0	750	0	19	532	0
Future Volume (vph)	0	146	74	0	0	0	0	750	0	19	532	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0						6.0			6.0	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.94						1.00			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		3537						3725			3711	
Flt Permitted		1.00						1.00			0.89	
Satd. Flow (perm)		3537						3725			3292	
Peak-hour factor, PHF	0.25	0.91	0.70	0.25	0.25	0.25	0.25	0.88	0.25	0.75	0.97	0.25
Adj. Flow (vph)	0	160	106	0	0	0	0	852	0	25	548	0
RTOR Reduction (vph)	0	80	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	186	0	0	0	0	0	852	0	0	573	0
Confl. Peds. (#/hr)							1		1	1		1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	2%	0%	6%	2%	0%
Turn Type		NA						NA		Perm	NA	
Protected Phases		4 5 6						1 2 3			1 2 3	
Permitted Phases										1 2 3		
Actuated Green, G (s)		30.0						98.0			98.0	
Effective Green, g (s)		30.0						98.0			98.0	
Actuated g/C Ratio		0.21						0.70			0.70	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		757						2607			2304	
v/s Ratio Prot		c0.05						c0.23				
v/s Ratio Perm											0.17	
v/c Ratio		0.25						0.33			0.25	
Uniform Delay, d1		45.6						8.2			7.6	
Progression Factor		1.00						0.03			0.00	
Incremental Delay, d2		0.8						0.0			0.0	
Delay (s)		46.4						0.3			0.1	
Level of Service		D						A			A	
Approach Delay (s)		46.4			0.0			0.3			0.1	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

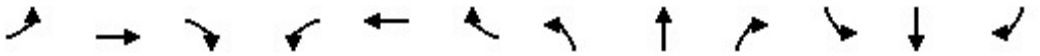
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	193	582	0	0	580	20	0	0	0	0	202	40
Future Volume (vph)	193	582	0	0	580	20	0	0	0	0	202	40
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0	6.0					6.0	
Lane Util. Factor	1.00	1.00			0.95	1.00					0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.98					1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00					1.00	
Frt	1.00	1.00			1.00	0.85					0.97	
Flt Protected	0.95	1.00			1.00	1.00					1.00	
Satd. Flow (prot)	1881	1961			3725	1673					3621	
Flt Permitted	0.25	1.00			1.00	1.00					1.00	
Satd. Flow (perm)	500	1961			3725	1673					3621	
Peak-hour factor, PHF	0.75	0.89	0.25	0.25	0.88	0.53	0.25	0.25	0.25	0.25	0.77	0.73
Adj. Flow (vph)	257	654	0	0	659	38	0	0	0	0	262	55
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	0	0	13	0
Lane Group Flow (vph)	257	654	0	0	659	12	0	0	0	0	304	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	0%	0%	0%	0%	0%	1%	8%
Turn Type	D.P+P	NA			NA	Perm					NA	
Protected Phases	2 3	1 2 3			1						4 5 6	
Permitted Phases	1					1						
Actuated Green, G (s)	92.0	98.0			45.0	45.0					30.0	
Effective Green, g (s)	92.0	98.0			45.0	45.0					30.0	
Actuated g/C Ratio	0.66	0.70			0.32	0.32					0.21	
Clearance Time (s)					6.0	6.0						
Vehicle Extension (s)					3.0	3.0						
Lane Grp Cap (vph)	792	1372			1197	537					775	
v/s Ratio Prot	0.11	c0.33			c0.18						c0.08	
v/s Ratio Perm	0.10					0.01						
v/c Ratio	0.32	0.48			0.55	0.02					0.39	
Uniform Delay, d1	21.6	9.5			39.2	32.5					47.2	
Progression Factor	0.26	0.05			1.00	1.00					1.49	
Incremental Delay, d2	0.1	0.3			0.6	0.0					1.5	
Delay (s)	5.7	0.7			39.7	32.5					71.6	
Level of Service	A	A			D	C					E	
Approach Delay (s)		2.1			39.3			0.0			71.6	
Approach LOS		A			D			A			E	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2040 Base Condition PM Peak

Synchro Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	316	1378	336	399	1095	282	250	1398	328	460	1879	486
Future Volume (veh/h)	316	1378	336	399	1095	282	250	1398	328	460	1879	486
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		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	1984	1984	2000	1969	1984	2000	1984	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	372	1548	0	512	1177	324	298	1487	386	484	1978	0
Peak Hour Factor	0.85	0.89	0.87	0.78	0.93	0.87	0.84	0.94	0.85	0.95	0.95	0.87
Percent Heavy Veh, %	1	1	0	2	1	0	1	1	1	0	1	1
Cap, veh/h	462	1565		539	1173	892	375	1297	334	845	2370	
Arrive On Green	0.13	0.29	0.00	0.30	0.62	0.61	0.07	0.20	0.19	0.30	0.58	0.00
Sat Flow, veh/h	3666	5417	1695	3638	3770	1659	3666	4270	1100	3695	5596	0
Grp Volume(v), veh/h	372	1548	0	512	1177	324	298	1256	617	484	1978	0
Grp Sat Flow(s),veh/h/ln	1833	1806	1695	1819	1885	1659	1833	1806	1759	1848	1806	0
Q Serve(g_s), s	13.3	38.4	0.0	18.6	42.0	0.0	10.8	41.0	41.0	14.9	40.1	0.0
Cycle Q Clear(g_c), s	13.3	38.4	0.0	18.6	42.0	0.0	10.8	41.0	41.0	14.9	40.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		0.00
Lane Grp Cap(c), veh/h	462	1565		539	1173	892	375	1097	534	845	2370	
V/C Ratio(X)	0.81	0.99		0.95	1.00	0.36	0.79	1.14	1.16	0.57	0.83	
Avail Cap(c_a), veh/h	462	1565		539	1173	892	380	1097	534	845	2370	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	0.00	0.91	0.91	0.91	0.88	0.88	0.88	0.09	0.09	0.00
Uniform Delay (d), s/veh	57.4	47.8	0.0	47.0	25.5	9.3	61.5	53.8	54.2	41.4	24.2	0.0
Incr Delay (d2), s/veh	9.4	20.3	0.0	24.9	25.9	1.0	8.9	75.1	87.6	0.1	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	6.7	19.8	0.0	8.7	15.2	3.2	5.6	30.5	31.6	6.3	14.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	68.1	0.0	71.9	51.4	10.4	70.4	128.9	141.8	41.5	24.6	0.0
LnGrp LOS	E	E		E	F	B	E	F	F	D	C	
Approach Vol, veh/h		1920	A		2013			2171			2462	A
Approach Delay, s/veh		67.8			50.0			124.5			27.9	
Approach LOS		E			D			F			C	

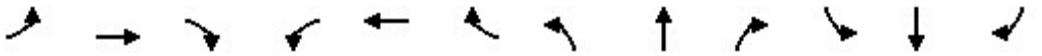
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.9	45.0	21.0	46.0	17.8	63.1	24.0	43.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	5.0	6.0	5.0	6.0
Max Green Setting (Gmax), s	18.0	* 39	16.0	40.0	13.0	44.0	19.0	37.0
Max Q Clear Time (g_c+I1), s	16.9	43.0	15.3	44.0	12.8	42.1	20.6	40.4
Green Ext Time (p_c), s	0.1	0.0	0.0	0.0	0.0	1.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	66.5
HCM 6th LOS	E

Notes

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

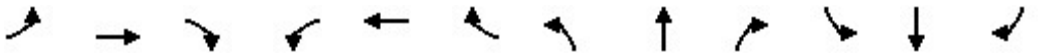
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1212	162	193	1256	52	177	399	183	141	505	41
Future Volume (veh/h)	25	1212	162	193	1256	52	177	399	183	141	505	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.83	1.00		0.87	1.00		0.92	1.00		0.92
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	1922	1953	1984	1984	1969	1938	1984	1938	1984	1984	1969	2000
Adj Flow Rate, veh/h	27	1237	191	199	1336	59	199	448	208	155	537	55
Peak Hour Factor	0.92	0.98	0.85	0.97	0.94	0.88	0.89	0.89	0.88	0.91	0.94	0.75
Percent Heavy Veh, %	5	3	1	1	2	4	1	4	1	1	2	0
Cap, veh/h	149	1542	582	237	1945	739	237	603	590	263	581	459
Arrive On Green	0.42	0.42	0.42	0.07	0.52	0.52	0.09	0.31	0.30	0.07	0.30	0.30
Sat Flow, veh/h	378	3711	1400	1890	3741	1421	1890	1938	1546	1890	1969	1555
Grp Volume(v), veh/h	27	1237	191	199	1336	59	199	448	208	155	537	55
Grp Sat Flow(s),veh/h/ln	378	1856	1400	1890	1870	1421	1890	1938	1546	1890	1969	1555
Q Serve(g_s), s	7.8	39.4	12.5	8.0	36.0	2.8	9.9	28.0	13.1	7.8	35.7	3.5
Cycle Q Clear(g_c), s	29.7	39.4	12.5	8.0	36.0	2.8	9.9	28.0	13.1	7.8	35.7	3.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	1542	582	237	1945	739	237	603	590	263	581	459
V/C Ratio(X)	0.18	0.80	0.33	0.84	0.69	0.08	0.84	0.74	0.35	0.59	0.92	0.12
Avail Cap(c_a), veh/h	149	1542	582	292	1945	739	266	639	618	280	605	478
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)	0.88	0.88	0.88	0.84	0.84	0.84	0.68	0.68	0.68	0.73	0.73	0.73
Uniform Delay (d), s/veh	40.5	34.6	26.7	29.6	24.2	16.2	34.9	41.6	30.5	33.5	46.1	34.8
Incr Delay (d2), s/veh	2.3	4.0	1.3	11.9	1.7	0.2	12.4	2.6	0.1	1.3	15.2	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	0.8	18.5	4.4	4.3	15.9	1.0	5.4	13.8	5.0	3.7	19.8	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	38.6	28.0	41.4	25.9	16.4	47.3	44.2	30.5	34.8	61.3	34.8
LnGrp LOS	D	D	C	D	C	B	D	D	C	C	E	C
Approach Vol, veh/h		1455			1594			855			747	
Approach Delay, s/veh		37.3			27.5			41.6			53.9	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	14.1	60.6	13.8	46.5		74.7	16.0	44.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s	14.0	47.0	11.0	43.0		65.0	14.0	40.0				
Max Q Clear Time (g_c+I1), s	10.0	41.4	9.8	30.0		38.0	11.9	37.7				
Green Ext Time (p_c), s	0.1	4.1	0.0	2.0		11.8	0.0	0.6				

Intersection Summary												
HCM 6th Ctrl Delay			37.4									
HCM 6th LOS			D									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	53	88	187	78	99	112	1942	233	187	2083	220
Future Volume (veh/h)	183	53	88	187	78	99	112	1942	233	187	2083	220
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	0.98		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	2000	2000	2000	2000	2000	2000	1984	2000	2000	1984	1984
Adj Flow Rate, veh/h	197	64	98	253	88	0	153	2232	0	220	2314	250
Peak Hour Factor	0.93	0.83	0.90	0.74	0.89	0.91	0.73	0.87	0.83	0.85	0.90	0.88
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	0	0	1	1
Cap, veh/h	369	82	126	323	294		219	3024		279	2855	301
Arrive On Green	0.10	0.12	0.10	0.13	0.15	0.00	0.10	1.00	0.00	0.14	1.00	1.00
Sat Flow, veh/h	1890	694	1062	1905	2000	1695	1905	5417	1695	1905	4960	523
Grp Volume(v), veh/h	197	0	162	253	88	0	153	2232	0	220	1670	894
Grp Sat Flow(s),veh/h/ln	1890	0	1756	1905	2000	1695	1905	1806	1695	1905	1806	1872
Q Serve(g_s), s	12.0	0.0	12.1	15.8	5.3	0.0	4.9	0.0	0.0	7.2	0.0	0.0
Cycle Q Clear(g_c), s	12.0	0.0	12.1	15.8	5.3	0.0	4.9	0.0	0.0	7.2	0.0	0.0
Prop In Lane	1.00		0.60	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	369	0	208	323	294		219	3024		279	2079	1077
V/C Ratio(X)	0.53	0.00	0.78	0.78	0.30		0.70	0.74		0.79	0.80	0.83
Avail Cap(c_a), veh/h	383	0	208	367	326		263	3024		346	2079	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	0.40	0.40	0.00	0.26	0.26	0.26
Uniform Delay (d), s/veh	44.1	0.0	58.4	46.1	51.4	0.0	13.8	0.0	0.0	13.3	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	15.6	8.1	0.2	0.0	1.7	0.7	0.0	2.0	0.9	2.1
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	5.7	0.0	6.3	8.3	2.7	0.0	1.9	0.2	0.0	2.7	0.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	0.0	74.0	54.1	51.6	0.0	15.6	0.7	0.0	15.3	0.9	2.1
LnGrp LOS	D	A	E	D	D		B	A		B	A	A
Approach Vol, veh/h		359			341	A		2385	A		2784	
Approach Delay, s/veh		57.9			53.5			1.6			2.4	
Approach LOS		E			D			A			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	79.9	21.9	20.0	10.9	82.2	18.0	23.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	14.0	66.0	21.0	14.0	10.0	70.0	15.0	20.0
Max Q Clear Time (g_c+I1), s	9.2	2.0	17.8	14.1	6.9	2.0	14.0	7.3
Green Ext Time (p_c), s	0.1	32.1	0.1	0.0	0.0	41.9	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	8.5
HCM 6th LOS	A

Notes

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

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

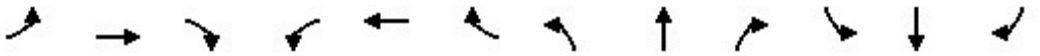
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	21	7	87	14	128	9	1623	97	113	2392	19
Future Volume (veh/h)	24	21	7	87	14	128	9	1623	97	113	2392	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.93	0.95		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	2000	2000	1984	2000	1969	1782	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	45	40	9	114	20	173	16	1673	105	135	2518	27
Peak Hour Factor	0.53	0.53	0.75	0.76	0.69	0.74	0.58	0.97	0.92	0.84	0.95	0.71
Percent Heavy Veh, %	0	0	0	1	0	2	14	1	1	1	1	1
Cap, veh/h	125	104	20	230	277	217	136	3807	239	307	4391	47
Arrive On Green	0.14	0.14	0.12	0.14	0.14	0.14	0.97	0.97	0.96	0.07	1.00	1.00
Sat Flow, veh/h	614	751	145	1302	2000	1564	114	5200	326	1890	5524	59
Grp Volume(v), veh/h	94	0	0	114	20	173	16	1161	617	135	1644	901
Grp Sat Flow(s),veh/h/ln	1510	0	0	1302	2000	1564	114	1806	1915	1890	1806	1972
Q Serve(g_s), s	5.1	0.0	0.0	4.3	1.2	14.5	0.6	2.0	2.1	2.5	0.0	0.0
Cycle Q Clear(g_c), s	7.3	0.0	0.0	11.6	1.2	14.5	0.6	2.0	2.1	2.5	0.0	0.0
Prop In Lane	0.48		0.10	1.00		1.00	1.00		0.17	1.00		0.03
Lane Grp Cap(c), veh/h	249	0	0	230	277	217	136	2644	1402	307	2871	1567
V/C Ratio(X)	0.38	0.00	0.00	0.50	0.07	0.80	0.12	0.44	0.44	0.44	0.57	0.57
Avail Cap(c_a), veh/h	284	0	0	262	326	255	136	2644	1402	356	2871	1567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	0.24	0.24	0.24	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.1	0.0	0.0	55.1	50.6	56.3	0.5	0.5	0.5	3.8	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.6	0.0	11.9	0.4	0.1	0.2	0.0	0.1	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	3.0	0.0	0.0	3.8	0.6	6.5	0.0	0.4	0.5	0.7	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	0.0	0.0	55.8	50.6	68.3	0.9	0.6	0.8	3.8	0.1	0.1
LnGrp LOS	D	A	A	E	D	E	A	A	A	A	A	A
Approach Vol, veh/h		94			307			1794			2680	
Approach Delay, s/veh		53.4			62.5			0.7			0.3	
Approach LOS		D			E			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.5	103.8		22.7		112.3		22.7				
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s	8.0	91.0		20.0		103.0		20.0				
Max Q Clear Time (g_c+I1), s	4.5	4.1		16.5		2.0		9.3				
Green Ext Time (p_c), s	0.0	24.2		0.2		49.6		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		5.4	
HCM 6th LOS		A	

Notes

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



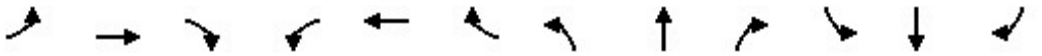
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	326	235	213	162	191	54	247	1869	111	126	2513	327
Future Volume (veh/h)	326	235	213	162	191	54	247	1869	111	126	2513	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	0.99		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	2000	1984	2000	2000	1953	2000	2000	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	398	283	257	178	215	68	281	2124	135	173	2762	355
Peak Hour Factor	0.82	0.83	0.83	0.91	0.89	0.79	0.88	0.88	0.82	0.73	0.91	0.92
Percent Heavy Veh, %	0	1	0	0	3	0	0	1	1	1	1	1
Cap, veh/h	367	441	365	248	246	203	293	2598	164	240	2254	276
Arrive On Green	0.16	0.22	0.22	0.07	0.13	0.13	0.08	0.34	0.33	0.18	0.93	0.90
Sat Flow, veh/h	1905	1984	1641	1905	1953	1616	1905	5196	328	1890	4870	595
Grp Volume(v), veh/h	398	283	257	178	215	68	281	1471	788	173	2012	1105
Grp Sat Flow(s),veh/h/ln	1905	1984	1641	1905	1953	1616	1905	1806	1913	1890	1806	1853
Q Serve(g_s), s	22.0	17.5	14.1	9.0	14.6	4.1	16.0	50.3	51.1	6.2	62.5	62.5
Cycle Q Clear(g_c), s	22.0	17.5	14.1	9.0	14.6	4.1	16.0	50.3	51.1	6.2	62.5	62.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.32
Lane Grp Cap(c), veh/h	367	441	365	248	246	203	293	1806	956	240	1672	858
V/C Ratio(X)	1.08	0.64	0.70	0.72	0.87	0.33	0.96	0.81	0.82	0.72	1.20	1.29
Avail Cap(c_a), veh/h	367	441	365	248	246	203	293	1806	956	240	1672	858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.72	0.72	0.44	0.44	0.44
Uniform Delay (d), s/veh	43.8	47.6	25.4	51.7	57.9	34.2	59.8	39.2	39.5	51.0	5.0	5.5
Incr Delay (d2), s/veh	71.4	2.5	5.2	8.3	26.6	0.4	33.6	3.0	5.9	4.0	94.1	133.8
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	18.0	8.9	6.1	1.7	9.1	2.1	12.2	23.5	26.1	5.1	23.9	34.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.2	50.1	30.5	60.1	84.5	34.5	93.5	42.2	45.4	55.0	99.1	139.3
LnGrp LOS	F	D	C	E	F	C	F	D	D	E	F	F
Approach Vol, veh/h		938			461			2540			3290	
Approach Delay, s/veh		72.4			67.7			48.9			110.3	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	72.0	13.0	34.0	21.0	67.0	26.0	21.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	12.0	66.0	9.0	28.0	17.0	61.0	22.0	15.0
Max Q Clear Time (g_c+I1), s	8.2	53.1	11.0	19.5	18.0	64.5	24.0	16.6
Green Ext Time (p_c), s	0.0	8.3	0.0	1.1	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	81.1
HCM 6th LOS	F

Notes

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



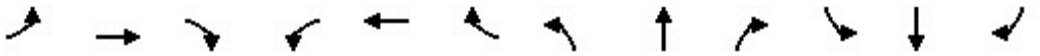
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	373	1333	209	444	871	354	277	1534	455	386	1766	202
Future Volume (veh/h)	373	1333	209	444	871	354	277	1534	455	386	1766	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	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	1984	1984	1984	1969	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	429	1360	290	467	1001	369	308	1686	535	406	1840	215
Peak Hour Factor	0.87	0.98	0.72	0.95	0.87	0.96	0.90	0.91	0.85	0.95	0.96	0.94
Percent Heavy Veh, %	1	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	407	1149	245	534	1166	430	975	2734	1070	482	1966	772
Arrive On Green	0.15	0.34	0.33	0.20	0.40	0.38	0.18	0.34	0.33	0.09	0.24	0.24
Sat Flow, veh/h	3666	4432	944	3638	3856	1421	3666	5417	1655	3666	5417	1645
Grp Volume(v), veh/h	429	1108	542	467	937	433	308	1686	535	406	1840	215
Grp Sat Flow(s),veh/h/ln	1833	1806	1765	1819	1806	1665	1833	1806	1655	1833	1806	1645
Q Serve(g_s), s	15.0	35.0	35.0	16.8	32.0	32.2	9.9	35.1	17.3	14.7	44.9	7.4
Cycle Q Clear(g_c), s	15.0	35.0	35.0	16.8	32.0	32.2	9.9	35.1	17.3	14.7	44.9	7.4
Prop In Lane	1.00		0.53	1.00		0.85	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	936	457	534	1092	504	975	2734	1070	482	1966	772
V/C Ratio(X)	1.05	1.18	1.19	0.87	0.86	0.86	0.32	0.62	0.50	0.84	0.94	0.28
Avail Cap(c_a), veh/h	407	936	457	539	1092	504	975	2734	1070	489	1966	772
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	0.67	0.67	0.67	0.67	0.67	0.67
Upstream Filter(I)	0.96	0.96	0.96	0.95	0.95	0.95	0.61	0.61	0.61	0.77	0.77	0.77
Uniform Delay (d), s/veh	57.5	44.2	44.9	53.1	37.7	38.8	44.8	33.8	18.9	60.2	49.5	18.0
Incr Delay (d2), s/veh	58.3	92.9	103.0	13.5	8.4	16.4	0.0	0.6	1.0	9.3	8.0	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	9.9	26.5	27.3	8.2	14.1	14.4	4.6	16.1	9.2	7.6	22.2	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.9	137.2	147.9	66.6	46.1	55.2	44.8	34.4	19.9	69.5	57.6	18.7
LnGrp LOS	F	F	F	E	D	E	D	C	B	E	E	B
Approach Vol, veh/h		2079			1837			2529			2461	
Approach Delay, s/veh		135.6			53.4			32.6			56.2	
Approach LOS		F			D			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.7	72.7	19.0	44.8	41.5	53.0	24.8	39.0
Change Period (Y+Rc), s	5.0	6.0	5.0	6.0	6.0	* 6	6.0	* 6
Max Green Setting (Gmax), s	17.0	44.0	14.0	38.0	14.0	* 47	19.0	* 33
Max Q Clear Time (g_c+I1), s	16.7	37.1	17.0	34.2	11.9	46.9	18.8	37.0
Green Ext Time (p_c), s	0.0	5.7	0.0	2.2	0.1	0.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	67.4
HCM 6th LOS	E

Notes

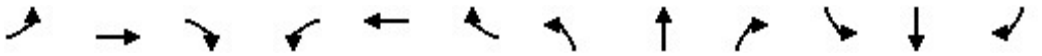
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	825	200	194	1182	10	189	86	119	7	88	3
Future Volume (veh/h)	14	825	200	194	1182	10	189	86	119	7	88	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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	2000	1969	1969	1984	1984	1984	1953	1953	1953	2000	2000	2000
Adj Flow Rate, veh/h	23	917	247	231	1244	13	217	109	172	18	117	8
Peak Hour Factor	0.60	0.90	0.81	0.84	0.95	0.75	0.87	0.79	0.69	0.38	0.75	0.38
Percent Heavy Veh, %	0	2	2	1	1	1	3	3	3	0	0	0
Cap, veh/h	248	1296	348	329	2208	23	278	116	178	89	536	34
Arrive On Green	0.45	0.45	0.44	0.09	0.58	0.57	0.11	0.11	0.11	0.33	0.33	0.33
Sat Flow, veh/h	448	2898	779	1890	3821	40	662	348	533	132	1609	103
Grp Volume(v), veh/h	23	591	573	231	614	643	498	0	0	143	0	0
Grp Sat Flow(s),veh/h/ln	448	1870	1806	1890	1885	1976	1543	0	0	1844	0	0
Q Serve(g_s), s	3.0	23.0	23.2	5.7	18.3	18.4	24.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.7	23.0	23.2	5.7	18.3	18.4	28.9	0.0	0.0	4.7	0.0	0.0
Prop In Lane	1.00		0.43	1.00		0.02	0.44		0.35	0.13		0.06
Lane Grp Cap(c), veh/h	248	837	808	329	1089	1142	572	0	0	660	0	0
V/C Ratio(X)	0.09	0.71	0.71	0.70	0.56	0.56	0.87	0.00	0.00	0.22	0.00	0.00
Avail Cap(c_a), veh/h	248	837	808	377	1089	1142	572	0	0	660	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.6	20.1	20.3	17.1	11.9	11.9	39.1	0.0	0.0	21.6	0.0	0.0
Incr Delay (d2), s/veh	0.7	5.0	5.2	3.6	2.1	2.0	10.1	0.0	0.0	0.1	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	0.4	10.4	10.2	2.5	7.4	7.7	13.5	0.0	0.0	2.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.3	25.1	25.5	20.7	14.0	13.9	49.2	0.0	0.0	21.6	0.0	0.0
LnGrp LOS	B	C	C	C	B	B	D	A	A	C	A	A
Approach Vol, veh/h		1187			1488			498			143	
Approach Delay, s/veh		25.2			15.0			49.2			21.6	
Approach LOS		C			B			D			C	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.7	44.3		34.0		56.0		34.0				
Change Period (Y+Rc), s	4.0	5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s	10.0	37.0		29.0		51.0		29.0				
Max Q Clear Time (g_c+I1), s	7.7	25.2		6.7		20.4		30.9				
Green Ext Time (p_c), s	0.1	6.1		0.5		10.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		24.1	
HCM 6th LOS		C	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	1044	259	541	891	111	222	808	491	132	909	47
Future Volume (veh/h)	79	1044	259	541	891	111	222	808	491	132	909	47
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		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1969	1984	1984	1984	1984	1984	1984	1969	1969	1984	1984	1984
Adj Flow Rate, veh/h	103	1228	282	588	1100	144	252	908	540	178	999	67
Peak Hour Factor	0.77	0.85	0.92	0.92	0.81	0.77	0.88	0.89	0.91	0.74	0.91	0.70
Percent Heavy Veh, %	2	1	1	1	1	1	1	2	2	1	1	1
Cap, veh/h	127	1159	692	831	1758	901	276	1141	866	237	967	65
Arrive On Green	0.07	0.31	0.30	0.23	0.47	0.46	0.12	0.31	0.30	0.08	0.27	0.26
Sat Flow, veh/h	1875	3770	1665	3666	3770	1671	1890	3741	1618	1890	3577	240
Grp Volume(v), veh/h	103	1228	282	588	1100	144	252	908	540	178	526	540
Grp Sat Flow(s),veh/h/ln	1875	1885	1665	1833	1885	1671	1890	1870	1618	1890	1885	1931
Q Serve(g_s), s	7.3	41.5	8.4	19.9	29.7	5.9	13.9	30.1	7.1	9.2	36.5	36.5
Cycle Q Clear(g_c), s	7.3	41.5	8.4	19.9	29.7	5.9	13.9	30.1	7.1	9.2	36.5	36.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	127	1159	692	831	1758	901	276	1141	866	237	510	522
V/C Ratio(X)	0.81	1.06	0.41	0.71	0.63	0.16	0.91	0.80	0.62	0.75	1.03	1.03
Avail Cap(c_a), veh/h	167	1159	692	831	1758	901	277	1141	866	262	510	522
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)	0.95	0.95	0.95	0.70	0.70	0.70	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	62.1	46.7	13.1	48.1	27.1	15.7	39.8	43.0	12.2	36.0	49.2	49.3
Incr Delay (d2), s/veh	14.7	43.1	1.7	1.7	1.2	0.3	31.4	5.8	3.4	8.5	48.0	47.6
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	4.0	25.9	3.2	9.2	13.2	2.3	8.0	14.5	8.1	4.8	23.9	24.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.8	89.8	14.8	49.8	28.3	16.0	71.2	48.8	15.6	44.5	97.2	96.9
LnGrp LOS	E	F	B	D	C	B	E	D	B	D	F	F
Approach Vol, veh/h		1613			1832			1700			1244	
Approach Delay, s/veh		75.9			34.2			41.6			89.6	
Approach LOS		E			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.9	41.0	14.1	67.5	15.2	45.7	35.6	46.0
Change Period (Y+Rc), s	4.0	6.0	5.0	6.0	4.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	16.0	35.0	12.0	51.0	13.0	38.0	23.0	* 40
Max Q Clear Time (g_c+I1), s	15.9	38.5	9.3	31.7	11.2	32.1	21.9	43.5
Green Ext Time (p_c), s	0.0	0.0	0.0	5.2	0.0	3.8	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	57.5
HCM 6th LOS	E

Notes

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

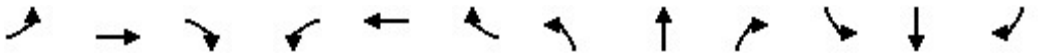
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	105	19	61	110	32	9	659	24	19	752	23
Future Volume (veh/h)	23	105	19	61	110	32	9	659	24	19	752	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.93		0.83	0.93		0.83	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	2000	2000	2000	2000	1953	1953	2000	1969	1969
Adj Flow Rate, veh/h	51	144	31	68	151	41	13	775	36	27	817	32
Peak Hour Factor	0.45	0.73	0.61	0.90	0.73	0.78	0.67	0.85	0.66	0.71	0.92	0.71
Percent Heavy Veh, %	1	1	1	0	0	0	0	3	3	0	2	2
Cap, veh/h	146	307	60	164	275	67	333	1127	52	353	1145	45
Arrive On Green	0.25	0.25	0.23	0.25	0.25	0.23	0.61	0.61	0.59	0.61	0.61	0.59
Sat Flow, veh/h	270	1244	241	332	1112	270	660	1849	86	683	1880	74
Grp Volume(v), veh/h	226	0	0	260	0	0	13	0	811	27	0	849
Grp Sat Flow(s),veh/h/ln	1755	0	0	1715	0	0	660	0	1935	683	0	1953
Q Serve(g_s), s	0.0	0.0	0.0	1.2	0.0	0.0	0.8	0.0	15.7	1.5	0.0	16.8
Cycle Q Clear(g_c), s	5.7	0.0	0.0	6.9	0.0	0.0	17.5	0.0	15.7	17.3	0.0	16.8
Prop In Lane	0.23		0.14	0.26		0.16	1.00		0.04	1.00		0.04
Lane Grp Cap(c), veh/h	513	0	0	505	0	0	333	0	1179	353	0	1190
V/C Ratio(X)	0.44	0.00	0.00	0.51	0.00	0.00	0.04	0.00	0.69	0.08	0.00	0.71
Avail Cap(c_a), veh/h	577	0	0	568	0	0	333	0	1179	353	0	1190
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	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	18.4	0.0	0.0	13.6	0.0	7.3	13.1	0.0	7.5
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	0.1	0.0	2.2	0.4	0.0	3.7
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	2.3	0.0	0.0	2.8	0.0	0.0	0.1	0.0	5.1	0.3	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	0.0	0.0	18.7	0.0	0.0	13.7	0.0	9.5	13.6	0.0	11.2
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	B
Approach Vol, veh/h		226			260			824			876	
Approach Delay, s/veh		18.3			18.7			9.6			11.3	
Approach LOS		B			B			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		38.0		17.8		38.0		17.8				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		33.0		15.0		33.0		15.0				
Max Q Clear Time (g_c+I1), s		19.5		7.7		19.3		8.9				
Green Ext Time (p_c), s		8.0		0.5		8.6		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			12.3									
HCM 6th LOS			B									

Notes

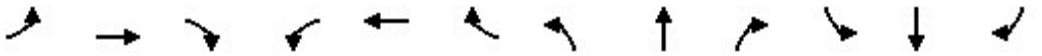
User approved pedestrian interval to be less than phase max green.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	314	87	39	441	14	36	409	32	11	480	19
Future Volume (veh/h)	10	314	87	39	441	14	36	409	32	11	480	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	2000	2000	2000	1938	1938	1938	1969	1969	1969
Adj Flow Rate, veh/h	13	374	109	78	519	19	54	449	36	22	533	31
Peak Hour Factor	0.75	0.84	0.80	0.50	0.85	0.75	0.67	0.91	0.88	0.50	0.90	0.61
Percent Heavy Veh, %	1	1	1	0	0	0	4	4	4	2	2	2
Cap, veh/h	49	556	159	108	574	20	102	754	58	59	889	51
Arrive On Green	0.38	0.38	0.39	0.38	0.38	0.39	0.50	0.50	0.50	0.17	0.17	0.17
Sat Flow, veh/h	20	1458	416	164	1505	53	116	1502	116	35	1771	101
Grp Volume(v), veh/h	496	0	0	616	0	0	539	0	0	586	0	0
Grp Sat Flow(s),veh/h/ln	1894	0	0	1722	0	0	1734	0	0	1907	0	0
Q Serve(g_s), s	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Cycle Q Clear(g_c), s	19.7	0.0	0.0	31.1	0.0	0.0	18.8	0.0	0.0	25.2	0.0	0.0
Prop In Lane	0.03		0.22	0.13		0.03	0.10		0.07	0.04		0.05
Lane Grp Cap(c), veh/h	763	0	0	702	0	0	914	0	0	999	0	0
V/C Ratio(X)	0.65	0.00	0.00	0.88	0.00	0.00	0.59	0.00	0.00	0.59	0.00	0.00
Avail Cap(c_a), veh/h	869	0	0	801	0	0	914	0	0	999	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.72	0.00	0.00	0.77	0.00	0.00
Uniform Delay (d), s/veh	23.3	0.0	0.0	26.5	0.0	0.0	15.6	0.0	0.0	29.2	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	9.1	0.0	0.0	2.0	0.0	0.0	2.0	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	8.6	0.0	0.0	13.9	0.0	0.0	7.7	0.0	0.0	13.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.2	0.0	0.0	35.6	0.0	0.0	17.6	0.0	0.0	31.1	0.0	0.0
LnGrp LOS	C	A	A	D	A	A	B	A	A	C	A	A
Approach Vol, veh/h		496			616			539			586	
Approach Delay, s/veh		24.2			35.6			17.6			31.1	
Approach LOS		C			D			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.2		39.8		50.2		39.8				
Change Period (Y+Rc), s		6.0		5.0		6.0		5.0				
Max Green Setting (Gmax), s		39.0		40.0		39.0		40.0				
Max Q Clear Time (g_c+I1), s		20.8		21.7		27.2		33.1				
Green Ext Time (p_c), s		6.3		2.1		5.1		1.8				

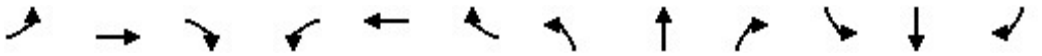
Intersection Summary												
HCM 6th Ctrl Delay			27.6									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	220	66	84	172	177	69	2361	93	233	2195	79
Future Volume (veh/h)	91	220	66	84	172	177	69	2361	93	233	2195	79
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		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	1969	1969	2000	1922	1969	2000	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	110	289	78	98	226	201	82	2434	107	284	2240	98
Peak Hour Factor	0.83	0.76	0.85	0.86	0.76	0.88	0.84	0.97	0.87	0.82	0.98	0.81
Percent Heavy Veh, %	1	2	2	0	5	2	0	1	1	0	1	1
Cap, veh/h	192	364	98	118	470	538	141	2984	130	304	3646	159
Arrive On Green	0.24	0.24	0.23	0.24	0.24	0.23	1.00	1.00	1.00	0.19	1.00	1.00
Sat Flow, veh/h	965	1490	402	1029	1922	1655	157	5320	232	1905	5321	232
Grp Volume(v), veh/h	110	0	367	98	226	201	82	1646	895	284	1516	822
Grp Sat Flow(s),veh/h/ln	965	0	1893	1029	1922	1655	157	1806	1941	1905	1806	1941
Q Serve(g_s), s	14.9	0.0	24.6	8.4	13.6	12.6	0.0	0.0	0.0	10.8	0.0	0.0
Cycle Q Clear(g_c), s	28.5	0.0	24.6	33.0	13.6	12.6	0.0	0.0	0.0	10.8	0.0	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.12	1.00		0.12
Lane Grp Cap(c), veh/h	192	0	463	118	470	538	141	2025	1088	304	2475	1330
V/C Ratio(X)	0.57	0.00	0.79	0.83	0.48	0.37	0.58	0.81	0.82	0.93	0.61	0.62
Avail Cap(c_a), veh/h	192	0	463	118	470	538	141	2025	1088	321	2475	1330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09	0.45	0.45	0.45
Uniform Delay (d), s/veh	55.9	0.0	48.0	64.7	43.7	35.1	0.0	0.0	0.0	22.3	0.0	0.0
Incr Delay (d2), s/veh	2.6	0.0	8.5	35.8	0.3	0.2	1.6	0.3	0.7	18.3	0.5	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	3.8	0.0	12.7	4.6	6.6	5.2	0.1	0.1	0.2	5.3	0.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.5	0.0	56.5	100.5	44.0	35.2	1.6	0.3	0.7	40.6	0.5	1.0
LnGrp LOS	E	A	E	F	D	D	A	A	A	D	A	A
Approach Vol, veh/h		477			525			2623			2622	
Approach Delay, s/veh		57.0			51.2			0.5			5.0	
Approach LOS		E			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	16.8	81.2		37.0		98.0		37.0				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	14.0	73.0		31.0		91.0		31.0				
Max Q Clear Time (g_c+I1), s	12.8	2.0		30.5		2.0		35.0				
Green Ext Time (p_c), s	0.0	49.8		0.1		36.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		11.0	
HCM 6th LOS		B	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	1771	325	107	1546	701	452	1451	53	673	1188	69
Future Volume (veh/h)	78	1771	325	107	1546	701	452	1451	53	673	1188	69
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	2000	1984	2000	1984	1984	1984	1984	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	99	1904	0	149	1645	0	491	1560	0	701	1335	0
Peak Hour Factor	0.79	0.93	0.76	0.72	0.94	0.88	0.92	0.93	0.89	0.96	0.89	0.69
Percent Heavy Veh, %	0	1	0	1	1	1	1	1	1	1	1	1
Cap, veh/h	226	3469		209	2456		336	1786		679	1705	
Arrive On Green	0.01	0.21	0.00	0.04	0.65	0.00	0.36	0.66	0.00	0.06	0.10	0.00
Sat Flow, veh/h	1905	5417	1695	1890	3770	1682	1890	5596	0	3666	5596	0
Grp Volume(v), veh/h	99	1904	0	149	1645	0	491	1560	0	701	1335	0
Grp Sat Flow(s),veh/h/ln	1905	1806	1695	1890	1885	1682	1890	1806	0	1833	1806	0
Q Serve(g_s), s	2.5	42.3	0.0	3.9	36.4	0.0	24.0	31.2	0.0	25.0	32.5	0.0
Cycle Q Clear(g_c), s	2.5	42.3	0.0	3.9	36.4	0.0	24.0	31.2	0.0	25.0	32.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	226	3469		209	2456		336	1786		679	1705	
V/C Ratio(X)	0.44	0.55		0.71	0.67		1.46	0.87		1.03	0.78	
Avail Cap(c_a), veh/h	261	3469		266	2456		336	1786		679	1705	
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.52	0.52	0.00	0.90	0.90	0.00	0.30	0.30	0.00	0.12	0.12	0.00
Uniform Delay (d), s/veh	16.1	35.8	0.0	24.3	14.6	0.0	43.5	20.7	0.0	63.4	56.0	0.0
Incr Delay (d2), s/veh	0.3	0.3	0.0	3.6	1.3	0.0	212.6	2.0	0.0	21.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	20.5	0.0	3.2	14.3	0.0	28.7	7.3	0.0	14.3	15.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	36.2	0.0	27.9	15.9	0.0	256.1	22.8	0.0	84.9	56.4	0.0
LnGrp LOS	B	D		C	B		F	C		F	E	
Approach Vol, veh/h		2003	A		1794	A		2051	A		2036	A
Approach Delay, s/veh		35.2			16.9			78.6			66.2	
Approach LOS		D			B			E			E	

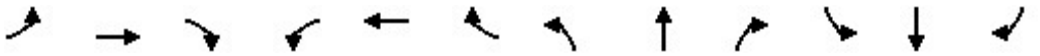
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	91.4	31.0	47.0	8.4	92.9	29.0	49.0
Change Period (Y+Rc), s	4.0	7.0	7.0	* 7	4.0	7.0	5.0	7.0
Max Green Setting (Gmax), s	10.0	39.0	24.0	* 40	7.0	42.0	24.0	39.0
Max Q Clear Time (g_c+I1), s	5.9	44.3	26.0	34.5	4.5	38.4	27.0	33.2
Green Ext Time (p_c), s	0.0	0.0	0.0	3.7	0.0	2.9	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	50.3
HCM 6th LOS	D

Notes

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

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



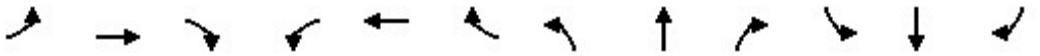
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	506	1579	70	232	1042	230	178	2101	258	492	1458	329
Future Volume (veh/h)	506	1579	70	232	1042	230	178	2101	258	492	1458	329
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.99	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	1984	1984	1984	1984	1969	1969	2000	1984	1984	1984	1984	1984
Adj Flow Rate, veh/h	582	1858	93	267	1097	240	212	2284	293	529	1602	346
Peak Hour Factor	0.87	0.85	0.75	0.87	0.95	0.96	0.84	0.92	0.88	0.93	0.91	0.95
Percent Heavy Veh, %	1	1	1	1	2	2	0	1	1	1	1	1
Cap, veh/h	543	1329	66	280	1170	256	212	1587	198	2743	4331	928
Arrive On Green	0.15	0.25	0.24	0.15	0.27	0.25	0.07	0.22	0.21	0.25	0.32	0.32
Sat Flow, veh/h	3666	5275	263	1890	4387	959	1905	4868	608	3666	4463	956
Grp Volume(v), veh/h	582	1271	680	267	896	441	212	1679	898	529	1294	654
Grp Sat Flow(s),veh/h/ln	1833	1806	1927	1890	1792	1763	1905	1806	1864	1833	1806	1807
Q Serve(g_s), s	20.0	34.0	34.0	18.9	33.0	33.1	15.0	44.0	44.0	15.4	37.3	37.8
Cycle Q Clear(g_c), s	20.0	34.0	34.0	18.9	33.0	33.1	15.0	44.0	44.0	15.4	37.3	37.8
Prop In Lane	1.00		0.14	1.00		0.54	1.00		0.33	1.00		0.53
Lane Grp Cap(c), veh/h	543	910	485	280	956	470	212	1177	608	2743	3505	1754
V/C Ratio(X)	1.07	1.40	1.40	0.95	0.94	0.94	1.00	1.43	1.48	0.19	0.37	0.37
Avail Cap(c_a), veh/h	543	910	485	280	956	470	212	1177	608	2743	3505	1754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	0.33	0.33	0.33
Upstream Filter(I)	0.19	0.19	0.19	1.00	1.00	1.00	0.17	0.17	0.17	0.71	0.71	0.71
Uniform Delay (d), s/veh	57.5	50.5	50.6	57.0	48.4	49.0	62.5	52.8	53.0	18.6	14.0	14.3
Incr Delay (d2), s/veh	39.8	180.0	183.1	40.9	17.5	28.7	25.9	192.6	216.8	0.0	0.2	0.4
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	12.0	37.6	40.6	12.0	16.6	17.9	8.9	51.7	57.5	7.5	12.6	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.3	230.5	233.8	97.9	65.9	77.6	88.4	245.3	269.8	18.6	14.2	14.7
LnGrp LOS	F	F	F	F	E	E	F	F	F	B	B	B
Approach Vol, veh/h		2533			1604			2789			2477	
Approach Delay, s/veh		200.8			74.4			241.3			15.3	
Approach LOS		F			E			F			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	108.0	48.0	24.0	40.0	19.0	137.0	26.0	38.0
Change Period (Y+Rc), s	6.0	* 6	5.0	6.0	4.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	20.0	* 42	19.0	32.0	15.0	48.0	20.0	* 32
Max Q Clear Time (g_c+I1), s	17.4	46.0	22.0	35.1	17.0	39.8	20.9	36.0
Green Ext Time (p_c), s	0.2	0.0	0.0	0.0	0.0	6.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	142.4
HCM 6th LOS	F

Notes

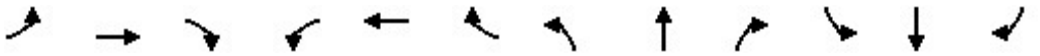
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	36	106	39	43	23	255	2167	67	47	2295	94
Future Volume (veh/h)	157	36	106	39	43	23	255	2167	67	47	2295	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1984	2000	2000	2000	1953	1953	1984	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	185	55	132	49	61	31	280	2435	83	63	2391	124
Peak Hour Factor	0.85	0.65	0.80	0.80	0.71	0.75	0.91	0.89	0.81	0.75	0.96	0.76
Percent Heavy Veh, %	1	0	0	0	3	3	1	1	1	0	1	1
Cap, veh/h	284	112	269	203	265	135	300	3823	130	131	3113	160
Arrive On Green	0.22	0.22	0.20	0.22	0.22	0.20	0.18	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1302	512	1228	1206	1209	614	1890	5380	182	131	5274	271
Grp Volume(v), veh/h	185	0	187	49	0	92	280	1630	888	63	1630	885
Grp Sat Flow(s),veh/h/ln	1302	0	1740	1206	0	1823	1890	1806	1950	131	1806	1933
Q Serve(g_s), s	18.4	0.0	12.8	5.0	0.0	5.6	10.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	24.0	0.0	12.8	17.8	0.0	5.6	10.2	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.71	1.00		0.34	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	284	0	381	203	0	399	300	2566	1386	131	2132	1141
V/C Ratio(X)	0.65	0.00	0.49	0.24	0.00	0.23	0.93	0.64	0.64	0.48	0.76	0.78
Avail Cap(c_a), veh/h	317	0	425	234	0	446	325	2566	1386	131	2132	1141
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.49	0.49	0.49	0.09	0.09	0.09
Uniform Delay (d), s/veh	53.3	0.0	46.8	54.0	0.0	43.6	22.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	2.7	0.0	0.4	0.2	0.0	0.1	18.8	0.6	1.1	1.1	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	5.7	1.6	0.0	2.6	5.5	0.2	0.4	0.0	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.0	0.0	47.1	54.2	0.0	43.8	40.7	0.6	1.1	1.1	0.2	0.5
LnGrp LOS	E	A	D	D	A	D	D	A	A	A	A	A
Approach Vol, veh/h		372			141			2798			2578	
Approach Delay, s/veh		51.5			47.4			4.8			0.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	16.2	85.2		33.6		101.4		33.6				
Change Period (Y+Rc), s	4.0	7.0		6.0		7.0		6.0				
Max Green Setting (Gmax), s	14.0	73.0		31.0		91.0		31.0				
Max Q Clear Time (g_c+I1), s	12.2	2.0		26.0		2.0		19.8				
Green Ext Time (p_c), s	0.1	48.5		0.5		43.7		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			6.8									
HCM 6th LOS			A									



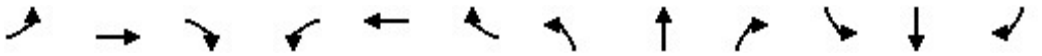
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	130	124	310	97	61	200	1972	587	65	1331	43
Future Volume (veh/h)	36	130	124	310	97	61	200	1972	587	65	1331	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.98	1.00		0.97	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	1938	1984	1953	2000	2000	2000	1984	1984	1984	2000	1984	1984
Adj Flow Rate, veh/h	59	162	177	323	135	65	238	2054	660	97	1479	54
Peak Hour Factor	0.61	0.80	0.70	0.96	0.72	0.94	0.84	0.96	0.89	0.67	0.90	0.80
Percent Heavy Veh, %	4	1	3	0	0	0	1	1	1	0	1	1
Cap, veh/h	218	284	229	390	406	195	365	2275	670	128	2767	101
Arrive On Green	0.14	0.14	0.14	0.15	0.32	0.31	0.07	0.55	0.54	0.08	1.00	1.00
Sat Flow, veh/h	1149	1984	1603	1905	1265	609	1890	4125	1214	1905	5361	196
Grp Volume(v), veh/h	59	162	177	323	0	200	238	1775	939	97	996	537
Grp Sat Flow(s),veh/h/ln	1149	1984	1603	1905	0	1875	1890	1806	1727	1905	1806	1945
Q Serve(g_s), s	6.3	10.3	14.4	19.5	0.0	11.0	8.0	58.5	72.2	3.4	0.0	0.0
Cycle Q Clear(g_c), s	6.3	10.3	14.4	19.5	0.0	11.0	8.0	58.5	72.2	3.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.32	1.00		0.70	1.00		0.10
Lane Grp Cap(c), veh/h	218	284	229	390	0	601	365	1992	953	128	1864	1004
V/C Ratio(X)	0.27	0.57	0.77	0.83	0.00	0.33	0.65	0.89	0.99	0.76	0.53	0.53
Avail Cap(c_a), veh/h	232	309	249	390	0	625	393	1992	953	166	1864	1004
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.00	0.68	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	52.3	54.0	55.7	41.7	0.0	35.1	13.0	26.7	30.5	30.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.1	11.2	9.2	0.0	0.1	2.5	6.5	25.9	4.9	0.5	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	1.8	5.3	6.4	10.0	0.0	5.0	3.5	25.0	34.5	1.6	0.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	55.0	66.9	50.9	0.0	35.2	15.5	33.2	56.3	35.6	0.5	1.0
LnGrp LOS	D	E	E	D	A	D	B	C	E	D	A	A
Approach Vol, veh/h		398			523			2952			1630	
Approach Delay, s/veh		60.0			44.9			39.2			2.8	
Approach LOS		E			D			D			A	

Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	73.7	24.0	23.3	9.2	78.5		47.3				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	12.0	64.0	20.0	19.0	8.0	68.0		43.0				
Max Q Clear Time (g_c+I1), s	10.0	2.0	21.5	16.4	5.4	74.2		13.0				
Green Ext Time (p_c), s	0.0	14.3	0.0	0.3	0.0	0.0		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C

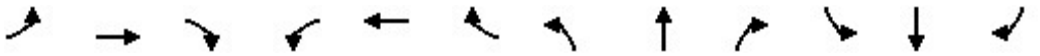
Notes

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



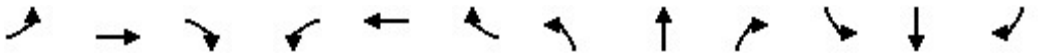
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	131	828	51	58	44	420	1612	56	72	1841	27
Future Volume (vph)	37	131	828	51	58	44	420	1612	56	72	1841	27
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.5	4.5	4.0	4.5	4.5		4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89	0.85	1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1886	1683	1599	1900	1874		1863	5370		1900	3747	
Flt Permitted	0.60	1.00	1.00	0.10	1.00		0.07	1.00		0.11	1.00	
Satd. Flow (perm)	1187	1683	1599	203	1874		143	5370		226	3747	
Peak-hour factor, PHF	0.63	0.90	0.95	0.88	0.63	0.82	0.86	0.97	0.77	0.56	1.00	0.61
Adj. Flow (vph)	59	146	872	58	92	54	488	1662	73	129	1841	44
RTOR Reduction (vph)	0	69	12	0	16	0	0	4	0	0	1	0
Lane Group Flow (vph)	59	452	485	58	130	0	488	1731	0	129	1884	0
Confl. Peds. (#/hr)	7					7	4					4
Confl. Bikes (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	2%	1%	2%	0%	1%	0%
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	38.0	38.0	68.0	38.0	38.0		85.0	73.8		58.2	51.0	
Effective Green, g (s)	39.5	39.5	68.0	39.5	39.5		85.0	75.3		58.2	52.5	
Actuated g/C Ratio	0.29	0.29	0.50	0.29	0.29		0.63	0.56		0.43	0.39	
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	2.0	2.0	1.5	2.0	2.0		1.5	3.0		1.5	3.0	
Lane Grp Cap (vph)	347	492	805	59	548		472	2995		186	1457	
v/s Ratio Prot		0.27	0.13		0.07		c0.23	0.32		0.04	c0.50	
v/s Ratio Perm	0.05		0.17	c0.29			0.42			0.26		
v/c Ratio	0.17	0.92	0.60	0.98	0.24		1.03	0.58		0.69	1.29	
Uniform Delay, d1	35.5	46.2	23.9	47.4	36.3		44.3	19.5		23.6	41.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.52	0.82		1.46	1.39	
Incremental Delay, d2	0.1	21.8	0.9	110.3	0.1		32.0	0.2		4.7	134.6	
Delay (s)	35.6	68.1	24.7	157.7	36.4		99.3	16.2		39.2	192.1	
Level of Service	D	E	C	F	D		F	B		D	F	
Approach Delay (s)		46.3			70.9			34.5			182.4	
Approach LOS		D			E			C			F	

Intersection Summary			
HCM 2000 Control Delay	92.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	112.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	218	48	26	206	2	42	917	27	0	936	28
Future Volume (vph)	40	218	48	26	206	2	42	917	27	0	936	28
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	1.00			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1879	1899		1900	1975			3696			3737	
Flt Permitted	0.47	1.00		0.38	1.00			0.75			1.00	
Satd. Flow (perm)	920	1899		760	1975			2794			3737	
Peak-hour factor, PHF	0.79	0.84	0.87	0.78	0.81	0.50	0.83	0.93	0.66	0.25	0.90	0.65
Adj. Flow (vph)	51	260	55	33	254	4	51	986	41	0	1040	43
RTOR Reduction (vph)	0	7	0	0	1	0	0	3	0	0	3	0
Lane Group Flow (vph)	51	308	0	33	257	0	0	1075	0	0	1080	0
Confl. Peds. (#/hr)	7		9	9		7	3		6	6		3
Confl. Bikes (#/hr)							2					2
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		3 4 5			3 4 5			1 2			1 2	
Permitted Phases	3 4 5			3 4 5			1 2					
Actuated Green, G (s)	33.0	33.0		33.0	33.0			56.0			56.0	
Effective Green, g (s)	33.0	33.0		33.0	33.0			56.0			56.0	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.50			0.50	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	268	554		221	576			1384			1851	
v/s Ratio Prot		c0.16			0.13						0.29	
v/s Ratio Perm	0.06			0.04				c0.38				
v/c Ratio	0.19	0.56		0.15	0.45			0.78			0.58	
Uniform Delay, d1	30.0	33.8		29.6	32.6			23.4			20.2	
Progression Factor	1.00	1.00		0.11	0.11			1.00			0.23	
Incremental Delay, d2	0.1	0.7		0.1	0.1			2.8			0.4	
Delay (s)	30.1	34.5		3.5	3.5			26.2			5.0	
Level of Service	C	C		A	A			C			A	
Approach Delay (s)		33.9			3.5			26.2			5.0	
Approach LOS		C			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	196	109	0	0	0	0	754	0	29	724	0
Future Volume (vph)	0	196	109	0	0	0	0	754	0	29	724	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		6.0						6.0			6.0	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		0.99						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.94						1.00			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		3514						3725			3711	
Flt Permitted		1.00						1.00			0.84	
Satd. Flow (perm)		3514						3725			3115	
Peak-hour factor, PHF	0.25	0.80	0.76	0.25	0.25	0.25	0.25	0.82	0.25	0.61	0.88	0.25
Adj. Flow (vph)	0	245	143	0	0	0	0	920	0	48	823	0
RTOR Reduction (vph)	0	75	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	313	0	0	0	0	0	920	0	0	871	0
Confl. Peds. (#/hr)	3		2	2		3	2		4	4		2
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%	0%	2%	0%	4%	2%	0%
Turn Type		NA						NA		Perm	NA	
Protected Phases		4 5 6						1 2 3			1 2 3	
Permitted Phases										1 2 3		
Actuated Green, G (s)		30.0						71.0			71.0	
Effective Green, g (s)		30.0						71.0			71.0	
Actuated g/C Ratio		0.27						0.63			0.63	
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		932						2340			1957	
v/s Ratio Prot		c0.09						0.25				
v/s Ratio Perm											c0.28	
v/c Ratio		0.34						0.39			0.45	
Uniform Delay, d1		33.5						10.4			10.8	
Progression Factor		1.00						0.10			0.13	
Incremental Delay, d2		1.0						0.1			0.1	
Delay (s)		34.4						1.1			1.5	
Level of Service		C						A			A	
Approach Delay (s)		34.4			0.0			1.1			1.5	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	156	647	0	0	856	2	0	0	0	0	130	47
Future Volume (vph)	156	647	0	0	856	2	0	0	0	0	130	47
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	6.0	6.0			6.0	6.0					6.0	
Lane Util. Factor	1.00	1.00			0.95	1.00					0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.98					0.99	
Flpb, ped/bikes	1.00	1.00			1.00	1.00					1.00	
Frt	1.00	1.00			1.00	0.85					0.96	
Flt Protected	0.95	1.00			1.00	1.00					1.00	
Satd. Flow (prot)	1844	1980			3762	1666					3643	
Flt Permitted	0.17	1.00			1.00	1.00					1.00	
Satd. Flow (perm)	328	1980			3762	1666					3643	
Peak-hour factor, PHF	0.85	0.94	0.25	0.25	0.92	0.50	0.25	0.25	0.25	0.25	0.75	0.85
Adj. Flow (vph)	184	688	0	0	930	4	0	0	0	0	173	55
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	27	0
Lane Group Flow (vph)	184	688	0	0	930	2	0	0	0	0	201	0
Confl. Peds. (#/hr)	5		2	2		5				1		1
Heavy Vehicles (%)	3%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	D.P+P	NA			NA	Perm					NA	
Protected Phases	2 3	1 2 3			1						4 5 6	
Permitted Phases	1					1						
Actuated Green, G (s)	65.0	71.0			44.0	44.0					30.0	
Effective Green, g (s)	65.0	71.0			44.0	44.0					30.0	
Actuated g/C Ratio	0.58	0.63			0.39	0.39					0.27	
Clearance Time (s)					6.0	6.0						
Vehicle Extension (s)					3.0	3.0						
Lane Grp Cap (vph)	470	1244			1464	648					967	
v/s Ratio Prot	0.07	c0.35			c0.25						c0.06	
v/s Ratio Perm	0.15					0.00						
v/c Ratio	0.39	0.55			0.64	0.00					0.21	
Uniform Delay, d1	27.8	12.0			28.0	21.1					32.3	
Progression Factor	0.30	0.05			1.00	1.00					1.35	
Incremental Delay, d2	0.2	0.5			0.9	0.0					0.5	
Delay (s)	8.5	1.1			28.9	21.1					43.9	
Level of Service	A	A			C	C					D	
Approach Delay (s)		2.6			28.9			0.0			43.9	
Approach LOS		A			C			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	113.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX B – TRAVEL TIME AND SPEED STUDY RESULTS

Havana Street Travel Time Survey Summary - 2018 Citywide Signal Re-timing "After"

Survey Time: 6:30 AM - 9:00 AM, 3:30 PM - 6:00 PM, 04/18/2019, 04/23/2019, 04/25/2019
Corridor: Yale Avenue to 6th Avenue

Peak Hour Travel Time MOEs Summary

Time	Direction	Average Travel Time (sec)	Average Travel Distance (ft)	Average Travle Speed (mph)	Design Travel Distance (ft)	Travel Time with Design Speed (sec)	Average Travel Delay (sec)	Stopped Delay (sec)	Time Below 10 mph (sec)	Time Above 10 mph (sec)	Time Below 30 mph (sec)	Time Above 30 mph (sec)	Number of Stops
AM Peak	NB	627	21186	23	21164	361	266	221	224	403	331	296	5
	SB	593	21184	25	21164	341	252	164	168	424	295	298	5
PM Peak	NB	665	21180	22	21164	361	304	228	240	425	371	294	5
	SB	697	21174	21	21164	341	356	249	252	445	408	289	5

Segment Average Travel Time and Speed from Yale Avenue to 6th Avenue

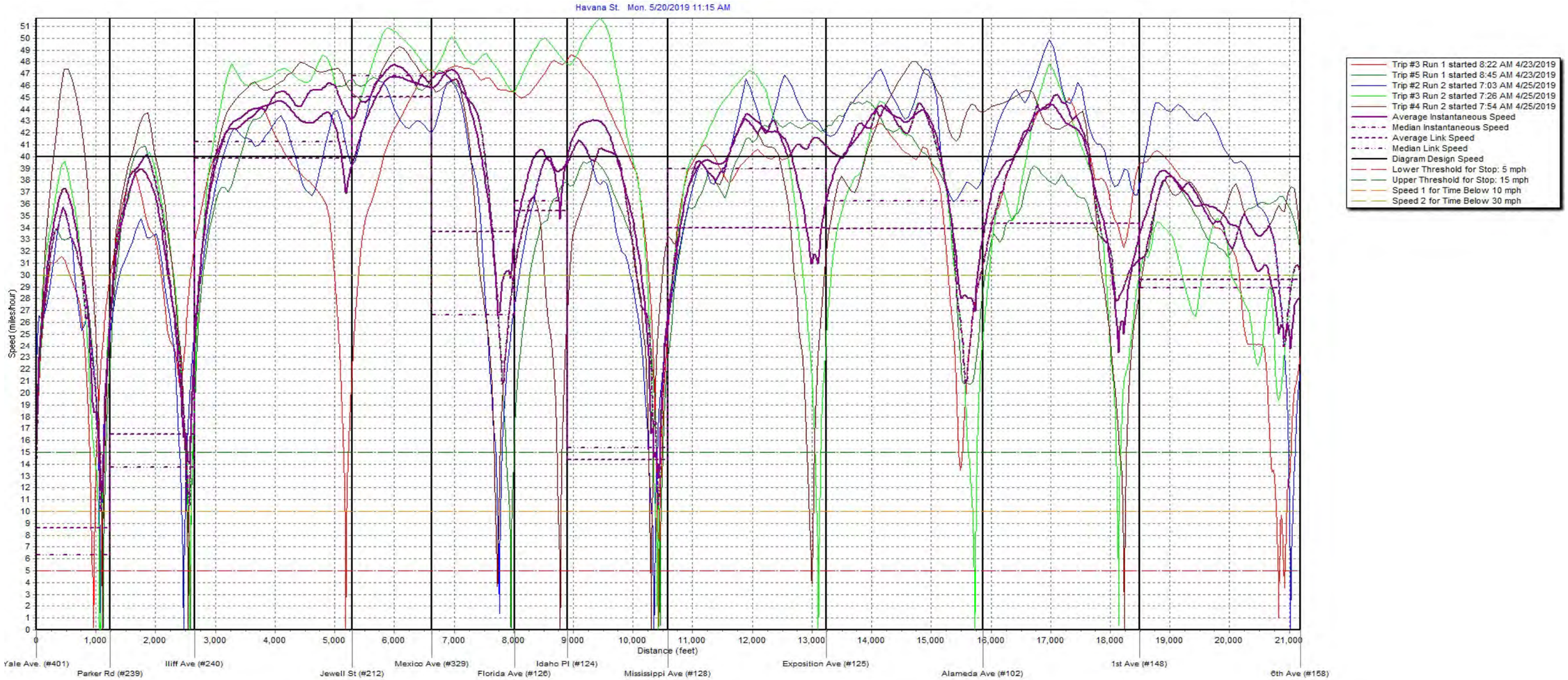
AM Peak	Northbound	5 Runs
Segment	**Average Travel Time (sec)**	**Average Speed (mph)**
to Parker Rd	120	8.6
to Iliff Ave	68.4	16.5
to Jewell St	46.2	39.9
to Mexico Ave	20.2	45.0
to Florida Ave	31.6	33.6
to Idaho Pl	20.6	35.4
to Mississippi Ave	81.8	14.4
to Exposition Ave	56.8	34.0
to Alameda Ave	63.4	33.9
to 1st Ave	53.8	34.3
to 6th Ave	64.4	29.6

PM Peak	Northbound	5 Runs
Segment	**Average Travel Time (sec)**	**Average Speed (mph)**
to Parker Rd	43.6	25.7
to Iliff Ave	52	18.8
to Jewell St	66.2	31.3
to Mexico Ave	30.2	33.8
to Florida Ave	44.4	26.3
to Idaho Pl	28.8	28.4
to Mississippi Ave	90.8	13.8
to Exposition Ave	59	32.4
to Alameda Ave	119.6	15.1
to 1st Ave	50.4	37.1
to 6th Ave	80.4	30.1

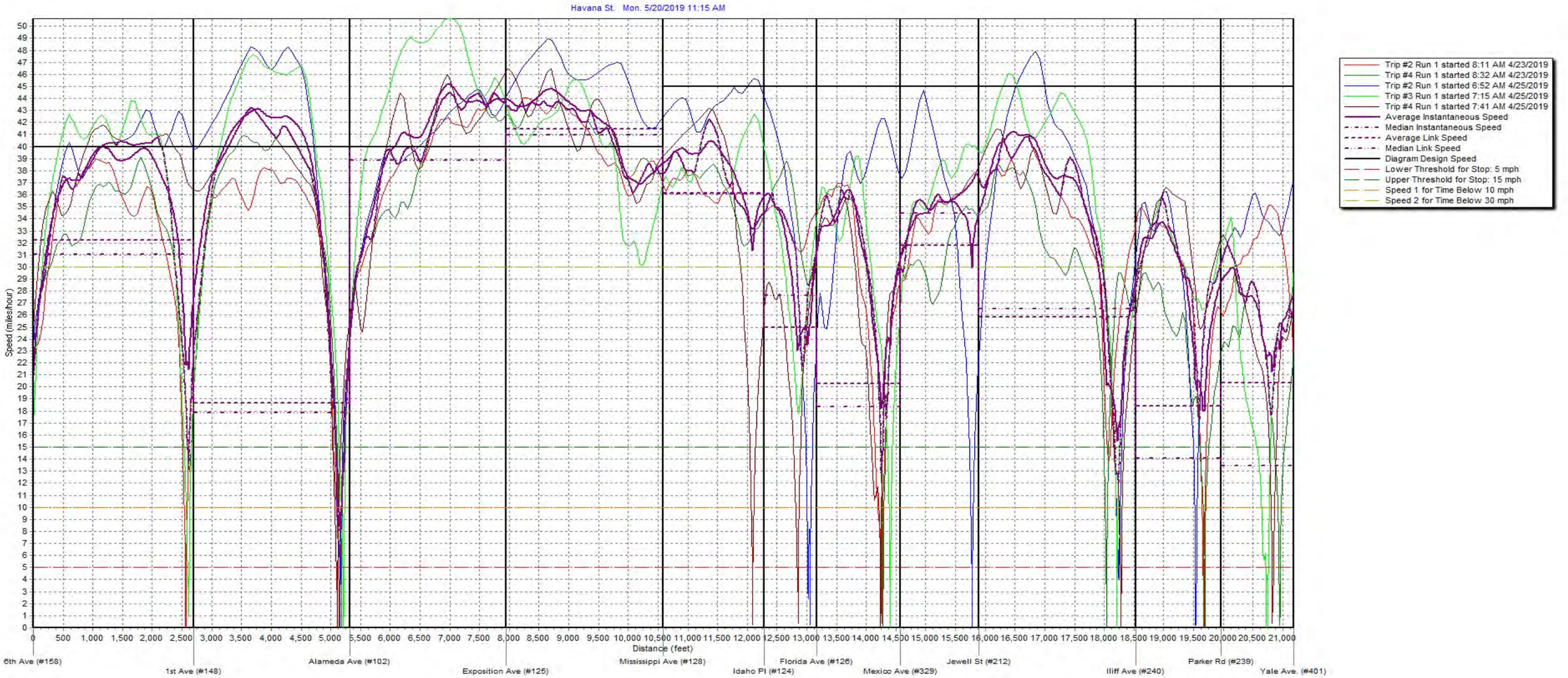
AM Peak	Southbound	5 Runs
Segment	**Average Travel Time (sec)**	**Average Speed (mph)**
to 1st Ave	59.2	32
to Alameda Ave	96.2	19
to Exposition Ave	44.8	40
to Mississippi Ave	43.4	41
to Idaho Pl	32.8	36
to Florida Ave	28	25
to Mexico Ave	52.6	20
to Jewell St	29.6	32
to Iliff Ave	77	26
to Parker Rd	76.8	18
to Yale Ave	52.2	20

PM Peak	Southbound	5 Runs
Segment	**Average Travel Time (sec)**	**Average Speed (mph)**
to 1st Ave	111	20.3
to Alameda Ave	122.8	14.6
to Exposition Ave	46	39.0
to Mississippi Ave	99.6	23.6
to Idaho Pl	40.8	29.3
to Florida Ave	19.4	31.8
to Mexico Ave	30.2	32.2
to Jewell St	29.2	34.0
to Iliff Ave	99.8	19.2
to Parker Rd	57.6	18.8
to Yale Ave	41.2	28.2

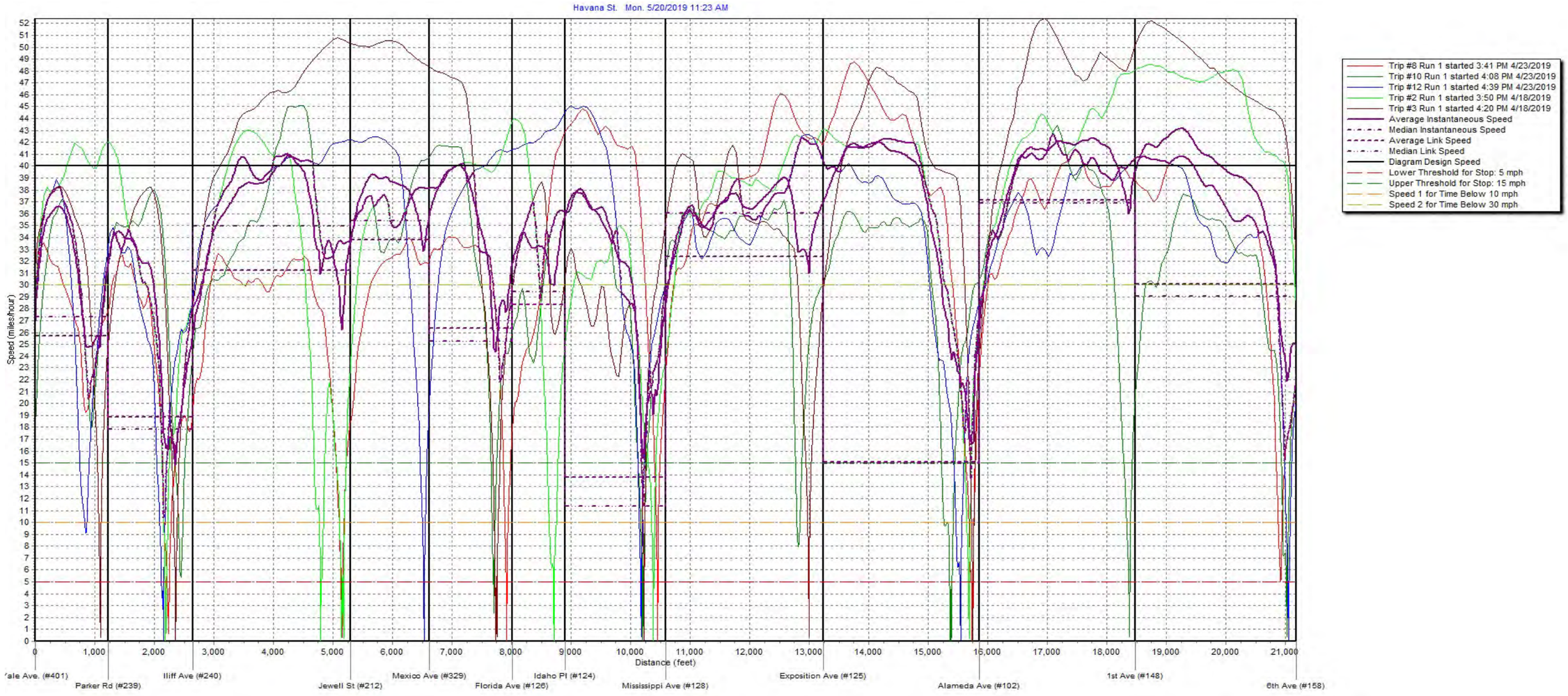
AM Peak Northbound Travel Speed



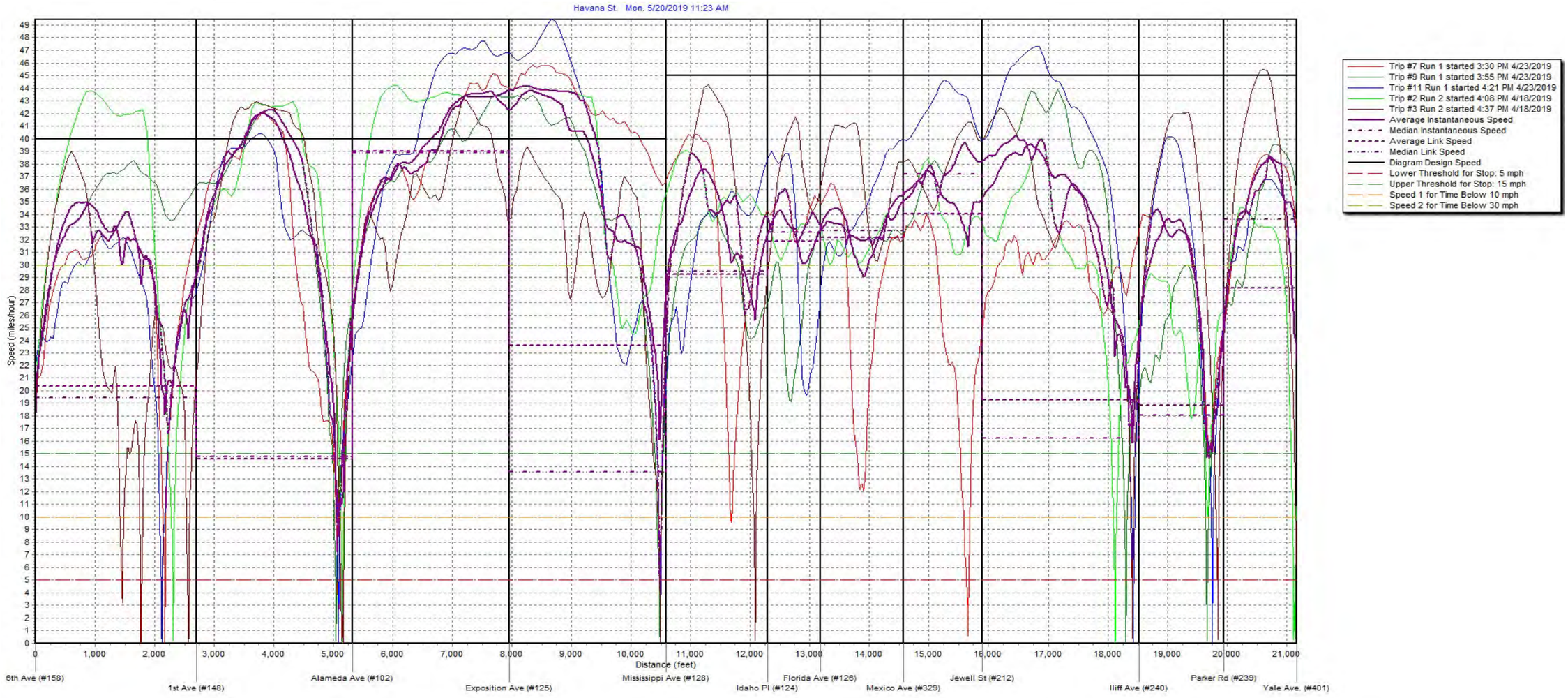
AM Peak Southbound Travel Speed



PM Peak Northbound Travel Speed



PM Peak Southbound Travel Speed



APPENDIX C – TCQSM TRANSIT LOS WORKSHEETS

Multimodal Transit LOS Calculation NB - Existing Conditions

	Inputs	Segment 1: Between Yale and Parker	Segment 2: Between Parker and Illiff	Segment 3: Between Illiff and Jewell	Segment 4: Between Jewell and Mexico	Segment 5: Between Mexico and Florida	Segment 6: Between Florida and Wyoming / Idaho	Segment 7: Between Wyoming / Idaho and Mississippi	Segment 8: Between Mississippi and Exposition	Segment 9: Between Exposition and Alameda	Segment 10: Between Alameda and 1st Ave	Segment 11: Between 1st Ave and 6th Ave	Segment 12: Between 6th Ave and 11th Ave	Segment 13: Between 11th Ave and Del Mar Pkwy	Segment 14: Between Del Mar Pkwy and 13th Ave	Segment 15: Between 13th Ave and Colfax	Segment 16: Between Colfax and 16th Ave	Segment 17: Between 16th Ave and 17th Ave	Segment 18: Between 17th Ave and Montview
		NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
	TRANSIT OPERATIONS INFORMATION																		
	Number of local buses on street segment per hour (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Number of express buses stopping in segment per hour (bus/h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
t_{ex}	Average excess wait time (min)	3.57	3.57	3.59	3.65	3.70	3.74	3.79	3.89	4.12	4.40	4.94	5.12	5.09	-	5.05	5.01	-	5.25
L_f	Average passenger load factor (p/seat)	0.35	0.36	0.44	0.44	0.43	0.43	0.43	0.48	0.44	0.43	0.41	0.40	0.40	-	0.39	0.29	-	0.27
S	Average transit travel speed (mi/h)	13.5	13.5	13.6	13.8	14.0	14.2	14.3	14.5	14.6	14.4	12.7	12.2	12.3	-	12.4	12.6	-	13.4
l_{pt}	Average passenger trip length (mi)	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
	Is the segment in the CBD of a metro area of 5 million or more?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	TRANSIT AMENITY DATA																		
p_{sh}	Percent stops in segment with a shelter	100%	100%	50%	0%	0%	0%	0%	0%	50%	50%	33%	0%	0%	0%	0%	100%	0%	0%
p_{be}	Percent stops in segment with a bench	100%	100%	100%	100%	100%	0%	100%	100%	100%	50%	100%	0%	100%	0%	0%	100%	0%	50%
	PEDESTRIAN ENVIRONMENT DATA																		
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	8.0	8.5	7.0	7.8	10.0	8.7	10.0	9.0	7.8	8.8	7.8	4.8	8.5	2.1	3.3	3.0	3.0	2.5
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	0.0	0.0	6.3	10.0	10.0	5.0	0.0	7.8	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Does a continuous barrier exist between the street and sidewalk?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Is the street divided?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Are parking spaces striped?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
p_{pk}	Proportion of on-street parking occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	90%	20%
W_{bl}	Bicycle lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W_{os}	Shoulder/parking lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	7.5
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	11.5	12.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.5	12.3	12.3	12.0	13.20	13.0	12.0	12.0	11.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	380	578	618	648	621	727	693	535	589	454	803	428	552	620	704	432	432	372
S_R	Average vehicle running speed, including intersection delay (mi/h)	25.7	18.8	31.3	33.8	26.3	28.4	13.8	32.4	15.1	37.1	30.1	17.0	19.0	20.0	13.0	18.0	18.0	12.0
	Calculations																		
f	Transit frequency (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
f_h	Headway factor	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	#VALUE!	1.00	1.00	#VALUE!	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.5	0.5	0.3	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.2	0.0	0.1	0.0	0.0	0.5	0.0	0.0
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.6	1.6	1.6	#VALUE!	1.6	1.6	#VALUE!	1.7
T_{ptt}	Perceived travel time rate (min/mi)	6.2	6.2	6.4	6.6	6.6	6.6	6.5	6.5	6.5	6.7	7.7	8.2	8.0	#VALUE!	8.0	7.5	#VALUE!	7.8
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.84	0.84	0.83	0.82	0.82	0.82	0.82	0.82	0.83	0.81	0.78	0.76	0.76	#VALUE!	0.76	0.78	#VALUE!	0.77
s_{w-r}	Transit wait-ride score	2.34	2.35	2.32	2.30	2.30	2.29	2.30	2.30	2.32	2.28	2.17	2.12	2.13	#VALUE!	2.13	2.19	#VALUE!	2.16
f_s	Motorized vehicle speed adjustment factor	0.26	0.14	0.39	0.46	0.28	0.32	0.08	0.42	0.09	0.55	0.36	0.12	0.14	0.16	0.07	0.13	0.13	0.06
f_v	Motorized vehicle volume adjustment factor	0.86	1.31	1.41	1.47	1.41	1.65	1.58	1.22	1.34	1.03	1.83	0.97	1.26	1.41	1.60	0.98	0.98	0.85
W_{aA}	Adjusted available sidewalk width (ft)	8.0	8.5	7.0	7.8	10.0	8.7	10.0	9.0	7.8	8.8	7.8	4.8	8.5	2.1	3.3	3.0	3.0	2.5
f_{sw}	Sidewalk width coefficient	3.60	3.45	3.90	3.68	3.00	3.40	3.00	3.30	3.68	3.38	3.68	4.58	3.45	5.37	5.03	5.10	5.10	5.25
f_b	Buffer area coefficient	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	11.5	12.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.5	12.3	12.3	12.0	13.2	13.0	12.0	12.0	11.0
W_v	Effective total width as a function of traffic volume (ft)	11.5	12.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.5	12.3	12.3	12.0	13.2	13.0	12.0	12.0	11.0
W_1	Effective width of combined bike lane and shoulder (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	10.0	7.5
f_w	Cross-section adjustment factor	-4.54	-4.57	-4.51	-4.72	-4.85	-4.84	-4.75	-4.58	-4.76	-4.56	-4.81	-4.33	-4.57	-3.93	-4.15	-4.41	-5.34	-4.46
I_p	Pedestrian environment score	2.64	2.94	3.34	3.26	2.89	3.18	2.95	3.10	2.72	3.07	3.43	2.81	2.88	3.69	3.57	2.75	1.82	2.49
	Pedestrian LOS	B	C	C	C	C	C	C	C	B	C	C	C	C	D	D	B	A	B
I_t	Transit LOS score	2.878	2.922	3.022	3.045	2.984	3.038	2.985	3.011	2.935	3.044	3.257	3.240	3.232	#VALUE!	3.335	3.129	#VALUE!	3.136
	Output																		
	Transit LOS	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***No Stops***	***C***	***C***	***No Stops***	***C***

Multimodal Transit LOS Calculation SB - Existing Conditions

	Inputs	Segment 1: Between Yale and Parker	Segment 2: Between Parker and Illiff	Segment 3: Between Illiff and Jewell	Segment 4: Between Jewell and Mexico	Segment 5: Between Mexico and Florida	Segment 6: Between Florida and Wyoming / Idaho	Segment 7: Between Wyoming / Idaho and Mississippi	Segment 8: Between Mississippi and Exposition	Segment 9: Between Exposition and Alameda	Segment 10: Between Alameda and 1st Ave	Segment 11: Between 1st Ave and 6th Ave	Segment 12: Between 6th Ave and 11th Ave	Segment 13: Between 11th Ave and Del Mar Pkwy	Segment 14: Between Del Mar Pkwy and 13th Ave	Segment 15: Between 13th Ave and Colfax	Segment 16: Between Colfax and 16th Ave	Segment 17: Between 16th Ave and 17th Ave	Segment 18: Between 17th Ave and Montview
		SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
	TRANSIT OPERATIONS INFORMATION																		
	Number of local buses on street segment per hour (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Number of express buses stopping in segment per hour (bus/h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
t_{ex}	Average excess wait time (min)	4.02	4.05	4.09	4.13	4.16	4.18	4.21	4.36	4.66	4.46	3.76	3.20	2.98	2.76	2.54	-	2.28	2.03
L_f	Average passenger load factor (p/seat)	0.27	0.28	0.34	0.36	0.38	0.39	0.40	0.46	0.53	0.57	0.61	0.62	0.63	0.63	0.63	-	0.45	0.45
S	Average transit travel speed (mi/h)	16.5	17.1	16.4	15.7	15.2	14.8	14.3	14.3	14.2	13.7	12.8	12.0	11.7	11.4	11.1	-	10.6	10.2
l_{pt}	Average passenger trip length (mi)	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29
	Is the segment in the CBD of a metro area of 5 million or more?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	TRANSIT AMENITY DATA																		
p_{sh}	Percent stops in segment with a shelter	0%	0%	50%	100%	0%	0%	100%	0%	33%	0%	0%	0%	0%	0%	100%	0%	0%	0%
p_{be}	Percent stops in segment with a bench	100%	100%	100%	100%	100%	0%	100%	100%	33%	0%	66%	0%	0%	0%	100%	0%	100%	0%
	PEDESTRIAN ENVIRONMENT DATA																		
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	8.0	10.0	5.0	8.0	7.1	6.5	8.3	5.0	4.5	7.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	6.5	2.4	0.0	5.3	0.0	0.0	0.0	9.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Does a continuous barrier exist between the street and sidewalk?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Is the street divided?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Are parking spaces striped?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
p_{pk}	Proportion of on-street parking occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	90%	20%
W_{bl}	Bicycle lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W_{os}	Shoulder/parking lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	7.0
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	12.0	12.5	12.0	12.0	11.9	11.8	11.5	12.0	12.0	12.0	12.2	13.5	12.0	15.0	14.8	11.8	11.8	11.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	351	344	645	538	643	822	768	681	721	811	732	467	426	880	728	648	648	500
S_R	Average vehicle running speed, including intersection delay (mi/h)	28.2	18.8	19.2	34.0	32.2	31.8	29.3	23.6	39.0	14.6	20.3	10.0	18.0	12.0	23.0	10.0	10.0	20.0

	Calculations																		
f	Transit frequency (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
f_h	Headway factor	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	#VALUE!	1.00	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.1	0.1	0.3	0.5	0.1	0.0	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.1	1.0	0.9	0.8	0.8	#VALUE!	0.7	0.6
T_{ptt}	Perceived travel time rate (min/mi)	6.0	5.9	5.9	5.9	6.4	6.6	6.3	6.8	6.9	7.1	6.9	6.9	6.9	6.9	6.5	#VALUE!	7.0	7.1
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.85	0.86	0.86	0.86	0.83	0.82	0.84	0.81	0.81	0.80	0.81	0.81	0.81	0.81	0.83	#VALUE!	0.80	0.80
s_{w-r}	Transit wait-ride score	2.38	2.39	2.40	2.40	2.32	2.30	2.34	2.27	2.26	2.24	2.25	2.25	2.25	2.25	2.31	#VALUE!	2.25	2.23
f_s	Motorized vehicle speed adjustment factor	0.32	0.14	0.15	0.46	0.41	0.41	0.34	0.22	0.61	0.09	0.16	0.04	0.13	0.06	0.21	0.04	0.04	0.16
f_v	Motorized vehicle volume adjustment factor	0.80	0.78	1.47	1.22	1.46	1.87	1.75	1.55	1.64	1.85	1.67	1.06	0.97	2.00	1.66	1.47	1.47	1.14
W_{aA}	Adjusted available sidewalk width (ft)	8.0	10.0	5.0	8.0	7.1	6.5	8.3	5.0	4.5	7.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
f_{sw}	Sidewalk width coefficient	3.60	3.00	4.50	3.60	3.86	4.05	3.50	4.50	4.65	3.75	4.95	5.10	5.10	5.10	5.10	5.10	5.10	5.10
f_b	Buffer area coefficient	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
W_c	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	12.0	12.5	12.0	12.0	11.9	11.8	11.5	12.0	12.0	12.0	12.2	13.5	12.0	15.0	14.8	11.8	11.8	11.0
W_v	Effective total width as a function of traffic volume (ft)	12.0	12.5	12.0	12.0	11.9	11.8	11.5	12.0	12.0	12.0	12.2	13.5	12.0	15.0	14.8	11.8	11.8	11.0
W_1	Effective width of combined bike lane and shoulder (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	10.0	7.0
f_w	Cross-section adjustment factor	-4.55	-4.78	-4.43	-4.55	-4.66	-4.47	-4.55	-4.35	-4.59	-5.08	-4.15	-4.13	-4.06	-4.19	-4.18	-4.40	-5.33	-4.52
I_p	Pedestrian environment score	2.61	2.19	3.23	3.18	3.26	3.85	3.59	3.47	3.71	2.89	3.72	3.02	3.09	3.92	3.74	3.16	2.23	2.82
	Pedestrian LOS	B	B	C	C	C	D	D	C	D	C	D	C	C	D	D	C	B	C
I_t	Transit LOS score	2.82	2.74	2.89	2.88	3.00	3.13	3.03	3.11	3.17	3.08	3.18	3.07	3.08	3.21	3.09	#VALUE!	2.96	3.08

	Output																		
	Transit LOS	***C***	***B***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***No Stops***	***C***	***C***

Multimodal Transit LOS Calculation NB - Future 2040 Conditions

	Inputs	Segment 1: Between Yale and Parker	Segment 2: Between Parker and Illiff	Segment 3: Between Illiff and Jewell	Segment 4: Between Jewell and Mexico	Segment 5: Between Mexico and Florida	Segment 6: Between Florida and Wyoming / Idaho	Segment 7: Between Wyoming / Idaho and Mississippi	Segment 8: Between Mississippi and Exposition	Segment 9: Between Exposition and Alameda	Segment 10: Between Alameda and 1st Ave	Segment 11: Between 1st Ave and 6th Ave	Segment 12: Between 6th Ave and 11th Ave	Segment 13: Between 11th Ave and Del Mar Pkwy	Segment 14: Between Del Mar Pkwy and 13th Ave	Segment 15: Between 13th Ave and Colfax	Segment 16: Between Colfax and 16th Ave	Segment 17: Between 16th Ave and 17th Ave	Segment 18: Between 17th Ave and Montview
		NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB
	TRANSIT OPERATIONS INFORMATION																		
	Number of local buses on street segment per hour (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Number of express buses stopping in segment per hour (bus/h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
t_{ex}	Average excess wait time (min)	3.57	3.57	3.59	3.65	3.70	3.74	3.79	3.89	4.12	4.40	4.94	5.12	5.09	-	5.05	5.01	-	5.25
L_f	Average passenger load factor (p/seat)	0.44	0.45	0.56	0.56	0.54	0.54	0.54	0.60	0.56	0.54	0.52	0.51	0.50	-	0.48	0.37	-	0.34
S	Average transit travel speed (mi/h)	13.5	13.5	13.6	13.8	14.0	14.2	14.3	14.5	14.6	14.4	12.7	12.2	12.3	-	12.4	12.6	-	13.4
l_{pt}	Average passenger trip length (mi)	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14	3.14
	Is the segment in the CBD of a metro area of 5 million or more?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	TRANSIT AMENITY DATA																		
p_{sh}	Percent stops in segment with a shelter	100%	100%	50%	0%	0%	0%	0%	0%	50%	50%	33%	0%	0%	0%	0%	100%	0%	0%
p_{be}	Percent stops in segment with a bench	100%	100%	100%	100%	100%	0%	100%	100%	100%	50%	100%	0%	100%	0%	0%	100%	0%	50%
	PEDESTRIAN ENVIRONMENT DATA																		
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	8.0	8.5	7.0	7.8	10.0	8.7	10.0	9.0	7.8	8.8	7.8	4.8	8.5	2.1	3.3	3.0	3.0	2.5
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	0.0	0.0	6.3	10.0	10.0	5.0	0.0	7.8	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Does a continuous barrier exist between the street and sidewalk?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Is the street divided?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Are parking spaces striped?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
p_{pk}	Proportion of on-street parking occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	90%	20%
W_{bl}	Bicycle lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W_{os}	Shoulder/parking lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	7.5
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	11.5	12.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.5	12.3	12.3	12.0	13.20	13.0	12.0	12.0	11.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	512	923	840	753	702	847	941	610	771	566	875	518	521	692	759	477	477	395
S_R	Average vehicle running speed, including intersection delay (mi/h)	8.0	4.0	25.0	24.0	18.0	20.0	12.0	38.0	11.0	24.0	23.0	15.0	20.0	19.0	12.0	17.0	17.0	10.0
	Calculations																		
f	Transit frequency (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
f_h	Headway factor	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	#VALUE!	1.00	1.00	#VALUE!	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.5	0.5	0.3	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.2	0.0	0.1	0.0	0.0	0.5	0.0	0.0
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.6	1.6	1.6	#VALUE!	1.6	1.6	#VALUE!	1.7
T_{ptt}	Perceived travel time rate (min/mi)	6.2	6.2	6.4	6.6	6.6	6.6	6.5	6.5	6.5	6.7	7.7	8.2	8.0	#VALUE!	8.0	7.5	#VALUE!	7.8
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.84	0.84	0.83	0.82	0.82	0.82	0.82	0.82	0.83	0.81	0.78	0.76	0.76	#VALUE!	0.76	0.78	#VALUE!	0.77
s_{w-r}	Transit wait-ride score	2.34	2.35	2.32	2.30	2.30	2.29	2.30	2.30	2.32	2.28	2.17	2.12	2.13	#VALUE!	2.13	2.19	#VALUE!	2.16
f_s	Motorized vehicle speed adjustment factor	0.03	0.01	0.25	0.23	0.13	0.16	0.06	0.58	0.05	0.23	0.21	0.09	0.16	0.14	0.06	0.12	0.12	0.04
f_v	Motorized vehicle volume adjustment factor	1.16	2.10	1.91	1.71	1.60	1.93	2.14	1.39	1.75	1.29	1.99	1.18	1.19	1.57	1.73	1.09	1.09	0.90
W_{aA}	Adjusted available sidewalk width (ft)	8.0	8.5	7.0	7.8	10.0	8.7	10.0	9.0	7.8	8.8	7.8	4.8	8.5	2.1	3.3	3.0	3.0	2.5
f_{sw}	Sidewalk width coefficient	3.60	3.45	3.90	3.68	3.00	3.40	3.00	3.30	3.68	3.38	3.68	4.58	3.45	5.37	5.03	5.10	5.10	5.25
f_b	Buffer area coefficient	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	11.5	12.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.5	12.3	12.3	12.0	13.2	13.0	12.0	12.0	11.0
W_v	Effective total width as a function of traffic volume (ft)	11.5	12.0	12.0	12.0	12.0	12.0	13.0	12.0	12.0	11.5	12.3	12.3	12.0	13.2	13.0	12.0	12.0	11.0
W_1	Effective width of combined bike lane and shoulder (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	10.0	7.5
f_w	Cross-section adjustment factor	-4.54	-4.57	-4.51	-4.72	-4.85	-4.84	-4.75	-4.58	-4.76	-4.56	-4.81	-4.33	-4.57	-3.93	-4.15	-4.41	-5.34	-4.46
I_p	Pedestrian environment score	2.70	3.58	3.70	3.27	2.92	3.30	3.49	3.43	3.09	3.01	3.44	2.99	2.82	3.84	3.68	2.84	1.91	2.52
	Pedestrian LOS	B	D	D	C	C	C	C	C	C	C	C	C	C	D	D	C	A	B
I_t	Transit LOS score	2.887	3.019	3.077	3.047	2.990	3.054	3.067	3.060	2.991	3.034	3.259	3.267	3.224	#VALUE!	3.352	3.142	#VALUE!	3.141
	Output																		
	Transit LOS	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***No Stops***	***C***	***C***	***No Stops***	***C***

Multimodal Transit LOS Calculation SB - Future 2040 Conditions

	Inputs	Segment 1: Between Yale and Parker	Segment 2: Between Parker and Illiff	Segment 3: Between Illiff and Jewell	Segment 4: Between Jewell and Mexico	Segment 5: Between Mexico and Florida	Segment 6: Between Florida and Wyoming / Idaho	Segment 7: Between Wyoming / Idaho and Mississippi	Segment 8: Between Mississippi and Exposition	Segment 9: Between Exposition and Alameda	Segment 10: Between Alameda and 1st Ave	Segment 11: Between 1st Ave and 6th Ave	Segment 12: Between 6th Ave and 11th Ave	Segment 13: Between 11th Ave and Del Mar Pkwy	Segment 14: Between Del Mar Pkwy and 13th Ave	Segment 15: Between 13th Ave and Colfax	Segment 16: Between Colfax and 16th Ave	Segment 17: Between 16th Ave and 17th Ave	Segment 18: Between 17th Ave and Montview
		SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
	TRANSIT OPERATIONS INFORMATION																		
	Number of local buses on street segment per hour (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Number of express buses stopping in segment per hour (bus/h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
t_{ex}	Average excess wait time (min)	4.02	4.05	4.09	4.13	4.16	4.18	4.21	4.36	4.66	4.46	3.76	3.20	2.98	2.76	2.54	-	2.28	2.03
L_f	Average passenger load factor (p/seat)	0.33	0.35	0.43	0.45	0.47	0.49	0.51	0.58	0.66	0.72	0.76	0.78	0.79	0.79	0.79	-	0.57	0.57
S	Average transit travel speed (mi/h)	16.5	17.1	16.4	15.7	15.2	14.8	14.3	14.3	14.2	13.7	12.8	12.0	11.7	11.4	11.1	-	10.6	10.2
l_{pt}	Average passenger trip length (mi)	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29	3.29
	Is the segment in the CBD of a metro area of 5 million or more?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	TRANSIT AMENITY DATA																		
p_{sh}	Percent stops in segment with a shelter	0%	0%	50%	100%	0%	0%	100%	0%	33%	0%	0%	0%	0%	0%	100%	0%	0%	0%
p_{be}	Percent stops in segment with a bench	100%	100%	100%	100%	100%	0%	100%	100%	33%	0%	66%	0%	0%	0%	100%	0%	100%	0%
	PEDESTRIAN ENVIRONMENT DATA																		
W_A	Sidewalk width (ft) (Enter 0 if no sidewalk)	8.0	10.0	5.0	8.0	7.1	6.5	8.3	5.0	4.5	7.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
W_{buf}	Buffer width from sidewalk to street (ft)	0.0	6.5	2.4	0.0	5.3	0.0	0.0	0.0	9.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Does a continuous barrier exist between the street and sidewalk?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Is the street divided?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Are parking spaces striped?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
p_{pk}	Proportion of on-street parking occupied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	90%	20%
W_{bl}	Bicycle lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W_{os}	Shoulder/parking lane width (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	7.0
W_{ol}	Outside travel lane (closest to sidewalk) width (ft)	12.0	12.5	12.0	12.0	11.9	11.8	11.5	12.0	12.0	12.0	12.2	13.5	12.0	15.0	14.8	11.8	11.8	11.0
v_m	Outside lane demand flow rate at midsegment (veh/h)	464	505	791	774	821	1122	879	761	776	1080	901	524	434	858	794	686	686	510
S_R	Average vehicle running speed, including intersection delay (mi/h)	31.0	15.0	16.0	26.0	21.0	4.0	11.0	18.0	35.0	7.0	8.0	8.0	17.5	12.0	22.0	10.0	10.0	19.0

	Calculations																		
f	Transit frequency (bus/h)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
f_h	Headway factor	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
f_{pl}	Passenger load weighting factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	#VALUE!	1.00	1.00
T_{at}	Perceived amenity time rate (min/mi)	0.1	0.1	0.3	0.5	0.1	0.0	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0
T_{ex}	Excess wait time rate due to late arrivals (min/mi)	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.1	1.0	0.9	0.8	0.8	#VALUE!	0.7	0.6
T_{ptt}	Perceived travel time rate (min/mi)	6.0	5.9	5.9	5.9	6.4	6.6	6.3	6.8	6.9	7.1	6.9	6.9	6.9	6.9	6.5	#VALUE!	7.0	7.1
T_{btt}	Base travel time rate (min/mi)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
f_{tt}	Perceived travel time factor	0.85	0.86	0.86	0.86	0.83	0.82	0.84	0.81	0.81	0.80	0.81	0.81	0.81	0.81	0.83	#VALUE!	0.80	0.80
s_{w-r}	Transit wait-ride score	2.38	2.39	2.40	2.40	2.32	2.30	2.34	2.27	2.26	2.24	2.25	2.25	2.25	2.25	2.31	#VALUE!	2.25	2.23
f_s	Motorized vehicle speed adjustment factor	0.38	0.09	0.10	0.27	0.18	0.01	0.05	0.13	0.49	0.02	0.03	0.03	0.12	0.06	0.19	0.04	0.04	0.14
f_v	Motorized vehicle volume adjustment factor	1.06	1.15	1.80	1.76	1.87	2.55	2.00	1.73	1.77	2.46	2.05	1.19	0.99	1.95	1.81	1.56	1.56	1.16
W_{aA}	Adjusted available sidewalk width (ft)	8.0	10.0	5.0	8.0	7.1	6.5	8.3	5.0	4.5	7.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
f_{sw}	Sidewalk width coefficient	3.60	3.00	4.50	3.60	3.86	4.05	3.50	4.50	4.65	3.75	4.95	5.10	5.10	5.10	5.10	5.10	5.10	5.10
f_b	Buffer area coefficient	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
W_t	Total width of outside lane, bike lane, and parking lane/shoulder (ft)	12.0	12.5	12.0	12.0	11.9	11.8	11.5	12.0	12.0	12.0	12.2	13.5	12.0	15.0	14.8	11.8	11.8	11.0
W_v	Effective total width as a function of traffic volume (ft)	12.0	12.5	12.0	12.0	11.9	11.8	11.5	12.0	12.0	12.0	12.2	13.5	12.0	15.0	14.8	11.8	11.8	11.0
W_1	Effective width of combined bike lane and shoulder (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	10.0	7.0
f_w	Cross-section adjustment factor	-4.55	-4.78	-4.43	-4.55	-4.66	-4.47	-4.55	-4.35	-4.59	-5.08	-4.15	-4.13	-4.06	-4.19	-4.18	-4.40	-5.33	-4.52
I_p	Pedestrian environment score	2.94	2.51	3.52	3.53	3.43	4.14	3.55	3.56	3.72	3.44	3.97	3.14	3.10	3.87	3.87	3.25	2.31	2.83
	Pedestrian LOS	C	B	D	D	C	D	D	D	D	C	D	C	C	D	D	C	B	C
I_t	Transit LOS score	2.87	2.78	2.93	2.93	3.03	3.18	3.02	3.13	3.17	3.16	3.22	3.09	3.08	3.20	3.11	#VALUE!	2.97	3.08

	Output																		
	Transit LOS	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***C***	***No Stops***	***C***	***C***

APPENDIX D – SIDEWALK OBSTRUCTIONS

APPENDIX D – SIDEWALK OBSTRUCTIONS[1]

Location	Obstruction Type	ADA Compliant	Notes
Montview Blvd to Colfax Ave (West)	Sidewalk less than 4'	No	Sidewalk is less than 4' wide and adjacent to curb.
Del Mar to 11th (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
11th to 6th Ave (West)	Sidewalk less than 4'	No	Sidewalk is less than 4' wide and adjacent to curb.
6th Ave to Hanover Way (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Hanover Way (West)	Sidewalk obstruction	No	Streetlight post in the middle of sidewalk (less than 4' travel space on either side)
Fan Fair Liquors (West)	Substandard pedestrian ramp	No	Missing warning marks
Family Dollar (West)	Sidewalk obstruction	Yes	Telephone pole/lightpost in the middle of sidewalk (does not constrain sidewalk width to less than 4')
Tierra Maya (West)	Sidewalk obstruction	No	Streetlight post in the middle of sidewalk (less than 4' travel space on either side)
Tierra Maya (West)	Sidewalk obstruction	No	Streetlight post in the middle of sidewalk (less than 4' travel space on either side)
Tierra Maya to 1st Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Virginia to Mississippi Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.

[1] *Data observed in April 2020.*

Mississippi Ave to Florida Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Buckingham Village Shopping Plaza (West)	Substandard pedestrian ramp	No	Missing warning marks
Buckingham Village Shopping Plaza (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Mexico Ave to Colorado Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Colorado Ave (West)	Substandard pedestrian ramp	No	Missing warning marks
Colorado Ave to Jewell Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Jewell Ave to Evans Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Evans Ave (West)	Substandard pedestrian ramp	No	Missing warning marks
Warren Ave to gas station (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Gas station (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Gas station (West)	Substandard pedestrian ramp	No	Missing warning marks
Gas station (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Illiff Ave (West)	Substandard pedestrian ramp	No	Missing warning marks
Illiff Ave to Ross Dress for Less (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.

Yale Ave to Dartmouth Ave (West)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Montview Blvd to Colfax Ave (East)	Sidewalk less than 4'	No	Sidewalk is less than 4' wide and adjacent to curb.
Del Mar Parkway (Northeast)	Sidewalk obstruction	No	Missing sidewalk
Del Mar Parkway (Southeast)	Sidewalk obstruction	No	Missing sidewalk
10th Ave (East)	Sidewalk obstruction	No	Streetlight post in the middle of sidewalk (less than 4' travel space on either side)
Del Mar Parkway to 6th Ave (East)	Sidewalk less than 4'	No	Sidewalk is less than 4' wide and adjacent to curb.
6th Ave (East)	Substandard pedestrian ramp	No	Missing warning marks
Ironton Ct	Substandard pedestrian ramp	No	Missing warning marks
4th Way (East)	Missing pedestrian ramp	No	Intersection lacks pedestrian ramp.
4th Way (East)	Sidewalk obstruction	No	Utility boxes in the middle of sidewalk (less than 4' travel space on either side)
3rd Ave (East)	Missing pedestrian ramp	No	Intersection lacks pedestrian ramp.
3rd Ave (East)	Sidewalk obstruction	No	Missing sidewalk
1st Ave to Alameda (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Bayaud Ave (East)	Substandard pedestrian ramp	No	Missing warning marks
Virginia Ave (East)	Sidewalk obstruction	Yes	Bus stop (bench, sign, structure) in the middle of sidewalk (does not constrain

			sidewalk width to less than 4')
Virginia Ave to Mississippi (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Kentucky Ave (East)	Substandard pedestrian ramp	No	Missing warning marks
Mississippi Ave (East)	Substandard pedestrian ramp	No	Missing warning marks
Mississippi Ave to Phillips 66 (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Garden Dr to Wells Fargo (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Wells Fargo to Starbucks (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Idaho Place to Florida Ave (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Colorado Ave to Jewell Ave (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Jewell Ave to Illiff Ave (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Illiff Ave to Parker Road (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Stampede restaurant (East)	Substandard pedestrian ramp	No	Missing warning marks
Parker Rd to Yale Ave (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.
Yale Ave to Cornell Ave (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.

Bicycle Village (East)	Substandard pedestrian ramp	No	Missing warning marks
Mr Panda Chinese (East)	Substandard pedestrian ramp	No	Missing warning marks
Eurocar (East)	Substandard pedestrian ramp	No	Missing warning marks
Mitsubishi Dealership (East)	Substandard pedestrian ramp	No	Missing warning marks
Infiniti Car Dealership (East)	Substandard pedestrian ramp	No	Missing warning marks
7-11 to Dartmouth (East)	Curb Adjacent Sidewalk	Yes	Sidewalk is not separated by buffer from traffic.

APPENDIX E – BICYCLE AND PEDESTRIAN COUNTS

APPENDIX E – BICYCLE AND PEDESTRIAN COUNTS[2]

Table E.1. Bicycle and Pedestrian Counts per Peak Hour in 2020

	East				West				North				South				Total
	AM	Noon	PM	Sat PM	AM	Noon	PM	Sat PM	AM	Noon	PM	Sat PM	AM	Noon	PM	Sat PM	
Montview Boulevard																	
Bicycles	0	0	0	0	1	0	0	0	6	0	1	0	0	0	2	0	10
Pedestrians	2	1	5	1	3	0	3	3	11	2	2	3	1	4	1	1	44
17th Avenue																	
Bicycles	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Pedestrians	1	0	5	1	2	0	3	0	2	1	2	1	1	3	4	1	27
13th Avenue																	
Bicycles	0	1	0	1	0	0	1	2	1	2	1	0	3	1	16	2	32
Pedestrians	4	2	7	8	2	1	0	5	19	4	59	3	34	10	54	2	215
Del Mar Parkway																	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	2	6	5	5	0	0	2	1	0	0	1	0	0	2	1	2	27
6th Avenue																	
Bicycles	0	0	0	2	0	0	1	0	4	0	0	0	3	0	0	5	15
Pedestrians	7	9	18	15	2	4	3	4	3	16	10	9	1	11	2	6	122
1st Avenue																	
Bicycles	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	3
Pedestrians	2	2	4	1	5	1	0	2	0	3	0	4	10	5	7	14	61
Alameda Avenue																	
Bicycles	0	1	5	0	0	0	0	0	0	1	2	0	0	0	0	0	9
Pedestrians	2	5	5	0	8	2	1	2	2	9	8	3	7	9	0	3	67
Exposition Avenue																	
Bicycles	1	2	4	2	1	0	0	0	0	0	0	0	6	7	0	7	31
Pedestrians	7	2	8	4	5	5	3	3	0	0	0	1	13	16	30	13	111
Mississippi Avenue																	
Bicycles	1	1	0	1	1	0	0	0	1	0	0	0	1	0	0	0	6
Pedestrians	10	12	26	19	6	18	14	25	9	21	36	40	3	6	11	11	270
Idaho Place																	
Bicycles	0	2	0	0	1	0	1	0	0	2	0	0	0	1	0	0	7
Pedestrians	0	7	10	6	1	6	8	16	1	3	10	13	4	10	14	16	127
Florida Avenue																	
Bicycles	0	0	3	1	2	0	0	0	0	0	4	0	1	0	0	0	11
Pedestrians	2	13	6	11	2	9	10	10	2	7	6	11	4	11	12	12	130
Mexico Avenue																	
Bicycles	0	0	0	0	2	0	0	0	0	0	0	0	1	0	1	1	5
Pedestrians	0	3	5	3	3	4	9	12	0	4	3	3	4	6	9	4	73
Jewell Avenue																	
Bicycles	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Pedestrians	1	4	3	14	5	7	8	2	5	7	6	12	0	0	0	4	79
Yale Avenue																	
Bicycles	2	0	1	0	1	1	0	0	0	0	1	0	0	0	2	0	8
Pedestrians	4	4	2	4	1	3	6	8	3	5	8	4	2	5	5	6	71
Total																	
Bicycles	4	8	15	8	9	1	3	2	13	5	10	1	15	9	21	15	141
Pedestrians	45	71	111	94	46	61	71	95	58	83	152	108	84	100	151	97	1426

[2] *Source: All Traffic Data Services. Original counts taken April 2018. Average annual growth factor of 0.88 applied for 2020 count estimates.*

Table E.2. Projected Bicycle & Pedestrian Volumes per Peak Hour in 2040

	East				West				North				South				Total
	AM	Noon	PM	Sat PM	AM	Noon	PM	Sat PM	AM	Noon	PM	Sat PM	AM	Noon	PM	Sat PM	
Montview Boulevard																	
Bicycles	0	0	0	0	1	0	0	0	7	0	1	0	0	0	2	0	12
Pedestrians	2	1	6	1	4	0	4	4	13	2	2	4	1	5	1	1	52
17th Avenue																	
Bicycles	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Pedestrians	1	0	6	1	2	0	4	0	2	1	2	1	1	4	5	1	33
13th Avenue																	
Bicycles	0	1	0	1	0	0	1	2	1	2	1	0	4	1	19	2	38
Pedestrians	5	2	8	10	2	1	0	6	23	5	70	4	40	12	64	2	256
Del Mar Parkway																	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	2	7	6	6	0	0	2	1	0	0	1	0	0	2	1	2	33
6th Avenue																	
Bicycles	0	0	0	2	0	0	1	0	5	0	0	0	4	0	0	6	18
Pedestrians	8	11	22	18	2	5	4	5	4	19	12	11	1	13	2	7	146
1st Avenue																	
Bicycles	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	4
Pedestrians	2	2	5	1	6	1	0	2	0	4	0	5	12	6	8	17	73
Alameda Avenue																	
Bicycles	0	1	6	0	0	0	0	0	0	1	2	0	0	0	0	0	11
Pedestrians	2	6	6	0	10	2	1	2	2	11	10	4	8	11	0	4	80
Exposition Avenue																	
Bicycles	1	2	5	2	1	0	0	0	0	0	0	0	7	8	0	8	36
Pedestrians	8	2	10	5	6	6	4	4	0	0	0	1	16	19	35	16	132
Mississippi Avenue																	
Bicycles	1	1	0	1	1	0	0	0	1	0	0	0	1	0	0	0	7
Pedestrians	12	15	32	23	7	22	17	30	11	25	42	47	4	7	13	13	321
Idaho Place																	
Bicycles	0	2	0	0	1	0	1	0	0	2	0	0	0	1	0	0	8
Pedestrians	0	8	12	7	1	7	10	19	1	4	12	16	5	12	17	19	152
Florida Avenue																	
Bicycles	0	0	4	1	2	0	0	0	0	0	5	0	1	0	0	0	13
Pedestrians	2	16	7	13	2	11	12	12	2	8	7	13	5	13	15	15	155
Mexico Avenue																	
Bicycles	0	0	0	0	2	0	0	0	0	0	0	0	1	0	1	1	6
Pedestrians	0	4	6	4	4	5	11	15	0	5	4	4	5	7	11	5	87
Jewell Avenue																	
Bicycles	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
Pedestrians	1	5	4	17	6	8	10	2	6	8	7	15	0	0	0	5	95
Yale Avenue																	
Bicycles	2	0	1	0	1	1	0	0	0	0	1	0	0	0	2	0	10
Pedestrians	5	5	2	5	1	4	7	10	4	6	10	5	2	6	6	7	85
Total																	
Bicycles	5	10	18	10	11	1	4	2	16	6	12	1	18	11	25	18	169
Pedestrians	53	85	132	112	55	73	85	113	69	99	181	129	101	119	179	115	1699

APPENDIX F – GROWTH RATE METHODOLOGY

APPENDIX F – GROWTH RATE METHODOLOGY

2020 GROWTH RATE

Due to the traffic volume impacts of the COVID-19 pandemic-related shutdowns, available 2018 TMC data from Aurora, and other historical data from adjoining agencies such as CDOT and Denver were used to estimate 2020 volumes, in lieu of collecting new data for this project.

The 2018 Aurora data was factored up uniformly based on an annual growth rate of 1.67%. This is equivalent to a growth factor of 1.033, which represents a 3.3% total growth rate for the two-year time frame between 2018 to 2020.

2040 GROWTH RATE

To calculate 2040 growth rates for this study, growth rates calculated based on historic traffic counts obtained from CDOT and DRCOG were evaluated but did not provide consistent and reasonable outcomes. Traffic volumes on Havana Street decreased at various locations between the 2018 traffic counts and earlier years.

Further evaluation of available data led to the decision to use the DRCOG 2040 model outputs. They were viewed as providing the best future year forecasted traffic link volume, while also representing a worst-case scenario in terms of automobile travel. It was agreed that the NCHRP 255 or 765 methodology would be used and that the 2018 turning movement counts from the signal retiming project, along with the 2040 DRCOG model link volumes would provide the inputs to forecast 2040 turning movement forecasts. A review of the two NCHRP methodologies indicated that the methodology for refining model output based on the existing turning movement counts didn't change. Since the TurnsW32 software, developed to implement the NCHRP 255 methodology, would provide 100 iterations of the inputs to come up with the most reasonable forecasted volumes, and the spreadsheet associated with NCHRP 765 only included 6 iterations of the volumes, it was agreed that the 255 methodology would be used. This methodology also provided unreasonable outcomes as the resulting 2040 turning movement counts showed decreased values in many locations.

The methodology that was ultimately used to forecast 2040 turning movement volumes started with the calculation of growth rates, by intersection approach, based on the 2015 and 2040 DRCOG model outputs. The resulting annual growth rates were then adjusted for reasonableness. The following were evaluated to determine if adjustments were needed.

1) The calculated growth rate was applied to the 2018 turning movement counts from the signal retiming project to come up with 2040 turning movement forecasts. Those forecasts were then compared to 8% of the 2040 DRCOG link volumes (assuming 8% of the daily traffic would pass thru the study intersections during the PM peak hour). In all of the cases where the results were significantly different, the average of the two forecasted numbers was used to adjust the growth rate by intersection approach.

2) Roads that serve as minor residential connectors or provide access to shopping centers were also evaluated to ensure that the increase in growth was not unrealistic for the roadway/driveway being served. As a result of this evaluation, the growth rates on Wyoming Street, Idaho Place and Mexico Avenue

The adjustments for reasonableness impacted, at least one approach from every studied intersection between 1st Avenue and Yale Avenue.