Norwood Avenue Mobility Project – Alternatives Development Report

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Glossary of Terms

95th Percentile Queue: A queue is a line of vehicles waiting to be served, such as at a traffic signal, that occurs due to demand exceeding the available capacity. The 95th percentile queue is the length of the queue which is exceeded five percent of the time during the analysis time period. The 95th percentile queue is useful in determining the appropriate storage requirements such as length of turn pockets but is not representative of what an average driver would typically experience during their commute.

Accessible Pedestrian Signal Systems (APS): A device that uses audible tones or vibrations to help people with vision or hearing impairments safely cross the street at signalized intersections.

Average Annual Daily Traffic (AADT): The average number of vehicles that travel on a street per day over the course of a year.

Bicycle Detection: Passive traffic signal system that detects the presence of a person bicycling to trigger a green light without requiring the person bicycling to press a button.

Bicycle Level of Traffic Stress (BLTS): A numeric suitability rating (1 = low stress, 4 = high stress) that assesses how safe and comfortable a bike route feels to a person bicycling, accounting for factors like lane separation, width, and traffic speed.

Bike Box: A painted area at a traffic signal that gives people on bicycles a designated and visible space to wait in front of cars during a red light.

Bus Bulb-Out: A sidewalk extension at bus stops allowing buses to load/unload passengers without leaving the travel lane, improving accessibility and reducing dwell time.

Cantilevered Bike Lane: A bike lane built onto the side of a bridge, extending out from the structure to create more space for people biking without removing vehicle lanes.

Channelized Right Turn: A dedicated turning lane at an intersection that separates right-turning traffic from through lanes and allows turning traffic to either bypass or experience different traffic control than the adjacent through traffic. Channelized turn lanes often pose challenges for pedestrians due to higher vehicle speeds.

Class I Shared Use Path : A fully separated shared use path shared by people walking and biking. A Class I shared use path is defined separately from a Class IV bikeway by its width and the requirement that it have wider horizontal separation from vehicle traffic.

Class II Bikeway – Bike Lane and Buffered Bike Lane: A bike lane at street level separated by a painted line (Bike Lane) or a painted or physical buffer space between it and adjacent vehicle travel lanes (Buffered Bike Lane), increasing cyclist comfort and safety.

Class IV Bikeway – Separated Bikeway: A fully separated facility for bicycles, often at sidewalk level and protected by landscaping or physical barriers from vehicle travel lanes.

Conflict Zone: Area where multiple travel modes cross each other and are in conflict. A few examples are where driveways cross sidewalks or bikeways, where bikeways cross with transit vehicles at bus stops, or at intersections where those walking, rolling, or biking cross with vehicle paths.

Controlled Pedestrian Crossings: A designated area for people bicycling, walking, or rolling to cross a street where traffic is controlled (where a traffic signal, stop sign, or yield sign directs driver movement) to allow people a safer opportunity to cross.

Dilemma Zone Detection: A type of traffic signal technology that helps reduce crashes by detecting vehicles approaching an intersection near the end of the signal phase and can adjust timing to reduce the likelihood of a collision if it is likely that a driver would enter the intersection on red.

High Injury Network: Streets or intersections where a high number of severe or fatal crashes have occurred, as identified by the City in its Vision Zero Plan.

Leading Pedestrian Interval (LPI): A traffic signal timing strategy that gives pedestrians a head start to cross the street before vehicles get a green light.

Level of Service (LOS): The LOS is a measure of street performance when compared to user's expectations. Streets are given a "letter grade" of "A" through "F" where "A" represents little to no experienced delay or travel congestion and "F" represents high delay or travel congestion. The calculation of LOS is based on the methodologies as outlined in the Highway Capacity Manual 7th Edition published by the Transportation Research Board. The calculation of LOS varies by the type of facility or intersection being reviewed.

On-Street Parking: Parking of vehicles along the sides of public streets, often in designated spaces marked by painted lines, signs, or meters.

Pedestrian/Walking Level of Traffic Stress (PLTS): A numeric suitability rating (1 = low stress, 4 = high stress) that indicates how safe and comfortable walking conditions are, considering sidewalk width, speed limits, and buffer zones.

Queue: A queue is a line of vehicles waiting to be served, such as at a traffic signal.

Right-of-Way (ROW): Space designated for use by the public for travel. This typically includes the street, landscaping, and sidewalks. The right-of-way includes land which may be owned by the City, other public agencies, utility companies, or private citizens and includes land which has an easement for use by the public for the purposes of travel infrastructure.

Roundabout: A circular intersection, used as an alternative to stop-sign or signal-controlled intersections, designed to improve traffic flow and reduce crash severity by slowing vehicles and eliminating left-turn conflicts.

Sacramento Regional Transit District (SacRT): The Sacramento Regional Transit District operates public transit services and collaborates on transit stop modifications and pedestrian access enhancements.

SacSim-19 Model: A travel demand forecasting tool developed by the Sacramento Area Council of Governments (SACOG) used to simulate and predict future traffic patterns, volumes, and vehicle miles traveled under different development scenarios.

Safety Corridor: A designation street under California Vehicle Code Section 22358.7 which allows local authorities to designate a reduced speed limit from the one that would typically be applied based on an engineering and traffic survey. Safety corridors are designated based on a history of serious injuries and fatalities on a given street. No more than one-fifth of streets may be designated as safety corridors

Sidewalk Scale Lighting: Lower height lighting installed along sidewalks to enhance visibility and safety for people walking, especially at night. It is designed specifically to illuminate the sidewalk rather than the vehicle travel lanes and typically includes shorter poles and may include decorative elements.

Signal Modifications: Upgrades to traffic signals to meet modern standards, including pedestrian countdown timers, improved visibility, and transit signal priority features.

Turn Pocket: Vehicle storage lane at an intersection which does not extend to the previous intersection. Typically used to accommodate turning vehicles at an intersection.

Vehicle Miles Traveled (VMT): A metric representing the total distance driven by all vehicles in a specified area and timeframe, used to evaluate environmental and land use impacts.

Wayfinding: Signage and visual cues placed along transportation routes to guide people to key destinations, like parks, community centers, or transit stops.

Introduction

The purpose of this report is to summarize the initially proposed project alternatives for the Norwood Mobility Project. The following conditions were determined from the existing conditions analysis that the project alternatives are to address:

- There are gaps in the walking infrastructure and most of the existing sidewalks on the corridor are 5’ in width without separation between the sidewalk and the vehicle travel lanes. Community input identified enhancements to the walking infrastructure as a top priority.
- Only a small portion of the corridor has dedicated space for people riding bicycles.
- There is a trend of injury collisions involving people walking and biking, particularly near the Robertson Community Center and in the block between Bell Avenue and Jessie Avenue. The collision trends, field observations, and community input show that people are crossing where infrastructure does not exist to support them and that additional infrastructure is needed.
- There is a trend of broadside collisions at the majority of intersections along the corridor. Rear end crashes, driving at unsafe speeds, and signal violations were mostly concentrated between the I-80 Interchange and Harris Avenue where congestion during commute periods can occur. The most common cited causes of collisions were:
  - Auto right-of-way (violations involve a street user failing to yield the legal right-of-way to another vehicle when required under the California Vehicle Code (CVC), generally by failing to yield when entering a roadway, intersection, or when merging.);
  - Unsafe speed (a street user travelling faster than is safe for street or weather conditions), and;
  - Signal and sign violations (a street user not following the direction provided by a sign or traffic signal).
- All intersections operate at Level of Service (LOS) C or better during peak hours, but some locations have turn movement queues which extend beyond the available turn pockets. Related to this, travel times along the corridor are highly variable, primarily driven by operations at the I-80 interchange especially during commute periods. Outside commute periods, travel times along the corridor are consistent and uncongested.
- There is limited right of way (ROW) throughout the corridor for modifications. Generally, the corridor varies between 48 and 78 feet in width with limited to no space to widen the paved street without impacting the use of adjacent properties. There is no room to modify the street on the bridge over I-80 without widening the structure.

From these findings, the following priorities were considered when developing project alternatives:

- Improve walking infrastructure including the addition of striped and signal-protected crossing opportunities, wherever feasible.
- Create low stress facilities that improve safety for people biking, walking, and rolling.
- Improve corridor safety, particularly between Jessie Avenue and Bell Avenue and between Silver Eagle Road and Harris Avenue.
- Create low stress, accessible travel paths for people biking, walking, and rolling to reach transit
- Ensure project implementation does not negatively impact the operations and values of any private properties along Norwood Avenue.

The city currently has an Intelligent Transportation System (ITS) project underway for the Norwood corridor. The project would upgrade traffic signal controllers and communications by replacing existing end-of-life equipment and outdated communication systems with fiber optic cable-based systems, network switches, new cabinets and controllers, and traffic monitoring cameras. The project would also provide significant multi-modal safety benefits with updated vehicle and bicycle detection, adding yellow reflective border signal heads, pedestrian countdown signal heads, and accessible pedestrian signal push buttons.

The remainder of this report describes several alternatives for consideration for the Norwood Mobility Project. All alternatives contained herein are draft concepts and subject to change based on input from the community and project partners.

Feasibility Analysis Methodology

To determine the feasibility of each proposed alternative, several forms of analysis were conducted. This analysis includes:

- Travel Demand Forecasting
- Right-Of-Way Assessment
- Walking Level of Traffic Stress Analysis
- Bicycle Level of Traffic Stress Analysis
- Traffic Operations Analysis
- Safety Benefit Assessment
- Transit Assessment

The analysis methodology for each of these assessments is described in further detail in the following sections.

Travel Demand Forecasting

A modified version of the SACOG SacSim-19 Travel Demand Model was used to develop future year vehicle travel demand along Norwood Avenue. This model is consistent with the modeling used for the City's 2040 General Plan Update with only minor revisions made in the vicinity of the study area to better reflect local streets which are part of the project. The model is generally only sensitive to major changes in street design which affect either vehicle capacity or transit capacity. For this reason, changes in future vehicle demand for Norwood Avenue are only shown when the number of vehicle travel lanes is changed in an alternative.

The travel demand model was used to develop future year AADT and future year vehicle turning movement demand. Model outputs for AADT and vehicle turning movement demand were adjusted using the post processing methodology described in the National Cooperative Highway Research Program Report 765 (NCHRP-765) Analytical Travel Forecasting Approaches for Project-Level Planning and Design.

Estimates for VMT were derived from the travel demand model and made in accordance with the California Environmental Quality Act (CEQA) as updated by California Senate Bill 743 (SB 743) based on the Guidelines published by the Natural Resources Agency. VMT is a systemic metric and is a useful indicator of overall land use and transportation efficiency, where the most efficient system is one that minimizes VMT by encouraging shorter vehicle trip lengths, more walking and biking, or increased carpooling and transit. VMT is not a good indicator of congestion nor is it useful for identifying hot-spot locations or infrastructure deficiencies. Measuring VMT requires estimating or measuring the full length of vehicle trips by purpose, such as commutes, deliveries, or shopping trips that often cross between cities, counties, or states. For this reason, regional travel demand models, "big data," and household travel surveys that are less limited by local agency boundaries are the preferred tools to estimate VMT under SB 743. VMT is reported by travel speed for all vehicles on all streets within the region for each alternative.

Right-of-Way Assessment

The existing right-of-way was measured on publicly available aerial imagery at multiple points along Norwood Avenue to determine the smallest common cross section, from back of sidewalk to back of sidewalk, along the corridor. From this analysis, it was determined that there is generally 72 feet or more of current right-of-way along Norwood Avenue. The exceptions to this are:

- The bridge structure over I-80 (Where Caltrans requires additional lane width between vehicle travel lanes and sidewalks);
- The southern end of the corridor south of Fairbanks Avenue (55 feet), and;
- The Northern end of the corridor north of Berthoud Street (66 feet).

For the bridge over I-80, the plan alternatives specifically avoid making recommendations for changing the allocation of right-of-way as there are limited options available without needing to widen the bridge structure. At the southern end of the corridor, the plan alternatives do not propose any changes, as this section is already two vehicle travel lanes with a Class II bikeway in each direction and seven-foot sidewalks. At the north end of the corridor, the plan alternatives continue with their standard cross sections as there are undeveloped and soon to be developed parcels fronting Norwood Avenue which can implement the plan improvements when they move forward with construction.

Level of Traffic Stress Analysis

Bicycling LTS

The bicycling LTS analysis was calculated using the methodologies describe in the Mineta Transportation Institute Report 11-19 Low Stress Bicycling and Network Connectivity (2012). Bicycling LTS scores quantify the stress level of a street segment through a variety of criteria such as street width (number of lanes), speed limit and/or prevailing speed, presence and width of bike lanes, signals, and presence and width of parking lanes. Bicycle LTS is given a score of 1 through 4, with 1 being the most comfortable and 4 being the least comfortable for people bicycling. Typically, a LTS score of 1 indicates that the stress level of a street is suitable for most people bicycling regardless of skill such as children, while an LTS of 4 indicates that the stress level is better suited for more skilled bicyclists, as shown in **Figure 1**.

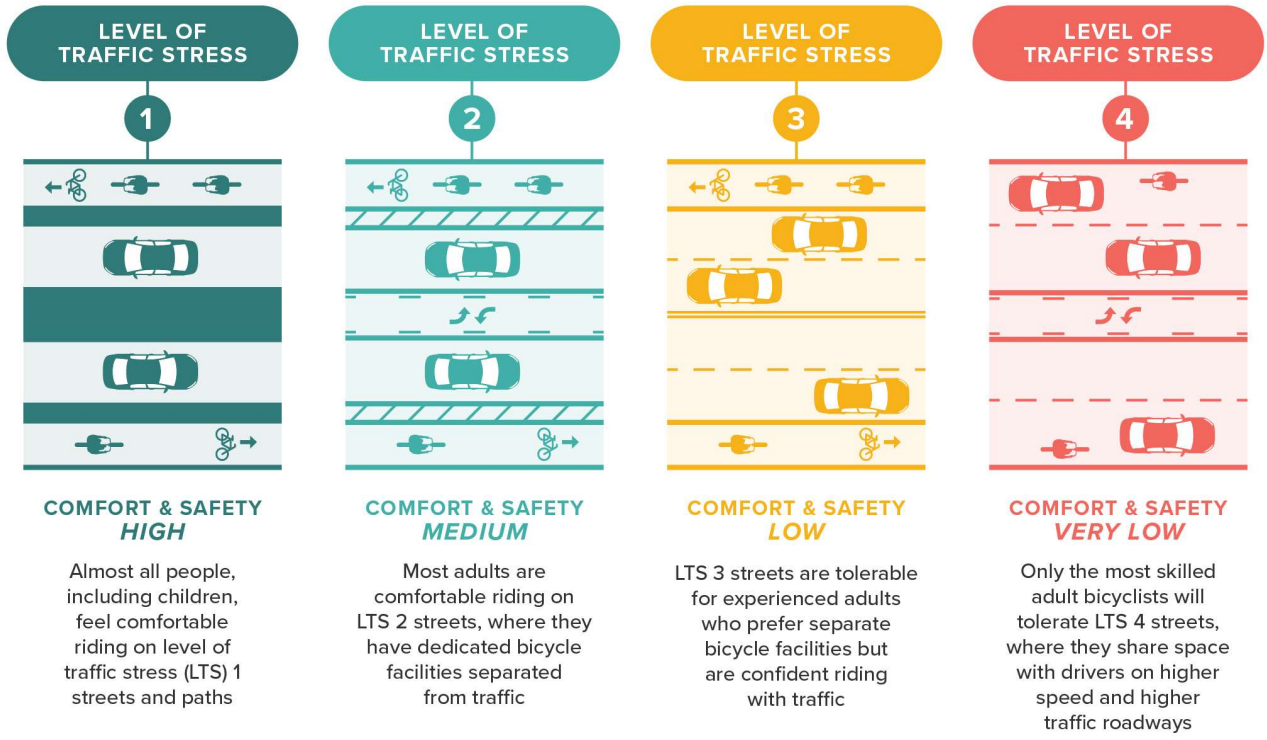

Figure 1. Bicycle Level of Traffic Stress Scores

Walking LTS

The walking level of traffic stress (LTS) analysis was done using the Oregon Department of Transportation (ODOT) Level of Traffic Stress Analysis Procedures (2020). Similar to bicycling LTS methodology, walking LTS also undergoes several criteria to develop a LTS score of 1 through 4 including the presence of sidewalks, crosswalks, median refuges, traffic volume, and current speed limits as shown in **Figure 2**.

Figure 2. Walking Level of Traffic Stress

Traffic Operations Analysis

The study intersections were analyzed using the Synchro 12 software package for signalized intersections and Sidra 9.1 software package for roundabouts. Each study intersection was evaluated for operational performance during typical weekday AM and PM peak hour operations. Key performance metrics include average vehicle delay, intersection LOS[1], and 95th percentile queue.

The delay and LOS analysis is based on the latest version of the Transportation Research Board Highway Capacity Manual (HCM) methodology. This methodology assigns an LOS grade to intersection operations based on the average vehicle control delay, ranging from LOS A (free flow) to LOS F (most congested conditions). **Table 1** documents the LOS criteria for signalized intersections and roundabouts. The latest version of the Synchro analysis software was used to report the 95th percentile queue lengths for approach lanes to signalized study intersections. Sidra 9.1 was used to perform this same analysis for study roundabouts.

[1] A Level of Service (LOS) analysis refers to the quantifiable assessment of traffic under various scenarios.

Table 1: Level of Service Criteria Definitions

Level of Service	Description	Signalized Intersection (Delay in Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤10.0
B	Operations with very low delay occurring with good progression and/or short cycle lengths.	>10.0 to 20.0
C	Operations with very average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	>20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	>35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and V/C ratios. Individual cycle failures are frequent occurrences.	>55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	>80.0

Source: Highway Capacity Manual, 7th Edition

Safety Assessment

Each alternative was qualitatively reviewed for improvements which directly affect collision trends which were identified in the Existing Conditions Report. This includes looking at elements which reduce travel speeds, reduce potential conflicts between vehicles or between vehicles and those walking, biking, or rolling, or better alert people to these potential conflicts. As this project is still in the planning phase, there is not sufficient design data at this time in the project alternatives to quantify collision reductions associated with the proposed improvements.

Transit Assessment

Each alternative was qualitatively reviewed for its compatibility with future transit enhancements. Sacramento Regional Transit (SacRT) owns, operates, and maintains

transit facilities and services along Norwood Avenue and has identified planned and desired improvements to stops along the corridor in their 2023 Bus Stop Improvement Plan. The Norwood Mobility Project is supportive of these proposed improvements and the transit assessment of each alternative will identify if the project option meets or exceeds the planned improvements from SacRT

Community Priority Alignment

Based on community feedback from the Community Advisory Committee, during the in-person and virtual community workshops, and from the project website, the following community priorities for the project were identified:

- Improve corridor safety, particularly between Jessie Avenue and Bell Avenue, and between Silver Eagle Road and Harris Avenue
- Improve walking infrastructure, including the addition of signal-protected crossing opportunities, wherever feasible
- Create low-stress facilities that improve safety and comfort for people walking, rolling, and bicycling to reach transit
- Create low-stress facilities that improve safety and comfort for people biking

Each alternative will be qualitatively evaluated for alignment with these priorities.

Alternatives Evaluation

Common Elements for All Alternatives

This section lists the common elements that are proposed for all alternatives. The project elements in this section are compatible with all of the major project alternatives and have major safety and functionality benefits without affecting the corridor's vehicle operating capacity.

Remove On-Street Parking between Jessie Avenue and Bell Avenue

Norwood Avenue is one of the few arterial streets in Sacramento, outside of the Central City, that has on-street parking. This condition does not align with current City standards. Over the past five years, collision trends have shown more collisions in this segment with on-street parking compared to the rest of the corridor. Many of these collisions involve people walking or biking. From site observations, people frequently cross the street in this section outside of designated crossing locations, after parking their vehicle. The parked vehicles create sight distance issues for drivers to see these people crossing, particularly in this section where the driver is not alerted to be searching for people crossing the

street. Similarly, there are no bike lanes in this section and bicyclists frequently have to avoid the door zone of parked vehicles by shifting into the path of vehicles traveling at 35 miles per hour.

Install Sidewalks

There are two locations that lack sidewalks along Norwood Avenue. One is on the west side of the street from approximately Berthoud Street to Grace Avenue. In this section, there is an informal asphalt path which is overgrown in places and shows cracking and degradation. The second gap is on the east side of the street from Grace Avenue to Main Avenue. The northern portion of this gap will be constructed by planned housing development in the near future. The Norwood Mobility Project ensures that the corridor has sidewalks along the entire corridor.

Signalize Channelized Right Turns at the I-80 Interchange

Interchanges generally pose a challenge to people walking or biking to cross. At the I-80/Norwood Avenue Interchange there is no dedicated space for people or bicycling and people walking are required to cross channelized uncontrolled right-turn movements at both intersections where people driving enter and exit the freeway. Three out of four of these crossings are currently unmarked (no crosswalk) which creates a higher stress environment for those walking to cross the vehicle lane. Additionally, the lack of marked crosswalks reduces visibility and awareness of someone walking to cross their path. Current Caltrans and City standards support signalizing. Converting the sweeping right turn to an appropriately designed slip lane, with a straight approach, with a pedestrian and bike crossing perpendicular to the lane, placed before the vehicles turning movement, increases driver focus and attention on persons crossing the lane, which can reduce conflicts. It also improves the ability to signalize the approach.

Signalize Midblock Pedestrian Crossings

From both anecdotal evidence during the community workshops and observation during the project site walk, people who walk along Norwood Avenue are looking for additional protected crossing opportunities. People regularly cross Norwood Avenue at unmarked locations which has contributed to a concentration of collisions between Jessie Avenue and Bell Avenue and between Silver Eagle Road and Morey Avenue. There is approximately 1,200 feet and 1,600 feet between signalized crossing opportunities in these two cases respectively. Based on observations and collision data, it is recommended that a signalized crossing be added near the north end of the Robertson Community Center, and another be added near the north end of the Norwood Center shopping plaza. SacRT also identified the need for a pedestrian crossing at Kesner Avenue in their 2023 Bus Stop Improvement Plan to enhance access to transit.

Shorten Pedestrian Crossing Distances

For all alternatives, it is recommended that the project try to achieve the shortest crossing distance feasible to reduce pedestrian exposure to traffic. Reducing lane widths and adding intersection curb extensions are a few ways this may be achieved. Curb extension additionally helps the person walking be more visible and helps drivers determine that the person walking is committed to that crossing, improving the driver's recognition of the person intending to cross.

Modify Signal Operations

For all alternatives, it is recommended that the traffic signals be brought up to current City standards. This process has already started with upgrades at Bell Avenue and Silver Eagle Road. Upgrades at a minimum should include retro-reflective back plates for signal heads, advanced dilemma zone detection, accessible pedestrian signal upgrades, leading pedestrian interval signal timing per city policies and guidelines, curb ramp upgrades to current standards, and crosswalk restriping for high visibility. Consideration should also be given to implementing transit signal priority, especially for alternatives which reallocate ROW away from vehicle travel lanes.

Implement Bus Stop Infrastructure and Stop Amenities

SacRT completed their Bus Stop Improvement Plan in February 2023 which identified several stops along Norwood Avenue for enhancements, including:

- SB Norwood Avenue north of Jessie Street – construct a new concrete pad behind the sidewalk and add a transit shelter and bench
- NB Norwood Avenue north of Jessie Street – construct a new concrete pad behind the sidewalk
- NB Norwood Avenue north of Morrison Avenue – construct a new concrete pad behind the sidewalk with a retaining wall
- NB Norwood Avenue south of Lindsay Avenue – construct a new concrete pad behind the sidewalk and add a transit shelter and bench
- SB Norwood Avenue south of Grand Avenue – construct a new concrete pad behind the sidewalk and add a transit shelter and bench
- NB Norwood Avenue north of Kesner Avenue – construct a new concrete pad behind the sidewalk with a retaining wall
- NB Norwood Avenue north of Hayes Avenue – construct a new concrete pad behind the sidewalk with retaining curbs and add a transit shelter and bench
- SB Norwood Avenue north of Silver Eagle Road (Robertson Community Center) – construct a new concrete pad behind the sidewalk with retaining curbs and add a transit shelter and bench

- SB Norwood Avenue north of Carroll Avenue – construct a new concrete pad behind the sidewalk with a retaining wall
- NB Norwood Avenue north of Carroll Avenue – construct a new concrete pad behind the sidewalk with a retaining wall

The Norwood Mobility Project is an opportunity for the City to support these SacRT efforts.

Reduce Posted Speed Limits

Assembly Bills 43 and 1938 updated the California Vehicle Code to allow for a five mile per hour reduction of posted speed limits below what would be recommended based on 85th percentile observed speeds on streets that are designated as Safety Corridors or on streets adjacent to land uses that generate a high number of people walking or biking. Only one speed limit reduction is allowed to be applied on each street. Norwood Avenue is eligible to be designated as a Safety Corridor. Norwood Avenue is also eligible to be designated as a high activity walking or biking corridor based on local land use patterns if it is not designated as a Safety Corridor. Streets in front of and up to ¼ mile from schools, public parks, houses of worship, community centers, and other facilities which encourage walking or biking may be designated as high walking and biking activity areas. Enough of these uses exist along Norwood Avenue that virtually all of the study area is within ¼ mile of one of these land uses.

Provide Additional Storage Lanes for the I-80 Westbound On-Ramp

The City should coordinate with Caltrans to add a second queue storage lane to the I-80 Westbound On-Ramp before the ramp meter. Currently it is the only ramp of four at this interchange which does not have two lanes of travel. The current design provides approximately 550 feet of storage between the ramp meter and Norwood Avenue. Based on vehicle speed and travel time data collected for Norwood Avenue, travel times on the corridor are highly variable and appear to be tied in part to queues at this on-ramp during peak hours. The additional lane could be designed as a high occupancy vehicle preference lane or a standard storage lane and would require additional operational study beyond this plan to determine the specifics of its design. This is not a currently planned Caltrans project and is outside of the City's jurisdiction. This modification would require coordination between the City and Caltrans.

Add Wayfinding for People Walking and Biking

Installation of wayfinding signs placed at key locations along the corridor such as bus stops and high-volume areas will direct people to popular destinations, such as the community center, shopping opportunities, and the Sacramento Northern Parkway shared use path.

Alternative 1

Description

The majority of items included in Alternative 1 are consistent across all alternatives and presented in the previous section. This alternative is the only one that does not propose a right-of-way reallocation on Norwood Avenue. Elements unique to this alternative include:

Widen Sidewalks

Norwood Avenue is generally not wide enough to include standard bikeways without reducing the number of vehicle travel lanes. City Ordinance 10.76.010[2] allows people to bicycle on sidewalk under certain requirements. In lieu of providing on-street bicycle infrastructure, this alternative widens the sidewalk on the west side of the street to allow people bicycling, walking, and rolling to navigate potential conflicts between users.

Figure 3 shows the general cross section proposed for this alternative. **Figure 4** shows a representative map view of Norwood Avenue and where improvements would be applied.

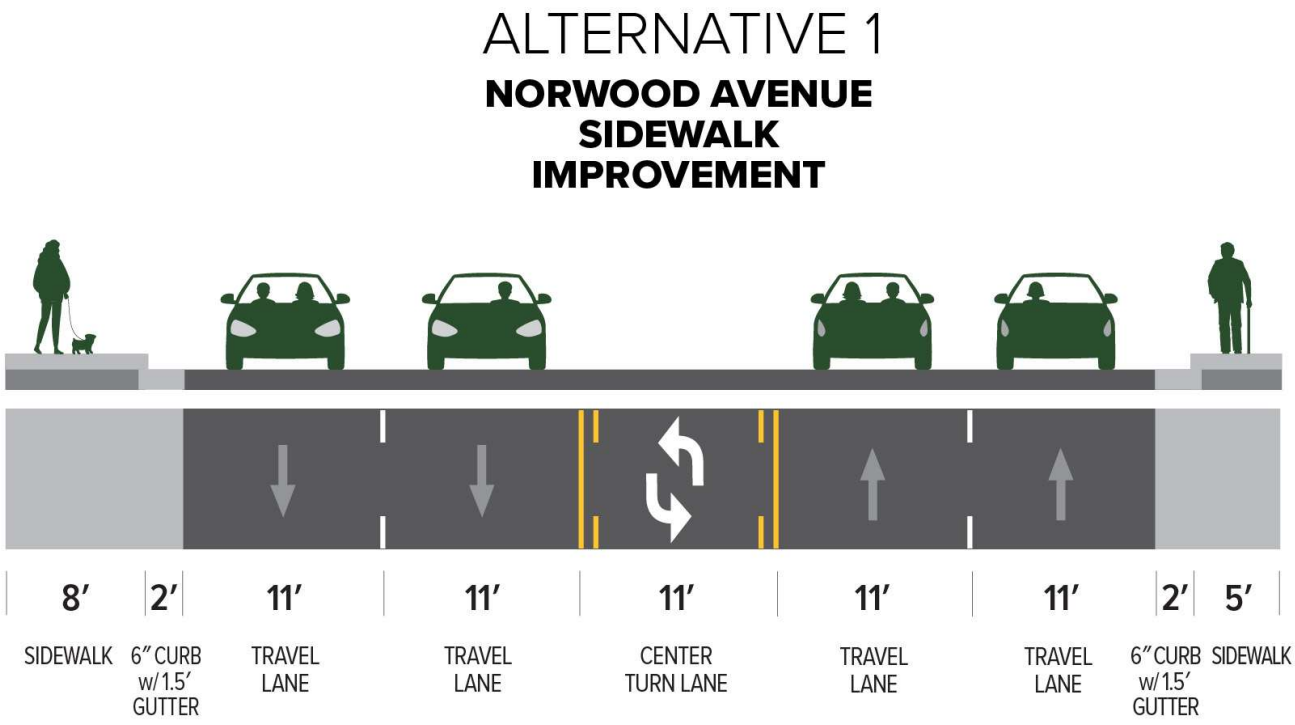

Figure 3: Alternative 1 Cross-Section

[2] City of Sacramento Ordinance 10.76.010

Figure 4: Alternative 1 Plan View of Proposed Improvements

Feasibility Analysis

Travel Demand Forecasting

Based on the SacSim-19 travel demand model as modified for the City of Sacramento 2040 General Plan Update, future volumes on Norwood Avenue range between 19,000 and 41,000 AADT for Alternative 1. The highest volumes are on the segment between Jessie Avenue and Harris Avenue. These volumes drop to the 26,000-30,000 AADT range between Jessie Avenue and Bell Avenue and between Harris Avenue and Grand Avenue. North of Bell Avenue and south of Grand Avenue, volumes drop to the 19,000-22,000 AADT range. The Travel demand model was also used to forecast future turning movement demand volumes at study intersection along the corridor. These volumes are shown in **Figure 5**. Because Alternative 1 does not change the vehicle capacity of Norwood Avenue, no net change in future VMT is expected.

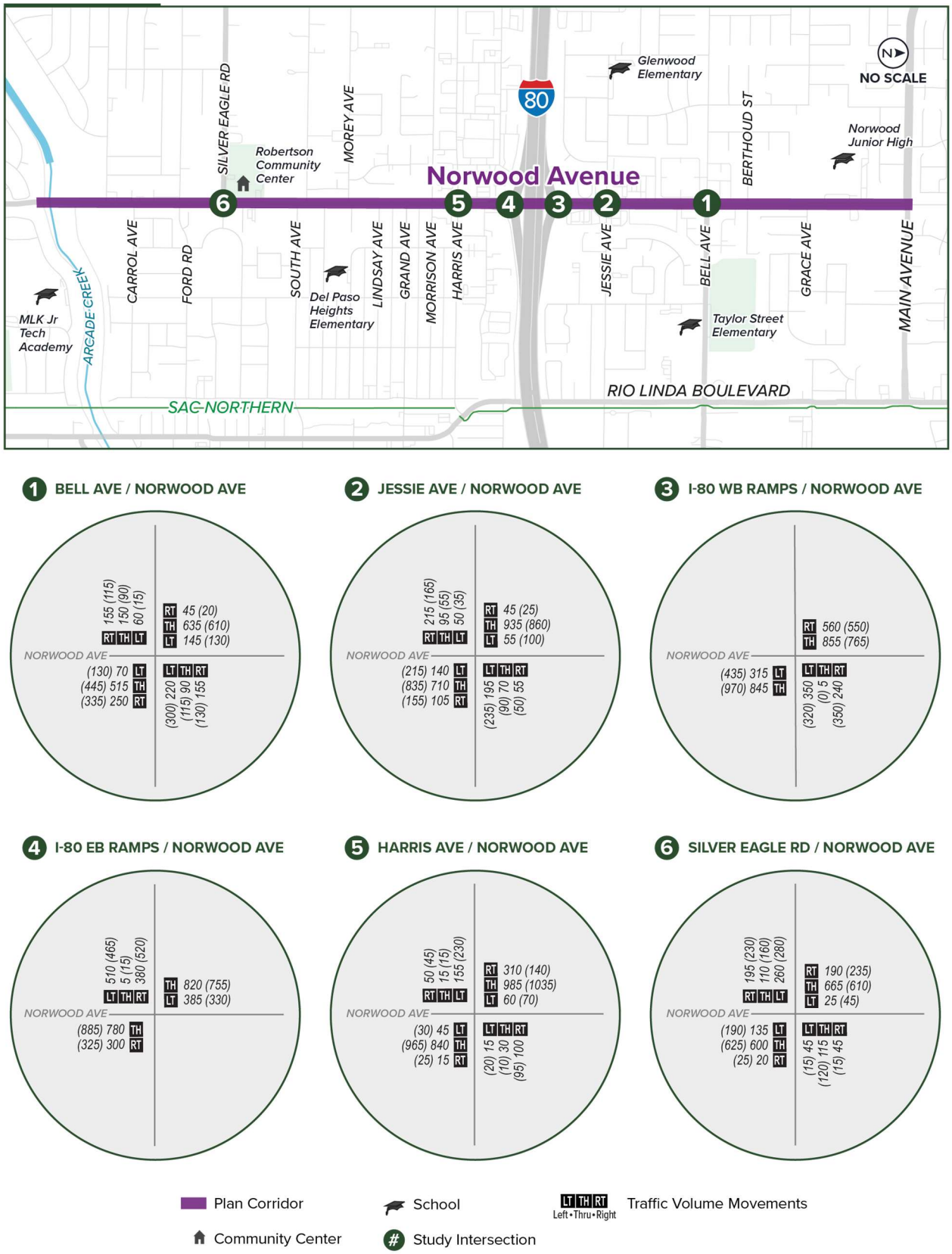

Figure 5: Future (2045) Turning Movement Volumes Alternative 1

Level of Traffic Stress Analysis

The focus of Alternative 1 is to provide some improvements for those walking, biking, and rolling without significantly altering the vehicle capacity of Norwood Avenue. This alternative adds new crossing opportunities and widens the sidewalk on the west side of Norwood Avenue, but the improvements made do not significantly alter the walking and biking environment. **Table 2** and **Table 3** show the evaluation of the walking and biking level of traffic stress. **Figure 6** and **Figure 7** show the results of this evaluation in a map form.

Table 2: Analysis of Pedestrian Level of Traffic Stress –Alternative 1

	Main Avenue to Bell Avenue	Bell Avenue to I-80 WB Ramps	I-80 EB Ramps to Fairbanks Avenue	Fairbank Avenue to Arcade Creek
Street Width (Through Lanes per Direction)	2	2	2	1
Buffer Type	None	None	None	None
Total Buffer Width (Ft)	0	0	0	0
Sidewalk Width (Ft)	5ft	5ft	5ft	5ft
Speed Limit Or Prevailing Speed[A] (MPH)	30	30	30	25
Existing PLTS Score[B]	4	4	4	3
Alternative 1 PLTS Score	3	3	3	2

Source: DKS Associates, 2025. ODOT Level of Traffic Stress Analysis Procedures.

A Alternative 1 recommends speed limit reductions throughout the corridor. This analysis was conducted under the assumption that existing speed limits have been reduced by 5 mph.

B Existing PLTS has variability in score for each segment as the analysis was done bi-directional. The Existing PLTS Score included in Table 4 is the highest existing score per segment for purposes of this analysis.

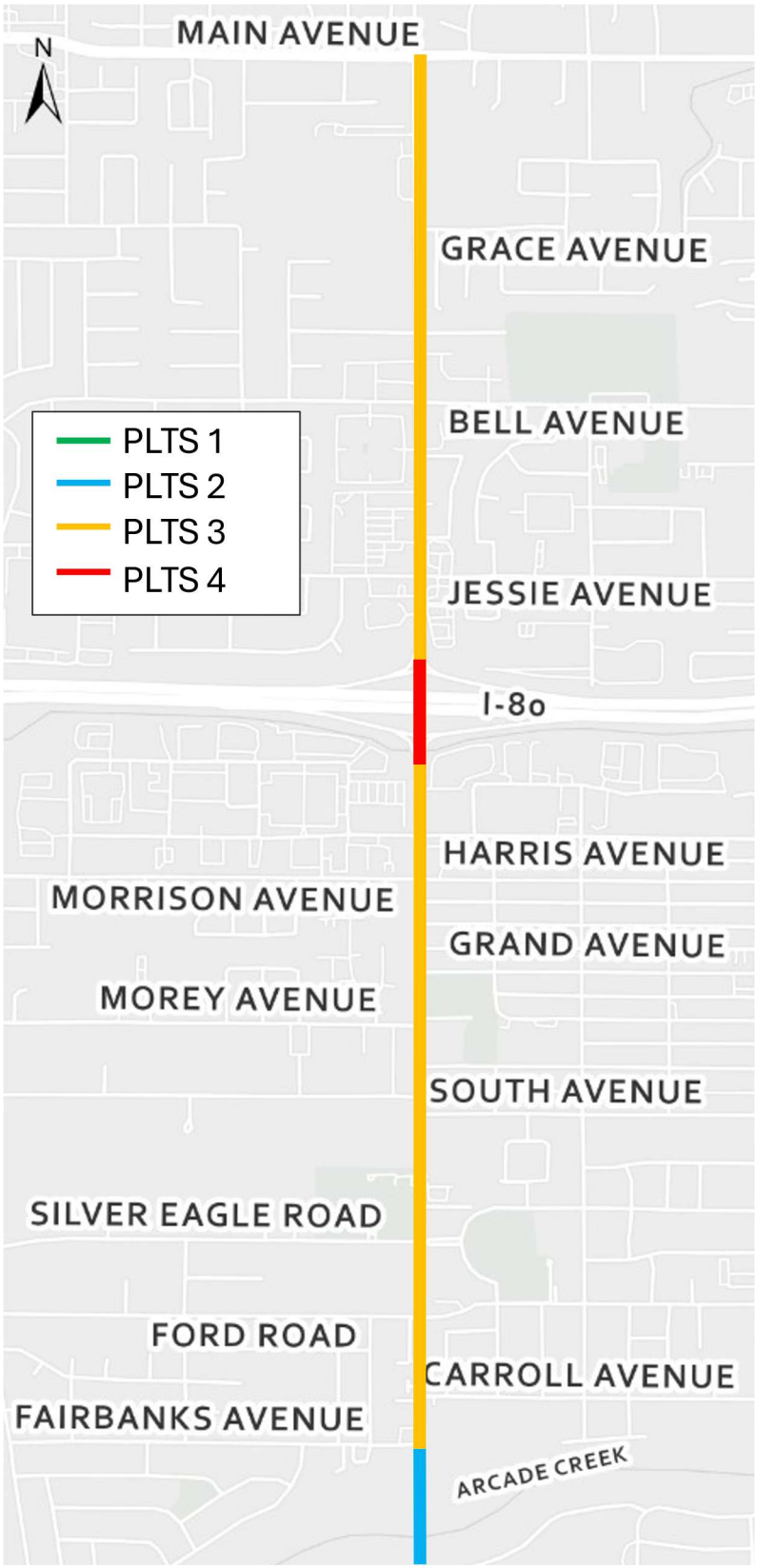

Figure 6: Walking Level of Traffic Stress – Alternative 1

Table 3. Analysis of Bicycle Level of Traffic Stress – Alternative1

	Main Avenue to Bell Avenue	Bell Avenue to I-80 EB Ramps	I-80 EB Ramps to Fairbanks Avenue	Fairbanks Avenue to Arcade Creek
Street Width (Through Lanes per Direction)	2	2	2	1
Bike Lane Width (Inc. Bike Lane, Buffer Width, Gutter) (Ft)	0	0	0	5
Speed Limit or Prevailing Speed[A] (MPH)	30	30	30	25
Physically Separated Bike Lane?	No	No	No	No
Existing BLTS Score[B]	4	4	4	3
Alternative 1 BLTS Score	3	3	3	2

Source: DKS Associates, 2025. Mineta Transportation Institute, Low Stress Bicycling and Network Connectivity.

A Alternative 1 recommends speed limit reductions throughout the corridor. This analysis was conducted under the assumption that existing speed limits have been reduced by 5 mph.

B Existing BLTS has variability in score for Segment 3 and Segment 4 as the analysis was done bi-directional. The Existing BLTS Score included in Table 7 is the highest existing score per segment for the purpose of this analysis.

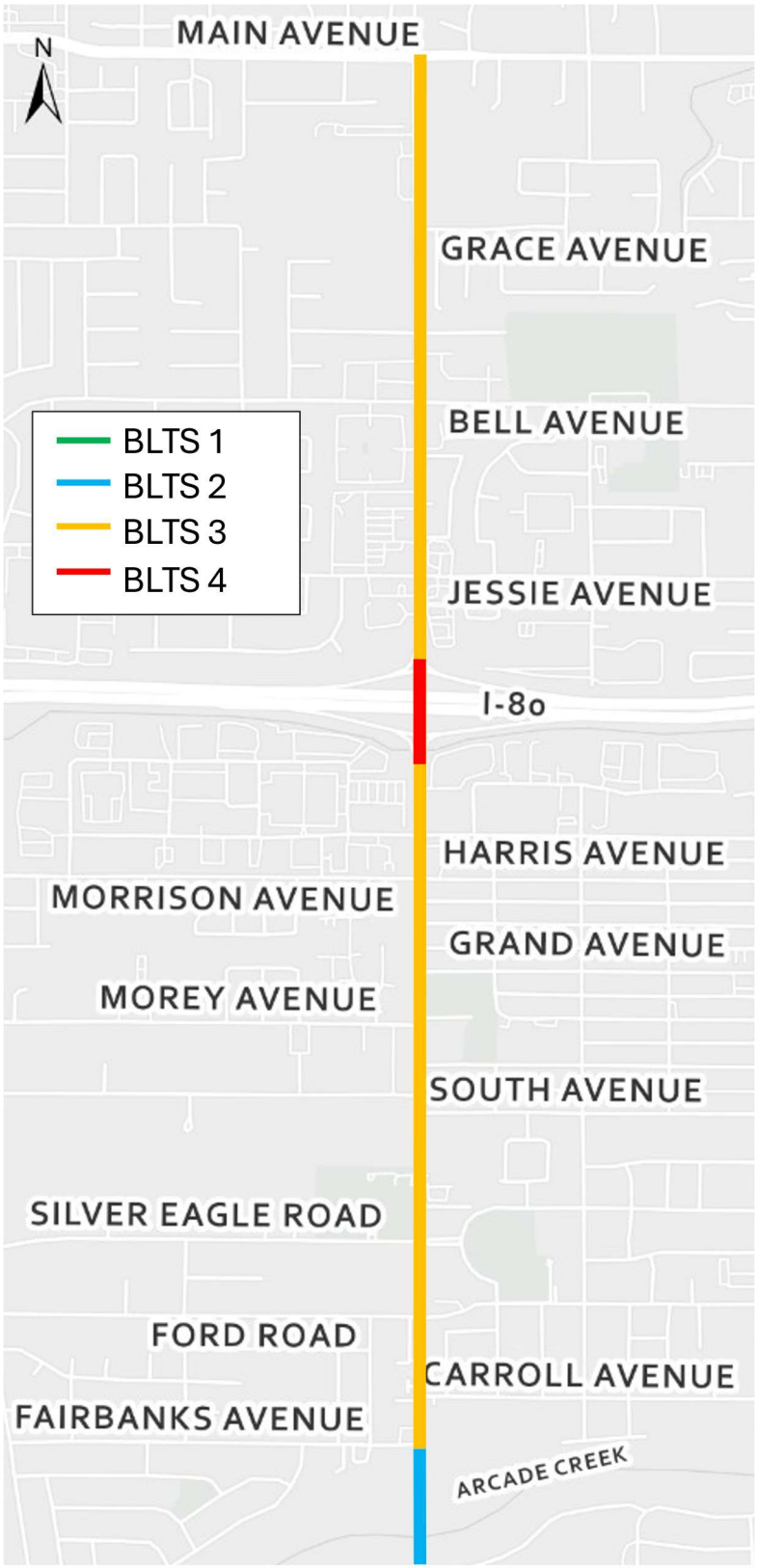

Figure 7: Bicycle Level of Traffic Stress – Alternative 1

Traffic Operations Analysis

The analysis for Alternative 1 assumed minimal changes from the current operating conditions along the corridor. Signal timing adjustments were made in relation to the proposed improvements and to accommodate higher traffic volumes associated with future growth. All signals were assumed to operate without coordination, but signal coordination would likely improve operations from the results shown. Table 4 shows a comparison of anticipated future intersection delays compared to existing operations.

95th percentile queues were also evaluated for Alternative 1. The AM and PM peak hour queues are shown in Figure 8 and Figure 9 respectively. In these figures, lines are shown on each approach to the intersection representing the queue for the left turn lane (if one exists), the through movements, and the right turn lane (if one exists). These queues are generally color coded as green if they are less than the available vehicle storage, yellow if they are at or near the available vehicle storage, and red if they exceed the available vehicle storage or block access to adjacent lanes. Note that 95th percentile queues represent the longest queue that is likely to be observed during the peak hour and most queues would be shorter. From this analysis, the key finding is that queues are longest at the intersections which comprise the I-80 interchange. There are other locations where queues exceed their available storage along Norwood Avenue, but in most cases it is due to short formal turn pockets being blocked by through movement queues.

Table 4: Future (2045) Alternative 1 Intersection Operational Analysis Results

Intersection	AM Peak Hour [A]		PM Peak Hour [A]	
	Existing	Future	Existing	Future
1. Norwood Avenue / Bell Avenue	20.6 (C)	23.9 (C)	17.6 (B)	23.7 (C)
2. Norwood Avenue / Jessie Avenue	28.2 (C)	29.3 (C)	23.8 (C)	30.7 (C)
3. Norwood Avenue / WB 80 Ramps	10.9 (B)	13.6 (B)	10.3 (B)	16.0 (B)
4. Norwood Avenue / EB 80 Ramps	12.0 (B)	16.3 (B)	12.0 (B)	16.0 (B)
5. Norwood Avenue / Harris Avenue	19.7 (B)	25.8 (C)	19.2 (B)	24.4 (C)
Norwood Avenue / Morey Avenue[B]	-	22.1 (C)	-	9.7 (A)
6. Norwood Avenue / Silver Eagle Road	18.6 (B)	11.4 (B)	18.2 (B)	23.1 (C)

Source: DKS Associates, March 2025.

Notes:

A. 20.6 (C) = Delay (LOS)

B. Not a study intersection, provided for informational purposes because of recommended control modifications

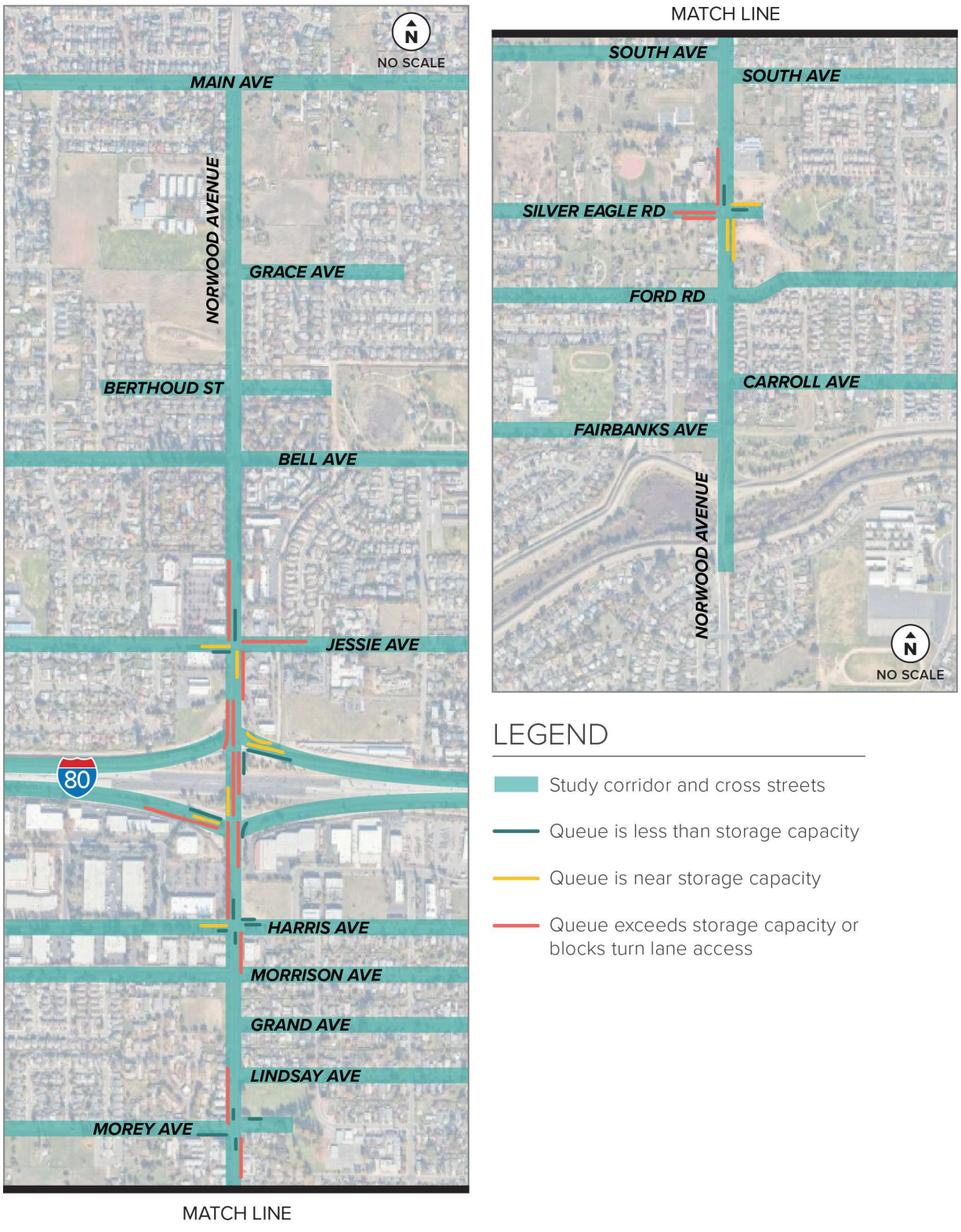

Figure 8: Future (2045) AM Peak Hour 95th Percentile Intersection Queues Alternative 1

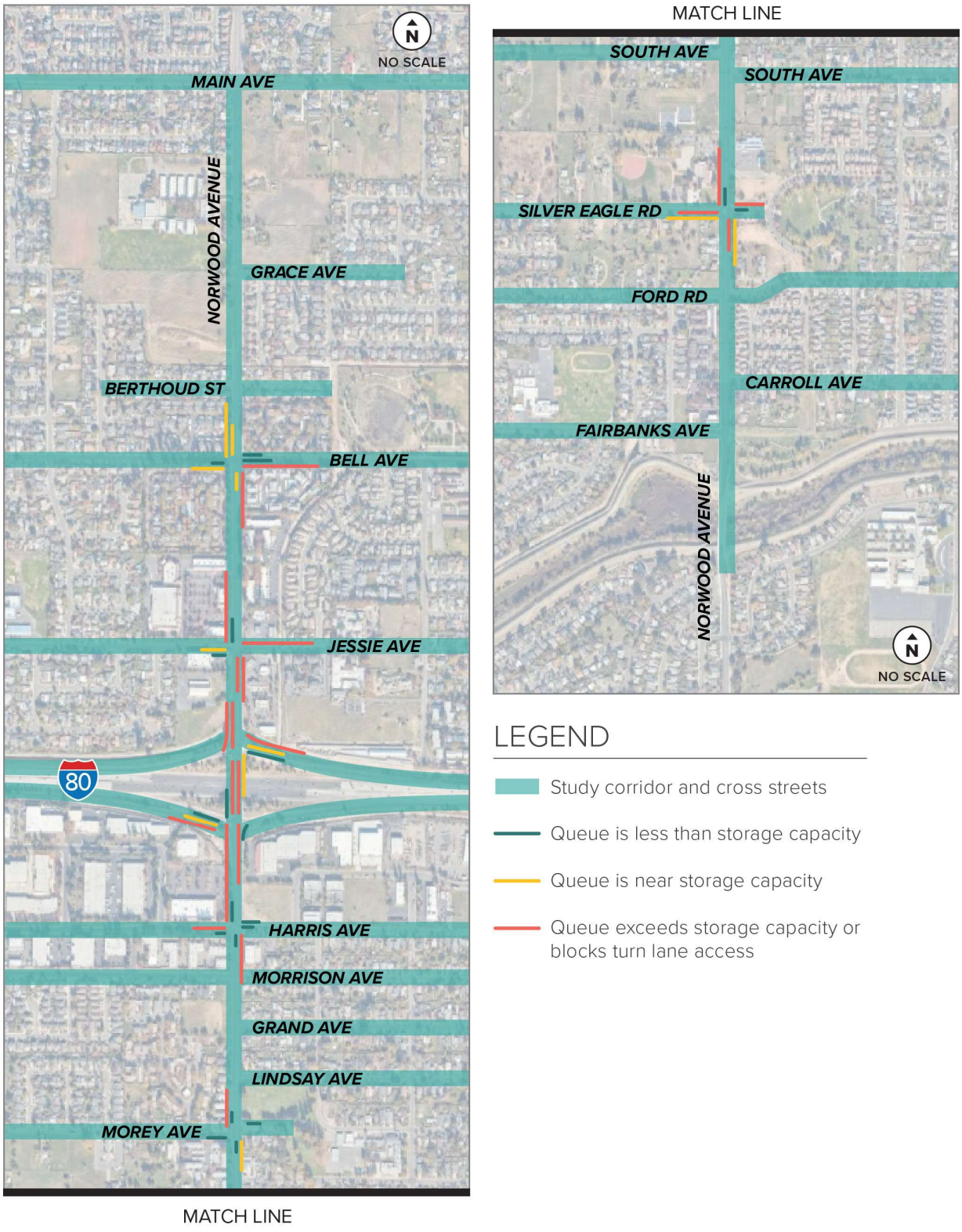

Figure 9: Future (2045) PM Peak Hour 95th Percentile Intersection Queues Alternative 1

Safety Benefit Assessment

Alternative 1 addresses some of the corridor-wide safety concerns by reducing the speed limit, removing on-street parking between Bell Avenue and Jesse Avenue, adding additional controlled crossing locations, and improving visibility of signals. An additional metered lane on the WB I-80 on-ramp would also help address congestion-based crashes. These safety upgrades come from elements common across all alternatives and are not unique to Alternative 1.

Transit Assessment

Alternative 1 provides only minimal potential benefits for transit operations. This alternative would provide the least amount of improvement by supporting stop enhancements identified by SacRT and closing sidewalk gaps. The wider sidewalk on the west side of the street would provide some additional waiting area for transit stops used by people traveling in the southbound direction.

Community Priority Alignment

Alternative 1 improves corridor safety by removing on-street parking between Jessie Avenue and Bell Avenue and by reducing speed limits along the corridor. It also includes the addition of three new marked and signalized pedestrian crosswalks and signalizes pedestrian crossings at the freeway ramps. Alternative 1, while reducing the level of traffic stress slightly for people walking and biking by reducing traffic speeds, still does not provide any low stress segments or connections to transit.

Alternative 2

Description

Alternative 2 proposes installing a Class IV separated bikeway along Norwood Avenue by reallocating space from one of the vehicle travel lanes in each direction. There are multiple ways in which this alternative can be achieved and thus three sub alternatives (2A, 2B, and 2C) are included under Alternative 2. The primary way these sub alternatives are differentiated is in how they place the separated bikeway within the proposed cross section. The proposed cross sections for Alternatives 2A, 2B, and 2C are shown in **Figure 10**, **Figure 11**, and **Figure 12** respectively. All other elements in the alternative description are shared between the three sub-alternatives. **Figure 4** shows a representative map view of Norwood Avenue and where improvements would be applied for Alternative 2. The elements in this alternative include:

Reallocate Street Space from Driving to Walking and Bicycling: Fairbanks Avenue to Grand Avenue and from Bell Avenue to Grace Avenue

In order to create space for walking and bicycling enhancements along the lower volume segments of the corridor, the number of vehicle travel lanes would be reduced from two per direction with a center turn lane to one per direction with a center turn lane. Sections south of Fairbanks Avenue and north of Grace Avenue would maintain their current cross-sections. The section between Harris Avenue to Jessie Avenue would be maintained as two lanes per direction to provide capacity for higher car and truck volumes and demands at the I-80 Interchange.

Install Roundabouts at Silver Eagle Road, Morey Avenue, and Bell Avenue

A single lane roundabout at Silver Eagle Road and at Morey Avenue would slow traffic in the vicinity of the Robertson Community Center and two nearby parks.

A single lane roundabout at Morey Avenue would also provide a direct path for people wanting to cross the street at Morey Avenue, which is currently an offset intersection with a marked crossing in the middle of the intersection.

A single lane roundabout at Bell Avenue would slow southbound vehicles as they approach the higher residential density and commercial portion of the corridor. It would also reduce conflict points at this high crash location.

All three roundabout locations have undergone a preliminary review for right-of-way requirements to install a single lane roundabout, and it was found that a roundabout could be installed at each location without impacting existing structures or causing a loss of use for adjacent developed properties.

Install Separated Bikeway

Removing an existing vehicle travel lane in each direction would provide sufficient space to add separated bikeways to the corridor. In Alternatives 2A and 2B, the separated bikeway would be kept at the same level as the vehicle travel lanes and separated with a painted buffer and raised elements separating the bikeway from vehicle lanes (precise design to be determined at a later date). In Alternative 2C, the separated bikeway is brought to sidewalk level and would be separated from the vehicle travel lanes by a landscaping strip. An additional one-foot buffer with visually and texturally unique elements placed parallel to the bikeway would be placed between the bikeway and the sidewalk to reduce potential conflicts between people walking and people biking. Due to lack of physical width available on the interchange, people riding bikes seeking to cross I-80 would still need to ride on the sidewalk.

Add Bicycle Detection

The remaining signalized intersections (those not updated to roundabouts) would be updated to include bicycle detection. This would allow the signals to react to people on bicycles and change signal phases without requiring the person riding to dismount and cross the intersection as a pedestrian or wait for a vehicle trigger the signal phase change.

Widen Sidewalks and Add Landscape Buffer

Existing sidewalks along Norwood Avenue would be widened to more than five feet to allow for a more comfortable and low stress walking environment, regardless of existing utility and signal poles. Landscape buffers would be installed between traffic and the sidewalk north of Jessie Avenue and south of Harris Avenue to expand the low-stress walking network while keeping right-of-way acquisition minor and constrained to landscaping. Alternatives 2A, 2B, and 2C allocate this landscaping buffer differently which changes what can ultimately be planted in this space. Alternative 2A would allow for grasses and small bushes to be planted in this space. Alternative 2B eliminates to landscape buffer on the east side of the street to allow for small to medium sized trees to be planted on the west side of the street. Alternative 2C moves the bikeway to sidewalk level eliminating the need for the buffer area between people riding bikes and vehicles and reallocates this space to the planted buffers. This would allow for large trees to be planted on the west side of the street and grasses and small bushes to be planted on the east side of the street.

Install Sidewalk Scale Lighting

Sidewalk scale lighting would ensure the area where people are walking is illuminated, increasing comfort and feelings of security and safety.

Relocate Utilities

The installation of a landscape buffer and wider sidewalks would allow for an opportunity to relocate utility poles either outside of the walkway or underground to provide appropriate sidewalk widths. This would require collaboration with and support from utility providers.

Install Bus Bulb-Outs with In-Lane Bus Stops

The sidewalk would be extended to allow for the bus to load passengers directly from the vehicle travel lane, with the bikeway continuing behind the bus stop. This treatment would also allow some stops to be turned to allow for better protection from the sun. By allowing buses to stop in-lane, transit time reliability is improved by not requiring the bus to seek gaps in traffic to re-enter the travel lane. This is recommended as the default treatment for all bus stops along the corridor, but design specifics would have to be determined in coordination with SacRT, such as those requiring space for a bus to dwell for schedule adherence.

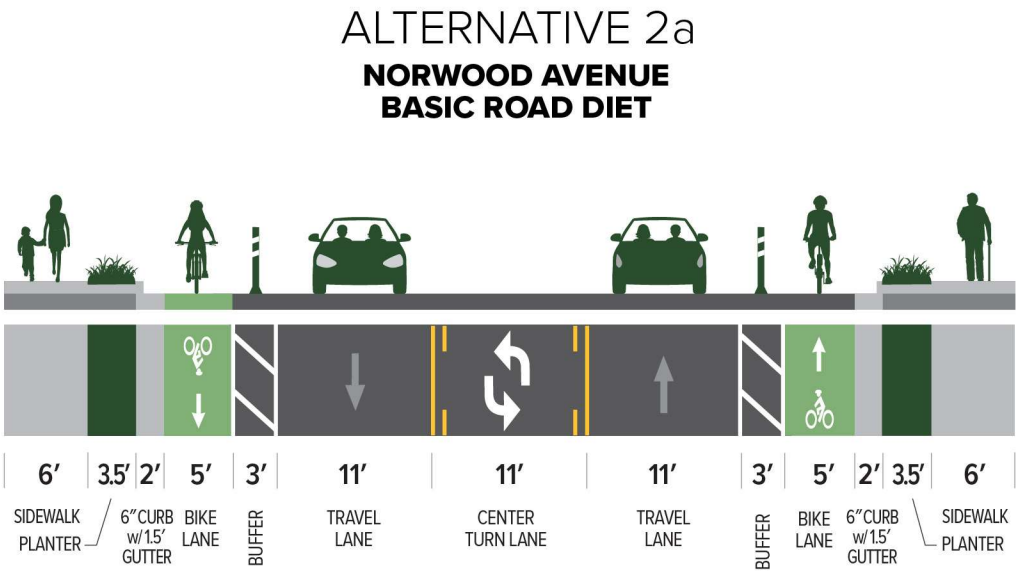

Figure 10: Alternative 2A Cross-Section

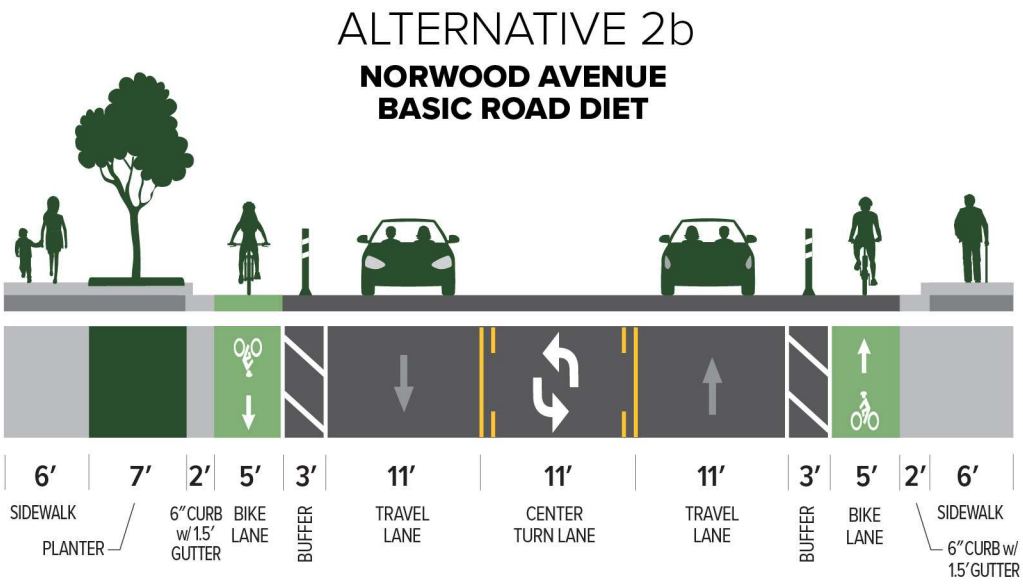

Figure 11: Alternative 2B Cross-Section

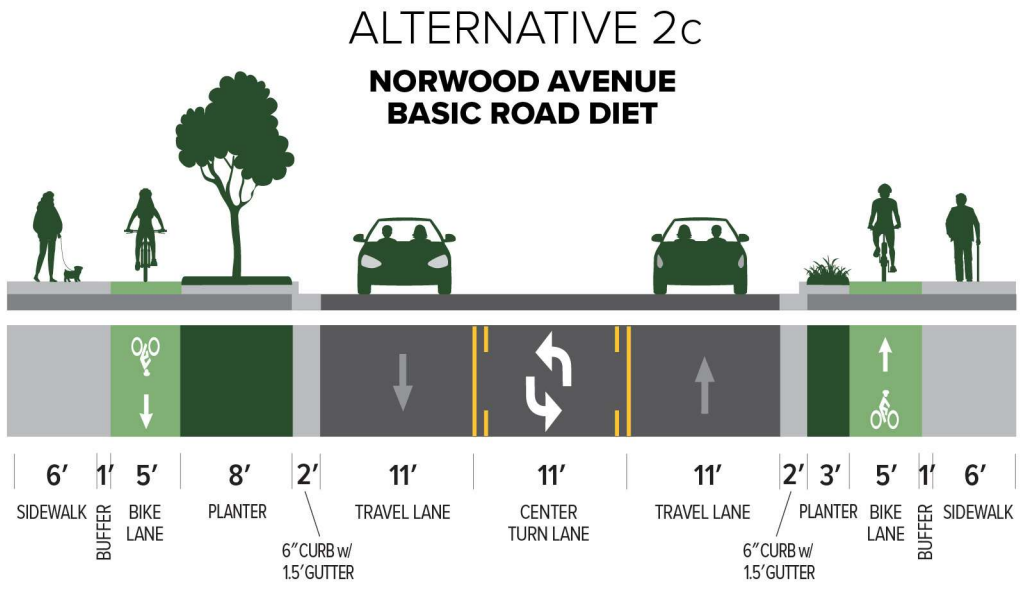

Figure 12: Alternative 2C Cross-Section

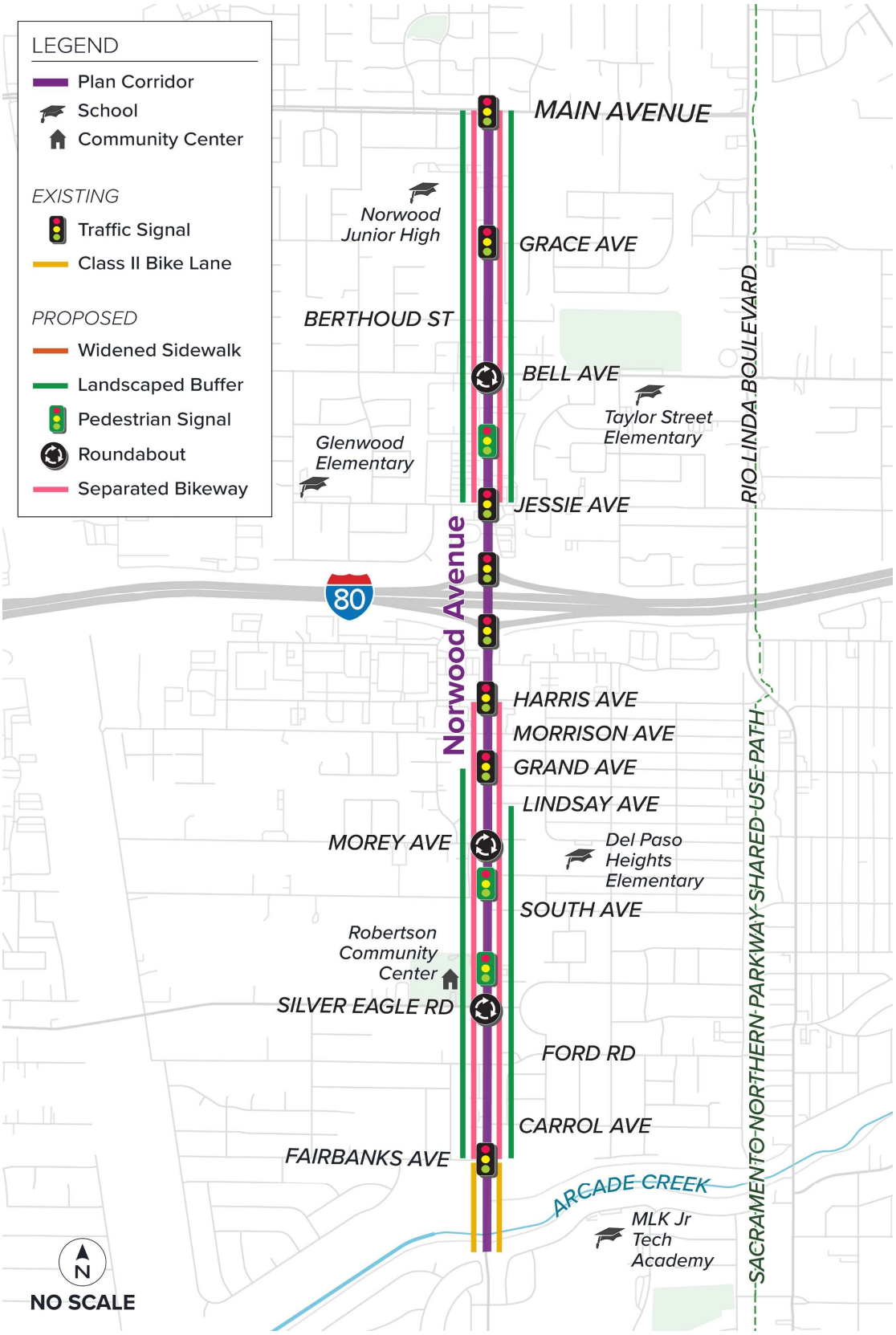

Figure 13: Alternative 2 Plan View of Proposed Improvements

Feasibility Analysis

Travel Demand Forecasting

Based on the SacSim-19 travel demand model as modified for the City of Sacramento 2040 General Plan Update, future volumes on Norwood Avenue range between 17,000 and 37,000 AADT for Alternative 2. The highest volumes are on the segment between Jessie Avenue and Harris Avenue. These volumes drop to the 21,000-25,000 AADT range between Jessie Avenue and Bell Avenue and between Harris Avenue and Grand Avenue. North of Bell Avenue and south of Grand Avenue, volumes drop to the 17,000-20,000 AADT range. These daily volumes are lower than those in Alternative 1 due to the reduction in travel lanes. A portion of the volume which was using Norwood Avenue before the reduction in travel lanes would instead use parallel roads such as Northgate Boulevard and Rio Linda Boulevard. The Travel demand model was also used to forecast future turning movement demand volumes at study intersections along the corridor. These volumes are shown in **Figure 14**.

Alternative 2 reduces the total number of vehicle travel lanes on Norwood Avenue which could potentially cause an increase in VMT related to the infrastructure project. Based on the Transportation Analysis under CEQA for Projects on the State Highway System guidelines published by Caltrans, projects which reduce the number of through lanes and projects which add or enhance bikeways and walking facilities would not likely lead to a measurable increase in VMT. All elements which are proposed under Alternative 2 would meet the State's screening criteria guidance for VMT analysis and do not require further evaluation for VMT impacts.

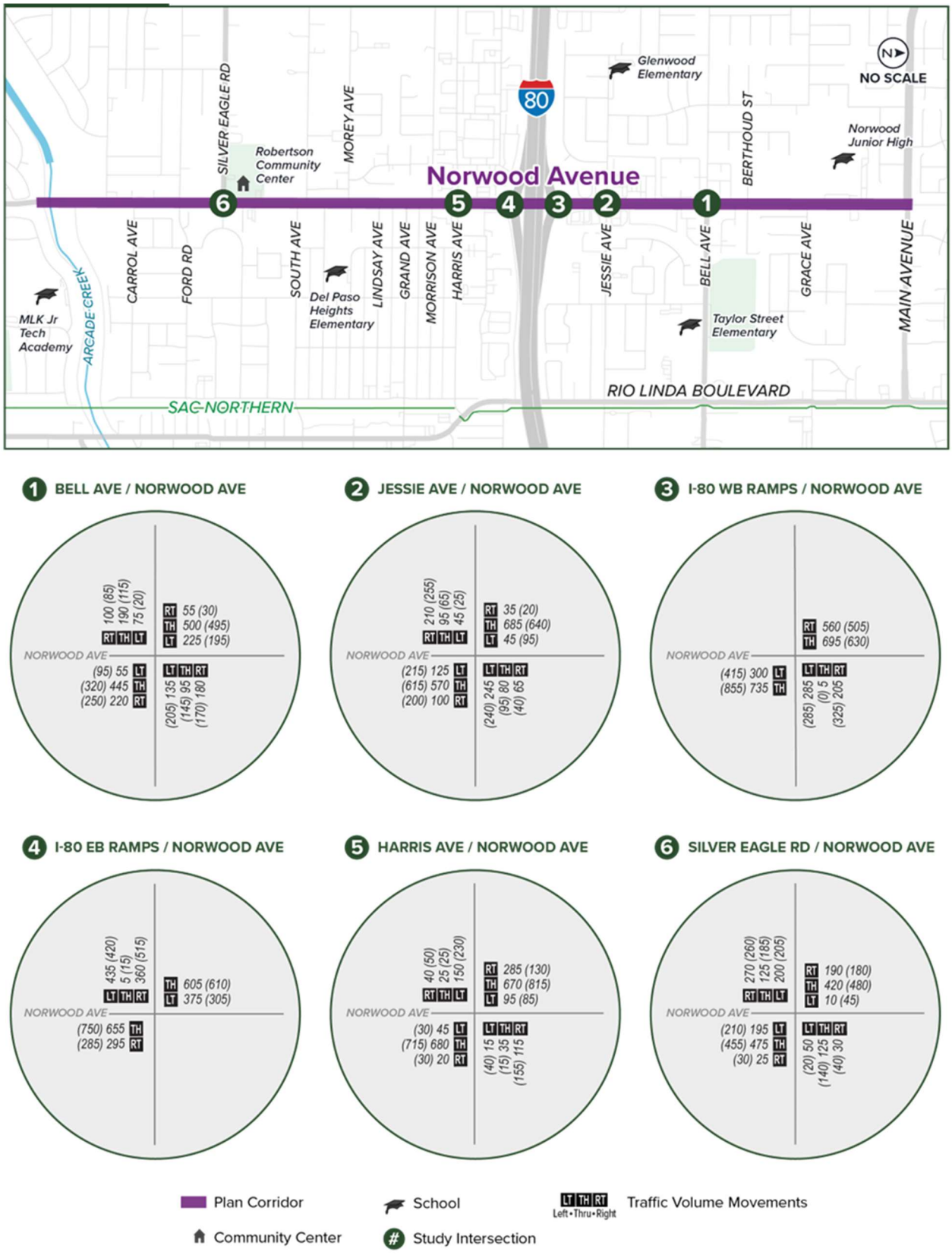

Figure 14: Future (2045) Turning Movement Volumes Alternative 2

Level of Traffic Stress Analysis

The focus of Alternative 2 is to provide significant improvements for those walking, biking, and rolling by reallocating existing right-of-way away from vehicles and towards walking and biking. This alternative adds new crossing opportunities and widens the sidewalks on Norwood Avenue. Additionally, this alternative provides a separated bikeway to enhance safety and comfort for those biking. **Table 2** and **Table 3** show the evaluation of the walking and biking level of traffic stress. **Figure 6** and **Figure 7** show the results of this evaluation in a map form.

Table 5: Analysis of Walking Level of Traffic Stress –Alternative 2

	Main Avenue to Bell Avenue	Bell Avenue to I-80 WB Ramps	I-80 EB Ramps to Fairbanks Avenue	Fairbank Avenue to Arcade Creek
Street Width (Through Lanes per Direction)	1	1	1	1
Buffer Type	Landscaped Buffer	Landscaped Buffer	Landscaped Buffer	None
Total Buffer Width (Ft)	13.5ft	13.5ft	13.5ft	0
Sidewalk Width (Ft)	6	6	6	6
Speed Limit or Prevailing Speed[A] (MPH)	30	30	30	25
Existing PLTS Score[B]	4	4	4	3
Alternative 2 PLTS Score	1	1	1	2

Source: DKS Associates, 2025. ODOT Level of Traffic Stress Analysis Procedures.

A Alternative 1 recommends speed limit reductions throughout the corridor. This analysis was conducted under the assumption that existing speed limits have been reduced by 5 mph.

B Existing PLTS has variability in score for each segment as the analysis was done bi-directional. The Existing PLTS Score included in Table 4 is the highest existing score per segment for the purpose of this analysis.

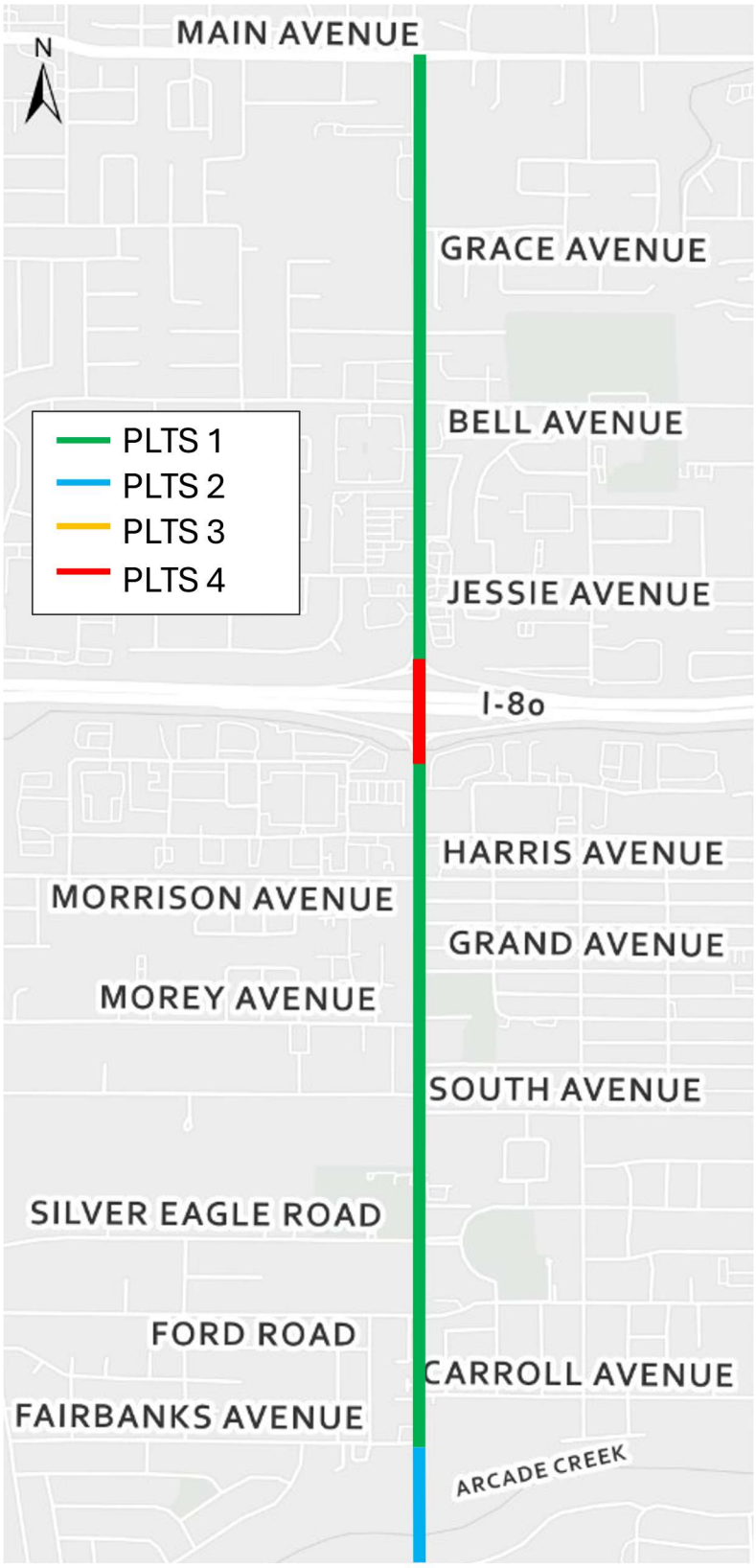

Figure 15: Walking Level of Traffic Stress – Alternative 2

Table 6. Analysis of Bicycle Level of Traffic Stress – Alternative 2

	Main Avenue to Bell Avenue	Bell Avenue to I-80 EB Ramps	I-80 EB Ramps to Fairbanks Avenue	Fairbanks Avenue to Arcade Creek
Street Width (Through Lanes per Direction)	1	1	1	1
Bike Lane Width (Inc. Bike Lane, Buffer Width, Gutter) (Ft)	9ft to 12ft	9ft to 12ft	9ft to 12ft	5
Speed Limit or Prevailing Speed[A] (MPH)	30	30	30	25
Physically Separated Bike Lane?	Yes	Yes	Yes	No
Existing BLTS Score[B]	4	4	4	3
Alternative 2 BLTS Score	1	1	1	2

Source: DKS Associates, 2025. Mineta Transportation Institute, Low Stress Bicycling and Network Connectivity.

A Alternative 1 recommends speed limit reductions throughout the corridor. This analysis was conducted under the assumption that existing speed limits have been reduced by 5 mph.

B Existing BLTS has variability in score for Segment 3 and Segment 4 as the analysis was done bi-directional. The Existing BLTS Score included in Table 7 is the highest existing score per segment for the purpose of this analysis.

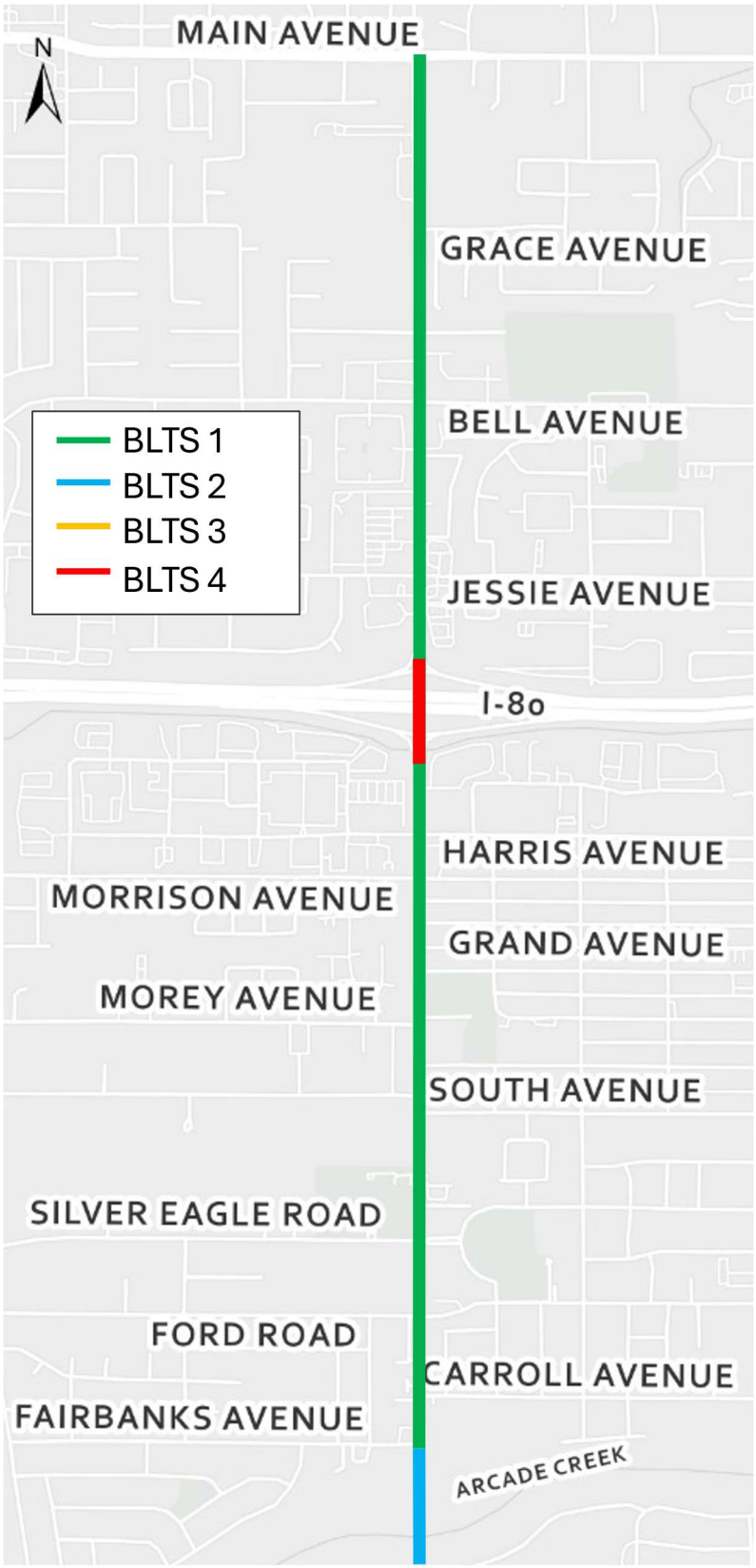

Figure 16: Bicycle Level of Traffic Stress – Alternative 2

Traffic Operations Analysis

The analysis for Alternative 2 includes adjustments to the number of vehicle lanes on Norwood Avenue and basic changes to intersection operational characteristics that would be associated with this lane removal. Signal timing adjustments were made in relation to the proposed improvements and to accommodate higher traffic volumes associated with future growth. All signals were assumed to operate without coordination, but signal coordination would likely improve operations from the results shown. Due to limitations in the analysis software, dedicated bicycle phases were not evaluated at the study intersections, but it is likely that there is sufficient vehicle capacity based on these results to incorporate dedicated bicycle phasing into the design at select locations. Table 7 shows a comparison of anticipated future intersection delays compared to existing operations. Note that for the purposes of the traffic operations analysis that Alternatives 2A, 2B, and 2C are effectively the same so only one analysis was completed.

95th percentile queues were also evaluated for Alternative 2. The AM and PM peak hour queues are shown in Figure 17 and Figure 18 respectively. In these figures, lines are shown on each approach to the intersection representing the queue for the left turn lane (if one exists), the through movements, and the right turn lane (if one exists). These queues are generally color coded as green if they are less than the available vehicle storage, yellow if they are at or near the available vehicle storage, and red if they exceed the available vehicle storage or block access to adjacent lanes. Note that 95th percentile queues represent the longest queue that is likely to be observed during the peak hour and most queues would be shorter. From this analysis, the key finding is that queues are longest at the intersections which comprise the I-80 interchange. There are other locations where queues exceed their available storage along Norwood Avenue, but in most cases it is due to short formal turn pockets being blocked by through movement queues. When compared to Alternative 1, queues are shorter in Alternative 2 at Bell Avenue, Morey Avenue, and Silver Eagle Road where the roundabouts would be installed with this alternative. Queues are longer at Harris Avenue and Jessie Avenue due to the reduction in travel lanes through the intersection. At Harris Avenue, this could be an issue as northbound queues would extend back to Grand Avenue. This could be addressed by adjusting the proposed design at Harris Avenue to maintain two through lanes in the northbound direction and should be evaluated further at the project design phase if Alternative 2 is selected as the preferred Alternative.

Table 7: Future (2045) Alternative 2 Intersection Operational Analysis Results

Intersection	AM Peak Hour [A]		PM Peak Hour [A]	
	Existing	Future Alt. 2	Existing	Future Alt. 2
1. Norwood Avenue / Bell Avenue	20.6 (C)	16.2 (B)	17.6 (B)	15.4 (B)
2. Norwood Avenue / Jessie Avenue	28.2 (C)	53.1 (D)	23.8 (C)	44.6 (D)
3. Norwood Avenue / WB 80 Ramps	10.9 (B)	12.6 (B)	10.3 (B)	14.2 (B)
4. Norwood Avenue / EB 80 Ramps	12.0 (B)	14.4 (B)	12.0 (B)	14.2 (B)
5. Norwood Avenue / Harris Avenue	19.7 (B)	29.1 (C)	19.2 (B)	36.1 (D)
Norwood Avenue / Morey Avenue[B]	-	8.5 (A)	-	9.9 (A)
6. Norwood Avenue / Silver Eagle Road	18.6 (B)	13.9 (B)	18.2 (B)	18.0 (B)

Source: DKS Associates, March 2025.

Notes:

A. 20.6 (C) = Delay (LOS)

B. Not a study intersection, provided for informational purposes because of recommended control modifications

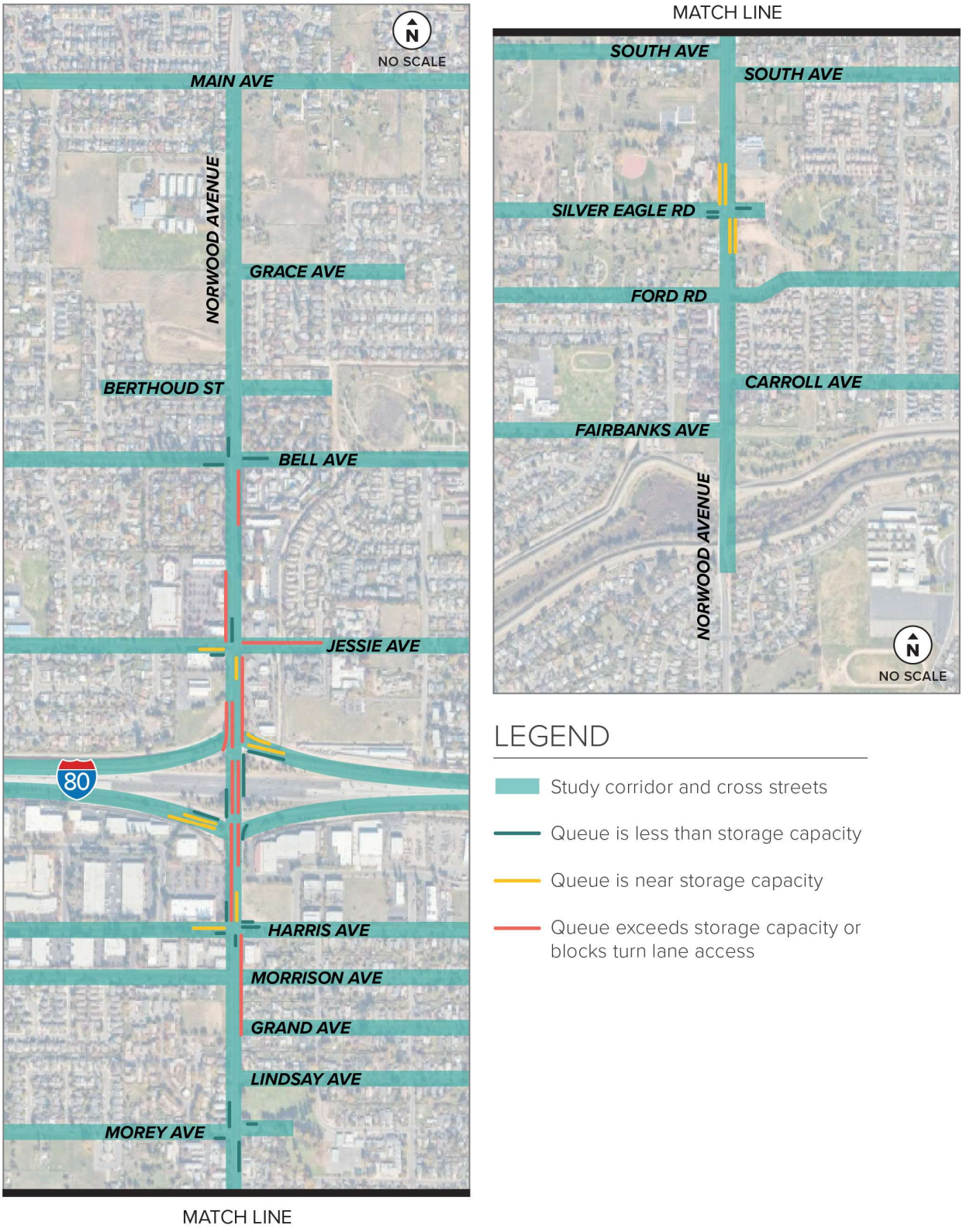

Figure 17: Future (2045) AM Peak Hour 95th Percentile Intersection Queues Alternative 2

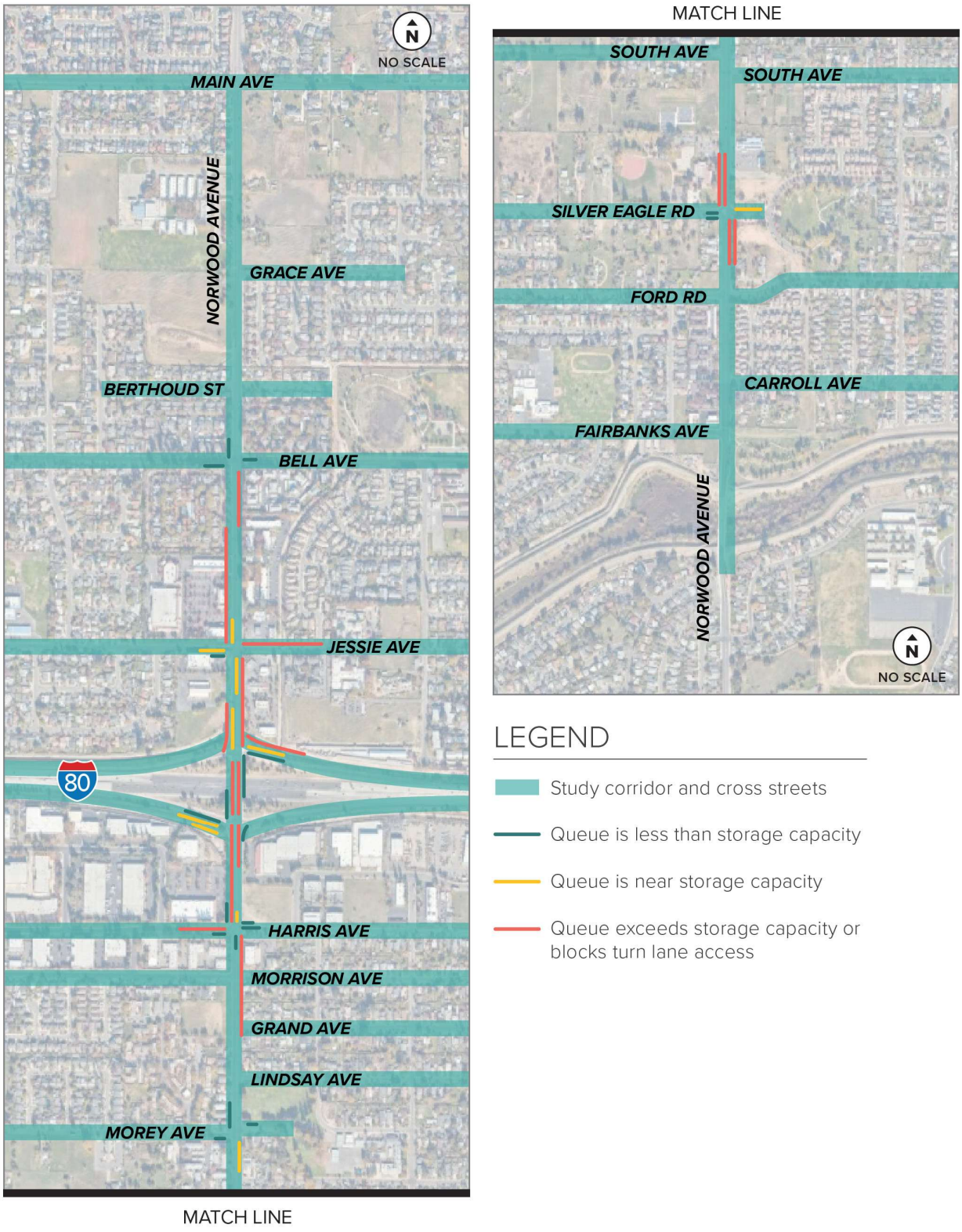

Figure 18: Future (2045) PM Peak Hour 95th Percentile Intersection Queues Alternative 2

Safety Benefit Assessment

Alternative 2 provides safety benefits through traffic calming and separation of travel modes. This alternative would reduce speeds by narrowing vehicle travel lanes, removing a vehicle travel lane per direction, adding roundabouts at Bell Avenue, Morey Avenue, and Silver Eagle Road, and by reducing the speed limit on Norwood Avenue. The roundabouts at Bell Avenue and Silver Eagle Road also address the collision trends observed at these intersections by lowering speeds and eliminating several vehicle conflicts within the intersections.

The addition of a separated bikeway would separate those riding bicycles from vehicle traffic, reducing the observed trend of bicycle involved collisions. Added crossing opportunities would help address the observed trend of pedestrian involved collisions along Norwood Avenue at unmarked crossing locations.

Transit Assessment

Alternatives 2A and 2B provide opportunities for transit stop enhancements beyond the improvements identified by SacRT. The landscaping strip included with these alternatives gives space for expanding loading platforms and adding stop amenities such as benches and shade structures. Alternative 2B eliminates the landscape strip on the east side of the street to allow for a wider landscape strip on the west side of the street which can include tree planting. This modification means there would be fewer opportunities for enhanced bus stops with Alternative 2B when compared with Alternative 2A. In Alternatives 2A and 2B, the conflicts between the bus and people on bicycles would need to be handled at each stop and would follow SacRTs standard design plans.

Alternative 2C provides the same benefits as Alternative 2A, but because the bike path starts at sidewalk level, it would be easier to address the conflicts between those riding bicycles and those boarding transit. Additionally, the wider landscaping strips would allow for greater space at transit stops for amenities.

Community Priority Alignment

In addition to the safety benefits described above, Alternative 2 includes the addition of three new marked and signalized pedestrian crosswalks and signalizes pedestrian crossings at the freeway ramps. Alternative 2 also provides a low stress environment for people walking, biking, and accessing transit along most of the corridor by reducing traffic speeds and separating travel modes with physical buffers. The only gap in the low stress environment is across the freeway interchange.

Alternative 3

Description

Alternative 3 proposes installing a Class I shared use path along Norwood Avenue by reallocating space from one of the vehicle travel lanes in each direction. The proposed cross section for Alternative 3 is shown in Figure 19. Figure 20 shows a representative map view of Norwood Avenue and where improvements would be applied for Alternative 3. The elements in this alternative include:

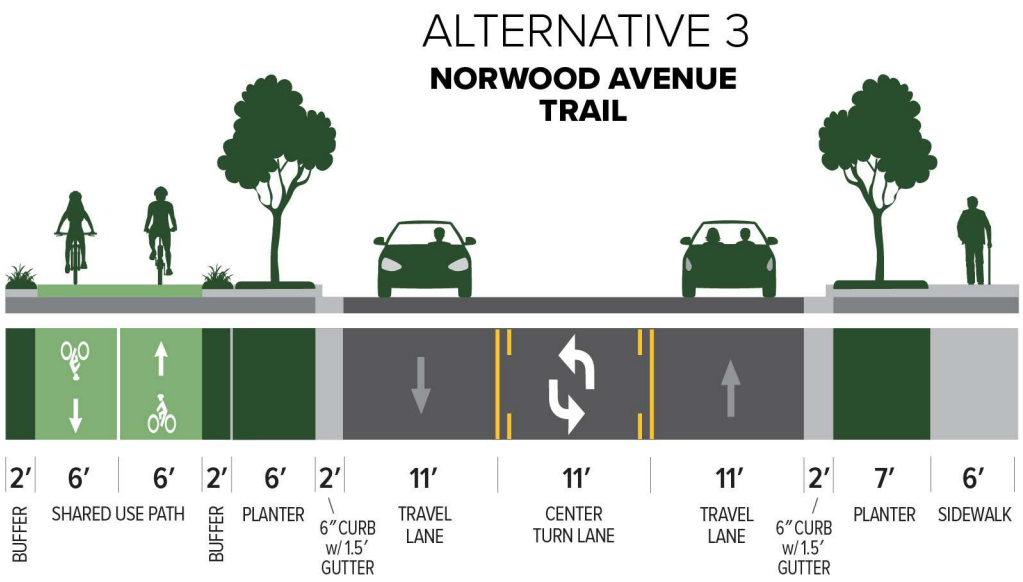

Figure 19: Alternative 3 Cross-Section

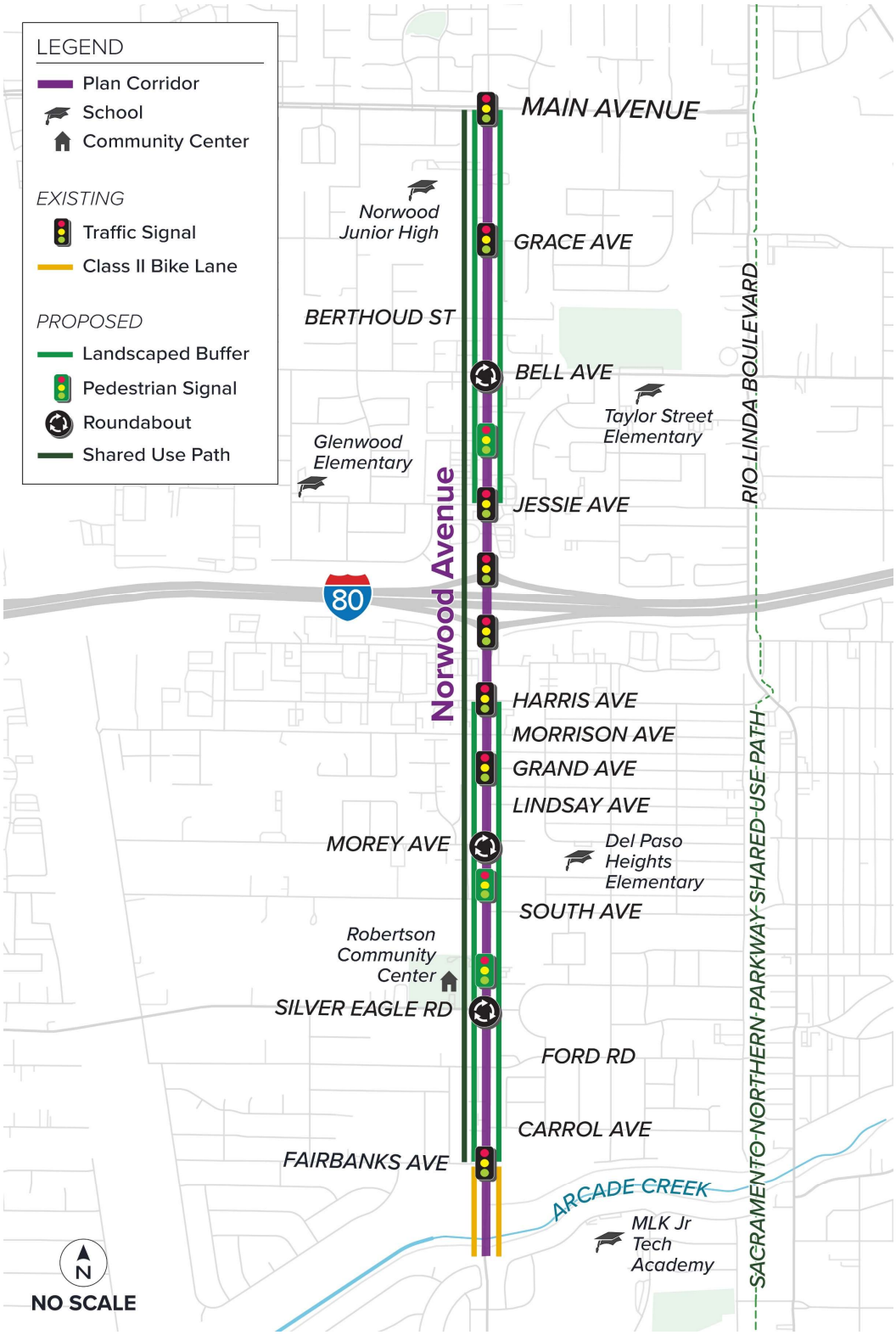

Figure 20: Alternative 3 Plan View of Proposed Improvements

Reallocate Street Space from Driving to Walking and Bicycling: Fairbanks Avenue to Harris Avenue and from Jessie Avenue to Grace Avenue

In order to create space for walking and bicycling improvements along the majority of the corridor, the number of vehicle travel lanes would be reduced from two per direction with a center running two way left turn lane to one per direction with a center running two way left turn lane. Sections south of Fairbanks Avenue and north of Grace Avenue would maintain their current cross-sections. The section from Harris Avenue to Jessie Avenue would be maintained as two lanes per direction to provide capacity for higher car and truck volumes and demands at the I-80 Interchange.

Install Roundabouts at Silver Eagle Road, Morey Avenue, and Bell Avenue

A single lane roundabout at Silver Eagle Road and Morey Avenue would slow traffic in the vicinity of the Robertson Community Center and two nearby parks.

A single lane roundabout at Morey Avenue would also provide better pathing for people wanting to cross the street at Morey Avenue, which is currently an offset intersection with a marked crossing in the middle of the intersection.

A single lane roundabout at Bell Avenue would slow southbound vehicles as they approach the higher residential density and commercial portion of the corridor. It would also reduce conflict points at a high crash frequency location.

All three roundabout locations have undergone a preliminary review for right-of-way requirements to install a single lane roundabout and it was found that a roundabout could be installed at each location without impacting existing structures or causing a loss of use for adjacent developed properties.

Install Shared Use Path

Removing an existing vehicle travel lane in each direction would provide sufficient space to add a shared use path to the western side of the corridor. This would be at sidewalk level and be separated from vehicle traffic by a planted buffer. Street and driveway crossings of the path would have conflict zone striping to alert people driving and people using the path of the crossing conflict. North of Grace Avenue, this design should be coordinated with developers so right-of-way can be preserved for this future improvement. The shared use path should end at Fairbanks Avenue with wayfinding directing people on bicycles to the Sacramento Northern Parkway shared use path.

Install Shared Use Path over I-80

There is insufficient width on the existing Norwood Avenue overcrossing structure over I-80 to provide a lower stress crossing of the freeway. To create a lower stress method to connect people walking, rolling, and biking over I-80, a separated facility using either a cantilevered structure attached to the overpass or an independent structure would need to

be constructed between Jessie Avenue and Harris Avenue on the west side of Norwood Avenue. This would require significant design work and right-of-way acquisition beyond the scope of the current study so a specific alignment is not included. The goal should be to place this new facility on the west side of the street to align with the proposed shared use path. An alternative option to a fully separated structure could be a cantilevered path off of the existing bridge structure. This would be a lower cost option but may not be structurally feasible. Both options should be reviewed during the design process should Alternative 3 be selected as the preferred alternative.

Widen Sidewalks and Add Landscape Buffer

Similar to other alternatives, Alternative 3 includes wider sidewalks and a landscape buffer. Sidewalks would be widened to greater than five feet in width along the full corridor. The specific width of the landscaped buffer would vary throughout the corridor based on available right-of-way. Generally, the landscaped buffer would be at least eight feet (six feet dedicated landscaping plus two feet shoulder of shared use path) on the west side of the street and seven feet on the east side of the street. This would allow for larger shade trees to be planted on the west side of the street and small to medium sized trees to be planted on the east side of the street.

Install Sidewalk Scale Lighting

Sidewalk scale lighting along the entire length of the corridor would ensure the area where people are walking is illuminated and increase comfort and feelings of security and safety.

Relocate Utilities

The installation of a landscape buffer and wider sidewalks would allow for an opportunity to relocate utility poles either outside of the walkway or underground to provide appropriate sidewalk widths. This would require collaboration with and support from utility providers.

Install In-Lane Bus Stops

The sidewalk would be extended to allow for the bus to load passengers directly from the vehicle travel lane, with the shared use path continuing behind the bus stop. By allowing buses to stop in-lane, transit time reliability is improved by not requiring the bus to seek gaps in traffic to re-enter the travel lane. This is recommended as the default treatment for all bus stops along the corridor, but design specifics would have to be determined in coordination with SacRT , such as those requiring space for a bus to dwell for schedule adherence.

Feasibility Analysis

Travel Demand Forecasting

For the purposes of travel demand forecasting, Alternative 3 is effectively the same as Alternative 2 and thus the results in this section match those reported under Alternative 2. Based on the SacSim-19 travel demand model as modified for the City of Sacramento 2040 General Plan Update, future volumes on Norwood Avenue range between 17,000 and 37,000 AADT for Alternative 3. The highest volumes are on the segment between Jessie Avenue and Harris Avenue. These volumes drop to the 21,000-25,000 AADT range between Jessie Avenue and Bell Avenue and between Harris Avenue and Grand Avenue. North of Bell Avenue and south of Grand Avenue, volumes drop to the 17,000-20,000 AADT range. These daily volumes are lower than Alternative 1 due to the reduction in travel lanes. A portion of the volume which were using Norwood Avenue before the reduction in travel lanes would instead use parallel streets such as Northgate Boulevard and Rio Linda Boulevard. The Travel demand model was also used to forecast future turning movement demand volumes at study intersection along the corridor. These volumes are shown in **Figure 14**.

Alternative 3 does reduce the total number of vehicle travel lanes on Norwood Avenue which could potentially cause an increase in VMT related to the infrastructure project. Based on the Transportation Analysis under CEQA for Projects on the State Highway System guidelines published by Caltrans, projects which reduce the number of through lanes and projects which add or enhance bikeways and walking facilities would not likely lead to a measurable increase in VMT. All elements which are proposed under Alternative 3 would meet the State's screening criteria guidance for VMT analysis and do not require further evaluation for VMT impacts.

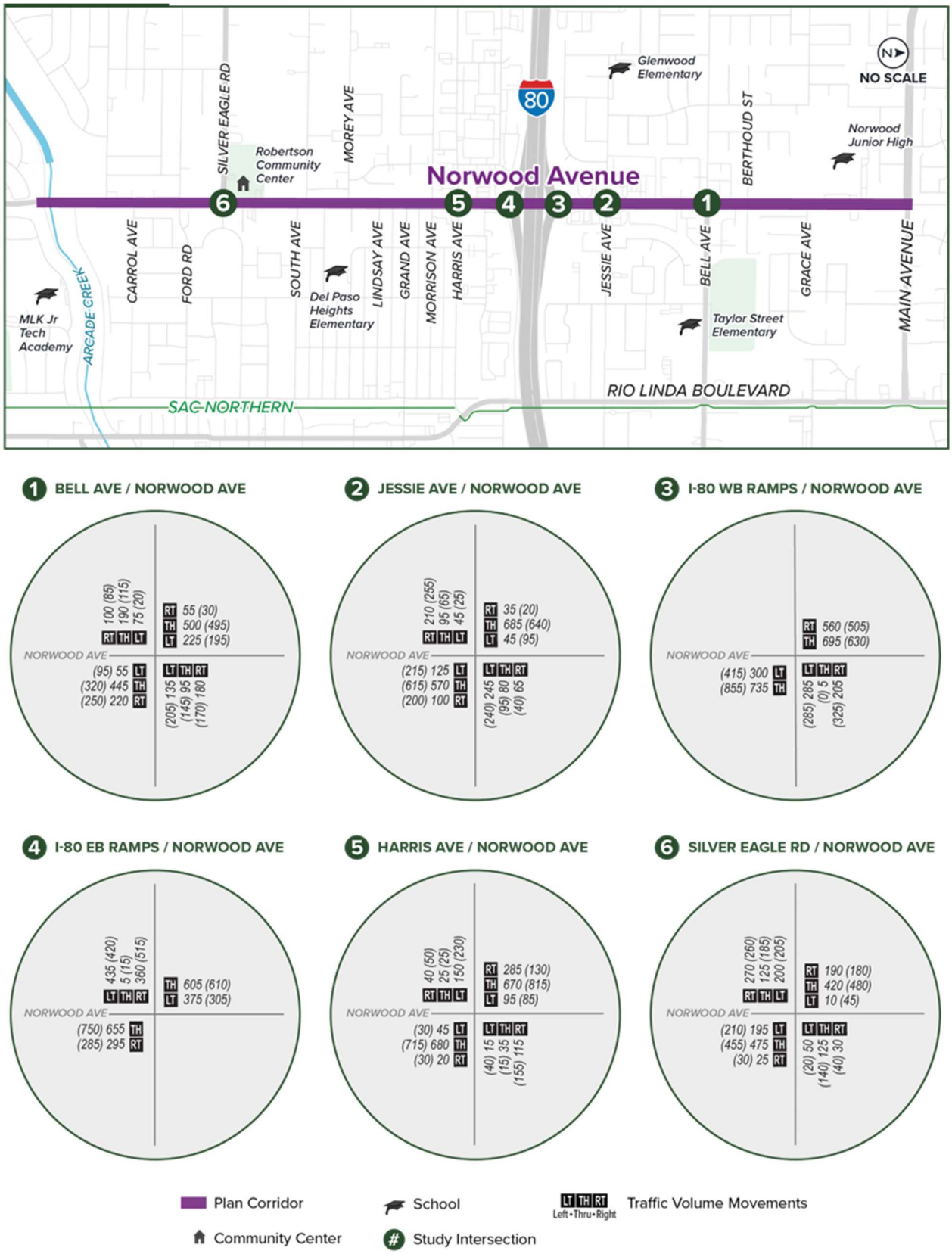

Figure 21: Future (2045) Turning Movement Volumes Alternative 3

Level of Traffic Stress Analysis

The focus of Alternative 3 is to provide significant improvements for those walking, biking, and rolling by reallocating existing right-of-way away from vehicles and towards walking and biking. This alternative adds new crossing opportunities and widens the sidewalks on Norwood Avenue. Additionally, this alternative provides a shared use path on the west side of the street to enhance safety and comfort for those walking, biking, and rolling. Table 8 and Table 9 show the evaluation of the walking and biking level of traffic stress. Figure 22 and Figure 23 show the results of this evaluation in a map form.

Table 8: Analysis of Walking Level of Traffic Stress –Alternative 3

	Main Avenue to Bell Avenue	Bell Avenue to I-80 WB Ramps	I-80 EB Ramps to Fairbanks Avenue	Fairbank Avenue to Arcade Creek
Street Width (Through Lanes per Direction)	1	1	1	1
Buffer Type	Landscaped Buffer	Landscaped Buffer	Landscaped Buffer	None
Total Buffer Width (Ft)	16 ft	16 ft	16 ft	0
Sidewalk Width (Ft)	6	6	6	6
Speed Limit Or Prevailing Speed[A] (MPH)	30	30	30	25
Existing PLTS Score[B]	4	4	4	3
Alternative 3 PLTS Score	1	1	1	2

Source: DKS Associates, 2025. ODOT Level of Traffic Stress Analysis Procedures.

A Alternative 1 recommends speed limit reductions throughout the corridor. This analysis was conducted under the assumption that existing speed limits have been reduced by 5 mph.

B Existing PLTS has variability in score for each segment as the analysis was done bi-directional. The Existing PLTS Score included in Table 4 is the highest existing score per segment for purpose of this analysis.

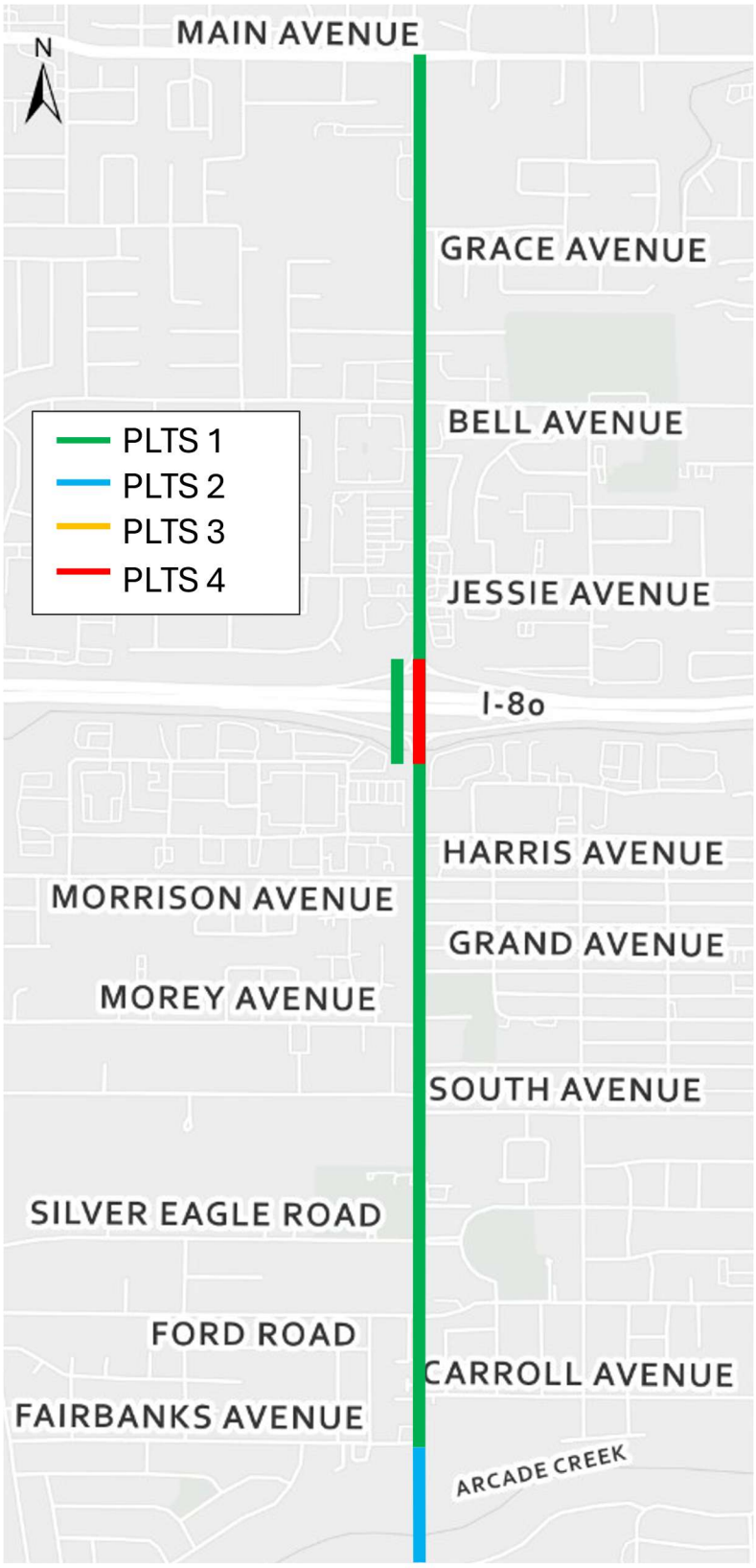

Figure 22: Walking Level of Traffic Stress – Alternative 3

Table 9. Analysis of Bicycle Level of Traffic Stress – Alternative 3

	Main Avenue to Bell Avenue	Bell Avenue to I-80 EB Ramps	I-80 EB Ramps to Fairbanks Avenue	Fairbanks Avenue to Arcade Creek
Street Width (Through Lanes per Direction)	1	1	1	1
Bike Lane Width (Inc. Bike Lane, Buffer Width, Gutter) (Ft)	16ft	16ft	16ft	5ft
Speed Limit Or Prevailing Speed[A] (MPH)	30	30	30	25
Physically Separated Bike Lane?	Yes	Yes	Yes	No
Existing BLTS Score[B]	4	4	4	3
Alternative 3 BLTS Score	1	1	1	2

Source: DKS Associates, 2025. Mineta Transportation Institute, Low Stress Bicycling and Network Connectivity.

A Alternative 1 recommends speed limit reductions throughout the corridor. This analysis was conducted under the assumption that existing speed limits have been reduced by 5 mph.

B Existing BLTS has variability in score for Segment 3 and Segment 4 as the analysis was done bi-directional. The Existing BLTS Score included in Table 7 is the highest existing score per segment for purpose of this analysis.

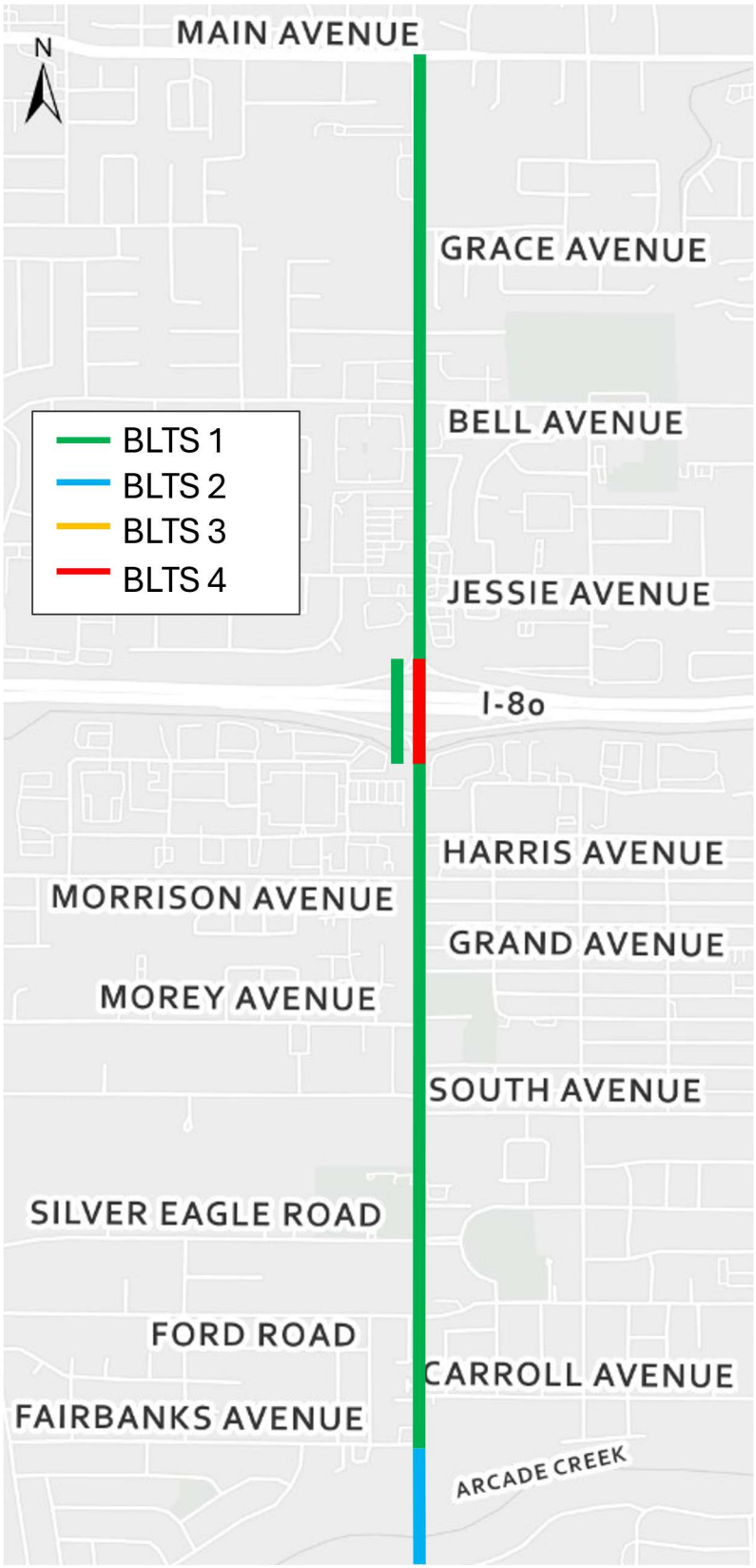

Figure 23: Bicycle Level of Traffic Stress – Alternative 3

Traffic Operations Analysis

This analysis matches the analysis done for Alternative 2 as from a traffic operations perspective, the two options are nearly identical. Where they differ is in how dedicated bicycle signal phasing would be implemented, but this analysis is beyond the capabilities of the analysis software used for this study. Additionally, more detailed analysis should be conducted on signal operations at a later project phase if Alternative 3 is selected as the preferred alternative.

The analysis for Alternative 3 includes adjustments to the number of vehicle lanes on Norwood Avenue and basic changes to intersection operational characteristics that would be associated with this lane removal. Signal timing adjustments were made in relation to the proposed improvements and to accommodate higher traffic volumes associated with future growth. All signals were assumed to operate without coordination, but signal coordination would likely improve operations from the results shown. Due to limitations in the analysis software, dedicated bicycle phases were not evaluated at the study intersections, but it is likely that there is sufficient vehicle capacity based on these results to incorporate dedicated bicycle phasing into the design at select locations. Table 10 shows a comparison of anticipated future intersection delays compared to existing operations.

95th percentile queues were also evaluated for Alternative 2. The AM and PM peak hour queues are shown in Figure 24 and Figure 25 respectively. In these figures, lines are shown on each approach to the intersection representing the queue for the left turn lane (if one exists), the through movements, and the right turn lane (if one exists). These queues are generally color coded as green if they are less than the available vehicle storage, yellow if they are at or near the available vehicle storage, and red if they exceed the available vehicle storage or block access to adjacent lanes. Note that 95th percentile queues represent the longest queue that is likely to be observed during the peak hour and most queues would be shorter.

From this analysis, the key finding is that queues are longest at the intersections which comprise the I-80 interchange. There are other locations where queues exceed their available storage along Norwood Avenue, but in most cases it is due to short formal turn pockets being blocked by through movement queues. When compared to Alternative 1, queues are shorter in Alternative 3 at Bell Avenue, Morey Avenue, and Silver Eagle Road where the roundabouts would be installed with this alternative. Queues are longer at Harris Avenue and Jessie Avenue due to the reduction in travel lanes through the intersection. At Harris Avenue, this could be an issue as northbound queues would extend back to Grand Avenue. This could be addressed by adjusting the proposed design at Harris Avenue to maintain two through lanes in the northbound direction and should be evaluated further at the project design phase if Alternative 3 is selected as the preferred Alternative.

Table 10: Future (2045) Alternative 3 Intersection Operational Analysis Results

Intersection	AM Peak Hour [A]		PM Peak Hour [A]	
	Existing	Future Alt. 3	Existing	Future Alt. 3
1. Norwood Avenue / Bell Avenue	20.6 (C)	16.2 (B)	17.6 (B)	15.4 (B)
2. Norwood Avenue / Jessie Avenue	28.2 (C)	53.1 (D)	23.8 (C)	44.6 (D)
3. Norwood Avenue / WB 80 Ramps	10.9 (B)	12.6 (B)	10.3 (B)	14.2 (B)
4. Norwood Avenue / EB 80 Ramps	12.0 (B)	14.4 (B)	12.0 (B)	14.2 (B)
5. Norwood Avenue / Harris Avenue	19.7 (B)	29.1 (C)	19.2 (B)	36.1 (D)
Norwood Avenue / Morey Avenue[B]	-	8.5 (A)	-	9.9 (A)
6. Norwood Avenue / Silver Eagle Road	18.6 (B)	13.9 (B)	18.2 (B)	18.0 (B)

Source: DKS Associates, March 2025.

Notes:

A. 20.6 (C) = Delay (LOS)

B. Not a study intersection, provided for informational purposes because of recommended control modifications

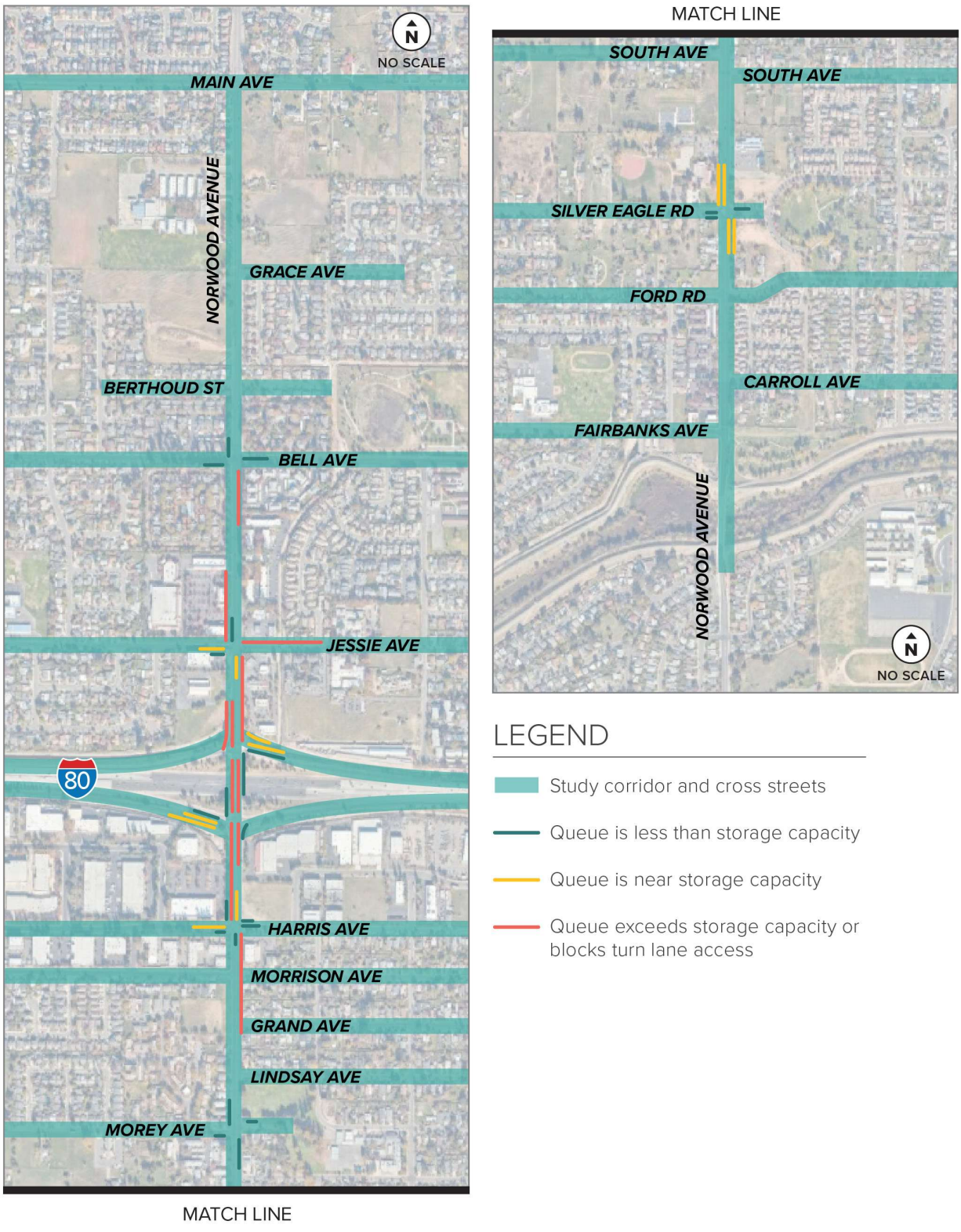

Figure 24: Future (2045) AM Peak Hour 95th Percentile Intersection Queues Alternative 3

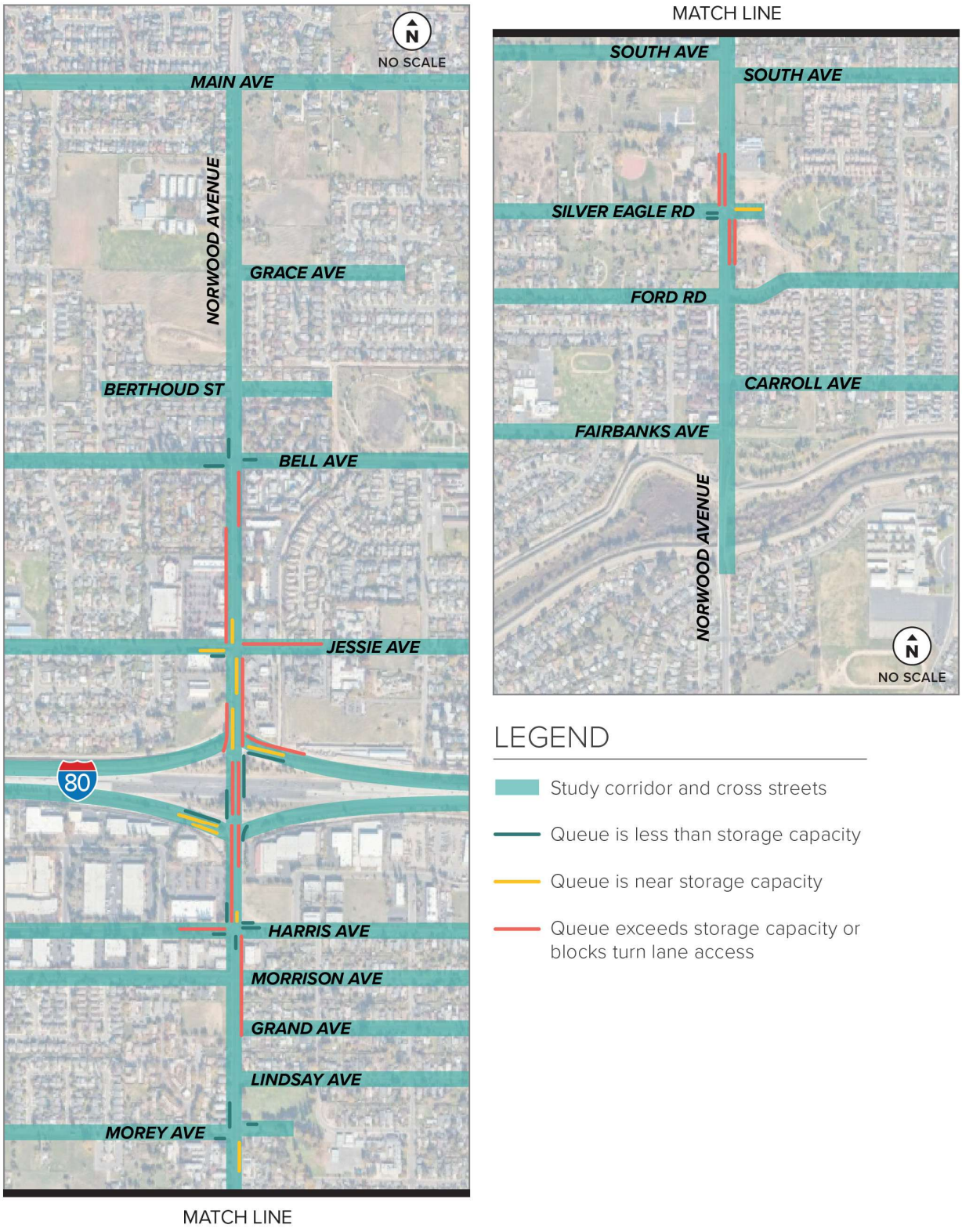

Figure 25: Future (2045) PM Peak Hour 95th Percentile Intersection Queues Alternative 3

Safety Benefit Assessment

Alternative 3 provides safety benefits through traffic calming and separation of travel modes. This alternative would reduce speeds by narrowing vehicle travel lanes, removing a vehicle travel lane per direction, adding roundabouts at Bell Avenue, Morey Avenue, and Silver Eagle Road, and by reducing the speed limit on Norwood Avenue. The roundabouts at Bell Avenue and Silver Eagle Road also address the collision trends observed at these intersections by lowering speeds and eliminating several vehicle conflicts within the intersections.

The addition of a shared use path would separate those riding bicycles from vehicle traffic, reducing the observed trend of bicycle involved collisions. Added crossing opportunities would help address the observed trend of pedestrian involved collisions along Norwood Avenue at unmarked crossing locations.

Transit Assessment

Alternative 3 would provide similar transit benefit opportunities as Alternative 2C and provide for transit stop enhancements beyond the improvements identified by SacRT. The landscaping strip included with this alternative gives space for expanding loading platforms and adding stop amenities such as benches and shade structures.

Alternative 3 provides space for people riding bikes at the sidewalk level so conflicts between transit vehicles and people riding bikes is not a concern with this alternative. The wide landscaping strip would allow for stops to be designed where those boarding transit are not in conflict with people riding bikes.

Community Priority Alignment

In addition to the safety benefits described above, Alternative 3 includes the addition of three new marked and signalized pedestrian crosswalks and signalizes pedestrian crossings at the freeway ramps. Alternative 3 also provides a low stress environment for people walking, biking, and accessing transit along the entire corridor by reducing traffic speeds and separating travel modes with physical buffers, including a separated structure across the freeway interchange.

Comparison of Alternative Analysis Results

Table 11 on the next page summarizes the findings of this report in regards to how the proposed alternatives perform on key metrics in comparison with each other. Each alternative is compared based on how it addresses mobility and safety along the corridor. Discussion with the community is still underway to better understand which alternative best aligns with local community values so no one alternative is recommended over another at this time.

Table 11: Comparison of Alternatives

Metric	No Build	Alt. 1	Alt. 2	Alt. 3
Defining Characteristics	No Change	• Additional Crossing Opportunities • Widen Sidewalk on West Side of Street	• Additional Crossing Opportunities • Separated Bikeway • Landscaped buffers • Roundabouts at Bell Ave, Morey Ave, and Silver Eagle Rd	• Additional Crossing Opportunities • Shared Use Path • Landscaped buffers • Roundabouts at Bell Ave, Morey Ave, and Silver Eagle Rd • Shared Use Path Over I-80
Average Level of Traffic Stress				
Walking		3	1	1
Biking		3	1	1
Travel Demand				
Traffic Diversion to Parallel Streets	N/A	None	~10%	~10%
Increases in VMT	N/A	None	None	None
Traffic Operations				
Intersection Delay	LOS C or Better	LOS C or Better	LOS D or Better	LOS D or Better
Extensive Queues	• Jessie Ave • I-80 WB Ramps • I-80 EB Ramps • Harris Ave • Silver Eagle Rd	• Jessie Ave • I-80 WB Ramps • I-80 EB Ramps • Harris Ave • Silver Eagle Rd	• Jessie Ave • I-80 WB Ramps • I-80 EB Ramps • Harris Ave	• Jessie Ave • I-80 WB Ramps • I-80 EB Ramps • Harris Ave

Metric	No Build	Alt. 1	Alt. 2	Alt. 3
Safety Improvements				
Added Crossing Opportunities	N/A	3	3	3
Traffic Calming Elements	N/A	• Speed Limit Reduction • Lane Width Reduction	• Speed Limit Reduction • Lane Width Reduction • Roundabout at Bell Ave • Roundabout at Morey Ave • Roundabout at Silver Eagle Rd	• Speed Limit Reduction • Lane Width Reduction • Roundabout at Bell Ave • Roundabout at Morey Ave • Roundabout at Silver Eagle Rd
Other Safety Enhancements	N/A	• Removal of On-Street Parking • Crossing Enhancements at I-80 Interchange	• Removal of On-Street Parking • Crossing Enhancements at I-80 Interchange • Separated Bikeways • Landscaped Buffers • Pedestrian Scale Lighting	• Removal of On-Street Parking • Crossing Enhancements at I-80 Interchange • Separated Bikeways • Landscaped Buffers • Pedestrian Scale Lighting
Transit Enhancements	N/A	• Added Bus Shelters • Wider Sidewalks Increase Waiting Area	• Added Bus Shelters • Wider Sidewalks Increase Waiting Area • In Lane Bus Stops	• Added Bus Shelters • Wider Sidewalks Increase Waiting Area • In Lane Bus Stops

Appendix

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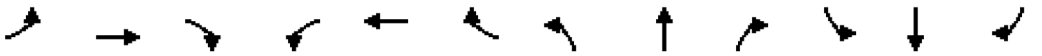
Section 1. Synchro Intersection Analysis Results



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	150	155	220	90	155	70	515	250	145	635	45
Future Volume (veh/h)	60	150	155	220	90	155	70	515	250	145	635	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.96	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	1885	1885	1885	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	60	150	155	220	90	155	70	515	250	145	635	45
Peak Hour 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
Percent Heavy Veh, %	1	1	1	4	4	4	3	3	3	3	3	3
Cap, veh/h	450	203	210	272	253	209	188	740	320	262	853	60
Arrive On Green	0.25	0.24	0.24	0.16	0.14	0.14	0.11	0.21	0.21	0.15	0.26	0.26
Sat Flow, veh/h	1795	831	859	1753	1841	1520	1767	3526	1525	1767	3331	236
Grp Volume(v), veh/h	60	0	305	220	90	155	70	515	250	145	336	344
Grp Sat Flow(s),veh/h/ln	1795	0	1690	1753	1841	1520	1767	1763	1525	1767	1763	1804
Q Serve(g_s), s	1.8	0.0	11.6	8.5	3.1	5.1	2.6	9.4	5.6	5.3	12.2	12.3
Cycle Q Clear(g_c), s	1.8	0.0	11.6	8.5	3.1	5.1	2.6	9.4	5.6	5.3	12.2	12.3
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.13
Lane Grp Cap(c), veh/h	450	0	413	272	253	209	188	740	320	262	451	462
V/C Ratio(X)	0.13	0.00	0.74	0.81	0.36	0.74	0.37	0.70	0.78	0.55	0.74	0.75
Avail Cap(c_a), veh/h	674	0	1099	658	1197	988	668	2293	992	661	1147	1174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	0.0	24.3	28.5	27.3	15.8	29.0	25.5	6.9	27.6	23.9	23.9
Incr Delay (d2), s/veh	0.0	0.0	1.0	2.2	0.3	1.9	0.5	0.4	1.6	0.7	0.9	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	0.7	0.0	4.6	3.4	1.3	2.3	1.0	3.7	3.4	2.2	4.9	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.3	0.0	25.3	30.6	27.6	17.8	29.5	26.0	8.5	28.3	24.8	24.8
LnGrp LOS	C		C	C	C	B	C	C	A	C	C	C
Approach Vol, veh/h		365			465			835			825	
Approach Delay, s/veh		24.5			25.8			21.0			25.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.1	14.2	11.0	22.5	14.6	21.7	14.2	19.3
Change Period (Y+Rc), s	* 4.6	* 4.6	3.6	* 4.6	3.8	* 4.6	3.9	* 4.6
Max Green Setting (Gmax), s	* 26	* 45	26.4	* 45	26.2	* 45	26.1	* 45
Max Q Clear Time (g_c+I1), s	3.8	7.1	4.6	14.3	10.5	13.6	7.3	11.4
Green Ext Time (p_c), s	0.1	0.5	0.1	2.9	0.3	1.4	0.2	2.6

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

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

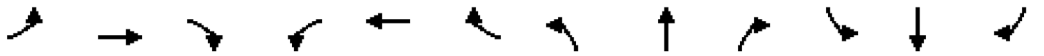
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	95	215	195	70	55	140	710	105	55	935	45
Future Volume (veh/h)	50	95	215	195	70	55	140	710	105	55	935	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.97	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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	50	95	215	195	70	55	140	710	105	55	935	45
Peak Hour 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
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	3	3	3
Cap, veh/h	104	198	261	245	88	69	179	1078	159	136	1119	54
Arrive On Green	0.16	0.16	0.16	0.23	0.23	0.23	0.10	0.35	0.35	0.08	0.33	0.33
Sat Flow, veh/h	634	1205	1585	1059	380	299	1767	3067	453	1767	3423	165
Grp Volume(v), veh/h	145	0	215	320	0	0	140	408	407	55	481	499
Grp Sat Flow(s),veh/h/ln	1839	0	1585	1738	0	0	1767	1763	1757	1767	1763	1825
Q Serve(g_s), s	6.1	0.0	11.2	14.9	0.0	0.0	6.6	16.7	16.8	2.5	21.7	21.7
Cycle Q Clear(g_c), s	6.1	0.0	11.2	14.9	0.0	0.0	6.6	16.7	16.8	2.5	21.7	21.7
Prop In Lane	0.34		1.00	0.61		0.17	1.00		0.26	1.00		0.09
Lane Grp Cap(c), veh/h	303	0	261	401	0	0	179	619	617	136	576	596
V/C Ratio(X)	0.48	0.00	0.82	0.80	0.00	0.00	0.78	0.66	0.66	0.41	0.84	0.84
Avail Cap(c_a), veh/h	784	0	676	741	0	0	547	935	932	547	935	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	34.6	31.0	0.0	0.0	37.6	23.4	23.4	37.7	26.7	26.7
Incr Delay (d2), s/veh	0.4	0.0	2.5	1.4	0.0	0.0	2.8	0.4	0.5	0.7	1.7	1.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	4.3	6.2	0.0	0.0	2.9	6.5	6.5	1.1	9.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.9	0.0	37.1	32.4	0.0	0.0	40.4	23.9	23.9	38.4	28.4	28.3
LnGrp LOS	C		D	C			D	C	C	D	C	C
Approach Vol, veh/h		360			320			955			1035	
Approach Delay, s/veh		35.4			32.4			26.3			28.9	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	23.3	12.2	32.6	17.6	10.1	34.7
Change Period (Y+Rc), s	3.5	3.5	* 4.6	3.5	3.5	* 4.6
Max Green Setting (Gmax), s	36.5	26.5	* 45	36.5	26.5	* 45
Max Q Clear Time (g_c+I1), s	16.9	8.6	23.7	13.2	4.5	18.8
Green Ext Time (p_c), s	1.2	0.2	4.3	0.9	0.1	3.2

Intersection Summary	
HCM 7th Control Delay, s/veh	29.3
HCM 7th LOS	C

Notes

* HCM 7th 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)	0	0	0	350	5	240	315	845	0	0	855	560
Future Volume (veh/h)	0	0	0	350	5	240	315	845	0	0	855	560
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1841	1841	1841	1841	1841	0	0	1870	1870
Adj Flow Rate, veh/h				354	0	0	315	845	0	0	855	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				4	4	4	4	4	0	0	2	2
Cap, veh/h				586	0		388	2274	0	0	1266	
Arrive On Green				0.17	0.00	0.00	0.22	0.65	0.00	0.00	0.36	0.00
Sat Flow, veh/h				3506	0	1560	1753	3589	0	0	3647	1585
Grp Volume(v), veh/h				354	0	0	315	845	0	0	855	0
Grp Sat Flow(s),veh/h/ln				1753	0	1560	1753	1749	0	0	1777	1585
Q Serve(g_s), s				4.5	0.0	0.0	8.2	5.4	0.0	0.0	9.8	0.0
Cycle Q Clear(g_c), s				4.5	0.0	0.0	8.2	5.4	0.0	0.0	9.8	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				586	0		388	2274	0	0	1266	
V/C Ratio(X)				0.60	0.00		0.81	0.37	0.00	0.00	0.68	
Avail Cap(c_a), veh/h				2621	0		965	2556	0	0	2598	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.6	0.0	0.0	17.8	3.9	0.0	0.0	13.1	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.1	0.1	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				1.7	0.0	0.0	3.1	0.8	0.0	0.0	3.3	0.0
Unsig. Movement Delay, s/veh						26.60						22.40
LnGrp Delay(d), s/veh				19.0	0.0	26.6	20.9	4.0	0.0	0.0	13.6	22.4
LnGrp LOS				B		C	C	A			B	C
Approach Vol, veh/h					474			1160			1135	
Approach Delay, s/veh					20.9			8.6			15.8	
Approach LOS					C			A			B	

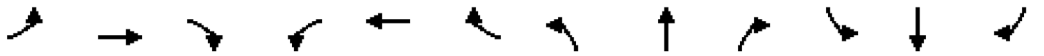
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	14.1	22.0		12.0		36.1						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	10.2	11.8		6.5		7.4						
Green Ext Time (p_c), s	0.6	5.3		0.7		5.0						

Intersection Summary		
HCM 7th Control Delay, s/veh		13.6
HCM 7th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR, SBR] is included in calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	5	510	0	0	0	0	780	300	385	820	0
Future Volume (veh/h)	380	5	510	0	0	0	0	780	300	385	820	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826				0	1841	1841	1841	1841	0
Adj Flow Rate, veh/h	384	0	0				0	780	0	385	820	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	5	5	5				0	4	4	4	4	0
Cap, veh/h	619	0					0	1117		458	2271	0
Arrive On Green	0.18	0.00	0.00				0.00	0.32	0.00	0.26	0.65	0.00
Sat Flow, veh/h	3478	0	1547				0	3589	1560	1753	3589	0
Grp Volume(v), veh/h	384	0	0				0	780	0	385	820	0
Grp Sat Flow(s),veh/h/ln	1739	0	1547				0	1749	1560	1753	1749	0
Q Serve(g_s), s	5.2	0.0	0.0				0.0	10.0	0.0	10.6	5.5	0.0
Cycle Q Clear(g_c), s	5.2	0.0	0.0				0.0	10.0	0.0	10.6	5.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	619	0					0	1117		458	2271	0
V/C Ratio(X)	0.62	0.00					0.00	0.70		0.84	0.36	0.00
Avail Cap(c_a), veh/h	2457	0					0	2416		912	2416	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.3	0.0	0.0				0.0	15.2	0.0	17.8	4.1	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0				0.0	0.6	0.0	3.2	0.1	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
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0				0.0	3.3	0.0	4.1	1.1	0.0
Unsig. Movement Delay, s/veh			44.50									
LnGrp Delay(d), s/veh	19.7	0.0	44.5				0.0	15.8	0.0	21.0	4.2	0.0
LnGrp LOS	B		D					B		C	A	
Approach Vol, veh/h		639						780			1205	
Approach Delay, s/veh		29.6						15.8			9.6	
Approach LOS		C						B			A	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		37.9			16.8	21.1		13.1				
Change Period (Y+Rc), s		4.8			3.5	4.8		4.0				
Max Green Setting (Gmax), s		35.2			26.5	35.2		36.0				
Max Q Clear Time (g_c+I1), s		7.5			12.6	12.0		7.2				
Green Ext Time (p_c), s		5.3			0.8	4.3		0.7				

Intersection Summary	
HCM 7th Control Delay, s/veh	16.3
HCM 7th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is included in calculations of the approach delay and intersection delay.

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

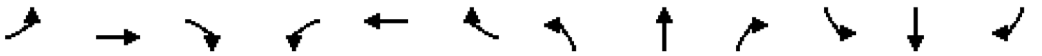
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	15	50	15	30	100	45	840	15	60	985	310
Future Volume (veh/h)	155	15	50	15	30	100	45	840	15	60	985	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	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	1707	1707	1707	1826	1826	1826	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	155	15	50	15	30	100	45	840	15	60	985	310
Peak Hour 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
Percent Heavy Veh, %	13	13	13	5	5	5	2	2	2	4	4	4
Cap, veh/h	215	21	321	83	166	212	144	1522	27	150	1122	351
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.08	0.43	0.43	0.09	0.43	0.43
Sat Flow, veh/h	1489	144	1413	599	1197	1526	1781	3570	64	1753	2606	815
Grp Volume(v), veh/h	170	0	50	45	0	100	45	418	437	60	659	636
Grp Sat Flow(s),veh/h/ln	1633	0	1413	1796	0	1526	1781	1777	1857	1753	1749	1672
Q Serve(g_s), s	7.5	0.0	2.1	1.7	0.0	4.6	1.8	13.3	13.3	2.4	26.0	26.4
Cycle Q Clear(g_c), s	7.5	0.0	2.1	1.7	0.0	4.6	1.8	13.3	13.3	2.4	26.0	26.4
Prop In Lane	0.91		1.00	0.33		1.00	1.00		0.03	1.00		0.49
Lane Grp Cap(c), veh/h	236	0	321	249	0	212	144	757	792	150	753	720
V/C Ratio(X)	0.72	0.00	0.16	0.18	0.00	0.47	0.31	0.55	0.55	0.40	0.87	0.88
Avail Cap(c_a), veh/h	787	0	798	861	0	732	861	833	871	847	820	784
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	23.5	28.7	0.0	30.0	32.7	16.3	16.3	32.7	19.6	19.8
Incr Delay (d2), s/veh	1.6	0.0	0.1	0.1	0.0	0.6	0.5	0.5	0.5	0.6	9.6	10.8
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	3.0	0.0	0.7	0.7	0.0	1.6	0.8	4.8	5.1	1.0	11.6	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.4	0.0	23.6	28.9	0.0	30.6	33.2	16.7	16.7	33.3	29.2	30.5
LnGrp LOS	C		C	C		C	C	B	B	C	C	C
Approach Vol, veh/h		220			145			900			1355	
Approach Delay, s/veh		30.4			30.0			17.5			30.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	14.3	9.6	37.1	14.5	9.9	36.8
Change Period (Y+Rc), s	3.8	3.5	* 4.6	3.6	3.5	* 4.6
Max Green Setting (Gmax), s	36.2	36.5	* 35	36.4	36.5	* 35
Max Q Clear Time (g_c+I1), s	6.6	3.8	28.4	9.5	4.4	15.3
Green Ext Time (p_c), s	0.3	0.0	4.1	0.7	0.1	4.0

Intersection Summary	
HCM 7th Control Delay, s/veh	25.8
HCM 7th LOS	C

Notes

* HCM 7th 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)	260	110	195	45	115	45	135	600	20	25	665	190
Future Volume (veh/h)	260	110	195	45	115	45	135	600	20	25	665	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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	1826	1826	1826	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	260	110	195	45	115	45	135	600	20	25	665	190
Peak Hour 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
Percent Heavy Veh, %	5	5	5	3	3	3	2	2	2	3	3	3
Cap, veh/h	310	142	251	150	189	74	222	1358	45	89	840	240
Arrive On Green	0.18	0.24	0.24	0.09	0.15	0.15	0.12	0.39	0.39	0.05	0.31	0.31
Sat Flow, veh/h	1739	584	1035	1767	1261	493	1781	3509	117	1767	2688	767
Grp Volume(v), veh/h	260	0	305	45	0	160	135	304	316	25	436	419
Grp Sat Flow(s),veh/h/ln	1739	0	1619	1767	0	1754	1781	1777	1849	1767	1763	1692
Q Serve(g_s), s	9.5	0.0	11.6	1.6	0.0	5.6	4.7	8.3	8.3	0.9	14.9	14.9
Cycle Q Clear(g_c), s	9.5	0.0	11.6	1.6	0.0	5.6	4.7	8.3	8.3	0.9	14.9	14.9
Prop In Lane	1.00		0.64	1.00		0.28	1.00		0.06	1.00		0.45
Lane Grp Cap(c), veh/h	310	0	393	150	0	262	222	688	716	89	551	529
V/C Ratio(X)	0.84	0.00	0.78	0.30	0.00	0.61	0.61	0.44	0.44	0.28	0.79	0.79
Avail Cap(c_a), veh/h	698	0	641	710	0	705	715	953	992	710	946	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	23.3	28.3	0.0	26.3	27.3	14.9	14.9	30.2	20.7	20.7
Incr Delay (d2), s/veh	2.3	0.0	1.3	0.4	0.0	0.9	1.0	0.2	0.2	0.6	1.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	4.3	0.7	0.0	2.3	1.9	2.9	3.0	0.4	5.8	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.5	0.0	24.6	28.7	0.0	27.1	28.3	15.1	15.1	30.8	21.7	21.8
LnGrp LOS	C		C	C		C	C	B	B	C	C	C
Approach Vol, veh/h		565			205			755			880	
Approach Delay, s/veh		26.4			27.5			17.5			22.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	13.8	11.7	25.2	9.1	19.9	6.8	30.1
Change Period (Y+Rc), s	3.5	* 3.9	3.5	* 4.6	3.5	3.9	3.5	* 4.6
Max Green Setting (Gmax), s	26.5	* 27	26.5	* 35	26.5	26.1	26.5	* 35
Max Q Clear Time (g_c+I1), s	11.5	7.6	6.7	16.9	3.6	13.6	2.9	10.3
Green Ext Time (p_c), s	0.3	0.5	0.1	3.6	0.0	1.0	0.0	2.2

Intersection Summary	
HCM 7th Control Delay, s/veh	22.1
HCM 7th LOS	C

Notes

* HCM 7th 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)	90	1	45	5	1	5	23	881	1	1	1004	45
Future Volume (veh/h)	90	1	45	5	1	5	23	881	1	1	1004	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	1	49	5	1	5	25	958	1	1	1091	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	1	68	11	2	11	52	1825	2	4	1638	74
Arrive On Green	0.12	0.12	0.12	0.01	0.01	0.01	0.03	0.50	0.50	0.00	0.47	0.47
Sat Flow, veh/h	1133	12	567	770	154	770	1781	3643	4	1781	3464	156
Grp Volume(v), veh/h	148	0	0	11	0	0	25	467	492	1	560	580
Grp Sat Flow(s),veh/h/ln	1712	0	0	1693	0	0	1781	1777	1870	1781	1777	1842
Q Serve(g_s), s	4.1	0.0	0.0	0.3	0.0	0.0	0.7	8.8	8.8	0.0	12.0	12.0
Cycle Q Clear(g_c), s	4.1	0.0	0.0	0.3	0.0	0.0	0.7	8.8	8.8	0.0	12.0	12.0
Prop In Lane	0.66		0.33	0.45		0.45	1.00		0.00	1.00		0.08
Lane Grp Cap(c), veh/h	206	0	0	24	0	0	52	890	936	4	840	871
V/C Ratio(X)	0.72	0.00	0.00	0.46	0.00	0.00	0.48	0.53	0.53	0.28	0.67	0.67
Avail Cap(c_a), veh/h	867	0	0	854	0	0	183	1681	1769	180	1678	1740
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	0.0	0.0	24.2	0.0	0.0	23.7	8.4	8.4	24.7	10.1	10.1
Incr Delay (d2), s/veh	4.6	0.0	0.0	13.0	0.0	0.0	6.6	0.5	0.5	37.4	0.9	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	1.8	0.0	0.0	0.2	0.0	0.0	0.4	2.4	2.5	0.0	3.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.6	0.0	0.0	37.2	0.0	0.0	30.3	8.9	8.8	62.1	11.0	10.9
LnGrp LOS	C			D			C	A	A	E	B	B
Approach Vol, veh/h		148			11			984			1141	
Approach Delay, s/veh		25.6			37.2			9.4			11.0	
Approach LOS		C			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	29.3		10.5	6.0	27.9		5.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	46.9		25.1	5.1	46.8		25.0				
Max Q Clear Time (g_c+I1), s	2.0	10.8		6.1	2.7	14.0		2.3				
Green Ext Time (p_c), s	0.0	6.7		0.7	0.0	9.4		0.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			11.4									
HCM 7th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	60	305	220	90	155	70	515	250	145	680
v/c Ratio	0.12	0.73	0.65	0.26	0.38	0.33	0.64	0.46	0.54	0.63
Control Delay (s/veh)	27.7	42.7	48.4	45.0	10.3	50.6	39.0	7.8	49.6	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.7	42.7	48.4	45.0	10.3	50.6	39.0	7.8	49.6	34.0
Queue Length 50th (ft)	24	147	118	50	0	38	141	0	80	186
Queue Length 95th (ft)	73	309	261	120	60	106	267	69	184	331
Internal Link Dist (ft)		878		976			1238			453
Turn Bay Length (ft)	150		195		200	75		200	95	
Base Capacity (vph)	610	880	510	931	849	519	1787	896	513	1767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.35	0.43	0.10	0.18	0.13	0.29	0.28	0.28	0.38

Intersection Summary

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	215	320	140	815	55	980
v/c Ratio	0.60	0.54	0.79	0.63	0.54	0.35	0.75
Control Delay (s/veh)	60.2	12.0	57.2	63.7	27.2	62.0	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	60.2	12.0	57.2	63.7	27.2	62.0	37.5
Queue Length 50th (ft)	103	0	220	100	225	39	316
Queue Length 95th (ft)	196	73	381	195	388	95	#550
Internal Link Dist (ft)	758		547		632		1238
Turn Bay Length (ft)		100		100		120	
Base Capacity (vph)	610	671	581	423	1534	423	1442
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.32	0.55	0.33	0.53	0.13	0.68

Intersection Summary

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

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	178	177	240	315	845	855	560
v/c Ratio	0.56	0.56	0.56	0.72	0.36	0.63	0.76
Control Delay (s/veh)	37.5	37.3	16.4	38.2	5.8	22.8	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (s/veh)	37.5	37.3	16.4	38.2	5.9	22.8	20.6
Queue Length 50th (ft)	86	85	32	143	70	167	126
Queue Length 95th (ft)	167	166	108	274	146	307	#356
Internal Link Dist (ft)		874			446	632	
Turn Bay Length (ft)			50	175			75
Base Capacity (vph)	834	837	856	646	2929	1750	883
Starvation Cap Reductn	0	0	0	0	700	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.28	0.49	0.38	0.49	0.63

Intersection Summary

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	194	191	510	780	300	385	820
v/c Ratio	0.40	0.39	0.89	0.76	0.45	0.84	0.39
Control Delay (s/veh)	29.8	29.6	40.1	35.9	5.7	53.2	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	29.8	29.6	40.1	35.9	5.7	53.2	11.1
Queue Length 50th (ft)	101	98	210	238	0	234	137
Queue Length 95th (ft)	177	174	#420	323	61	#448	194
Internal Link Dist (ft)		679		657			446
Turn Bay Length (ft)			50		220	180	
Base Capacity (vph)	662	665	718	1376	782	518	2502
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.29	0.71	0.57	0.38	0.74	0.33

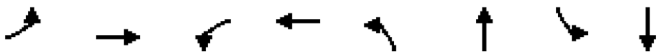
Intersection Summary

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

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	170	50	45	100	45	855	60	1295
v/c Ratio	0.61	0.11	0.19	0.35	0.21	0.56	0.31	0.90
Control Delay (s/veh)	42.5	6.4	38.3	12.2	39.7	21.3	42.3	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.5	6.4	38.3	12.2	39.7	21.3	42.3	34.6
Queue Length 50th (ft)	87	0	22	0	22	176	30	332
Queue Length 95th (ft)	150	23	60	47	60	298	74	#592
Internal Link Dist (ft)	655		515			251		657
Turn Bay Length (ft)		140			85		110	
Base Capacity (vph)	703	891	774	717	776	1526	761	1432
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.06	0.06	0.14	0.06	0.56	0.08	0.90

Intersection Summary

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

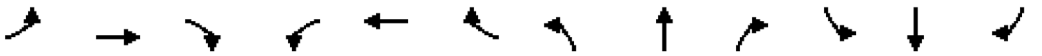


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	260	305	45	160	135	620	25	855
v/c Ratio	0.73	0.54	0.22	0.56	0.55	0.39	0.14	0.78
Control Delay (s/veh)	48.6	27.2	47.0	43.2	49.4	19.7	47.6	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	48.6	27.2	47.0	43.2	49.4	19.7	47.6	34.1
Queue Length 50th (ft)	138	128	24	79	73	102	13	214
Queue Length 95th (ft)	280	243	72	168	162	243	48	398
Internal Link Dist (ft)		710		228		480		903
Turn Bay Length (ft)	110				95		55	
Base Capacity (vph)	526	585	537	548	542	1646	537	1395
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.52	0.08	0.29	0.25	0.38	0.05	0.61

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	148	11	25	959	1	1140
v/c Ratio	0.44	0.06	0.16	0.45	0.01	0.56
Control Delay (s/veh)	26.5	27.4	35.9	8.8	36.0	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	26.5	27.4	35.9	8.8	36.0	11.3
Queue Length 50th (ft)	33	2	7	67	0	86
Queue Length 95th (ft)	129	21	41	254	6	322
Internal Link Dist (ft)	329	438		256		304
Turn Bay Length (ft)			100		50	
Base Capacity (vph)	776	760	159	2938	156	2916
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.01	0.16	0.33	0.01	0.39

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	90	115	300	115	130	130	445	335	130	610	20
Future Volume (veh/h)	15	90	115	300	115	130	130	445	335	130	610	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	15	90	115	300	115	130	130	445	335	130	610	20
Peak Hour 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
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	376	125	159	353	271	224	253	767	333	278	823	27
Arrive On Green	0.21	0.17	0.17	0.20	0.14	0.14	0.14	0.21	0.21	0.15	0.23	0.23
Sat Flow, veh/h	1795	741	947	1781	1870	1544	1795	3582	1557	1795	3536	116
Grp Volume(v), veh/h	15	0	205	300	115	130	130	445	335	130	309	321
Grp Sat Flow(s),veh/h/ln	1795	0	1688	1781	1870	1544	1795	1791	1557	1795	1791	1861
Q Serve(g_s), s	0.4	0.0	7.3	10.4	3.6	3.4	4.3	7.1	7.5	4.2	10.2	10.2
Cycle Q Clear(g_c), s	0.4	0.0	7.3	10.4	3.6	3.4	4.3	7.1	7.5	4.2	10.2	10.2
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	376	0	284	353	271	224	253	767	333	278	417	433
V/C Ratio(X)	0.04	0.00	0.72	0.85	0.42	0.58	0.51	0.58	1.00	0.47	0.74	0.74
Avail Cap(c_a), veh/h	736	0	1199	730	1328	1097	741	2543	1106	733	1272	1321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	25.2	24.7	24.9	12.0	25.4	22.5	7.6	24.6	22.7	22.7
Incr Delay (d2), s/veh	0.0	0.0	1.3	2.2	0.4	0.9	0.6	0.3	15.1	0.5	1.0	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	0.2	0.0	2.9	4.1	1.5	1.7	1.7	2.7	5.3	1.7	4.1	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.2	0.0	26.5	26.9	25.3	12.9	26.0	22.8	22.7	25.1	23.7	23.7
LnGrp LOS	C		C	C	C	B	C	C	F	C	C	C
Approach Vol, veh/h		220			545			910			760	
Approach Delay, s/veh		26.0			23.2			23.2			23.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	13.9	12.6	19.5	16.5	15.4	13.8	18.3
Change Period (Y+Rc), s	* 4.6	* 4.6	3.6	* 4.6	3.8	* 4.6	3.9	* 4.6
Max Green Setting (Gmax), s	* 26	* 45	26.4	* 45	26.2	* 45	26.1	* 45
Max Q Clear Time (g_c+I1), s	2.4	5.6	6.3	12.2	12.4	9.3	6.2	9.5
Green Ext Time (p_c), s	0.0	0.6	0.1	2.6	0.4	0.9	0.2	2.4

Intersection Summary	
HCM 7th Control Delay, s/veh	23.7
HCM 7th LOS	C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

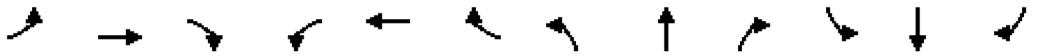
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	55	165	235	90	50	215	835	155	100	860	25
Future Volume (veh/h)	35	55	165	235	90	50	215	835	155	100	860	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	55	165	235	90	50	215	835	155	100	860	25
Peak Hour 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
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	101	159	219	275	105	59	255	1022	190	172	1044	30
Arrive On Green	0.14	0.14	0.14	0.25	0.25	0.25	0.14	0.34	0.34	0.10	0.29	0.29
Sat Flow, veh/h	719	1130	1559	1115	427	237	1795	3001	557	1795	3551	103
Grp Volume(v), veh/h	90	0	165	375	0	0	215	498	492	100	434	451
Grp Sat Flow(s),veh/h/ln	1849	0	1559	1780	0	0	1795	1791	1767	1795	1791	1863
Q Serve(g_s), s	3.8	0.0	8.7	17.2	0.0	0.0	10.0	21.7	21.7	4.6	19.3	19.3
Cycle Q Clear(g_c), s	3.8	0.0	8.7	17.2	0.0	0.0	10.0	21.7	21.7	4.6	19.3	19.3
Prop In Lane	0.39		1.00	0.63		0.13	1.00		0.32	1.00		0.06
Lane Grp Cap(c), veh/h	260	0	219	439	0	0	255	610	602	172	527	548
V/C Ratio(X)	0.35	0.00	0.75	0.85	0.00	0.00	0.84	0.82	0.82	0.58	0.82	0.82
Avail Cap(c_a), veh/h	790	0	666	760	0	0	557	952	939	557	952	990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	0.0	35.3	30.7	0.0	0.0	35.7	25.7	25.7	37.0	28.1	28.1
Incr Delay (d2), s/veh	0.3	0.0	2.0	1.9	0.0	0.0	2.9	1.6	1.6	1.2	1.3	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	1.7	0.0	3.3	7.4	0.0	0.0	4.4	8.8	8.7	2.0	8.1	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	33.5	0.0	37.3	32.6	0.0	0.0	38.6	27.3	27.4	38.2	29.4	29.3
LnGrp LOS	C		D	C			D	C	C	D	C	C
Approach Vol, veh/h		255			375			1205			985	
Approach Delay, s/veh		35.9			32.6			29.4			30.2	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	24.6	15.6	29.7	15.5	11.7	33.7
Change Period (Y+Rc), s	3.5	3.5	* 4.6	3.5	3.5	* 4.6
Max Green Setting (Gmax), s	36.5	26.5	* 45	36.5	26.5	* 45
Max Q Clear Time (g_c+I1), s	19.2	12.0	21.3	10.7	6.6	23.7
Green Ext Time (p_c), s	1.4	0.2	3.8	0.6	0.1	3.9

Intersection Summary	
HCM 7th Control Delay, s/veh	30.7
HCM 7th LOS	C

Notes

* HCM 7th 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)	0	0	0	320	0	350	435	970	0	0	765	550
Future Volume (veh/h)	0	0	0	320	0	350	435	970	0	0	765	550
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				320	0	0	435	970	0	0	765	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				579	0		509	2390	0	0	1131	
Arrive On Green				0.16	0.00	0.00	0.28	0.67	0.00	0.00	0.32	0.00
Sat Flow, veh/h				3591	0	1598	1795	3676	0	0	3676	1598
Grp Volume(v), veh/h				320	0	0	435	970	0	0	765	0
Grp Sat Flow(s),veh/h/ln				1795	0	1598	1795	1791	0	0	1791	1598
Q Serve(g_s), s				4.2	0.0	0.0	11.8	6.3	0.0	0.0	9.5	0.0
Cycle Q Clear(g_c), s				4.2	0.0	0.0	11.8	6.3	0.0	0.0	9.5	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				579	0		509	2390	0	0	1131	
V/C Ratio(X)				0.55	0.00		0.86	0.41	0.00	0.00	0.68	
Avail Cap(c_a), veh/h				2517	0		927	2455	0	0	2455	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				19.8	0.0	0.0	17.4	3.9	0.0	0.0	15.3	0.0
Incr Delay (d2), s/veh				0.3	0.0	0.0	3.2	0.1	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				1.6	0.0	0.0	4.4	0.9	0.0	0.0	3.4	0.0
Unsig. Movement Delay, s/veh						38.50						32.30
LnGrp Delay(d), s/veh				20.1	0.0	38.5	20.6	4.0	0.0	0.0	15.8	32.3
LnGrp LOS				C		D	C	A			B	C
Approach Vol, veh/h					495			1405			1040	
Approach Delay, s/veh					26.6			9.1			20.2	
Approach LOS					C			A			C	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.1	21.0		12.3		39.1						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	13.8	11.5		6.2		8.3						
Green Ext Time (p_c), s	0.8	4.7		0.6		5.9						

Intersection Summary		
HCM 7th Control Delay, s/veh		16.0
HCM 7th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR, SBR] is included in calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	520	15	465	0	0	0	0	885	325	330	755	0
Future Volume (veh/h)	520	15	465	0	0	0	0	885	325	330	755	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1870	1870	1885	1885	0
Adj Flow Rate, veh/h	531	0	0				0	885	0	330	755	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3				0	2	2	1	1	0
Cap, veh/h	708	0					0	1232		400	2274	0
Arrive On Green	0.20	0.00	0.00				0.00	0.35	0.00	0.22	0.63	0.00
Sat Flow, veh/h	3534	0	1572				0	3647	1585	1795	3676	0
Grp Volume(v), veh/h	531	0	0				0	885	0	330	755	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1777	1585	1795	1791	0
Q Serve(g_s), s	7.6	0.0	0.0				0.0	11.6	0.0	9.3	5.2	0.0
Cycle Q Clear(g_c), s	7.6	0.0	0.0				0.0	11.6	0.0	9.3	5.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	708	0					0	1232		400	2274	0
V/C Ratio(X)	0.75	0.00					0.00	0.72		0.82	0.33	0.00
Avail Cap(c_a), veh/h	2382	0					0	2342		891	2361	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.1	0.0	0.0				0.0	15.2	0.0	19.8	4.5	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.0				0.0	0.6	0.0	3.3	0.1	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
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0				0.0	3.8	0.0	3.9	1.2	0.0
Unsig. Movement Delay, s/veh			33.50									
LnGrp Delay(d), s/veh	20.7	0.0	33.5				0.0	15.8	0.0	23.0	4.6	0.0
LnGrp LOS	C		C					B		C	A	
Approach Vol, veh/h		761						885			1085	
Approach Delay, s/veh		24.6						15.8			10.2	
Approach LOS		C						B			B	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		38.7			15.4	23.3		14.7				
Change Period (Y+Rc), s		4.8			3.5	4.8		4.0				
Max Green Setting (Gmax), s		35.2			26.5	35.2		36.0				
Max Q Clear Time (g_c+I1), s		7.2			11.3	13.6		9.6				
Green Ext Time (p_c), s		4.8			0.6	4.9		1.0				

Intersection Summary			
HCM 7th Control Delay, s/veh		16.0	
HCM 7th LOS		B	

Notes
User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [EBR] is included in calculations of the approach delay and intersection delay.

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

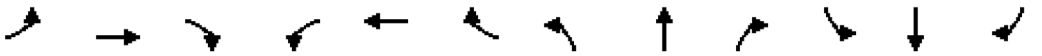
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	15	45	20	10	95	30	965	25	70	1035	140
Future Volume (veh/h)	230	15	45	20	10	95	30	965	25	70	1035	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1856	1856	1856	1856	1856	1856	1885	1885	1885	1856	1856	1856
Adj Flow Rate, veh/h	230	15	45	20	10	95	30	965	25	70	1035	140
Peak Hour 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
Percent Heavy Veh, %	3	3	3	3	3	3	1	1	1	3	3	3
Cap, veh/h	302	20	377	168	84	217	112	1316	34	166	1245	168
Arrive On Green	0.18	0.18	0.18	0.14	0.14	0.14	0.06	0.37	0.37	0.09	0.40	0.40
Sat Flow, veh/h	1664	109	1537	1197	599	1549	1795	3564	92	1767	3107	420
Grp Volume(v), veh/h	245	0	45	30	0	95	30	485	505	70	587	588
Grp Sat Flow(s),veh/h/ln	1772	0	1537	1796	0	1549	1795	1791	1865	1767	1763	1764
Q Serve(g_s), s	9.5	0.0	1.6	1.1	0.0	4.0	1.1	16.9	16.9	2.7	21.5	21.6
Cycle Q Clear(g_c), s	9.5	0.0	1.6	1.1	0.0	4.0	1.1	16.9	16.9	2.7	21.5	21.6
Prop In Lane	0.94		1.00	0.67		1.00	1.00		0.05	1.00		0.24
Lane Grp Cap(c), veh/h	321	0	377	252	0	217	112	661	689	166	706	707
V/C Ratio(X)	0.76	0.00	0.12	0.12	0.00	0.44	0.27	0.73	0.73	0.42	0.83	0.83
Avail Cap(c_a), veh/h	895	0	875	902	0	778	910	880	916	895	866	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	21.2	27.1	0.0	28.4	32.2	19.7	19.7	30.8	19.4	19.4
Incr Delay (d2), s/veh	1.4	0.0	0.1	0.1	0.0	0.5	0.5	1.8	1.7	0.6	5.4	5.4
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	4.0	0.0	0.6	0.4	0.0	1.4	0.5	6.5	6.8	1.1	9.1	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.4	0.0	21.3	27.2	0.0	28.9	32.7	21.5	21.4	31.4	24.7	24.9
LnGrp LOS	C		C	C		C	C	C	C	C	C	C
Approach Vol, veh/h		290			125			1020			1245	
Approach Delay, s/veh		28.2			28.5			21.8			25.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	13.9	8.0	33.5	16.7	10.3	31.2
Change Period (Y+Rc), s	3.8	3.5	* 4.6	3.6	3.5	* 4.6
Max Green Setting (Gmax), s	36.2	36.5	* 35	36.4	36.5	* 35
Max Q Clear Time (g_c+I1), s	6.0	3.1	23.6	11.5	4.7	18.9
Green Ext Time (p_c), s	0.3	0.0	5.3	1.0	0.1	4.5

Intersection Summary	
HCM 7th Control Delay, s/veh	24.4
HCM 7th LOS	C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.



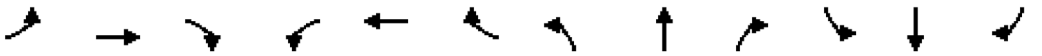
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	160	230	15	120	40	190	625	25	45	610	235
Future Volume (veh/h)	280	160	230	15	120	40	190	625	25	45	610	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		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	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	280	160	230	15	120	40	190	625	25	45	610	235
Peak Hour 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
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	332	202	290	65	192	64	237	1265	51	137	771	296
Arrive On Green	0.18	0.29	0.29	0.04	0.14	0.14	0.13	0.36	0.36	0.08	0.31	0.31
Sat Flow, veh/h	1795	693	996	1795	1348	449	1781	3478	139	1795	2506	964
Grp Volume(v), veh/h	280	0	390	15	0	160	190	319	331	45	436	409
Grp Sat Flow(s),veh/h/ln	1795	0	1690	1795	0	1797	1781	1777	1840	1795	1791	1679
Q Serve(g_s), s	10.0	0.0	14.2	0.5	0.0	5.6	6.9	9.3	9.3	1.6	14.8	14.9
Cycle Q Clear(g_c), s	10.0	0.0	14.2	0.5	0.0	5.6	6.9	9.3	9.3	1.6	14.8	14.9
Prop In Lane	1.00		0.59	1.00		0.25	1.00		0.08	1.00		0.57
Lane Grp Cap(c), veh/h	332	0	491	65	0	256	237	647	669	137	551	516
V/C Ratio(X)	0.84	0.00	0.79	0.23	0.00	0.63	0.80	0.49	0.49	0.33	0.79	0.79
Avail Cap(c_a), veh/h	714	0	662	714	0	715	708	944	977	714	951	892
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	21.8	31.2	0.0	26.9	28.1	16.4	16.4	29.2	21.1	21.1
Incr Delay (d2), s/veh	2.3	0.0	3.3	0.7	0.0	0.9	2.4	0.2	0.2	0.5	1.0	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	4.3	0.0	5.6	0.2	0.0	2.3	2.9	3.3	3.4	0.7	5.9	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.5	0.0	25.1	31.9	0.0	27.8	30.5	16.7	16.6	29.7	22.1	22.2
LnGrp LOS	C		C	C		C	C	B	B	C	C	C
Approach Vol, veh/h		670			175			840			890	
Approach Delay, s/veh		26.5			28.2			19.8			22.5	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	13.4	12.3	25.1	5.9	23.3	8.6	28.8
Change Period (Y+Rc), s	3.5	* 3.9	3.5	* 4.6	3.5	3.9	3.5	* 4.6
Max Green Setting (Gmax), s	26.5	* 27	26.5	* 35	26.5	26.1	26.5	* 35
Max Q Clear Time (g_c+I1), s	12.0	7.6	8.9	16.9	2.5	16.2	3.6	11.3
Green Ext Time (p_c), s	0.4	0.5	0.2	3.6	0.0	1.2	0.0	2.3

Intersection Summary	
HCM 7th Control Delay, s/veh	23.1
HCM 7th LOS	C

Notes

* HCM 7th 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)	45	1	23	5	1	5	45	899	1	1	1009	90
Future Volume (veh/h)	45	1	23	5	1	5	45	899	1	1	1009	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	1	23	5	1	5	45	899	1	1	1009	90
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	2	37	11	2	11	85	1899	2	4	1567	140
Arrive On Green	0.06	0.06	0.06	0.01	0.01	0.01	0.05	0.52	0.52	0.00	0.47	0.47
Sat Flow, veh/h	1116	25	571	770	154	770	1781	3642	4	1781	3300	294
Grp Volume(v), veh/h	69	0	0	11	0	0	45	439	461	1	543	556
Grp Sat Flow(s),veh/h/ln	1712	0	0	1693	0	0	1781	1777	1870	1781	1777	1817
Q Serve(g_s), s	1.8	0.0	0.0	0.3	0.0	0.0	1.1	7.1	7.1	0.0	10.4	10.4
Cycle Q Clear(g_c), s	1.8	0.0	0.0	0.3	0.0	0.0	1.1	7.1	7.1	0.0	10.4	10.4
Prop In Lane	0.65		0.33	0.45		0.45	1.00		0.00	1.00		0.16
Lane Grp Cap(c), veh/h	110	0	0	24	0	0	85	926	975	4	844	863
V/C Ratio(X)	0.63	0.00	0.00	0.46	0.00	0.00	0.53	0.47	0.47	0.25	0.64	0.64
Avail Cap(c_a), veh/h	952	0	0	938	0	0	257	1843	1939	201	1788	1829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	0.0	0.0	22.1	0.0	0.0	21.0	6.9	6.9	22.5	9.0	9.0
Incr Delay (d2), s/veh	5.8	0.0	0.0	12.8	0.0	0.0	5.0	0.4	0.4	30.6	0.8	0.8
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	0.8	0.0	0.0	0.2	0.0	0.0	0.5	1.6	1.7	0.0	3.1	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.4	0.0	0.0	34.8	0.0	0.0	26.0	7.2	7.2	53.1	9.8	9.8
LnGrp LOS	C			C			C	A	A	D	A	A
Approach Vol, veh/h		69			11			945			1100	
Approach Delay, s/veh		26.4			34.8			8.1			9.8	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	28.0		7.4	6.7	25.9		5.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	46.8		25.1	6.5	45.4		25.0				
Max Q Clear Time (g_c+I1), s	2.0	9.1		3.8	3.1	12.4		2.3				
Green Ext Time (p_c), s	0.0	6.1		0.3	0.0	9.0		0.0				

Intersection Summary			
HCM 7th Control Delay, s/veh		9.7	
HCM 7th LOS		A	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	15	205	300	115	130	130	445	335	130	630
v/c Ratio	0.06	0.66	0.59	0.14	0.17	0.54	0.55	0.55	0.52	0.75
Control Delay (s/veh)	36.8	41.0	38.4	23.9	6.6	49.6	35.4	7.4	48.6	40.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	36.8	41.0	38.4	23.9	6.6	49.6	35.4	7.4	48.6	40.3
Queue Length 50th (ft)	8	90	148	35	0	72	117	0	72	175
Queue Length 95th (ft)	27	190	#349	134	53	158	205	73	158	294
Internal Link Dist (ft)		878		976			1238			453
Turn Bay Length (ft)	150		195		200	75		200	95	
Base Capacity (vph)	521	861	505	930	838	513	1767	941	508	1758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.24	0.59	0.12	0.16	0.25	0.25	0.36	0.26	0.36

Intersection Summary

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

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	165	375	215	990	100	885
v/c Ratio	0.43	0.51	0.79	0.73	0.74	0.54	0.77
Control Delay (s/veh)	58.9	13.7	53.9	64.2	35.7	65.2	42.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	58.9	13.7	53.9	64.2	35.7	65.2	42.5
Queue Length 50th (ft)	65	0	248	153	324	72	314
Queue Length 95th (ft)	133	66	#510	289	520	155	497
Internal Link Dist (ft)	758		547		632		1238
Turn Bay Length (ft)		100		100		120	
Base Capacity (vph)	593	614	576	417	1470	417	1423
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.27	0.65	0.52	0.67	0.24	0.62

Intersection Summary

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

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	160	160	350	435	970	765	550
v/c Ratio	0.43	0.43	0.80	0.78	0.40	0.67	0.82
Control Delay (s/veh)	33.3	33.3	34.8	42.6	7.9	29.4	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (s/veh)	33.3	33.3	34.8	42.6	8.1	29.4	26.2
Queue Length 50th (ft)	83	83	125	230	110	187	147
Queue Length 95th (ft)	148	148	232	#502	220	301	#383
Internal Link Dist (ft)		874			446	632	
Turn Bay Length (ft)			50	175			75
Base Capacity (vph)	722	722	739	559	2752	1487	787
Starvation Cap Reductn	0	0	0	0	754	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.22	0.47	0.78	0.49	0.51	0.70

Intersection Summary

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

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	265	270	465	885	325	330	755
v/c Ratio	0.57	0.58	0.81	0.78	0.30	0.76	0.35
Control Delay (s/veh)	33.3	33.5	29.2	33.3	1.9	45.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.3	33.5	29.2	33.3	1.9	45.5	9.5
Queue Length 50th (ft)	132	135	141	232	0	170	98
Queue Length 95th (ft)	241	247	297	375	35	#347	174
Internal Link Dist (ft)		679		657			446
Turn Bay Length (ft)			50		220	180	
Base Capacity (vph)	763	767	817	1586	1267	603	2770
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.35	0.57	0.56	0.26	0.55	0.27

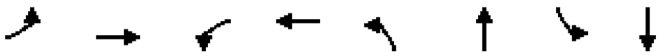
Intersection Summary

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

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	245	45	30	95	30	990	70	1175
v/c Ratio	0.69	0.08	0.12	0.32	0.13	0.62	0.33	0.77
Control Delay (s/veh)	43.9	6.4	38.6	12.2	39.7	23.4	43.2	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.9	6.4	38.6	12.2	39.7	23.4	43.2	27.5
Queue Length 50th (ft)	130	0	15	0	15	230	37	305
Queue Length 95th (ft)	214	22	45	47	46	366	84	#495
Internal Link Dist (ft)	655		515			251		657
Turn Bay Length (ft)		140			85		110	
Base Capacity (vph)	803	1042	810	753	817	1597	801	1533
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.04	0.04	0.13	0.04	0.62	0.09	0.77

Intersection Summary

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



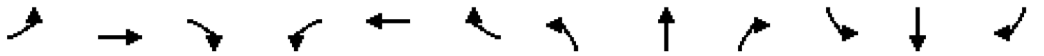
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	280	390	15	160	190	650	45	845
v/c Ratio	0.75	0.62	0.08	0.55	0.66	0.43	0.25	0.80
Control Delay (s/veh)	51.1	30.4	49.3	45.6	51.7	21.9	50.9	36.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.1	30.4	49.3	45.6	51.7	21.9	50.9	36.8
Queue Length 50th (ft)	158	157	8	85	109	150	26	226
Queue Length 95th (ft)	#329	356	34	178	220	260	75	#409
Internal Link Dist (ft)		710		228		480		903
Turn Bay Length (ft)	110				95		55	
Base Capacity (vph)	526	632	526	540	521	1576	526	1363
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.62	0.03	0.30	0.36	0.41	0.09	0.62

Intersection Summary

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

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	11	45	900	1	1099
v/c Ratio	0.26	0.06	0.21	0.35	0.01	0.49
Control Delay (s/veh)	23.8	25.1	31.6	6.3	32.0	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.8	25.1	31.6	6.3	32.0	10.2
Queue Length 50th (ft)	15	2	14	46	0	125
Queue Length 95th (ft)	63	19	56	203	6	274
Internal Link Dist (ft)	329	438		256		304
Turn Bay Length (ft)			100		50	
Base Capacity (vph)	863	847	227	2898	178	2801
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.20	0.31	0.01	0.39

Intersection Summary



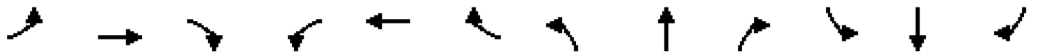
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	190	100	135	95	180	55	445	220	225	500	55
Future Volume (veh/h)	75	190	100	135	95	180	55	445	220	225	500	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	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	1885	1885	1885	1841	1841	1841	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	75	190	100	135	95	180	55	445	220	225	500	55
Peak Hour 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
Percent Heavy Veh, %	1	1	1	4	4	4	3	3	3	3	3	3
Cap, veh/h	295	232	122	172	238	193	130	466	230	256	778	86
Arrive On Green	0.16	0.20	0.20	0.10	0.13	0.13	0.07	0.40	0.40	0.14	0.48	0.48
Sat Flow, veh/h	1795	1143	602	1753	1841	1490	1767	1161	574	1767	1637	180
Grp Volume(v), veh/h	75	0	290	135	95	180	55	0	665	225	0	555
Grp Sat Flow(s),veh/h/ln	1795	0	1744	1753	1841	1490	1767	0	1735	1767	0	1818
Q Serve(g_s), s	4.0	0.0	17.6	8.3	5.2	11.0	3.3	0.0	41.1	13.8	0.0	25.5
Cycle Q Clear(g_c), s	4.0	0.0	17.6	8.3	5.2	11.0	3.3	0.0	41.1	13.8	0.0	25.5
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.33	1.00		0.10
Lane Grp Cap(c), veh/h	295	0	354	172	238	193	130	0	696	256	0	863
V/C Ratio(X)	0.25	0.00	0.82	0.79	0.40	0.93	0.42	0.00	0.95	0.88	0.00	0.64
Avail Cap(c_a), veh/h	426	0	717	416	756	613	390	0	744	386	0	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.3	0.0	42.1	48.7	44.2	32.8	48.9	0.0	32.1	46.3	0.0	21.9
Incr Delay (d2), s/veh	0.2	0.0	1.8	3.0	0.4	8.3	0.8	0.0	21.4	10.2	0.0	1.3
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	1.8	0.0	7.8	3.7	2.4	4.3	1.5	0.0	20.4	6.7	0.0	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.4	0.0	43.9	51.7	44.6	41.1	49.7	0.0	53.5	56.5	0.0	23.2
LnGrp LOS	D		D	D	D	D	D		D	E		C
Approach Vol, veh/h		365			410			720			780	
Approach Delay, s/veh		43.2			45.4			53.2			32.8	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.8	18.9	11.8	57.1	14.6	27.0	19.9	49.0
Change Period (Y+Rc), s	* 4.6	* 4.6	3.6	* 4.6	3.8	* 4.6	3.9	* 4.6
Max Green Setting (Gmax), s	* 26	* 45	24.4	* 47	26.2	* 45	24.1	* 47
Max Q Clear Time (g_c+I1), s	6.0	13.0	5.3	27.5	10.3	19.6	15.8	43.1
Green Ext Time (p_c), s	0.1	0.6	0.0	2.4	0.1	1.3	0.2	1.2

Intersection Summary	
HCM 7th Control Delay, s/veh	43.2
HCM 7th LOS	D

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.



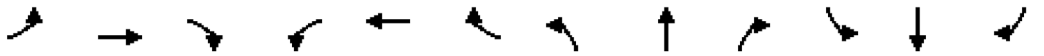
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	95	210	245	80	65	125	570	100	45	685	35
Future Volume (veh/h)	45	95	210	245	80	65	125	570	100	45	685	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.97	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	1870	1870	1870	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	95	210	245	80	65	125	570	100	45	685	35
Peak Hour 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
Percent Heavy Veh, %	2	2	2	3	3	3	3	3	3	3	3	3
Cap, veh/h	89	189	240	265	86	70	151	800	658	100	704	36
Arrive On Green	0.15	0.15	0.15	0.24	0.24	0.24	0.09	0.43	0.43	0.06	0.40	0.40
Sat Flow, veh/h	592	1249	1585	1092	357	290	1767	1856	1527	1767	1750	89
Grp Volume(v), veh/h	140	0	210	390	0	0	125	570	100	45	0	720
Grp Sat Flow(s),veh/h/ln	1841	0	1585	1739	0	0	1767	1856	1527	1767	0	1839
Q Serve(g_s), s	8.9	0.0	16.4	27.8	0.0	0.0	8.8	32.0	5.1	3.1	0.0	48.8
Cycle Q Clear(g_c), s	8.9	0.0	16.4	27.8	0.0	0.0	8.8	32.0	5.1	3.1	0.0	48.8
Prop In Lane	0.32		1.00	0.63		0.17	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	278	0	240	421	0	0	151	800	658	100	0	740
V/C Ratio(X)	0.50	0.00	0.88	0.93	0.00	0.00	0.83	0.71	0.15	0.45	0.00	0.97
Avail Cap(c_a), veh/h	457	0	394	500	0	0	355	800	658	355	0	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.5	0.0	52.7	47.0	0.0	0.0	57.1	29.6	22.0	58.0	0.0	37.2
Incr Delay (d2), s/veh	0.5	0.0	6.8	19.9	0.0	0.0	4.4	2.6	0.0	1.2	0.0	26.1
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	4.1	0.0	6.9	14.3	0.0	0.0	4.1	14.3	1.8	1.4	0.0	26.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	50.0	0.0	59.4	66.8	0.0	0.0	61.5	32.2	22.0	59.1	0.0	63.4
LnGrp LOS	D		E	E			E	C	C	E		E
Approach Vol, veh/h		350			390			795			765	
Approach Delay, s/veh		55.7			66.8			35.5			63.1	
Approach LOS		E			E			D			E	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	34.2	14.3	55.6	22.7	10.7	59.3
Change Period (Y+Rc), s	3.5	3.5	* 4.6	3.5	3.5	* 4.6
Max Green Setting (Gmax), s	36.5	25.5	* 51	31.5	25.5	* 51
Max Q Clear Time (g_c+I1), s	29.8	10.8	50.8	18.4	5.1	34.0
Green Ext Time (p_c), s	0.9	0.1	0.2	0.7	0.0	2.2

Intersection Summary	
HCM 7th Control Delay, s/veh	53.1
HCM 7th LOS	D

Notes

* HCM 7th 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)	0	0	0	285	5	205	300	735	0	0	695	560
Future Volume (veh/h)	0	0	0	285	5	205	300	735	0	0	695	560
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1841	1841	1841	1841	1841	0	0	1870	1870
Adj Flow Rate, veh/h				289	0	0	300	735	0	0	695	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				4	4	4	4	4	0	0	2	2
Cap, veh/h				643	0		378	2136	0	0	1114	
Arrive On Green				0.18	0.00	0.00	0.22	0.61	0.00	0.00	0.31	0.00
Sat Flow, veh/h				3506	0	1560	1753	3589	0	0	3647	1585
Grp Volume(v), veh/h				289	0	0	300	735	0	0	695	0
Grp Sat Flow(s),veh/h/ln				1753	0	1560	1753	1749	0	0	1777	1585
Q Serve(g_s), s				3.1	0.0	0.0	6.9	4.4	0.0	0.0	7.1	0.0
Cycle Q Clear(g_c), s				3.1	0.0	0.0	6.9	4.4	0.0	0.0	7.1	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				643	0		378	2136	0	0	1114	
V/C Ratio(X)				0.45	0.00		0.79	0.34	0.00	0.00	0.62	
Avail Cap(c_a), veh/h				2951	0		1086	2878	0	0	2924	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				15.5	0.0	0.0	15.9	4.1	0.0	0.0	12.5	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	2.8	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	2.5	0.6	0.0	0.0	2.3	0.0
Unsig. Movement Delay, s/veh						23.10						20.20
LnGrp Delay(d), s/veh				15.7	0.0	23.1	18.7	4.2	0.0	0.0	13.0	20.2
LnGrp LOS				B		C	B	A			B	C
Approach Vol, veh/h					394			1035			975	
Approach Delay, s/veh					17.7			8.4			15.0	
Approach LOS					B			A			B	

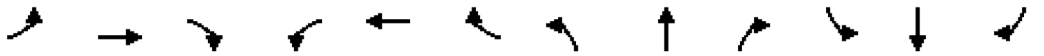
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	12.7	18.2		11.8		30.9						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	8.9	9.1		5.1		6.4						
Green Ext Time (p_c), s	0.6	4.3		0.5		4.2						

Intersection Summary		
HCM 7th Control Delay, s/veh		12.6
HCM 7th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR, SBR] is included in calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	5	435	0	0	0	0	655	295	375	605	0
Future Volume (veh/h)	360	5	435	0	0	0	0	655	295	375	605	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826				0	1841	1841	1841	1841	0
Adj Flow Rate, veh/h	364	0	0				0	655	0	375	605	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	5	5	5				0	4	4	4	4	0
Cap, veh/h	672	0					0	995		454	2162	0
Arrive On Green	0.19	0.00	0.00				0.00	0.28	0.00	0.26	0.62	0.00
Sat Flow, veh/h	3478	0	1547				0	3589	1560	1753	3589	0
Grp Volume(v), veh/h	364	0	0				0	655	0	375	605	0
Grp Sat Flow(s),veh/h/ln	1739	0	1547				0	1749	1560	1753	1749	0
Q Serve(g_s), s	4.4	0.0	0.0				0.0	7.7	0.0	9.4	3.7	0.0
Cycle Q Clear(g_c), s	4.4	0.0	0.0				0.0	7.7	0.0	9.4	3.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	672	0					0	995		454	2162	0
V/C Ratio(X)	0.54	0.00					0.00	0.66		0.83	0.28	0.00
Avail Cap(c_a), veh/h	2682	0					0	2637		995	2637	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.0	0.0	0.0				0.0	14.7	0.0	16.3	4.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0				0.0	0.6	0.0	2.9	0.1	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
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0				0.0	2.5	0.0	3.6	0.8	0.0
Unsig. Movement Delay, s/veh			27.70									
LnGrp Delay(d), s/veh	17.2	0.0	27.7				0.0	15.3	0.0	19.2	4.2	0.0
LnGrp LOS	B		C					B		B	A	
Approach Vol, veh/h		579						655			980	
Approach Delay, s/veh		21.1						15.3			9.9	
Approach LOS		C						B			A	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		33.7			15.6	18.1		13.0				
Change Period (Y+Rc), s		4.8			3.5	4.8		4.0				
Max Green Setting (Gmax), s		35.2			26.5	35.2		36.0				
Max Q Clear Time (g_c+I1), s		5.7			11.4	9.7		6.4				
Green Ext Time (p_c), s		3.7			0.8	3.6		0.7				

Intersection Summary	
HCM 7th Control Delay, s/veh	14.4
HCM 7th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is included in calculations of the approach delay and intersection delay.

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

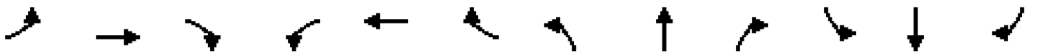
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	25	40	15	35	115	45	680	20	95	670	285
Future Volume (veh/h)	150	25	40	15	35	115	45	680	20	95	670	285
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		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	1707	1707	1707	1826	1826	1826	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	150	25	40	15	35	115	45	680	20	95	670	285
Peak Hour 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
Percent Heavy Veh, %	13	13	13	5	5	5	2	2	2	4	4	4
Cap, veh/h	206	34	323	75	176	211	143	739	22	179	792	656
Arrive On Green	0.15	0.15	0.15	0.14	0.14	0.14	0.08	0.41	0.41	0.10	0.43	0.43
Sat Flow, veh/h	1403	234	1413	540	1259	1512	1781	1806	53	1753	1841	1524
Grp Volume(v), veh/h	175	0	40	50	0	115	45	0	700	95	670	285
Grp Sat Flow(s),veh/h/ln	1637	0	1413	1799	0	1512	1781	0	1859	1753	1841	1524
Q Serve(g_s), s	7.8	0.0	1.7	1.9	0.0	5.4	1.8	0.0	27.3	3.9	24.9	10.0
Cycle Q Clear(g_c), s	7.8	0.0	1.7	1.9	0.0	5.4	1.8	0.0	27.3	3.9	24.9	10.0
Prop In Lane	0.86		1.00	0.30		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	240	0	323	251	0	211	143	0	760	179	792	656
V/C Ratio(X)	0.73	0.00	0.12	0.20	0.00	0.54	0.31	0.00	0.92	0.53	0.85	0.43
Avail Cap(c_a), veh/h	780	0	790	852	0	717	851	0	862	838	853	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	0.0	23.5	29.1	0.0	30.6	33.1	0.0	21.4	32.6	19.5	15.2
Incr Delay (d2), s/veh	1.6	0.0	0.1	0.1	0.0	0.8	0.5	0.0	13.6	0.9	7.2	0.3
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	3.1	0.0	0.5	0.8	0.0	1.9	0.8	0.0	13.2	1.7	11.3	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.8	0.0	23.6	29.2	0.0	31.4	33.6	0.0	35.0	33.5	26.7	15.6
LnGrp LOS	C		C	C		C	C		D	C	C	B
Approach Vol, veh/h		215			165			745			1050	
Approach Delay, s/veh		31.1			30.8			34.9			24.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	14.5	9.7	37.5	14.8	11.3	35.8
Change Period (Y+Rc), s	3.8	3.5	* 4.6	3.6	3.5	* 4.6
Max Green Setting (Gmax), s	36.2	36.5	* 35	36.4	36.5	* 35
Max Q Clear Time (g_c+I1), s	7.4	3.8	26.9	9.8	5.9	29.3
Green Ext Time (p_c), s	0.4	0.0	3.1	0.7	0.1	2.0

Intersection Summary	
HCM 7th Control Delay, s/veh	29.1
HCM 7th LOS	C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.



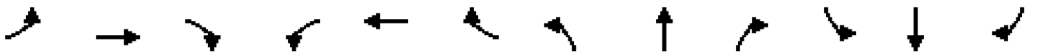
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	125	270	50	125	30	195	475	25	10	420	190
Future Volume (veh/h)	200	125	270	50	125	30	195	475	25	10	420	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	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	1826	1826	1826	1856	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	200	125	270	50	125	30	195	475	25	10	420	190
Peak Hour 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
Percent Heavy Veh, %	5	5	5	3	3	3	2	2	2	3	3	3
Cap, veh/h	234	133	287	134	295	71	229	845	44	39	447	202
Arrive On Green	0.13	0.26	0.26	0.08	0.21	0.21	0.13	0.48	0.48	0.02	0.37	0.37
Sat Flow, veh/h	1739	505	1090	1767	1440	346	1781	1761	93	1767	1199	542
Grp Volume(v), veh/h	200	0	395	50	0	155	195	0	500	10	0	610
Grp Sat Flow(s),veh/h/ln	1739	0	1595	1767	0	1786	1781	0	1853	1767	0	1741
Q Serve(g_s), s	11.0	0.0	23.7	2.6	0.0	7.4	10.5	0.0	18.8	0.5	0.0	33.1
Cycle Q Clear(g_c), s	11.0	0.0	23.7	2.6	0.0	7.4	10.5	0.0	18.8	0.5	0.0	33.1
Prop In Lane	1.00		0.68	1.00		0.19	1.00		0.05	1.00		0.31
Lane Grp Cap(c), veh/h	234	0	421	134	0	366	229	0	889	39	0	650
V/C Ratio(X)	0.85	0.00	0.94	0.37	0.00	0.42	0.85	0.00	0.56	0.26	0.00	0.94
Avail Cap(c_a), veh/h	471	0	426	479	0	484	392	0	889	389	0	719
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.4	0.0	35.2	43.0	0.0	33.8	41.7	0.0	18.1	47.0	0.0	29.6
Incr Delay (d2), s/veh	3.4	0.0	28.2	0.6	0.0	0.3	3.4	0.0	0.5	1.3	0.0	18.4
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	4.9	0.0	12.3	1.2	0.0	3.2	4.7	0.0	7.5	0.3	0.0	16.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.8	0.0	63.5	43.6	0.0	34.1	45.1	0.0	18.6	48.3	0.0	48.0
LnGrp LOS	D		E	D		C	D		B	D		D
Approach Vol, veh/h		595			205			695			620	
Approach Delay, s/veh		57.2			36.4			26.0			48.0	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	23.9	16.1	41.1	10.9	29.7	5.6	51.5
Change Period (Y+Rc), s	3.5	* 3.9	3.5	* 4.6	3.5	3.9	3.5	* 4.6
Max Green Setting (Gmax), s	26.5	* 27	21.5	* 40	26.5	26.1	21.5	* 40
Max Q Clear Time (g_c+I1), s	13.0	9.4	12.5	35.1	4.6	25.7	2.5	20.8
Green Ext Time (p_c), s	0.2	0.5	0.2	1.4	0.0	0.1	0.0	1.8

Intersection Summary	
HCM 7th Control Delay, s/veh	42.2
HCM 7th LOS	D

Notes

* HCM 7th 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)	90	1	45	5	1	5	23	681	1	1	679	45
Future Volume (veh/h)	90	1	45	5	1	5	23	681	1	1	679	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	1	49	5	1	5	25	740	1	1	738	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	1	67	11	2	11	51	1008	1	3	889	59
Arrive On Green	0.12	0.12	0.12	0.01	0.01	0.01	0.03	0.54	0.54	0.00	0.51	0.51
Sat Flow, veh/h	1133	12	567	770	154	770	1781	1867	3	1781	1734	115
Grp Volume(v), veh/h	148	0	0	11	0	0	25	0	741	1	0	787
Grp Sat Flow(s),veh/h/ln	1712	0	0	1693	0	0	1781	0	1870	1781	0	1850
Q Serve(g_s), s	4.6	0.0	0.0	0.4	0.0	0.0	0.8	0.0	16.7	0.0	0.0	20.0
Cycle Q Clear(g_c), s	4.6	0.0	0.0	0.4	0.0	0.0	0.8	0.0	16.7	0.0	0.0	20.0
Prop In Lane	0.66		0.33	0.45		0.45	1.00		0.00	1.00		0.06
Lane Grp Cap(c), veh/h	204	0	0	24	0	0	51	0	1010	3	0	948
V/C Ratio(X)	0.73	0.00	0.00	0.46	0.00	0.00	0.49	0.00	0.73	0.31	0.00	0.83
Avail Cap(c_a), veh/h	774	0	0	766	0	0	164	0	1590	161	0	1569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	0.0	27.0	0.0	0.0	26.4	0.0	9.7	27.6	0.0	11.4
Incr Delay (d2), s/veh	4.9	0.0	0.0	13.3	0.0	0.0	7.0	0.0	1.1	47.2	0.0	2.0
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	2.0	0.0	0.0	0.2	0.0	0.0	0.4	0.0	4.9	0.1	0.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.4	0.0	0.0	40.4	0.0	0.0	33.4	0.0	10.7	74.7	0.0	13.4
LnGrp LOS	C			D			C		B	E		B
Approach Vol, veh/h		148			11			766			788	
Approach Delay, s/veh		28.4			40.4			11.5			13.5	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	34.4		11.1	6.1	32.8		5.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	47.0		25.0	5.1	46.9		25.0				
Max Q Clear Time (g_c+I1), s	2.0	18.7		6.6	2.8	22.0		2.4				
Green Ext Time (p_c), s	0.0	5.4		0.7	0.0	6.4		0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		14.0
HCM 7th LOS		B

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	290	135	95	180	55	665	225	555
v/c Ratio	0.21	0.82	0.65	0.37	0.49	0.37	0.99	0.79	0.62
Control Delay (s/veh)	43.2	64.9	70.0	58.5	12.2	66.4	70.4	71.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.2	64.9	70.0	58.5	12.2	66.4	70.4	71.4	30.7
Queue Length 50th (ft)	50	216	107	76	0	43	~530	174	329
Queue Length 95th (ft)	104	342	194	140	70	98	#989	#332	601
Internal Link Dist (ft)		878		976			1238		453
Turn Bay Length (ft)	150		195		200	75		95	
Base Capacity (vph)	423	648	368	671	671	346	675	341	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.45	0.37	0.14	0.27	0.16	0.99	0.66	0.62

Intersection Summary

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

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

Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	140	210	390	125	570	100	45	720
v/c Ratio	0.66	0.57	0.84	0.68	0.69	0.14	0.35	1.00
Control Delay (s/veh)	71.6	13.2	62.2	75.7	36.5	11.0	69.3	73.7
Queue Delay	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0
Total Delay (s/veh)	71.6	13.2	62.2	75.7	37.3	11.0	69.3	73.7
Queue Length 50th (ft)	117	0	305	104	395	18	37	~609
Queue Length 95th (ft)	196	74	#555	183	619	60	86	#1050
Internal Link Dist (ft)	758		547		632			1238
Turn Bay Length (ft)		100		100			120	
Base Capacity (vph)	442	541	485	342	827	699	342	721
Starvation Cap Reductn	0	0	0	0	76	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.39	0.80	0.37	0.76	0.14	0.13	1.00

Intersection Summary

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

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

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	145	145	205	300	735	695	560
v/c Ratio	0.47	0.46	0.45	0.68	0.31	0.54	0.75
Control Delay (s/veh)	33.6	33.6	8.2	34.8	5.3	20.3	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.6	33.6	8.2	34.8	5.3	20.3	17.0
Queue Length 50th (ft)	57	57	0	109	47	111	83
Queue Length 95th (ft)	137	137	54	260	124	240	293
Internal Link Dist (ft)		874			446	632	
Turn Bay Length (ft)			50	175			75
Base Capacity (vph)	933	937	956	723	3064	1959	984
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.21	0.41	0.24	0.35	0.57

Intersection Summary

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	184	181	435	655	295	375	605
v/c Ratio	0.49	0.48	0.77	0.65	0.45	0.72	0.27
Control Delay (s/veh)	30.8	30.6	20.2	27.9	5.8	35.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	30.8	30.6	20.2	27.9	5.8	35.8	7.0
Queue Length 50th (ft)	76	75	61	135	0	142	50
Queue Length 95th (ft)	165	162	195	255	59	#402	127
Internal Link Dist (ft)		679		657			446
Turn Bay Length (ft)			50		220	180	
Base Capacity (vph)	847	851	922	1762	915	663	2973
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.21	0.47	0.37	0.32	0.57	0.20

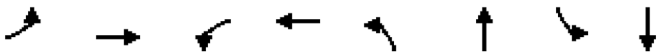
Intersection Summary

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

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	175	40	50	115	45	700	95	670	285
v/c Ratio	0.64	0.09	0.22	0.40	0.22	0.92	0.47	0.82	0.38
Control Delay (s/veh)	44.9	7.1	39.8	12.4	40.9	45.8	45.6	34.3	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.9	7.1	39.8	12.4	40.9	45.8	45.6	34.3	11.6
Queue Length 50th (ft)	90	0	25	0	22	339	49	325	51
Queue Length 95th (ft)	160	21	67	51	62	#726	107	#642	135
Internal Link Dist (ft)	655		515			251		657	
Turn Bay Length (ft)		140			85		110		
Base Capacity (vph)	671	849	738	696	739	759	725	813	747
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.05	0.07	0.17	0.06	0.92	0.13	0.82	0.38

Intersection Summary

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



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	200	395	50	155	195	500	10	610
v/c Ratio	0.74	0.83	0.30	0.49	0.76	0.50	0.07	0.91
Control Delay (s/veh)	61.1	47.1	54.6	45.5	64.7	20.5	52.4	52.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	61.1	47.1	54.6	45.5	64.7	20.5	52.4	52.0
Queue Length 50th (ft)	134	220	33	92	131	200	7	390
Queue Length 95th (ft)	232	365	81	178	235	446	27	#779
Internal Link Dist (ft)		710		228		480		903
Turn Bay Length (ft)	110				95		55	
Base Capacity (vph)	428	478	436	449	357	993	353	671
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.83	0.11	0.35	0.55	0.50	0.03	0.91

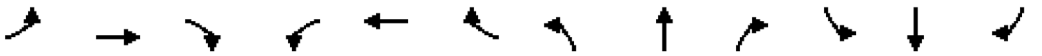
Intersection Summary

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

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	148	11	25	741	1	787
v/c Ratio	0.56	0.08	0.22	0.57	0.01	0.64
Control Delay (s/veh)	35.9	30.6	42.2	11.3	39.0	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.9	30.6	42.2	11.3	39.0	14.0
Queue Length 50th (ft)	51	2	10	120	0	133
Queue Length 95th (ft)	129	21	41	512	6	#630
Internal Link Dist (ft)	329	438		256		304
Turn Bay Length (ft)			100		50	
Base Capacity (vph)	565	552	116	1294	113	1238
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.02	0.22	0.57	0.01	0.64

Intersection Summary

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



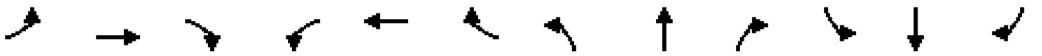
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	115	85	205	145	170	95	320	250	195	495	30
Future Volume (veh/h)	20	115	85	205	145	170	95	320	250	195	495	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.95	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	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	20	115	85	205	145	170	95	320	250	195	495	30
Peak Hour 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
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	286	154	114	246	232	187	195	354	277	240	692	42
Arrive On Green	0.16	0.15	0.15	0.14	0.12	0.12	0.11	0.37	0.37	0.13	0.39	0.39
Sat Flow, veh/h	1795	995	736	1781	1870	1511	1795	970	758	1795	1757	106
Grp Volume(v), veh/h	20	0	200	205	145	170	95	0	570	195	0	525
Grp Sat Flow(s),veh/h/ln	1795	0	1731	1781	1870	1511	1795	0	1728	1795	0	1863
Q Serve(g_s), s	0.8	0.0	9.0	9.1	6.0	6.9	4.0	0.0	25.4	8.6	0.0	19.3
Cycle Q Clear(g_c), s	0.8	0.0	9.0	9.1	6.0	6.9	4.0	0.0	25.4	8.6	0.0	19.3
Prop In Lane	1.00		0.43	1.00		1.00	1.00		0.44	1.00		0.06
Lane Grp Cap(c), veh/h	286	0	268	246	232	187	195	0	631	240	0	734
V/C Ratio(X)	0.07	0.00	0.75	0.83	0.63	0.91	0.49	0.00	0.90	0.81	0.00	0.72
Avail Cap(c_a), veh/h	579	0	968	575	1046	845	584	0	966	577	0	1042
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.0	0.0	32.8	34.1	33.8	20.3	34.0	0.0	24.4	34.2	0.0	20.8
Incr Delay (d2), s/veh	0.0	0.0	1.6	2.8	1.0	6.5	0.7	0.0	5.8	2.5	0.0	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	0.3	0.0	3.8	3.9	2.6	3.4	1.7	0.0	10.4	3.8	0.0	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.1	0.0	34.4	36.9	34.8	26.8	34.7	0.0	30.2	36.7	0.0	21.3
LnGrp LOS	C		C	D	C	C	C		C	D		C
Approach Vol, veh/h		220			520			665			720	
Approach Delay, s/veh		33.9			33.0			30.9			25.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.5	14.7	12.4	36.6	15.0	17.2	14.8	34.2
Change Period (Y+Rc), s	* 4.6	* 4.6	3.6	* 4.6	3.8	* 4.6	3.9	* 4.6
Max Green Setting (Gmax), s	* 26	* 45	26.4	* 45	26.2	* 45	26.1	* 45
Max Q Clear Time (g_c+I1), s	2.8	8.9	6.0	21.3	11.1	11.0	10.6	27.4
Green Ext Time (p_c), s	0.0	0.8	0.1	2.3	0.2	0.9	0.2	2.3

Intersection Summary	
HCM 7th Control Delay, s/veh	29.9
HCM 7th LOS	C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.



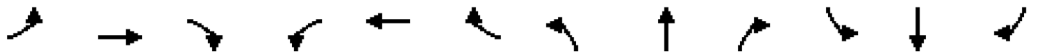
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	65	155	240	95	40	215	615	200	95	640	20
Future Volume (veh/h)	25	65	155	240	95	40	215	615	200	95	640	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	25	65	155	240	95	40	215	615	200	95	640	20
Peak Hour 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
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	66	171	194	265	105	44	245	825	682	133	682	21
Arrive On Green	0.13	0.13	0.13	0.23	0.23	0.23	0.14	0.44	0.44	0.07	0.38	0.38
Sat Flow, veh/h	516	1343	1530	1144	453	191	1795	1885	1558	1795	1816	57
Grp Volume(v), veh/h	90	0	155	375	0	0	215	615	200	95	0	660
Grp Sat Flow(s),veh/h/ln	1859	0	1530	1788	0	0	1795	1885	1558	1795	0	1873
Q Serve(g_s), s	5.2	0.0	11.4	23.7	0.0	0.0	13.7	31.6	9.6	6.0	0.0	39.5
Cycle Q Clear(g_c), s	5.2	0.0	11.4	23.7	0.0	0.0	13.7	31.6	9.6	6.0	0.0	39.5
Prop In Lane	0.28		1.00	0.64		0.11	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	236	0	194	414	0	0	245	825	682	133	0	703
V/C Ratio(X)	0.38	0.00	0.80	0.91	0.00	0.00	0.88	0.75	0.29	0.72	0.00	0.94
Avail Cap(c_a), veh/h	504	0	415	562	0	0	409	825	682	409	0	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.5	0.0	49.3	43.4	0.0	0.0	49.2	27.3	21.1	52.6	0.0	35.0
Incr Delay (d2), s/veh	0.4	0.0	2.8	12.6	0.0	0.0	6.0	3.3	0.1	2.7	0.0	16.2
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	2.4	0.0	4.4	11.9	0.0	0.0	6.4	14.3	3.4	2.8	0.0	20.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.9	0.0	52.1	56.1	0.0	0.0	55.2	30.5	21.2	55.3	0.0	51.2
LnGrp LOS	D		D	E			E	C	C	E		D
Approach Vol, veh/h		245			375			1030			755	
Approach Delay, s/veh		50.2			56.1			33.9			51.7	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	30.4	19.4	48.2	18.3	12.1	55.5
Change Period (Y+Rc), s	3.5	3.5	* 4.6	3.5	3.5	* 4.6
Max Green Setting (Gmax), s	36.5	26.5	* 50	31.5	26.5	* 50
Max Q Clear Time (g_c+I1), s	25.7	15.7	41.5	13.4	8.0	33.6
Green Ext Time (p_c), s	1.2	0.2	2.1	0.5	0.1	2.6

Intersection Summary	
HCM 7th Control Delay, s/veh	44.6
HCM 7th LOS	D

Notes

* HCM 7th 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)	0	0	0	285	0	325	415	855	0	0	630	505
Future Volume (veh/h)	0	0	0	285	0	325	415	855	0	0	630	505
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Lane Width Adj.				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)				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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1885	1885	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h				285	0	0	415	855	0	0	630	0
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				1	1	1	1	1	0	0	1	1
Cap, veh/h				634	0		497	2265	0	0	1001	
Arrive On Green				0.18	0.00	0.00	0.28	0.63	0.00	0.00	0.28	0.00
Sat Flow, veh/h				3591	0	1598	1795	3676	0	0	3676	1598
Grp Volume(v), veh/h				285	0	0	415	855	0	0	630	0
Grp Sat Flow(s),veh/h/ln				1795	0	1598	1795	1791	0	0	1791	1598
Q Serve(g_s), s				3.3	0.0	0.0	10.0	5.3	0.0	0.0	7.1	0.0
Cycle Q Clear(g_c), s				3.3	0.0	0.0	10.0	5.3	0.0	0.0	7.1	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				634	0		497	2265	0	0	1001	
V/C Ratio(X)				0.45	0.00		0.84	0.38	0.00	0.00	0.63	
Avail Cap(c_a), veh/h				2808	0		1033	2738	0	0	2738	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.0	0.0	0.0	15.7	4.1	0.0	0.0	14.5	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	2.8	0.1	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				1.2	0.0	0.0	3.6	0.8	0.0	0.0	2.5	0.0
Unsig. Movement Delay, s/veh						30.70						25.10
LnGrp Delay(d), s/veh				17.1	0.0	30.7	18.5	4.2	0.0	0.0	15.0	25.1
LnGrp LOS				B		C	B	A			B	C
Approach Vol, veh/h					450			1270			885	
Approach Delay, s/veh					22.1			8.8			17.9	
Approach LOS					C			A			B	

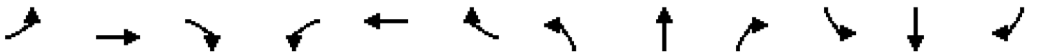
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.2	17.7		12.1		33.9						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	12.0	9.1		5.3		7.3						
Green Ext Time (p_c), s	0.8	3.8		0.5		5.0						

Intersection Summary	
HCM 7th Control Delay, s/veh	14.2
HCM 7th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR, SBR] is included in calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	515	15	420	0	0	0	0	750	285	305	610	0
Future Volume (veh/h)	515	15	420	0	0	0	0	750	285	305	610	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	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
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856				0	1870	1870	1885	1885	0
Adj Flow Rate, veh/h	526	0	0				0	750	0	305	610	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	3	3	3				0	2	2	1	1	0
Cap, veh/h	728	0					0	1123		382	2164	0
Arrive On Green	0.21	0.00	0.00				0.00	0.32	0.00	0.21	0.60	0.00
Sat Flow, veh/h	3534	0	1572				0	3647	1585	1795	3676	0
Grp Volume(v), veh/h	526	0	0				0	750	0	305	610	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1777	1585	1795	1791	0
Q Serve(g_s), s	6.4	0.0	0.0				0.0	8.5	0.0	7.5	3.8	0.0
Cycle Q Clear(g_c), s	6.4	0.0	0.0				0.0	8.5	0.0	7.5	3.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	728	0					0	1123		382	2164	0
V/C Ratio(X)	0.72	0.00					0.00	0.67		0.80	0.28	0.00
Avail Cap(c_a), veh/h	2742	0					0	2695		1025	2717	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.2	0.0	0.0				0.0	13.8	0.0	17.3	4.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0				0.0	0.5	0.0	2.9	0.1	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
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0				0.0	2.7	0.0	3.0	0.8	0.0
Unsig. Movement Delay, s/veh			25.00									
LnGrp Delay(d), s/veh	17.7	0.0	25.0				0.0	14.3	0.0	20.2	4.4	0.0
LnGrp LOS	B		C					B		C	A	
Approach Vol, veh/h		736						750			915	
Approach Delay, s/veh		19.8						14.3			9.7	
Approach LOS		B						B			A	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		32.8			13.4	19.5		13.6				
Change Period (Y+Rc), s		4.8			3.5	4.8		4.0				
Max Green Setting (Gmax), s		35.2			26.5	35.2		36.0				
Max Q Clear Time (g_c+I1), s		5.8			9.5	10.5		8.4				
Green Ext Time (p_c), s		3.7			0.6	4.2		1.0				

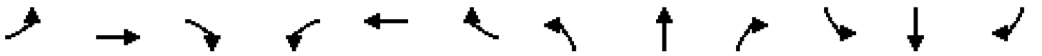
Intersection Summary		
HCM 7th Control Delay, s/veh	14.2	
HCM 7th LOS	B	

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR] is included in calculations of the approach delay and intersection delay.

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



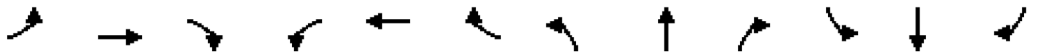
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	25	50	40	15	155	30	715	30	85	815	130
Future Volume (veh/h)	230	25	50	40	15	155	30	715	30	85	815	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1856	1856	1856	1856	1856	1856	1885	1885	1885	1856	1856	1856
Adj Flow Rate, veh/h	230	25	50	40	15	155	30	715	30	85	815	130
Peak Hour 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
Percent Heavy Veh, %	3	3	3	3	3	3	1	1	1	3	3	3
Cap, veh/h	285	31	365	162	61	191	105	787	33	155	868	713
Arrive On Green	0.18	0.18	0.18	0.12	0.12	0.12	0.06	0.44	0.44	0.09	0.47	0.47
Sat Flow, veh/h	1601	174	1537	1302	488	1532	1795	1794	75	1767	1856	1525
Grp Volume(v), veh/h	255	0	50	55	0	155	30	0	745	85	815	130
Grp Sat Flow(s),veh/h/ln	1775	0	1537	1790	0	1532	1795	0	1869	1767	1856	1525
Q Serve(g_s), s	12.5	0.0	2.3	2.5	0.0	8.9	1.4	0.0	33.7	4.2	37.8	4.5
Cycle Q Clear(g_c), s	12.5	0.0	2.3	2.5	0.0	8.9	1.4	0.0	33.7	4.2	37.8	4.5
Prop In Lane	0.90		1.00	0.73		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	316	0	365	223	0	191	105	0	820	155	868	713
V/C Ratio(X)	0.81	0.00	0.14	0.25	0.00	0.81	0.29	0.00	0.91	0.55	0.94	0.18
Avail Cap(c_a), veh/h	714	0	710	617	0	528	625	0	937	615	930	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	0.0	27.3	35.8	0.0	38.6	40.8	0.0	23.7	39.6	22.9	14.0
Incr Delay (d2), s/veh	1.9	0.0	0.1	0.2	0.0	3.1	0.5	0.0	11.3	1.1	16.0	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	5.5	0.0	0.8	1.1	0.0	3.4	0.6	0.0	15.9	1.8	19.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.6	0.0	27.4	36.0	0.0	41.7	41.4	0.0	35.0	40.7	38.9	14.1
LnGrp LOS	D		C	D		D	D		D	D	D	B
Approach Vol, veh/h		305			210			775			1030	
Approach Delay, s/veh		35.9			40.2			35.3			35.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	15.1	8.8	47.0	19.7	11.4	44.3
Change Period (Y+Rc), s	3.8	3.5	* 4.6	3.6	3.5	* 4.6
Max Green Setting (Gmax), s	31.2	31.5	* 45	36.4	31.5	* 45
Max Q Clear Time (g_c+I1), s	10.9	3.4	39.8	14.5	6.2	35.7
Green Ext Time (p_c), s	0.4	0.0	2.6	1.0	0.1	2.9

Intersection Summary	
HCM 7th Control Delay, s/veh	36.1
HCM 7th LOS	D

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.



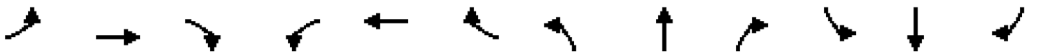
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	185	260	20	140	40	210	455	30	45	480	180
Future Volume (veh/h)	205	185	260	20	140	40	210	455	30	45	480	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		0.98	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	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	205	185	260	20	140	40	210	455	30	45	480	180
Peak Hour 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
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	241	188	264	77	250	71	245	802	53	117	507	190
Arrive On Green	0.13	0.27	0.27	0.04	0.18	0.18	0.14	0.46	0.46	0.07	0.39	0.39
Sat Flow, veh/h	1795	699	982	1795	1405	401	1781	1732	114	1795	1296	486
Grp Volume(v), veh/h	205	0	445	20	0	180	210	0	485	45	0	660
Grp Sat Flow(s),veh/h/ln	1795	0	1681	1795	0	1807	1781	0	1846	1795	0	1782
Q Serve(g_s), s	10.8	0.0	25.5	1.0	0.0	8.8	11.2	0.0	18.6	2.3	0.0	34.7
Cycle Q Clear(g_c), s	10.8	0.0	25.5	1.0	0.0	8.8	11.2	0.0	18.6	2.3	0.0	34.7
Prop In Lane	1.00		0.58	1.00		0.22	1.00		0.06	1.00		0.27
Lane Grp Cap(c), veh/h	241	0	452	77	0	321	245	0	854	117	0	697
V/C Ratio(X)	0.85	0.00	0.98	0.26	0.00	0.56	0.86	0.00	0.57	0.38	0.00	0.95
Avail Cap(c_a), veh/h	491	0	452	491	0	494	395	0	854	398	0	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	0.0	35.2	44.9	0.0	36.4	40.9	0.0	19.0	43.5	0.0	28.6
Incr Delay (d2), s/veh	3.3	0.0	37.8	0.7	0.0	0.6	5.7	0.0	0.6	0.8	0.0	20.0
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	4.9	0.0	14.9	0.5	0.0	3.9	5.1	0.0	7.4	1.1	0.0	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.3	0.0	73.0	45.6	0.0	37.0	46.6	0.0	19.5	44.2	0.0	48.6
LnGrp LOS	D		E	D		D	D		B	D		D
Approach Vol, veh/h		650			200			695			705	
Approach Delay, s/veh		64.0			37.8			27.7			48.3	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.5	21.2	16.8	42.5	7.7	30.0	9.8	49.5
Change Period (Y+Rc), s	3.5	* 3.9	3.5	* 4.6	3.5	3.9	3.5	* 4.6
Max Green Setting (Gmax), s	26.5	* 27	21.5	* 40	26.5	26.1	21.5	* 40
Max Q Clear Time (g_c+I1), s	12.8	10.8	13.2	36.7	3.0	27.5	4.3	20.6
Green Ext Time (p_c), s	0.2	0.5	0.2	1.2	0.0	0.0	0.0	1.7

Intersection Summary	
HCM 7th Control Delay, s/veh	45.6
HCM 7th LOS	D

Notes

* HCM 7th 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)	45	1	23	5	1	5	45	654	1	1	814	90
Future Volume (veh/h)	45	1	23	5	1	5	45	654	1	1	814	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	1	23	5	1	5	45	654	1	1	814	90
Peak Hour 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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	64	1	33	11	2	11	79	1153	2	3	950	105
Arrive On Green	0.06	0.06	0.06	0.01	0.01	0.01	0.04	0.62	0.62	0.00	0.57	0.57
Sat Flow, veh/h	1116	25	571	770	154	770	1781	1867	3	1781	1655	183
Grp Volume(v), veh/h	69	0	0	11	0	0	45	0	655	1	0	904
Grp Sat Flow(s),veh/h/ln	1712	0	0	1693	0	0	1781	0	1870	1781	0	1837
Q Serve(g_s), s	2.3	0.0	0.0	0.4	0.0	0.0	1.4	0.0	12.0	0.0	0.0	24.0
Cycle Q Clear(g_c), s	2.3	0.0	0.0	0.4	0.0	0.0	1.4	0.0	12.0	0.0	0.0	24.0
Prop In Lane	0.65		0.33	0.45		0.45	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	99	0	0	24	0	0	79	0	1154	3	0	1055
V/C Ratio(X)	0.70	0.00	0.00	0.46	0.00	0.00	0.57	0.00	0.57	0.33	0.00	0.86
Avail Cap(c_a), veh/h	736	0	0	728	0	0	153	0	1511	153	0	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	0.0	28.5	0.0	0.0	27.2	0.0	6.6	29.0	0.0	10.4
Incr Delay (d2), s/veh	8.5	0.0	0.0	13.5	0.0	0.0	6.3	0.0	0.4	52.5	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	1.1	0.0	0.0	0.2	0.0	0.0	0.7	0.0	3.0	0.1	0.0	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	35.4	0.0	0.0	41.9	0.0	0.0	33.5	0.0	7.0	81.5	0.0	14.1
LnGrp LOS	D			D			C		A	F		B
Approach Vol, veh/h		69			11			700			905	
Approach Delay, s/veh		35.4			41.9			8.7			14.2	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	40.4		7.9	7.1	37.9		5.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	47.0		25.0	5.0	47.0		25.0				
Max Q Clear Time (g_c+I1), s	2.0	14.0		4.3	3.4	26.0		2.4				
Green Ext Time (p_c), s	0.0	4.6		0.3	0.0	7.4		0.0				

Intersection Summary												
HCM 7th Control Delay, s/veh			13.0									
HCM 7th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	200	205	145	170	95	570	195	525
v/c Ratio	0.08	0.73	0.75	0.32	0.34	0.52	0.81	0.72	0.63
Control Delay (s/veh)	44.5	58.8	65.9	44.6	9.4	63.4	42.7	64.6	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.5	58.8	65.9	44.6	9.4	63.4	42.7	64.6	31.2
Queue Length 50th (ft)	14	126	146	76	0	68	355	139	287
Queue Length 95th (ft)	38	235	266	196	66	143	#758	253	547
Internal Link Dist (ft)		878		976			1238		453
Turn Bay Length (ft)	150		195		200	75		95	
Base Capacity (vph)	421	704	407	742	719	414	708	409	835
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.28	0.50	0.20	0.24	0.23	0.81	0.48	0.63

Intersection Summary

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

Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	155	375	215	615	200	95	660
v/c Ratio	0.48	0.52	0.86	0.80	0.73	0.26	0.58	0.91
Control Delay (s/veh)	66.5	14.9	67.4	76.4	38.2	11.9	74.2	57.6
Queue Delay	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
Total Delay (s/veh)	66.5	14.9	67.4	76.4	39.9	11.9	74.2	57.6
Queue Length 50th (ft)	76	0	297	179	423	40	80	535
Queue Length 95th (ft)	138	67	#539	299	724	115	153	#973
Internal Link Dist (ft)	758		547		632			1238
Turn Bay Length (ft)		100		100			120	
Base Capacity (vph)	449	495	504	364	841	756	364	725
Starvation Cap Reductn	0	0	0	0	102	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.31	0.74	0.59	0.83	0.26	0.26	0.91

Intersection Summary

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

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	142	143	325	415	855	630	505
v/c Ratio	0.42	0.42	0.74	0.71	0.35	0.58	0.76
Control Delay (s/veh)	32.3	32.4	26.7	34.0	6.2	25.4	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay (s/veh)	32.3	32.4	26.7	34.0	6.2	25.4	18.7
Queue Length 50th (ft)	62	63	73	162	71	132	86
Queue Length 95th (ft)	134	134	186	#431	157	221	240
Internal Link Dist (ft)		874			446	632	
Turn Bay Length (ft)			50	175			75
Base Capacity (vph)	848	848	865	657	3044	1746	894
Starvation Cap Reductn	0	0	0	0	685	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.38	0.63	0.36	0.36	0.56

Intersection Summary

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

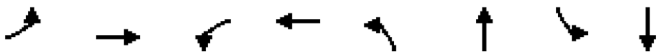
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	263	267	420	750	285	305	610
v/c Ratio	0.59	0.60	0.72	0.69	0.27	0.70	0.28
Control Delay (s/veh)	31.6	31.7	20.1	28.1	1.9	38.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	31.6	31.7	20.1	28.1	1.9	38.3	8.1
Queue Length 50th (ft)	105	106	70	148	0	119	57
Queue Length 95th (ft)	240	244	222	306	34	298	136
Internal Link Dist (ft)		679		657			446
Turn Bay Length (ft)			50		220	180	
Base Capacity (vph)	890	895	934	1850	1355	703	3049
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.30	0.45	0.41	0.21	0.43	0.20

Intersection Summary

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	255	50	55	155	30	745	85	815	130
v/c Ratio	0.77	0.11	0.28	0.51	0.17	0.89	0.47	0.92	0.17
Control Delay (s/veh)	55.7	7.4	48.6	13.9	47.7	41.7	53.6	43.4	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Total Delay (s/veh)	55.7	7.4	48.6	13.9	47.7	42.4	53.6	43.4	11.3
Queue Length 50th (ft)	157	0	33	0	18	422	53	501	27
Queue Length 95th (ft)	255	26	80	63	52	#804	109	#867	71
Internal Link Dist (ft)	655		515			251		657	
Turn Bay Length (ft)		140			85		110		
Base Capacity (vph)	631	794	545	581	553	837	542	890	743
Starvation Cap Reductn	0	0	0	0	0	13	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.06	0.10	0.27	0.05	0.90	0.16	0.92	0.17

Intersection Summary

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



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	205	445	20	180	210	485	45	660
v/c Ratio	0.73	0.83	0.12	0.64	0.76	0.52	0.28	0.93
Control Delay (s/veh)	58.5	47.3	51.3	52.4	62.3	23.1	54.4	54.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	58.5	47.3	51.3	52.4	62.3	23.1	54.4	54.4
Queue Length 50th (ft)	130	234	12	109	133	223	28	405
Queue Length 95th (ft)	236	#446	42	203	#254	438	76	#858
Internal Link Dist (ft)		710		228		480		903
Turn Bay Length (ft)	110				95		55	
Base Capacity (vph)	456	534	456	470	367	941	370	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.83	0.04	0.38	0.57	0.52	0.12	0.93

Intersection Summary

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

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	11	45	655	1	904
v/c Ratio	0.37	0.08	0.39	0.45	0.01	0.70
Control Delay (s/veh)	31.8	29.2	47.4	7.4	37.0	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	31.8	29.2	47.4	7.4	37.0	15.1
Queue Length 50th (ft)	22	3	21	75	0	247
Queue Length 95th (ft)	65	19	#61	364	6	#707
Internal Link Dist (ft)	329	438		256		304
Turn Bay Length (ft)			100		50	
Base Capacity (vph)	569	556	114	1453	114	1300
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.02	0.39	0.45	0.01	0.70

Intersection Summary

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

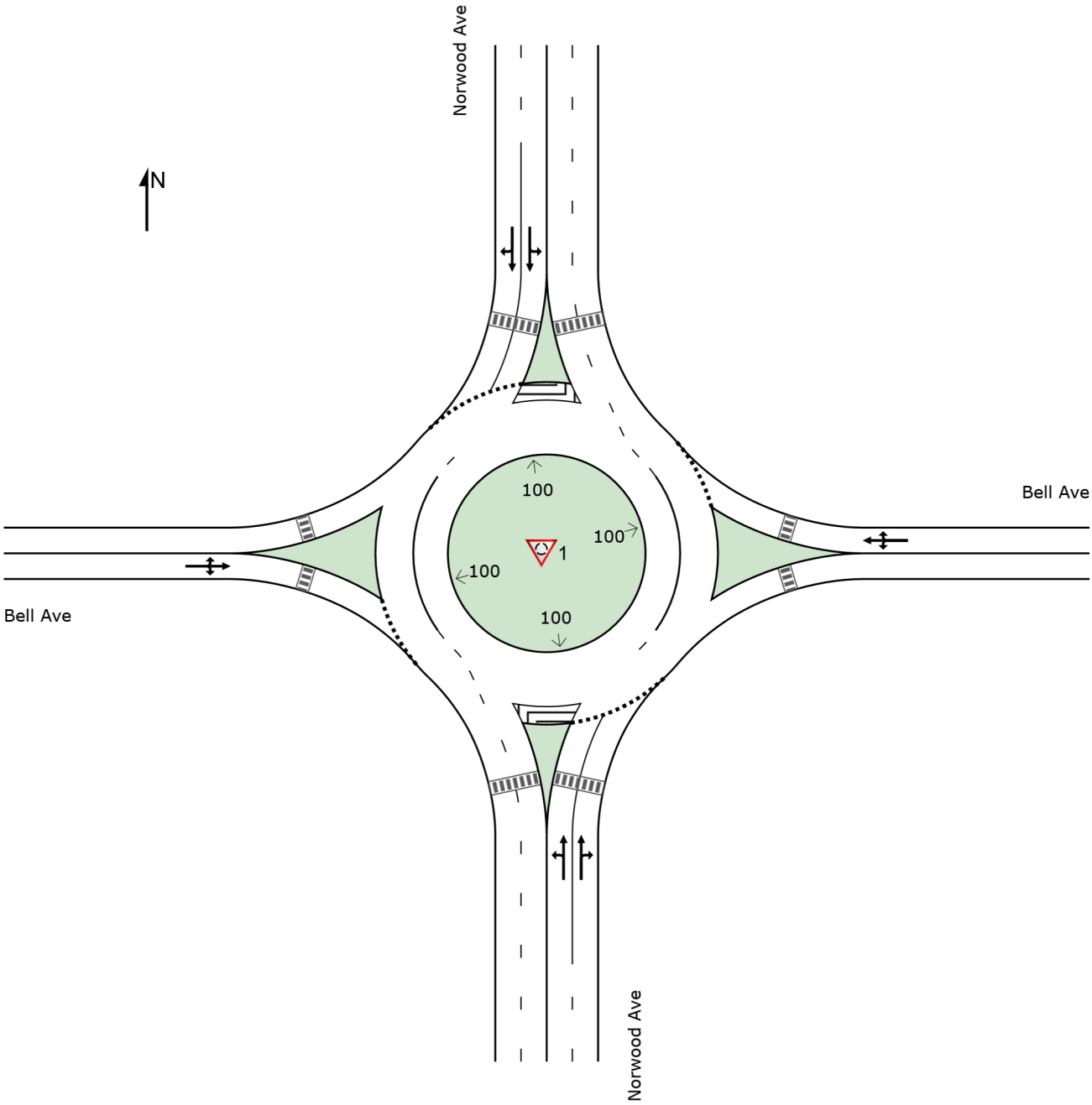
Section 2. Sidra Intersection Analysis Results

SITE LAYOUT

Site: 1 [Norwood/Bell - AM No Build (Site Folder: General)]

Norwood/Bell - AM No Build
Site Category: Future Conditions 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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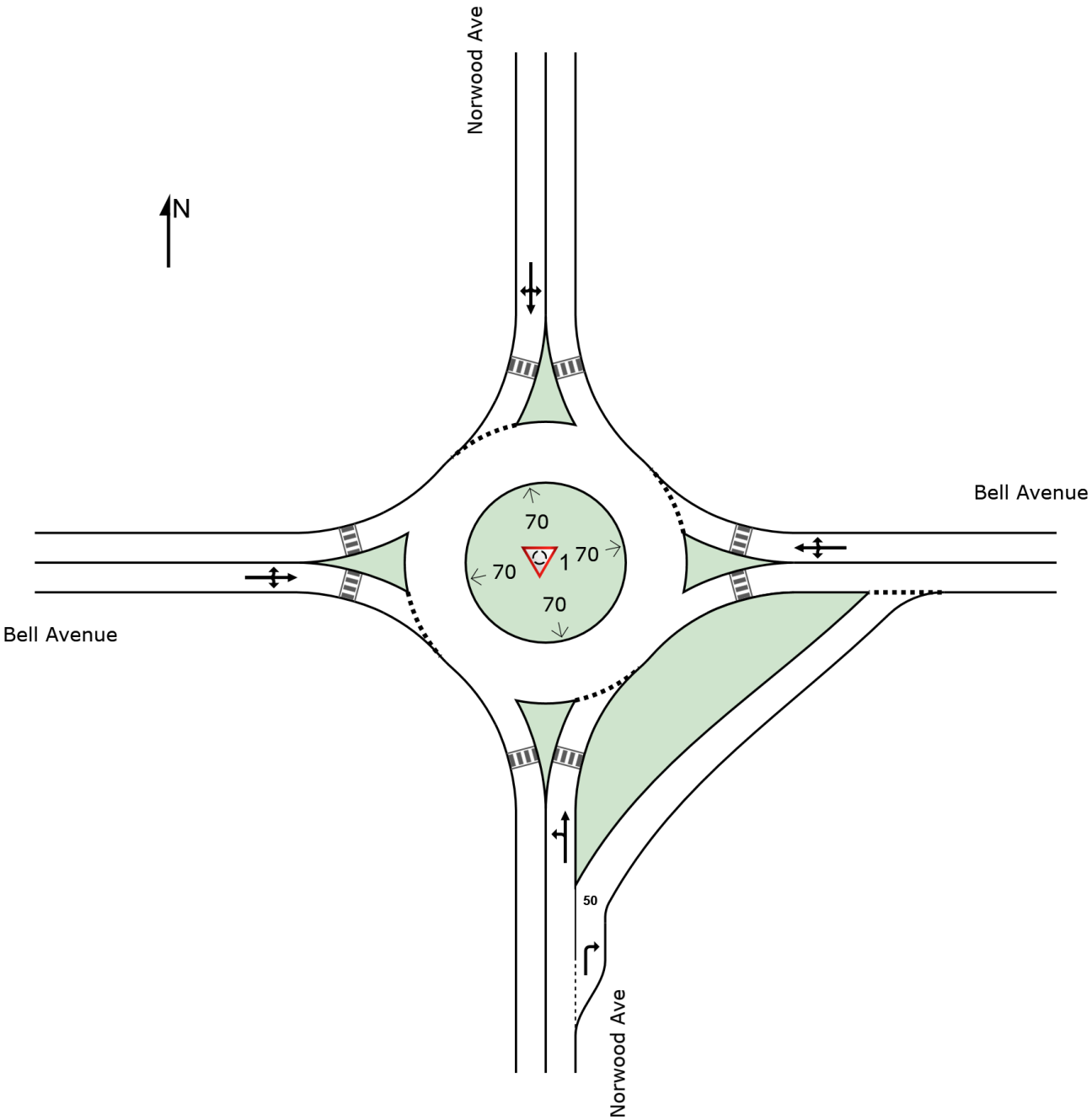
SITE LAYOUT

Site: 1 [Norwood/Bell - AM Road Diet (Site Folder: General)]

Norwood/Bell - AM Road Diet
Site Category: Future Conditions 2
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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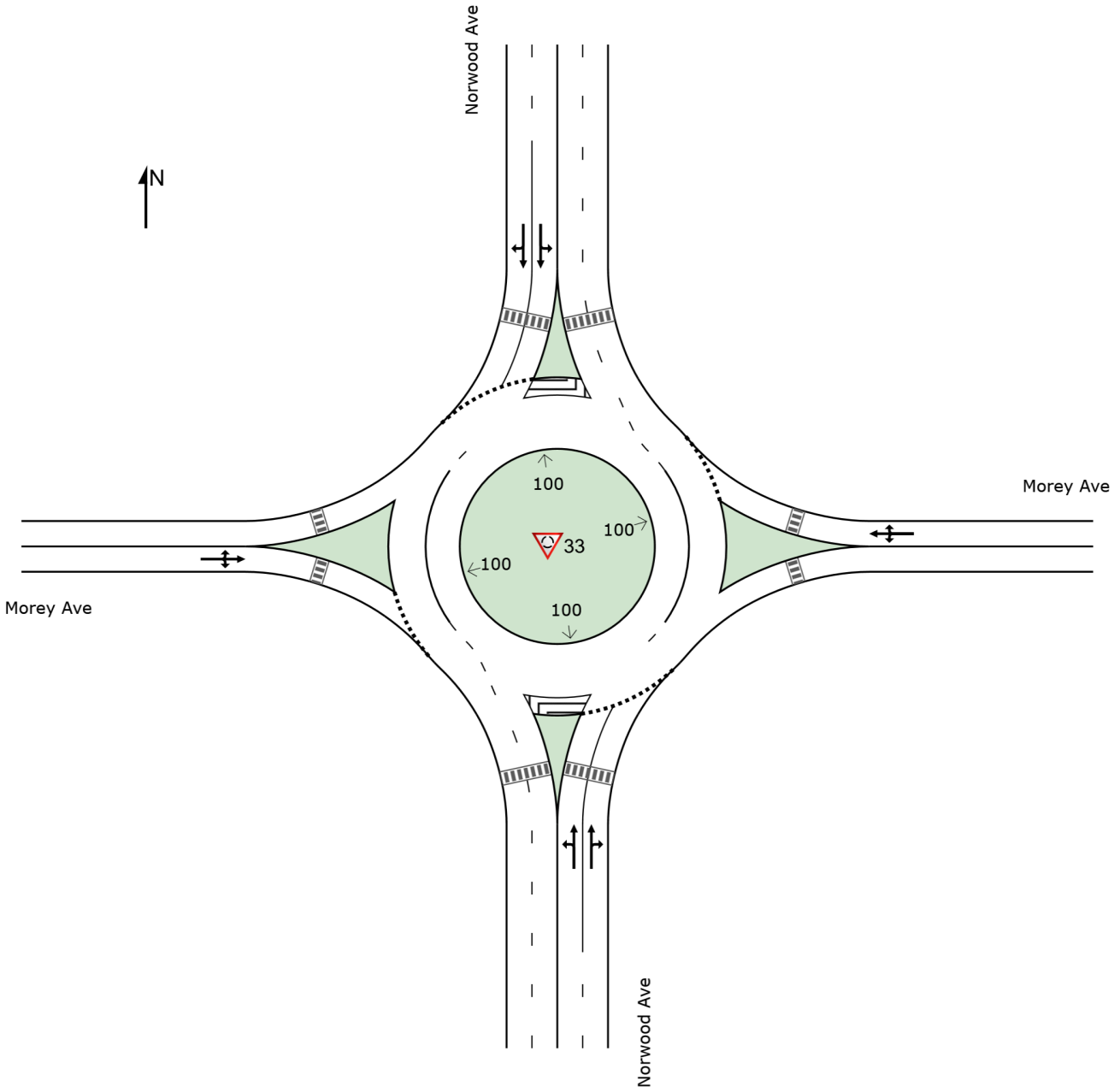
SITE LAYOUT

Site: 33 [Norwood/Morey - AM No Build (Site Folder: General)]

Norwood/Morey - AM No Build
Site Category: Future Conditions 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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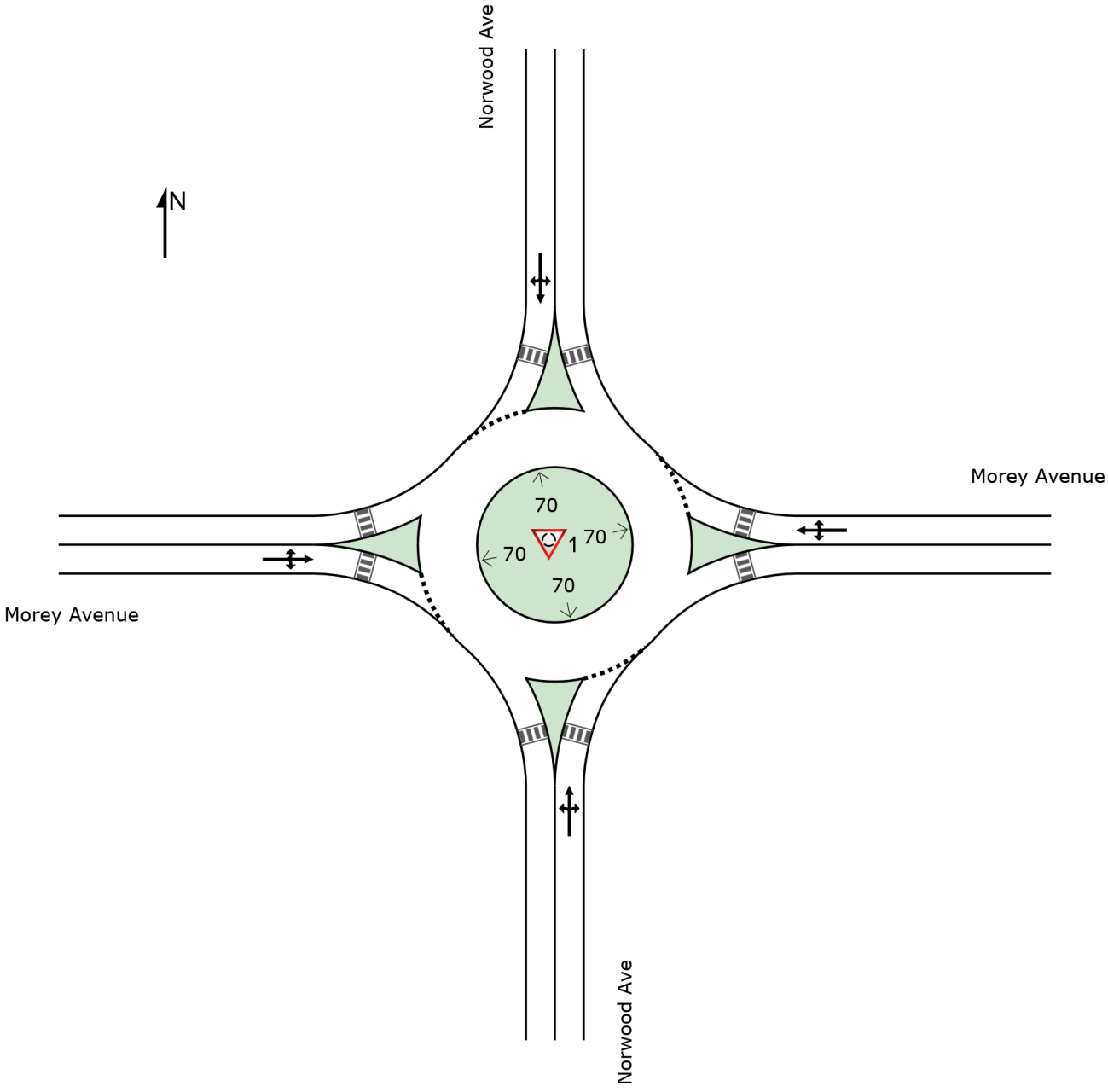
SITE LAYOUT

Site: 1 [Norwood/Morey - AM Road Diet (Site Folder: General)]

Norwood/Morey - AM Road Diet
Site Category: Future Conditions 2
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

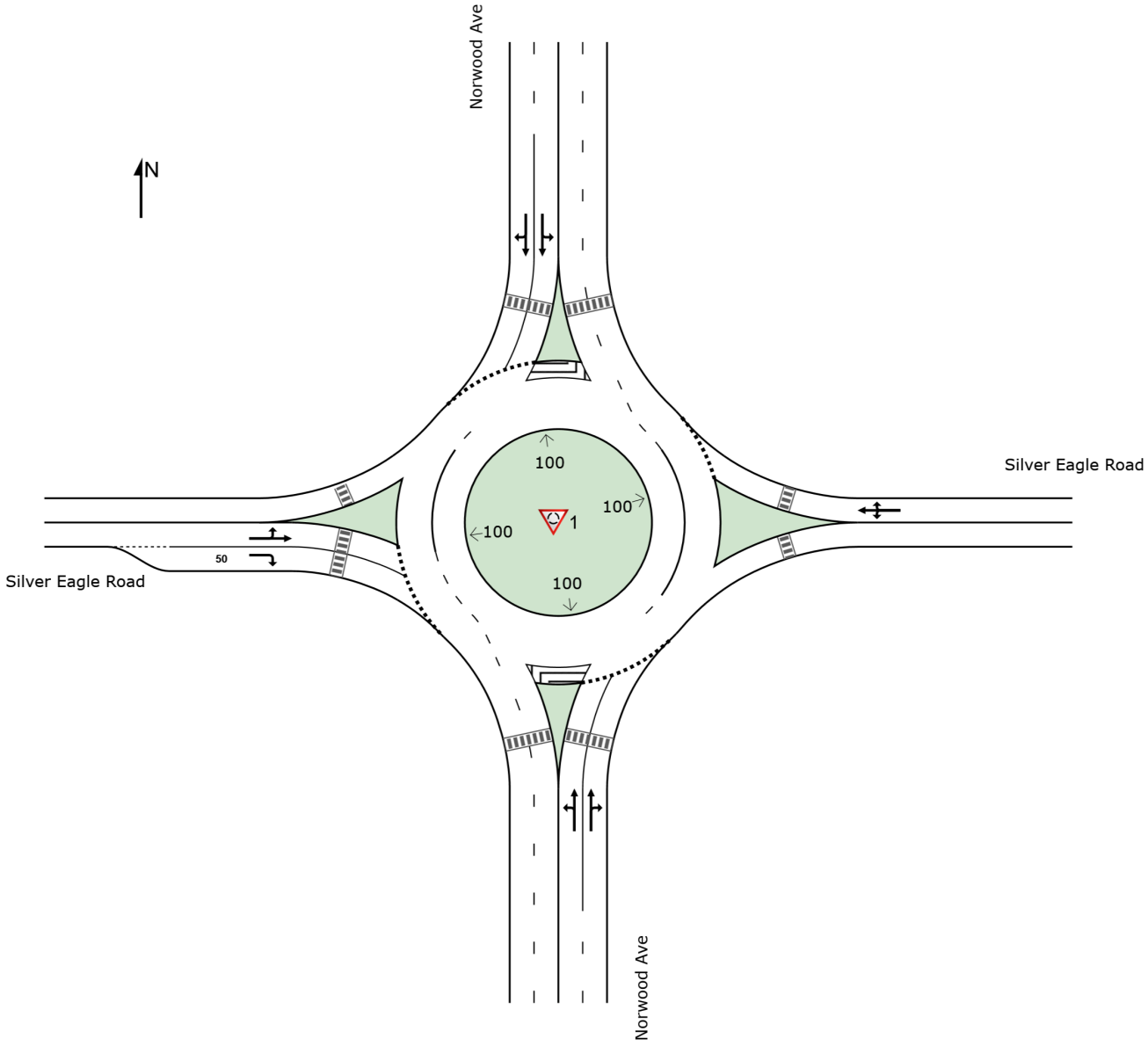


SITE LAYOUT

Site: 1 [Norwood/Silver Eagle Road - AM No Build (Site Folder: General)]

Norwood/Silver Eagle Road - AM No Build
Site Category: Future Conditions 1
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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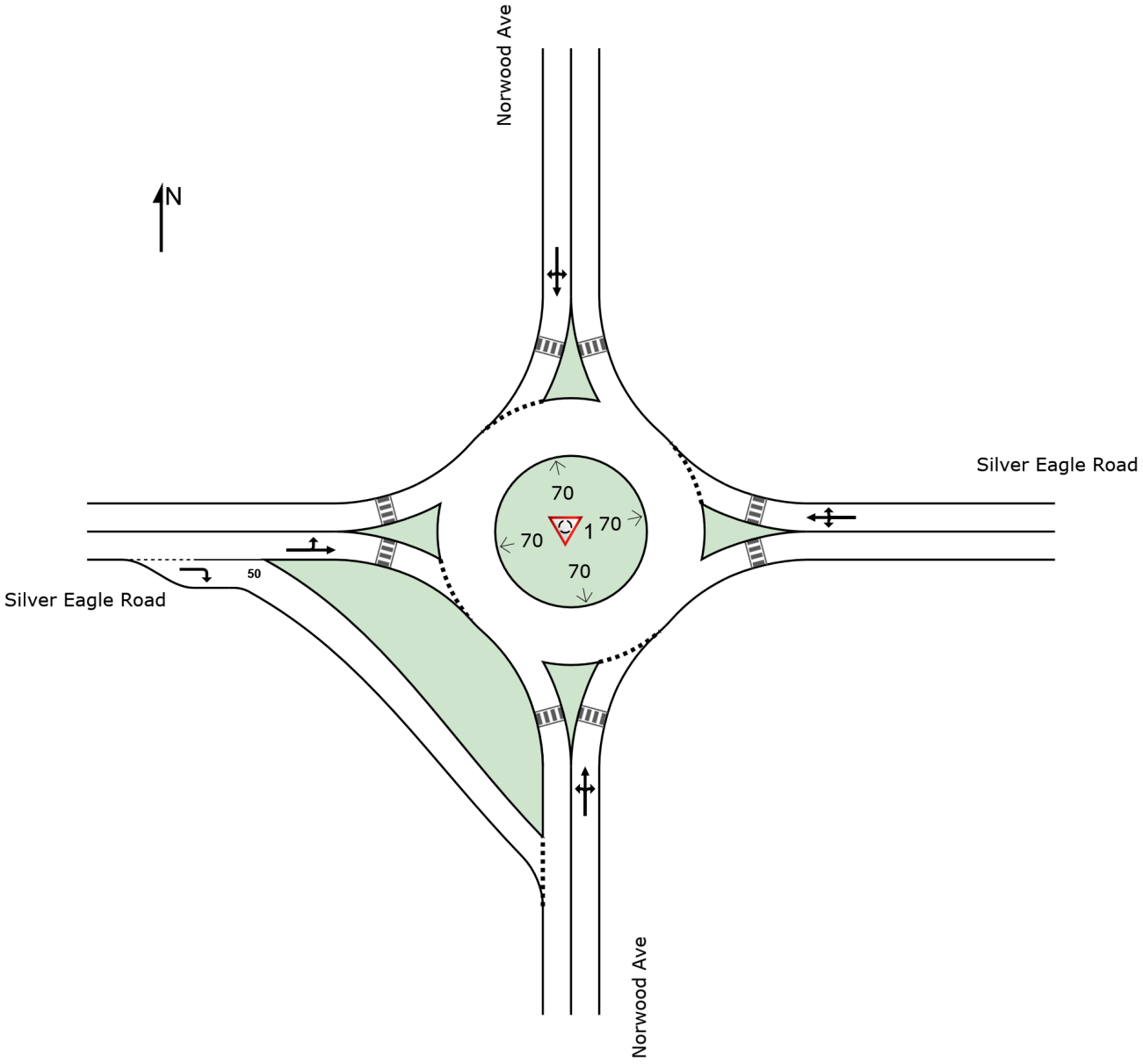
SITE LAYOUT

Site: 1 [Norwood/Silver Eagle Road - AM Road Diet (Site Folder: General)]

Norwood/Silver Eagle Road - AM Road Diet
Site Category: Future Conditions 2
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: 1 [Norwood/Bell - AM No Build (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Bell - AM No Build
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	70	3.0	70	3.0	0.428	8.5	LOS A	2.2	55.9	0.57	0.40	0.57	25.9
8	T1	All MCs	515	3.0	515	3.0	0.428	8.5	LOS A	2.2	55.9	0.57	0.40	0.57	26.2
18	R2	All MCs	250	3.0	250	3.0	0.428	8.5	LOS A	2.2	55.9	0.57	0.40	0.57	26.1
Approach			835	3.0	835	3.0	0.428	8.5	LOS A	2.2	55.9	0.57	0.40	0.57	26.1
East: Bell Ave															
1	L2	All MCs	220	4.0	220	4.0	0.624	15.4	LOS B	4.7	121.8	0.77	0.90	1.31	23.6
6	T1	All MCs	90	4.0	90	4.0	0.624	15.4	LOS B	4.7	121.8	0.77	0.90	1.31	23.8
16	R2	All MCs	155	4.0	155	4.0	0.624	15.4	LOS B	4.7	121.8	0.77	0.90	1.31	23.7
Approach			465	4.0	465	4.0	0.624	15.4	LOS B	4.7	121.8	0.77	0.90	1.31	23.7
North: Norwood Ave															
7	L2	All MCs	145	3.0	145	3.0	0.436	8.8	LOS A	2.4	61.4	0.59	0.46	0.65	25.5
4	T1	All MCs	635	3.0	635	3.0	0.436	8.8	LOS A	2.4	61.4	0.59	0.46	0.65	26.1
14	R2	All MCs	45	3.0	45	3.0	0.436	8.8	LOS A	2.4	61.4	0.59	0.46	0.65	26.2
Approach			825	3.0	825	3.0	0.436	8.8	LOS A	2.4	61.4	0.59	0.46	0.65	26.0
West: Bell Ave															
5	L2	All MCs	60	1.0	60	1.0	0.636	19.6	LOS B	3.9	98.7	0.80	1.01	1.38	22.9
2	T1	All MCs	150	1.0	150	1.0	0.636	19.6	LOS B	3.9	98.7	0.80	1.01	1.38	23.1
12	R2	All MCs	155	1.0	155	1.0	0.636	19.6	LOS B	3.9	98.7	0.80	1.01	1.38	23.1
Approach			365	1.0	365	1.0	0.636	19.6	LOS B	3.9	98.7	0.80	1.01	1.38	23.1
All Vehicles			2490	2.9	2490	2.9	0.636	11.5	LOS B	4.7	121.8	0.65	0.61	0.85	25.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1 [Norwood/Bell - PM No Build (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Bell - PM No Build
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	130	1.0	130	1.0	0.403	7.3	LOS A	2.2	55.7	0.47	0.29	0.47	26.1
8	T1	All MCs	445	1.0	445	1.0	0.403	7.3	LOS A	2.2	55.7	0.47	0.29	0.47	26.4
18	R2	All MCs	335	1.0	335	1.0	0.403	7.3	LOS A	2.2	55.7	0.47	0.29	0.47	26.5
Approach			910	1.0	910	1.0	0.403	7.3	LOS A	2.2	55.7	0.47	0.29	0.47	26.4
East: Bell Ave															
1	L2	All MCs	300	2.0	300	2.0	0.662	15.6	LOS B	6.1	155.0	0.79	0.93	1.39	23.5
6	T1	All MCs	115	2.0	115	2.0	0.662	15.6	LOS B	6.1	155.0	0.79	0.93	1.39	23.7
16	R2	All MCs	130	2.0	130	2.0	0.662	15.6	LOS B	6.1	155.0	0.79	0.93	1.39	23.6
Approach			545	2.0	545	2.0	0.662	15.6	LOS B	6.1	155.0	0.79	0.93	1.39	23.5
North: Norwood Ave															
7	L2	All MCs	130	1.0	130	1.0	0.452	9.9	LOS A	2.7	67.2	0.66	0.62	0.84	25.2
4	T1	All MCs	610	1.0	610	1.0	0.452	9.9	LOS A	2.7	67.2	0.66	0.62	0.84	25.8
14	R2	All MCs	20	1.0	20	1.0	0.452	9.9	LOS A	2.7	67.2	0.66	0.62	0.84	25.9
Approach			760	1.0	760	1.0	0.452	9.9	LOS A	2.7	67.2	0.66	0.62	0.84	25.7
West: Bell Ave															
5	L2	All MCs	15	1.0	15	1.0	0.391	12.3	LOS B	1.7	42.2	0.70	0.78	0.91	24.8
2	T1	All MCs	90	1.0	90	1.0	0.391	12.3	LOS B	1.7	42.2	0.70	0.78	0.91	25.1
12	R2	All MCs	115	1.0	115	1.0	0.391	12.3	LOS B	1.7	42.2	0.70	0.78	0.91	25.0
Approach			220	1.0	220	1.0	0.391	12.3	LOS B	1.7	42.2	0.70	0.78	0.91	25.0
All Vehicles			2435	1.2	2435	1.2	0.662	10.4	LOS B	6.1	155.0	0.62	0.58	0.83	25.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1 [Norwood/Bell - AM Road Diet (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Bell - AM Road Diet
Site Category: Future Conditions 2
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	55	3.0	55	3.0	0.584	12.7	LOS B	4.8	123.9	0.73	0.77	1.13	24.5
8	T1	All MCs	445	3.0	445	3.0	0.584	12.7	LOS B	4.8	123.9	0.73	0.77	1.13	24.7
18	R2	All MCs	220	3.0	220	3.0	0.256	6.9	LOS A	1.2	29.7	0.56	0.42	0.56	26.4
Approach			720	3.0	720	3.0	0.584	10.9	LOS B	4.8	123.9	0.68	0.66	0.95	25.2
East: Bell Avenue															
1	L2	All MCs	135	4.0	135	4.0	0.578	14.5	LOS B	4.3	111.2	0.78	0.84	1.19	23.7
6	T1	All MCs	95	4.0	95	4.0	0.578	14.5	LOS B	4.3	111.2	0.78	0.84	1.19	23.9
16	R2	All MCs	180	4.0	180	4.0	0.578	14.5	LOS B	4.3	111.2	0.78	0.84	1.19	23.9
Approach			410	4.0	410	4.0	0.578	14.5	LOS B	4.3	111.2	0.78	0.84	1.19	23.8
North: Norwood Ave															
7	L2	All MCs	225	3.0	225	3.0	0.793	19.3	LOS B	16.4	418.9	0.95	1.08	1.73	22.6
4	T1	All MCs	500	3.0	500	3.0	0.793	19.3	LOS B	16.4	418.9	0.95	1.08	1.73	22.9
14	R2	All MCs	55	3.0	55	3.0	0.793	19.3	LOS B	16.4	418.9	0.95	1.08	1.73	22.8
Approach			780	3.0	780	3.0	0.793	19.3	LOS B	16.4	418.9	0.95	1.08	1.73	22.8
West: Bell Avenue															
5	L2	All MCs	75	1.0	75	1.0	0.667	21.8	LOS C	4.6	115.5	0.85	1.03	1.40	22.1
2	T1	All MCs	190	1.0	190	1.0	0.667	21.8	LOS C	4.6	115.5	0.85	1.03	1.40	22.4
12	R2	All MCs	100	1.0	100	1.0	0.667	21.8	LOS C	4.6	115.5	0.85	1.03	1.40	22.3
Approach			365	1.0	365	1.0	0.667	21.8	LOS C	4.6	115.5	0.85	1.03	1.40	22.3
All Vehicles			2275	2.9	2275	2.9	0.793	16.2	LOS B	16.4	418.9	0.82	0.90	1.33	23.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1 [Norwood/Bell - PM Road Diet (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Bell - PM Road Diet
Site Category: Future Conditions 2
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	95	1.0	95	1.0	0.402	7.7	LOS A	2.1	52.7	0.54	0.37	0.54	25.7
8	T1	All MCs	320	1.0	320	1.0	0.402	7.7	LOS A	2.1	52.7	0.54	0.37	0.54	26.0
18	R2	All MCs	250	1.0	250	1.0	0.253	6.1	LOS A	1.2	30.8	0.49	0.33	0.49	26.6
Approach			665	1.0	665	1.0	0.402	7.1	LOS A	2.1	52.7	0.52	0.36	0.52	26.2
East: Bell Avenue															
1	L2	All MCs	205	2.0	205	2.0	0.607	13.3	LOS B	5.8	147.0	0.77	0.79	1.17	23.9
6	T1	All MCs	145	2.0	145	2.0	0.607	13.3	LOS B	5.8	147.0	0.77	0.79	1.17	24.2
16	R2	All MCs	170	2.0	170	2.0	0.607	13.3	LOS B	5.8	147.0	0.77	0.79	1.17	24.1
Approach			520	2.0	520	2.0	0.607	13.3	LOS B	5.8	147.0	0.77	0.79	1.17	24.1
North: Norwood Ave															
7	L2	All MCs	195	1.0	195	1.0	0.840	25.3	LOS C	15.9	401.1	1.00	1.36	2.18	21.4
4	T1	All MCs	495	1.0	495	1.0	0.840	25.3	LOS C	15.9	401.1	1.00	1.36	2.18	21.6
14	R2	All MCs	30	1.0	30	1.0	0.840	25.3	LOS C	15.9	401.1	1.00	1.36	2.18	21.5
Approach			720	1.0	720	1.0	0.840	25.3	LOS C	15.9	401.1	1.00	1.36	2.18	21.5
West: Bell Avenue															
5	L2	All MCs	20	1.0	20	1.0	0.410	13.3	LOS B	2.0	49.4	0.74	0.79	0.93	24.3
2	T1	All MCs	115	1.0	115	1.0	0.410	13.3	LOS B	2.0	49.4	0.74	0.79	0.93	24.6
12	R2	All MCs	85	1.0	85	1.0	0.410	13.3	LOS B	2.0	49.4	0.74	0.79	0.93	24.5
Approach			220	1.0	220	1.0	0.410	13.3	LOS B	2.0	49.4	0.74	0.79	0.93	24.5
All Vehicles			2125	1.2	2125	1.2	0.840	15.4	LOS B	15.9	401.1	0.77	0.85	1.29	23.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 33 [Norwood/Morey - AM No Build (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Morey - AM No Build
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	23	3.0	23	3.0	0.360	6.1	LOS A	2.0	50.6	0.29	0.12	0.29	26.8
8	T1	All MCs	881	3.0	881	3.0	0.360	6.1	LOS A	2.0	50.6	0.29	0.12	0.29	27.1
18	R2	All MCs	1	3.0	1	3.0	0.360	6.1	LOS A	2.0	50.6	0.29	0.12	0.29	27.0
Approach			905	3.0	905	3.0	0.360	6.1	LOS A	2.0	50.6	0.29	0.12	0.29	27.1
East: Morey Ave															
1	L2	All MCs	5	1.0	5	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.0
6	T1	All MCs	1	1.0	1	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.2
16	R2	All MCs	5	1.0	5	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.2
Approach			11	1.0	11	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.1
North: Norwood Ave															
7	L2	All MCs	1	3.0	1	3.0	0.394	5.9	LOS A	2.4	60.6	0.16	0.04	0.16	26.9
4	T1	All MCs	1004	3.0	1004	3.0	0.394	5.9	LOS A	2.4	60.6	0.16	0.04	0.16	27.2
14	R2	All MCs	45	3.0	45	3.0	0.394	5.9	LOS A	2.4	60.6	0.16	0.04	0.16	27.1
Approach			1050	3.0	1050	3.0	0.394	5.9	LOS A	2.4	60.6	0.16	0.04	0.16	27.2
West: Morey Ave															
5	L2	All MCs	90	1.0	90	1.0	0.239	9.5	LOS A	0.8	21.2	0.65	0.65	0.65	24.8
2	T1	All MCs	1	1.0	1	1.0	0.239	9.5	LOS A	0.8	21.2	0.65	0.65	0.65	25.1
12	R2	All MCs	45	1.0	45	1.0	0.239	9.5	LOS A	0.8	21.2	0.65	0.65	0.65	25.0
Approach			136	1.0	136	1.0	0.239	9.5	LOS A	0.8	21.2	0.65	0.65	0.65	24.9
All Vehicles			2102	2.9	2102	2.9	0.394	6.2	LOS A	2.4	60.6	0.25	0.12	0.25	27.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 33 [Norwood/Morey - PM No Build (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Morey - PM No Build
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	45	3.0	45	3.0	0.360	5.8	LOS A	2.0	52.1	0.20	0.06	0.20	26.8
8	T1	All MCs	899	3.0	899	3.0	0.360	5.8	LOS A	2.0	52.1	0.20	0.06	0.20	27.2
18	R2	All MCs	1	3.0	1	3.0	0.360	5.8	LOS A	2.0	52.1	0.20	0.06	0.20	27.1
Approach			945	3.0	945	3.0	0.360	5.8	LOS A	2.0	52.1	0.20	0.06	0.20	27.2
East: Morey Ave															
1	L2	All MCs	5	1.0	5	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.0
6	T1	All MCs	1	1.0	1	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.2
16	R2	All MCs	5	1.0	5	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.2
Approach			11	1.0	11	1.0	0.019	6.4	LOS A	0.1	1.5	0.59	0.53	0.59	26.1
North: Norwood Ave															
7	L2	All MCs	1	3.0	1	3.0	0.421	6.5	LOS A	2.6	66.6	0.23	0.08	0.23	26.7
4	T1	All MCs	1009	3.0	1009	3.0	0.421	6.5	LOS A	2.6	66.6	0.23	0.08	0.23	27.0
14	R2	All MCs	90	3.0	90	3.0	0.421	6.5	LOS A	2.6	66.6	0.23	0.08	0.23	26.9
Approach			1100	3.0	1100	3.0	0.421	6.5	LOS A	2.6	66.6	0.23	0.08	0.23	27.0
West: Morey Ave															
5	L2	All MCs	45	1.0	45	1.0	0.122	7.8	LOS A	0.4	10.2	0.62	0.62	0.62	25.3
2	T1	All MCs	1	1.0	1	1.0	0.122	7.8	LOS A	0.4	10.2	0.62	0.62	0.62	25.6
12	R2	All MCs	23	1.0	23	1.0	0.122	7.8	LOS A	0.4	10.2	0.62	0.62	0.62	25.5
Approach			69	1.0	69	1.0	0.122	7.8	LOS A	0.4	10.2	0.62	0.62	0.62	25.4
All Vehicles			2125	2.9	2125	2.9	0.421	6.2	LOS A	2.6	66.6	0.23	0.09	0.23	27.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1 [Norwood/Morey - AM Road Diet (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Morey - AM Road Diet
Site Category: Future Conditions 2
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	23	3.0	23	3.0	0.579	9.4	LOS A	4.9	125.7	0.44	0.19	0.44	25.5
8	T1	All MCs	681	3.0	681	3.0	0.579	9.4	LOS A	4.9	125.7	0.44	0.19	0.44	25.8
18	R2	All MCs	1	3.0	1	3.0	0.579	9.4	LOS A	4.9	125.7	0.44	0.19	0.44	25.6
Approach			705	3.0	705	3.0	0.579	9.4	LOS A	4.9	125.7	0.44	0.19	0.44	25.7
East: Morey Avenue															
1	L2	All MCs	5	1.0	5	1.0	0.019	6.3	LOS A	0.1	1.7	0.61	0.51	0.61	25.8
6	T1	All MCs	1	1.0	1	1.0	0.019	6.3	LOS A	0.1	1.7	0.61	0.51	0.61	26.1
16	R2	All MCs	5	1.0	5	1.0	0.019	6.3	LOS A	0.1	1.7	0.61	0.51	0.61	26.0
Approach			11	1.0	11	1.0	0.019	6.3	LOS A	0.1	1.7	0.61	0.51	0.61	25.9
North: Norwood Ave															
7	L2	All MCs	1	3.0	1	3.0	0.557	7.8	LOS A	4.9	126.1	0.24	0.07	0.24	25.9
4	T1	All MCs	679	3.0	679	3.0	0.557	7.8	LOS A	4.9	126.1	0.24	0.07	0.24	26.2
14	R2	All MCs	45	3.0	45	3.0	0.557	7.8	LOS A	4.9	126.1	0.24	0.07	0.24	26.1
Approach			725	3.0	725	3.0	0.557	7.8	LOS A	4.9	126.1	0.24	0.07	0.24	26.2
West: Morey Avenue															
5	L2	All MCs	90	1.0	90	1.0	0.206	7.9	LOS A	0.8	21.3	0.64	0.57	0.64	25.1
2	T1	All MCs	1	1.0	1	1.0	0.206	7.9	LOS A	0.8	21.3	0.64	0.57	0.64	25.4
12	R2	All MCs	45	1.0	45	1.0	0.206	7.9	LOS A	0.8	21.3	0.64	0.57	0.64	25.3
Approach			136	1.0	136	1.0	0.206	7.9	LOS A	0.8	21.3	0.64	0.57	0.64	25.1
All Vehicles			1577	2.8	1577	2.8	0.579	8.5	LOS A	4.9	126.1	0.37	0.17	0.37	25.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1 [Norwood/Morey - PM Road Diet (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Morey - PM Road Diet
Site Category: Future Conditions 2
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	45	3.0	45	3.0	0.548	8.2	LOS A	4.6	118.9	0.30	0.10	0.30	25.8
8	T1	All MCs	654	3.0	654	3.0	0.548	8.2	LOS A	4.6	118.9	0.30	0.10	0.30	26.1
18	R2	All MCs	1	3.0	1	3.0	0.548	8.2	LOS A	4.6	118.9	0.30	0.10	0.30	26.0
Approach			700	3.0	700	3.0	0.548	8.2	LOS A	4.6	118.9	0.30	0.10	0.30	26.0
East: Morey Avenue															
1	L2	All MCs	5	1.0	5	1.0	0.018	6.0	LOS A	0.1	1.6	0.59	0.49	0.59	25.9
6	T1	All MCs	1	1.0	1	1.0	0.018	6.0	LOS A	0.1	1.6	0.59	0.49	0.59	26.2
16	R2	All MCs	5	1.0	5	1.0	0.018	6.0	LOS A	0.1	1.6	0.59	0.49	0.59	26.1
Approach			11	1.0	11	1.0	0.018	6.0	LOS A	0.1	1.6	0.59	0.49	0.59	26.0
North: Norwood Ave															
7	L2	All MCs	1	3.0	1	3.0	0.712	11.4	LOS B	8.9	227.2	0.47	0.16	0.47	24.9
4	T1	All MCs	814	3.0	814	3.0	0.712	11.4	LOS B	8.9	227.2	0.47	0.16	0.47	25.2
14	R2	All MCs	90	3.0	90	3.0	0.712	11.4	LOS B	8.9	227.2	0.47	0.16	0.47	25.1
Approach			905	3.0	905	3.0	0.712	11.4	LOS B	8.9	227.2	0.47	0.16	0.47	25.2
West: Morey Avenue															
5	L2	All MCs	45	1.0	45	1.0	0.121	7.8	LOS A	0.5	11.5	0.64	0.61	0.64	25.1
2	T1	All MCs	1	1.0	1	1.0	0.121	7.8	LOS A	0.5	11.5	0.64	0.61	0.64	25.4
12	R2	All MCs	23	1.0	23	1.0	0.121	7.8	LOS A	0.5	11.5	0.64	0.61	0.64	25.3
Approach			69	1.0	69	1.0	0.121	7.8	LOS A	0.5	11.5	0.64	0.61	0.64	25.2
All Vehicles			1685	2.9	1685	2.9	0.712	9.9	LOS A	8.9	227.2	0.40	0.16	0.40	25.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Norwood/Silver Eagle Road - AM No Build (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Silver Eagle Road - AM No Build
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	135	2.0	135	2.0	0.401	8.3	LOS A	2.0	49.9	0.58	0.43	0.58	25.7
8	T1	All MCs	600	2.0	600	2.0	0.401	8.3	LOS A	2.0	49.9	0.58	0.43	0.58	26.2
18	R2	All MCs	20	2.0	20	2.0	0.401	8.3	LOS A	2.0	49.9	0.58	0.43	0.58	26.3
Approach			755	2.0	755	2.0	0.401	8.3	LOS A	2.0	49.9	0.58	0.43	0.58	26.1
East: Silver Eagle Road															
1	L2	All MCs	45	3.0	45	3.0	0.375	12.3	LOS B	1.5	38.7	0.69	0.76	0.89	24.7
6	T1	All MCs	115	3.0	115	3.0	0.375	12.3	LOS B	1.5	38.7	0.69	0.76	0.89	25.0
16	R2	All MCs	45	3.0	45	3.0	0.375	12.3	LOS B	1.5	38.7	0.69	0.76	0.89	24.9
Approach			205	3.0	205	3.0	0.375	12.3	LOS B	1.5	38.7	0.69	0.76	0.89	24.9
North: Norwood Ave															
7	L2	All MCs	25	3.0	25	3.0	0.426	8.1	LOS A	2.2	57.6	0.54	0.36	0.54	26.1
4	T1	All MCs	665	3.0	665	3.0	0.426	8.1	LOS A	2.2	57.6	0.54	0.36	0.54	26.4
14	R2	All MCs	190	3.0	190	3.0	0.426	8.1	LOS A	2.2	57.6	0.54	0.36	0.54	26.3
Approach			880	3.0	880	3.0	0.426	8.1	LOS A	2.2	57.6	0.54	0.36	0.54	26.4
West: Silver Eagle Road															
5	L2	All MCs	260	5.0	260	5.0	0.553	14.5	LOS B	3.3	85.3	0.74	0.85	1.17	23.6
2	T1	All MCs	110	5.0	110	5.0	0.553	14.5	LOS B	3.3	85.3	0.74	0.85	1.17	23.8
12	R2	All MCs	195	5.0	195	5.0	0.319	10.2	LOS B	1.2	32.4	0.65	0.63	0.72	25.5
Approach			565	5.0	565	5.0	0.553	13.0	LOS B	3.3	85.3	0.71	0.77	1.01	24.3
All Vehicles			2405	3.2	2405	3.2	0.553	9.7	LOS A	3.3	85.3	0.60	0.51	0.69	25.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Norwood/Silver Eagle Road - PM No Build (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Silver Eagle Road - PM No Build
Site Category: Future Conditions 1
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	190	2.0	190	2.0	0.480	10.2	LOS B	3.1	77.7	0.66	0.61	0.85	25.0
8	T1	All MCs	625	2.0	625	2.0	0.480	10.2	LOS B	3.1	77.7	0.66	0.61	0.85	25.7
18	R2	All MCs	25	2.0	25	2.0	0.480	10.2	LOS B	3.1	77.7	0.66	0.61	0.85	25.8
Approach			840	2.0	840	2.0	0.480	10.2	LOS B	3.1	77.7	0.66	0.61	0.85	25.5
East: Silver Eagle Road															
1	L2	All MCs	15	1.0	15	1.0	0.328	11.6	LOS B	1.3	32.0	0.70	0.75	0.83	25.1
6	T1	All MCs	120	1.0	120	1.0	0.328	11.6	LOS B	1.3	32.0	0.70	0.75	0.83	25.3
16	R2	All MCs	40	1.0	40	1.0	0.328	11.6	LOS B	1.3	32.0	0.70	0.75	0.83	25.3
Approach			175	1.0	175	1.0	0.328	11.6	LOS B	1.3	32.0	0.70	0.75	0.83	25.3
North: Norwood Ave															
7	L2	All MCs	45	1.0	45	1.0	0.430	8.1	LOS A	2.3	58.1	0.56	0.38	0.56	26.1
4	T1	All MCs	610	1.0	610	1.0	0.430	8.1	LOS A	2.3	58.1	0.56	0.38	0.56	26.4
14	R2	All MCs	235	1.0	235	1.0	0.430	8.1	LOS A	2.3	58.1	0.56	0.38	0.56	26.3
Approach			890	1.0	890	1.0	0.430	8.1	LOS A	2.3	58.1	0.56	0.38	0.56	26.3
West: Silver Eagle Road															
5	L2	All MCs	280	1.0	280	1.0	0.563	13.1	LOS B	3.9	98.2	0.73	0.81	1.14	24.0
2	T1	All MCs	160	1.0	160	1.0	0.563	13.1	LOS B	3.9	98.2	0.73	0.81	1.14	24.3
12	R2	All MCs	230	1.0	230	1.0	0.323	9.0	LOS A	1.4	34.3	0.63	0.57	0.66	25.9
Approach			670	1.0	670	1.0	0.563	11.7	LOS B	3.9	98.2	0.70	0.73	0.97	24.7
All Vehicles			2575	1.3	2575	1.3	0.563	10.0	LOS A	3.9	98.2	0.64	0.57	0.78	25.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Norwood/Silver Eagle Road - AM Road Diet (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Silver Eagle Road - AM Road Diet
Site Category: Future Conditions 2
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	195	2.0	195	2.0	0.740	17.1	LOS B	11.7	296.8	0.88	0.98	1.55	23.2
8	T1	All MCs	475	2.0	475	2.0	0.740	17.1	LOS B	11.7	296.8	0.88	0.98	1.55	23.4
18	R2	All MCs	25	2.0	25	2.0	0.740	17.1	LOS B	11.7	296.8	0.88	0.98	1.55	23.3
Approach			695	2.0	695	2.0	0.740	17.1	LOS B	11.7	296.8	0.88	0.98	1.55	23.3
East: Silver Eagle Road															
1	L2	All MCs	50	3.0	50	3.0	0.392	13.1	LOS B	1.8	45.8	0.74	0.78	0.91	24.2
6	T1	All MCs	125	3.0	125	3.0	0.392	13.1	LOS B	1.8	45.8	0.74	0.78	0.91	24.4
16	R2	All MCs	30	3.0	30	3.0	0.392	13.1	LOS B	1.8	45.8	0.74	0.78	0.91	24.3
Approach			205	3.0	205	3.0	0.392	13.1	LOS B	1.8	45.8	0.74	0.78	0.91	24.4
North: Norwood Ave															
7	L2	All MCs	10	3.0	10	3.0	0.688	15.4	LOS B	8.8	225.5	0.83	0.89	1.38	23.8
4	T1	All MCs	420	3.0	420	3.0	0.688	15.4	LOS B	8.8	225.5	0.83	0.89	1.38	24.1
14	R2	All MCs	190	3.0	190	3.0	0.688	15.4	LOS B	8.8	225.5	0.83	0.89	1.38	24.0
Approach			620	3.0	620	3.0	0.688	15.4	LOS B	8.8	225.5	0.83	0.89	1.38	24.0
West: Silver Eagle Road															
5	L2	All MCs	200	5.0	200	5.0	0.390	8.9	LOS A	1.9	48.8	0.61	0.51	0.67	24.9
2	T1	All MCs	125	5.0	125	5.0	0.390	8.9	LOS A	1.9	48.8	0.61	0.51	0.67	25.2
12	R2	All MCs	270	5.0	270	5.0	0.344	8.7	LOS A	1.6	41.1	0.62	0.49	0.62	25.8
Approach			595	5.0	595	5.0	0.390	8.8	LOS A	1.9	48.8	0.62	0.50	0.65	25.3
All Vehicles			2115	3.2	2115	3.2	0.740	13.9	LOS B	11.7	296.8	0.78	0.80	1.18	24.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 1 [Norwood/Silver Eagle Road - PM Road Diet (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Norwood/Silver Eagle Road - PM Road Diet
Site Category: Future Conditions 2
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Norwood Ave															
3	L2	All MCs	210	2.0	210	2.0	0.811	22.9	LOS C	14.0	354.7	0.98	1.25	1.99	21.9
8	T1	All MCs	455	2.0	455	2.0	0.811	22.9	LOS C	14.0	354.7	0.98	1.25	1.99	22.1
18	R2	All MCs	30	2.0	30	2.0	0.811	22.9	LOS C	14.0	354.7	0.98	1.25	1.99	22.0
Approach			695	2.0	695	2.0	0.811	22.9	LOS C	14.0	354.7	0.98	1.25	1.99	22.0
East: Silver Eagle Road															
1	L2	All MCs	20	1.0	20	1.0	0.365	12.0	LOS B	1.7	41.9	0.73	0.75	0.86	24.6
6	T1	All MCs	140	1.0	140	1.0	0.365	12.0	LOS B	1.7	41.9	0.73	0.75	0.86	24.9
16	R2	All MCs	40	1.0	40	1.0	0.365	12.0	LOS B	1.7	41.9	0.73	0.75	0.86	24.8
Approach			200	1.0	200	1.0	0.365	12.0	LOS B	1.7	41.9	0.73	0.75	0.86	24.8
North: Norwood Ave															
7	L2	All MCs	45	1.0	45	1.0	0.760	18.3	LOS B	12.5	314.7	0.91	1.05	1.66	23.1
4	T1	All MCs	480	1.0	480	1.0	0.760	18.3	LOS B	12.5	314.7	0.91	1.05	1.66	23.3
14	R2	All MCs	180	1.0	180	1.0	0.760	18.3	LOS B	12.5	314.7	0.91	1.05	1.66	23.2
Approach			705	1.0	705	1.0	0.760	18.3	LOS B	12.5	314.7	0.91	1.05	1.66	23.3
West: Silver Eagle Road															
5	L2	All MCs	205	1.0	205	1.0	0.662	15.2	LOS B	6.4	160.9	0.81	0.90	1.34	23.5
2	T1	All MCs	185	1.0	185	1.0	0.662	15.2	LOS B	6.4	160.9	0.81	0.90	1.34	23.7
12	R2	All MCs	260	1.0	260	1.0	0.662	12.5	LOS B	6.4	160.9	0.74	0.78	1.09	24.5
Approach			650	1.0	650	1.0	0.662	14.1	LOS B	6.4	160.9	0.78	0.85	1.24	24.0
All Vehicles			2250	1.3	2250	1.3	0.811	18.0	LOS B	14.0	354.7	0.88	1.03	1.57	23.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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