

HAVANA STREET CORRIDOR STUDY

Existing Conditions Memo

June 29, 2020

TABLE OF CONTENTS

| | |
|--|-----------|
| SECTION 1. PROJECT OVERVIEW | 1 |
| 1.1 PURPOSE AND NEED | 1 |
| 1.2 STUDY AREA | 1 |
| SECTION 2. REVIEW OF STUDIES, REGULATIONS AND PROJECTS | 3 |
| 2.1 OVERVIEW | 3 |
| 2.2 AURORA PLACES AND CORRIDOR VISION | 3 |
| 2.3 TRANSIT | 5 |
| 2.4 INTELLIGENT TRANSPORTATION SYSTEMS AND NEW TECHNOLOGIES | 7 |
| 2.5 UNIFIED DEVELOPMENT ORDINANCE | 9 |
| 2.6 BUSINESS IMPROVEMENT DISTRICT | 13 |
| SECTION 3. EXISTING CONDITIONS DATA COLLECTION AND ANALYSIS | 15 |
| 3.1 DEMOGRAPHICS | 15 |
| 3.2 EXISTING ROADWAY CHARACTERISTICS AND TRAFFIC OPERATIONS | 20 |
| 3.3 EXISTING TRANSIT FACILITIES AND OPERATIONS | 30 |
| 3.4 EXISTING BICYCLE & PEDESTRIAN ACCOMMODATIONS | 37 |
| 3.5 BICYCLE & PEDESTRIAN VOLUME AND LEVEL OF TRAFFIC STRESS | 45 |
| 3.6 VEHICLE, BICYCLE & PEDESTRIAN CRASH DATA | 56 |
| SECTION 4. EXISTING AND FUTURE LAND USES | 64 |
| 4.1 ORGANIZING STRUCTURE | 64 |
| 4.2 LAND USE ANALYSIS KEY TAKEAWAYS | 71 |
| SECTION 5. FUTURE BACKGROUND CONDITIONS AND ANALYSIS | 74 |
| 5.1 PLANNED AND PROGRAMMED MAJOR TRANSPORTATION IMPROVEMENTS | 74 |
| 5.2 2040 NO-BUILD VEHICULAR TRAFFIC ANALYSIS | 74 |
| 5.3 2040 TRANSIT ANALYSIS | 82 |
| 5.4 2040 BICYCLE & PEDESTRIAN ASSESSMENT | 84 |
| SECTION 6. FOCUS AREAS | 86 |
| 6.1 OVERVIEW | 86 |

LIST OF FIGURES

| | |
|---|----|
| Figure 1.2.1: Havana Street Corridor Study Area..... | 2 |
| Figure 3.1.1: One, Three, & Five Mile Buffer Zones | 16 |
| Figure 3.1.2: Population within the Study Area..... | 17 |
| Figure 3.1.3: Employment within the Study Area | 19 |
| Figure 3.2.1: Existing Functional Classification Map | 21 |
| Figure 3.2.2: Existing Average Daily Traffic Volumes..... | 22 |
| Figure 3.2.3: 2020 Intersection Turning Movement Volumes (North Intersections) | 23 |
| Figure 3.2.4: 2020 Intersection Turning Movement Volumes (South Intersections) | 24 |
| Figure 3.2.5: 2020 Intersection LOS (North Intersections) | 27 |
| Figure 3.2.6: 2020 Intersection LOS (South Intersections) | 28 |
| Figure 3.2.7: Northbound Direction Average Travel Speed | 29 |
| Figure 3.2.8: Southbound Direction Average Travel Speed | 30 |
| Figure 3.3.1: Transit Amenities by Stop | 33 |
| Figure 3.4.1: Existing Bicycle Facilities | 38 |
| Figure 3.4.2: Existing Sidewalk Facilities | 41 |
| Figure 3.4.3: Accessibility & Sidewalk Inventory..... | 42 |
| Figure 3.4.4: Existing Crosswalks | 44 |
| Figure 3.5.1: Bicycle & Pedestrian Counts..... | 46 |
| Figure 3.5.2: Bicycle LTS Analysis..... | 51 |
| Figure 3.5.3: Pedestrian LTS Analysis | 54 |
| Figure 3.5.4: Pedestrian LTS Intersection Analysis..... | 55 |
| Figure 3.6.1: Percent of Reported Crashes by Mode and Severity | 57 |
| Figure 3.6.2: Percent of Reported Fatal Crashes by Mode | 57 |
| Figure 3.6.3: Percent of Reported Injury Crashes by Mode | 57 |
| Figure 3.6.4: Reported Crash Occurrence by Time and Day of the Week | 57 |
| Figure 3.6.5: Comparison of Crashes to Gas Prices (2012-2019)..... | 58 |
| Figure 3.6.6: Motor Vehicle/Pedestrian/Bicycle Crash Density Distributions (2012 – 2019)..... | 59 |
| Figure 3.6.7: Reported Fatal & Injury Motor Vehicle Crashes..... | 61 |
| Figure 3.6.8: Reported Bicycle Crashes..... | 62 |
| Figure 3.6.9: Reported Pedestrian Crashes | 63 |
| Figure 4.1.1: Land Use and Built Form Analysis – Original Aurora..... | 65 |
| Figure 4.1.2: Land Use and Built Form Analysis - Original Aurora (Cont.)..... | 66 |
| Figure 4.1.3: Land Use and Built Form Analysis – City Corridor..... | 67 |
| Figure 4.1.4: Land Use and Built Form Analysis – City Corridor (Cont.) | 68 |
| Figure 4.1.5: Land Use and Built Form Analysis – Urban District | 69 |
| Figure 4.1.6: Land Use and Built Form Analysis – Urban District (Cont.)..... | 70 |
| Figure 5.2.1: 2040 No-Build Intersection Turning Movement Volumes (North Intersections) | 77 |
| Figure 5.2.2: 2040 No-Build Intersection Turning Movement Volumes (South Intersections) | 78 |
| Figure 5.2.3: 2040 No-Build Vehicle LOS (North Intersections)..... | 80 |
| Figure 5.2.4: 2040 Vehicle LOS (South Intersections)..... | 81 |

LIST OF TABLES

| | |
|---|----|
| Table 3.1.1: Havana Street Corridor Population Demographics..... | 15 |
| Table 3.1.2: Havana Street Corridor Household Demographics..... | 15 |
| Table 3.1.3: Havana Street Corridor Businesses Demographics | 18 |
| Table 3.2.1: Havana Street Typical Sections and Posted Speed Limits..... | 20 |
| Table 3.2.2: HCM LOS Criteria for Signalized Intersections..... | 26 |
| Table 3.3.1: Summary of Existing Transit Amenities..... | 31 |
| Table 3.3.2: Transit Amenities by Stop (NB) | 31 |
| Table 3.3.3: Transit Amenities by Stop (SB)..... | 32 |
| Table 3.3.4: TCQSM Transit LOS Thresholds | 35 |
| Table 3.3.5: Existing (2019) Transit LOS Summary | 36 |
| Table 3.5.1: Bicycle and Pedestrian Counts per Peak Hour | 47 |
| Table 3.5.2: Levels of Traffic Stress Definitions Source: ODOT Analysis Procedure Manual, Version 2 | 48 |
| Table 3.6.1: Summary of 2012-2019 Reported Crashes | 56 |
| Table 5.2.1: 2040 Traffic Volume Growth Rates and Growth Factors..... | 76 |
| Table 5.3.1: Future (2040) Transit LOS Summary | 83 |
| Table 5.4.1: Projected Bicycle & Pedestrian Volumes in 2040..... | 84 |
| Table 6.1.1: Focus Areas | 87 |

APPENDICES

- Appendix A: Synchro Results
- Appendix B: Travel Time and Speed Study Results
- Appendix C: Transit LOS Worksheets
- Appendix D: Sidewalk Obstructions
- Appendix E: Bicycle and Pedestrian Counts
- Appendix F: Growth Rate Methodology

SECTION 1. PROJECT OVERVIEW

1.1 PURPOSE AND NEED

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 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. The corridor has a high concentration of vulnerable populations which can greatly benefit from multimodal enhancements and place making.

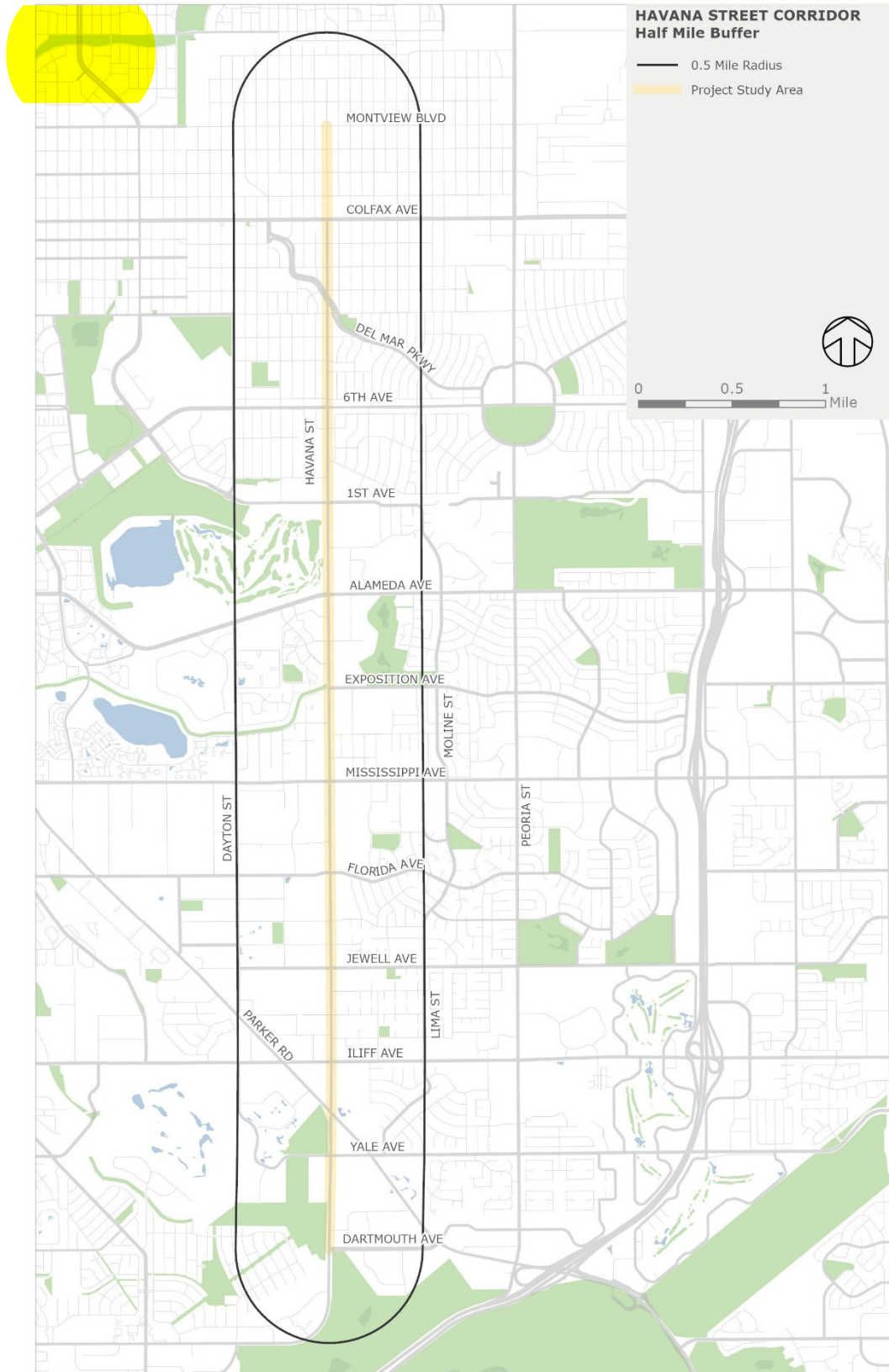
Goals for this project include:

- 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, and 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. The *Havana District Design Concept Plan* 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.

The *Havana District Design Concept Plan* 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.

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.

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* 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 transfer with Bus Routes 15L and 15 at Colfax Avenue, the busiest and only 24-hour bus route in the RTD system, has approximately 1,800 daily riders at the Colfax Avenue/Havana Street stop, one of the highest bus boarding locations in the region.

RTD conducted the *Network Analysis of Potential Improvements to Bus Speed, Delay & Access Study* 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 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

Bus rapid transit (BRT) service is high-frequency bus service that emulates rail transit and provides fast and reliable service on a dedicated route. As the metro area continues to experience rapid population and travel demand growth, RTD undertook the *Regional Bus Rapid Transit Feasibility Study* to explore opportunities for new service and sustainable solutions for enhancing regional mobilities. The *Regional Bus Rapid Transit Feasibility Study* 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 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. There is good potential for repurposing travel lanes along Havana Street 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.

The following provides a summary of the relevant transit studies reviewed as a part of this study effort.

| Transit Study | Relevant to This Study |
|---|--|
| RTD Network Analysis of Potential Improvements to Bus Speed, Delay & Access | 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 | 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 | 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 Havana multimodal study will align with the transit improvements that are ongoing through RTD and city efforts. This study will evaluate the existing transit facilities, operations, and multimodal connectivity for the corridor and the multimodal improvement alternatives will prioritize of a well-connected, well-maintained, safe, convenient and reliable multimodal transportation network.

2.4 INTELLIGENT TRANSPORTATION SYSTEMS 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* 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 motor vehicle locations with greatest crash frequency.

The *Aurora ITS Strategic Plan* 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 existing ITS service packages 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

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* also 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. Also, the City has Bluetooth sensors pending installation, an Automatic Vehicle Location (AVL) system for its street maintenance fleet, and an agreement with Traffic Technology Services (TTS) to implement connected vehicle technology into the City's signal system. The following outlines the 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 available 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 TrafficSense 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 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 and can be used when implementing timing changes remotely from a transportation management center to modify operations.

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.

As many of the improvements outlined in the Aurora ITS Strategic Plan 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)* identifies the parameters and regulations for new development in the corridor. The focus of this memo is on mixed use zone districts as it is assumed that the 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). 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, 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.

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, 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. May be reduced to 5 feet with 2.5 foot high masonry wall or continuous landscape hedge.

Condition 3 Requirements:

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

| | 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 include:

| | 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 also 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 dominant 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 was down 5.7% compared to 2018, however.

Eat on Havana

Another important contributor to Havana Street is food and dining. 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 mile of the Havana Street corridor is approximately 144,100, which is projected to increase to 154,600 in 2040. Within this area, 44.6% of residents identified as minorities and children ages 5 to 17 years old account for 16.0%. Individuals over 65 years old account for 11.8% of the total population, and individuals with disabilities account for 6.0% of the total population. Table 3.1.1 presents the major population statistics within one, three and five miles of the Havana Street corridor and Figure 3.1.1 shows the area encompassed by the 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 Demographics¹

| Population | 1-Mile | 3-Mile | 5-Mile |
|-----------------------------------|---------|---------|---------|
| Total Population (2020) | 144,102 | 430,949 | 735,690 |
| Total Population (2040) | 154,634 | 484,179 | 825,322 |
| Population older than 65 years | 11.8% | 12.5% | 11.9% |
| Children ages 5-17 years | 16.0% | 15.8% | 16.1% |
| Minority persons | 44.6% | 40.4% | 36.9% |
| Linguistically challenged persons | 10,403 | 26,597 | 39,155 |
| Individuals with disabilities | 6.0% | 5.5% | 5.1% |

Households

As shown in Table 3.1.2, there are approximately 51,800 households within one mile of the Havana Street corridor and 11 new residential units were developed in the last two years. The 2019 median household income is \$51,783, and low-income households (percent of households with income below the poverty line) comprise 14.3% of the area. Households without a motor vehicle account for 10.3% of the total households in this area.

Table 3.1.2: Havana Street Corridor Household Demographics²

| Households | 1-Mile | 3-Mile | 5-Mile |
|---|----------|----------|----------|
| Total Households (2020) | 51,783 | 161,670 | 273,907 |
| 2019 Median household income | \$51,639 | \$58,200 | \$65,712 |
| Households without a motor vehicle | 10.3% | 8.7% | 7.8% |
| Low income households | 14.3% | 13.2% | 12.3% |
| Residential units developed in last 2 years (2018-2019) | 11 | 89 | 113 |

¹ Data provided by the City of Aurora Planning Department.

² Data provided by the City of Aurora Planning Department.

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

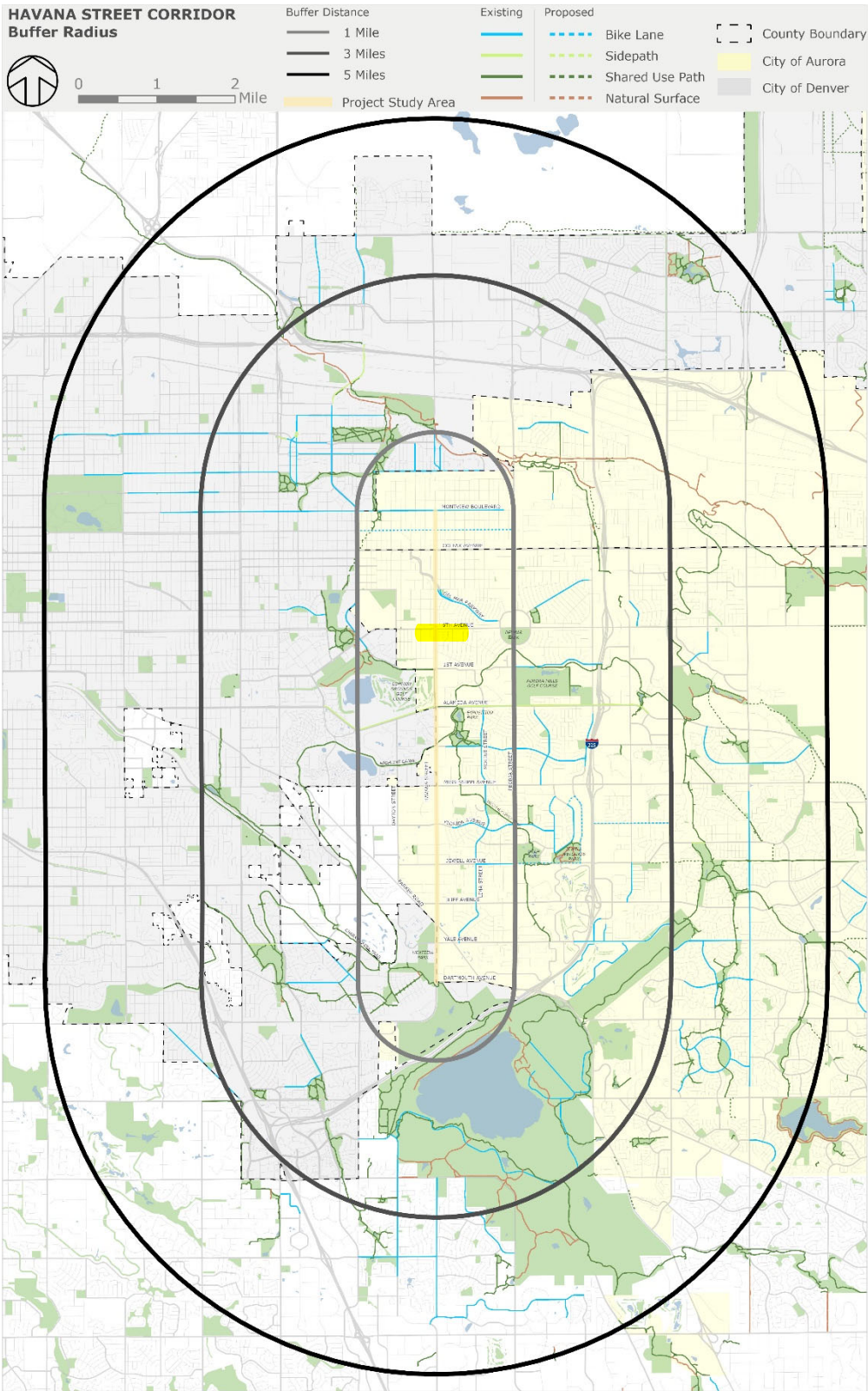
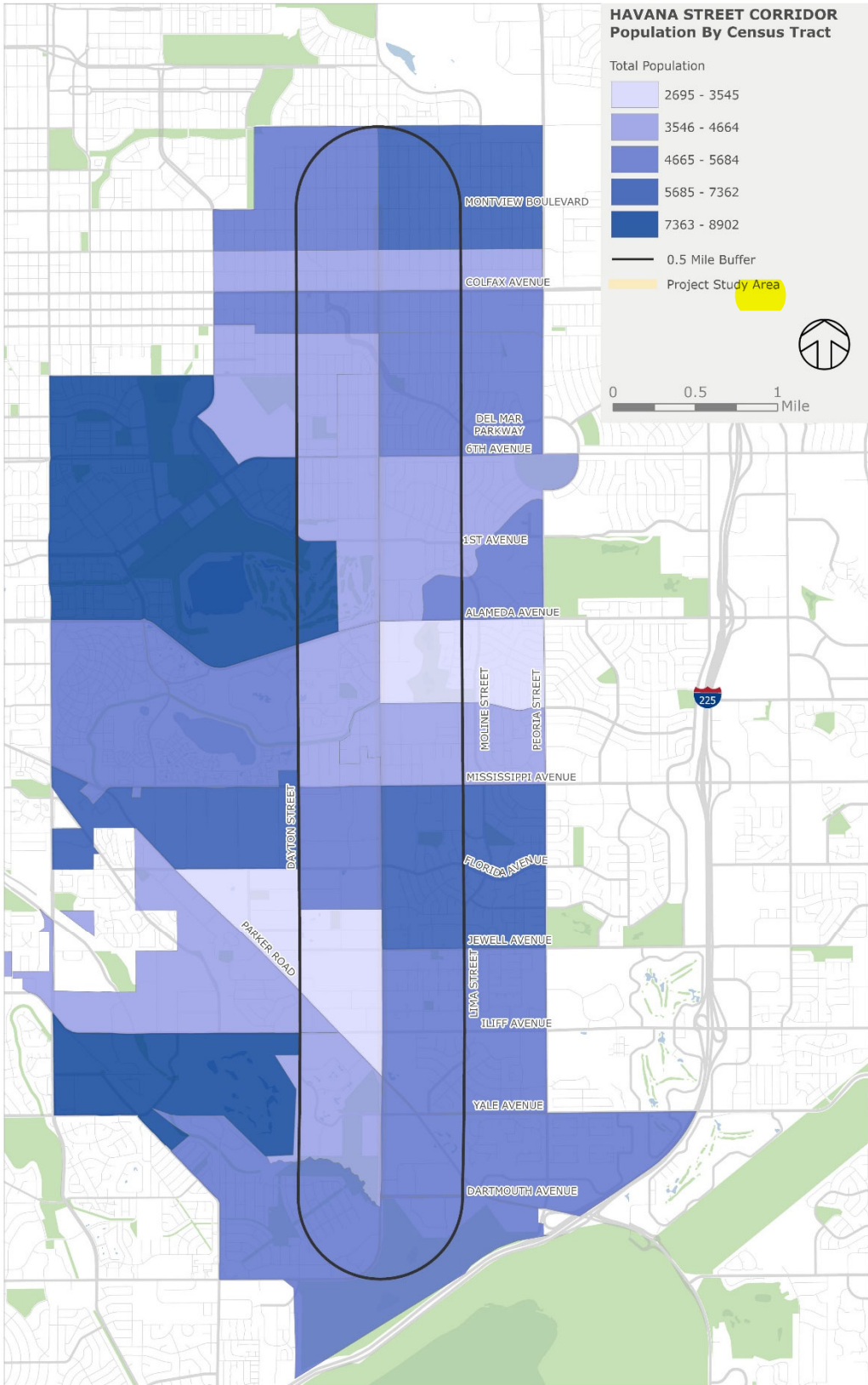


Figure 3.1.2: Population within the Study Area



Employment

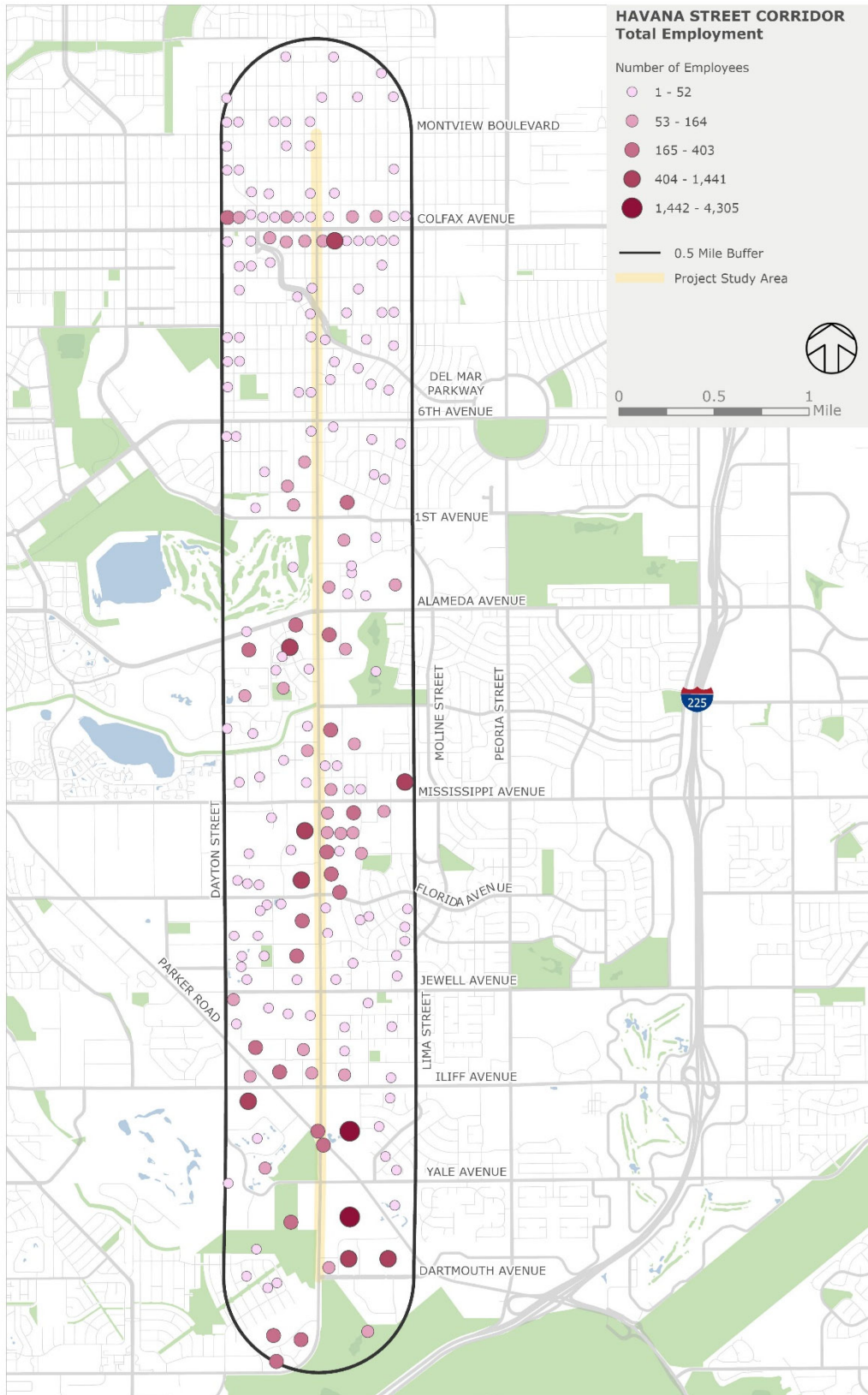
Currently there are 48,245 jobs within one mile of the corridor, which is estimated to grow to 63,313 in 2040 and there are 233 health care facilities, as shown in Table 3.1.3. Figure 3.1.3 shows total employment within the study area (half mile radius around Havana Street).

Table 3.1.3: Havana Street Corridor Businesses Demographics³

| Businesses | 1-Mile | 3-Mile | 5-Mile |
|------------------------------------|--------|-----------|---------|
| Jobs (2020) | 48,245 | 192,523 | 460,788 |
| Jobs (2040) | 63,313 | 247,276 | 543,453 |
| Commercial Development (2018-2019) | 0 | 2,974,849 | 21,169 |
| Health Care Facilities | 233 | 681 | 1,168 |

³ Data provided by the City of Aurora Planning Department.

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 and has posted speeds ranging from 30 to 45 mph. The study boundaries encompass six miles of the Havana Street corridor from Montview Boulevard to 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. 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 6 th Avenue | 0.63 | 4 | - | 30 | Minor Arterial |
| 6 th Avenue to 1 st Avenue | 0.5 | 4 | Opposing left-turn lanes parallel to one another | 40 | Major Arterial |
| 1 st 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 3.2.2) 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

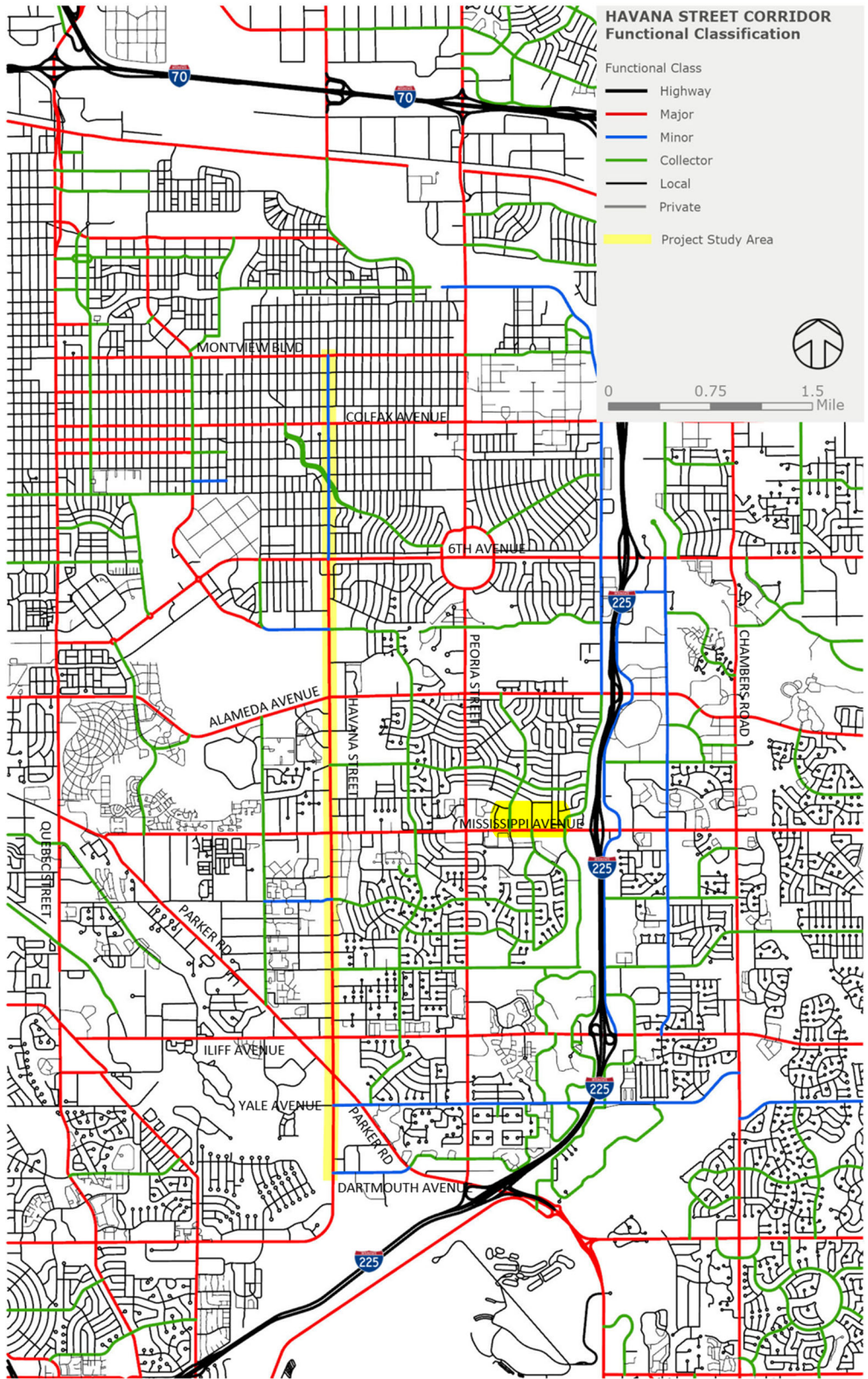
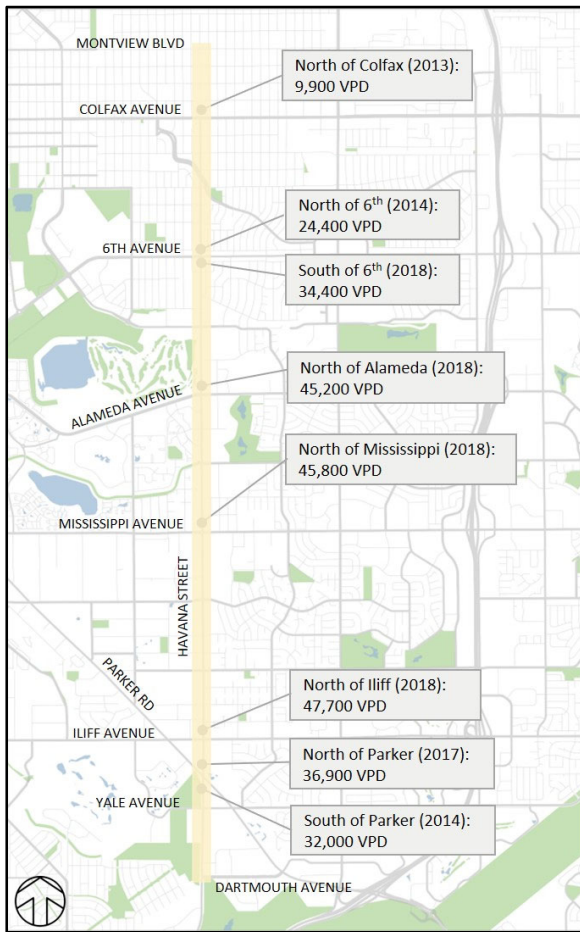


Figure 3.2.2: Existing Average Daily Traffic Volumes



Data source: DRCOG Regional Traffic Counts⁴

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, 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 3.2.3 and 3.2.4 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.

⁴ Traffic counts can be found at <https://gis.drcog.org/trafficcounts/>. Data shown is the most recent available.

Figure 3.2.3: 2020 Intersection Turning Movement Volumes (North Intersections)

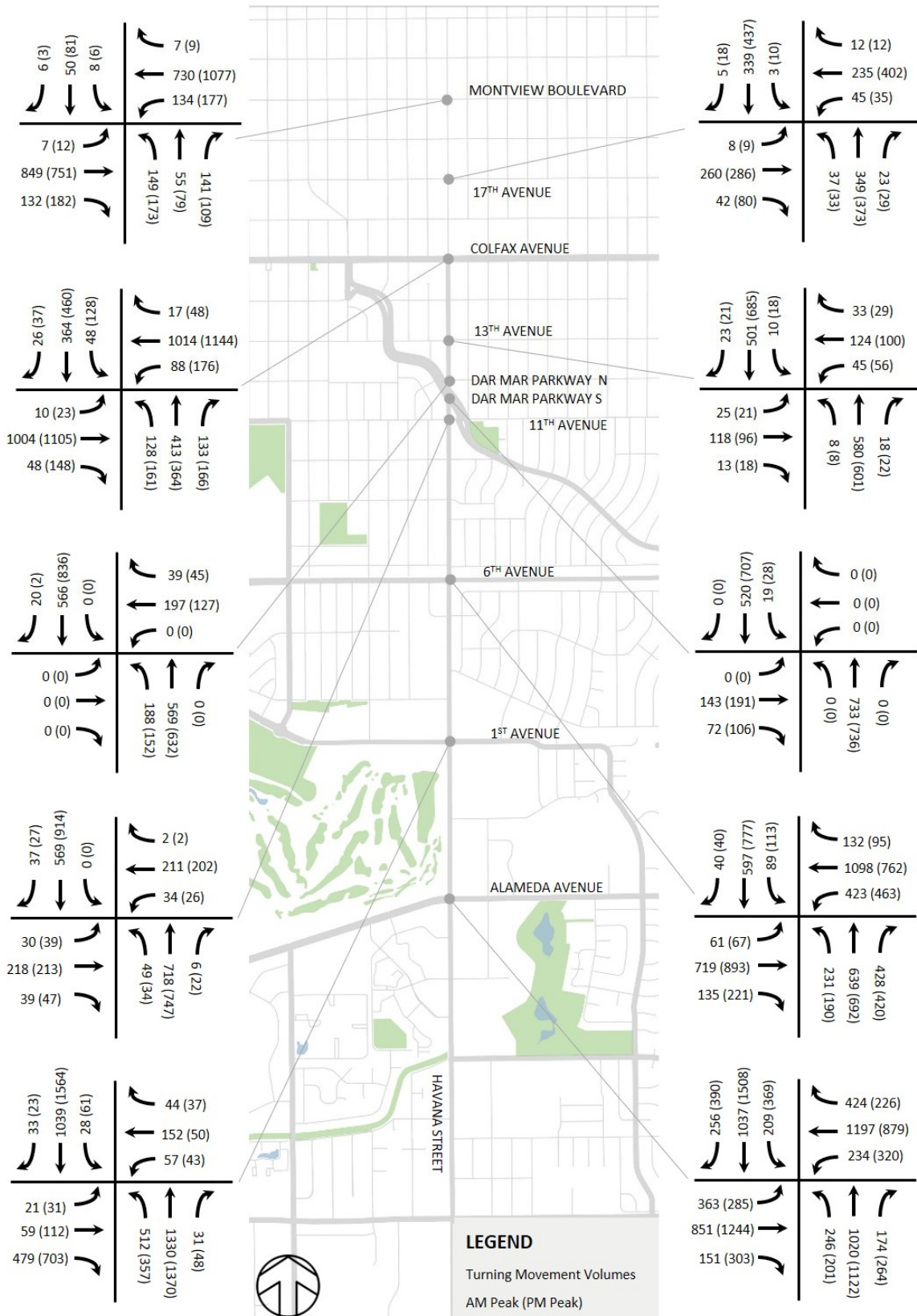
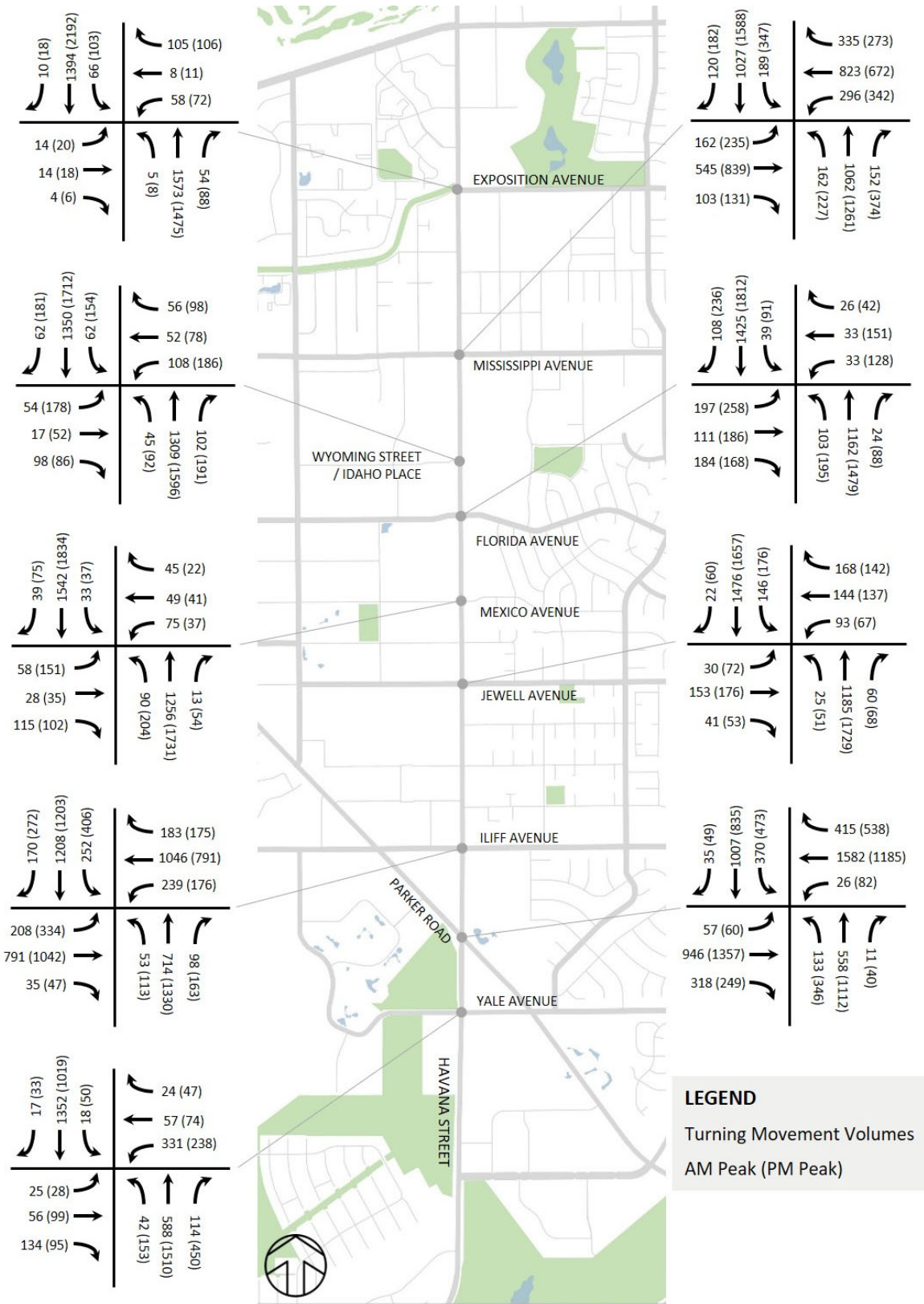


Figure 3.2.4: 2020 Intersection Turning Movement Volumes (South Intersections)



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, congestions and potential improvement needs.

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 people and more cars. This will in turn cause some congestion or delays. As Robert Steuteville, in "Good Congestion, Bad Congestion"⁵, 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 study⁶ 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"⁷.

⁵ "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>

⁶ "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

⁷ *Transportation, Airports and Public Works (TAPS) Policy Committee*, November 2019

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 |

Figures 3.2.5 and 3.2.6 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 of the 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 of the 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.

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 demand automobile traffic and have the potential to shift demand to alternative modes such as walking, biking and 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.

Figure 3.2.5: 2020 Intersection LOS (North Intersections)

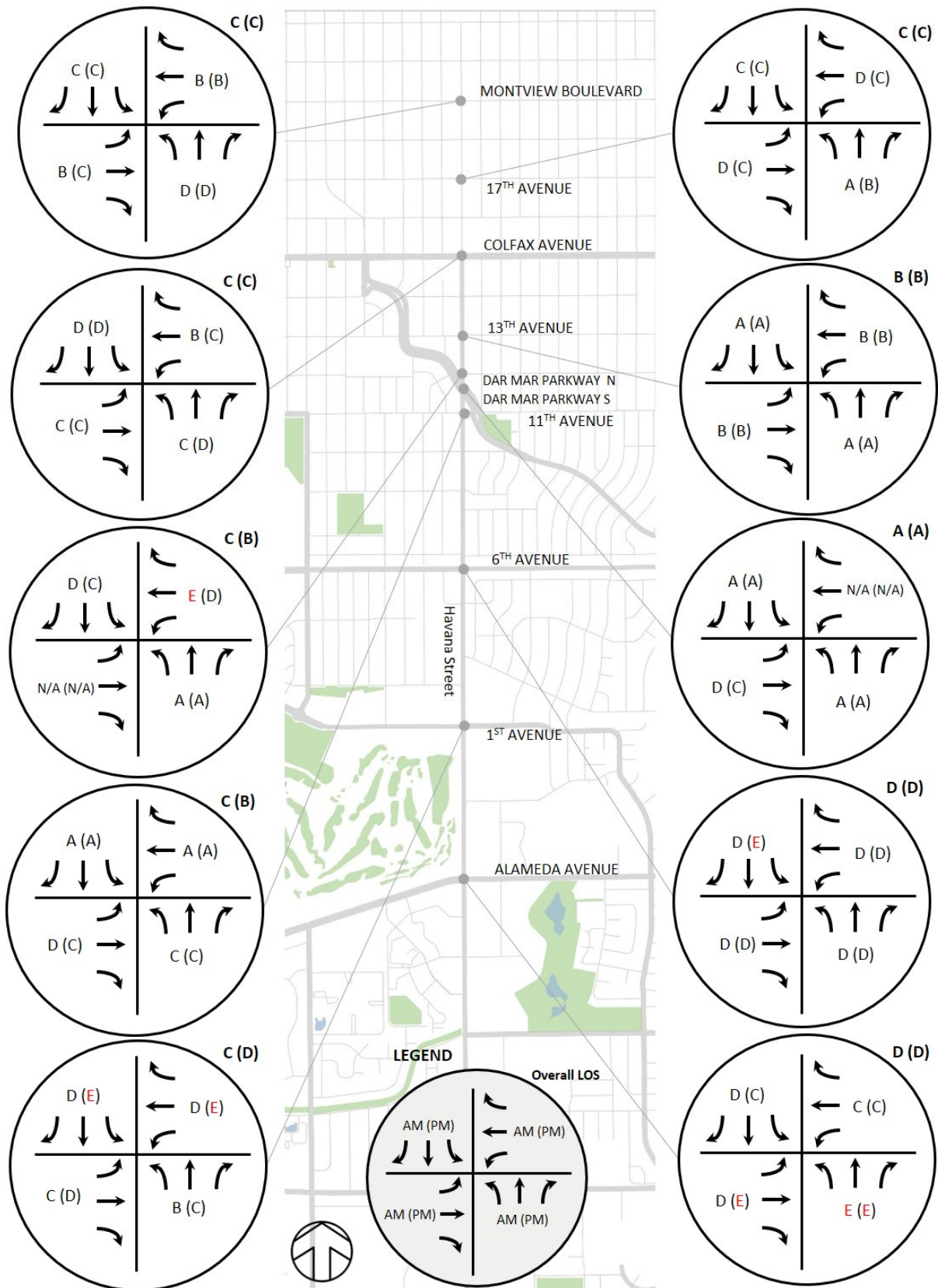
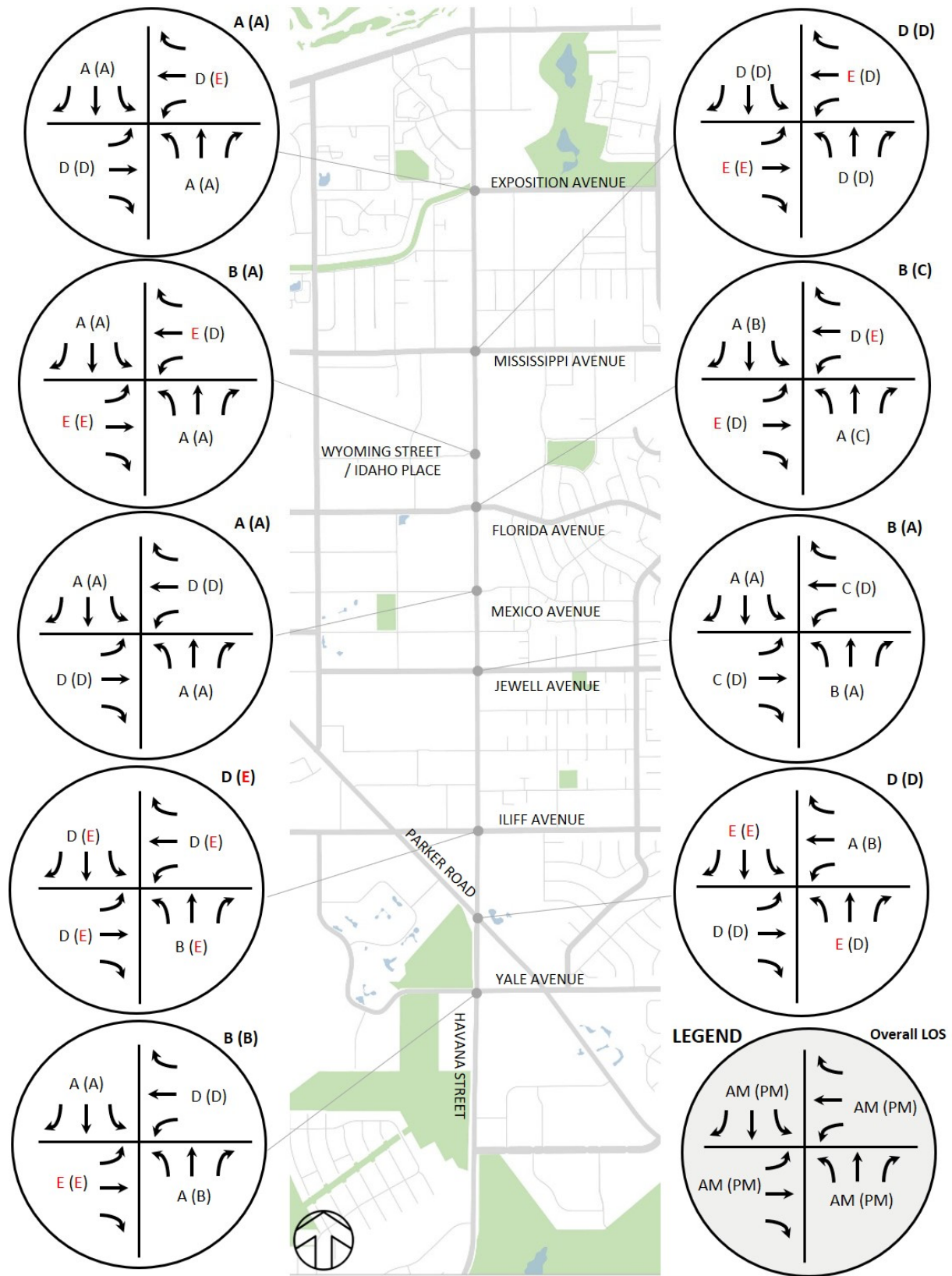


Figure 3.2.6: 2020 Intersection LOS (South Intersections)



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 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 3.2.7 and 3.2.8 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.

Figure 3.2.7: Northbound Direction Average Travel Speed

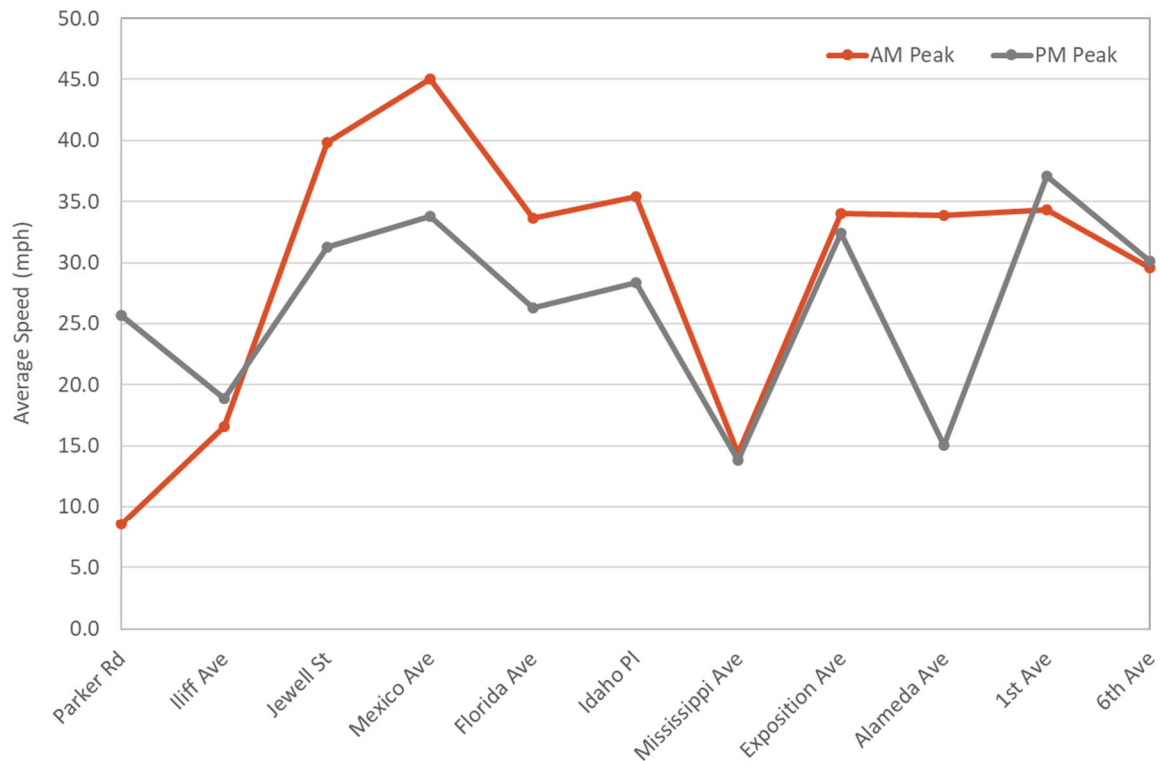
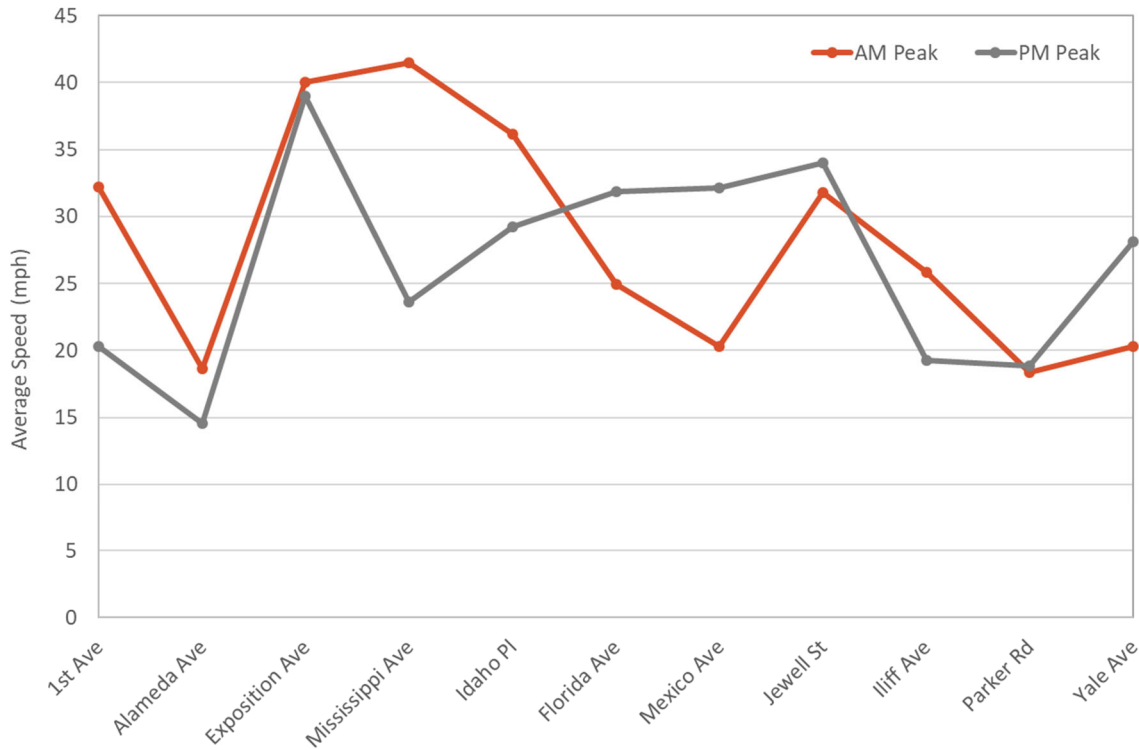


Figure 3.2.8: Southbound Direction Average Travel Speed



3.3 EXISTING TRANSIT FACILITIES 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 at 31% of the stops, no amenities are provided, benches are provided at 42% of the stops, and the remaining 27% have a bench and shelter, although 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. 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 (#) | Riders Boarding (%) |
|--------------------|---------------|---------------|---------------------|---------------------|
| None | 15 | 31% | 402 | 13% |
| Bench Only | 20 | 42% | 961 | 32% |
| Bench and Shelter | 13 | 27% | 1634 | 55% |

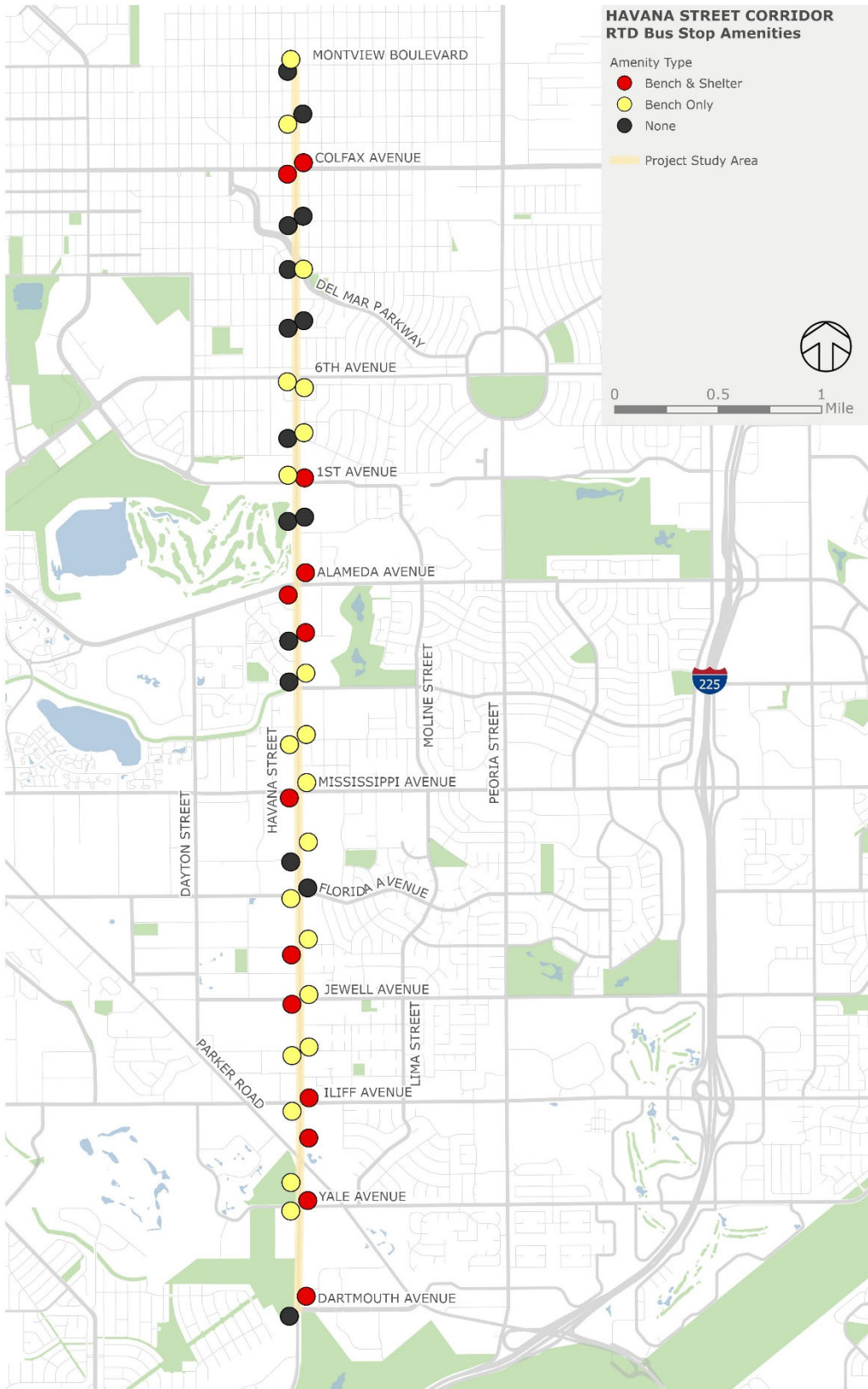
Table 3.3.2: Transit Amenities by Stop (NB)

| NB BUS STOPS | | | | | |
|------------------------------------|-----------|------------|---------------------|------------------|-----------------------------|
| Stop | Boardings | Alightings | Lighting Conditions | | |
| | | | 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 | | | | | |
|------------------------------------|-----------|------------|---------------------|------------------|-----------------------------|
| Stop | Boardings | Alightings | Lighting Conditions | | |
| | | | 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



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 consultant 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 did 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.

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 commuters 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 commuters 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 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 environment will increase the LOS; however, a low-quality 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. Overall most of the segments operate at an acceptable LOS “D”, except for the segment between Illiff Avenue and Jewell Avenue NB and the segment between Florida Avenue and Idaho Place SB, which operate at LOS “E”. The primary factors contributing to the transit LOS are the low transit travel speed and the excess wait time. The average transit travel speed across the corridor is about three mph compared to the ten mph which the TCQSM lists as a base speed for central business districts with populations of five million or more, or 15 mph as the base speed otherwise. It is anticipated that the low speed on this route is caused by a combination of signal delays, traffic congestion and the total number of stops along the corridor. An excess wait time averaging four minutes for each segment plus a lack of benches at 31% of the stops also has a significant 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, greatly improving the transit LOS.

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 | 4.111 | D |
| | SB | 4.170 | D |
| Between 16th Avenue and 17th Avenue | NB | No Stops | No Stops |
| | SB | 4.047 | D |
| Between Colfax Avenue and 16th Avenue | NB | 4.053 | D |
| | SB | No Stops | No Stops |
| Between 13th Avenue and Colfax Avenue | NB | 4.170 | D |
| | SB | 4.233 | D |
| Between Del Mar Parkway and 13th Avenue | NB | No Stops | No Stops |
| | SB | 4.249 | D |
| Between 11th Avenue and Del Mar Parkway | NB | 4.049 | D |
| | SB | 4.104 | D |
| Between 6th Avenue and 11th Avenue | NB | 4.025 | D |
| | SB | 4.076 | D |
| Between 1st Avenue and 6th Avenue | NB | 4.068 | D |
| | SB | 4.172 | D |
| Between Alameda Avenue and 1st Avenue | NB | 3.939 | D |
| | SB | 4.070 | D |
| Between Exposition Avenue and Alameda Avenue | NB | 3.917 | D |
| | SB | 4.206 | D |
| Between Mississippi Avenue and Exposition Avenue | NB | 4.048 | D |
| | SB | 4.188 | D |
| Between Idaho Place and Mississippi Avenue | NB | 4.070 | D |
| | SB | 4.204 | D |
| Between Florida Avenue and Idaho Place | NB | 4.136 | D |
| | SB | 4.262 | E |
| Between Mexico Avenue and Florida Avenue | NB | 4.120 | D |
| | SB | 4.180 | D |
| Between Jewell Avenue and Mexico Avenue | NB | 4.207 | D |
| | SB | 4.169 | D |
| Between Illiff Avenue and Jewell Avenue | NB | 4.263 | E |
| | SB | 4.193 | D |
| Between Parker Road and Illiff Avenue | NB | 4.244 | D |
| | SB | 4.054 | D |
| Between Yale and Parker | NB | 4.228 | D |
| | SB | 4.148 | D |

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, neither 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 Highline Canal Trail at Exposition Avenue and the Cherry Creek Trail at Dartmouth Avenue.

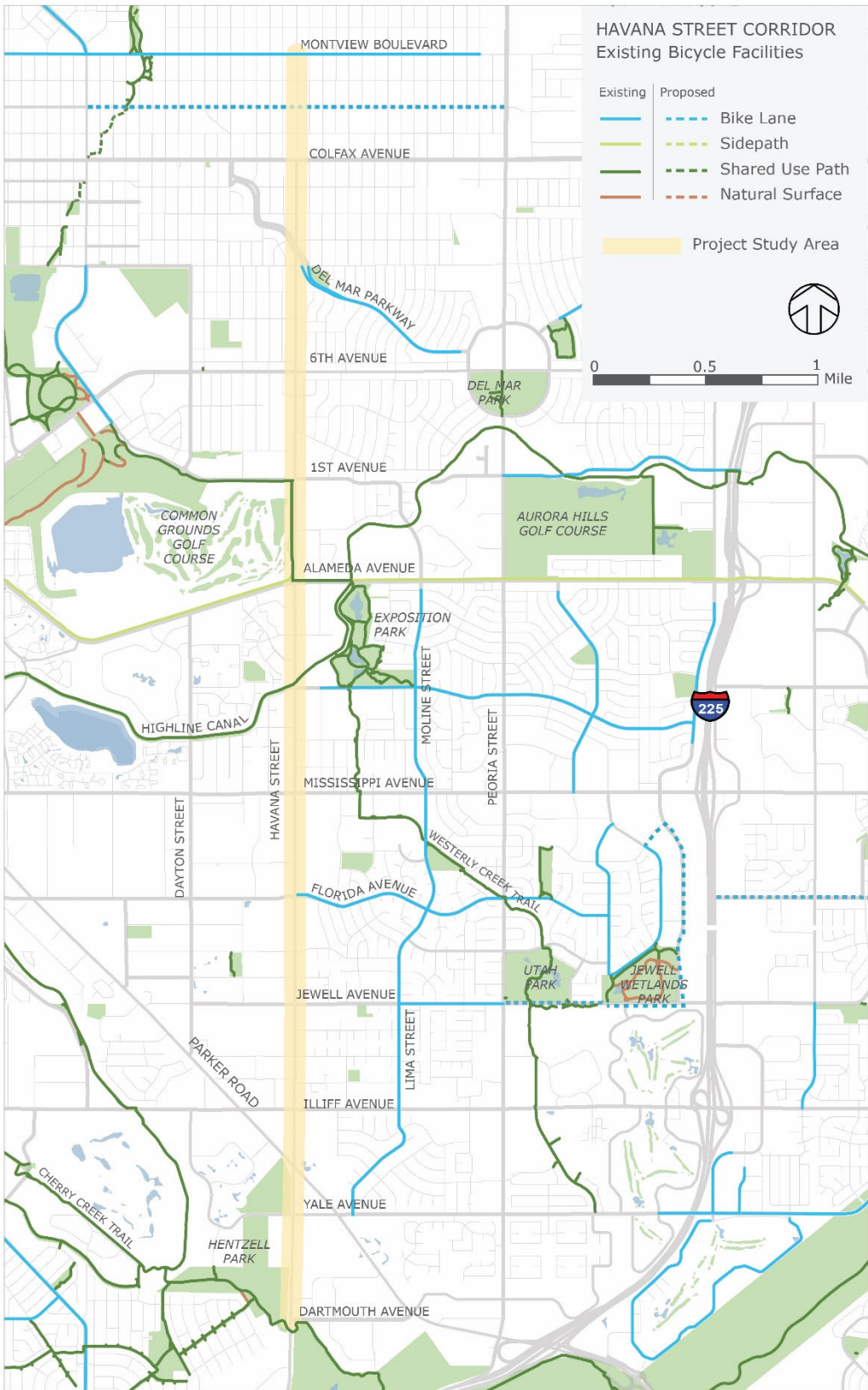
EXISTING PEDESTRIAN FACILITIES

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 also 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:

- **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

Figure 3.4.1: Existing Bicycle Facilities



mobility assisted devices to pass each other.⁸ 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 and 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.⁹ 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.¹⁰ 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 in 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. The majority of 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

⁸ United States Access Board. *ADA Accessibility Guidelines*. <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/adaag>

⁹ <https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/background/revised-draft-guidelines/chapter-3>

¹⁰ https://nacto.org/docs/usdg/accessible_sidewalks_and_street_crossings_boodlal.pdf

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.¹¹ 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.¹² The frequency and adequacy of lighting within the specific focus areas will be examined more closely in the next phase of the project.

¹¹ FHWA Pedestrian Safety Guide and Countermeasure Selection System available at http://www.pedbikesafe.org/pedsafe/countermeasures_detail.cfm?CM_NUM=8

¹² *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 3.4.2: Existing Sidewalk Facilities

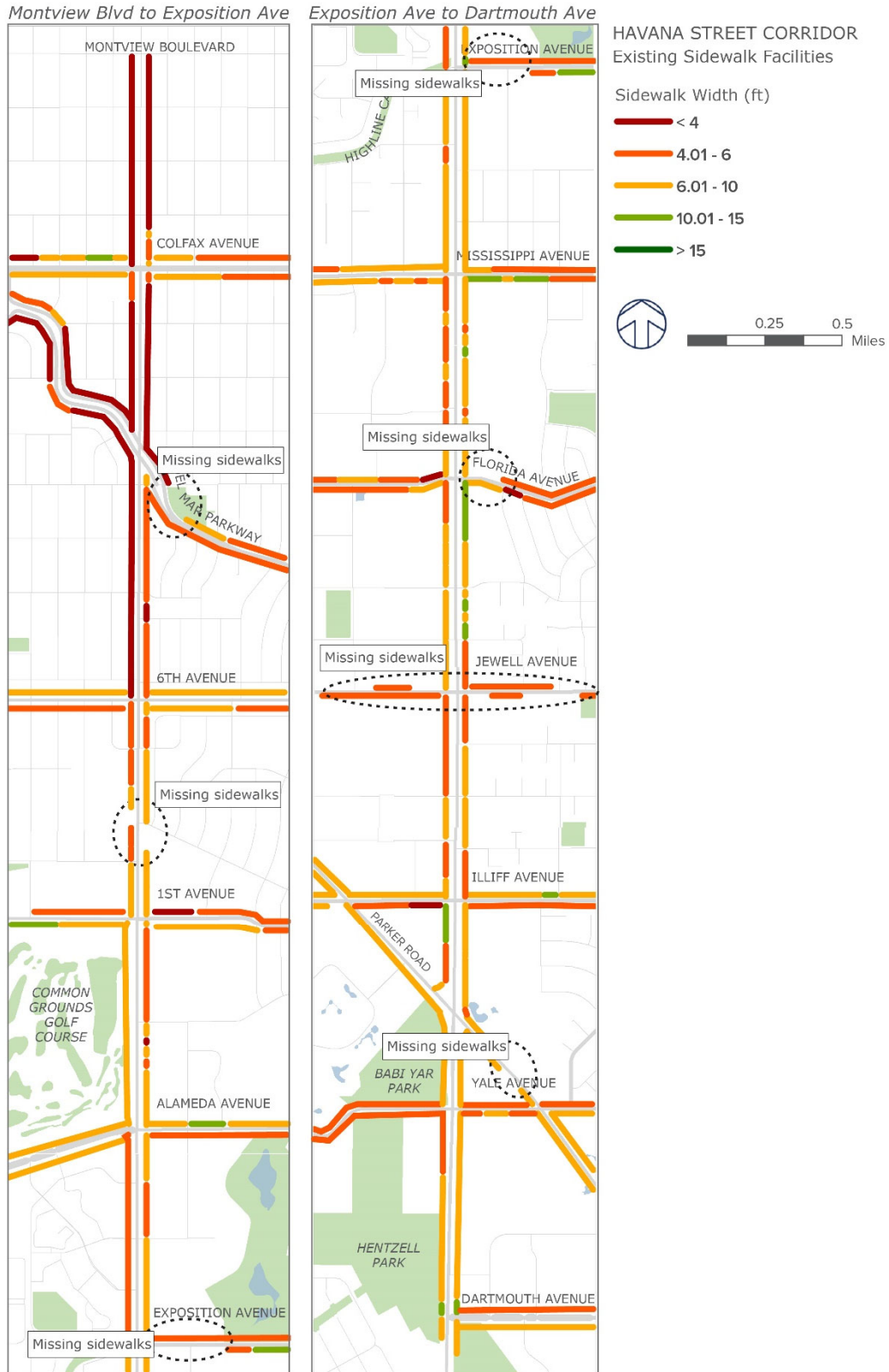
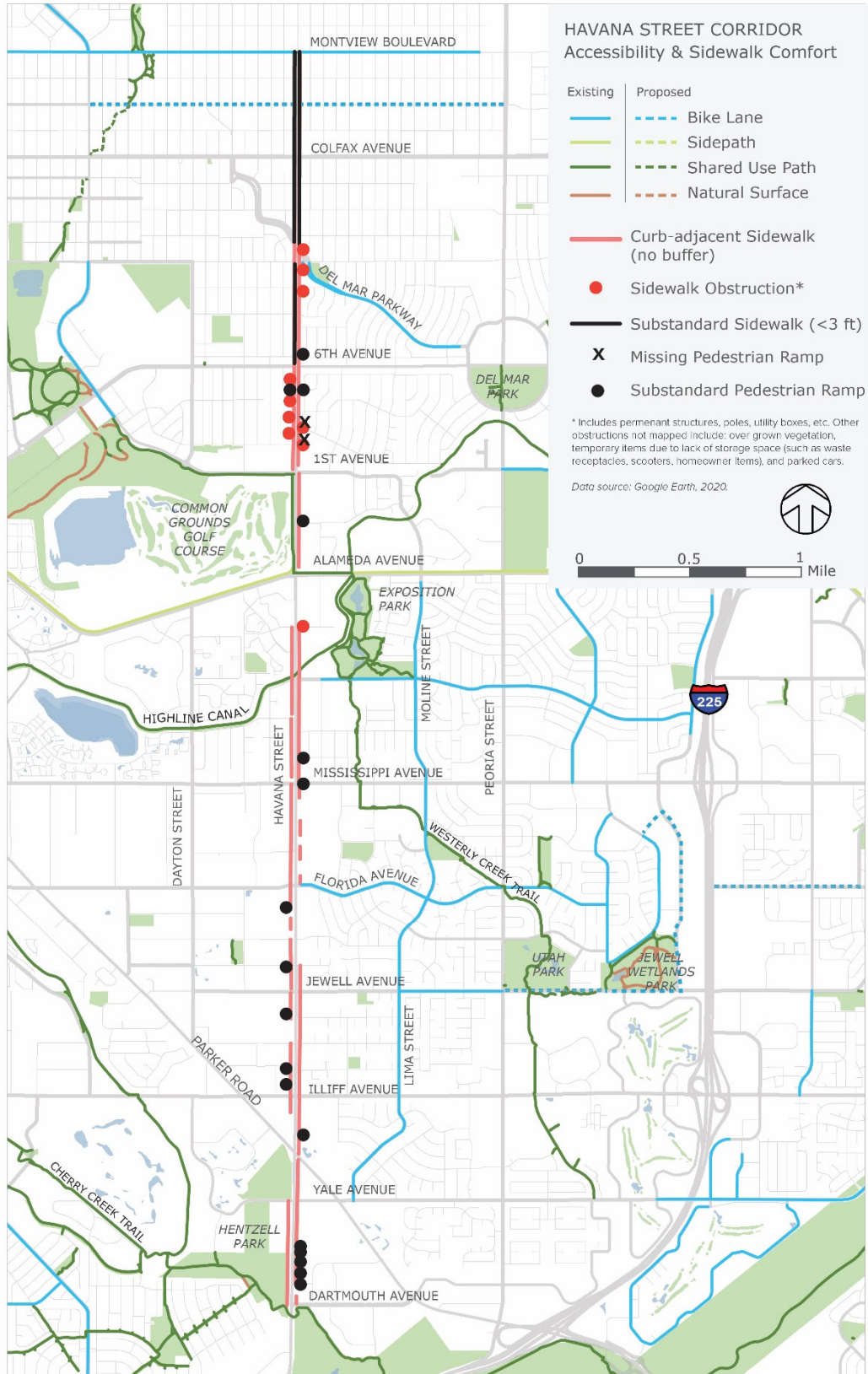


Figure 3.4.3: Accessibility & Sidewalk Inventory



Crossing the Corridor

Havana Street is a key connection to retail and services, and 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 and/or traffic control. Existing crossing types that include marked crosswalks include:

- 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.¹³ 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.

¹³ 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/>)

Figure 3.4.4: Existing Crosswalks



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*¹⁴), 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.

¹⁴ All Traffic Data Services, Inc. April 2018. www.alltrafficdata.net

Figure 3.5.1: Bicycle & Pedestrian Counts

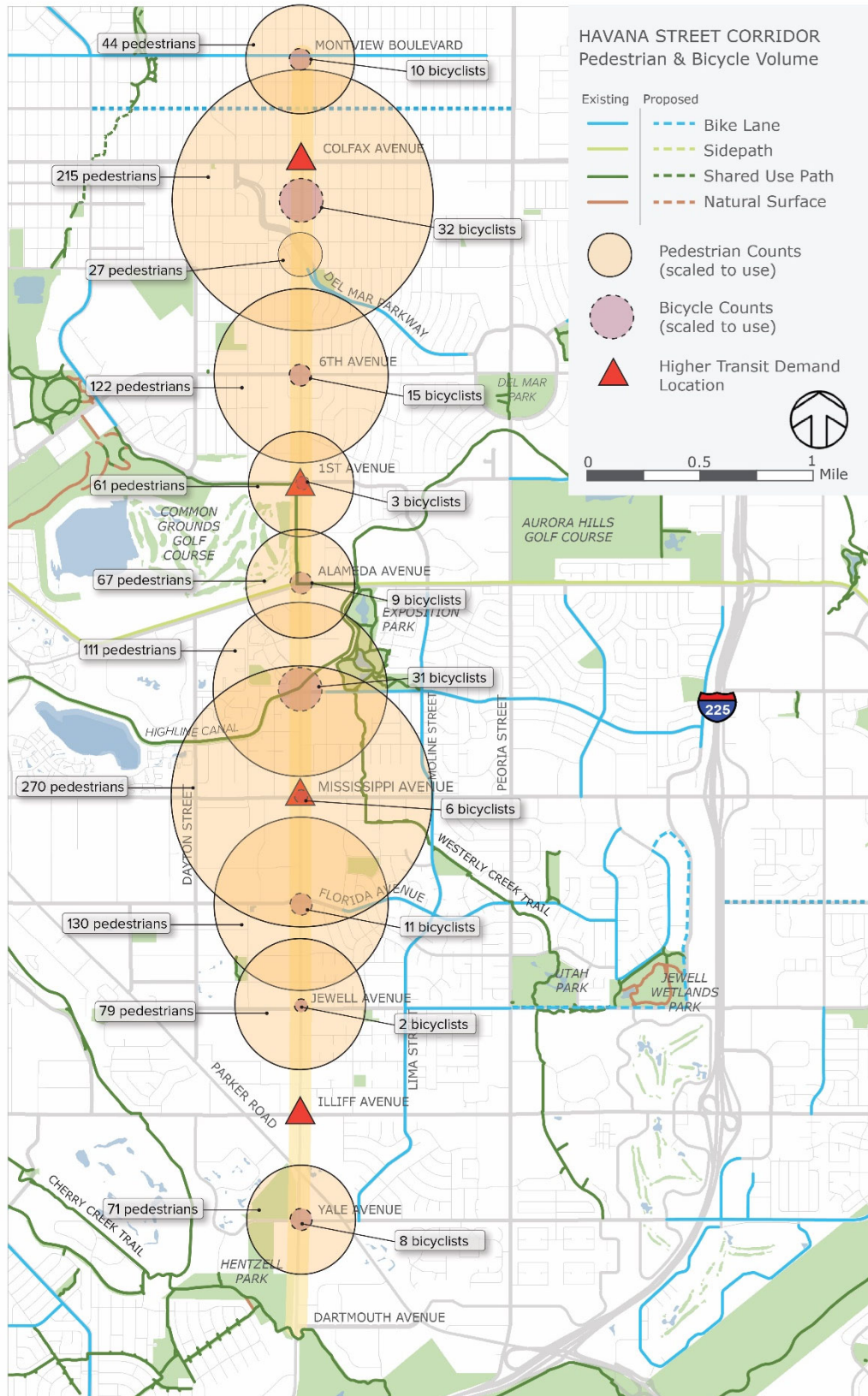


Table 3.5.1: Bicycle and Pedestrian Counts per Peak Hour¹⁵

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

¹⁵ 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 Level of Traffic Stress Analysis were adapted from the 2016 Oregon Department of Transportation (ODOT) Analysis Procedure Manual.¹⁶ 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.

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. |
|-------|---|

¹⁶ Oregon Department of Transportation. *Analysis Procedures Manual Version 2. Updated May 2020.*
https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf

| | |
|-------|---|
| 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. 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. Level of Traffic Stress 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.¹⁷

17 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.

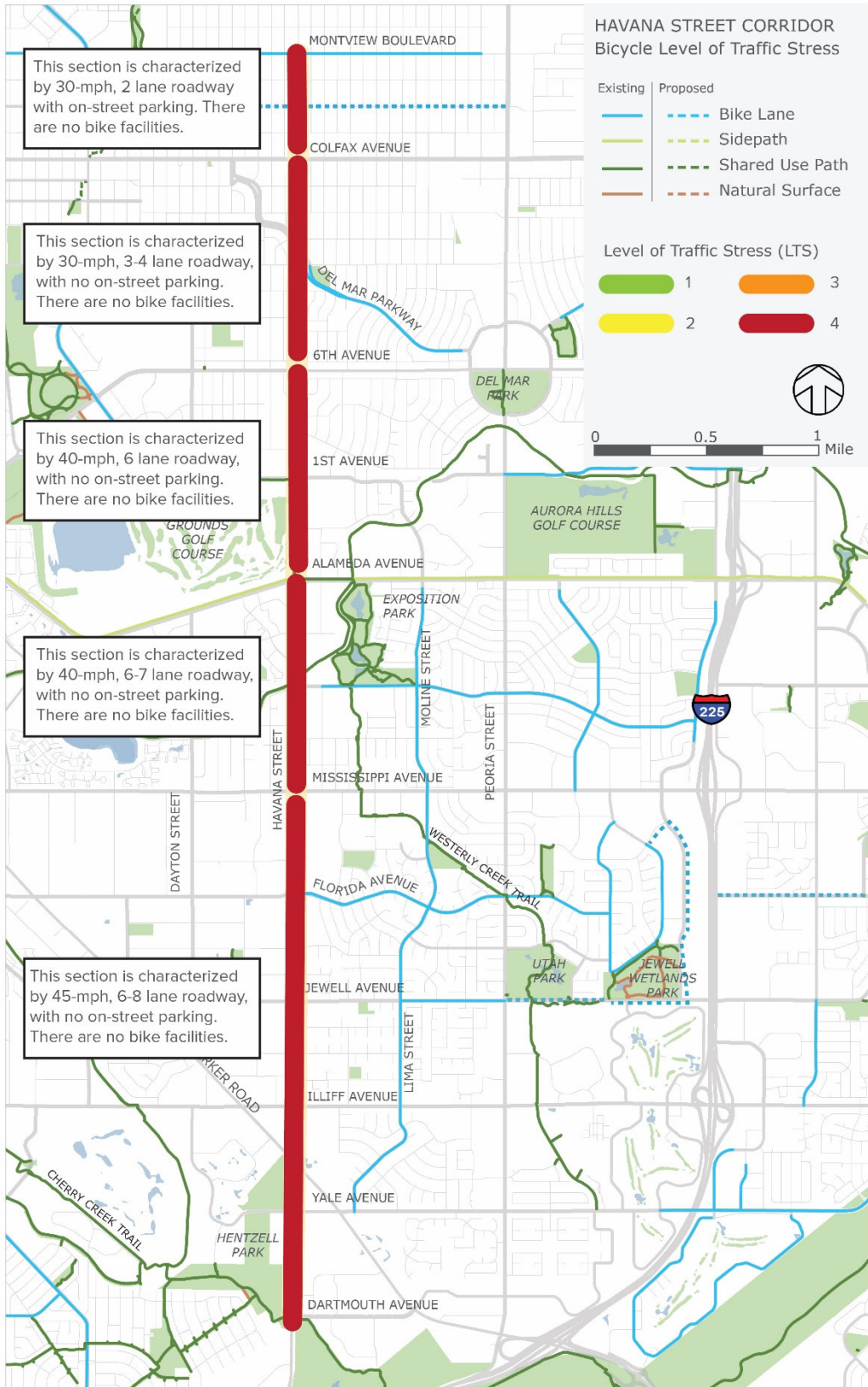
Bicycle LTS Conclusion

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 volumes and 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). 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 Level of Traffic Stress 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.

Figure 3.5.2: Bicycle LTS Analysis



Pedestrian Level of Stress

The methods used for the Pedestrian Level of Traffic Stress Analysis were also adapted from the 2016 Oregon Department of Transportation (ODOT) Analysis Procedure Manual.¹⁸ 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 Level of Traffic Stress methodology (see Table 3.5.2, above), the Pedestrian Level of Traffic Stress 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. The majority of 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' 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 Level of Traffic Stress (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 PLTS 1, however that may be higher as in the following instances:

- Where permissive left or right turns can occur, pedestrians will need to be more wary about the potential for increased conflicts, so PLTS 2 is typically assigned;

¹⁸ Oregon Department of Transportation. *Analysis Procedures Manual Version 2*. Updated May 2020.
https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch14.pdf

- Missing basic features such as lighting or countdown pedestrian signal heads will increase the PLTS to 2.

Furthermore, the presence or absence of other elements that will increase the PLTS 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 crosswalks available; and
- Free-flow or yield-controlled channelized right turns.¹⁹

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 Level of Traffic Stress specifically on Havana. However, in considering how to improve pedestrian and bicycle access and safety on the corridor, the LTS 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 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.

¹⁹ 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 3.5.3: Pedestrian LTS Analysis

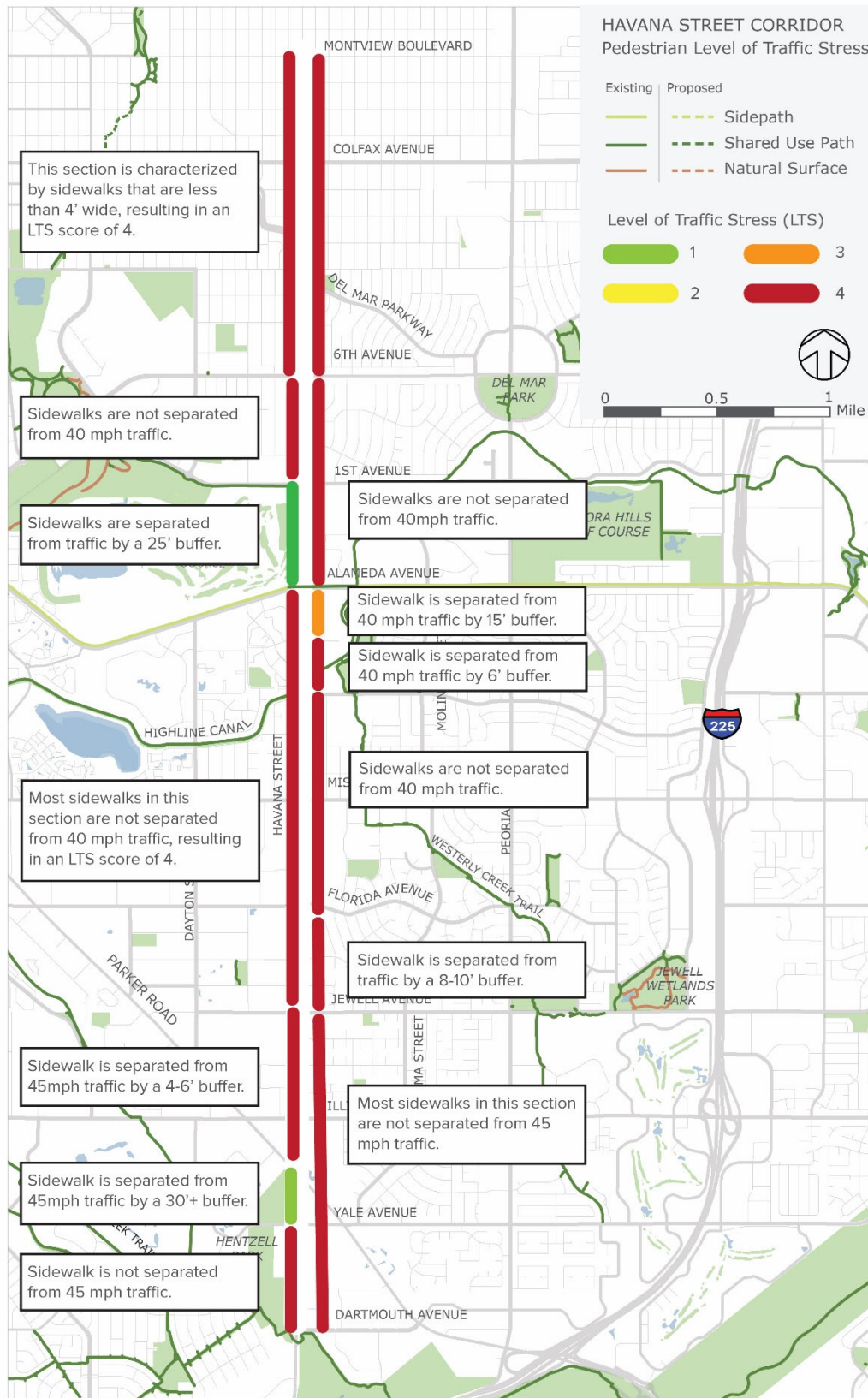
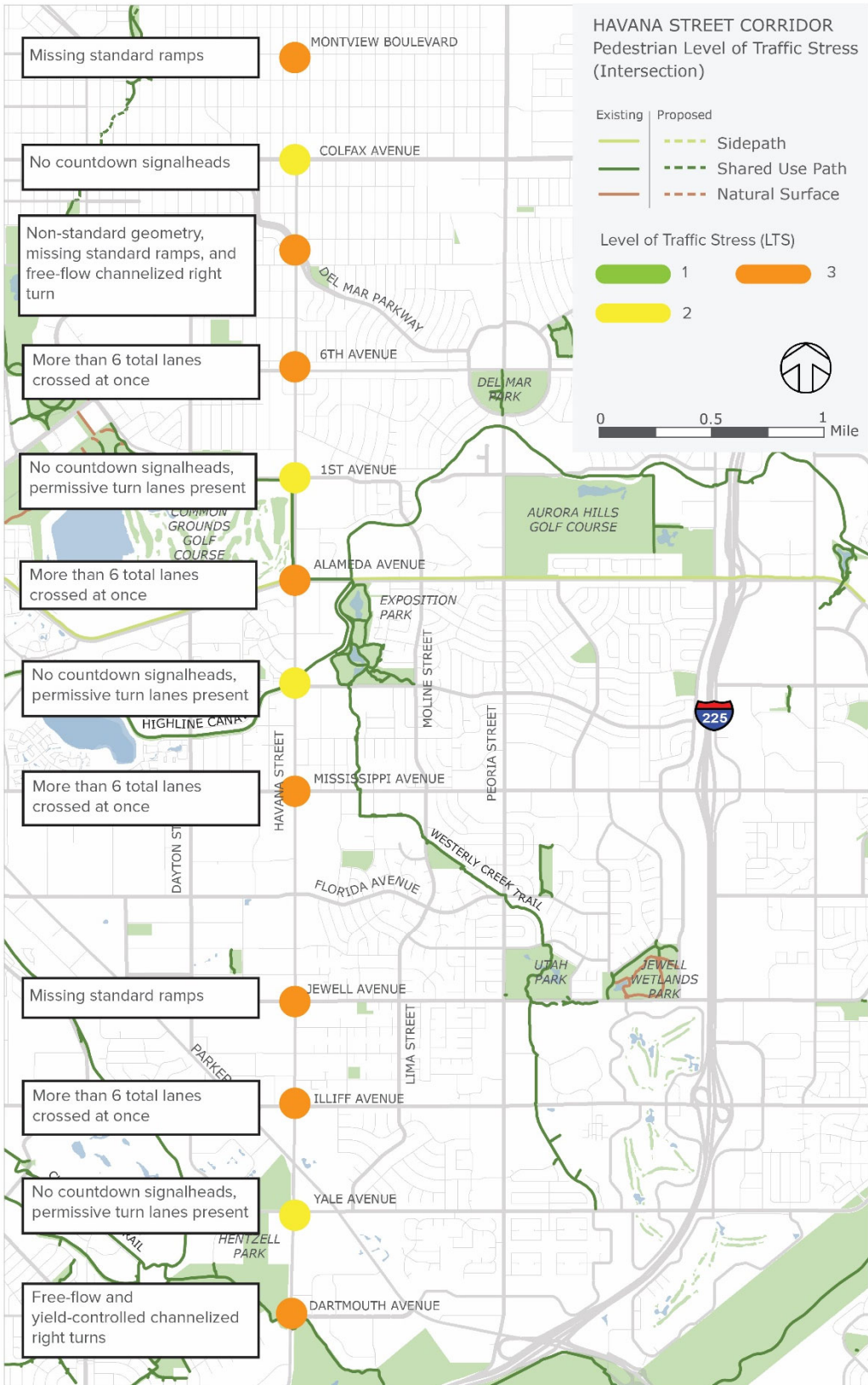


Figure 3.5.4: Pedestrian LTS Intersection Analysis



3.6 VEHICLE, BICYCLE & PEDESTRIAN CRASH DATA

OVERVIEW

The City provided crash data from 2012 thru 2019 which details reported 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 Crashes²⁰

| 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, indicating that lighting may not be a critical factor in these crashes. However, without the proper data to correlate crashes to actual ambient lighting, lighting could still be a factor. Increasing the visibility of bicyclists and pedestrians in the higher crash locations could contribute to a reduction in motor vehicle crashes involving bicyclists and pedestrians.

Data shows that there is a correlation between crashes and gas prices²¹. This data indicates that when gas prices increase, people drive less, and crashes go down. On the contrary, 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).

²⁰ City of Aurora, Colorado. Crashes retrieved from 2012-2019.

²¹ 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>

Figure 3.6.1: Percent of Reported Crashes by Mode and Severity

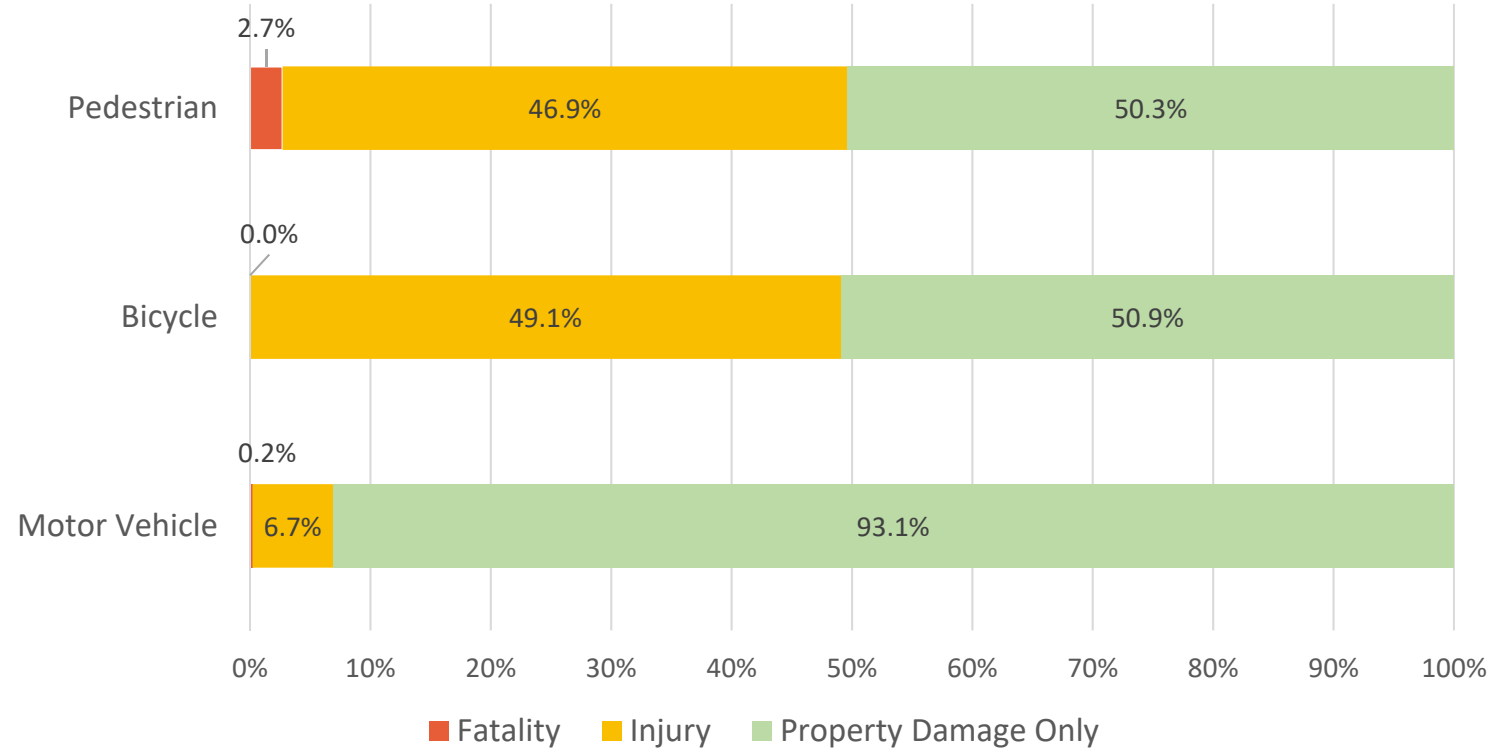


Figure 3.6.2: Percent of Reported Fatal Crashes by Mode

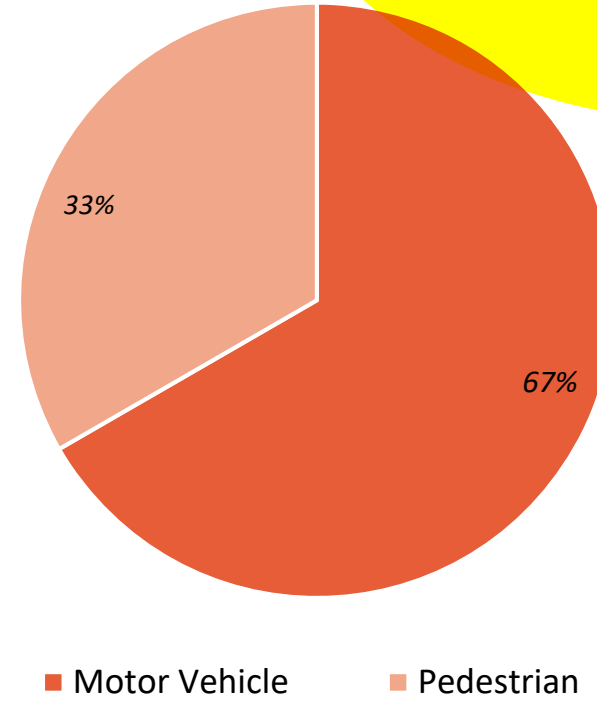


Figure 3.6.3: Percent of Reported Injury Crashes by Mode

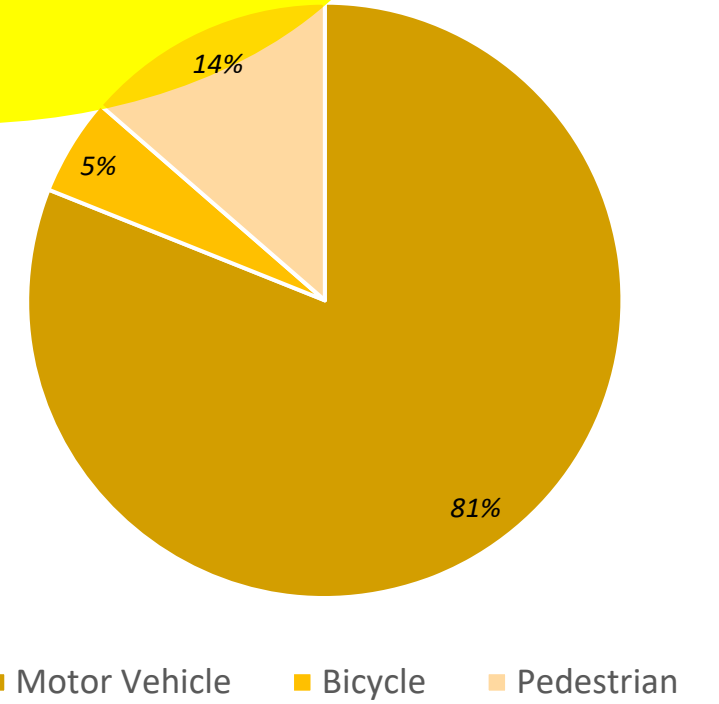


Figure 3.6.4: Reported Crash Occurrence by Time and Day of the Week

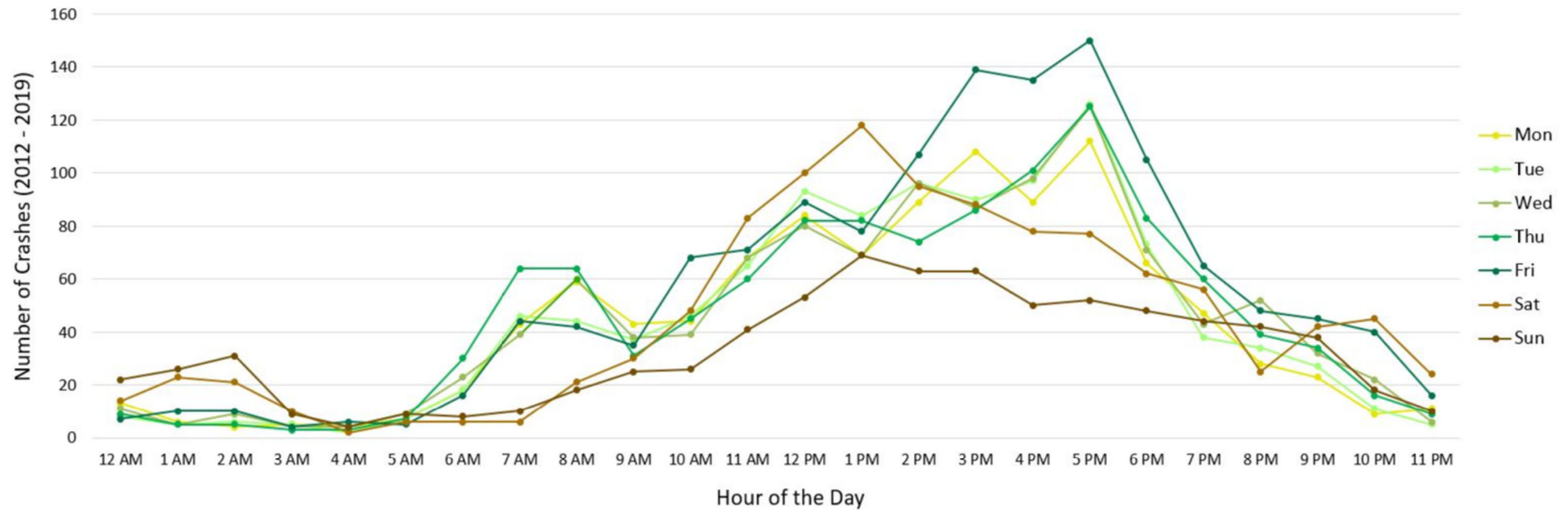
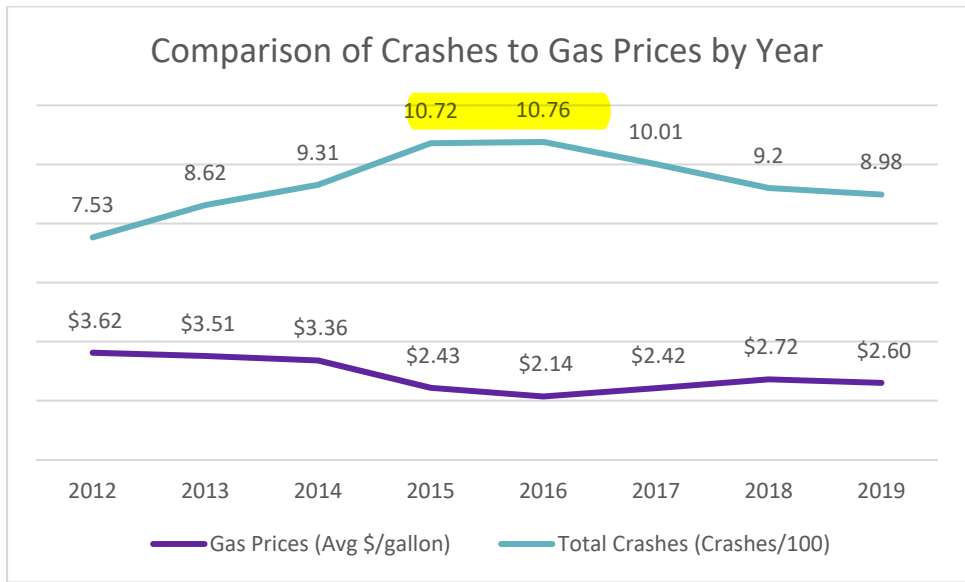


Figure 3.6.5: Comparison of Crashes to Gas Prices (2012-2019)



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 between Kentucky Drive and Kentucky Avenue.

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



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 Highline Canal Trail. The majority of these crashes occurred due to careless driving or drivers failing to yield the right-of-way to bicyclists. These primary 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 3.6.7: Reported Fatal & Injury Motor Vehicle Crashes

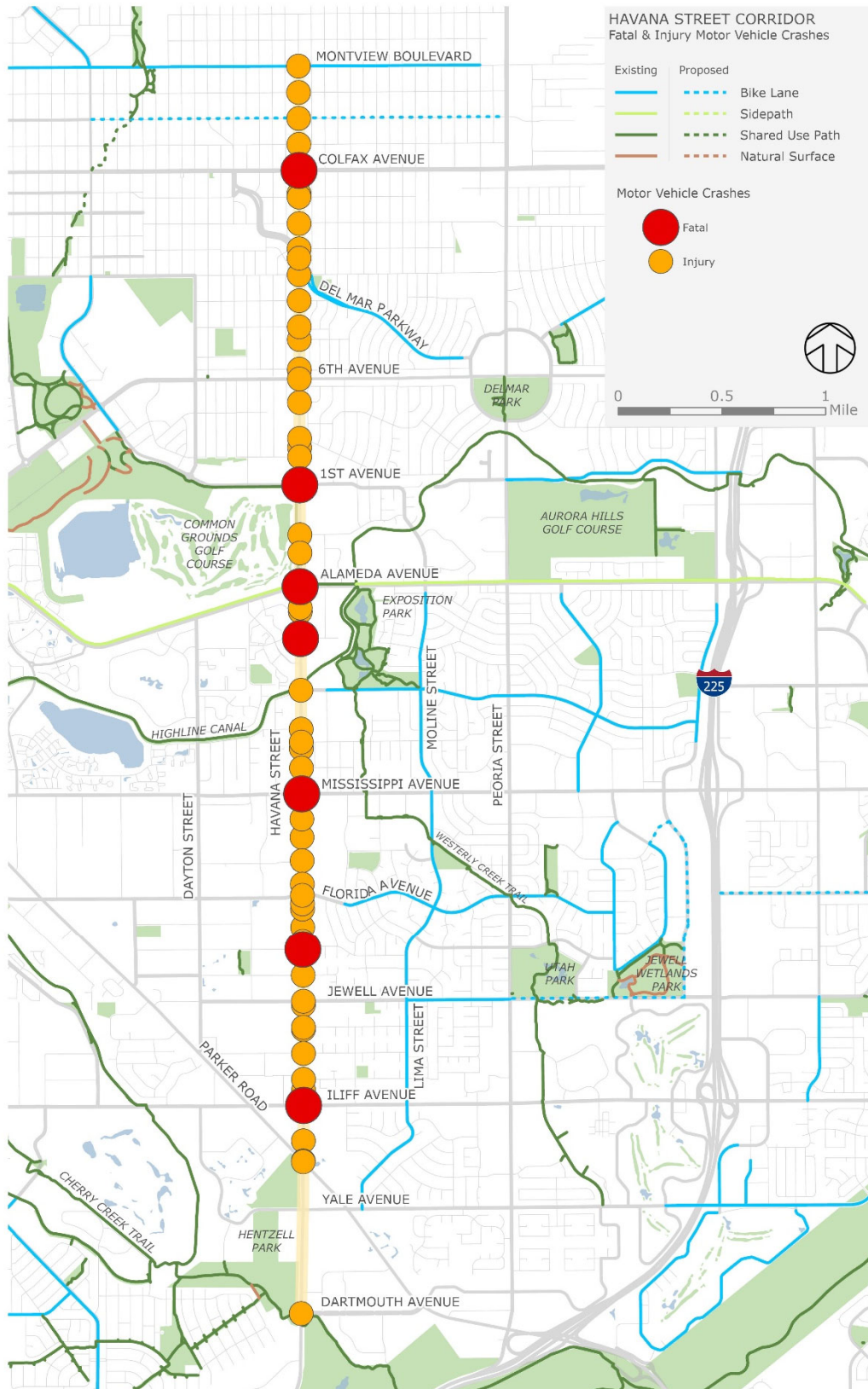
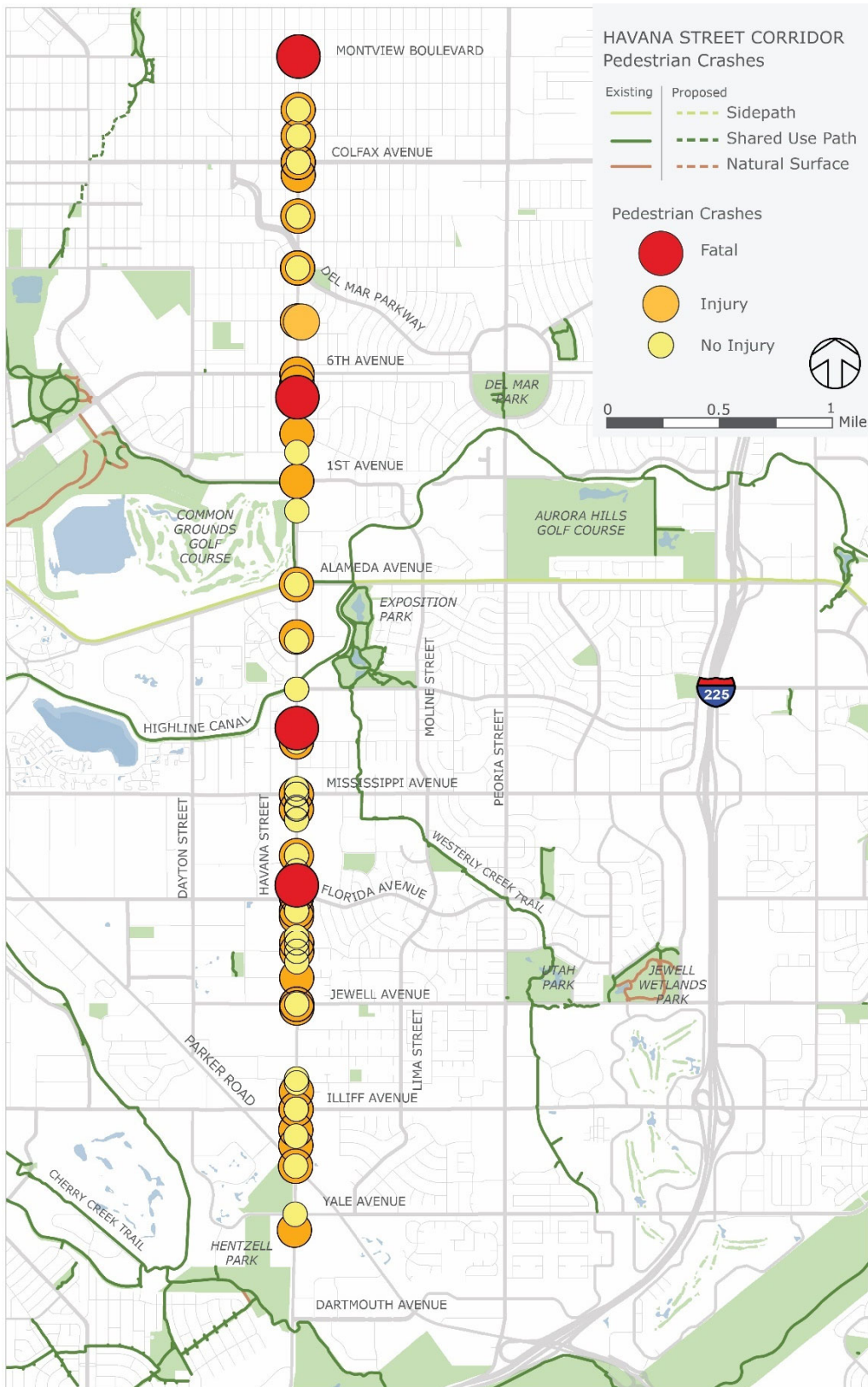


Figure 3.6.8: Reported Bicycle Crashes



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 a lot of 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:

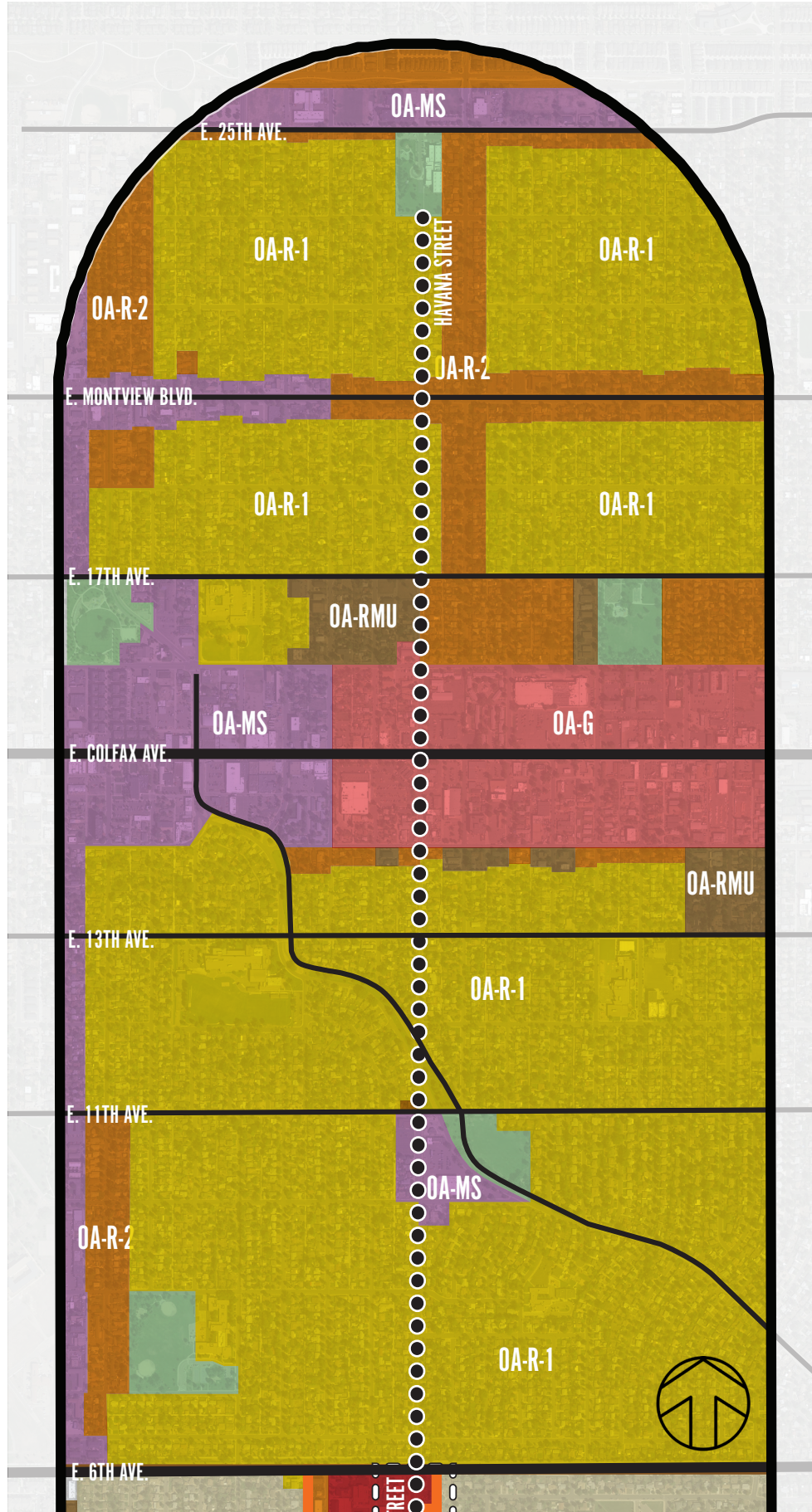
- 1) *What's Envisioned?* (Figures 4.1.1, 4.1.3, and 4.1.5) – This portion offers a summary of *Aurora Places'* future vision, land uses and defining features for each Placetype.
- 2) *What's Allowed?* (Figures 4.1.1, 4.1.3, and 4.1.5) – This portion offers a summary of what the Unified Development Ordinance 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.

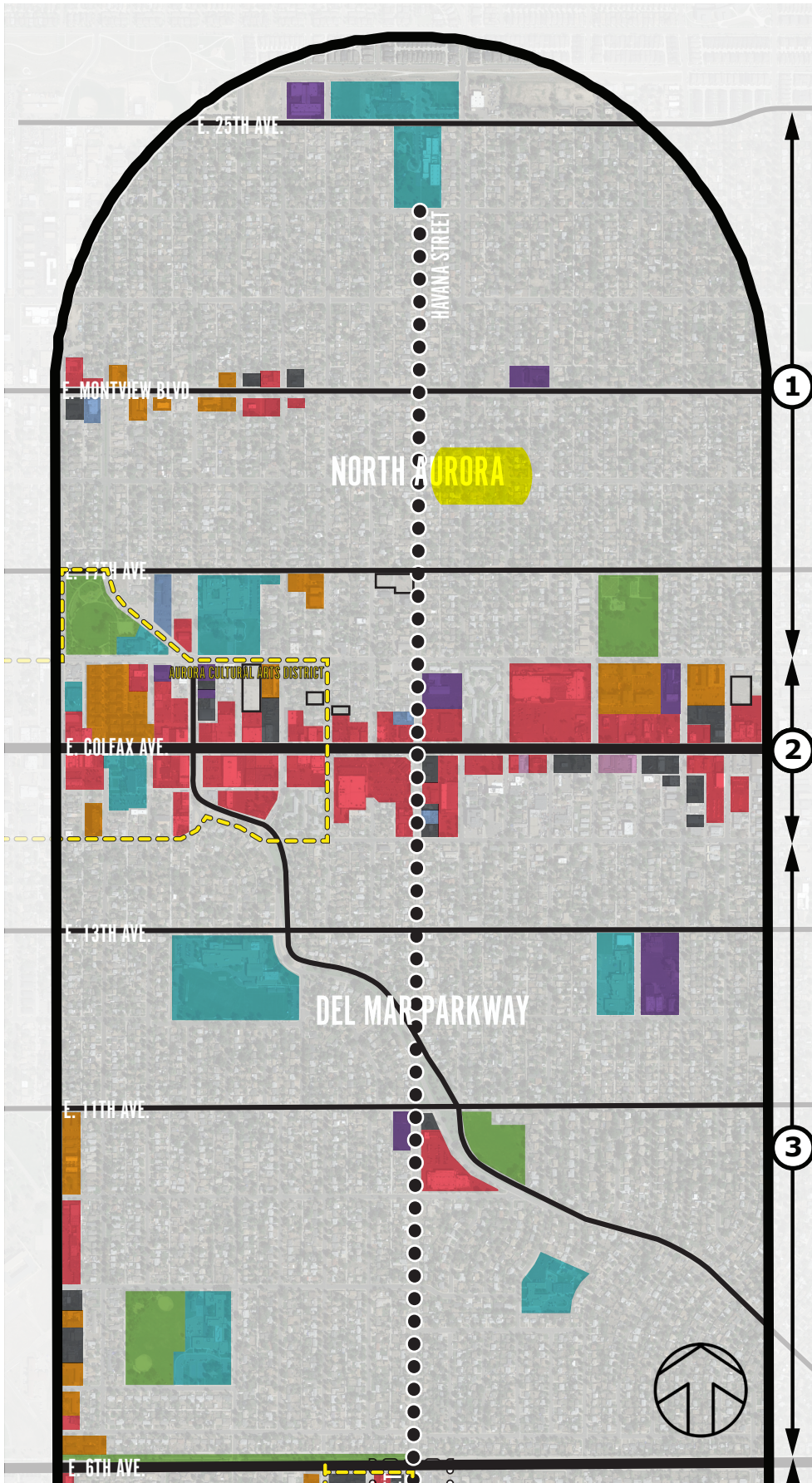
- **OA-R-1 (Original Aurora Low Density)** - To promote and protect residential neighborhoods and improve the overall image and character of Original Aurora. The building form standards and permitted uses work together to promote desirable residential areas. These regulations shall reinforce the existing 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**
- 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 Mar 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?

How can the vision be met?

COLFAX AVENUE/AURORA CULTURAL ARTS DISTRICT (ACAD)

Colfax Avenue in this section is more of a primary destination and arterial than Havana Street, which is more residential in nature through this section. Currently, 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 Anschutz campus. This area is seeing more recent investment in local business and is a walkable destination from both North Aurora and Del Mar Parkway neighborhoods. This area includes 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.

11TH AVENUE NODE

The triangular area 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.

STANLEY MARKETPLACE

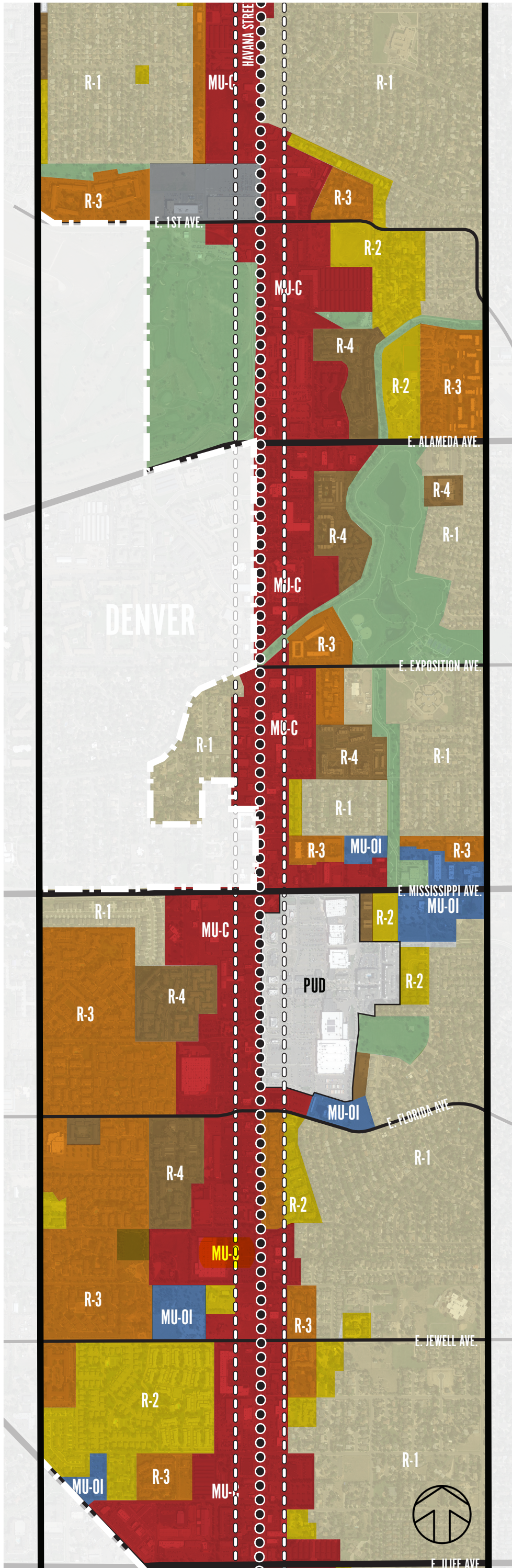
Stanley Marketplace is located just northwest of the study area boundary. It includes multiple dining establishments and fitness and entertainment businesses. This is a recent addition to Original Aurora that also likely serves as a popular destination for these residents.

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

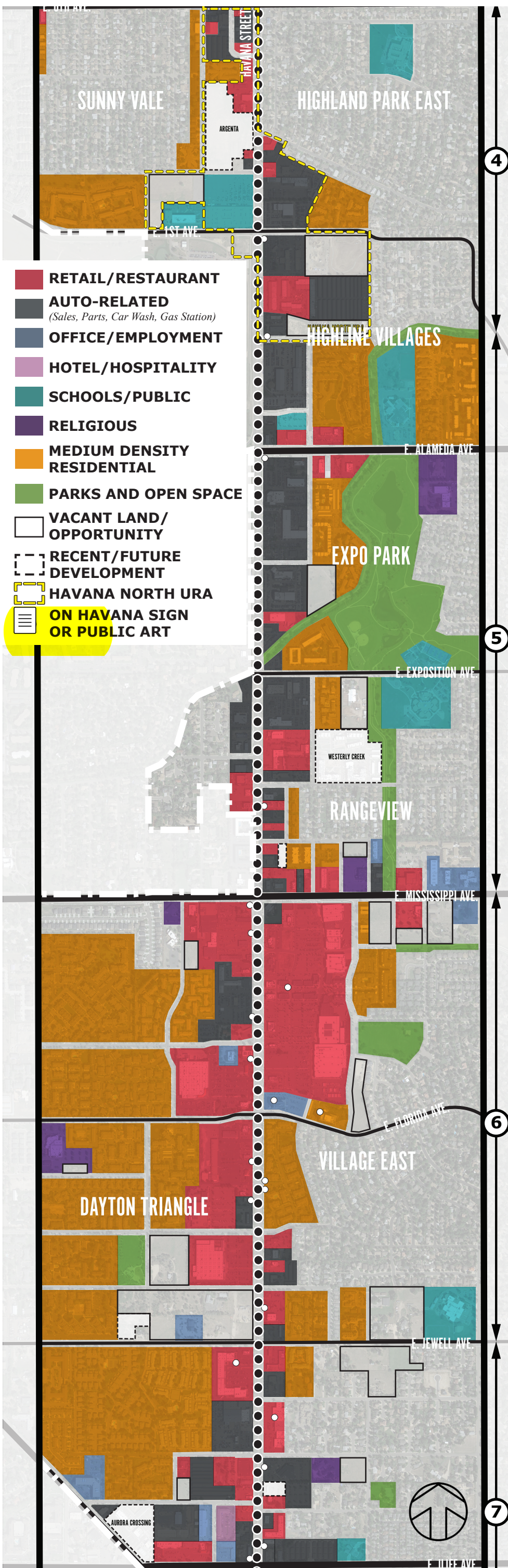
The following zone districts are located within the City Corridor boundary, as defined in Aurora Places.

- **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)**
- **R-3 (MEDIUM DENSITY MULTIFAMILY)**
- **R-2 (MEDIUM DENSITY)**
- **R-1 (LOW DENSITY SINGLE FAMILY)**
- HSO (HAVANA STREET OVERLAY)**
- **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?

How can the vision be met?

HAVANA NORTH URA / ARGENTA DEVELOPMENT

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 in the area, which should serve as a catalyst for other new development and 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.

VACANT/UNDERUTILIZED LAND NEAR OPEN SPACE AND TRAILS

West of Expo Park there is a large vacant parcel adjacent to the Highline Canal which is ideal for residential uses. South of Exposition Avenue, also adjacent to a regional trail, is an equine property that is underutilized given its location and proximity to Havana Street. This could also be an opportunity for new housing, as it is adjacent to the new Westerly Creek development and has premium access to open space and trails. There are also a few vacant and underutilized properties along E. Mississippi Avenue that are located adjacent to regional trails.

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.

CONNECTIONS TO TRAILS AND OPEN SPACE

Particular attention should be paid to making safe and convenient access to the parks, open space and trails in this area. Having Westerly Creek Trail and Highline Canal Trail in this vicinity makes for hundreds of miles of trails within walking and biking distance of most of the residents in the area.

CONNECTIONS FROM HIGHER DENSITY HOUSING

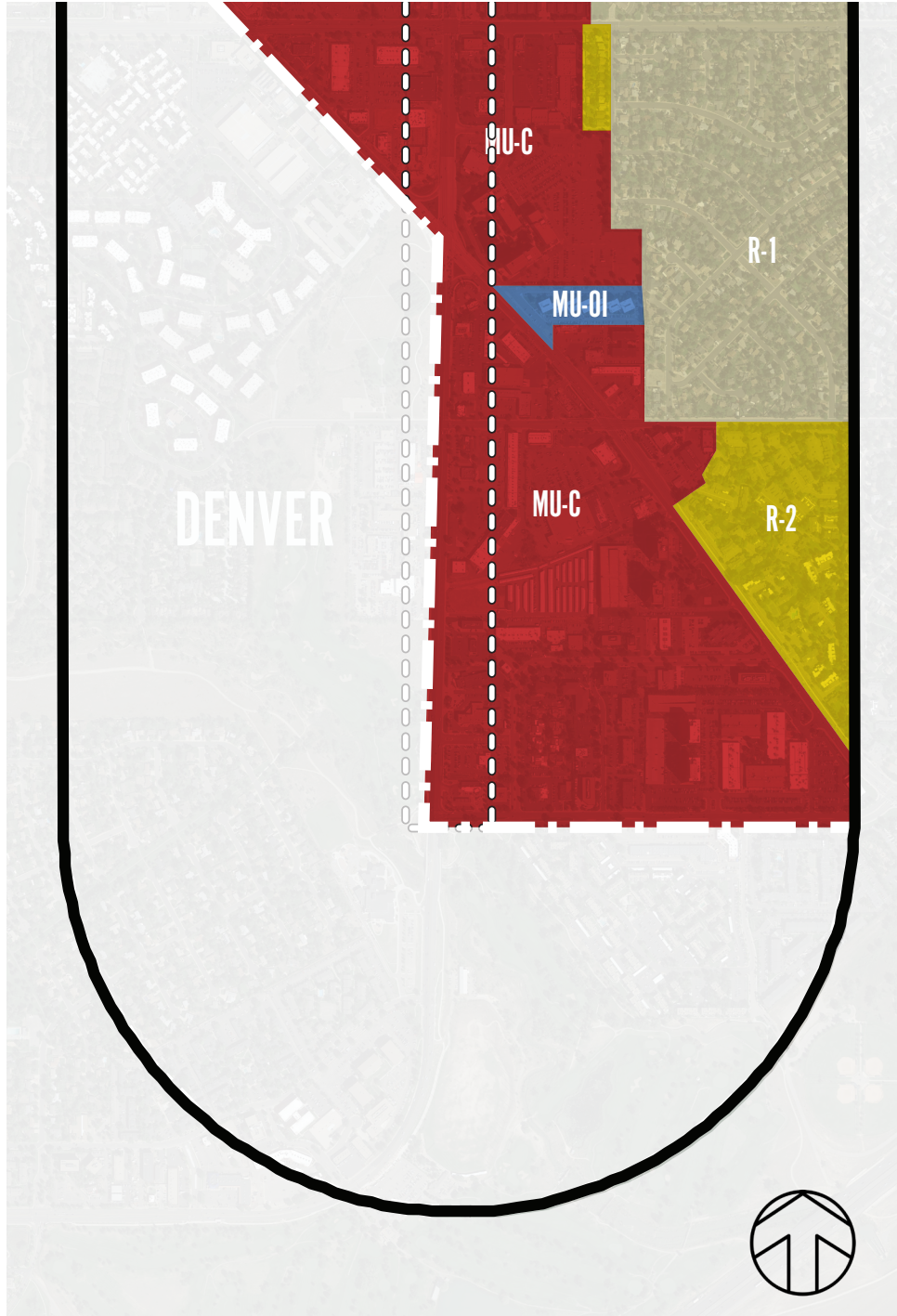
Additionally, safe and convenient connections between higher density housing developments and retail and entertainment destinations and transit stops should be paramount. This especially applies to the Dayton Triangle neighborhood subdivisions and retail centers along Havana.

FIGURE 4.1.5

URBAN DISTRICT

E. Iliff Ave. to E. Dartmouth Ave.

ZONING



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

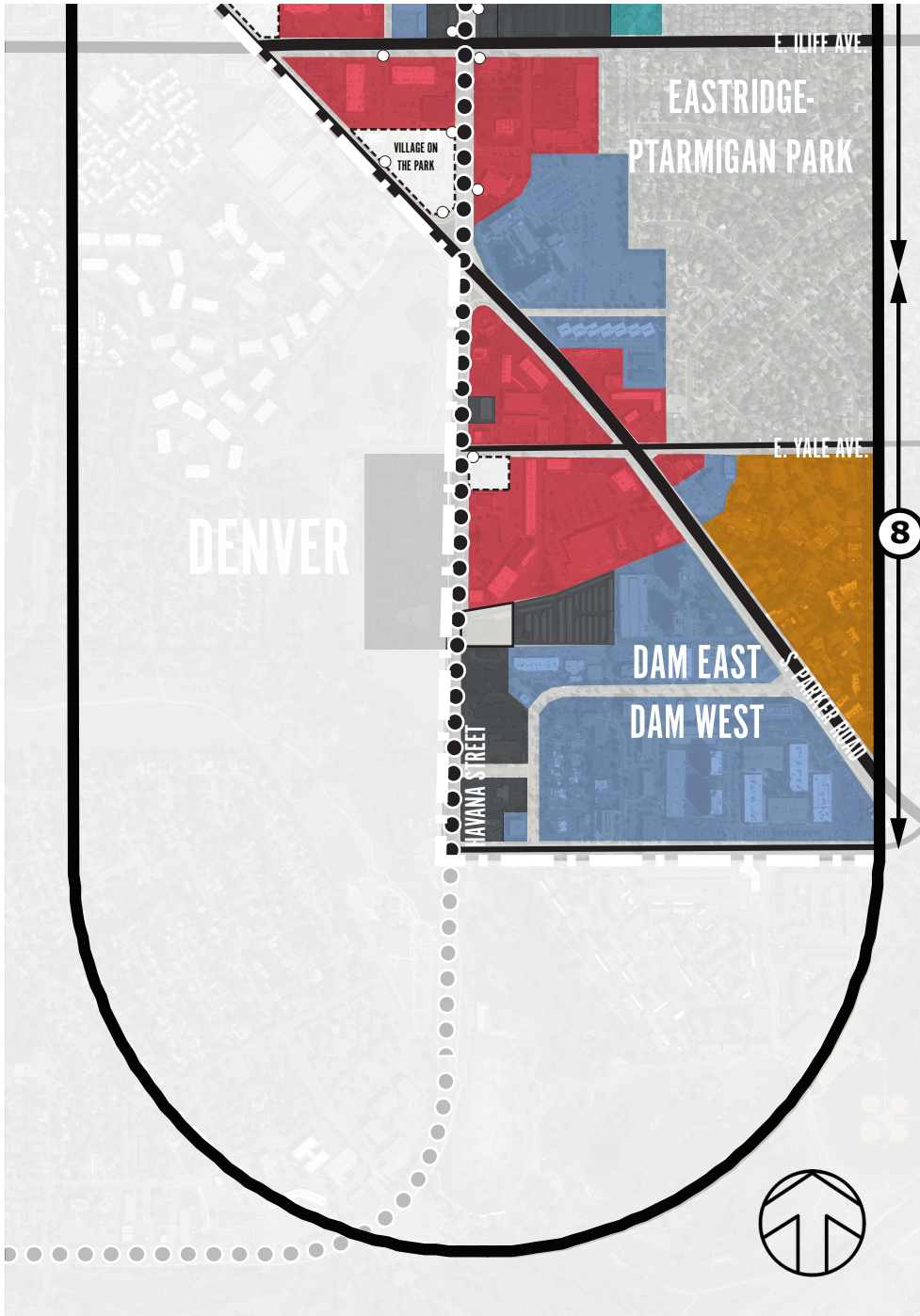
- **HSO (Havana Street Overlay)** - All properties that touch Havana Street in this area, in addition to the base underlying zoning, have to follow the Havana Street Overlay standards. The HSO is intended to encourage improvement to streetscape, landscaping, and the general aesthetics of the street edges 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**
- RELIGIOUS**
- MEDIUM DENSITY RESIDENTIAL**
- PARKS AND OPEN SPACE**
- VACANT LAND/ OPPORTUNITY**
- RECENT/FUTURE DEVELOPMENT**
- ON HAVANA SIGN OR PUBLIC ART**

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, triangular-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.

SUBAREA I - PARKER TO DARTMOUTH

This section of Havana includes more large auto dealerships and suburban retail and restaurants. HMart, a Korean 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?

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.

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.

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.

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, though they also 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 more narrow 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 included 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 Highline Canal (71 miles), 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 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 this 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 the interstate. 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.

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 bicycles and pedestrians as it provides a dedicated phase for the left turns and does not allow vehicles to turn during the “walk” phase for bicycles 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 Application*. 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 were 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 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.

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.

Table 5.2.1: 2040 Traffic Volume Growth Rates and Growth Factors

| 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 & 17 th 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 |

Note: The growth factor is the number by which a quantity multiplies over a period of time (i.e. 2018-2040 Growth Factor = $(1 + \text{Annual Growth Rate})^{22}$). 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.

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

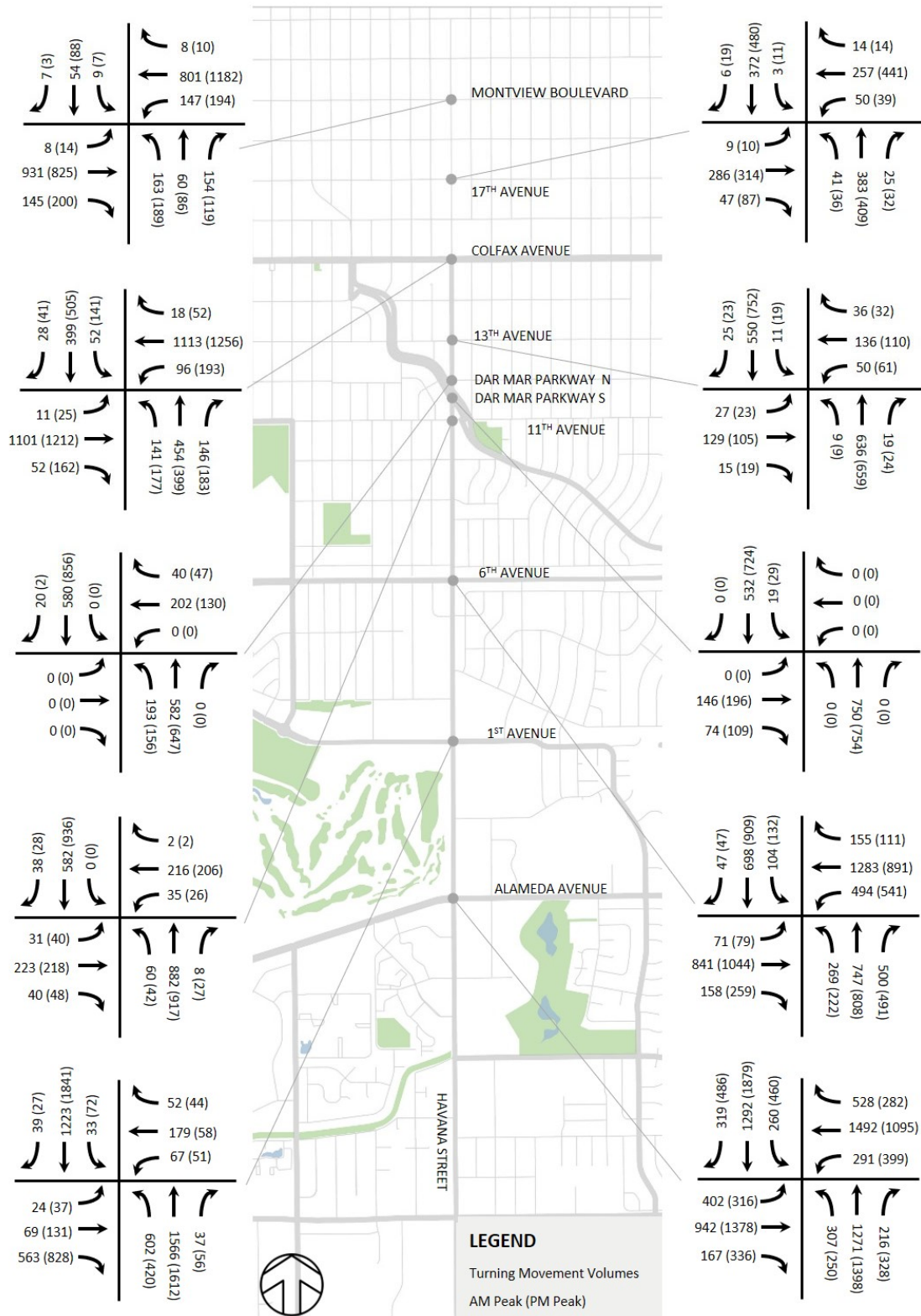
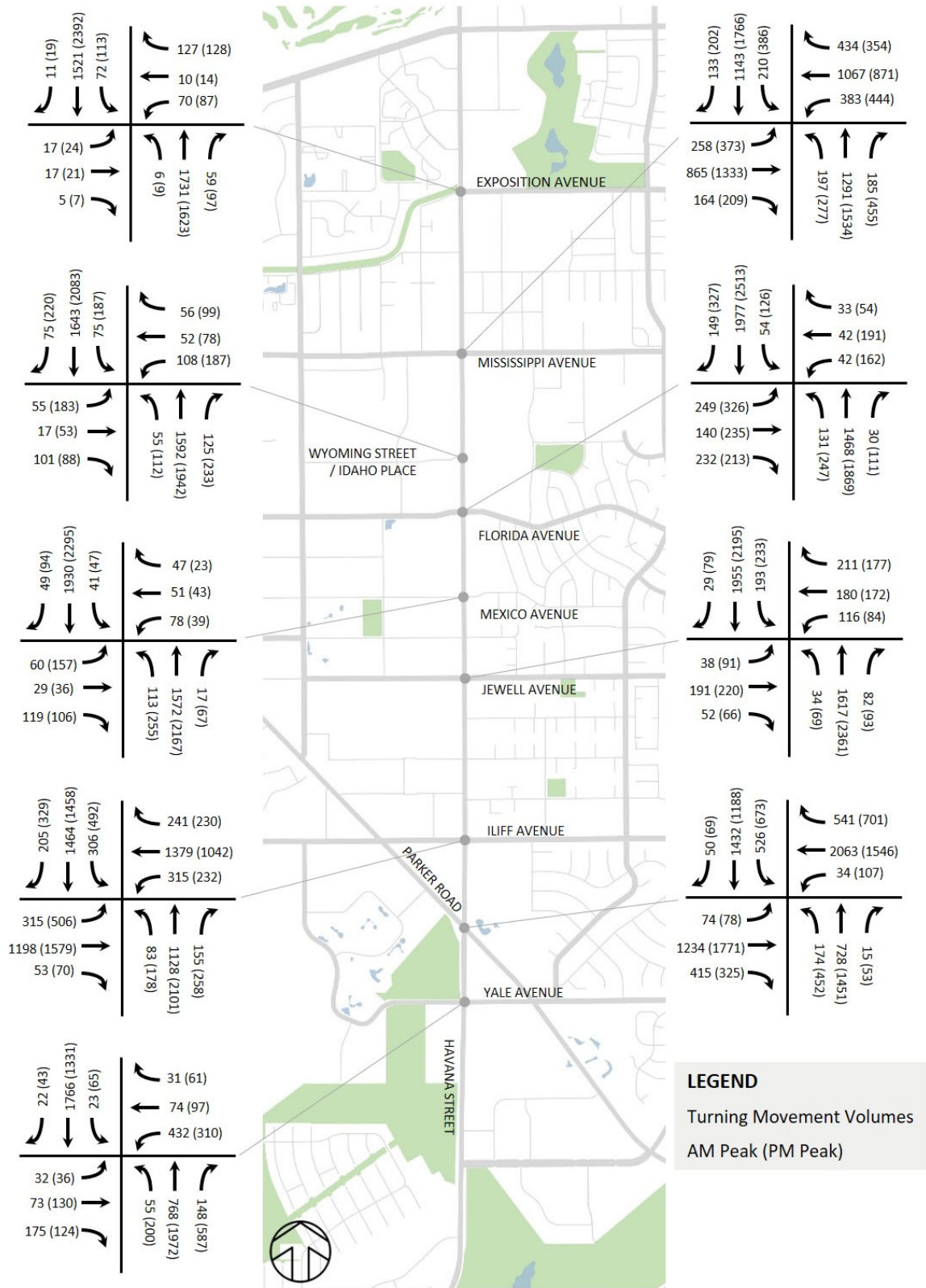


Figure 5.2.2: 2040 No-Build Intersection Turning Movement Volumes (South Intersections)



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". However, overall intersections should operate at LOS "D" or better during peak periods. 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.

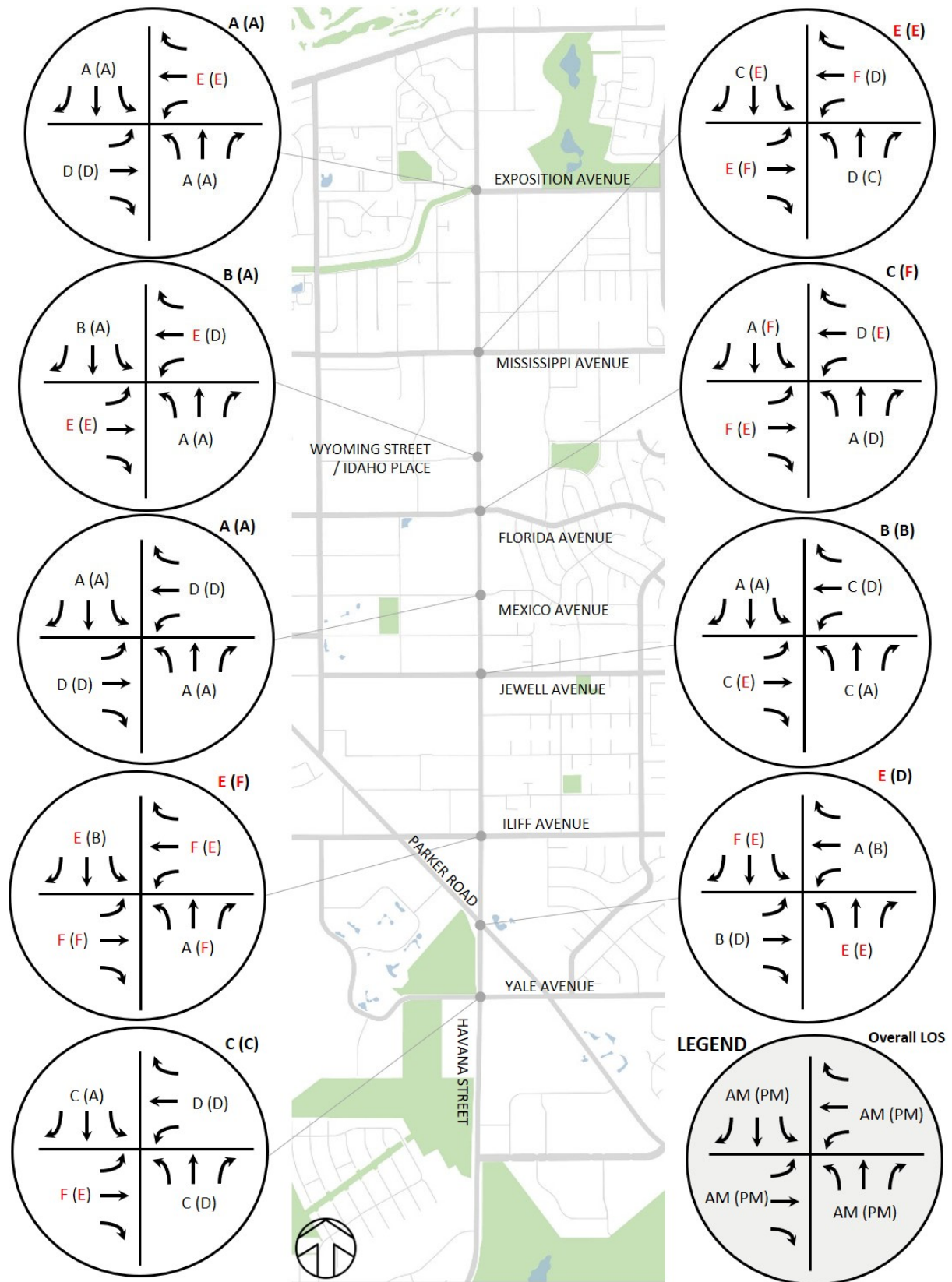
The traffic conditions are expected to deteriorate further during the 2040 PM peak hour. As shown in Figures 5.2.3 and 5.2.4, half of the intersections from 6th Avenue to the south are expected to operate with an overall intersection performance of LOS "E" or "F". Those operating at LOS "F" are expected 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 demand automobile traffic and have the potential to shift demand to alternative modes such as walking, biking and 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 5.2.3: 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, contribute to poor transit LOS. The more significant degradations in LOS (change from LOS D and E) are shown to occur on SB Havana Street from Colfax Avenue to 13th Avenue and NB Havana Street from Iliff Avenue to Parker Road. Other segments that are very close to LOS E operations in 2040 include Yale Avenue to Parker Road NB, Iliff Avenue to Jewell Avenue SB and Del Mar Parkway to 13th Avenue SB. Slow bus running speed and wait time at stops play a large role in the existing and projected LOS on this corridor. Both of these factors should see improvements with the implementation of the recommendations outlined in the *Havana Street Transit Improvements - 2020 -2023 DRCOG TIP project Application*, such as the proposed bus bypass lanes and TSP. Additional improvements that should be considered 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 | 4.116 | D |
| | SB | 4.171 | D |
| Between 16th Avenue and 17th Avenue | NB | No Stops | No Stops |
| | SB | 4.060 | D |
| Between Colfax Avenue and 16th Avenue | NB | 4.066 | D |
| | SB | No Stops | No Stops |
| Between 13th Avenue and Colfax Avenue | NB | 4.187 | D |
| | SB | 4.253 | E |
| Between Del Mar Parkway and 13th Avenue | NB | No Stops | No Stops |
| | SB | 4.242 | D |
| Between 11th Avenue and Del Mar Parkway | NB | 4.041 | D |
| | SB | 4.106 | D |
| Between 6th Avenue and 11th Avenue | NB | 4.051 | D |
| | SB | 4.093 | D |
| Between 1st Avenue and 6th Avenue | NB | 4.070 | D |
| | SB | 4.209 | D |
| Between Alameda Avenue and 1st Avenue | NB | 3.930 | D |
| | SB | 4.152 | D |
| Between Exposition Avenue and Alameda Avenue | NB | 3.973 | D |
| | SB | 4.207 | D |
| Between Mississippi Avenue and Exposition Avenue | NB | 4.097 | D |
| | SB | 4.201 | D |
| Between Idaho Place and Mississippi Avenue | NB | 4.152 | D |
| | SB | 4.198 | D |
| Between Florida Avenue and Idaho Place | NB | 4.153 | D |
| | SB | 4.305 | E |
| Between Mexico Avenue and Florida Avenue | NB | 4.126 | D |
| | SB | 4.205 | D |
| Between Jewell Avenue and Mexico Avenue | NB | 4.209 | D |
| | SB | 4.221 | D |
| Between Illiff Avenue and Jewell Avenue | NB | 4.318 | E |
| | SB | 4.236 | D |
| Between Parker Road and Illiff Avenue | NB | 4.342 | E |
| | SB | 4.101 | D |
| Between Yale and Parker | NB | 4.237 | D |
| | SB | 4.197 | D |

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

Table 5.4.1: Projected Bicycle & Pedestrian Volumes in 2040²²

| Intersection | Total | Intersection | Total |
|-------------------------|-------|--------------------|-------|
| Montview Boulevard | | Exposition Avenue | |
| Bicycles | 12 | Bicycles | 36 |
| Pedestrians | 52 | Pedestrians | 132 |
| 17 th Avenue | | Mississippi Avenue | |
| Bicycles | 2 | Bicycles | 7 |
| Pedestrians | 33 | Pedestrians | 321 |
| 13 th Avenue | | Idaho Place | |
| Bicycles | 38 | Bicycles | 8 |
| Pedestrians | 256 | Pedestrians | 152 |
| Del Mar Parkway | | Florida Avenue | |
| Bicycles | 0 | Bicycles | 13 |
| Pedestrians | 33 | Pedestrians | 155 |
| 6 th Avenue | | Mexico Avenue | |
| Bicycles | 18 | Bicycles | 6 |
| Pedestrians | 146 | Pedestrians | 87 |
| 1 st Avenue | | Jewell Avenue | |
| Bicycles | 4 | Bicycles | 2 |
| Pedestrians | 73 | Pedestrians | 95 |
| Alameda Avenue | | Yale Avenue | |
| Bicycles | 11 | Bicycles | 10 |
| Pedestrians | 80 | Pedestrians | 85 |
| | | Total | |
| | | Bicycles | 169 |
| | | Pedestrians | 1699 |

²² Projection is based on 0.88% user increase per year from 2018 counts. Counts by All Traffic Data Services, Inc. April 2018.

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

Proposed focus areas were determined through an evaluation of multimodal 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, the top two to three focus areas will be identified for further assessment and identification of proposed 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 any 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 NB 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 NB 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 SB 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 SB riders is approximately four and a half minutes. 3) The average delay between the bus schedule and bus arrival for NB 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 SB segment between Idaho Place and Florida Avenue experiences a Transit LOS of E. 4) The NB segment between Iliff Avenue and Jewell Avenue experiences a Transit LOS of E. 5) The average delay between the bus schedule and bus arrival for SB riders is approximately four minutes. 6) Transit patrons on the east sidewalk experience 600-700 vph passing by in the adjacent lane. 7) 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 SB riders is approximately four minutes. |
| Multimodal Considerations | Bicycle | 1) The distance (1/2 mile) to amenities, services and transit on Colfax Avenue are within a short bicycling distance from all locations along this segment. 2) There are no designated bicycling facilities in this segment and the substandard, narrow sidewalks (three feet or less) are not well-suited for use by bicyclists due to the high potential for user conflict (collisions). 3) The segment only has two lanes and a comparatively 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 shared use path 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 WB 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 (1/2 mile) to amenities, services and transit on Colfax Avenue are generally less than a 10 minute walk for patrons along this segment. 2) There are substandard sidewalk widths (generally three feet or less in width) on this segment. | 1) There is a concentration of crashes involving pedestrians at Colfax Avenue. 2) There are substandard sidewalk widths (greater than or equal to 3 feet) on Havana Street for NB and SB segments approaching Colfax Avenue. 3) There are a cluster of sidewalk obstructions on Havana Street near Del Mar Parkway. | 1) There is a connection to the shared use path 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 average distance between signalized crosswalks along this segment is 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 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 orthogonal 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 URA boundary, which increases chances for future redevelopment and investment. There is a vocational school and elementary school on the NW corner, a vacant parcel on the SW 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 dealerships 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 |
| | | | | | | | | 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 |
| 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 |
| WB | 28.6 | C | EBR | | | | | - | 0 | A |
| | | | 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 |
| | | | | WB | 50.4 | D | EBR | 0 | 0 | A |
| | | | | | | | 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 |
| | | | | WB | 62.7 | E | EBR | 0.53 | 57.2 | 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 |
| | | | | | | | WBL | 0.85 | 76.8 | E |
| WB | 66.6 | 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 |
| | | | | | | | WBL | 0.38 | 42 | D |
| WB | 42.8 | 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 |
| | | | | | | | WBL | 0.71 | 62.3 | E |
| WB | 50.2 | D | 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 |
| | | | | | | | WBL | 0.49 | 43 | D |
| WB | 32.6 | C | 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 |
| | | | | | | | | | | |
| 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 |
| 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 |
| WB | 32.9 | C | EBR | | | | | - | 0 | A |
| | | | WBL | | | | | 0.84 | 56.6 | E |
| | | | WBT | 0.81 | 27.9 | C | | | | |
| WB | 32.9 | C | WBR | 0.35 | 13.7 | 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 |
|-----|---------------------------------|------------------------------|-----|----------|------------------------------|-----|----------|------|------------------------------|-----|
| 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 - 20 0 AM Peak

20 0 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 - 20 0 AM Peak

20 0 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 |
| 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 - 20 0 AM Peak

20 0 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 |
| | | | | EB | 32.3 | C | | | | 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 - 20 0 AM Peak

20 0 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 |
| | | | | | | | WBL | 0.85 | 76.8 | E |
| WB | 66.6 | 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 - 20 0 AM Peak

20 0 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 - 20 0 PM Peak

20 0 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 - 20 0 PM Peak

20 0 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 |
| | | | | | | | | | | |
| 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 - 20 0 PM Peak

20 0 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 |
| | | | | 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 |
| | | | | EB | 53.4 | B | SBR | 0.57 | 0.1 | A |
| | | | | | | | EBL | 0.38 | 53.4 | D |
| | | | | | | | EBT | 0 | 0 | A |
| WB | 62.5 | E | EBR | 0 | 0 | A | | | | |
| | | | 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 |
| | | | | EB | 135.6 | F | SBR | 0.28 | 18.7 | B |
| | | | | | | | EBL | 1.05 | 115.9 | F |
| | | | | | | | EBT | 1.18 | 137.2 | F |
| WB | 53.4 | D | EBR | 1.19 | 147.9 | F | | | | |
| | | | WBL | 0.87 | 66.6 | E | | | | |
| WBT | 0.86 | 46.1 | D | | | | | | | |
| WBR | 0.86 | 55.2 | E | | | | | | | |

Havana St Future Condition Performance Measures - 20 0 PM Peak

20 0 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 - 20 0 PM Peak

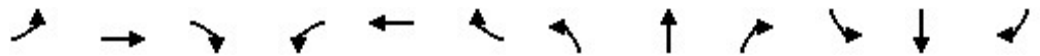
20 0 PM Peak

| 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

Havana Street Corridor Study
102: Havana St & Alameda Ave

2020 Existing Condition AM Peak



| 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.

Havana Street Corridor Study
115: Havana St & Colfax Ave

2020 Existing Condition AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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.

Havana Street Corridor Study
125: Havana St & Exposition Ave

2020 Existing Condition AM Peak



| 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(l) | 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.

Havana Street Corridor Study
126: Havana St & Florida Ave

2020 Existing Condition AM Peak

| 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(l) | 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+l1), 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. | | | | | | | | | | | | |

Havana Street Corridor Study
128: Havana St & Mississippi Ave

2020 Existing Condition AM Peak



| 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

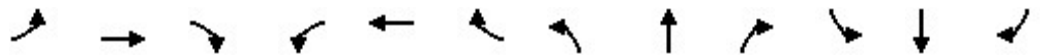
| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 51.1 |
| HCM 6th LOS | D |

Notes

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

Havana Street Corridor Study
129: Havana St & Montview Blvd

























2020 Existing Condition AM Peak



| 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 | | | | | | | | |

Havana Street Corridor Study
158: Havana St & 6th Ave

2020 Existing Condition AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | | | | | | | | | |

Havana Street Corridor Study
172: Havana St & 13th Ave

2020 Existing Condition AM Peak



| 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(l) | 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.

Havana Street Corridor Study
179: Havana St & 17th Ave

2020 Existing Condition AM Peak



| 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(l) | 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 |

Havana Street Corridor Study
212: Havana St & Jewell St/Jewell Ave

2020 Existing Condition AM Peak



| 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(l) | 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 |

Havana Street Corridor Study
239: Havana St & Parker Rd

2020 Existing Condition AM Peak



| 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.

Havana Street Corridor Study
240: Havana St & Iliff Ave

2020 Existing Condition AM Peak



| 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.

Havana Street Corridor Study
329: Havana St & Mexico Ave

2020 Existing Condition AM Peak



| 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(l) | 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+l1), 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.

Havana Street Corridor Study
401: Havana St & Yale Ave

2020 Existing Condition AM Peak



| 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 | | | |













Havana Street Corridor Study
166: Havana St & 11th Ave

2020 Existing Condition AM Peak

| 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 | |
| Frbp, 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 | | | | | | | | | | | | |



















Havana Street Corridor Study
1663: Havana St & Del Mar Pkwy SB

2020 Existing Condition AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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 | |
| 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 | | | | | | | | | | | | |

Havana Street Corridor Study
1664: Havana St & Del Mar Pkwy NB



































2020 Existing Condition AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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

























Havana Street Corridor Study
102: Havana St & Alameda Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
115: Havana St & Colfax Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | | | | | | | | | |

Havana Street Corridor Study
124: Havana St & Idaho PI

2020 Existing Condition PM Peak

| 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.

Havana Street Corridor Study
125: Havana St & Exposition Ave

2020 Existing Condition PM Peak



| 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.






































Havana Street Corridor Study
126: Havana St & Florida Ave

2020 Existing Condition PM Peak

| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
128: Havana St & Mississippi Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|--|---|---|---|---|---|---|--|---|---|---|---|---|
| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
129: Havana St & Montview Blvd

























2020 Existing Condition PM Peak



| 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(l) | 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+l1), 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 | | | | | | | | |

Havana Street Corridor Study
158: Havana St & 6th Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|--|---|---|---|---|---|---|--|---|---|---|---|---|
| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
172: Havana St & 13th Ave

2020 Existing Condition PM Peak



| 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(l) | 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. | | | | | | | | | | | | |

Havana Street Corridor Study
179: Havana St & 17th Ave

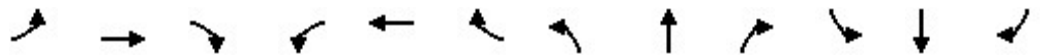
2020 Existing Condition PM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
212: Havana St & Jewell St/Jewell Ave

2020 Existing Condition PM Peak



| 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(l) | 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 | | | | | | | | | |

































Havana Street Corridor Study
239: Havana St & Parker Rd

2020 Existing Condition PM Peak

| 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. | | | | | | | | | | | | |

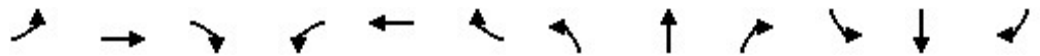
Havana Street Corridor Study
240: Havana St & Iliff Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|--|---|---|---|---|---|---|--|---|---|---|---|---|
| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
329: Havana St & Mexico Ave

2020 Existing Condition PM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
401: Havana St & Yale Ave






















2020 Existing Condition PM Peak



| 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(l) | 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. | | | | | | | | | | | | |





















Havana Street Corridor Study
148: Havana St & 1st Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | | | | | | | | | | | | |













Havana Street Corridor Study
166: Havana St & 11th Ave

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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 | | | | | | | | | | | |

Havana Street Corridor Study
1663: Havana St & Del Mar Pkwy SB



















2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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

Havana Street Corridor Study
1664: Havana St & Del Mar Pkwy NB

2020 Existing Condition PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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

Havana Street Corridor Study
102: Havana St & Alameda Ave

2040 AM Peak



| 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.

Havana Street Corridor Study
115: Havana St & Colfax Ave

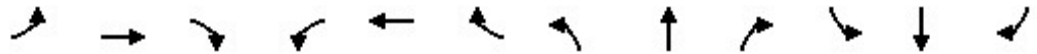
2040 AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
125: Havana St & Exposition Ave

2040 AM Peak



| 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(l) | 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

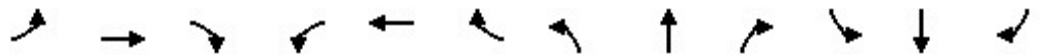
| | |
|--------------------|-----|
| HCM 6th Ctrl Delay | 8.1 |
| HCM 6th LOS | A |

Notes

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

Havana Street Corridor Study
126: Havana St & Florida Ave

2040 AM Peak



| 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.

Havana Street Corridor Study
128: Havana St & Mississippi Ave

2040 AM Peak

| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
129: Havana St & Montview Blvd

























2040 AM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
158: Havana St & 6th Ave

2040 AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | | | | | | | | |

Havana Street Corridor Study
172: Havana St & 13th Ave

2040 AM Peak



| 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(l) | 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.

Havana Street Corridor Study
179: Havana St & 17th Ave

2040 AM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
212: Havana St & Jewell St/Jewell Ave

2040 AM Peak



| 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(l) | 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 | | | | | | | | | |

Havana Street Corridor Study
239: Havana St & Parker Rd

2040 AM Peak



| 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.

Havana Street Corridor Study
240: Havana St & Iliff Ave

2040 AM Peak



| 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(l) | 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+l1), 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(l) | 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.

Havana Street Corridor Study
401: Havana St & Yale Ave

2040 AM Peak















| 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 | |
| Frbp, 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 | |
| Frbp, 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 | | | | | | | | | | | | |

Havana Street Corridor Study
1663: Havana St & Del Mar Pkwy SB



















2040 AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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 | |
| 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

Havana Street Corridor Study
1664: Havana St & Del Mar Pkwy NB

2040 AM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 |
| Frbp, 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

Havana Street Corridor Study
102: Havana St & Alameda Ave

2040 PM Peak



| 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

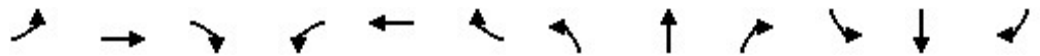
| | |
|--------------------|------|
| HCM 6th Ctrl Delay | 66.5 |
| HCM 6th LOS | E |

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.

Havana Street Corridor Study
115: Havana St & Colfax Ave
























2040 PM Peak



| 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 | | | | | | | | |

Havana Street Corridor Study
124: Havana St & Idaho PI

2040 PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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(l) | 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. | | | | | | | | | | | | |

Havana Street Corridor Study
125: Havana St & Exposition Ave

2040 PM Peak



| 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(l) | 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.

Havana Street Corridor Study
126: Havana St & Florida Ave

2040 PM Peak

| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
128: Havana St & Mississippi Ave

2040 PM Peak



| 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. | | | | | | | | | | | | |

Havana Street Corridor Study
129: Havana St & Montview Blvd

2040 PM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
158: Havana St & 6th Ave

2040 PM Peak



| 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.

Havana Street Corridor Study
172: Havana St & 13th Ave

2040 PM Peak



| 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(l) | 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.

Havana Street Corridor Study
179: Havana St & 17th Ave

2040 PM Peak



| 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 | | | | | | | | |

Havana Street Corridor Study
212: Havana St & Jewell St/Jewell Ave

2040 PM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
239: Havana St & Parker Rd

2040 PM Peak



| 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 |

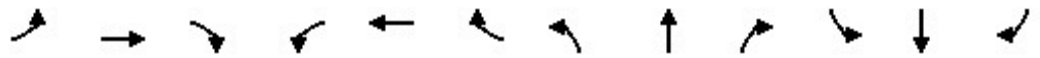
Notes

* 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.

Havana Street Corridor Study
240: Havana St & Iliff Ave

2040 PM Peak



| 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.

Havana Street Corridor Study
329: Havana St & Mexico Ave

2040 PM Peak



| 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(l) | 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 | | | | | | | | |

Havana Street Corridor Study
401: Havana St & Yale Ave

2040 PM Peak























| 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 | | | | | | | | | | | | |

Havana Street Corridor Study
166: Havana St & 11th Ave

2040 PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 | |
| Frbp, 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 | | | | | | | | | | | |

Havana Street Corridor Study
1663: Havana St & Del Mar Pkwy SB

2040 PM Peak





















| 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 | |
| Frbp, 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

Havana Street Corridor Study
1664: Havana St & Del Mar Pkwy NB

2040 PM Peak

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| 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 |
| Frbp, 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 - 20 City Wide 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 Travel Speed (mph) | Design Travel Distance (ft) | Travel Time with Design Speed (sec) | Average Travel Delay (sec) | Stopped Delay (sec) | Time above 0 mph (sec) | Time Above 0 mph (sec) | Time above 0 mph (sec) | Time Above 0 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 | 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 |

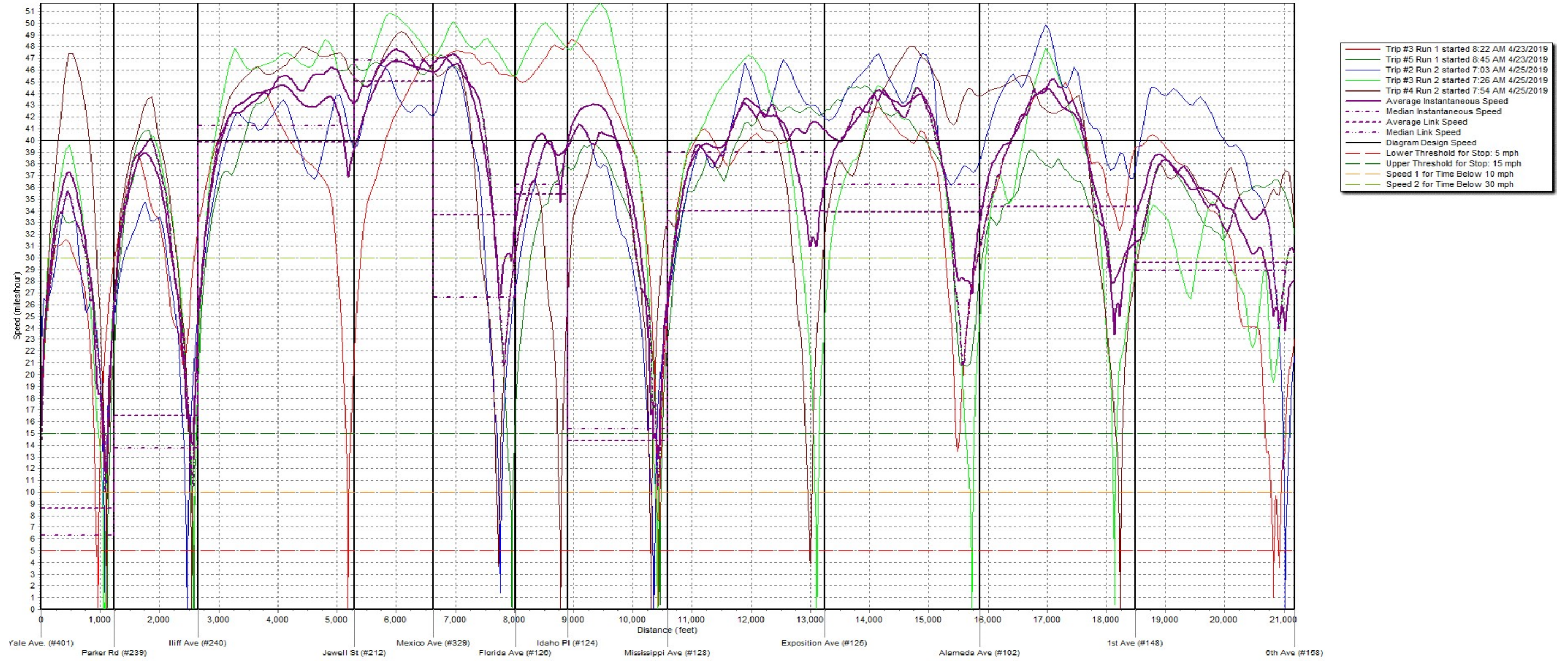
| PM Peak | Northbound | Runs |
|--------------------|---------------------------|---------------------|
| Segment | Average Travel Time (sec) | Average Speed (mph) |
| to Parker Rd | 43.6 | 25.7 |
| to Iliff Ave | 52 | 18.8 |
| to Jewell St | 66.2 | 31.3 |
| to Mexico Ave | 30.2 | 33.8 |
| to Florida 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 | 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 | 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 |

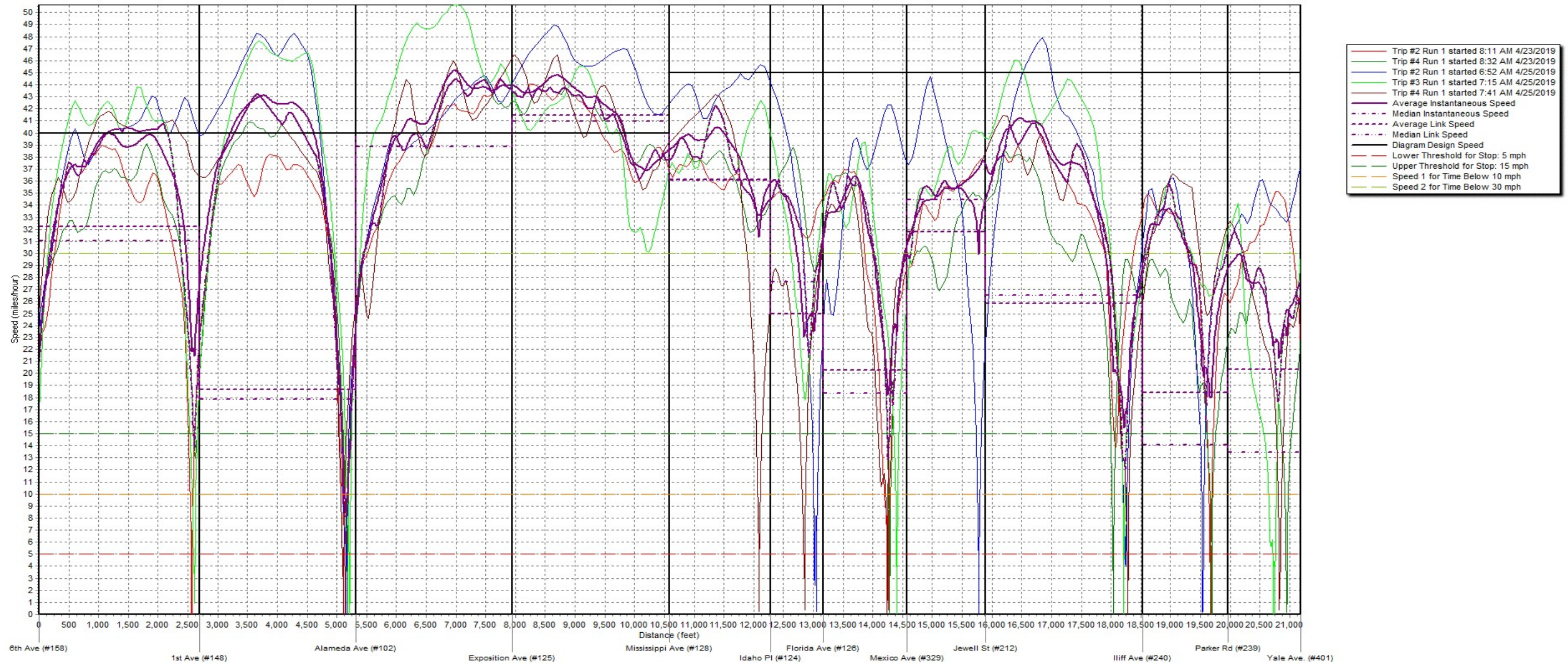
AM Peak Northbound Travel Speed

Havana St. Mon. 5/20/2019 11:15 AM



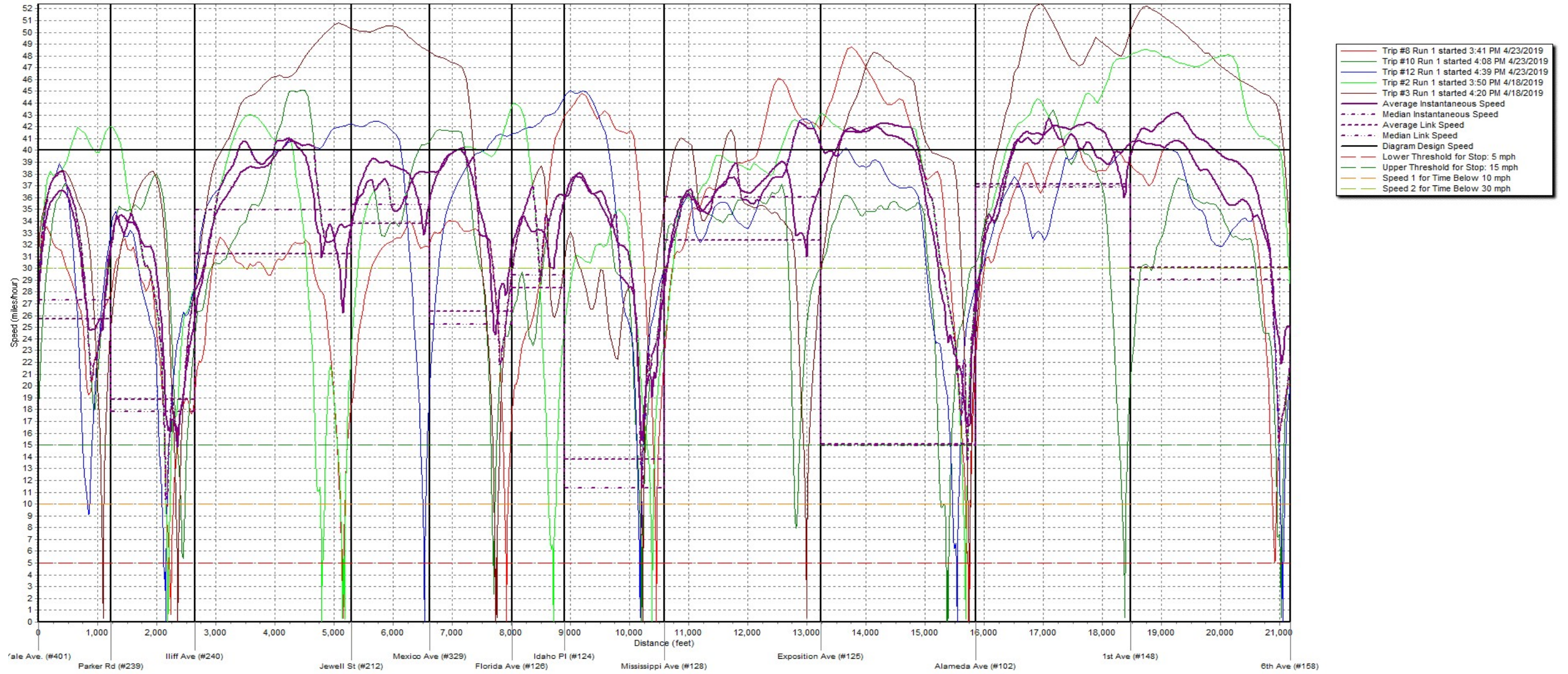
AM Peak Southbound Travel Speed

Havana St. Mon. 5/20/2019 11:15 AM



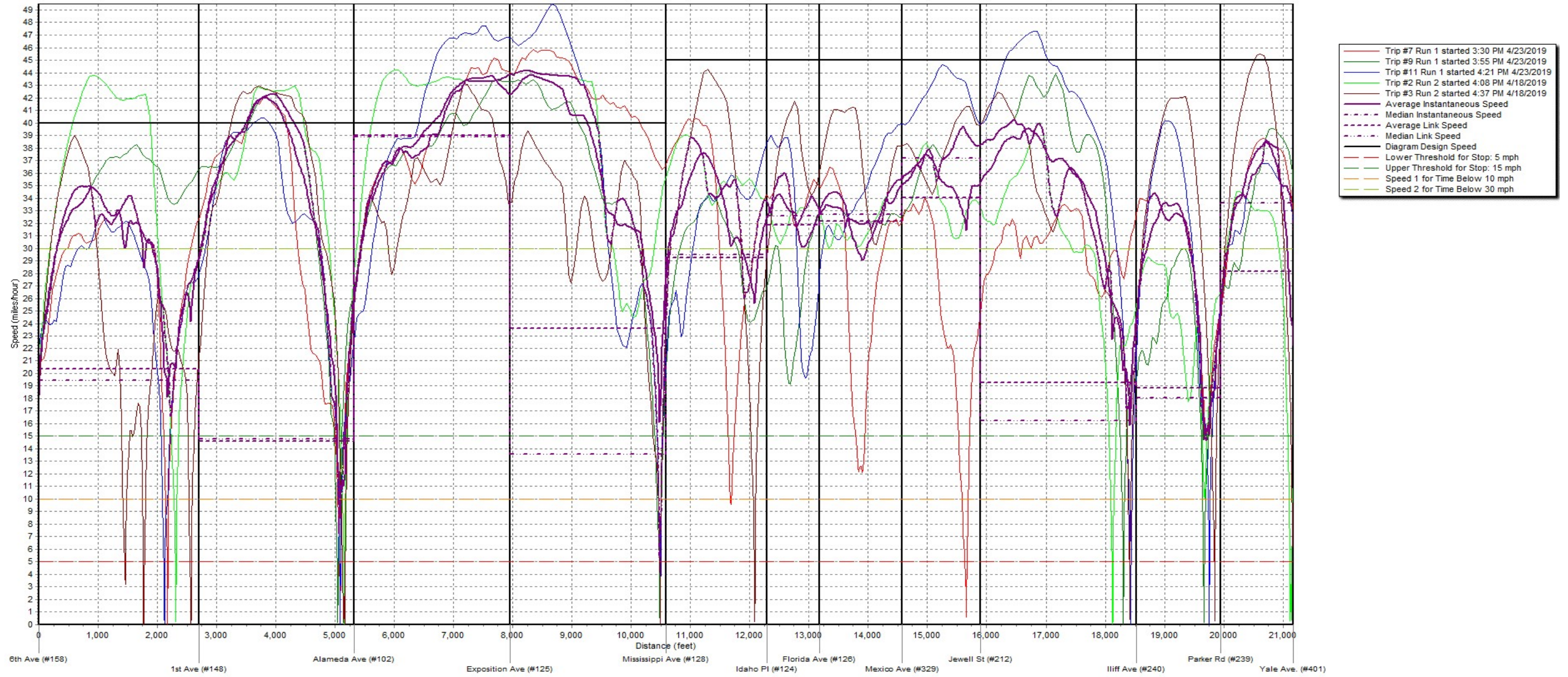
PM Peak North bound Travel Speed

Havana St. Mon. 5/20/2019 11:23 AM



PM Peak South bound Travel Speed

Havana St. Mon. 5/20/2019 11:23 AM



APPENDIX C - TRANSIT LOS WORKSHEETS

Multimodal Transit LOS Calculation NB - Existing Conditions

| Inputs | | Segments | | | | | | | | | | | | | | | | | |
|--|--|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|----------|-------|
| | | 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) | 1.8 | 1.9 | 2.2 | 2.5 | 2.7 | 2.9 | 3.0 | 3.3 | 3.8 | 4.1 | 3.7 | 3.4 | 3.2 | - | 3.1 | 3.0 | - | 2.5 |
| 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) | 35.2 | 32.6 | 29.4 | 26.5 | 24.8 | 23.4 | 22.1 | 20.3 | 18.0 | 17.2 | 19.4 | 21.1 | 21.7 | #VALUE! | 22.4 | 22.6 | #VALUE! | 27.7 |
| 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 | 0.52 | 0.52 | 0.53 | 0.54 | 0.55 | 0.56 | 0.57 | 0.58 | 0.59 | 0.60 | 0.58 | 0.57 | 0.57 | #VALUE! | 0.56 | 0.56 | #VALUE! | 0.54 |
| S _{w-r} | Transit wait-ride score | 1.45 | 1.46 | 1.49 | 1.52 | 1.54 | 1.56 | 1.58 | 1.61 | 1.66 | 1.68 | 1.63 | 1.60 | 1.59 | #VALUE! | 1.58 | 1.57 | #VALUE! | 1.51 |
| 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 _d | 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 | 4.228 | 4.244 | 4.263 | 4.207 | 4.120 | 4.136 | 4.070 | 4.048 | 3.917 | 3.939 | 4.068 | 4.025 | 4.049 | #VALUE! | 4.170 | 4.053 | #VALUE! | 4.111 |
| Output | | | | | | | | | | | | | | | | | | | |
| Transit LOS | | D | D | E | D | D | D | D | D | D | D | D | D | D | No Stops | D | D | No Stops | D |

Multimodal Transit LOS Calculation SB - Existing Conditions

| Inputs | | Segments | | | | | | | | | | | | | | | | | |
|---------------------------------------|--|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|----------|-------|-------|
| | | 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 _r | 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) | 2.3 | 2.5 | 2.5 | 2.6 | 2.7 | 2.7 | 2.8 | 2.8 | 2.9 | 3.0 | 3.1 | 3.0 | 2.9 | 2.7 | 2.6 | - | 2.4 | 2.2 |
| 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 | 1.4 | 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) | 28.9 | 26.9 | 25.9 | 25.1 | 25.0 | 24.6 | 23.8 | 23.0 | 22.4 | 21.5 | 21.8 | 22.6 | 23.5 | 24.1 | #VALUE! | 26.2 | 28.3 | 28.3 |
| 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 | 0.54 | 0.54 | 0.55 | 0.55 | 0.55 | 0.55 | 0.56 | 0.56 | 0.56 | 0.56 | 0.57 | 0.57 | 0.56 | 0.56 | 0.56 | #VALUE! | 0.55 | 0.54 |
| S _{w-r} | Transit wait-ride score | 1.50 | 1.52 | 1.53 | 1.54 | 1.54 | 1.54 | 1.56 | 1.56 | 1.57 | 1.58 | 1.59 | 1.59 | 1.57 | 1.56 | 1.55 | #VALUE! | 1.53 | 1.50 |
| 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 _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 |
| l _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 |
| l _t | Transit LOS score | 4.15 | 4.05 | 4.19 | 4.17 | 4.18 | 4.26 | 4.20 | 4.19 | 4.21 | 4.07 | 4.17 | 4.08 | 4.10 | 4.25 | 4.23 | #VALUE! | 4.05 | 4.17 |
| Output | | | | | | | | | | | | | | | | | | | |
| Transit LOS | | D | D | D | D | D | E | D | D | D | D | D | D | D | D | D | No Stops | D | D |

Multimodal Transit LOS Calculation NB - Future 2040 Conditions

| Inputs | Segments | | | | | | | | | | | | | | | | | | |
|---------------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|----------|-------|---------|----------|---|
| | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | NB | |
| TRANSIT OPERATIONS INFORMATION | | | | | | | | | | | | | | | | | | | |
| t _{ex} | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| L _f | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| S | 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 | |
| I _{pt} | 0.44 | 0.45 | 0.56 | 0.56 | 0.54 | 0.54 | 0.60 | 0.56 | 0.54 | 0.54 | 0.52 | 0.51 | 0.50 | - | 0.48 | 0.37 | - | 0.34 | |
| | 1.8 | 1.9 | 2.2 | 2.5 | 2.7 | 2.9 | 3.0 | 3.3 | 3.8 | 4.1 | 3.7 | 3.4 | 3.2 | - | 3.1 | 3.0 | - | 2.5 | |
| | 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 | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| TRANSIT AMENITY DATA | | | | | | | | | | | | | | | | | | | |
| P _{sh} | 100% | 100% | 50% | 0% | 0% | 0% | 0% | 0% | 50% | 50% | 33% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | |
| P _{be} | 100% | 100% | 100% | 100% | 100% | 0% | 100% | 100% | 100% | 50% | 100% | 0% | 100% | 0% | 0% | 100% | 0% | 50% | |
| PEDESTRIAN ENVIRONMENT DATA | | | | | | | | | | | | | | | | | | | |
| W _A | 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} | 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 | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| P _{pk} | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 10% | 90% | 20% | |
| W _{bl} | 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} | 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} | 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 | 512 | 923 | 840 | 753 | 702 | 847 | 941 | 610 | 771 | 566 | 875 | 518 | 521 | 692 | 759 | 477 | 477 | 395 | |
| S _R | 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 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| f _h | 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} | 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} | 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} | 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} | 35.2 | 32.6 | 29.4 | 26.5 | 24.8 | 23.4 | 22.1 | 20.3 | 18.0 | 17.2 | 19.4 | 21.1 | 21.7 | #VALUE! | 22.4 | 22.6 | #VALUE! | 27.7 | |
| T _{btt} | 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} | 0.52 | 0.52 | 0.53 | 0.54 | 0.55 | 0.56 | 0.57 | 0.58 | 0.59 | 0.60 | 0.58 | 0.57 | 0.57 | #VALUE! | 0.56 | 0.56 | #VALUE! | 0.54 | |
| S _{w-r} | 1.45 | 1.46 | 1.49 | 1.52 | 1.54 | 1.56 | 1.58 | 1.61 | 1.66 | 1.68 | 1.63 | 1.60 | 1.59 | #VALUE! | 1.58 | 1.57 | #VALUE! | 1.51 | |
| f _s | 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 | 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} | 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} | 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 | 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 | 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 | 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 | 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 | -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 _D | 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 | |
| | B | D | D | C | C | C | C | C | C | C | C | C | C | D | D | C | A | B | |
| I _t | 4.237 | 4.342 | 4.318 | 4.209 | 4.126 | 4.153 | 4.152 | 4.097 | 3.973 | 3.930 | 4.070 | 4.051 | 4.041 | #VALUE! | 4.187 | 4.066 | #VALUE! | 4.116 | |
| Output | | | | | | | | | | | | | | | | | | | |
| Transit LOS | D | E | E | D | D | D | D | D | D | D | D | D | D | D | No Stops | D | D | No Stops | D |

Multimodal Transit LOS Calculation SB - Future 2040 Conditions

| Inputs | Segment | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|----------|-------|---|
| | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | SB | |
| TRANSIT OPERATIONS INFORMATION | | | | | | | | | | | | | | | | | | | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| t _{ex} | 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 | 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 | 2.3 | 2.5 | 2.5 | 2.6 | 2.7 | 2.7 | 2.8 | 2.8 | 2.9 | 3.0 | 3.1 | 3.0 | 2.9 | 2.7 | 2.6 | - | 2.4 | 2.2 | |
| l _{pt} | 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 | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| TRANSIT AMENITY DATA | | | | | | | | | | | | | | | | | | | |
| P _{sh} | 0% | 0% | 50% | 100% | 0% | 0% | 100% | 0% | 33% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | 0% | |
| P _{be} | 100% | 100% | 100% | 100% | 100% | 0% | 100% | 100% | 33% | 0% | 66% | 0% | 0% | 0% | 100% | 0% | 100% | 0% | |
| PEDESTRIAN ENVIRONMENT DATA | | | | | | | | | | | | | | | | | | | |
| W _A | 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} | 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 | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | |
| P _{pk} | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 10% | 90% | 20% | |
| W _{bl} | 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} | 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} | 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 | 464 | 505 | 791 | 774 | 821 | 1122 | 879 | 761 | 776 | 1080 | 901 | 524 | 434 | 858 | 794 | 686 | 686 | 510 | |
| S _R | 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 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| f _h | 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} | 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 _{ait} | 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} | 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} | 28.9 | 26.9 | 25.9 | 25.1 | 25.0 | 24.6 | 23.8 | 23.8 | 23.0 | 22.4 | 21.5 | 21.8 | 22.6 | 23.5 | 24.1 | #VALUE! | 26.2 | 28.3 | |
| T _{btt} | 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} | 0.54 | 0.54 | 0.55 | 0.55 | 0.55 | 0.55 | 0.56 | 0.56 | 0.56 | 0.56 | 0.57 | 0.57 | 0.56 | 0.56 | 0.56 | #VALUE! | 0.55 | 0.54 | |
| S _{w-r} | 1.50 | 1.52 | 1.53 | 1.54 | 1.54 | 1.54 | 1.56 | 1.56 | 1.57 | 1.58 | 1.59 | 1.59 | 1.57 | 1.56 | 1.55 | #VALUE! | 1.53 | 1.50 | |
| f _s | 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 | 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} | 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} | 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 | 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 | 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 | 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 | 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 | -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 _d | 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 | |
| | C | B | D | D | C | D | D | D | D | C | D | C | C | D | D | C | B | C | |
| I _t | 4.20 | 4.10 | 4.24 | 4.22 | 4.20 | 4.30 | 4.20 | 4.20 | 4.21 | 4.15 | 4.21 | 4.09 | 4.11 | 4.24 | 4.25 | #VALUE! | 4.06 | 4.17 | |
| Output | | | | | | | | | | | | | | | | | | | |
| Transit LOS | D | D | D | D | D | E | D | D | D | D | D | D | D | D | D | E | No Stops | D | D |

APPENDIX D – SIDEWALK OBSTRUCTIONS

APPENDIX D – SIDEWALK OBSTRUCTIONS

| 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. |

| | | | |
|---|-----------------------------|-----|---|
| 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

Table D.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 |

Table D.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.