Norwood Avenue Mobility Project

Existing Conditions Analysis Report

April 2025

PREPARED FOR:

City of SACRAMENTO

DKS

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Introduction

Project Background

Norwood Avenue is part of the High Injury Network in the City of Sacramento's Vison Zero Action Plan[1], which means that the corridor experiences a high number of fatal and serious injury crashes for people driving, walking, and bicycling. Additionally, Norwood Avenue is a high priority corridor in the Sacramento Transportation Priorities Plan[2]. The purpose of the Norwood Mobility Project is to evaluate the safety and mobility for all users of the corridor and identify areas for improvements that will eliminate barriers, improve access, and support the needs of the surrounding community. The project will also meet State, regional, and local requirements such as California Executive Order of reducing greenhouse gas emissions, California State Transportation Agency (CalSTA) Climate Action Plan of investing in safer walking and bicycling infrastructure, Sacramento Regional Transit (SacRT) Bus Stop Improvement Plan, and the Sacramento Area Council of Governments (SACOG) Regional Trail Network.

Policy Framework and Setting

In 2019, the City of Sacramento adopted a Complete Streets Policy[3] which confirms the City's commitment to Complete Streets to ensure that future transportation projects support a safer, accessible, and connected multi-modal transportation network.

On February 27, 2024, the City of Sacramento adopted the Sacramento 2040 General Plan and Climate Action & Adaptation Plan. The General Plan lists several goals, policies, and implementation actions for the City. The Mobility section of the 2040 General Plan outlines several policies that are related to the Norwood Mobility Plan.

The following policies relate to Norwood Avenue:

- M-1.1. *The City shall maintain a street classification system that considers the role of streets as corridors for movement but prioritizes a context-sensitive Complete Streets concept that enables connected, comfortable, and convenient travel for those walking, rolling, and taking transit.*
- M-1.2. *The City shall prioritize mobility, comfort, health, safety, and convenience for those walking, followed by those bicycling and riding transit, ahead of design and operations for those driving.*
- M-1.3. *The City shall plan and make investments to foster a transportation system that improves the health of Sacramento residents through actions that make active transportation, nonmotorized modes, high-occupancy, and zero emission vehicles*

[1] City of Sacramento Vision Zero Action Plan (2018)

[2] City of Sacramento Transportation Priorities Plan (2022)

[3] Resolution 2019-0460

(ZEVs) viable, attractive alternatives to automobiles that use internal combustion engines.

- M-1.4. *In planning, designing, and managing the transportation system, the City shall prioritize person throughput to shift trips to more efficient travel modes and upgrade the performance of limited street space.*
- M-1.5. *The City shall maintain street design and operations standards that prioritize comfort and travel time for walking, bicycling, and transit, while managing vehicle speeds and traffic volumes, updating them as best practices evolve.*
- M-1.6. *Wherever feasible, the City shall design buildings, the public realm, streets, and pedestrian access to integrate transit into existing neighborhoods and proposed developments and destinations such as schools, employment centers, commercial centers, major attractions, and public walking spaces to improve access for users by transit.*
- M-1.9. *The City shall ensure that the transportation system is planned and implemented with an equitable process to achieve equitable outcomes and investments so that all neighborhoods one day will have similar levels of transportation infrastructure such as sidewalks, marked low stress crossings, and bikeways.*
- M-1.10. *The City shall continue to engage the community in decisions that affect mobility, including planning, design outcomes and implementation, with a particular focus on planning with, and not for, historically marginalized, disadvantaged communities and environmental justice communities.*
- M.1.11. *The City shall strive to increase bicycling and walking citywide so that it can meet its equity, reduced vehicle miles traveled, and sustainability goals.*
- M-1.13. *The City shall design streets to prioritize walking by including design elements such as the following:*
    - *Grid networks that provide high levels of connectivity;*
    - *Closely spaced intersections;*
    - *Frequent and low-stress crossings;*
    - *Wide, unobstructed walkable sidewalks;*
    - *Separation from vehicle traffic;*
    - *Street trees that provide shading; and*
    - *Minimal curb cuts.*
- M-1.14. *The City shall work to complete the network of tree-shaded sidewalks throughout the city, to the greatest extent feasible, by building new sidewalks and crossings, especially within the high-injury network, in disadvantaged communities, near high-ridership transit stops, and near important destinations, such as schools, parks, and commercial areas. Walking facilities should incorporate shade trees.*
- M-1.15. *The City shall require new subdivisions, new multi-unit dwelling developments, and new developments along commercial corridors to include well-lit, tree-shaded walkways where feasible, that provide direct links to the public realm or adjacent public destinations such as transit stops and stations, schools, parks and shopping centers.*

- M-1.16. *The City shall remove barriers to walking, where feasible, and work with utility companies to remove barriers to allow people of all abilities to move with comfort and convenience throughout the city, including through the following:*
    - *Provisions of curb ramps, crosswalks, and overpasses;*
    - *Relocation of infrastructure of street furniture that impedes travel pathways;*
    - *Reducing or consolidating driveways and curb cuts;*
    - *Providing long and short-term bicycle and scooter parking to minimize sidewalk obstructions; and*
    - *Creation of additional walking entrances to important destinations like schools, parks, and commercial areas.*
- M-1.17. *The City shall plan and seek funding for a continuous, low-stress bikeway network consisting of bicycling-friendly facilities that connect neighborhoods with destinations and activity centers throughout the city.*
- M-1.8. *When designing projects, the City shall prioritize designs that strengthen the protection of people bicycling such as improvements that increase visibility of bicyclists, increase bikeway widths, raise bikeways, design safer intersection crossings and turns, and separate bikeways from driving traffic wherever feasible.*
- M-1.9. *When designing projects, the City shall prioritize designs that encourage walking and improve walking safety best practice designs and considerations for efficiencies in walking.*
- M-1.26. *The City shall encourage the Sacramento Regional Transit District (SacRT) to implement bus shelter design that encourages transit use, informed by ADA-compliance, bus stop placement, and passenger safety best practices. Where feasible, the City should collaborate with SacRT on bus stop designs for major corridor improvement projects.*

Additionally, in the 2040 General Plan is the North Sacramento Community Plan, which identifies policies specific to North Sacramento which includes Norwood Avenue. The North Sacramento Community Plan also identifies the Norwood Area Circulation and Infrastructure Plan (2007) as a plan that is directly related to the North Sacramento community.

The following North Sacramento Community Plan policies in the 2040 General Plan relate to Norwood Avenue:

- NS-M-2. *The City shall continue to support community efforts to offer, promote, and expand access to bikes, bike skills, and bike repair.*
- NS-M-3. *The City shall continue to invest in walking improvements in North Sacramento Community Plan Area, working closely with the communities to ensure the community needs are addressed.*
- NS-M-4. *When making street improvements the City shall recognize that speed is the greatest factor in collisions, and this should be addressed in the North Sacramento Community Plan Area. Staff should apply speed reduction measures as funding allows.*

- NS-M-5. *The City should encourage and collaborate with the Sacramento Regional Transit District (SacRT) to plan and implement high frequency, connected, and convenient trans tot the North Natomas Community Plan Area and the wider city.*
- NS-M-6. *The City shall continue to seek funding to carry out improvements as prioritized in the Transportation Priorities Plan for streets that lack sidewalks and street lighting, are under heavy use by pedestrians, or will not be improved through new development and assessment districts.*
- NS-PFS-7. *The City shall encourage property owners to form assessment districts in order to support the provision of infrastructure.*

The Norwood Area Circulation & Infrastructure Plan recommendations for Norwood Avenue include, "stripe the bike lanes and properly mark them along Norwood Avenue to improve the safety of the bicyclists and request that RT provide bus shelters and other pertinent improvements at the existing bus stops to improve the comfort of riders as well as aesthetics. Additionally, as improvements occur along Norwood Avenue, sidewalk improvements should comply with ADA requirements, including removing impediments in the sidewalks and improving the curb ramps to current standards." Similar recommendations are provided in the Norwood Circulation & Infrastructure Plan for adjacent corridors included in the Norwood Mobility Plan. **Table 1** shows recommendations for Norwood Avenue and adjacent roadways from the Norwood Area Circulation & Infrastructure Plan.

Table 1. Recommended Circulation and Roadway Improvements

Norwood Area Roadways	Roadway	Curb/Gutter	Parkway	Sidewalk	Bike Lanes	Bus Stop Improvements	Lighting	Traffic Calming Devices				
								Speed Humps	Stop Signs	Crosswalks	Traffic Signs	Speed Limit
Norwood Avenue					X	X					X	
Morrison Avenue	X	X		X			X			X		X
Morey Avenue	X	X	X	X			X	X	X	X		X
South Avenue	X	X	X	X			X	X	X	X		X
Silver Eagle Road	X	X	X	X	X	X	X			X	X	X
Ford Road	X	X		X		X	X			X	X	
Western Avenue	X	X	X	X	X		X		X			X

Source: Norwood Area Circulation & Infrastructure Plan, 2007.

Literature Review

The City of Sacramento has developed planning studies that overlap with the Norwood Mobility Project corridor. This section provides a brief literature review of several key plans and policies by the City of Sacramento, focusing on their relevance to Norwood Avenue.

Norwood Area Circulation and Infrastructure Plan (2007)

In 2007, the Norwood Area Circulation and Infrastructure Plan was adopted by the City of Sacramento. The Norwood Area Circulation and Infrastructure Plan assessed existing circulation patterns and infrastructure conditions to provide recommendations for improvements for existing and future development.

Vision Zero Action Plan (2018)

In January 2017, the City of Sacramento adopted a goal to eliminate traffic fatalities and serious injuries[4]. Norwood Avenue was identified in the City of Sacramento Visions Zero Action Plan as a High Injury Corridor. The Sacramento Vision Zero Action Plan aims to support the City's General Plan in maintaining safety and health of its residents and visitors. The Vision Zero Action Plan outlines crash trends and patterns in the City while providing a short- and long-term action plan for improving transportation safety and eventually eliminating fatal and severe injury crashes. The Vision Zero Plan is actively updated with new traffic data and progress towards a Vision Zero goal.

Transportation Priorities Plan (2022)

In November 2022, the City of Sacramento adopted a list of priority transportation projects. The Transportation Priorities Plan (TPP) provides the city with a prioritized list of projects and funding needs for improvements. The TPP outlines funding sources for transportation projects, priority areas, and needs of the city. In the TPP, Norwood Avenue and intersecting corridors are identified as medium to high priority corridors for projects that include streetscape, walking improvements, and bike lanes.

2040 General Plan - Environmental Justice Element (2024)

In the 2040 Sacramento General Plan, Norwood Avenue is a designated Disadvantaged Community (DAC) in Sacramento. DAC designation is determined based on several factors such as pollution, income, and food resources.

[4] Resolution NO. 2017-0032

Climate Action & Adaptation Plan (2024)

On February 27, 2024, the City of Sacramento adopted the Climate Action & Adaptation Plan (CAAP). The CAAP includes measures for Sacramento to implement to reduce greenhouse gas emissions (GHG) by 2030. The CAAP builds upon the City's 2012 Climate Action Plan and emphasizes the need for active transportation as a key strategy for reducing GHG.

Streets for People: Sacramento's Active Transportation Plan (Draft 2024-2025)

Streets for People: Sacramento's Active Transportation Plan (S4P) is currently in draft form and aims to improve walking, biking, and rolling in Sacramento. S4P will serve to update the City's 2018 Bicycle Master Plan and 2006 Pedestrian Master Plan. The draft S4P plan will serve as a guide for city staff, local agencies, public officials, residents, and developers to create a balanced and connected transportation system that supports all modes of travel and encourages active transportation. The primary goal of the draft S4P plan is to address active transportation needs and focus on improving infrastructure primarily in areas that are disadvantaged or marginalized.

Description of the Norwood Avenue Corridor

This section provides a physical description of Norwood Avenue and the surrounding community's socio-economic characteristics.

Socio-Economic Characteristics

Norwood Avenue is located in North Sacramento, west of the Del Paso Heights community. As described by the Sacramento Area Council of Governments (SACOG), Norwood Avenue is in an Environmental Justice (EJ) community of low income and minority groups. The Norwood Avenue Mobility Project corridor is also within two SB 535 disadvantaged communities[5]. As illustrated in the City of Sacramento 2040 General Plan[6], Norwood Avenue is in an area with the highest cumulative air pollution burden.

According to the American Community Survey 5-Year Estimates, the four census tracts surrounding the project area contain approximately 17,437[7] people with an average annual median household income of $60,570, whereas the citywide median household income is

[5] These areas represent the 25% highest scoring census tracts in CalEnviroScreen 4.0, census tracts previously identified in the top 25% in CalEnviroScreen 3.0, census tracts with high amounts of pollution and low populations, and federally recognized tribal areas as identified by the Census in the 2021 American Indian Areas Related National Geodatabase. *https://oehha.ca.gov/calenviroscreen/sb535*

[6] City of Sacramento 2040 General Plan, Map EJ-2: Census Tracts with Highest Cumulative Air Pollution Burden

[7] ACS 2023 5-Year Estimates, Table S0101

$83,753[8]. Citywide, 14.4% of the population experience poverty, whereas the population of the four census tracts surrounding the project corridor range between 14.5% to 31.3% of people experiencing poverty[9]. According to the United States Environmental Protection Agency (EPA) Climate and Economic Justice Screening Tool, Norwood Avenue is located in disadvantaged communities that are above the percentile threshold for low income, fine particulate (PM 2.5) exposure, asthma, low life expectancy, housing costs, and wastewater discharge.

Physical Characteristics

Norwood Avenue is a north-south arterial that connects the North Sacramento community to Interstate 80, employment and retail destinations, and other services.

The road profile consists of two general purpose travel lanes per direction with a striped center two way left turn median. However, from Grace Avenue to Main Avenue, the roadway is one travel lane per direction with no two-way left turn lane median. Lane widths throughout the corridor vary from 11 to 12 feet for through travel lanes and 10 to 11 feet for two-way left turn center lanes. Per the City's standards, the minimum lane width for travel lanes is 11 feet unless the City Traffic Engineer deems appropriate otherwise[10].

Norwood Avenue consists of 11 signalized intersections, two of which are at I-80 on and off ramps. The posted speed limit throughout the study corridor is 35 mph. The right-of-way (ROW) of the study corridor varies between 50 to 70 feet, when measured from curb to curb.

Throughout the study corridor, sidewalks are approximately five feet wide. The corridor consists of two major sidewalk gaps on the west side of the road from Berthoud Street to Grace Avenue where there is an informal asphalt path and on the east side of Norwood Avenue from Grace Avenue to Main Avenue there is no sidewalk present. However, the sidewalk gap on the east side of the corridor from Grace Avenue to Main Avenue will be closed with future planned development. Throughout the entire corridor, utility poles are installed in the sidewalk, creating regular obstructions in the sidewalk width. The City has completed recent crosswalk upgrades at the intersection of Norwood Avenue and Bell Avenue. The remaining crosswalk locations along the corridor require some level of improvement to meet City standards including updates to push buttons, curb ramps, accessible pedestrian signal (APS) upgrades, and/or striping. The City Engineering Services team is currently upgrading several intersections on Norwood Avenue to include intelligent transportation systems (ITS) that will improve safety and efficiency.

Norwood Avenue consists of disconnected and incomplete bike lanes and lacks any striped markings or wayfinding signage for existing bicycle facilities. From Main Avenue to Norwood Junior High School, a bike lane exists along the southbound travel lane but drops off 160

[8] ACS 2023 5-Year Estimates, Table S1901
[9] ACS 2023 5-Year Estimates, Table S1701
[10] City of Sacramento, Section 15 - Street Design Standards

feet north of the Norwood Avenue and Grace Avenue intersection. A bike lane begins approximately 200 feet south of the northbound Bell Avenue intersection approach and continues along the northbound travel lanes from Bell Avenue to Grace Avenue. At the southern end of the corridor, from the Arcade Creek overpass to Carroll Avenue, bike lanes are present along the northbound and southbound travel lanes.

The corridor has been broken into four segments for the purposes of this study based on their general characteristics. This segmentation is shown in **Figure 1** and **Table 2** and provides a summary of the existing conditions and characteristics for each road segment. Each segment is further described in the following sections.

Figure 1. Norwood Avenue Roadway Segments

Table 2. Summary of Existing Conditions and Characteristics along Norwood Avenue

	Road Segment 1	Road Segment 2	Road Segment 3	Road Segment 4
Boundaries	Main Avenue to Bell Avenue	Bell Avenue to I-80	I-80 to Carroll Avenue	Carroll Avenue to Arcade Creek
Length (Approx)	2,670 ft	2,300 ft	5,300 ft	1,200 ft
Number of Lanes	2 - 4	4	4	2-3
Lighting	Street Lighting	Street and Pedestrian Lighting	Street Lighting	Street and Pedestrian Lighting
Posted Speed Limit	25 MPH – School Zone 35 MPH	35 MPH	25 MPH – School Zone 35 MPH	35 MPH
Annual Daily Traffic	12,064	19,310	10,772	14,302
Adjacent Land Uses	Standard Single-Family, Single-Family Alternative, Agricultural, and Multi-Family	Multi-Family, Commercial, and Industrial	Multi-Family, Standard Single-Family, Single-Family Alternative, Commercial	Multi-Family and Single-Family Standard

	Road Segment 1	Road Segment 2	Road Segment 3	Road Segment 4
Notable Locations	Norwood Junior High School	Norwood Center	Sacramento County Department of Human Assistance, Dollar General, Robertson Community Center, Del Paso Park	Gateway Park
Major Cross-Streets within Road Segment	Grace Avenue, Bell Avenue	Jessie Avenue	Harris Avenue, Morrison Avenue, Grand Avenue, Silver Eagle Road, Ford Road	Fairbanks Avenue
Median Types	None	None	None	None
Existing Bicycle Facilities	Bike Lanes-SB Lane from Main Avenue to Norwood Jr High parking lot exit and NB lane north of Bell Avenue to Grace Avenue	Bike Lane – NB lane approx. 200 ft prevailing Bell/Norwood intersection	None	Bike Lanes – NB and SB lanes from Arcade Creek overpass to Carroll Avenue

	Road Segment 1	Road Segment 2	Road Segment 3	Road Segment 4
Condition of Walking Facilities	• No sidewalk along NB lane from Grace Ave to Main Ave • Sidewalks are continuous with no obvious deterioration along SB lane from Main Ave to Grace Ave • Sidewalk from Grace Ave to Berthoud St along SB lane is discontinuous in material transitioning from concrete to asphalt and consists of cracks is deteriorating	• Sidewalks are continuous and does not show obvious signs of deteriorating but contains some cracks in the concrete. • Sidewalk lacks buffers from travel lanes	• Sidewalks are continuous but consists of concrete gaps and uneven pavement • Sidewalk lacks buffers from travel lanes • Utility poles within sidewalk width	• Sidewalks is continuous and does not consist of obvious signs of deterioration
Parking	On-street parking along SB lanes from Main Ave to Norwood JHS	On-street parking along NB and SB lanes from Bell Ave to Jessie Ave	No on-street parking	No on-street parking
Bus Shelter Locations	None	1 – Route 19 at Bell/Norwood (SB)	None	None

Segment 1: Norwood Avenue - Main Avenue to Bell Avenue

The northernmost segment on the study corridor as shown in **Figure 2** begins at Main Avenue and ends at Bell Avenue. The adjacent land use is residential, with Norwood Junior High School located south of Main Avenue. This segment of Norwood Avenue has one lane per direction from Grace Avenue to Main Avenue and transitions to two lanes per direction with a center turn-lane from Grace Avenue to Bell Avenue.

On-street parking is permitted from Main Avenue to Norwood Junior High School along the southbound travel lane. Sidewalks along this segment have inconsistent widths with gaps in the network on either side and are in fair to poor condition. Bicycle lanes are present on one side of the roadway (southbound north of Grace Avenue, and northbound south of Grace Avenue). No public transit bus stops are present along Segment 1.

While walking and biking infrastructure does not currently exist at the southeast corner of Norwood Avenue and Main Avenue, a future planned development will incorporate roadway widening and pavement addition for a travel lane, buffered bike lane, on-street parking, curb & gutter, a 6’ wide landscape planer and a 6’ wide sidewalk. The future roadway configuration with the planned development will be two northbound through lanes, one northbound left turn pocket, one right northbound turn lane, and one northbound buffered bike lane.

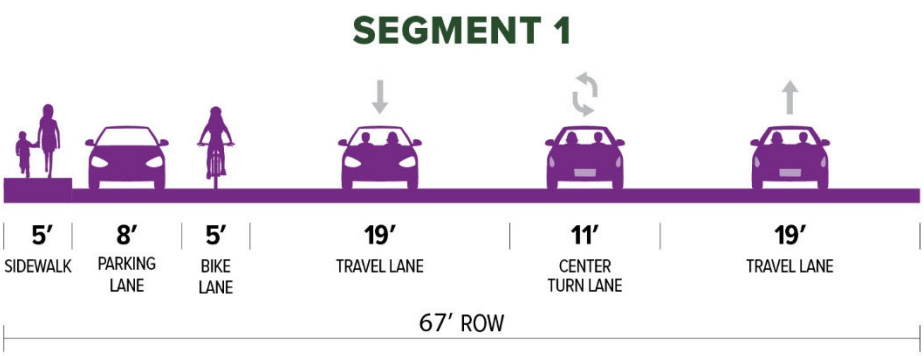


Figure 2. Segment 1: Norwood Avenue (Main Avenue to Bell Avenue)

Segment 2: Norwood Avenue - Bell Avenue to I-80

The second segment stretches from Bell Avenue to I-80 as shown in **Figure 3**. Adjacent land uses include residential and commercial uses, with some parking lot frontage and fast-food restaurants near the freeway. This segment of Norwood Avenue is two lanes per direction with a center turn-lane. Sidewalks are present on both sides of the roadway. The only bike lane that exists in Segment 2 is a 200-foot-long bicycle lane at the northbound Bell Avenue intersection approach. On-street parking is permitted between Bell Avenue and Jessie Avenue along the northbound and southbound travel lanes, in front of adjacent apartments and businesses.

Route 19 operated by SacRT runs along Norwood Avenue, turns onto Bell Avenue and continues onto Rio Linda Boulevard, operating on one-hour headways. There is a bus stop located approximately 250 feet from the Norwood Avenue/Bell Avenue intersection in the eastbound direction on Bell Avenue; along Norwood Avenue in the southbound direction, there is another bus stop located approximately 80 feet south of the intersection. Route 19 bus stops also exist in both directions on Norwood Avenue, 100 feet north of Jessie Avenue.

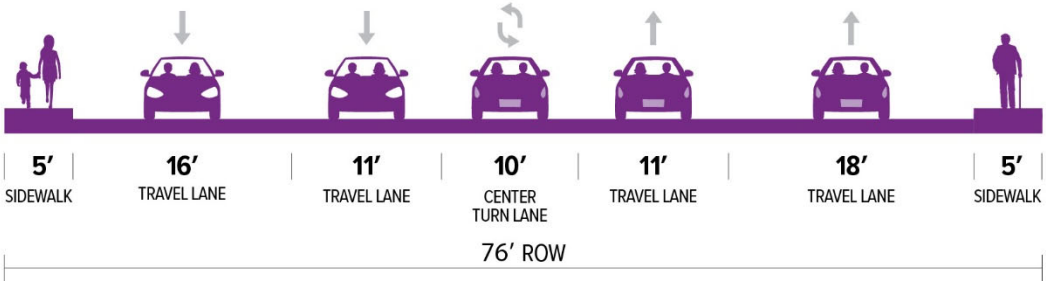


Figure 3. Segment 2: Norwood Avenue (Bell Avenue to I-80)

Segment 3: Norwood Avenue - I-80 to Carroll Avenue

The third segment begins at I-80 and ends at Carroll Avenue, with two travel lanes per direction with a center two-way turn lane as shown in **Figure 4**. There is a mix of single family and multi-family residential adjacent to Norwood Avenue, as well as commercial land use along the segment, including a Dollar General, parks, and the Robertson Community Center. There are consistent sidewalks on both sides but no bike lanes. Route 86 and Route 19 are operated by SacRT and have several stops on this segment near Harris Avenue, Morrison Avenue, Lindsay Avenue, Kesner Avenue, South Avenue, Hayes Avenue, Silver Eagle Road, Ford Road, and Carroll Avenue.

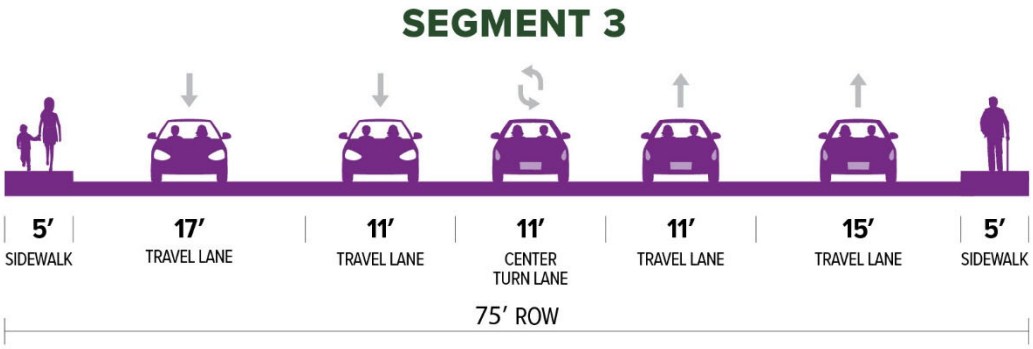


Figure 4. Segment 3: Norwood Avenue (I-80 to Carroll Avenue)

Segment 4: Norwood Avenue - Carroll Avenue to Arcade Creek

Segment 4 starts at Carroll Avenue and ends at Arcade Creek as shown in **Figure 5**. The adjacent land use is made up of single-family and multi-family residential and includes Gateway Park. There are two lanes per direction with a center turn lane from Carroll Avenue to Fairbanks Avenue. From Fairbanks Avenue to Arcade Creek the roadway narrows to one lane per direction across the Arcade Creek bridge. There are consistent sidewalks and bike lanes on both sides of the road in this segment. SacRT Route 19 runs through this segment with a bus stop located at the Caroll Avenue intersection along the northbound travel lanes. Route 19 operates on a one-hour headway.

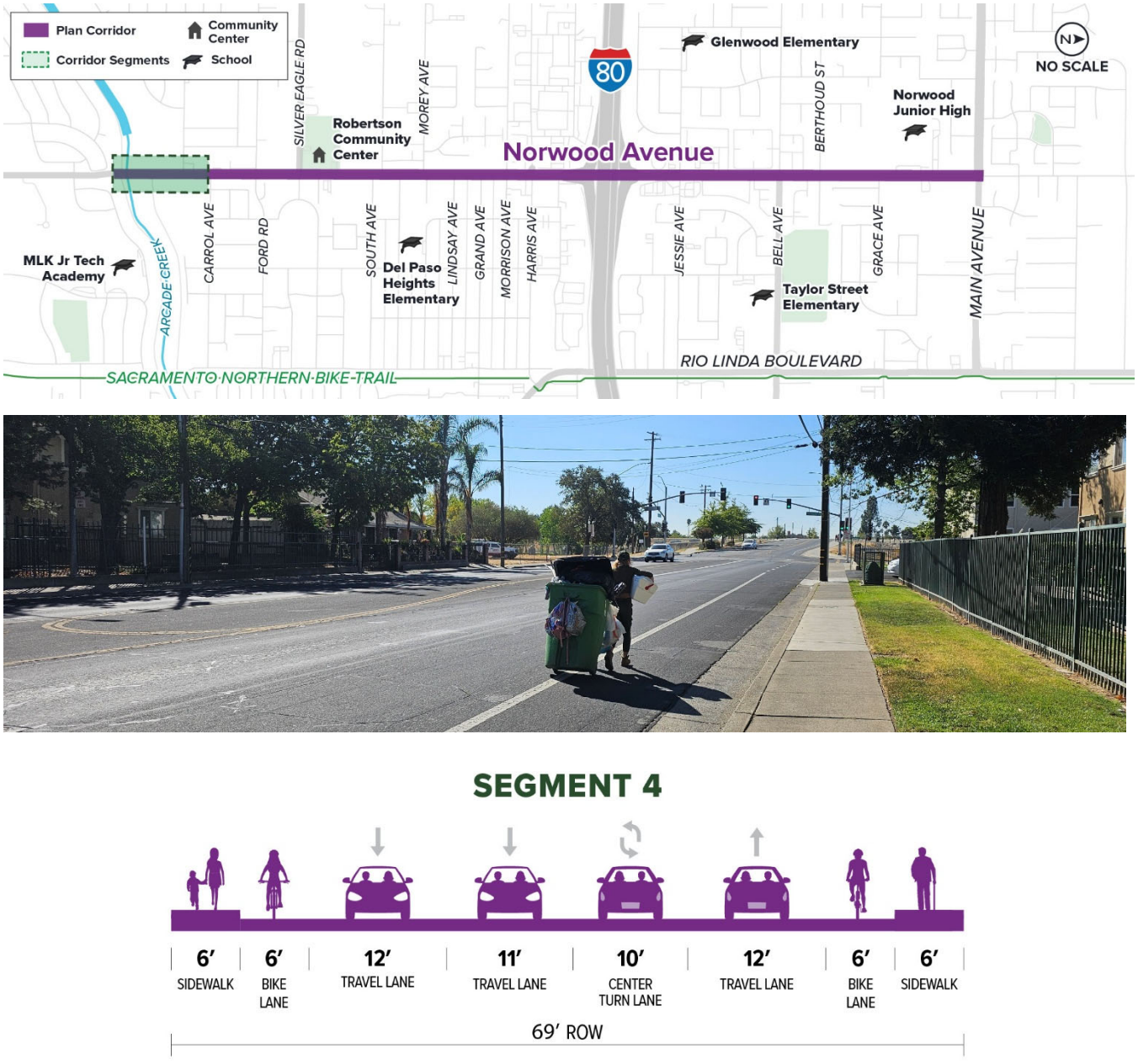


Figure 5. Segment 4: Norwood Avenue (Carroll Avenue to Arcade Creek)

Existing Conditions Multimodal Analysis

This section summarizes the findings of existing multimodal conditions which includes vehicles, people walking, biking, or taking transit. The multimodal findings are further detailed in the following sections.

Study Intersections

Six study intersections were identified and evaluated as part of the analysis of traffic operations. The study area consisted of the following signalized study intersections:

1. Norwood Avenue / Bell Avenue
2. Norwood Avenue / Jessie Avenue
3. Norwood Avenue / WB I-80 Ramps
4. Norwood Avenue / EB I-80 Ramps
5. Norwood Avenue / Harris Avenue
6. Norwood Avenue / Silver Eagle Road

Traffic Volumes

Vehicle, walking, and bicycle counts were collected during weekday a.m. (7:00 a.m. to 9:00 a.m.) and p.m. (4:00 p.m. to 6:00 p.m.) peak hours on Tuesday, October 8, 2024, when school was in session. The peak hours were found to be 7:30 to 8:30 AM and 5:00 to 6:00 PM. Turning Movement Count sheets can be found in *Appendix A.*

The intersection with the highest vehicle traffic was Norwood Avenue and Jessie Avenue. Vehicle traffic at Norwood Avenue and Jessie Avenue during the AM resulted in 3,589 vehicles, 59% of total AM traffic was during the AM peak hour. The PM vehicle traffic was higher than AM traffic with 4,285 total vehicles and 50% of PM traffic occurring during the PM peak hour.

Heavy vehicles such as trailers and other commercial fleets were included in traffic volume counts. Heavy vehicle counts for all intersections ranged from 48 to 226 for AM and PM. The Norwood Avenue and I-80 eastbound ramps and Harris Avenue intersections had the highest number of heavy vehicles with 354 and 310. At both locations, over 42% of heavy vehicle traffic occurred during the AM and PM peak hours.

Walking activity was greatest on the south leg of Norwood Avenue at Bell Avenue and the north leg of Norwood at Jessie Avenue. Both crosswalks at these locations experienced approximately 20 people walking at crossings per hour during the AM peak. The activity of people walking at Bell Avenue and Jessie Avenue can be attributed to adjacent commercial businesses and apartments, the Line 19 bus stops at both intersections, and Glenwood Elementary School.

Bicycle activity was greatest at Norwood Avenue and Silver Eagle Road with 10 people biking during the AM and 21 people biking during the PM. Both AM and PM peak hour bicycle counts accounted for over 54% of daily bicycling activity.

Transit Data Summary

Norwood Avenue is served by SacRT's Route 19 and Route 86. Route 19 connects riders between the Arden/Del Paso Light Rail Station to Elverta Road and Watt Avenue. Route 86 provides connections between Downtown Sacramento and the Marconi/Arcade Light Rail Station. Route 19 and Route 86 overlap for six stops on Norwood Avenue from Silver Eagle Road to Lindsay Avenue. On weekdays and weekends, Route 19 operates on a 60-minute headway for Norwood Avenue bus stops. On weekdays, Route 86 operates Norwood Avenue stops between a 25-to-30-minute headway and a 60-minute headway on weekends.

Through coordination with SacRT, weekday ridership data was collected for the 14 existing transit stops along Norwood Avenue. The data given captures ridership from January to August 2024. As shown in **Figure 6**, the monthly total of all weekday ridership[11] for all stops on Norwood Avenue is relatively steady with an exponential increase occurring in August.

The average monthly ridership from January to August was 195 riders across all stops in 2024. The average weekday ridership for all transit stops on Norwood Avenue is 14 riders per stop. Stops serviced by only Route 19 had a total of 698 riders while stops serviced by both Route 19 and Route 86 had a total of 860 riders during this time period. **Figure 7** shows the average weekday ridership by bus stops along Norwood Avenue. As shown, the southbound Norwood Avenue/Silver Eagle Road bus stop serviced by both Route 19 and Route 86 observed the highest average number of riders (25) on any given weekday from January to August. In contrast, the northbound Norwood Avenue/Carroll Avenue bus stop is serviced by only Route 19 and observed the lowest average number of riders (4) on any given weekday for the same time period.

[11] Includes only boardings at bus stops

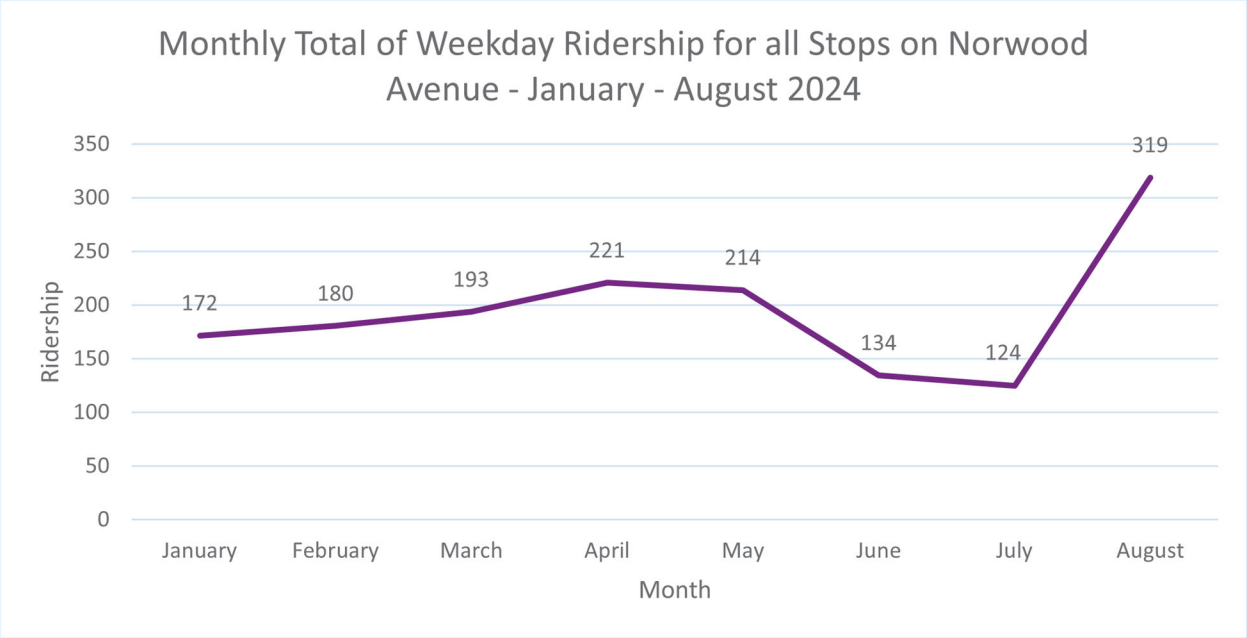


Figure 6. SacRT Monthly Transit Ridership

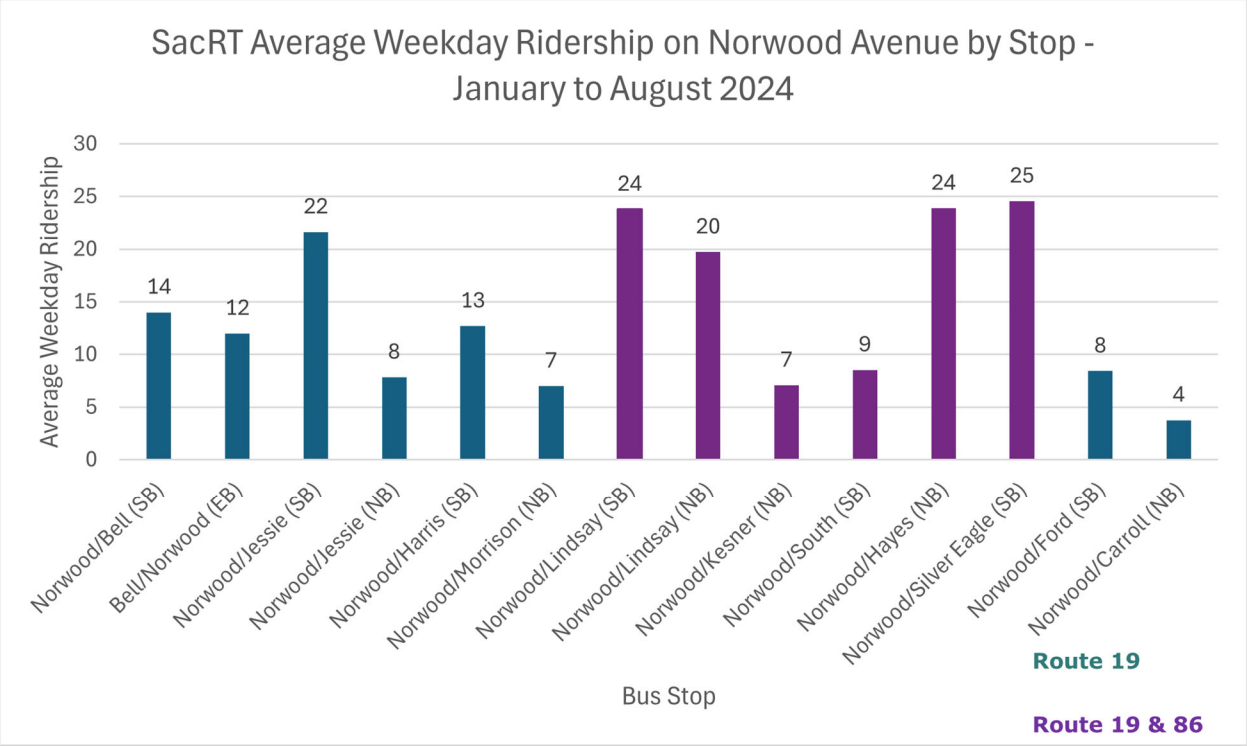


Figure 7. SacRT Transit Ridership by Bus Stop on Norwood Avenue (Segment 1-4)

Level of Traffic Stress/All Ages and Abilities Walking /Bicycle analysis

A Level of Traffic Stress (LTS) analysis has been calculated for people walking and bicycling.

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 roadway 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 roadway 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 8**.

Table 3 lists the criteria for each roadway segment and the associated LTS score. As shown in **Figure 9**, the existing LTS for people bicycling on Norwood Avenue is consistently high stress, often not comfortable for all ages and abilities. The only low stress environment on Norwood Avenue exists from Fairbanks Avenue to Arcade Creek, characterized by marked bike lanes and lower vehicle speeds.

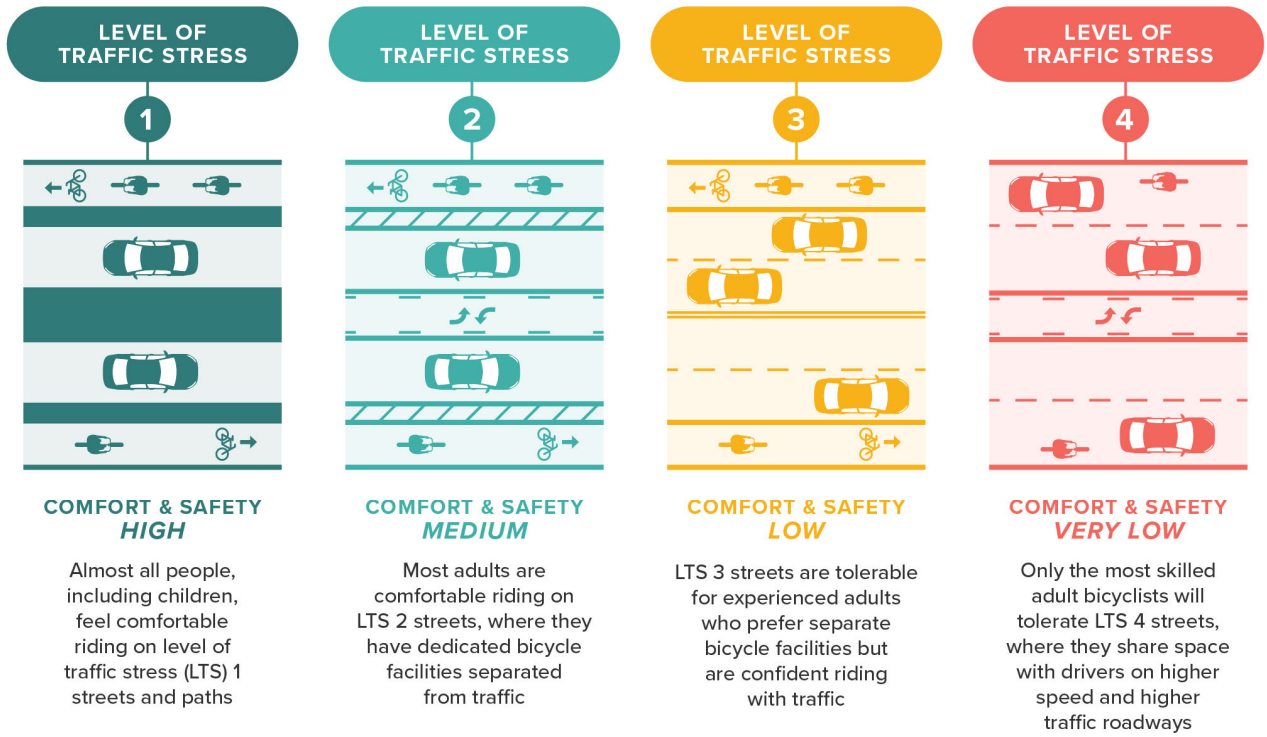


Figure 8. Bicycle Level of Traffic Stress Scores

Table 3. Bicycle Level of Traffic Stress Criteria

SEGMENT	POSTED SPEED (MPH)	BIKE PRESENCE AND TYPE	PARKING LANE	NUMBER OF TRAVEL LANES	LTS SCORE
SEGMENT 1 MAIN AVENUE TO BELL AVENUE	35	Yes Class II Bike Lanes	Yes: SB from Main Ave to Grace Ave No: Grace Ave to Bell Ave	1: Main Ave to Berthoud St 2: Berthoud St to Bell Ave	4
SEGMENT 2 BELL AVENUE TO I-80 EB ON/OFF RAMPS	35	No	Yes: Bell Ave to Jessie Ave No: Jessie Ave to I-80 EB	2	4
SEGMENT 3 I-80 EB ON/OFF RAMPS TO CARROLL AVENUE	35	No	No	2	4: I-80 EB On/Off Ramps to Grand Ave 3: Grand Ave to Carroll Ave
SEGMENT 4 CARROLL AVENUE TO ARCADE CREEK	30	Yes Class II Bike Lanes	No	1	3: Carroll Ave to Fairbanks Ave 1: Fairbanks Ave to Arcade Creek

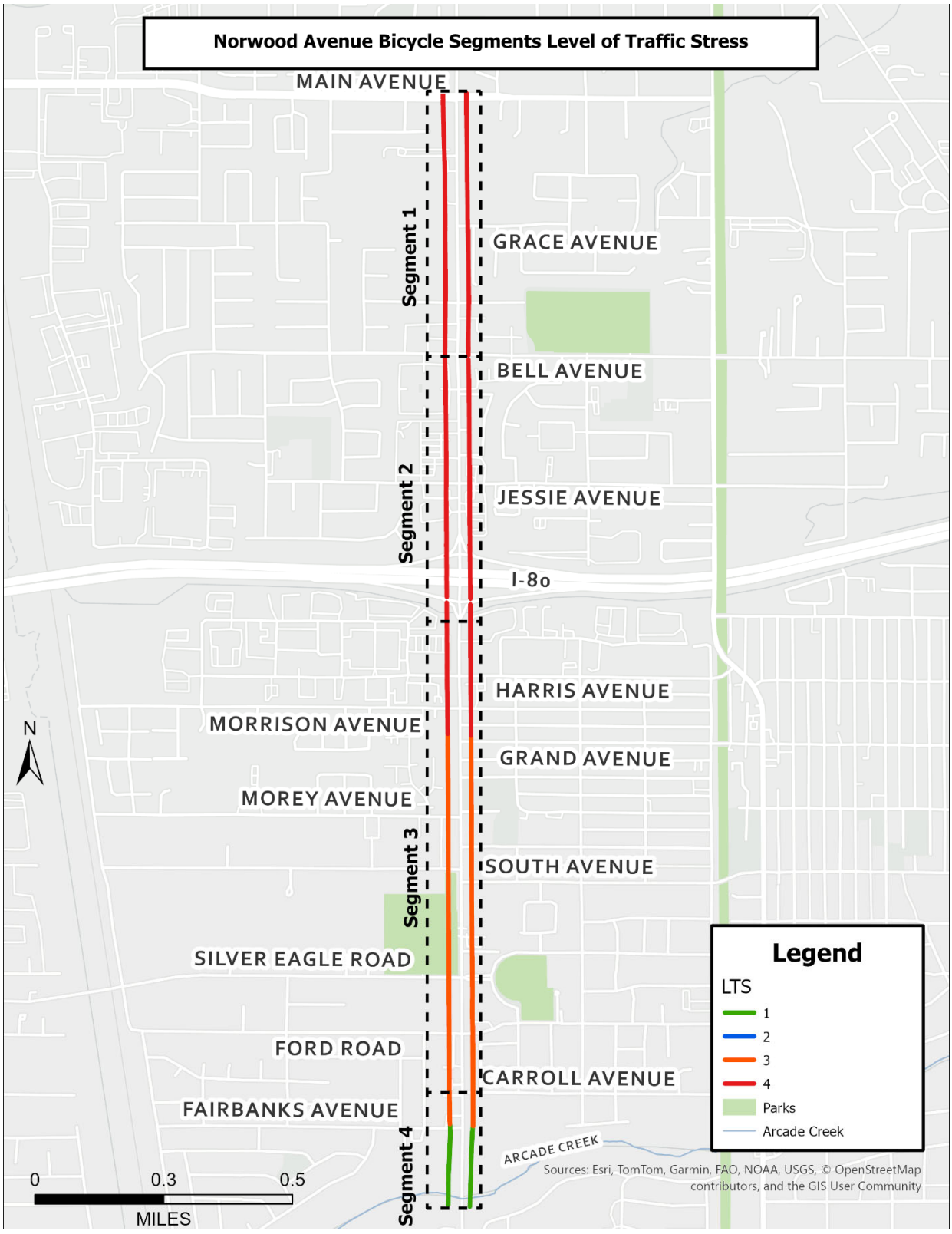


Figure 9. Norwood Avenue Bicycle LTS

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 10**.

Table 4 lists the criteria for each roadway segment and the associated LTS score Similar to the bicycling LTS results, Norwood Avenue also received common LTS scores of 3 and 4 throughout the study limits indicating that the corridor is uncomfortable to traverse for the majority of people walking. As shown in **Figure 11**, walking LTS for people walking along the corridor is a primarily a high stress environment not suitable for all ages and abilities. However, for people walking, low stress pockets exist near Fairbanks Avenue and Main Avenue.

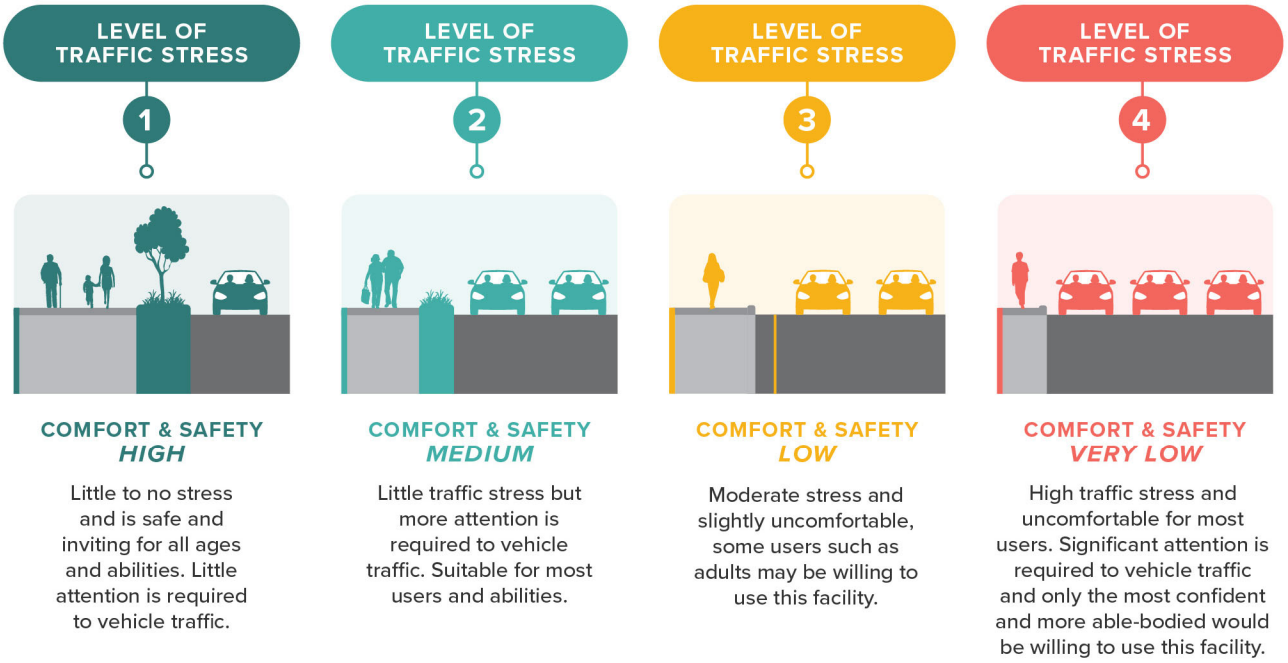


Figure 10. Walking Level of Traffic Stress

Table 4. Walking Level of Traffic Stress Criteria

Segment	Street Width[12] (Number of Lanes)	Buffer Types	Sidewalk Width	Sidewalk Condition	Speed Limit[13]	LTS Score
Segment 1 Main Avenue to Bell Avenue	1: Main Avenue to Grace Avenue 2: Grace Avenue to Bell Avenue	Landscaping Buffer: SB Norwood JHS to Berthoud Street	5 ft: SB Main Avenue to Bell Avenue 5 ft: NB Bell Avenue to Grace Avenue 0 ft: NB Main Avenue to Gace Avenue	Good: SB Main Avenue to Grace Avenue No Sidewalk: Main Avenue to Grace Avenue	35	2: SB Norwood JHS to Grace Avenue 3: SB Grace Avenue to Bell Avenue 4: NB Main Avenue to Bell Avenue
Segment 2 Bell Avenue to I-80 EB On/Off Ramps	3	None	5 ft	Fair	35	4
Segment 3 I-80 EB On/Off Ramps to Carroll Avenue	3	None	5 ft	Fair	35	3: Grand Avenue to Carroll Avenue
Segment 4 Carroll Avenue to Arcade Creek	2: SB Carroll Avenue to Fairbanks Avenue 1: Fairbanks Avenue to Arcade Creek	Landscaping Buffer: NB Fairbanks to South Gateway Park	5 ft	Good	35	2: SB Fairbanks Avenue to South Gateway Park 3: NB Arcade Creek to Gateway Park, Fairbanks Avenue to Carroll Avenue, SB Carroll Avenue to Arcade Creek

[12] Lanes per direction and includes two-way left turn lane.

[13] Posted speed limit or prevailing speed.

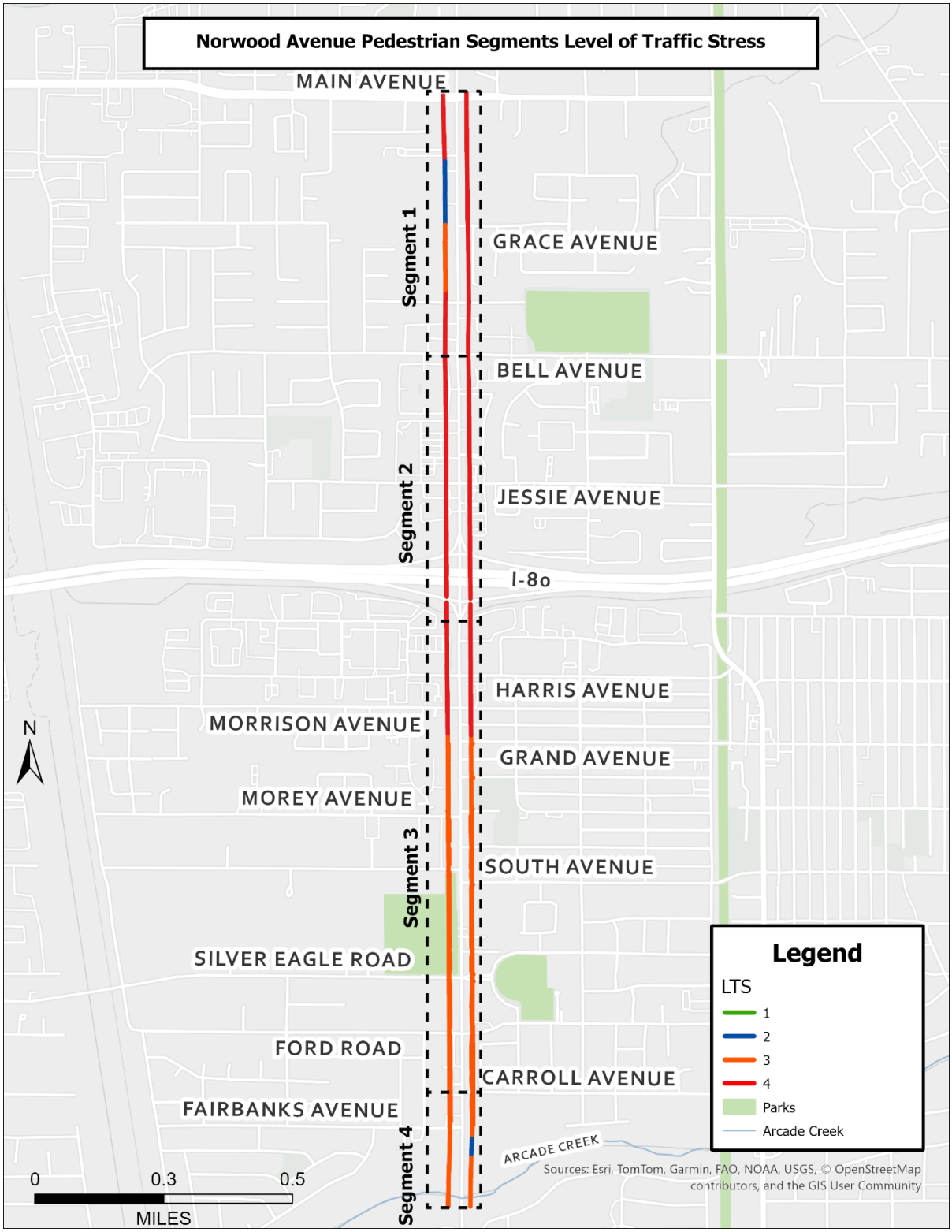


Figure 11. Norwood Avenue Walking LTS

Parking Inventory and Utilization Summary

Parking Context

On-street parking along the study corridor is only permitted on the west side of Norwood Avenue along the SB travel lane between Main Avenue and the southern driveway of Norwood Junior High School (Segment 1) and along the NB and SB travel lanes from Bell Avenue to Jessie Avenue (Segment 2). The areas where on-street parking is permitted are not striped with individual parking spaces. Bell and Jessie Avenues are characterized by multi-family housing and commercial businesses with several driveways into parking lots, creating conflicts with through traffic. From Bell Avenue to Jessie Avenue, "No parking" signs exist within approximately 10 feet of an apartment driveway. Additionally, along the SB lane from Bell Avenue to the first driveway entrance at The Charleston, no parking is permitted at any time.

Given the high frequency and severity of crashes occurring between Bell Avenue and Jessie Avenue, parking data was collected on Tuesday, November 17 at 1:00pm and 8:00pm, to determine midday and evening (overnight) on-street parking capacity and utilization. Due to the area being primarily residential, a low turnover rate of on-street parking spaces was observed.

Parking Capacity

Along the corridor there are several areas where on-street parking is permitted, varying in spots available from two to thirteen spaces for a total of 49 parking spaces. The majority of on-street parking exists on the east side of Norwood Avenue along the NB travel lanes. The parking zones and their associated occupancy are shown in **Figure 12**.

Figure 12. Norwood Avenue Total on-street Parking Spaces

Parking Utilization & Findings

While there are 49 on-street parking spaces provided along Segment 2, not all spaces are filled at any given time. On-street parking utilization is a metric to determine the percentage of occupied spaces at different times of the day over the total number of spaces along the roadway. The midday and evening parking utilization between Bell Avenue and Jessie

Avenue is summarized in **Table 5**. During midday, on-street parking along the NB (east) side of Norwood Avenue approaches capacity at 88% utilized, whereas parking along the SB side is only at 20% of capacity. Evening parking operations along NB Norwood Avenue exceed parking capacity at 108% while the SB parking utilization increases slightly to 24%. During the midday and evening hours, it was observed that NB parking consistently had vehicles that were illegally parked despite No-Parking signage and red curb markings. This can be attributed to the lack of marked crossings, lighting, and high speeds on Norwood Avenue that may influence drivers to illegally park along the NB lanes rather than seek SB side parking and cross on foot.

Table 5. Midday and Evening Parking Utilization

	Northbound	Southbound
Number of Spaces	24	25
Midday Utilization	21	5
Utilization/Spaces	88%	20%
Evening Utilization	26	6
Evening Utilization/Spaces	108%	24%

During the parking observation, it was noted that on-street parking is permitted on Bell Avenue from Norwood Avenue to Rio Linda Boulevard, adjacent to Robla Community Park and Morningside Creek apartments.

Crash Analysis Summary

Crash data was collected for the five-year period (2018-2022) from the Transportation Injury Mapping System (TIMS) maintained by UC Berkeley to conduct an analysis of the corridor. TIMS data only includes injury crashes, so this analysis does not include property damage only crashes. The data consisted of injury crashes on Norwood Avenue from Main Avenue to Arcade Creek. *Appendix B includes the detailed crash data.*

The study corridor experienced a total of 137 injury crashes. Of these, 16 crashes resulted in someone being killed or severely injured (KSI). Of the total injury crashes, 29 crashes involved someone walking or biking.

Table 6 summarizes crashes by year and severity, and **Figure 13** shows the location of crashes on the corridor during the analysis period. The map also shows nearby schools and community centers.

Table 6: Crashes by Severity

Crash Severity	2018	2019	2020	2021	2022	Total
Fatal Injury	1	0	0	1	1	3
Serious Injury	2	3	1	5	2	13
Minor Injury	5	6	5	12	9	37
Possible Injury	12	16	19	14	23	84
Total	20	25	25	32	35	137

Figure 13: Crash Map by Severity

Table 7 summarizes crashes by study segment. 86% of injury crashes and 88% of KSIs occur in Segment 2 and Segment 3, with similar results for bicycle- and pedestrian-involved crashes. As Segment 3 is almost twice the length of Segment 2, the highest density of crashes occur in Segment 2, which is also characterized by high density residential and commercial use, on-street parking, and high-volume uncontrolled access points.

Table 7: Crashes by Segment

Crash Segment	Injury Crashes	KSI Crashes	Bicycle-Involved Crashes	Pedestrian-Involved Crashes
Segment 1	9	1	1	0
Segment 2	60	7	7	9
Segment 3	58	7	8	3
Segment 4	10	1	0	1
Total	137	16	16	13

Citywide, the highest frequency of crashes occurs during weekday afternoons, consistent with the evening commute period[14]. The Howe Avenue study corridor, in comparison, shows the highest frequency of crashes occurring Tuesday late afternoon (3pm-6pm) and the time period with the highest average frequency of crashes across all days to be the early afternoon period (12pm-3pm) as shown in **Table 8**.

Table 8: Study Corridor Crashes by Day of Week and Time of Day

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
00:00-02:59	0	0	0	0	0	1	0
03:00-05:59	0	0	0	1	1	0	1
06:00-08:59	3	3	1	1	2	1	0
09:00-11:59	4	0	4	0	1	2	4
12:00-14:59	**3**	**5**	**7**	**6**	**9**	**3**	**2**
15:00-17:59	4	**14**	2	2	4	3	4
18:00-20:59	5	4	2	1	3	3	5
21:00-23:59	1	2	0	2	2	2	7

[14] Vision Zero Sacramento Action Plan, 2018; Transportation Injury Mapping System, https://safetrec.berkeley.edu/tools/transportation-injury-mapping-system-tims, 2025

Crash Type Summary

Figure 14 shows crashes by type during the five-year data period. Of the 137 crashes, 65 of them were broadside crashes, with the next highest type being rear-end crashes (27 crashes). Both crash types occur primarily at intersections along the corridor, with 108 (79%) of the injury crashes occurring at intersections.

KSI (fatal and serious injury) crashes are also represented in **Figure 14**, showing that the highest crash type resulting in a fatality or serious injury is vehicle/pedestrian crashes, with 6 KSI crashes. Because people walking are more vulnerable without the protection of a vehicle, crashes involving people who walk are more likely to lead to more severe outcomes.

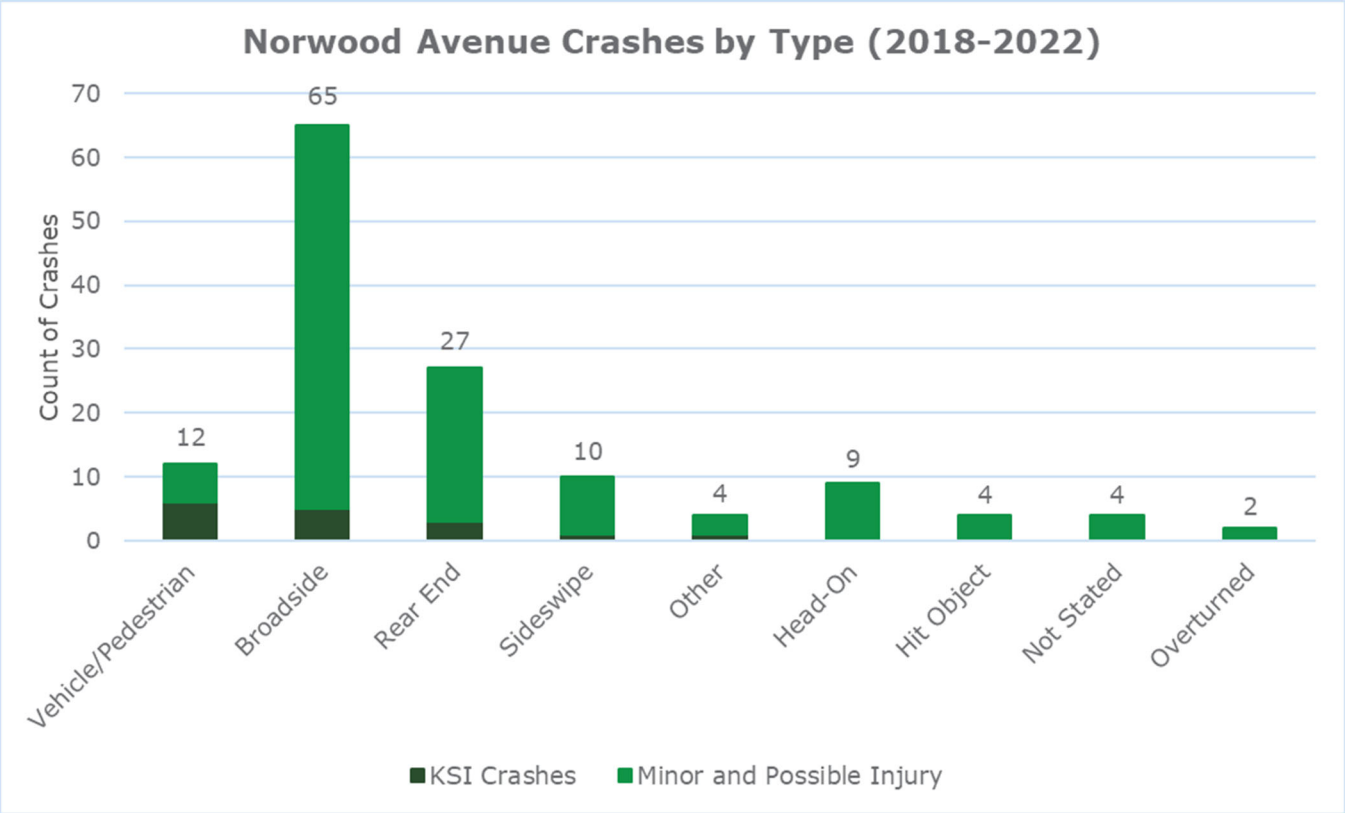


Figure 14: Crashes by Type

Primary Crash Factor Summary

Figure 15 shows the crashes by primary crash factor (PCF) as recorded by the reporting officer. Of the 137 crashes, the top three PCFs are: automobile right of way (36 crashes), unsafe speed (28 crashes), and traffic signals and signs (26 crashes). Automobile right of way generally indicates that a driver enters an intersection when they are not allowed to, such as when the signal is red. Traffic signals and signs may include disobeying traffic signals or road signs, such as red light running or not stopping at a stop sign, but could also include infrastructure, such as confusing or missing signage. Together, these three causes account for 66% of all crashes occurring along the corridor during the study period.

For KSI crashes, pedestrian violations, which are generally defined as events when a pedestrian crosses at an unstriped crossing or against a signal, were the primary crash factor for five of the 16 crashes during the analysis/study period, with the second highest PCF being DUI (driving or cycling under the influence) crashes (4 during the study period).

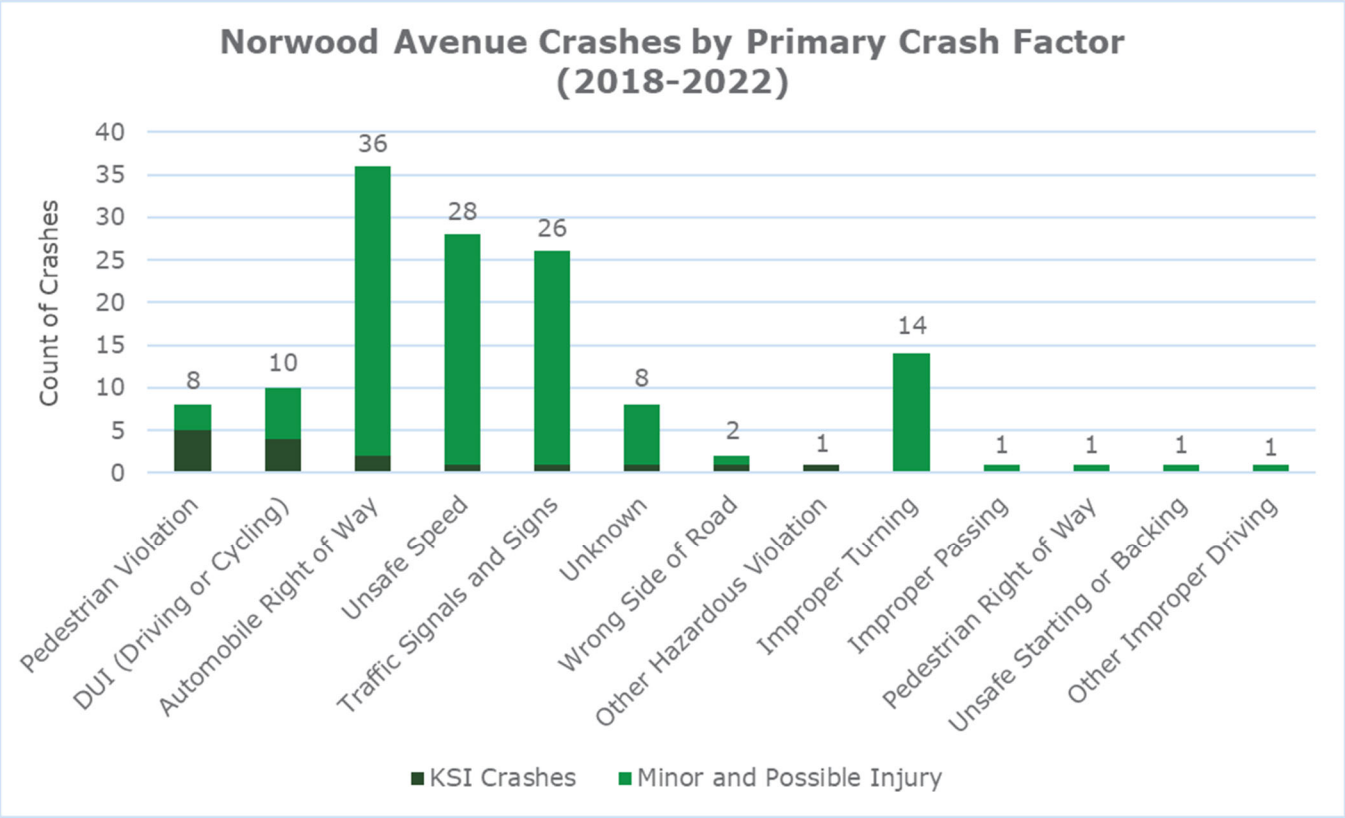


Figure 15: Crashes by Primary Crash Factor

Pedestrian and Bicycle Crashes

The study corridor is located within Environmental Justice (EJ) communities with low income and minority groups where many residents rely on modes of transportation other than private vehicles. Additionally, there are multiple schools, parks, and community centers along the corridor that serve younger and older residents who are reliant on walking, biking, and transit to access key destinations. While the study corridor lacks consistent sidewalks and bicycle lanes, many people were still observed walking and biking along the corridor.

Initial analysis showed that there was a high frequency of crashes involving people walking and biking, many of which resulted in fatalities or severe injuries. Due to these elements, further safety analysis regarding those people walking and biking was determined to be needed. **Table 9** summarizes crashes involving people walking or biking for all severities. During the analysis study period, there were 29 crashes involving someone walking or biking, with 10 crashes resulting in KSI.

Table 9: Pedestrian and Bicycle Crashes

Crash Category	Pedestrian Crashes	Bicycle Crashes
Fatal Injury	2	0
Serious Injury	4	4
Minor Injury	3	4
Possible Injury	4	8
Total	13	16

Of the 13 pedestrian-involved crashes, 6 were KSI crashes, and of the 16 bicycle crashes, 4 were KSI crashes. Of all crashes involving people walking or biking, 16 occurred in Segment 2 between Bell Avenue and I-80 as shown in **Figure 16** and **Figure 17**. In Segment 2, there are apartments on the east side of the road, commercial uses on the west, and on-street parking is allowed, which can reduce visibility for drivers along this segment.

The primary crash factor resulting in the highest number of KSI crashes during the period was pedestrian violations. Of crashes involving people walking, 38% involved someone crossing outside of a marked crosswalk and 31% from walking in the road which includes the roadway shoulder. There is high walking activity on this segment of Norwood, and during the site walk people were observed crossing outside of a marked crosswalk.

Of the 16 bicycle crashes, there were no fatal crashes but four serious injuries. Roughly 44% of crashes involving someone biking were reported as broadside crashes, characterized by a vehicle hitting the side of a person biking. Additionally, 19% of the crashes involving someone biking were reported as sideswipes, where a vehicle collides with the side of someone biking in the same direction as the car. Notably 63% of bicycle crashes were a result of improper turning or automobile right of way as the primary collision factor.

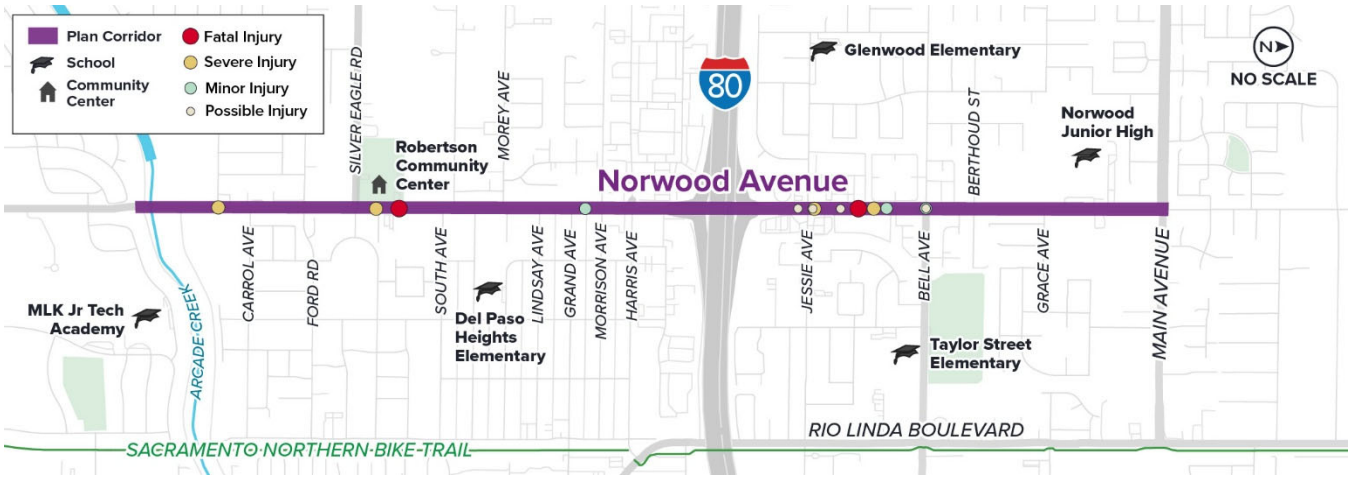


Figure 16: Pedestrian Crash Map

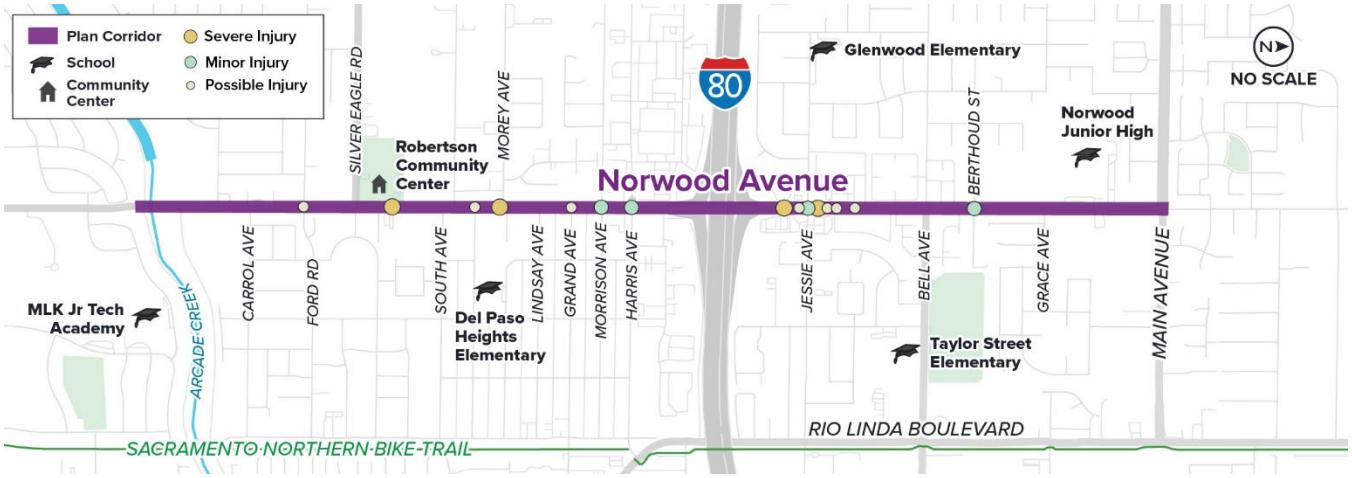


Figure 17: Bicycle Crash Map

Crash Trends by Location

The most frequently occurring primary collision factors and crash types reported for crashes along the study corridor, along with the associated locations, are provided in **Figure 18**.

Broadside crashes were the most common and occurred at most intersections along the corridor. Rear end crashes, unsafe speeds, and signal violations were mostly concentrated between the I-80 interchange and Harris Avenue where congestion during commute periods can occur. Signal violations were also cited at Grand Avenue and Silver Eagle Road. Unsafe speeds were also cited between Silver Eagle Road and Fairbanks Avenue on the southern portion of the corridor.

The highest concentration of crashes along the study corridor was between Belle Avenue and Jessie Avenue in Segment 2 and involves a unique crash profile with the majority of

head-on, sideswipe, and improper turning crashes occurring along this portion of the road. Most of the crashes involving conflicts between cars and people walking or biking occurred on this stretch with people biking being broadsided or sideswept, and people crossing midblock.

The intersection of Norwood Avenue at Grand Avenue was the location of multiple DUIs, hit object crashes, and sideswipes involving someone biking.

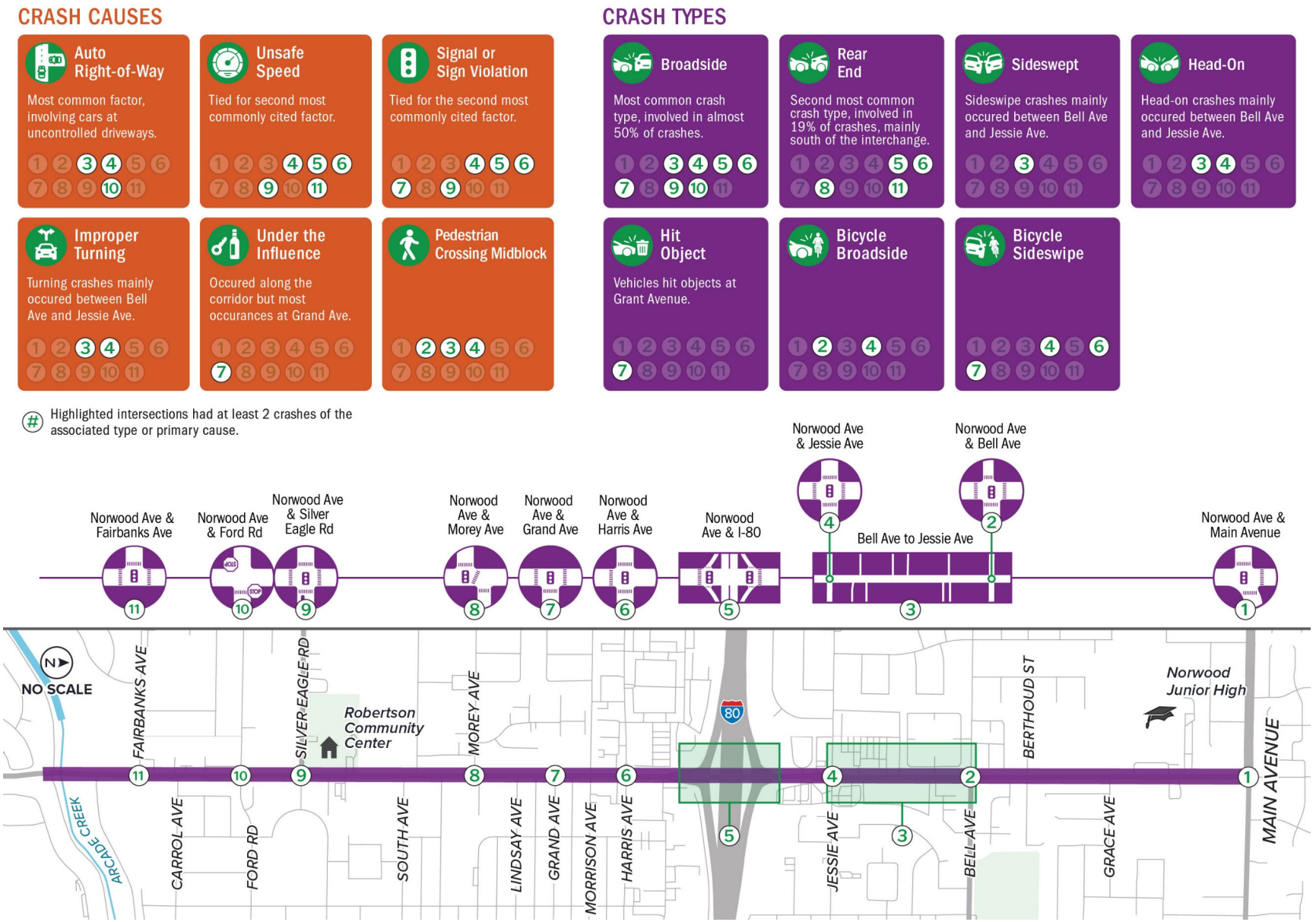


Figure 18: Crash Trends by Location

Existing Conditions Traffic Analysis

Traffic Operations Standards and Methodology

The following section describes the methodology used to analyze and evaluate the traffic conditions at the study intersections and the potential operational effects at the study intersections. The analysis methodologies and level of service standards used to determine effect at study intersections are described.

Signalized Intersections

The study intersections were analyzed using the Synchro 12 software package. A model for existing conditions was developed in Synchro using the existing roadway geometry, signal timing plans, and intersection turn movement volumes for the peak hour within the weekday AM and weekday PM periods. Key performance metrics include average vehicle delay, intersection LOS[15], 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 10** documents the LOS criteria for signalized intersections. The latest version of the Synchro analysis software was used to report the 95th percentile queue lengths for approach lanes to study intersections.

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

Table 10: 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, 6th Edition

Intersection Operations Analysis

A model for existing conditions was developed in Synchro using the existing roadway geometry, signal timing plans, and intersection turn movement volumes for the weekday AM and weekday PM hours. Intersection geometry was derived from aerial photographs (Google Maps). The latest signal timing information was acquired from the City of Sacramento. *Appendix C contains the Signal Timing Worksheets. Appendix D contains the Existing Conditions Synchro Reports (Lanes/Volumes/Timings, Queues, and delay/LOS)* from Synchro.

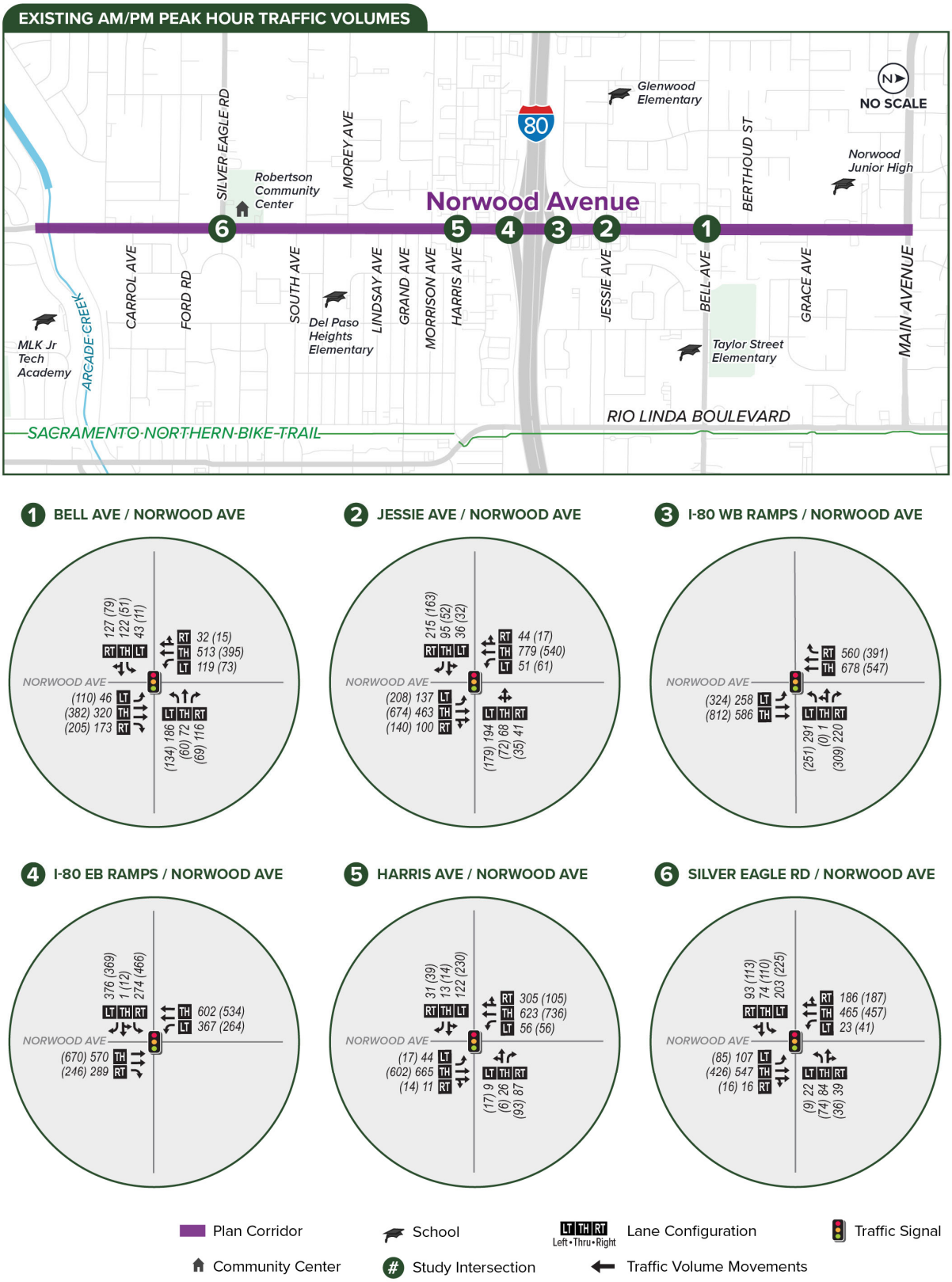
Existing Vehicular Level of Service

Table 11 summarizes the existing peak hour intersection operating conditions. Results indicate that all study intersections operate at LOS C or better during both a.m. and p.m. peak hours. Figure 19 illustrates the AM and PM peak hour turning movement counts at the study intersections.

Table 11: Existing Conditions Operational Analysis Results

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (Seconds)	LOS	Delay (Seconds)	LOS
1. Norwood Avenue / Bell Avenue	20.6	C	17.6	B
2. Norwood Avenue / Jessie Avenue	28.2	C	23.8	C
3. Norwood Avenue / WB 80 ramps	10.9	B	10.3	B
4. Norwood Avenue / EB 80 ramps	12.0	B	12.0	B
5. Norwood Avenue / Harris Avenue	19.7	B	19.2	B
6. Norwood Avenue / Silver Eagle Road	18.6	B	18.2	B

Source: DKS Associates, December 2024.



AM (PM) Peak Hour Volumes, Level of Service, and Delay

Figure 19. Existing Traffic Volumes and Operation Results at Study Intersections

95th Percentile Queueing

The 95th percentile queueing reported by Synchro refers to the queue length (in vehicles) that has only a five percent probability of being exceeded during the analysis time period (the average driver would likely experience shorter queue lengths than what is being reported).

Queue lengths are analyzed to determine if there are any potential safety impacts present, either from blocking side street or driveway access (a moderate safety concern) or extend to the point of creating queue spill-back conditions in the nearest upstream intersection (larger safety concern). Queue overflows are described as the number of additional vehicles that may extend past the available storage, assuming 25 feet per vehicle, rounding up. As shown in **Table 12**, queue overflow can occur at five intersections listed below:

- Norwood Avenue/Bell Avenue
- Norwood Avenue/Jessie Avenue
- Norwood Avenue/ Westbound I-80 Ramps
- Norwood Avenue/ Eastbound I-80 Ramps
- Norwood Avenue/Silver Eagle Road

Table 12. 95th Percentile Queueing Results at Study Intersections

Intersection	Turning Movement	Available Storage Length (Feet)	Existing Conditions	
			95th Percentile Queue (Feet)[1]	
			AM Peak Hour	PM Peak Hour
1. Norwood Avenue / Bell Avenue	NBL	75	66	**112**
	SBL	95	**132**	84
	EBL	150	51	20
	WBL	195	183	131
2. Norwood Avenue / Jessie Avenue	NBL	100	**192**	**242**
	SBL	120	90	96
3. Norwood Avenue / WB 80 Ramps	WBL	435	137	111
	NBL	175	**222**	**259**
4. Norwood Avenue / EB 80 Ramps	EBL	360	118	203
	SBL	180	**295**	**220**
5. Norwood Avenue / Harris Avenue	NBL	85	60	30
	SBL	110	71	71
6. Norwood Avenue / Silver Eagle Road	EBL	110	**208**	**219**
	WBL	210	41	22
	NBL	95	**128**	**105**
	SBL	55	43	**63**

BOLD *represents 95th percentile queueing above the available storage length.*
Source: DKS Associates, December 2024.

Travel Time Reliability and Congestion

Two metrics for measuring traffic operations on a corridor level are congestion and travel time reliability. Congestion can be thought of as typical peak period travel times being significantly slower than the free flowing or desired travel time for the corridor. Travel time reliability is the measure of the variability in travel times and is used to calculate the predictability of how long a specific trip will take at the same time day after day. Typical factors which cause a corridor to have unreliable travel times are:

- Normal travel fluctuations
- Physical bottlenecks
- Special events
- Traffic incidents
- Inclement weather
- Traffic control devices
- Work/construction zones

Congestion is measured by travel time index which is calculated as the corridor travel time at a certain time of day divided by the free flow travel time. Travel time reliability is measured using the buffer time index which is the difference between the average travel time and the 95th percentile travel time normalized to the free flow travel time. Another way to think of the buffer time index is how much additional time does a person need to dedicate to their trip to ensure they arrive to their destination in a timely manner. The relationship between the travel time index, 95th percentile travel time index (also called the planning time index), and the buffer time index is shown in **Figure 20**.

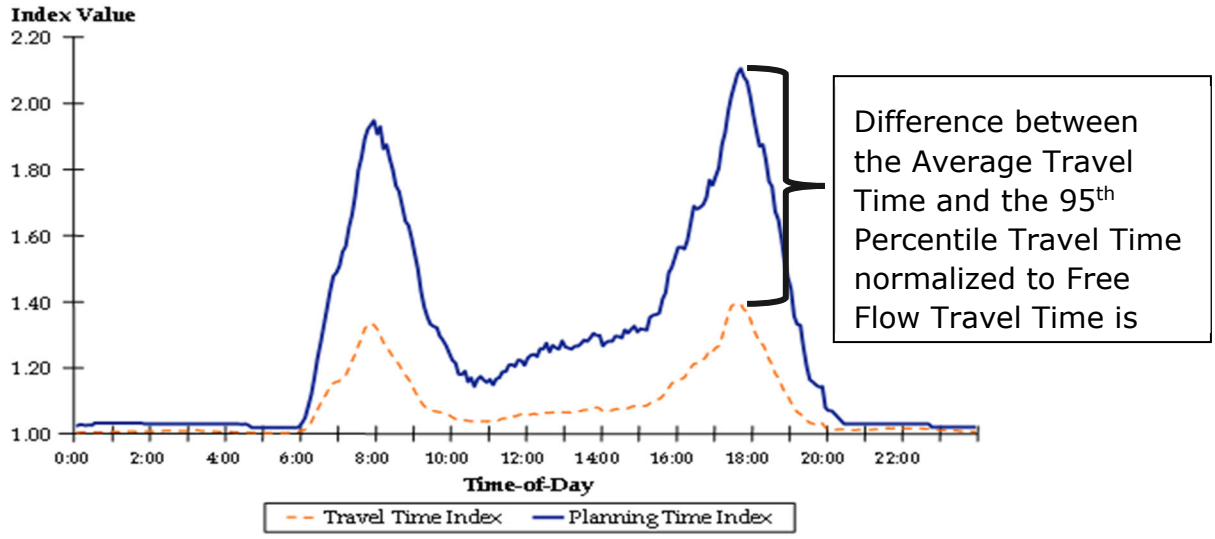


Figure 20: Relationship Between Average Travel Time and 95th Percentile Travel Time which Results in the Buffer Time Index[16]

Policies from the City of Sacramento General Plan indicate that corridor congestion is acceptable. The goal of improvements should be to improve travel for all users and to create a reliable travel experience, even if those improvements result in some increase in travel delays during peak hours. Reliable travel times allow people to consistently plan their driving and transit trips even if those trips are slower than their ideal travel time.

To calculate travel time reliability and congestion for Norwood Avenue, average speed data was obtained from the National Performance Management Research Data Set (NPMRDS) from the Federal Highway Administration (FHWA). Congestion is defined for this data set as peak hour speeds that are 60% or less of free-flow speeds.

To reflect annual average weekday conditions, the data was filtered to isolate average conditions: Tues-Thurs AM/PM peak periods for passenger vehicles and heavy-duty trucks separately and together. The AM and PM peak periods were identified by the highest congestion continuous 60-minute span for both passenger vehicles and trucks. The free flow speed (FFS) of the corridor was determined through analyzing the fastest vehicle speeds recorded which typically occur during the hours of 12:00-3:00am. Additionally, the Highway Capacity Manual 7th Edition defines congestion and reliability through thresholds shown in **Table 13**.

[16] Source: *Traffic Congestion and Reliability: Linking Solutions to Problems,* FHWA, 2004

Table 13. Congestion and Reliability Performance Measures

	Reliable	Moderately Reliable	Unreliable
Buffer Time Index	**BTI < 1.25**	**BTI 1.25-< 1.5**	**BTI >= 1.5**
Uncongested *>= 60% Of Free Flow*	Predictable and efficient	Not always predictable, usually efficient	Unpredictable, not often congested
Congested *<60% Of Free Flow*	Predictable and inefficient	Not always predictable, usually inefficient	Unpredictable, not often congestion

Source: Highway Capacity Manual, 7th Edition.

Travel time reliability and congestion was analyzed for passenger vehicles, trucks, and passenger vehicles and trucks combined during the AM peak hour (8:00-9:00am) and PM peak hour (3:00-4:00pm). The results, as shown in **Figure 21** to **Figure 26**, provide a summary of how reliable speeds and congestion are experienced by users during the AM and PM peak hour periods. The majority of the corridor experiences congested conditions during peak hours, but not consistently, with the exception of a small portion of Segment 2 near the I-80 interchange, which is reliably congested during the weekday PM peak hour.

While the figures show areas of free flow and congestion along the study corridor, the majority of the data along Segment 1, Segment 2, and Segment 3 shows that there is a high amount of variability in travel times along the corridor. The exception to this is a short southbound segment around the I-80 overpass which is reliably congested during the PM peak hour. Segment 4 shows generally reliable free flow travel in the northbound direction and unreliable free flow travel in the southbound direction during the AM and PM peak hours. From these results, it is clear that travel times vary widely along the Norwood Avenue Corridor from day to day. Based on the patterns of congested segments and field observations, it is clear that a majority of this variability in travel time is driven by two factors. The first is concentrated periods of congestion centered around the local school bell schedules. There are five schools either on or near Norwood Avenue which generate short periods of congestion that quickly dissipate outside of the times leading up to and following the school pick up and drop off periods. The second factor is queues coming from demand going to I-80. When the freeway is congested, this congestion spills back onto the local street system at the interchange

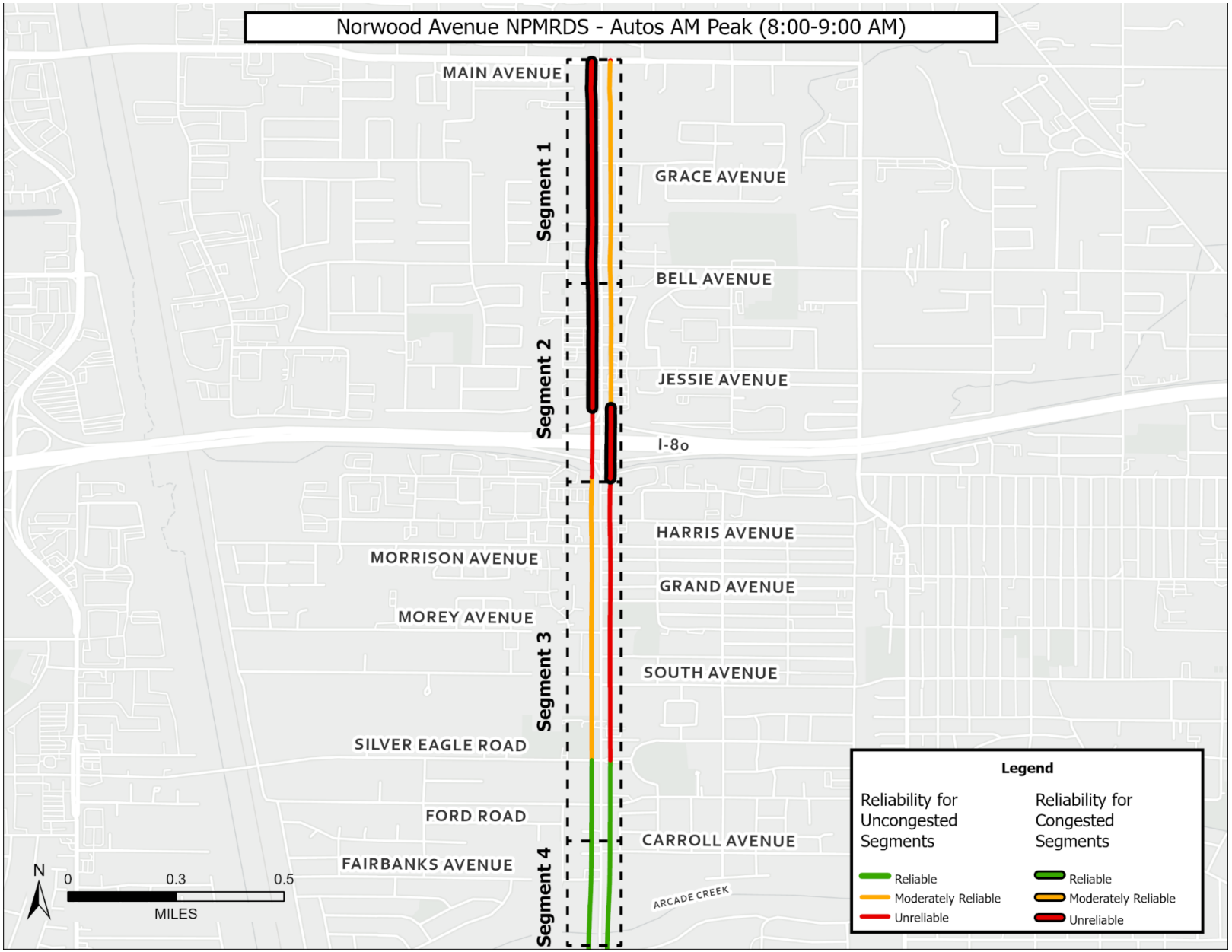


Figure 21. Autos AM Peak Hour Reliability and Congestion

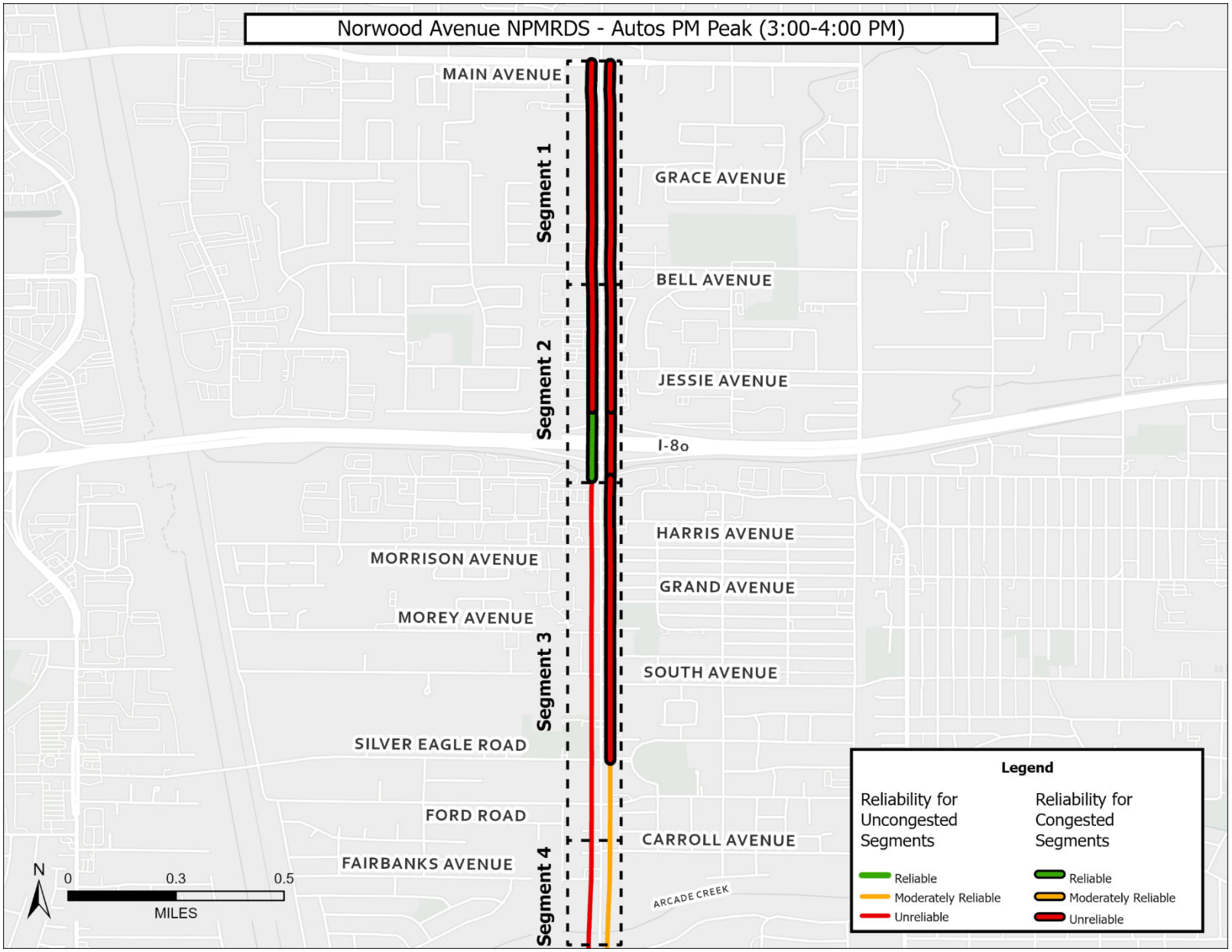


Figure 22. Autos PM Peak Hour Reliability and Congestion

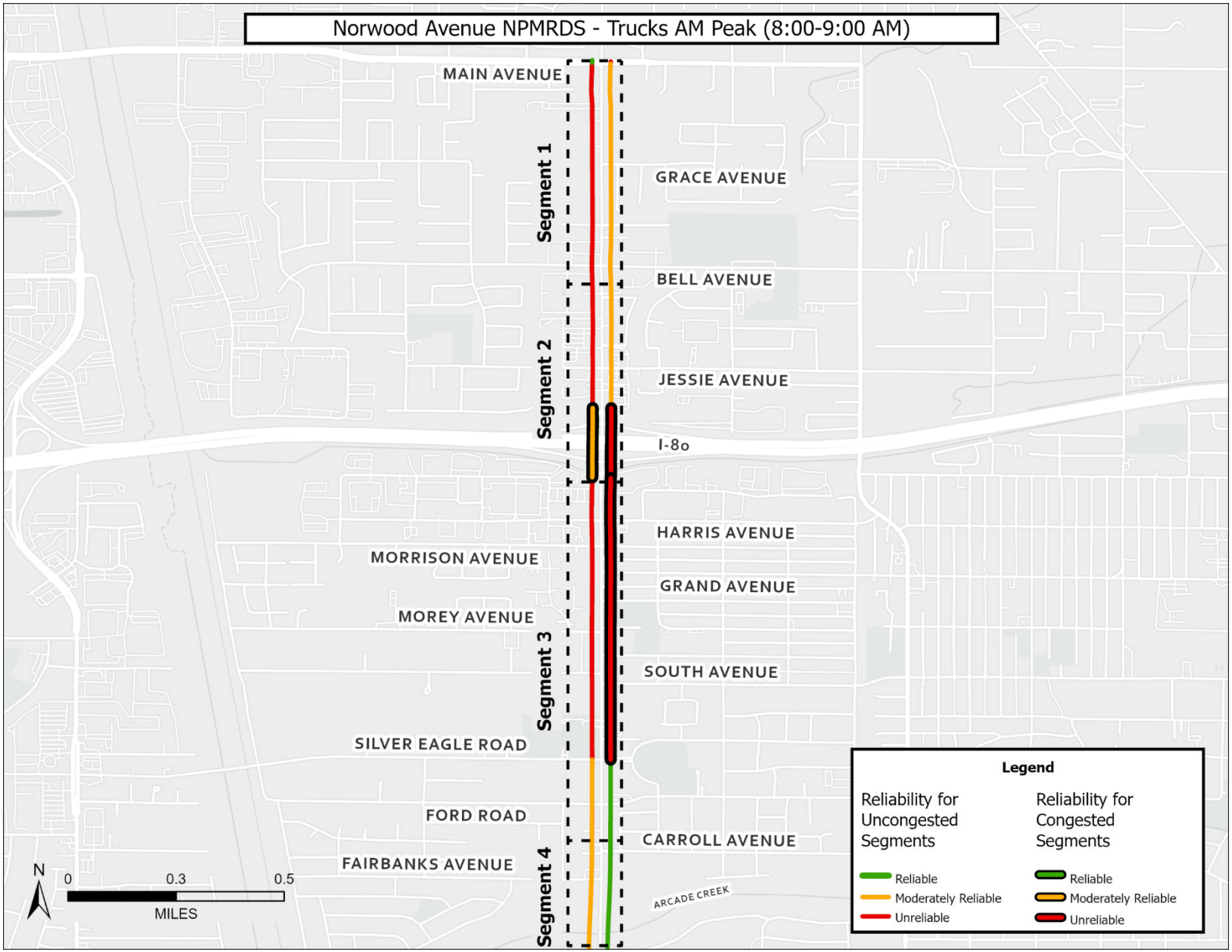


Figure 23. Trucks AM Peak Hour Reliability and Congestion

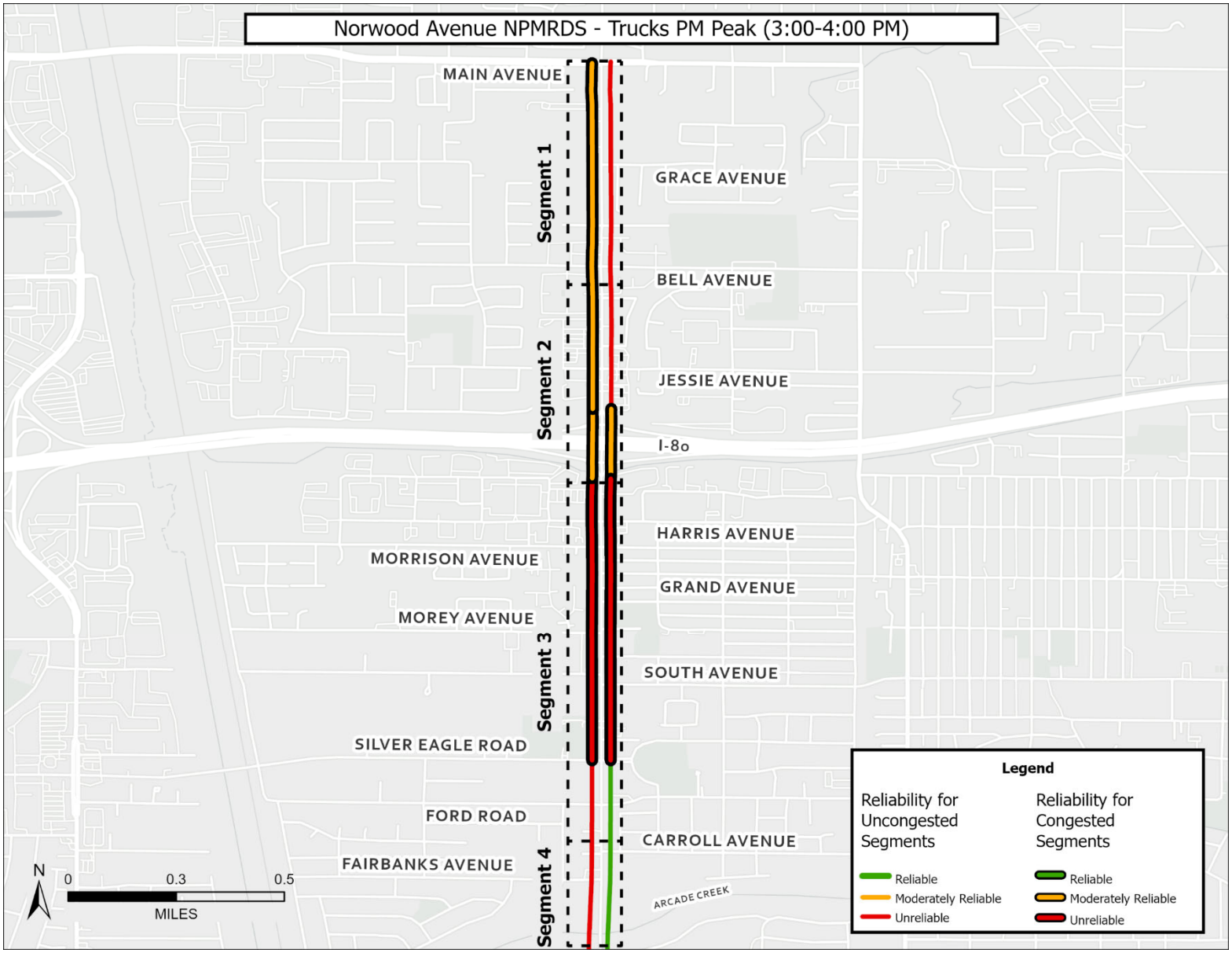


Figure 24. Trucks PM Peak Hour Reliability and Congestion

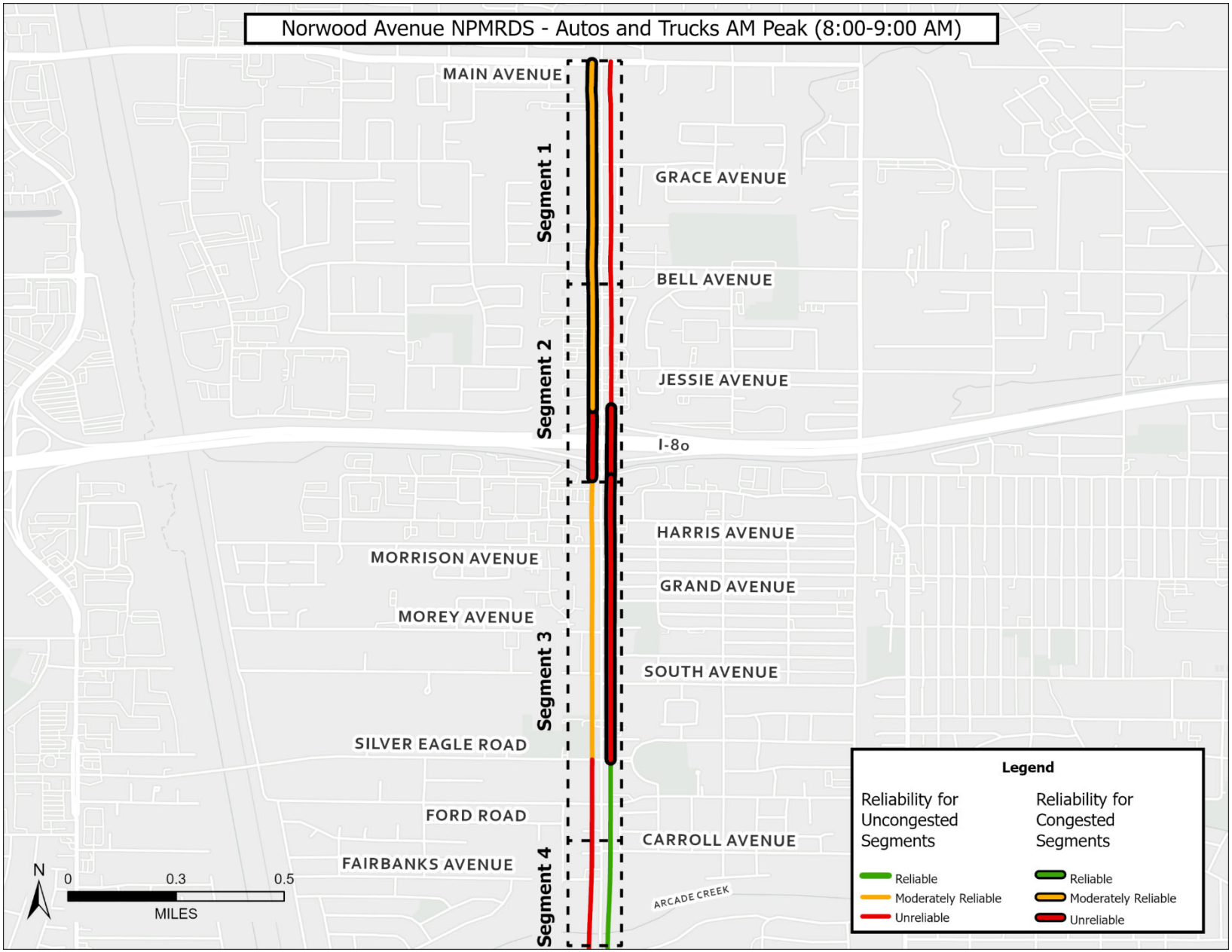


Figure 25. Autos and Trucks AM Peak Hour Reliability and Congestion

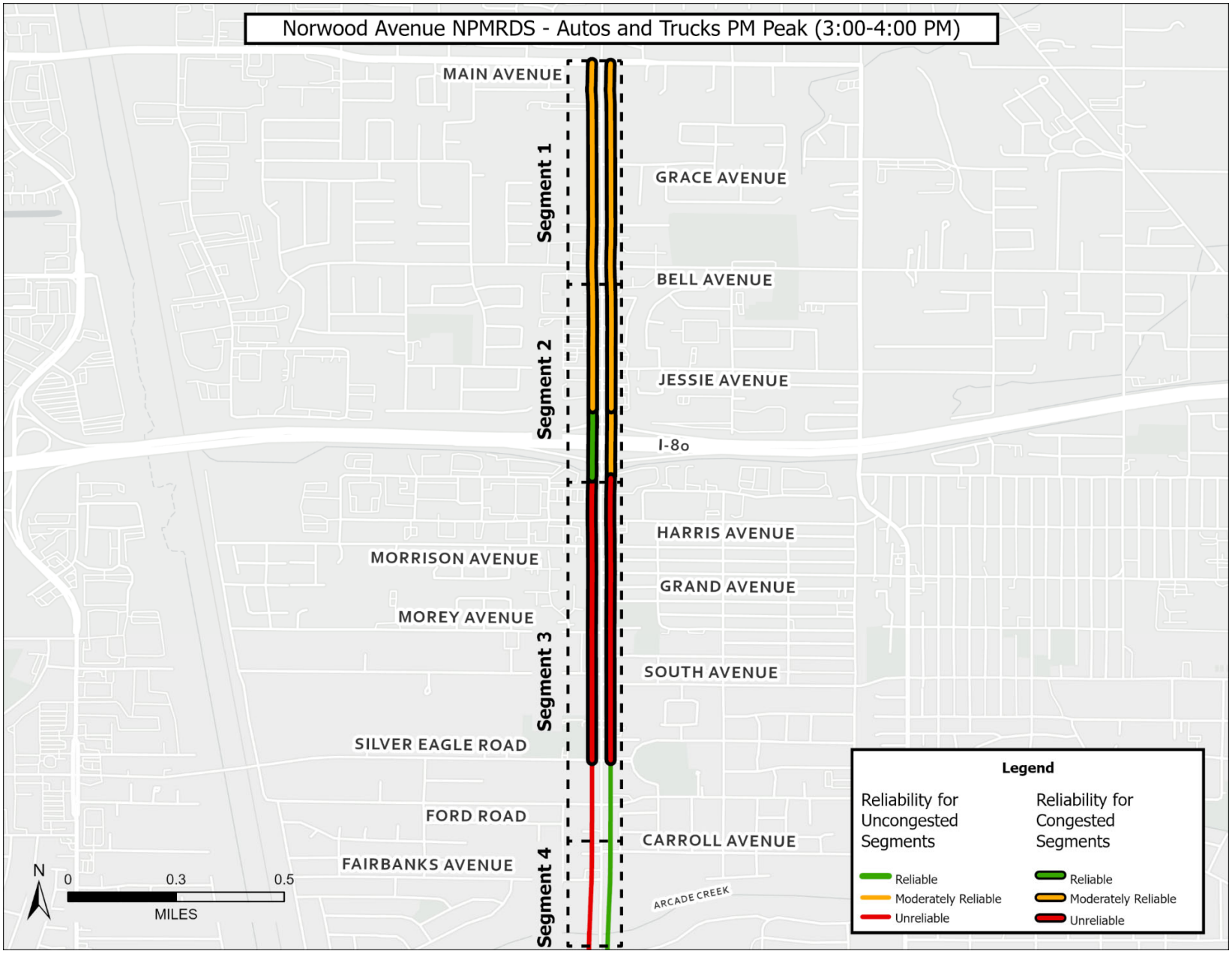


Figure 26. Autos and Trucks PM Peak Hour Reliability and Congestion

Public Engagement Summary

The following section summarizes engagement methods and feedback received during the first round of public engagement.

Public Engagement Events

In-Person Events

The project team attended the Harvest Festival on Saturday, October 26, 2024. The Harvest Festival is a family friendly event that is highly attended and includes vendors, local organizations, and public agencies to promote their services and goods while providing a space for families to "trick or treat". This event was attended by the City to promote awareness of the Norwood Mobility Project, gather public input about current issues along the corridor, and encourage community members to complete a project survey. The project team interacted with over 50 people at the Harvest Festival.

A public workshop was held on Monday, November 18, 2024, from 6:30 to 8:00 pm. The workshop provided residents, employees, business owners, school district officials, parents, and other interested parties an opportunity to learn about the study and the City's efforts to improve corridor conditions. Attendees were introduced to the project's purpose, need, and goals, provided an opportunity to complete a community survey, and/or leave comments on the social pinpoint interactive map. Four comment boards were also provided to gather public input with each board denoting a transportation mode (i.e., walking, biking, driving, or transit). Approximately 10 people from the public attended the workshop. Attendees were engaged and receptive to the project and provided feedback regarding areas of concern on Norwood Avenue and potential improvements they would support.

On December 19, 2024, City staff attended a public workshop hosted by the Neighborhood Development Action Team (NDAT). The NDAT workshop was held at Bella's Boba, east of Norwood Avenue on Eleanor Avenue. This event was attended by approximately 20

members of the community and provided attendees with project information and the opportunity to complete a community survey, provide input on a map board, or discuss corridor issues with project staff.

Virtual Meeting

On Monday, December 9, 2024, a virtual community meeting was held. This virtual meeting served the same purpose as the in-person workshop to raise project awareness, gather public comment, and concerns. The event was held via Zoom from 6:30pm to 7:30pm in an effort to ensure community members could participate in project discussion and provide input. The virtual workshop consisted of a brief presentation to introduce the project purpose, need, and overall goals. During the virtual meeting, attendees were given the opportunity to provide comments, questions, or raise concerns to project staff. Participants were also given the project website information to complete the survey and/or interactive map on their own time.

Engagement Media Methods

Project Website

Integrated into the City of Sacramento website, a project specific webpage was created for the Norwood Mobility Project[17]. As shown in **Figure 27**, information such as project background, corridor extents, project schedule, and input methods are provided. The project webpage offers two forms of public input such as a community survey and interactive Social Pinpoint map (**Figure 28**). The community survey was provided at the in-person workshop in English and Spanish, the online version allows for translation (**Figure** 29).

[17] Norwood Mobility Project

The Norwood Mobility Project

Project overview

Norwood Avenue between Main Avenue and Arcade Creek is a critical corridor serving local neighborhoods, as well as students and businesses. However, it is part of the City's High Injury Network, corridors with a high number of transportation related severe injuries and fatalities, and identified as a high priority project in the City's Transportation Priorities Plan.

The City was awarded a competitive planning grant to review data and work with the community to develop a plan to address safety and mobility on the corridor.

The goal of the plan is to identify a data driven, community supported vision for a future Norwood Avenue, inclusive of all users and reflective of the needs of the community it serves, eliminating barriers to jobs, housing, and services.

Having a Council adopted plan ensures the City is eligible for competitive grant funding for any next phases such as Preliminary Engineering Design, Environmental Clearance, Final Design and Construction.

Project schedule

Fall 2024: Existing conditions analysis

Fall-Winter 2024/2025: Community engagement phase 1, including in-person and virtual workshops and pop-ins

Fall 2024 – Spring 2025: Alternatives analysis

Winter 2025: Community engagement phase 2, including community survey, virtual open house and focus groups

Spring -Fall 2025: Draft plan development and community engagement

Winter 2025: Final Plan

The Norwood Mobility Project Schedule

Share your input

Explore The Norwood Mobility Project interactive map where you can share your comments.

There will be a variety of opportunities for you to get involved and provide your input, including community pop-ins where we will meet with the community where they are, as well as in-person and virtual workshops.

In-Person Workshop

Monday, November 18, 2024 (completed!)

Virtual Workshop

Monday, December 9, 2024

6:30-7:30pm

Registration link

Registration required

You can review our Norwood Mobility Project Phase 1 presentation here.

The Norwood Mobility Project

Figure 27. Norwood Mobility Project Web Page

We need your input!

Use the interactive map to provide comments about locations in the study area.

Follow these instructions to use the map:

- To add a comment > Select the 'Add Marker' button in the lower right corner of the map and click the specific location where you want to leave your comment. Fill out the details of the input form as required and select the 'Submit' button.

  Add Marker

- To view the map legend and/or turn map layer on/off > Select the icon in the upper left corner of the map that looks like a stack of papers. The display box will show the maps layers. Click next to the circle to the right of each layer label to toggle that layer on/off.

- To select an a different base map > Select the icon in the upper left corner of the map that looks like an unfolded map. The display box will show several base map options to choose from.

- To view additional map instructions > Select the question mark icon just above the map in the upper left corner. The display box will include more instruction information.

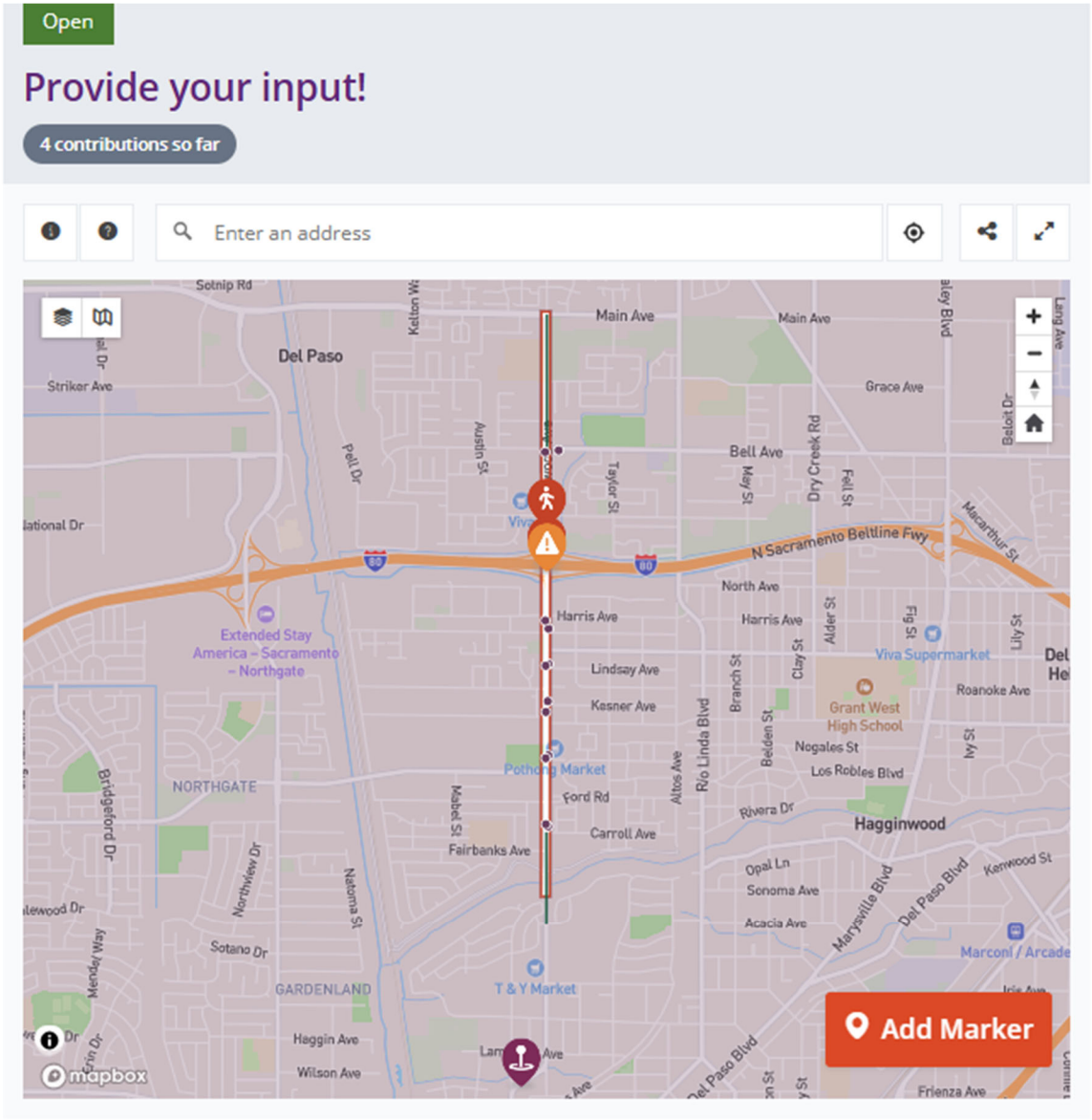
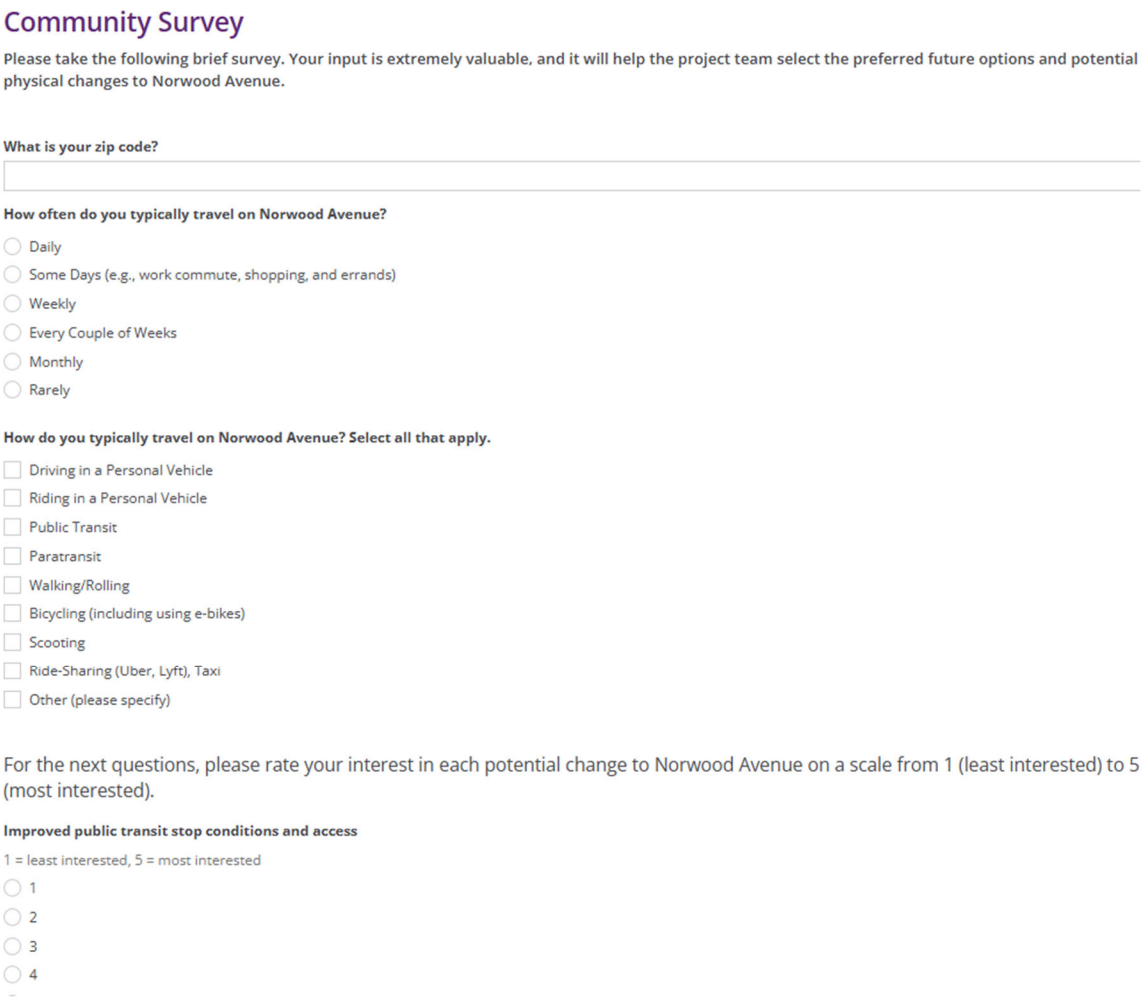


Figure 28. Norwood Avenue Interactive Comment Map



Community Survey

Please take the following brief survey. Your input is extremely valuable, and it will help the project team select the preferred future options and potential physical changes to Norwood Avenue.

What is your zip code?

How often do you typically travel on Norwood Avenue?

- ○ Daily
- ○ Some Days (e.g., work commute, shopping, and errands)
- ○ Weekly
- ○ Every Couple of Weeks
- ○ Monthly
- ○ Rarely

How do you typically travel on Norwood Avenue? Select all that apply.

- ☐ Driving in a Personal Vehicle
- ☐ Riding in a Personal Vehicle
- ☐ Public Transit
- ☐ Paratransit
- ☐ Walking/Rolling
- ☐ Bicycling (including using e-bikes)
- ☐ Scooting
- ☐ Ride-Sharing (Uber, Lyft), Taxi
- ☐ Other (please specify)

For the next questions, please rate your interest in each potential change to Norwood Avenue on a scale from 1 (least interested) to 5 (most interested).

Improved public transit stop conditions and access

1 = least interested, 5 = most interested

- ○ 1
- ○ 2
- ○ 3
- ○ 4

Figure 29. Norwood Avenue Community Survey

Event Flyers

To promote awareness of the public workshop and virtual meeting, a flyer was circulated on the City of Sacramento website, pop-up events, and social media outlets to promote the upcoming events. As shown in **Figure 30**, the event flyer consisted of meeting information, project background, links, and a QR code to route views to the project website, survey, and comment map.

Figure 30. Norwood Avenue Event Flyer

Public Engagement Results

Since the project webpage launch in September up to December 2024, the Norwood Mobility Project received several comments through various outlets such as the interactive map, public survey, and engagement events.

The community survey results are based on 75 respondents, 49 of the survey responses are from in-person events. Survey results indicated that around 76% of survey respondents travel on Norwood Avenue daily; about 75% typically drive in their personal vehicle, approximately 29% walk/roll, and about 16% take public transit on Norwood Avenue.

Survey respondents were mostly interested in improving crossing opportunities for those walking and bicycling on Norwood Avenue, reduced driver speed, improved driver safety, and improved walking conditions such as wider sidewalks and street trees.

Based on 54 comments received via the online interactive map and in-person events, 26 comments were specific to Bell Avenue, Jessie Avenue, and I-80 eastbound and westbound on/off ramps and generated the most concern from those who provided input (**Figure 31**). Walking access, driving operations, and safety were the most prominent concerns for respondents at Bell Avenue, Jessie Avenue and I-80 ramps. Jessie Avenue is one of the primary community focal points along with the Robertson Community Center and Pothong Market. The Jessie Avenue intersection provides key access to the Viva Supermarket, Rite Aid, Arco, and fast-food restaurants. Additionally, I-80 westbound on-off ramps are directly accessed by Jessie Avenue. Bell Avenue is a key intersection for people living in adjacent multi-family housing to access Norwood Avenue.

Figure 32 illustrates the comments stratified by transportation mode on Norwood Avenue. Approximately 43% revolve around walking concerns, such as areas where people walking feel unsafe. As noted, community members would support improved safety for people walking, including high-visibility crosswalks and lighting. The complete list of survey results and comments received are included in *Appendix E*.

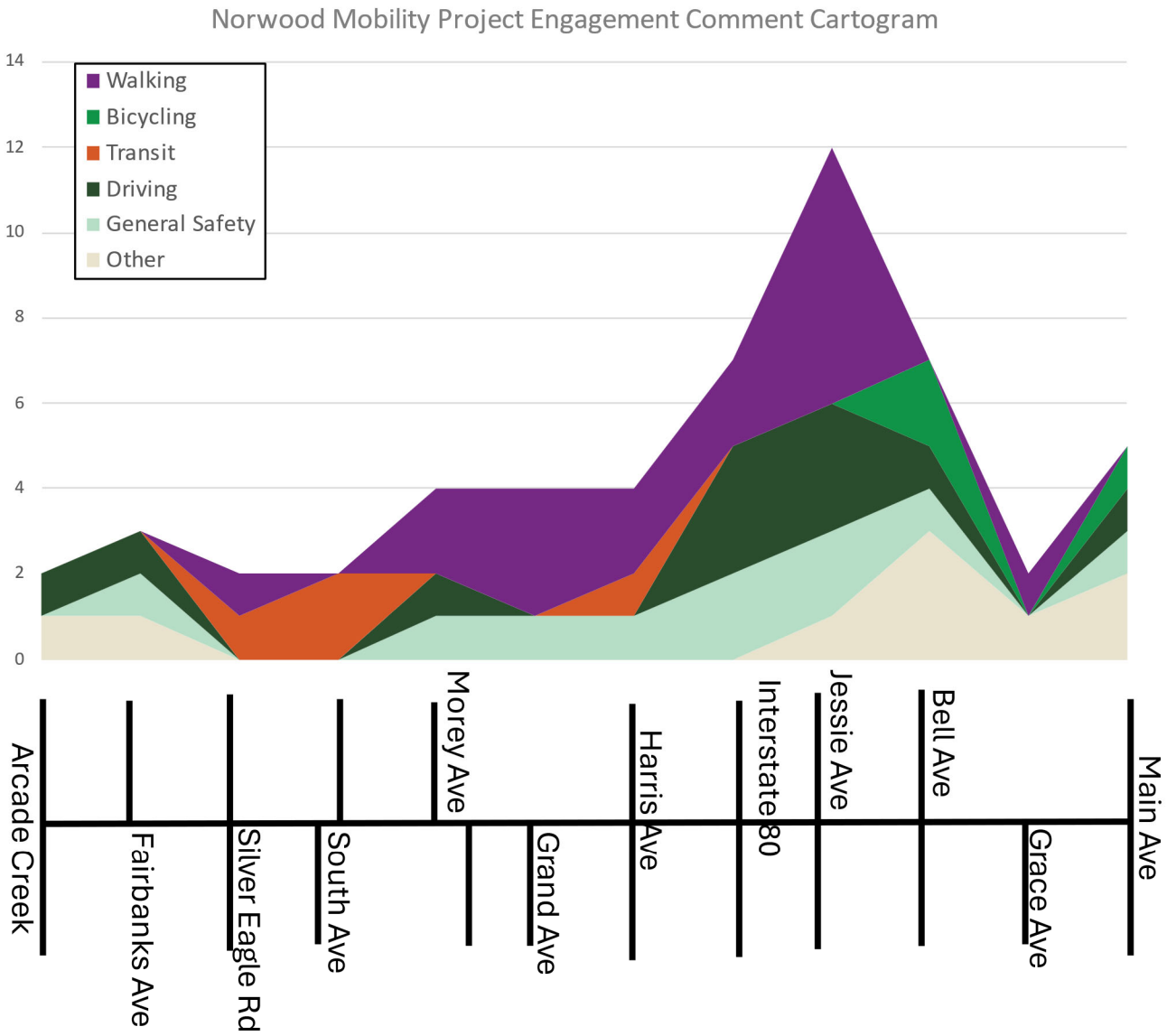


Figure 31. Engagement comments by Major Intersection

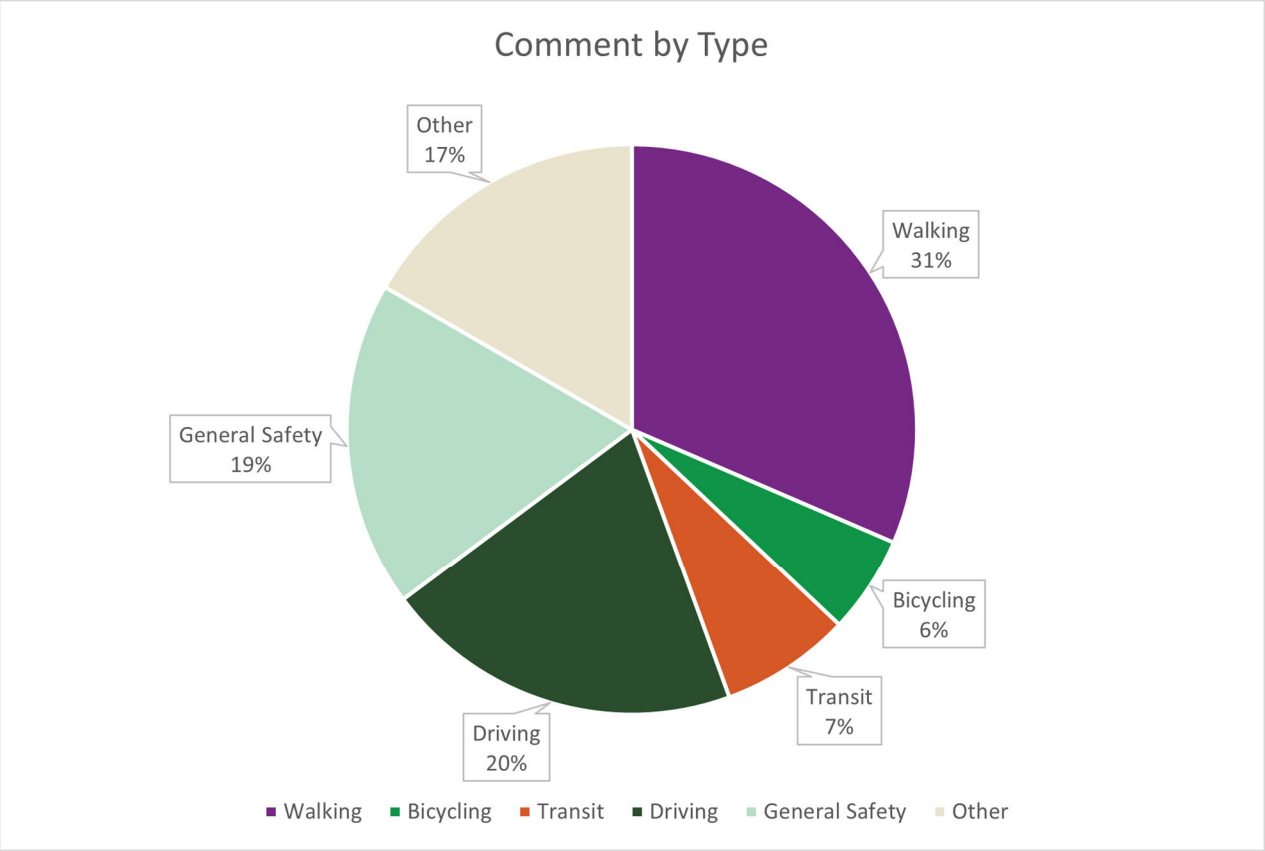


Figure 32. Comments by Type

Existing Transportation Challenges and Constraints

To gain a greater understanding of the challenges presented by this corridor, the primary concerns are outlined below. **Figure 33** illustrates the existing infrastructure along Norwood Avenue and identifies bicycle lanes and sidewalk gaps.

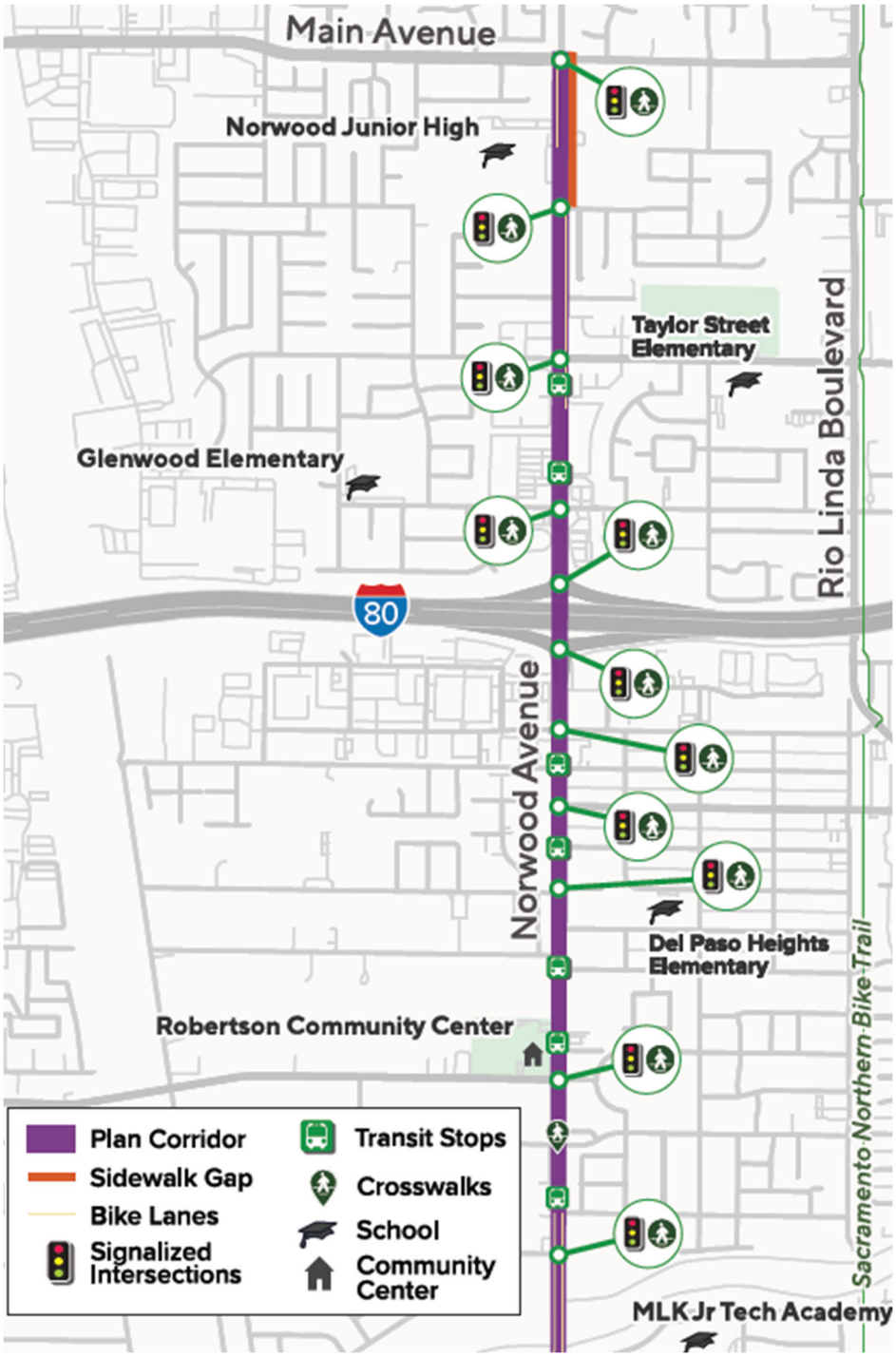


Figure 33. Infrastructure Gaps and Constraints

Walking Infrastructure

Sidewalks exist throughout the study corridor except along the northbound travel lanes from Grace Avenue to Main Avenue and along the southbound travel lanes from Grace Avenue to Berthoud Street. The existing sidewalks along Norwood Avenue do not show significant deterioration but contain some cracks and chipped concrete. In addition to sidewalk conditions, throughout the corridor the sidewalk width is five feet but are obstructed by utility poles placed within the sidewalk, reducing the available sidewalk width.

The sidewalk along the northbound lanes from Grace Avenue to Berthoud Street do not contain significant shade for people walking. Increased shade cover from street trees is prevalent from Berthoud Street to Jessie Avenue, the remainder of the corridor from Jessie Avenue to Arcade Creek consists of substantial tree cover to protect people walking from extreme temperatures.

There are 11 intersections that have controlled marked crosswalks, five are north of I-80 and six are south of I-80. The distance between marked controlled crosswalks can vary between 650 to over 1,500 feet. South of I-80, Morey Avenue is an offset controlled intersection with three marked crosswalks. At uncontrolled intersections south of I-80, there are no Norwood Avenue crossing opportunities which can present non-intuitive crossing needs for people walking, promoting crossing activity at uncontrolled locations.

Additionally, the I-80 freeway ramps can create another barrier to people walking. The lack of control and visibility enhancements at the freeway ramps create a high-stress environment for people walking as vehicles increase speeds to enter the freeway and there is no traffic control for vehicles exiting the freeway and merging onto Norwood Avenue.

Future potential design alternatives will seek to address increasing visibility and improving walking comfortability.

Bicycling Infrastructure

Bicycling infrastructure along Norwood Avenue is inconsistent and disconnected throughout the study corridor. Bike lane widths at the following locations are five feet and do not provide green paint to highlight conflict areas between modes or physical barriers to separate people biking from vehicle traffic. Bike lanes are present at the following locations:

- Northbound and southbound from Arcade Creek to Carroll Avenue
- Northbound Bell Avenue 200 feet south of the intersection approach
- Northbound from Bell Avenue to Grace Avenue.
- Southbound from Main Avenue to Grace Avenue

Having bike parking at locations could increase interest in biking as a form of transportation, allowing people biking to park their bike at commercial and recreational centers. Within the study corridor, there are five locations with bike parking ranging between three to seven spaces listed below:

- Robertson Community Center
- Nuevo Park
- Dollar General
- Department of Human Assistance
- Norwood Center

Future potential design alternatives will seek to address bicycle lane gaps, provide connection to the adjacent Sacramento Northern Bike Trail and Walter S. Ueda Bikeway, and improve access and comfortability for all ages and abilities of people biking.

Transit Infrastructure

Norwood Avenue is served by SacRT Route 19 and Route 86. Route 19 has 60-minute all day headways on weekdays and weekends. Route 86 has 30-minute weekday headways and between 45 and 60-minute headways on weekends.

Norwood Avenue has 14 bus stops with only one providing a bus shelter. The existing shelter is at the Norwood Avenue and Bell Avenue southbound bus stop and includes a bench for seating but does not have a trash bin. Bus stop locations vary along the corridor as being nearside or far-side of signalized intersections. All of the bus stops are located in-lane and, though the lanes are wider than City standards, a bus loading passengers would still block traffic.

Bus stops are heavily concentrated from Silver Eagle Road to Arcade Creek and there are no bus stops north of Bell Avenue. All bus stops along the corridor are identified by a transit sign. None of the bus stops are accessible via a low-stress walking or biking network.

Crashes

The study corridor experienced 137 injury crashes from 2018 to 2022. Of the 137 crashes, 21% were bicycle and pedestrian crashes (29 crashes). Fatal and severe injury crashes accounted for 34% of the 29 bicycle and pedestrian crashes. The highest density of crashes for all modes from 2018 to 2022 occurred between Bell Avenue and I-80, with 43% of all crashes occurring in Segment 2 of the corridor, making it a priority location for safety improvements.

This segment includes a mix of residential and commercial land use, on-street parking, and a high density of driveways. Of the 29 crashes involving people walking and biking, 16 occurred on this same segment between Bell Avenue and I-80.

The issues the design alternatives will seek to address are reducing uncontrolled conflicts between different modes of travel along the corridor, improving visibility and awareness of

potential conflict zones, reducing speeds along the corridor, and creating additional controlled crossing opportunities at high demand locations along the corridor.

OPERATIONS

Much of the corridor experiences unreliable travel times and congestion. Although corridor intersections operate acceptably, many of them experience weekday AM/PM peak hour queue conditions that exceed available storage. The corridor design alternatives will seek to address consistent cross-sections throughout the corridor, efficient signal timing for all users of the corridor including buses, providing sufficient storage for queuing, and operational modifications that improve safety for all roadway users.

Right of Way

Right of way (ROW) along the corridor varies throughout Norwood Avenue. From curb to curb, the ROW varies from 48 to 70 feet wide involving the following components:

- Inside travel lanes are 11 feet.
- Outside travel lane widths vary from 12 to 14 feet.
- Two-way center left turn lane is 10 feet.
- Sidewalks along the study corridor are 5 feet but are the responsibility of the fronting property owner[18]. Utility poles are located within the sidewalk width.
- Along the few segments where on-street parking is allowed, the parking lane is 8 feet.

Additional consideration for ROW will need to be given to the I-80 overpass and Arcade Creek bridge due to reduced roadway width and the structure providing a constrained roadway width. Where the corridor is two lanes per direction with a two-way center left turn lane, design alternatives will seek to use existing roadway space to improve infrastructure for people walking or biking such as widening sidewalks or implementing marked bike lanes or buffered bike lanes.

[18] Sacramento City Code, Section 12.32.020

APPENDIX

DKS

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CONTENTS

Appendix A. Turning Movement Counts

National Data & Surveying Services

Intersection Turning Movement Count

Location: Norwood Ave & I-80 EB Ramps
City: Sacramento
Control: Signalized

Project ID: 24-070189-004
Date: 10/8/2024

Data - Total

NS/EW Streets:	Norwood Ave				Norwood Ave				I-80 EB Ramps				I-80 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	104	55	0	53	103	0	0	56	0	83	0	0	0	0	0	454
7:15 AM	0	127	82	0	69	111	0	0	62	1	74	0	0	0	0	0	526
7:30 AM	0	154	93	0	105	146	0	0	57	1	88	0	0	0	0	0	644
7:45 AM	0	157	78	0	82	161	0	0	85	0	100	0	0	0	0	0	663
8:00 AM	0	133	65	0	95	160	0	0	75	0	89	0	0	0	0	0	617
8:15 AM	0	126	53	0	85	135	0	0	57	0	99	0	0	0	0	0	555
8:30 AM	0	131	62	0	79	122	0	0	54	1	91	0	0	0	0	0	540
8:45 AM	0	144	48	0	61	112	0	0	53	1	73	0	0	0	0	0	492
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1076	536	0	629	1050	0	0	499	4	697	0	0	0	0	0	4491
APPROACH %'s :	0.00%	66.75%	33.25%	0.00%	37.46%	62.54%	0.00%	0.00%	41.58%	0.33%	58.08%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	570	289	0	367	602	0	0	274	1	376	0	0	0	0	0	2479
PEAK HR FACTOR :	0.000	0.908	0.777	0.000	0.874	0.935	0.000	0.000	0.806	0.250	0.940	0.000	0.000	0.000	0.000	0.000	0.935
		0.869				0.950				0.880							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	155	82	0	68	138	0	0	110	1	78	0	0	0	0	0	632
4:15 PM	0	161	38	0	72	149	0	0	94	0	80	0	0	0	0	0	594
4:30 PM	0	163	69	0	68	137	0	0	109	0	75	0	0	0	0	0	621
4:45 PM	0	159	53	0	49	131	0	0	111	1	96	0	0	0	0	0	600
5:00 PM	0	185	69	0	64	111	0	0	115	4	88	0	0	0	0	0	636
5:15 PM	0	176	71	0	78	143	0	0	106	4	86	0	0	0	0	0	664
5:30 PM	0	158	57	0	65	141	0	0	125	4	98	0	0	0	0	0	648
5:45 PM	0	150	49	0	57	138	0	0	120	0	97	0	0	0	0	0	611
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1307	488	0	521	1088	0	0	890	14	698	0	0	0	0	0	5006
APPROACH %'s :	0.00%	72.81%	27.19%	0.00%	32.38%	67.62%	0.00%	0.00%	55.56%	0.87%	43.57%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	669	246	0	264	533	0	0	466	12	369	0	0	0	0	0	2559
PEAK HR FACTOR :	0.000	0.904	0.866	0.000	0.846	0.932	0.000	0.000	0.932	0.750	0.941	0.000	0.000	0.000	0.000	0.000	0.963
		0.901				0.902				0.933							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Norwood Ave & Harris Ave
City: Sacramento
Control: Signalized

Project ID: 24-070189-005
Date: 10/8/2024

Data - Total

NS/EW Streets:	Norwood Ave				Norwood Ave				Harris Ave				Harris Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	4	110	0	0	14	98	79	0	35	1	8	0	0	2	13	0	364
7:15 AM	3	164	1	0	13	101	66	0	37	0	7	0	5	5	14	0	416
7:30 AM	3	182	1	0	15	162	65	0	37	2	5	0	3	4	28	0	507
7:45 AM	16	193	3	0	17	143	80	0	30	3	4	0	2	8	17	0	516
8:00 AM	11	156	3	0	11	168	86	0	24	5	7	0	1	9	23	0	504
8:15 AM	14	134	4	0	13	150	74	0	31	3	15	0	3	5	19	0	465
8:30 AM	11	132	2	0	16	115	75	0	62	2	12	0	2	3	18	0	450
8:45 AM	9	94	3	0	16	113	55	0	63	3	17	0	3	9	17	0	402
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	71	1165	17	0	115	1050	580	0	319	19	75	0	19	45	149	0	3624
APPROACH %'s :	5.67%	92.98%	1.36%	0.00%	6.59%	60.17%	33.24%	0.00%	77.24%	4.60%	18.16%	0.00%	8.92%	21.13%	69.95%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	44	665	11	0	56	623	305	0	122	13	31	0	9	26	87	0	1992
PEAK HR FACTOR :	0.688	0.861	0.688	0.000	0.824	0.927	0.887	0.000	0.824	0.650	0.517	0.000	0.750	0.722	0.777	0.000	0.965
	0.849				0.928				0.847				0.871				

NS/EW Streets:	Norwood Ave				Norwood Ave				Harris Ave				Harris Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	2	132	7	0	20	178	24	0	70	3	14	0	4	5	32	0	491
4:15 PM	5	127	2	0	23	172	26	0	50	4	13	0	3	3	24	0	452
4:30 PM	5	140	4	0	15	182	18	0	57	3	10	0	0	1	29	0	464
4:45 PM	6	146	1	0	15	187	29	0	55	5	7	0	7	2	27	0	487
5:00 PM	4	132	4	0	13	150	28	0	79	4	17	0	2	2	24	0	459
5:15 PM	2	166	5	0	15	195	28	0	58	3	7	0	5	2	26	0	512
5:30 PM	5	158	4	0	13	204	20	0	38	2	8	0	3	0	16	0	471
5:45 PM	3	148	2	0	14	201	21	0	34	4	6	0	6	1	14	0	454
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	32	1149	29	0	128	1469	194	0	441	28	82	0	30	16	192	0	3790
APPROACH %'s :	2.64%	94.96%	2.40%	0.00%	7.15%	82.02%	10.83%	0.00%	80.04%	5.08%	14.88%	0.00%	12.61%	6.72%	80.67%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	17	602	14	0	56	736	105	0	230	14	39	0	17	6	93	0	1929
PEAK HR FACTOR :	0.708	0.907	0.700	0.000	0.933	0.902	0.905	0.000	0.728	0.700	0.574	0.000	0.607	0.750	0.861	0.000	0.942
	0.915				0.942				0.708				0.806				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Norwood Ave & Silver Eagle Rd
City: Sacramento
Control: Signalized

Project ID: 24-070189-006
Date: 10/8/2024

Data - Total

NS/EW Streets:	Norwood Ave				Norwood Ave				Silver Eagle Rd				Silver Eagle Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	67	1	0	3	72	19	0	18	5	16	0	3	8	11	0	232
7:15 AM	18	92	3	0	3	95	34	0	28	7	18	0	4	22	9	0	333
7:30 AM	24	131	5	0	6	137	37	0	42	10	31	0	12	17	10	0	462
7:45 AM	34	173	5	0	7	112	46	0	39	21	23	0	4	26	12	0	502
8:00 AM	28	144	3	0	3	109	53	0	63	16	22	0	4	19	9	0	473
8:15 AM	21	99	3	0	7	107	50	0	59	27	17	0	2	22	8	0	422
8:30 AM	10	92	2	0	6	105	67	0	42	26	19	0	6	20	8	0	403
8:45 AM	15	56	1	0	5	82	30	0	30	13	16	0	3	11	6	0	268
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	159	854	23	0	40	819	336	0	321	125	162	0	38	145	73	0	3095
APPROACH %'s :	15.35%	82.43%	2.22%	0.00%	3.35%	68.54%	28.12%	0.00%	52.80%	20.56%	26.64%	0.00%	14.84%	56.64%	28.52%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	107	547	16	0	23	465	186	0	203	74	93	0	22	84	39	0	1859
PEAK HR FACTOR :	0.787	0.790	0.800	0.000	0.821	0.849	0.877	0.000	0.806	0.685	0.750	0.000	0.458	0.808	0.813	0.000	0.926
	0.790				0.936				0.898				0.863				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	21	79	1	0	10	117	49	0	47	28	38	0	2	20	5	0	417
4:15 PM	17	97	4	0	8	110	36	0	51	37	26	0	1	16	4	0	407
4:30 PM	25	94	3	0	3	115	46	0	58	32	24	0	2	13	8	0	423
4:45 PM	25	101	2	0	11	106	51	0	57	36	29	0	2	16	8	0	444
5:00 PM	24	101	6	0	25	104	50	0	56	27	26	0	1	12	8	0	440
5:15 PM	20	98	3	0	6	116	39	0	74	40	24	0	1	20	10	0	451
5:30 PM	16	107	2	0	6	105	50	0	48	22	28	0	2	22	9	0	417
5:45 PM	25	120	5	0	4	132	48	0	47	21	35	0	5	20	9	0	471
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	173	797	26	0	73	905	369	0	438	243	230	0	16	139	61	0	3470
APPROACH %'s :	17.37%	80.02%	2.61%	0.00%	5.42%	67.19%	27.39%	0.00%	48.08%	26.67%	25.25%	0.00%	7.41%	64.35%	28.24%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	85	426	16	0	41	457	187	0	225	110	113	0	9	74	36	0	1779
PEAK HR FACTOR :	0.850	0.888	0.667	0.000	0.410	0.866	0.935	0.000	0.760	0.688	0.807	0.000	0.450	0.841	0.900	0.000	0.944
	0.878				0.931				0.812				0.875				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Norwood Ave & Bell Ave
City: Sacramento
Control: Signalized

Project ID: 24-070189-002
Date: 10/8/2024

Data - Total

NS/EW Streets:	Norwood Ave				Norwood Ave				Bell Ave				Bell Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	66	27	0	7	84	0	0	2	10	23	0	20	3	11	0	256
7:15 AM	11	83	28	0	7	109	1	0	0	10	33	0	43	7	18	0	350
7:30 AM	7	78	30	0	27	149	3	0	4	18	41	0	35	4	27	0	423
7:45 AM	17	98	44	0	43	142	14	1	12	23	39	0	40	19	40	0	532
8:00 AM	12	80	52	0	38	125	10	0	19	50	27	0	53	32	29	0	527
8:15 AM	10	64	47	0	10	97	5	0	8	31	20	0	58	17	20	0	387
8:30 AM	12	59	24	0	13	77	8	0	2	9	24	0	55	21	9	0	313
8:45 AM	13	50	17	0	8	79	2	0	1	8	19	0	39	11	14	0	261
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	85	578	269	0	153	862	43	1	48	159	226	0	343	114	168	0	3049
APPROACH %'s :	9.12%	62.02%	28.86%	0.00%	14.45%	81.40%	4.06%	0.09%	11.09%	36.72%	52.19%	0.00%	54.88%	18.24%	26.88%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	46	320	173	0	118	513	32	1	43	122	127	0	186	72	116	0	1869
PEAK HR FACTOR :	0.676	0.816	0.832	0.000	0.686	0.861	0.571	0.250	0.566	0.610	0.774	0.000	0.802	0.563	0.725	0.000	0.878
	0.847				0.830				0.760				0.820				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	28	90	37	0	18	109	3	0	2	8	20	0	40	24	20	0	399
4:15 PM	30	106	33	0	11	98	7	0	5	8	21	0	37	16	9	0	381
4:30 PM	32	103	50	0	23	99	4	0	5	10	19	0	29	16	20	0	410
4:45 PM	18	89	45	0	19	86	4	0	3	14	29	0	21	21	10	0	359
5:00 PM	21	87	57	0	15	98	2	0	5	11	15	0	37	17	18	0	383
5:15 PM	37	98	48	0	19	105	3	0	1	13	22	0	24	12	21	0	403
5:30 PM	29	82	55	0	21	108	7	0	2	15	14	0	38	17	16	0	404
5:45 PM	23	115	45	0	18	84	3	0	3	12	28	0	35	14	14	0	394
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	218	770	370	0	144	787	33	0	26	91	168	0	261	137	128	0	3133
APPROACH %'s :	16.05%	56.70%	27.25%	0.00%	14.94%	81.64%	3.42%	0.00%	9.12%	31.93%	58.95%	0.00%	49.62%	26.05%	24.33%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	110	382	205	0	73	395	15	0	11	51	79	0	134	60	69	0	1584
PEAK HR FACTOR :	0.743	0.830	0.899	0.000	0.869	0.914	0.536	0.000	0.550	0.850	0.705	0.000	0.882	0.882	0.821	0.000	0.980
	0.952				0.888				0.820				0.913				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Norwood Ave & I-80 WB Ramps
City: Sacramento
Control: Signalized

Project ID: 24-070189-003
Date: 10/8/2024

Data - Total

NS/EW Streets:	Norwood Ave				Norwood Ave				I-80 WB Ramps				I-80 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	57	103	0	0	0	84	108	0	0	0	0	0	71	0	50	0	473
7:15 AM	61	128	0	0	0	131	142	0	0	0	0	0	66	0	53	0	581
7:30 AM	75	135	0	0	0	171	161	0	0	0	0	0	82	0	50	0	674
7:45 AM	54	175	0	0	0	179	138	0	0	0	0	0	76	1	53	0	676
8:00 AM	68	148	0	0	0	157	119	0	0	0	0	0	67	0	64	0	623
8:15 AM	57	130	0	0	0	175	122	0	0	0	0	0	47	2	40	0	573
8:30 AM	69	115	0	0	0	137	100	0	0	0	0	0	65	2	56	0	544
8:45 AM	97	103	0	0	0	127	92	0	0	0	0	0	46	1	46	0	512
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	538	1037	0	0	0	1161	982	0	0	0	0	0	520	6	412	0	4656
APPROACH %'s :	34.16%	65.84%	0.00%	0.00%	0.00%	54.18%	45.82%	0.00%					55.44%	0.64%	43.92%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	258	586	0	0	0	638	560	0	0	0	0	0	291	1	220	0	2554
PEAK HR FACTOR :	0.860	0.837	0.000	0.000	0.000	0.891	0.870	0.000	0.000	0.000	0.000	0.000	0.887	0.250	0.859	0.000	0.945
	0.921				0.902								0.970				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	78	189	0	0	0	145	107	0	0	0	0	0	60	0	93	0	672
4:15 PM	75	181	0	0	0	143	106	0	0	0	0	0	77	0	65	0	647
4:30 PM	89	166	0	0	0	135	107	0	0	0	0	0	71	0	91	0	659
4:45 PM	93	193	0	0	0	122	89	0	0	0	0	0	57	0	77	0	631
5:00 PM	90	207	0	0	0	123	100	0	0	0	0	0	52	0	70	0	642
5:15 PM	78	203	0	0	0	158	88	0	0	0	0	0	65	0	82	0	674
5:30 PM	89	194	0	0	0	142	84	0	0	0	0	0	62	0	77	0	648
5:45 PM	67	208	0	0	0	124	119	0	0	0	0	0	72	0	80	0	670
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	659	1541	0	0	0	1092	800	0	0	0	0	0	516	0	635	0	5243
APPROACH %'s :	29.95%	70.05%	0.00%	0.00%	0.00%	57.72%	42.28%	0.00%					44.83%	0.00%	55.17%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	324	812	0	0	0	547	391	0	0	0	0	0	251	0	309	0	2634
PEAK HR FACTOR :	0.900	0.976	0.000	0.000	0.000	0.866	0.821	0.000	0.000	0.000	0.000	0.000	0.872	0.000	0.942	0.000	0.977
	0.956				0.953								0.921				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Norwood Ave & Jessie Ave
City: Sacramento
Control: Signalized

Project ID: 24-070189-001
Date: 10/8/2024

Data - Total

NS/EW Streets:	Norwood Ave				Norwood Ave				Jessie Ave				Jessie Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	103	23	0	6	130	0	0	2	5	28	0	34	1	5	0	346
7:15 AM	25	94	18	0	7	163	1	0	2	7	33	0	44	4	8	0	406
7:30 AM	24	122	24	0	8	226	5	0	4	12	35	0	56	5	8	0	529
7:45 AM	42	120	21	0	14	180	13	0	8	22	70	0	40	27	11	0	568
8:00 AM	48	122	36	0	18	179	21	0	15	33	74	0	39	16	15	0	616
8:15 AM	23	99	19	0	11	154	5	0	9	28	36	0	59	20	7	0	470
8:30 AM	24	93	25	0	6	154	5	0	0	6	26	0	37	10	6	0	392
8:45 AM	17	87	27	0	9	147	2	0	3	8	22	0	32	7	10	0	371
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	212	840	193	0	79	1333	52	0	43	121	324	0	341	90	70	0	3698
APPROACH %'s :	17.03%	67.47%	15.50%	0.00%	5.40%	91.05%	3.55%	0.00%	8.81%	24.80%	66.39%	0.00%	68.06%	17.96%	13.97%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	137	463	100	0	51	739	44	0	36	95	215	0	194	68	41	0	2183
PEAK HR FACTOR :	0.714	0.949	0.694	0.000	0.708	0.817	0.524	0.000	0.600	0.720	0.726	0.000	0.822	0.630	0.683	0.000	0.886
	0.850				0.872				0.709				0.881				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	57	159	32	0	17	152	7	0	7	16	48	0	64	21	9	0	589
4:15 PM	53	161	32	0	12	161	3	0	9	12	36	0	38	13	9	0	539
4:30 PM	46	157	21	0	7	134	5	0	9	10	37	0	50	17	12	0	505
4:45 PM	48	178	39	0	17	129	3	0	9	16	32	0	42	8	6	0	527
5:00 PM	51	170	28	0	12	142	3	0	4	11	39	0	47	23	8	0	538
5:15 PM	49	159	38	0	13	130	3	0	8	11	40	0	36	19	10	0	516
5:30 PM	55	172	36	0	20	130	5	0	12	11	45	0	44	17	9	0	556
5:45 PM	53	173	38	0	16	138	6	0	8	19	39	0	52	13	8	0	563
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	412	1329	264	0	114	1116	35	0	66	106	316	0	373	131	71	0	4333
APPROACH %'s :	20.55%	66.28%	13.17%	0.00%	9.01%	88.22%	2.77%	0.00%	13.52%	21.72%	64.75%	0.00%	64.87%	22.78%	12.35%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	208	674	140	0	61	540	17	0	32	52	163	0	179	72	35	0	2173
PEAK HR FACTOR :	0.945	0.974	0.921	0.000	0.763	0.951	0.708	0.000	0.667	0.684	0.906	0.000	0.861	0.783	0.875	0.000	0.965
	0.968				0.966				0.908				0.917				

Appendix B. Norwood Avenue Collision Data

Study Area Crashes

CASE_ID	COLLISION_DATE	PRIMARY_RD	SECONDARY_RD	DISTANCE	DIRECTION	INTERSECTION	WEATHER_1	COLLISION_SEVERITY	NUMBER_KILL	NUMBER_INJURED	PCF_VIOL_CATEGOR	TYPE_OF_COLLISION	MVIW	PED_ACTION	LIGHTING	CONTROL_DEVICE	PEDESTRIAN_ACCIDENT	BICYCLE_ACCIDENT	MOTORCYCLE_ACCIDENT	TRUCK_ACCIDENT	ALCOHOL_INVOLVED	LONGITUDE	LATITUDE
8619747	4/27/2018	NORWOO	SILVER EA	0		Y	A	3	0	1	12	D	C	A	A	A						-121.457	38.6
8687238	8/22/2018	NORWOO	MOREY AV	0		Y	A	3	0	2	3	C	C	A	A	A						-121.457	38.6
8713991	9/26/2018	NORWOO	JESSIE AV	130	S	N	A	4	0	2	9	D	C	A	A	D						-121.457	38.6
8536722	1/16/2018	NORWOO	HARRIS A	1	S	N	A	3	0	1	8	B	G	A	A	D		Y				-121.457	38.6
8635403	6/6/2018	NORWOO	JESSIE	390	S	N	A	4	0	2	3	C	C	A	A	A						-121.457	38.6
8533477	1/2/2018	NORWOO	JESSIE AV	120	S	N	B	4	0	3	9	D	C	A	C	D						-121.457	38.6
8613904	4/13/2018	NORWOO	GRACE AV	12	S	N	A	4	0	2	1	C	C	A	C	A					Y	-121.457	38.7
8637125	5/29/2018	NORWOO	JESSIE AV	149	S	N	A	3	0	2	3	C	C	A	A	B						-121.457	38.6
8715986	9/17/2018	NORWOO	JESSIE AV	100	S	N	A	4	0	1	8	D	G	A	A	-		Y				-121.457	38.6
8720731	10/17/2018	NORWOO	BELL AV	634	S	N	A	2	0	1	11	G	B	C	C	D	Y					-121.457	38.6
8772973	12/19/2018	NORWOO	MOREY AV	0		Y	-	3	0	2	12	D	C	A	A	A						-121.457	38.6
8565227	2/4/2018	SILVER EA	NORWOO	0		Y	A	4	0	1	3	A	C	A	C	A						-121.457	38.6
8580806	3/11/2018	NORWOO	GRAND A	0		Y	A	4	0	2	12	D	C	A	A	A						-121.457	38.6
8641605	6/12/2018	SILVER EA	NORWOO	0		Y	A	2	0	6	1	D	C	A	A	A					Y	-121.457	38.6
8651187	9/22/2018	NORWOO	HAYES AV	0		Y	A	1	1	0	11	G	B	D	A	D	Y					-121.457	38.6
8688230	8/12/2018	NORWOO	JESSIE AV	27	N	N	A	4	0	1	8	E	I	A	A	A						-121.457	38.6
8695610	9/13/2018	NORWOO	JESSIE AV	792	N	N	A	4	0	2	0	B	C	A	A	A						-121.457	38.6
8705472	9/23/2018	NORWOO	JESSIE AV	21	S	N	A	4	0	1	11	G	B	E	B	A	Y					-121.457	38.6
8711659	10/14/2018	NORWOO	KESNER A	0		Y	A	4	0	1	8	D	G	A	A	A		Y			Y	-121.457	38.6
8760801	12/28/2018	NORWOO	GRAND A	298	S	N	A	4	0	1	9	D	C	A	A	D						-121.457	38.6
8906987	7/28/2019	JESSIE AV	NORWOO	0	E	N	A	3	0	1	9	A	C	A	B	A						-121.457	38.6
8907167	7/8/2019	NORWOO	GRACE AV	0		Y	A	3	0	2	12	D	C	A	A	A						-121.457	38.7
8958359	10/12/2019	NORWOO	BELL AV	0	S	N	A	3	0	1	9	D	C	A	A	D						-121.457	38.6
8980984	10/23/2019	NORWOO	SILVER EA	150	N	N	A	4	0	3	3	C	C	A	C	A				Y		-121.457	38.6
8762124	1/5/2019	NORWOO	RT 80	0		Y	B	4	0	1	12	D	C	A	C	A						-121.457	38.6
8918341	8/11/2019	HARRIS AV	NORWOO	0		Y	A	4	0	3	12	-	C	A	A	A						-121.457	38.6
8816469	2/25/2019	NORWOO	HARRIS A	0		Y	B	4	0	2	12	D	C	A	A	A						-121.457	38.6
8818152	3/11/2019	NORWOO	BELL AV	678	S	N	A	4	0	3	8	A	C	A	C	D						-121.457	38.6
8833021	3/22/2019	NORWOO	BELL AV	32	S	N	A	4	0	1	10	G	B	B	A	A	Y					-121.457	38.6
8845231	4/19/2019	NORWOO	JESSIE AV	351	N	N	A	4	0	3	3	C	C	A	A	A						-121.457	38.6
8859897	5/9/2019	NORWOO	HARRIS A	0		Y	A	4	0	1	12	D	C	A	A	A						-121.457	38.6
8959662	8/6/2019	NORWOO	HAYES AV	148	N	N	A	2	0	1	17	H	G	A	C	D		Y				-121.457	38.6
8975705	11/13/2019	NORWOO	SILVER EA	0		Y	A	3	0	1	12	D	C	A	A	A						-121.457	38.6
8995600	12/1/2019	NORWOO	FAIRBANK	0		Y	C	4	0	1	3	B	C	A	A	D						-121.457	38.6
9006252	12/28/2019	NORWOO	SOUTH AV	3	N	N	A	4	0	1	1	D	C	A	C	A					Y	-121.457	38.6
8781799	1/24/2019	NORWOO	HARRIS A	120	N	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
8825701	3/19/2019	NORWOO	BELL AV	794	S	N	A	4	0	1	9	D	G	A	A	D		Y				-121.457	38.6
8838849	4/8/2019	NORWOO	HARRIS A	0		Y	A	4	0	2	12	D	C	A	A	A						-121.457	38.6
8839370	4/7/2019	FORD RD	NORWOO	0		Y	B	4	0	1	0	H	G	A	C	A		Y				-121.457	38.6
8850332	4/5/2019	NORWOO	BERTHOU	0	N	N	B	2	0	3	1	C	C	A	A	D						-121.457	38.6

8903231	7/22/2019	NORWOO	MOREY A	85	S	N	A	2	0	1	1	C	G	A	C	A		Y			Y	-121.457	38.6
8931544	8/26/2019	NORWOO	BERTHOU	0		Y	A	3	0	1	-	D	G	A	A	D		Y				-121.457	38.6
8981212	11/30/2019	NORWOO	BERTHOU	0		Y	A	3	0	3	9	D	C	A	B	A						-121.457	38.6
8995266	12/7/2019	NORWOO	MAIN AV	631	S	N	C	4	0	2	9	C	C	A	C	D						-121.457	38.7
9004881	12/13/2019	NORWOO	JESSIE AV	192	S	N	C	4	0	2	9	D	C	A	A	D						-121.457	38.6
9051125	3/4/2020	NORWOO	FAIRBANI	240	S	N	A	3	0	2	3	C	-	A	A	D						-121.457	38.6
9170901	10/27/2020	NORWOO	JESSIE AV	204	S	N	A	4	0	1	9	D	C	A	A	D						-121.457	38.6
9093413	4/14/2020	NORWOO	FAIRBANI	275	S	N	A	2	0	1	11	G	B	D	A	D	Y					-121.457	38.6
9126821	7/10/2020	GRAND AV	NORWOO	0		Y	A	4	0	2	3	C	C	A	A	A						-121.457	38.6
9149312	9/9/2020	NORWOO	FORD RD	0		Y	A	4	0	1	9	D	C	A	A	A						-121.457	38.6
9018759	1/11/2020	NORWOO	FORD RD	0		Y	A	4	0	2	9	D	C	A	A	A						-121.457	38.6
9031298	1/17/2020	NORWOO	JESSIE AV	300	N	N	A	4	0	1	11	G	B	D	A	D	Y					-121.457	38.6
9051222	2/28/2020	JESSIE AV	NORWOO	12	E	N	A	4	0	1	9	D	C	A	A	D						-121.457	38.6
9074513	5/10/2020	NORWOO	JESSIE AV	21	S	N	A	3	0	3	-	A	C	A	A	A						-121.457	38.6
9122727	7/18/2020	NORWOO	JESSIE AV	100	N	N	A	3	0	4	8	D	C	A	A	A			Y			-121.457	38.6
9126792	7/6/2020	NORWOO	CARROLL	120	N	N	A	4	0	1	3	E	I	A	A	D						-121.457	38.6
9128383	7/21/2020	NORWOO	JESSIE AV	257	S	N	A	4	0	1	9	A	C	A	A	D						-121.457	38.6
9153769	9/3/2020	NORWOO	JESSIE ST	492	N	N	A	4	0	1	8	A	C	A	A	A						-121.457	38.6
9025646	1/24/2020	NORWOO	JESSIE AV	0		-	A	4	0	1	22	D	C	A	A	A						-121.457	38.6
9031282	1/24/2020	NORWOO	JESSIE AV	204	S	N	A	4	0	2	9	D	C	A	A	A						-121.457	38.6
9051185	3/5/2020	NORWOO	FAIR BAN	0		Y	A	4	0	1	3	-	C	A	A	A						-121.457	38.6
9064923	3/16/2020	NORWOO	GRAND A	0		Y	C	4	0	1	12	D	C	A	A	A						-121.457	38.6
9069868	4/7/2020	NORWOO	JESSIE AV	485	N	N	C	4	0	1	9	D	C	A	A	D						-121.457	38.6
9088924	4/10/2020	NORWOO	JESSIE AV	0		Y	A	4	0	1	12	A	C	A	C	A						-121.457	38.6
9140990	8/21/2020	NORWOO	JESSIE AV	476	N	N	A	3	0	1	9	D	C	A	A	D			Y			-121.457	38.6
9140997	8/9/2020	NORWOO	SILVER EA	0		Y	A	4	0	1	12	D	C	A	A	A			Y			-121.457	38.6
9154021	9/3/2020	NORWOO	FORD RD	0		Y	A	3	0	4	12	F	C	A	A	A						-121.457	38.6
9187339	11/21/2020	NORWOO	SILVER EA	0		Y	A	4	0	1	12	D	C	A	A	A						-121.457	38.6
9194158	12/7/2020	NORWOO	JESSIE AV	320	N	N	A	4	0	1	8	B	G	A	A	D		Y				-121.457	38.6
9195834	11/27/2020	NORWOO	FORD RD	0		Y	A	4	0	1	9	D	C	A	A	A						-121.457	38.6
9371846	6/15/2021	NORWOO	RT 80	107	N	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
9360464	11/2/2021	NORWOO	HARRIS A	0		Y	A	3	0	1	3	D	C	A	A	A			Y	Y	Y	-121.457	38.6
9256286	5/31/2021	NORWOO	JESSIE AV	506	N	N	A	1	1	0	11	G	B	D	B	D	Y				Y	-121.457	38.6
9234868	3/4/2021	NORWOO	HAYES AV	118	N	N	A	4	0	2	9	D	C	A	A	D					Y	-121.457	38.6
9242987	3/15/2021	NORWOO	JESSIE AV	0		Y	A	3	0	1	3	D	C	A	A	A						-121.457	38.6
9352387	11/2/2021	NORWOO	FAIRBANI	184	N	N	B	4	0	1	3	C	C	A	A	A						-121.457	38.6
9241512	3/16/2021	NORWOO	JESSIE AV	223	N	N	A	4	0	1	9	D	A	A	A	D						-121.457	38.6
9323174	9/11/2021	NORWOO	RT 80	0		Y	A	4	0	1	12	A	C	A	A	A						-121.457	38.6
9341002	9/30/2021	NORWOO	GRAND A	0		Y	A	3	0	1	-	D	C	-	A	A	Y					-121.457	38.6
9245245	3/2/2021	NORWOO	GRAND A	0		Y	A	3	0	2	1	E	I	A	C	A					Y	-121.457	38.6
9250566	3/22/2021	NORWOO	JESSIE AV	208	S	N	A	4	0	1	9	-	C	A	A	D						-121.457	38.6
9291014	7/3/2021	NORWOO	FAIRBANI	0		Y	A	3	0	1	12	D	C	A	A	A						-121.457	38.6
9293418	7/25/2021	NORWOO	HARRIS A	0		Y	A	2	0	6	12	D	C	A	C	A						-121.457	38.6
9293889	7/30/2021	NORWOO	FAIRBANI	200	N	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6

9299813	8/3/2021	NORWOO	JESSIE AV	686	N	N	A	3	0	1	8	B	E	A	A	A					Y	-121.457	38.6
9316093	8/20/2021	NORWOO	MORRISO	0		Y	A	3	0	1	9	D	G	A	A	B		Y				-121.457	38.6
9324980	9/16/2021	NORWOO	JESSIE AV	158	S	N	A	2	0	2	5	D	C	A	C	A			Y			-121.457	38.6
9325977	9/19/2021	NORWOO	BELL AV	486	S	N	A	3	0	1	11	G	B	D	D	D	Y					-121.457	38.6
9326637	10/4/2021	NORWOO	GRAND A	0		Y	A	3	0	2	1	E	H	A	C	A			Y		Y	-121.457	38.6
9347044	9/26/2021	NORWOO	GRAND A	0		Y	A	3	0	2	12	F	C	A	A	A						-121.457	38.6
9220529	1/24/2021	NORWOO	GRACE AV	0	S	N	A	3	0	1	3	C	C	A	A	A						-121.457	38.7
9242942	3/26/2021	MAIN AV	NORWOO	0		Y	A	4	0	1	1	D	C	A	C	A					Y	-121.457	38.7
9254736	2/25/2021	NORWOO	HARRIS A	44	S	N	A	4	0	1	3	C	C	A	C	A						-121.457	38.6
9270442	5/22/2021	NORWOO	SILVER EA	0		Y	A	2	0	1	0	G	B	E	C	A	Y					-121.457	38.6
9291729	7/12/2021	NORWOO	JESSIE AV	510	N	N	A	3	0	1	9	D	C	A	A	D			Y			-121.457	38.6
9373194	11/21/2021	NORWOO	JESSIE AV	111	N	N	A	2	0	1	3	C	G	A	A	A		Y				-121.457	38.6
9373867	11/30/2021	NORWOO	HARRIS A	0		Y	A	4	0	1	12	D	C	A	A	D						-121.457	38.6
9374589	11/16/2021	NORWOO	JESSIE AV	655	S	N	A	4	0	2	3	C	C	A	C	A				Y		-121.457	38.6
9375036	11/25/2021	NORWOO	JESSIE AV	0		Y	A	2	0	1	11	G	B	E	C	A	Y					-121.457	38.6
9376581	12/7/2021	NORWOO	SOUTH AV	0		Y	A	4	0	2	8	B	C	A	C	A						-121.457	38.6
9376786	12/5/2021	NORWOO	SILVER EA	0		Y	A	4	0	2	9	D	C	A	B	A						-121.457	38.6
9379077	12/19/2021	NORWOO	FAIRBANI	36	S	N	A	4	0	1	9	D	C	A	C	A						-121.457	38.6
8.19E+07	9/13/2022	NORWOO	JESSIE AV	300	S	N	A	3	0	4	9	D	C	A	A	D						-121.457	38.6
8.20E+07	12/13/2022	NORWOO	80 EB	0		Y	A	4	0	2	3	C	C	A	A	A						-121.457	38.6
9380811	1/5/2022	NORWOO	JESSIE AV	174	S	N	A	4	0	2	9	D	C	A	A	A						-121.457	38.6
9413395	2/21/2022	NORWOO	JESSE AV	190	S	N	A	4	0	1	3	G	B	E	C	D	Y					-121.457	38.6
8.19E+07	10/31/2022	NORWOO	80 EB	70	S	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
8.20E+07	12/2/2022	NORWOO	GRAND A	0		Y	A	4	0	1	5	-	G	A	A	A		Y				-121.457	38.6
9380916	1/10/2022	NORWOO	GRAND A	0		Y	B	4	0	1	12	D	C	A	A	A						-121.457	38.6
9452448	5/24/2022	NORWOO	LINDSAY	90	S	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
8.19E+07	10/19/2022	NORWOO	GRAND A	0		Y	A	4	0	1	8	B	G	A	A	A		Y				-121.457	38.6
8.19E+07	11/11/2022	NORWOO	BELL AVE	33	S	N	A	3	0	1	0	G	B	B	A	A	Y					-121.457	38.6
8.19E+07	12/4/2022	NORWOO	FORD RD	336	S	N	A	4	0	3	-	H	C	A	C	D						-121.457	38.6
9320495	2/10/2022	NORWOO	GRAND A	0		Y	A	1	1	3	1	D	C	A	C	A					Y	-121.457	38.6
9422293	4/5/2022	NORWOO	FORD RD	0		Y	A	4	0	1	9	D	C	A	C	A						-121.457	38.6
9422816	3/7/2022	NORWOO	JESSIE AV	255	S	N	A	3	0	2	9	A	C	A	A	A						-121.457	38.6
9453122	3/14/2022	NORWOO	JESSIE AV	0		Y	A	4	0	1	12	D	C	A	A	A						-121.457	38.6
9462597	7/5/2022	NORWOO	JESSIE AV	0		Y	A	3	0	1	9	D	G	A	A	A		Y			Y	-121.457	38.6
9485934	8/13/2022	NORWOO	JESSIE AV	267	S	N	A	2	0	1	9	D	G	A	A	D		Y				-121.457	38.6
8.19E+07	9/18/2022	NORWOO	FAIRBANI	30	N	N	A	4	0	1	1	C	C	A	C	A					Y	-121.457	38.6
8.19E+07	9/23/2022	NORWOO	HARRIS A	375	N	N	A	4	0	3	8	D	C	A	A	D						-121.457	38.6
8.19E+07	10/6/2022	NORWOO	JESSIE AV	100	S	N	A	2	0	1	9	B	C	A	A	D			Y			-121.457	38.6
8.19E+07	10/12/2022	NORWOO	FORD RD	0		Y	A	4	0	1	9	D	D	A	A	A					Y	-121.457	38.6
8.19E+07	10/28/2022	NORWOO	MOREY AV	0		Y	A	4	0	1	21	C	C	A	C	A						-121.457	38.6
8.19E+07	10/12/2022	NORWOO	HARRIS A	423	N	N	A	4	0	1	3	C	D	A	A	D						-121.457	38.6
8.19E+07	11/16/2022	FORD RD	NORWOO	0		Y	A	4	0	3	9	D	D	A	C	A						-121.457	38.6
8.20E+07	12/21/2022	NORWOO	JESSIE AV	215	N	N	A	4	0	1	9	H	G	A	A	A		Y				-121.457	38.6
9405766	2/2/2022	NORWOO	RT 80	68	S	N	A	4	0	2	3	C	C	A	A	A						-121.457	38.6

9410314	3/12/2022	NORWOO	JESSIE AV	490	N	N	A	4	0	1	9	D	C	A	A	A						-121.457	38.6
9421400	3/8/2022	NORWOO	HARRIS A	0		Y	A	3	0	2	3	C	C	A	C	A						-121.457	38.6
9430466	3/26/2022	MAIN AV	NORWOO	0		Y	A	3	0	2	12	D	C	A	C	A				Y		-121.457	38.7
9446377	5/17/2022	RT 80	NORWOO	0		Y	A	3	0	2	12	D	C	A	A	A						-121.457	38.6
9452619	5/24/2022	NORWOO	MORRISO	0		Y	A	4	0	1	8	D	C	A	A	D						-121.457	38.6
9480992	7/24/2022	NORWOO	SILVER EA	0		Y	A	4	0	1	12	D	C	A	C	A						-121.457	38.6
9482155	8/7/2022	NORWOO	BELL AV	535	S	N	A	4	0	1	8	B	C	A	C	D						-121.457	38.6
9484501	5/17/2022	NORWOO	RT 80	0		Y	A	3	0	2	12	D	C	A	A	A						-121.457	38.6
9491239	8/25/2022	NORWOO	LINDLEY	637	N	N	A	3	0	1	6	B	C	A	A	D			Y	Y	Y	-121.457	38.6
81969294	1/6/2023	NORWOO	BELL AVE	300	S	N	B	3	0	1	8	C	E	A	C	D						-121.457	38.6
81981245	1/13/2023	NORWOO	BELL AVE	300	S	N	C	4	0	1	1	B	E	A	C	D					Y	-121.457	38.6
81988246	1/27/2023	NORWOO	JESSIE AV	434	N	N	A	3	0	1	9	D	C	A	A	D						-121.457	38.6
81993685	1/21/2023	NORWOO	GRAND A	0		Y	B	4	0	1	1	D	C	A	C	A					Y	-121.457	38.6
81994782	2/4/2023	MAIN AVE	NORWOO	8	E	N	A	3	0	1	1	E	I	A	C	A					Y	-121.457	38.7
82028440	1/27/2023	NORWOO	JESSIE AV	27	N	N	A	4	0	1	3	C	C	A	C	A						-121.457	38.6
82028943	3/13/2023	NORWOO	JESSIE AV	0		Y	A	4	0	1	12	D	C	A	A	A						-121.457	38.6
82037229	3/25/2023	NORWOO	JESSIE AV	0		Y	A	4	0	1	12	D	C	A	C	A					Y	-121.457	38.6
82040057	3/19/2023	NORWOO	SOUTH AV	0		Y	A	4	0	1	9	D	C	A	A	D					Y	-121.457	38.6
82053349	4/13/2023	ARDEN WA	ARDEN W	0		Y	A	4	0	1	-	D	C	A	C	A						-122.325	38.3
82057211	4/14/2023	NORWOO	HARRIS A	0		Y	A	4	0	1	12	D	C	A	C	A			Y			-121.457	38.6
82057675	4/17/2023	NORWOO	MAIN AVE	0		Y	A	3	0	2	1	D	C	A	A	A					Y	-121.457	38.7
82069521	4/23/2023	NORWOO	80 EB	25	N	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
82076961	5/13/2023	NORWOO	GRAND A	0		Y	A	3	0	3	12	D	C	A	A	A						-121.457	38.6
82086574	4/20/2023	NORWOO	GRAND A	0		Y	A	3	0	4	12	D	C	A	C	A						-121.457	38.6
82097498	6/3/2023	NORWOO	GRAND A	45	S	N	A	3	0	1	3	C	C	A	A	A						-121.457	38.6
82103819	6/16/2023	NORWOO	LINDSAY	0		Y	A	3	0	1	9	D	G	A	A	A		Y				-121.457	38.6
82107864	6/20/2023	NORWOO	80 EB	26	W	N	A	4	0	2	12	D	C	A	A	A						-121.457	38.6
82109175	5/11/2023	FORD RD	NORWOO	15	W	N	A	3	0	1	3	C	C	A	B	A					Y	-121.457	38.6
82114657	7/1/2023	NORWOO	FORD RD	0		Y	A	3	0	2	21	D	C	A	A	A						-121.457	38.6
82119376	6/16/2023	NORWOO	SILVER EA	360	N	N	A	4	0	1	0	C	C	A	C	D						-121.457	38.6
82119386	7/5/2023	NORWOO	BERTHOU	100	N	N	A	4	0	1	3	C	C	A	A	D						-121.457	38.6
82132674	7/20/2023	NORWOO	80 EB	62	S	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
82139305	7/21/2023	NORWOO	HARRIS A	168	N	N	A	4	0	2	3	C	C	A	A	A						-121.457	38.6
82142336	7/30/2023	NORWOO	GRAND A	38	N	N	A	4	0	1	3	C	C	A	A	A						-121.457	38.6
82148156	8/7/2023	NORWOO	BELL AVE	0		Y	A	3	0	1	12	D	C	A	A	A						-121.457	38.6
82166422	8/30/2023	NORWOO	JESSIE AV	252	N	N	A	4	0	1	7	D	C	A	A	A						-121.457	38.6
82166667	8/29/2023	NORWOO	HARRIS A	407	N	N	A	3	0	1	3	C	C	A	A	A						-121.457	38.6
82169718	9/1/2023	NORWOO	JESSIE AV	288	N	N	A	3	0	1	8	D	C	A	C	D					Y	-121.457	38.6
82180908	9/9/2023	FORD RD	NORWOO	0		Y	A	3	0	2	12	D	D	A	C	A						-121.457	38.6
82187082	9/19/2023	NORWOO	BELL AVE	465	S	N	A	2	0	1	1	B	C	A	C	D					Y	-121.457	38.6

Appendix C: Signal Timing Sheets

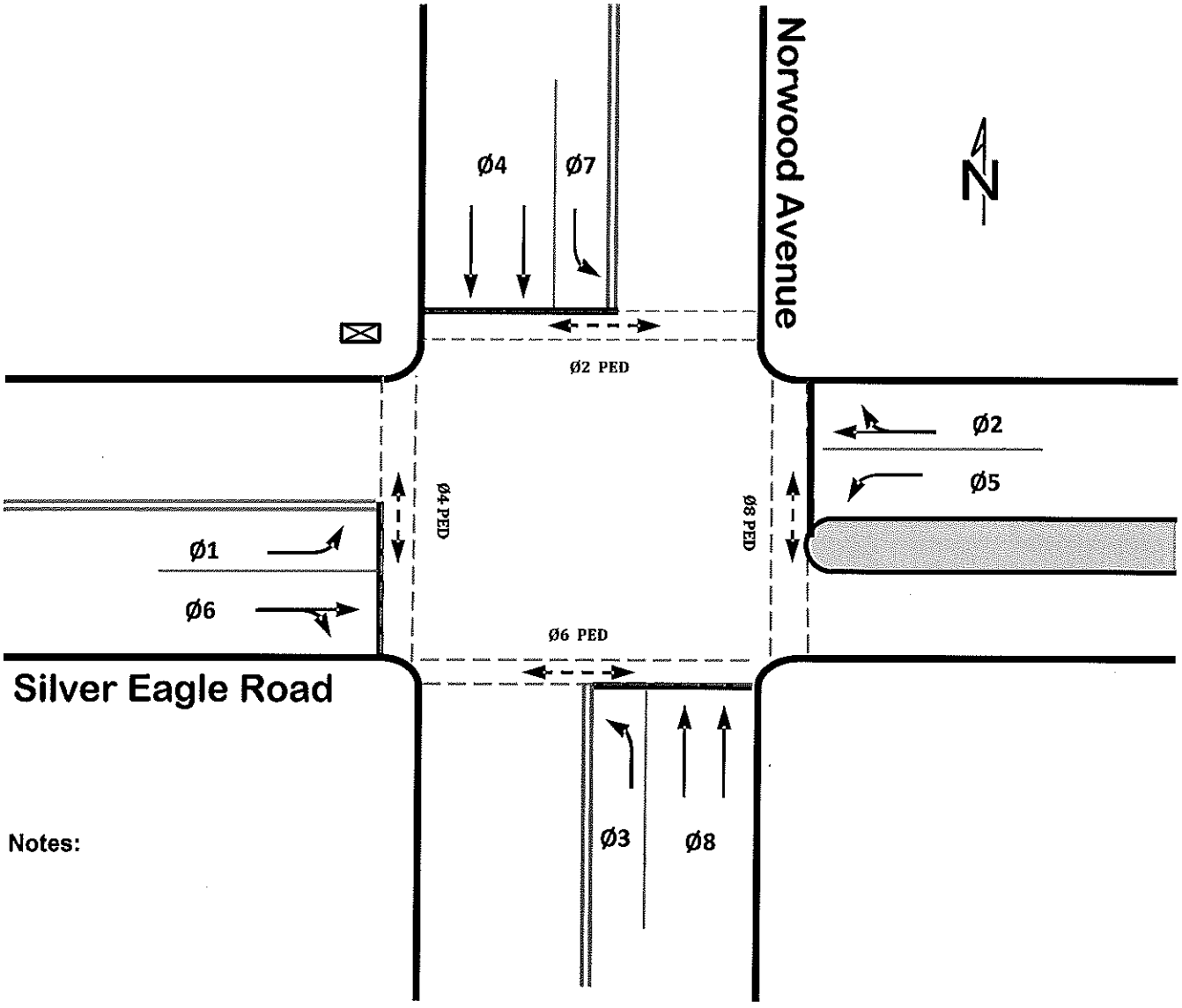
ECONOLITE ASC3

TRAFFIC SIGNAL CONTROLLER PROGRAM CHART

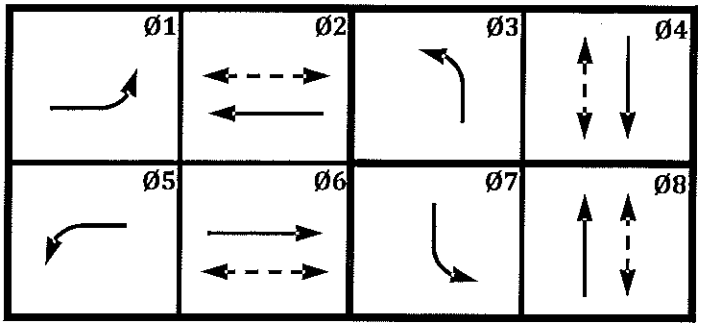
N/S Norwood Avenue **E/W** Silver Eagle Road

INTERSECTION #: 545 SYSTEM: _____ IP Address: _____

Device ID: _____ Channel: _____ Drop #: _____



Notes:



CITY OF SACRAMENTO

Econolite ASC/3 V2.49 and above

PHASE TIMING

I/S #: 545 Location: Norwood Avenue and Silver Eagle Road

Prepared by: [illegible] Approved by: [illegible] Date Implemented: 7-15-14

Controller Timing Data Key: 2-1

Phase	1	2	3	4	5	6	7	8
Min Green	10	10	9	8	10	9	9	8
Walk		7		7		7		7
Ped Clear		17		16		17		12
Yellow	3.5	3.5	3.5	4.3	3.5	3.9	3.5	4.3
Red Clearance				0.3				0.3
Red Rvt	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Vehicle Ext	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max 1	30	30	30	40	30	30	30	40
Max 2								
Max 3								
Act B4								
Sec/Act								
Max Ini								
Time B4								
Cars Wt								
Steps to Reduce								
Time to Reduce								
Min Gap								
Bike Green								
CndSrv Min Green								
Delay Green								
Walk 2								
Walk Max								
Ped Clear 2								
Ped Clear Max								
Ped CarryOver								
Vehicle Ext 2								
Dym Green								
Dym Step								
Red Max								

Guaranteed Min Time Data Key: 2-4

Phase	1	2	3	4	5	6	7	8
Min Green	10	10	9	8	10	9	9	8
Walk	0	7	0	7	0	7	0	7
Ped Clear	0	17	0	16	0	17	0	12
Red Clear	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.3
Overlap	A	B	C	D	E	F	G	H
Overlap Green	5	5	5	5	5	5	5	5

SET SCREEN FORMAT TO BASIC Key: 1-7-2

Controller Start/Flash Data Key: 2-5

Phase	1	2	3	4	5	6	7	8	
Phase (Color)				Y				Y	
Overlap	X	X	X	X					
Flash/Mon	No			Start Flash Time				0	sec
PWR Start Seq	1			All Red				6	sec

Note: Startup phase can be Y, R, G or W

Automatic Flash

Phase	1	2	3	4	5	6	7	8
Entry				4				8
Exit				4				8
Overlap	A	B	C	D	E	F	G	H
Exit	X	X	X	X				

Flash/Mon	No		Exit Flash	R
Min Flash	4	sec	Cycle Thru Phase	Yes
			Min Recall	Yes

Phase Recall Data Key: 2-8

Phase	1	2	3	4	5	6	7	8
Lock Det								
Vehicle Recall								
Ped Recall								
Max Recall								
Soft Recall				4				8
No Rest								
Added Initial Calc								

Controller Options KEY: 2-6-1

Ped Protect	.	Unit Red Revert			2.0	sec

Phase	1	2	3	4	5	6	7	8
Flashing Green Phase								
Guar Pass								
Non Act I								
Non Act II								
Dual Entry								
Cond Service								
Cond Reservice								
Ped Reservice								
Rest in Walk								
Flashing Walk								
PED Clear > yellow								
PED Clear > RED								
IG + VEH EXT								

CITY OF SACRAMENTO

Econolite ASC/3 V2.49 above

CONFIGURATION

Phase Ring Seq and Assignment Key: 1-1-1

Controller Sequence									1
Hardware Alternate Sequance Enable									No
Barrier	B		B		B		B		
Ring 1	1	2	3	4	9	10	13	14	
Ring 2	5	6	7	8	11	12	15	16	
Ring 3									
Ring 4									

Phase in Use/Exclusive Peds Key: 1-2

Phase	1	2	3	4	5	6	7	8
Phases in Use	1	2	3	4	5	6	7	8
Exclusive Ped								

Load Switch Assign (MMU Chan) Key: 1-3

CH	PHASE/ OVLP	type	DIMMING R	Y	G	D	FLASH P	A	TGR
1	1	V				+	A	R	
2	2	V				+	A	R	X
3	3	V				+	A	R	
4	4	V				+	A	R	X
5	5	V				-	A	R	
6	6	V				-	A	R	X
7	7	V				-	A	R	
8	8	V				-	A	R	X
9	2	P				+	A		
10	4	P				+	A		
11	6	P				-	A		
12	8	P				-	A		
13	1	O				+	A	R	
14	2	O				-	A	R	X
15	3	O				+	A	R	
16	4	O				-	A	R	X

Display Options Key: 1-7-2

Key Click Enabled	NO
BackLight Enable	YES
LED Mode	Auto
Main Status Display Mode	Basic
Screen Format	Basic

Ethernet Port Configuration Key: 1-5-1

IP ADDRESS	
ADDRESS MASK	
DEFAULT GATEWAY ADD	
SEVER IP ADDRESS	
LINK SPEED/DUPLEX	AUTO
DROP-OUT TIME	300

Port 1 (SDLC Options) Key: 1-4-1

BIU	1	2	3	4	5	6	7	8
TERM & FACILITY	X	X	.	.	.	.	.	.
DETECTOR	X	X	.	.	.	.	.	.
ENABLE TS2/MMU TYPE CABINET							YES	
ENABLE MMU EXTENDED STATUS							YES	
ENABLE SDLC START TIME							YES	
ENABLE 3 CRITICAL RFE'S LOCKUP							YES	
MMU TO CU SDLC EXTERNAL START							enabled	

Ped Detector Input Key: 6-3

PED DET ASSIGNMENT MODE								NTCIP
PHASE	1	2	3	4	5	6	7	8
DETECTOR	1	2	3	4	5	6	7	8
PHASE	9	10	11	12	13	14	15	16
DETECTOR	9	10	11	12	13	14	15	16

CITY OF SACRAMENTO

Econolite ASC/3 V2.49 above

EV PREEMPT/SCP SUBMENU

Preempt Plan 2 KEY: 4-1

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh	1					6		
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase	1					6		
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh		2			5			
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase		2			5			
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh			3					8
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase			3					8
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

Preempt Plan 5

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh				4			7	
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase				4			7	
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

CITY OF SACRAMENTO

TS2 DETECTION SCHEDULE

Location: Norwood Avenue and Silver Eagle Road

	Phase	Controller Det. Input	Location	Direction	Controller / Detector Type / Function						
					Type	TS-2	Call Option	Ext. Option	Extend Time	Delay Time	Notes
BIU1	Ø1	1	Rear	E-N	S	X					D1
	Ø1	2	Left	E-N	S	X					D2
	Ø1	3									
	Ø1	4									
	Ø6	5	Rear	EB	S	X					D1
	Ø6	6	Mid	EB	S	X					D2
	Ø6	7	Front	EB	S	X					D3
	Ø6	8									
	Ø5	9	Rear	W-S	S	X					D1
	Ø5	10	Front	W-S	S	X					D2
	Ø5	11									
	Ø5	12									
	Ø2	13	Rear	WB	S	X					D1
	Ø2	14	Mid	WB	S	X					D2
	Ø2	15	Front	WB	S	X					D3
	Ø2	16									
BIU2	Ø3	17	Rear	S-E	S	X					D1
	Ø3	18	Front	S-E	S	X					D2
	Ø3	19									
	Ø3	20									
	Ø8	21	Rear	SB	S	X					D1
	Ø8	22	Mid	SB	S	X					D2
	Ø8	23	Front	SB	S	X					D3
	Ø8	24									
	Ø7	25	Rear	N-W	S	X					D1
	Ø7	26	Front	N-W	S	X					D2
	Ø7	27									
	Ø7	28									
	Ø4	29	Rear	NB	S	X					D1
	Ø4	30	Mid	NB	S	X					D2
	Ø4	31	Front	NB	S	X					D3
	Ø4	32									
BIU 3	Ø1	33									
	Ø1	34									
	Ø6	35									
	Ø6	36									
	Ø6	37									
	Ø6	38									
	Ø6	39									
	Ø6	40									
	Ø5	41									
	Ø5	42									
	Ø2	43									
	Ø2	44									
	Ø2	45									
	Ø2	46									
	Ø2	47									
	Ø2	48									
BIU 4	Ø3	49									
	Ø3	50									
	Ø8	51									
	Ø8	52									
	Ø8	53									
	Ø8	54									
	Ø8	55									
	Ø8	56									
	Ø7	57									
	Ø7	58									
	Ø4	59									
	Ø4	60									
	Ø4	61									
	Ø4	62									
	Ø4	63									
	Ø4	64									

Type: N-NTCIP; B-Bike; S-Standard; D-Disconnect; P-Passage; C-Calling; R-Red Extend; G-Green Extend

Ext Option: Passage; Queue; None

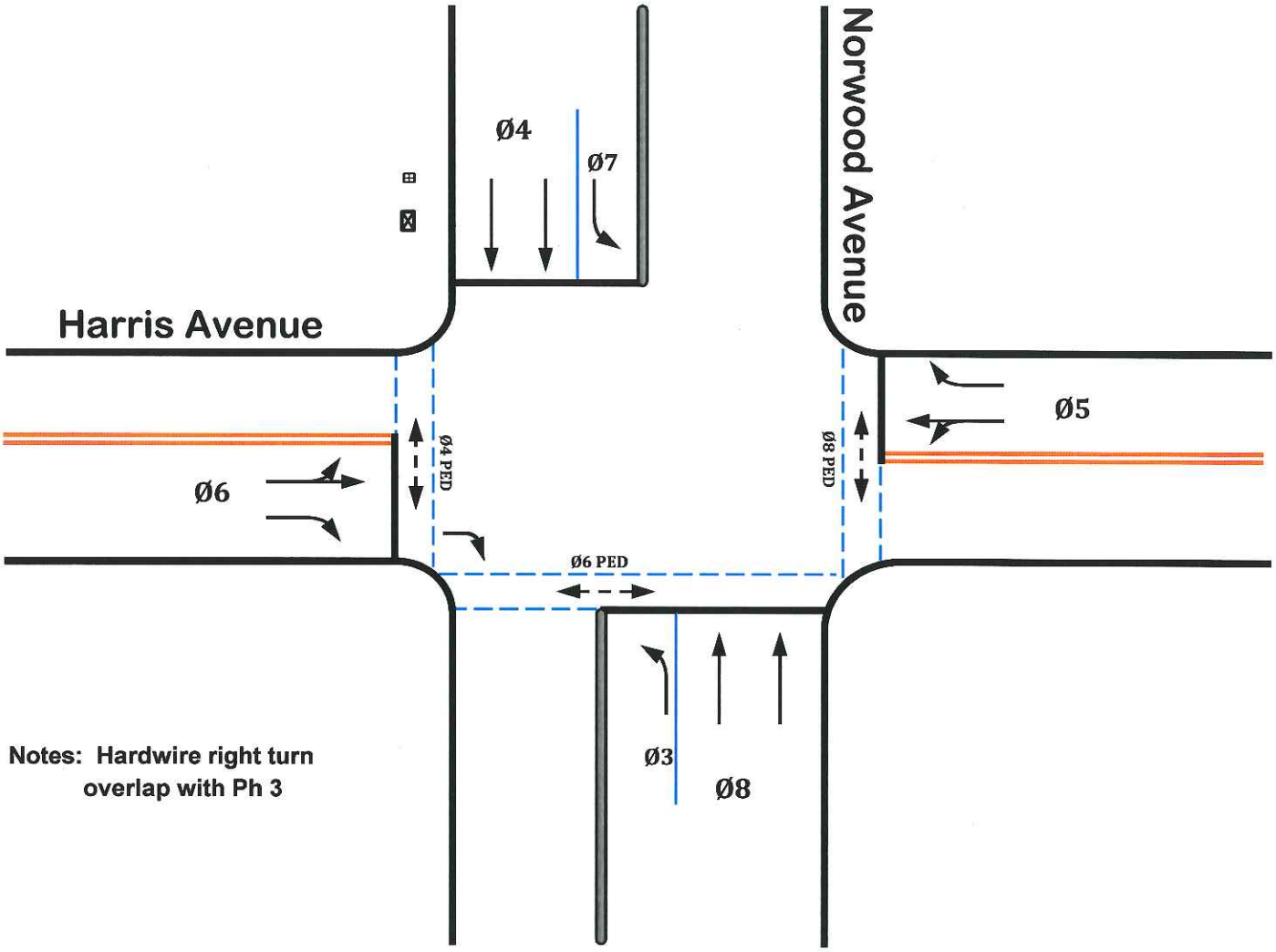
TRACONEX 390 K2c

TRAFFIC SIGNAL CONTROLLER PROGRAM CHART

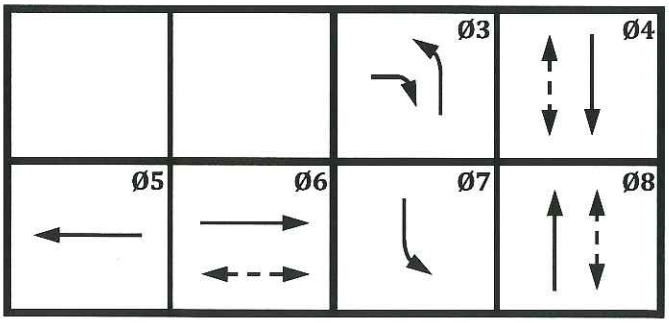
N/S Norwood Avenue **E/W** Harris Avenue

Intersection #: 458 System: _____ IP Address: _____

Device ID: _____ Channel: _____ Drop #: _____



Notes: Hardwire right turn overlap with Ph 3



Traconex TMP 390 K2c

CITY OF SACRAMENTO

Prepared by: ALL **Approved by:** JEM **Date Implemented:** 7-23-13

Phase Timing **Key: 390 - Page - 3 - Enter**

Phase		1	2	3	4	5	6	7	8
Min Green	MIN			10	8	11	10	9	7
Walk	WLK				7		7		7
Ped Clr	WCL				14		18		8
Passage Time	PSG			2.0	2.5	2.0	2.0	2.0	2.5
Max No. 1	MX1			40	40	40	40	40	40
Max No. 2	MX2								
Yellow Clr	YEL			3.5	4.3	3.5	3.5	3.5	4.3
All Red Clr	RED				0.3	0.3	0.1		0.3
Red Revert	RRT			2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Added	ABA								
Sec / Act	S/A								
Max Initial	MXI								
Time B4 Reduce	TBR								
Time to Reduce	TTR								
Min Gap	MNG			2.0	2.5	2.0	2.0	2.0	2.5
Cond Min Green	CMN								

Options **Key: 390 - Page - 2 - Enter**

Phase		8	7	6	5	4	3	2	1
Phase in Use	USE	8	7	6	5	4	3		
Ped Phases	PED	8		6		4			
Flashing Walk	FWK								
Act Rest in Walk	ARW								
Walk Clr Protect	WCP								
Density Phases	DEN								
Last Car Passage	LCP								
Veh call to NonAct 1	VN1								
Ped call to NonAct 1	PN1								
Veh call to NonAct 2	VN2								
Ped call to NonAct 2	PN2								
Fast Flash Green	FGN								
Enable Menu Scroll	MNU								
Left Turn Yellow Blan	LAB								
Select Anti -Backup	ABU								

Additional Parameters **Key: 390 - Page 4 - Enter**

Phase		8	7	6	5	4	3	2	1
Power Up Flash	PUF			sec					
Start Up Red Time	SAR	6		sec					
Start Up in Red	SUR								
Start up in Yel	SUY	8				4			
Start Up In Green	SUG								
Main ST (MUTCD)	MSF	8				4			
Min MUTCD FL Time	FMN	15		sec					
Dual Entry	DLE								
Sim Gap Out	SGO	8				4			
Min Recall	MNR								
Min Soft Recall	MNS								
Max Recall	MXR								
Ped Recall	PDR								
Lock Detector	LKD	8	7	6	5	4	3		1
Liq Crys Dis Test	LCD	0		0=OFF 1=ON					
Backlight On/Off	LBT	1		0=OFF 1=ON					

CITY OF SACRAMENTO

MORE DATA

Function Enable — **Key: 390 - Page - 6 - Enter**

Frnt Pnl O/L Enable	FOE	1	0 TO 3
Spcl Func Enable	SFE	0	0 OR 1 0=OFF 1=ON
Stop Time Enable	STE	0	0 OR 1 0=OFF 1=ON
Seq Rotat Enable	SQE	0	0 TO 2
Cond Serv Enable	CSE		
Neg OVL Enable	NOE	0	0 OR 1 0=OFF 1=ON
Dimming Enable	DME	0	1=50%, 2=66%, 3=
Pre w/Flsh Dwell	PFE	Preempt 1-5	
Preempt Out Mode	POM	0	0 TO 3
TOD On/Off	TOD	0	0 OR 1 0=OFF 1=ON
Coord On/Off	CRD	0	0 OR 1 0=OFF 1=ON
Diag Test Enable	DIA	1 TO 4	4 3 2 1
Security Code Accs	SCY	0	0-255 0=No Code
Config Control	CFG	0	0 TO 7
Volt Mon off Dur Flsh	FLE	0	0=OFF 1=ON
ime after Init B4 reduc	TBS	0	0 OR 1

More Data — **Key: 390 - Page - 7 - Enter**

Printer Report Enable	PNT	0	0 TO 99
Manual ø Rotate Sel	SQK	0	0 TO 15
Disp ø Seq, Remote	SQC	0	0 TO 15
Disp Effect ø Seq	SQI	0	0 TO 15
Dimming Red Enable	DRD		
Dimming Yello Enable	DYL		
Dimming Grn Enable	DGN		
Dim Ped Walk Enable	DWK		
Dim Ped DWlk Enable	DDW		
Dim Red OVLP's	DOR		
Dim Yello OVLP's	DOY		
Dim Grn OVLP's	DOG		
Clock	CLK	14	READ ONLY
Non Volatile Ram Sel	NVR		1
Active TOD Plan	ACT	0	0 TO 48
Audible Keyboard	AUD	1	0 OR 1 O=OFF 1=ON

CITY OF SACRAMENTO

OPTIONS

Manual Selections

Key: 390 - Page - 11 - Enter

Man Free-Coord	F/C	0	0=Free 1=Coordinated
Man Semi or Fully Act	S/F	0	0=Semi 1=Fully
Man Dwnld Request	DRQ	0	0=OFF 1=ON
Synch Puls Tolerance	SYC	2	0 TO 10 sec
Master/Local Cycle	M/L	1	0=Master 1=Local
Man Cycle Plan	CP	0	0 TO 18
Man Offset Selection	OFF	0	0 TO 5
Man Local/Remote	L/R	1	0=Local 1=Remote
Man TOD Plan	TDP	0	0 TO 48
Det Sample Period	SMP	15	0-255 sec
Divide Vol 4 Report	DVV	1	1 TO 100
Enable Max Coord	CME		
Disable Ped Omit Crd	DPO		
Enable Secdry Coord	SCP		

Manual Offset Set

Key: 390 - Page - 35 - Enter

Select CP to Synch	CP	0	1 TO 6
Select Ofset to Synch	OFF	0	1 TO 5
Synch	SET	0	SET 1,Press ENTER to Synch

System Parameters

Key: 390 - Page - 15 - Enter

System Enable	SYE	1	0 TO 2,1=Traconet 2= TOC
System Det Enable	SDT		
Drop Address	ADD	3	0 TO 31
Inter Plan# Disp	IPL	0	0 TO 48 READ ONLY
Inter Plan Mode	IPM	0	0 TO 2,2=WWV Time Receive
Local Det Fail Time	DFT	255	0-255 sec
Failed Local Det Disp	FDT		
Enable Local Det Mon	DFM		
Disp Local 5min Vol	5MV	9	0 TO 255
Sync Time to Hour	SHR	0	0 TO 23
Sync Time to Min	SMN	0	0 TO 59
Time On-Line B4 Bkup	ONL	5	min 0 TO 255 0=MODE2
Dyn Split Adjust, Glob	DSA	1	0 TO 1
Dyn Split Adjust Max	DS%	25	0 TO 100
DB Change Flag	DBC	NO ACCESS	
Drop Request	DRP	0	0 TO 1

CITY OF SACRAMENTO
DETECTION SCHEDULE

Norwood Avenue at Harris Avenue

	Phase	Controller Det. Input	Location	Direction	Controller / Detector Type / Function			
					Extend	Delay	Passage	Notes
BIU 1	**Loops or Retrofit Video**							
	Ø1	1						
	Ø2	2						
	Ø3	3	Front	N-W				
	Ø4	4	Front	SB				
	Ø5	5	Front	WB				
	Ø6	6	Front	EB				
	Ø7	7	Front	S-E				
	Ø8	8	Front	NB				
	Loops							
	Ø1	9						
	Ø2	10						
	Ø3	11						D1 2 sec delay
	Ø4	12						
	Ø5	13						D1 2 sec delay
	Ø6	14						D1 6 sec delay
	Ø7	15						D1 2 sec delay, D2 6 sec delay
	Ø8	16						
	New Video Detection	**BIU 2 (RESERVED) 17-32**						
BIU 3	Ø1	33						
	Ø1	34						
	Ø6	35						
	Ø6	36						
	Ø6	37						
	Ø6	38						
	Ø6	39						
	Ø6	40						
	Ø5	41						
	Ø5	42						
	Ø2	43						
	Ø2	44						
	Ø2	45						
	Ø2	46						
	Ø2	47						
	Ø2	48						
BIU 4	Ø3	49						
	Ø3	50						
	Ø8	51						
	Ø8	52						
	Ø8	53						
	Ø8	54						
	Ø8	55						
	Ø8	56						
	Ø7	57						
	Ø7	58						
	Ø4	59						
	Ø4	60						
	Ø4	61						
	Ø4	62						
	Ø4	63						
	Ø4	64						

2070 D4

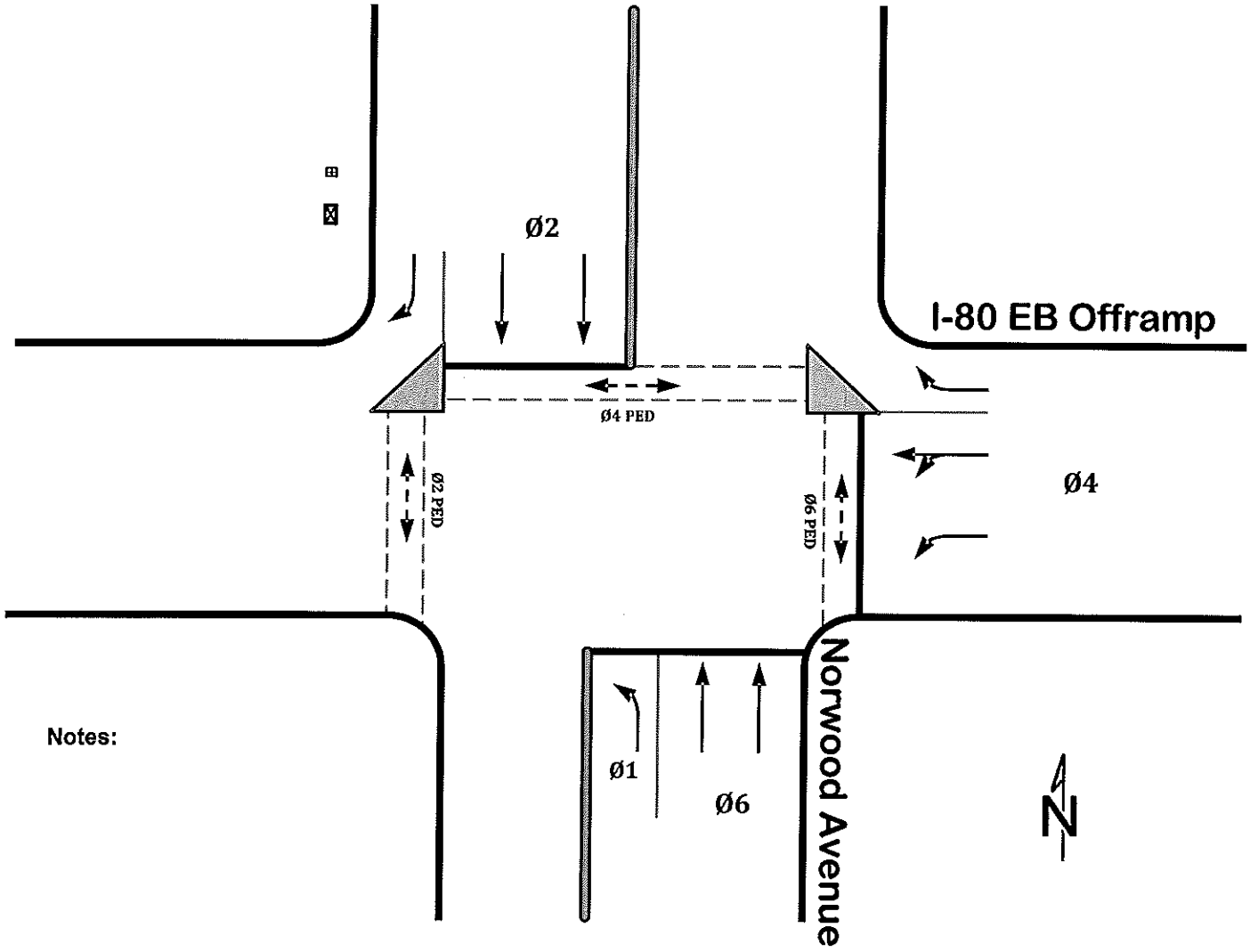
TRAFFIC SIGNAL CONTROLLER PROGRAM CHART

N/S Norwood Avenue **E/W** I-80 WB offramp

Intersection #: 570 System: _____ IP Address: _____

Device ID: _____ Channel: _____ Drop #: _____

Prepared by: _____ Approved by: _____ Date Implemented: 3-27-14



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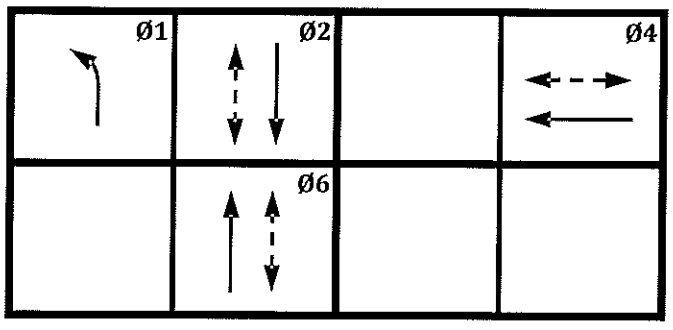

570 - Norwood & I-80 WB offramp

Phase Timing

3/27/2014 11:54:21 AM

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	8	6	0	8	0	6	0	0	0	0	0	0	0	0	0	0
Veh Ext	2.5	2.5	0.0	2.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Green 1	30	40	0	40	0	40	0	0	0	0	0	0	0	0	0	0
Max Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Green 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	3.5	4.3	0.0	3.5	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clr	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk	0	7	0	7	0	7	0	0	0	0	0	0	0	0	0	0
Ped Clr	0	6	0	18	0	7	0	0	0	0	0	0	0	0	0	0
Sol DW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Early Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TTReduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	2.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neg Ped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AP Disc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Ped Clr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Return Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

570 - Norwood & I-80 WB offramp

Phase Options

3/27/2014 11:54:21 AM

Phases	1-8								9-16							
Min Recalls																
Max Recalls																
Ped Recalls																
Soft Recall		2				6										
Dual Entry		2				6										
Red Rest																
Walk Rest																
Walk Expand																
Ped Recycle																
No Simult Gap																
Yel Lock																
Red Lock																
PhaseNext Lock																
No Term Call																
Cond Serv																
CS Enable																
Cond Reserve																
Reserve																
Veh Omit																
Ped Omit																
Perm Phase																
Protect Calls																
Flash Entry																
Flash Exit																
Flash Exit Yel																
Flash Exit Red																
Ped Scramble																
No Min Yel																
No Min Red Rev																
Max Scramble Walk																
Flash Yellow																
CNA 1																
CNA 2																

570 - Norwood & I-80 WB offramp

Phase Startup Options

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Startup Flash	0	Mode	Red->Yel
Startup All Red	6	Yellow	0.0

Phases	1-8							9-16							
Startup Phases		2			6										
Startup Yellow		2			6										
Startup Red															
Startup No Walk															
Startup Next															
No Veh Call															
No Ped Call															

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

570 - Norwood & I-80 WB offramp

Ring Sequence / Conflicting Phases

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Ringgroup 1

Ring 1	1	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0
Ring 2	5	6	7	8	0	0	0	0	0	0	0	0	0	0	0	0

Ringgroup 2

Custom Sequences

Seq 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Conflicting Phases

	1-8	9-16
Phase 1		
Phase 2		
Phase 3		
Phase 4		
Phase 5		
Phase 6		
Phase 7		
Phase 8		
Phase 9		
Phase 10		
Phase 11		
Phase 12		
Phase 13		
Phase 14		
Phase 15		
Phase 16		

570 - Norwood & I-80 WB offramp

MCE Options

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Phases	1-8	9-16
MCE Ped Protect		
MCE Veh Call		
MCE Ped Call		
MCE Veh Omit		
MCE Ped Omit		
MCE Veh Sync		
MCE Ped Sync		
MCE Halt Don't Walk		

LRV Phases	1-8
MCE LRV Term Early	

570 - Norwood & I-80 WB offramp

332/336 Outputs (Connector C1S)

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Output Index	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	4	4	4	4	4	3	3	3
Output Index	Pin 10	Pin 11	Pin 12	Pin 13	Pin 15	Pin 16	Pin 17	Pin 18
	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	2	2	2	2	2	1	1	1
Output Index	Pin 19	Pin 20	Pin 21	Pin 22	Pin 23	Pin 24	Pin 25	Pin 26
	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	8	8	8	8	8	7	7	7
Output Index	Pin 27	Pin 28	Pin 29	Pin 30	Pin 31	Pin 32	Pin 33	Pin 34
	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	6	6	6	6	6	5	5	5
Output Index	Pin 35	Pin 36	Pin 37	Pin 38	Pin 83	Pin 84	Pin 85	Pin 86
	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed
	0	0	0	0	0	0	0	0
Output Index	Pin 87	Pin 88	Pin 89	Pin 90	Pin 91	Pin 93	Pin 94	Pin 95
	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed
	0	0	0	0	0	0	0	0
Output Index	Pin 96	Pin 97	Pin 98	Pin 99	Pin 100	Pin 101	Pin 102	Pin 103
	VehRed	VehRed	VehRed	VehRed	VehRed	Flash	VehRed	VehRed
	0	0	0	0	0	1	0	0

332/336 Outputs (Connector C11S)

Output Index	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed
	0	0	0	0	0	0	0	0

570 - Norwood & I-80 WB offramp

332/336 Inputs (Connector C1S)

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	Pin 39	Pin 40	Pin 41	Pin 42	Pin 43	Pin 44	Pin 45	Pin 46
Input	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet
Index	2	6	4	8	2	6	4	8
	Pin 47	Pin 48	Pin 49	Pin 50	Pin 51	Pin 52	Pin 53	Pin 54
Input	VehDet	VehDet	VehDet	VehDet	None	None	None	None
Index	2	6	4	8	0	0	0	0
	Pin 55	Pin 56	Pin 57	Pin 58	Pin 59	Pin 60	Pin 61	Pin 62
Input	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet
Index	5	1	7	3	5	1	7	3
	Pin 63	Pin 64	Pin 65	Pin 66	Pin 67	Pin 68	Pin 69	Pin 70
Input	VehDet	VehDet	VehDet	VehDet	PedDet	PedDet	PedDet	PedDet
Index	2	6	4	8	2	6	4	8
	Pin 71	Pin 72	Pin 73	Pin 74	Pin 75	Pin 76	Pin 77	Pin 78
Input	Preempt	Preempt	Preempt	Preempt	None	VehDet	VehDet	VehDet
Index	4	2	5	3	0	2	4	6
	Pin 79	Pin 80	Pin 81	Pin 82				
Input	VehDet	None	LocFlash	StopTm				
Index	8	0	1	1				

332/336 Inputs (Connector C11S)

	Pin 10	Pin 11	Pin 12	Pin 13	Pin 15	Pin 16	Pin 17	Pin 18
Input	None	None	None	None	None	None	None	None
Index	0	0	0	0	0	0	0	0
	Pin 19	Pin 20	Pin 21	Pin 22	Pin 23	Pin 24	Pin 25	Pin 26
Input	None	None	None	None	None	None	None	None
Index	0	0	0	0	0	0	0	0
	Pin 27	Pin 28	Pin 29	Pin 30				
Input	None	None	None	None				
Index	0	0	0	0				

570 - Norwood & I-80 WB offramp

Cabinet / MMU Configuration

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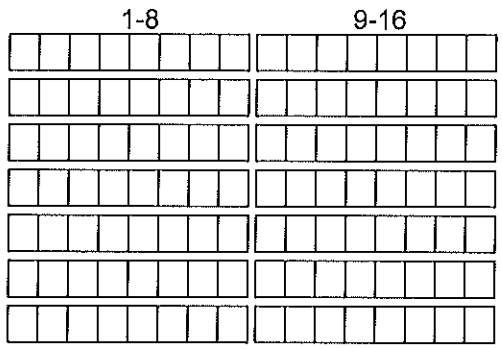
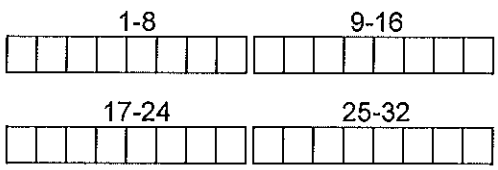
Cabinet Type	332/336
MMU Disable	No

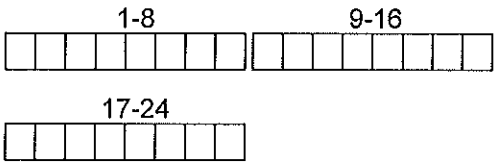
MMU Channel Ignore
Det BIU 1-No Fail Call
Det BIU 2-No Fail Call
Alt LS Flash
Alt Phase Flash
Alt Overlap Flash
Alt LRV Flash



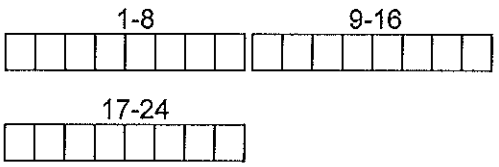
CMU Channel Ignore



Det IASM1-Det Diag



Det IASM2-Det Diag



Phase / Overlap Outputs

	Phase	Overlap
1	Normal	Normal
2	Normal	Normal
3	Normal	Normal
4	Normal	Normal
5	Normal	Normal
6	Normal	Normal
7	Normal	Normal
8	Normal	Normal
9	Normal	Normal
10	Normal	Normal
11	Normal	Normal
12	Normal	Normal
13	Normal	Normal
14	Normal	Normal
15	Normal	Normal
16	Normal	Normal

LRV Outputs

	LRV
1	2 Head
2	2 Head
3	2 Head
4	2 Head
5	2 Head
6	2 Head
7	2 Head
8	2 Head

570 - Norwood & I-80 WB offramp

Vehicle Detector 1

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Delay	2.0	Extend	0.0	Carryover	0.0	Queue Limit	0		
Mode	No Disc	Added	Disabled	System	Disabled				
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0

Phases	1-8							9-16							
Call Phases	1														
Yellow Lock Phases															
Red Lock Phases															
Extend Phases	1														
XSwitch Phases															

Vehicle Detector 2

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0		
Mode	No Disc	Added	Disabled	System	Disabled				
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0

Phases	1-8							9-16							
Call Phases		2													
Yellow Lock Phases															
Red Lock Phases															
Extend Phases		2													
XSwitch Phases															

570 - Norwood & I-80 WB offramp

Vehicle Detector 3

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Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						

Phases	1-8	9-16
Call Phases	6	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	6	
XSwitch Phases		

Vehicle Detector 4

Delay	2.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						

Phases	1-8	9-16
Call Phases	4	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	4	
XSwitch Phases		

570 - Norwood & I-80 WB offramp

Vehicle Detector 5

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Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						

Phases	1-8	9-16
Call Phases	5	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	5	
XSwitch Phases		

Vehicle Detector 6

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						

Phases	1-8	9-16
Call Phases	6	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	6	
XSwitch Phases		

570 - Norwood & I-80 WB offramp

Vehicle Detector 7

3/27/2014 11:54:21 AM

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						

Phases	1-8	9-16
Call Phases	7	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	7	
XSwitch Phases		

Vehicle Detector 8

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						

Phases	1-8	9-16
Call Phases	8	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	8	
XSwitch Phases		

570 - Norwood & I-80 WB offramp

Pedestrian Detector 1

3/27/2014 11:54:21 AM

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	1	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 2

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	2	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 3

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	3	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 4

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	4	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

570 - Norwood & I-80 WB offramp

Pedestrian Detector 5

3/27/2014 11:54:21 AM

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	5	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 6

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	6	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 7

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	7	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 8

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	8	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

570 - Norwood & I-80 WB offramp

Control / Config

3/27/2014 11:54:21 AM

Pattern Mode: Free

Manual Pattern: 0 Manual Offset: 0

Stop Time Input: Disabled

Aux Switch: None 0

DLS Mode: Off Time Zone: Pac (UTC-8)

Password Timeout: 5

	1-8	9-16
Maint Phs Recalls		
Maint Ped Recalls		

Serial 1 Port Configuration

Broadcast Plan/Sync: Disabled Broadcast Time: 00:00

Serial Rebroadcast: Disabled Response: None

Serial 2 Port Configuration

Broadcast Plan/Sync: Disabled Broadcast Time: 00:00

Ethernet Port Configuration

Broadcast Plan/Sync: Disabled Broadcast Time: 00:00

Serial Rebroadcast: Disabled

Peer Configuration

Peer 1: 0

Peer 2: 0

Peer 3: 0

Peer 4: 0

Peer 5: 0

Peer 6: 0

Peer 7: 0

Peer 8: 0

570 - Norwood & I-80 WB offramp

Logging

3/27/2014 11:54:21 AM

Power On	Disabled	1 of 2 Hits (Det BIU 1)	
Ext Start	Disabled	1 of 2 Hits (Det BIU 2)	
Man Control	Disabled	1 of 2 Hits (Det BIU 3)	
Cabinet Door	Disabled	1 of 2 Hits (Det BIU 4)	
MMU Faults	Disabled	SPmt 1 Req Switch	
BIU Faults	Disabled	SPmt 2 Req Switch	
Det Faults	Disabled	SPmt 3 Req Switch	
Coordination	Disabled	SPmt 4 Req Switch	
Preempt	Disabled	Zone 1 Req Switch	
Soft Preempt	Disabled	Zone 2 Req Switch	
Zone	Disabled	Zone 3 Req Switch	
Speed Traps	Disabled	Zone 4 Req Switch	
		Zone 5 Req Switch	
		Zone 6 Req Switch	
		Zone 7 Req Switch	
		Zone 8 Req Switch	
		Trap Grp 1 Req Switch	
		Trap Grp 2 Req Switch	
		Trap Grp 3 Req Switch	
		Trap Grp 4 Req Switch	

570 - Norwood & I-80 WB offramp

Restricted Data

3/27/2014 11:54:21 AM

(Serial Ports)

Serial Port 1	4					
Baud Rate	9600	8N1	RTS On	0	RTS Off	0
Serial Port 2	0					
Baud Rate	9600	8N1	RTS On	0	RTS Off	0

(Ethernet)

IP Address	160. 72. 44. 1		
Netmask	255. 255. 0. 0		
Broadcast Address	0. 0. 0. 0		
Gateway	192. 167. 4. 1		
Port	161	Reply Mode	Host
Broadcast Port	0	Response	Time/Plan
Time Port	0		

(General)

Controller Address	1	Timeout	0
Peer Address	0	Timeout	0
Remote Calls	Disabled		
Remote Preempt	Disabled		
Remote Soft Preempt	Disabled		
Remote Priority	Disabled		
Remote MCE	Disabled	MCE Max	0

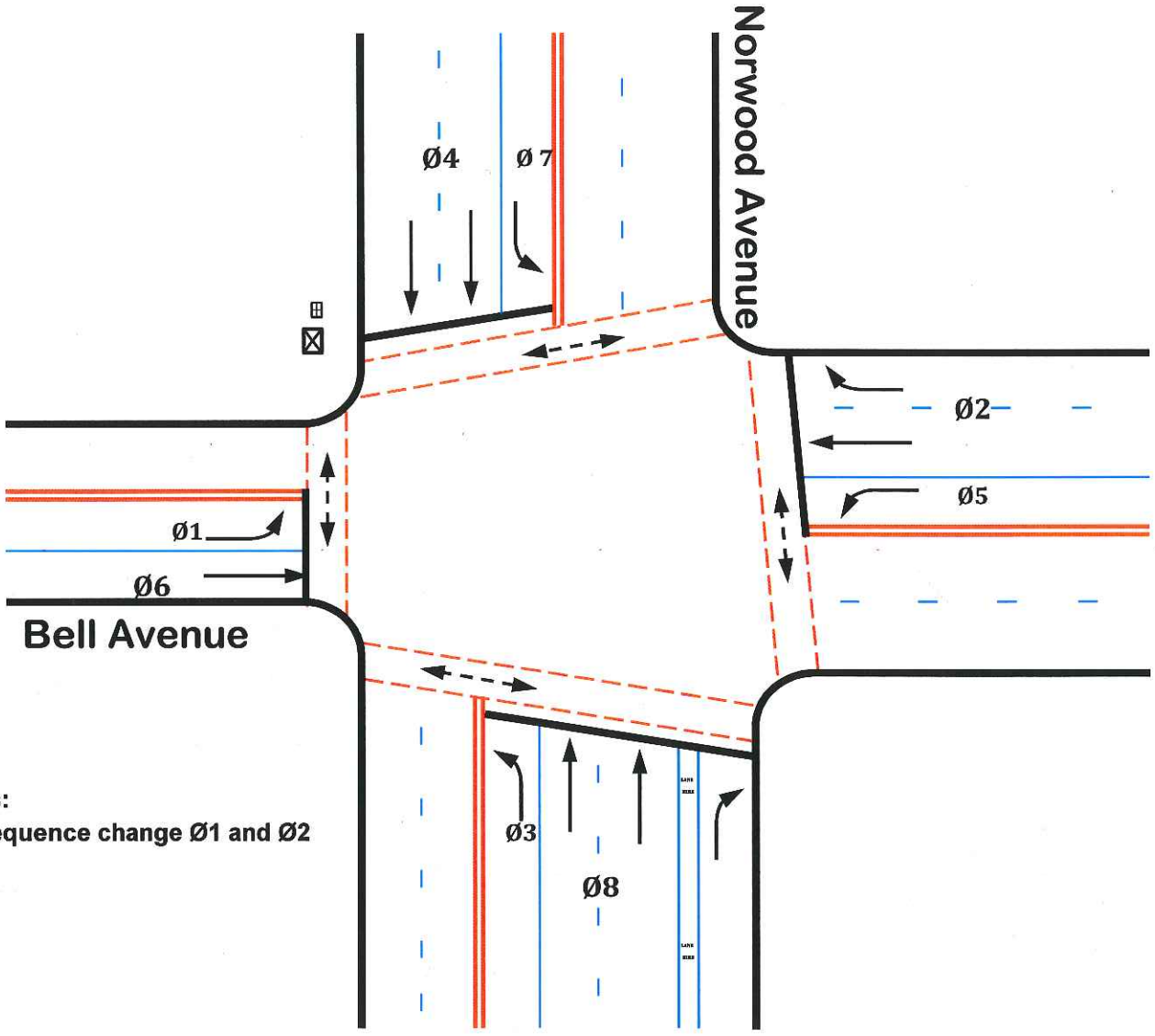
ECONOLITE ASC/2

TRAFFIC SIGNAL CONTROLLER PROGRAM CHART

N/S Norwood Avenue **E/W** Bell Avenue

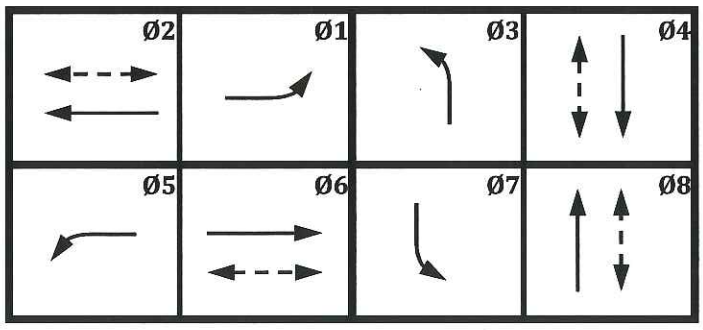
Intersection #: 584 System: _____ IP Address: _____

Device ID: _____ Channel: _____ Drop #: _____



Notes:

Sequence change Ø1 and Ø2



Econolite ASC/2

CITY OF SACRAMENTO

PHASE TIMING

Prepared by: MLL Approved by: JM Date Implemented: 3/22/13

Controller Timing Data

Key: (F1)-2-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Min Green	11	9	10	8	11	9	11	9				
Bike Green												
CndSrv MinGrn												
Walk		7		7		7		7				
Ped Clr		16		10		20		16				
Veh Ext	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
Veh Ext 2												
Max Ext												
Max1	30	50	30	50	30	50	30	50				
Max2												
Max3												
Det Max												
Yellow	3.5	4.3	3.5	4.3	3.5	4.3	3.5	4.3				
Red Clr	0.3	0.3	0.1	0.3	0.3	0.3	0.4	0.3				
Red Rvt	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
Act B4 Init												
Sec/Actuation												
Max Initial												
Time B4 Reduct												
Cars Wt												
Time To Reduce												
Min Gap												

Controller Option Data

Key: (F1)-2-9

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Guar Passage												
NonActuated I												
NonActuated II												
Dual Entry				4				8				
Cond Service												
Cond Reservice												
Rest in Walk												
Flashing Walk												

Five Section Left Turn Heads	5-2:		7-4:		1-6:	
	3-8:		11-10:		9-12:	

Dual Entry	ON	Backup Protection Grp 1	OFF
Cond Service Enable	NO	Backup Protection Grp 2	OFF
Cond Service Det X Switch	NO	Backup Protection Grp 3	OFF
Ped Clr Protect	NO	Simul Gap Grp 1	OFF
Spec Pre OVL Flash	OFF	Simul Gap Grp 2	OFF
Lock Det in Red		Simul Gap Grp 3	OFF
Reserved		unitBackup Time	
Reserved		unitRed Revert	

Controller Recall Data

Key: (F1)-2-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Locking Memory												
Vehicle Recall				4				8				
Ped Recall												
Recall to Max												
Soft Recall												
Don't Rest Here												
Ped Dark N/Call												

Controller Start/Flash Data

Key: (F1)-2-6

Phase	1	2	3	4	5	6	7	8	9	10	11	12
ø's Startup				4				8				
Entry Rem Flash				4				8				
Exit Rem Flash				4				8				
Rem Flash Yello												
Flsh Together ø	.	2	.	4	.	6	.	8	.	10	.	12
Flsh Tgther OV	A:	.	B:	.	C:	.	D:	.				

Startup Intvl Rng1	Yellow	Remote Flash Options	
Startup Intvl Rng2	Yellow	Out of Flash Yellow	Yes
Power Start All Red	6 sec	Out of Flash All Red	
Power Start Flash		Minimum Recall	Yes
		Spare	
		Flash Thru Ld Switch	
		Cycle Thru Phases	

CONFIGURATION

Controller Sequence

Key: (F1)-1-1

Priority	1	2	3	4	5	6	7	8	9	10	11	12
Ring 1	2	1	3	4	9	10	0	0	0	0	0	0
Ring 2	5	6	7	8	11	12	0	0	0	0	0	0
CG Barrier		^		^		^						

Phases in Use

Key: (F1)-1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Phases in Use	1	2	3	4	5	6	7	8				
Exclusive Ped												

SDLC Options

Key: (F1)-1-4

BIU Number	1	2	3	4	5	6	7	8
Term & Facil								
Detector Rack								

Type 2 Runs as Type 1	
MMU Disable	X
Diagnostic Enable	
Peer to Peer Enable	

Peer to Peer Addresses									
1)	255	2)	255	3)	255	4)	255	5)	255
6)	255	7)	255	8)	255	9)	255	10)	255

NEW CONTROLLER SHOULD BE DEFAULTED BEFORE INSTALLATION

To Default Controller: (F1)-8-2 Select All Press ENTER

(F1)-8-1-3 Select All Press ENTER

Ped Timing Carryover

Key: (F1)-2-3

Phase	Carryover
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0

Port 2

Key: (F1)-1-5

Port 2 Protocol	TERMNL
Port 2 Enable	NO
Data Rate (bps)	9600
Data, Parity, Stop	8, N, 1
NTCIP Address	0
NTCIP Grp Address	0
NTCIP Resp Delay	0
NTCIP Sgl Flg Enal	NO
NTCIP BackUp Tim	0
NTCIP Drop-Out Time	0
Port2 Drop-Out Tim	0
NTCIP RTS Timing	NO
NTCIP RTS to CTS Dlay	0
NTCIP RTS TurnOff Dla	0
NTCIP Early RTS	NO

Port 3

Key: (F1)-1-6

Port 3 Protocol	TELEM
Port 3 Enable	YES
Port 3 millisec Timing	NO
Port 3 RTS to CTS Delay	0
Port 3 RTS TurnOff Delay	0
Duplex -Half or Full	FULL
Modem Data Rate (bps)	1200
Data, Parity, Stop	8, N, 1
Telemetry Address	1
System Detector 9-16 Add	
Telemtry Response Delay	1
NTCIP Address	0
NTCIP Grp Address	0
NTCIP Resp Delay	0
NTCIP Single Flag Enable	NO
NTCIP BackUp Time	0
Port 3 Drop-Out Time	0
NTCIP Early RTS	NO

Options

Key: (F1)-1-8

Supervisor Access Code	0
Data Change Acces Code	0
Key Click Enable	NO
Backlight Enable	YES
Request Download	NO

CITY OF SACRAMENTO

PREEMPTION TABLES

Priority Preemptor 2

Key: (F1)-4-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Term Phase Ovlp												
Trk Clr Phase												
Hold Phases	1					6						
Exit Phases												
Exit Calls												
Spare												
Term Overlaps	A:	.		B:	.		C:	.		D:	.	

Active	YES	Ped Dark	
Priority		Ped Active	
Det Lock		Zero PC Time	
Hold Flash		PC Thru Yellow	
Term Ovlp ASAP		Term Phases	

Don't Override Flash	X
Flash all Outputs	
Yellow-Red goes Green	
Enable Max Preempt Time	
Active only During Hold	
No CVM in Flash	
Fast Flash GRN on Hold	
Out of Flash	GREEN

					GRN	YEL	RED
Max Time	55	Duration Time					
Min Hold Time	6	Delay Time		Minimum			
Min Ped Clear		Inhibit Time		Track Clear			
Exit Max		Hld Delay Tim		Hold			

Priority Preemptor 3

Key: (F1)-4-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Term Phase Ovlp												
Trk Clr Phase												
Hold Phases		2			5							
Exit Phases												
Exit Calls												
Spare												
Term Overlaps	A:	.		B:	.		C:	.		D:	.	

Active	YES	Ped Dark	
Priority		Ped Active	
Det Lock		Zero PC Time	
Hold Flash		PC Thru Yellow	
Term Ovlp ASAP		Term Phases	

Don't Override Flash	X
Flash all Outputs	
Yellow-Red goes Green	
Enable Max Preempt Time	
Active only During Hold	
No CVM in Flash	
Fast Flash GRN on Hold	
Out of Flash	

					GRN	YEL	RED
Max Time	55	Duration Time					
Min Hold Time	6	Delay Time		Minimum			
Min Ped Clear		Inhibit Time		Track Clear			
Exit Max		Hld Delay Tim		Hold			

Priority Preemptor 4

Key: (F1)-4-3

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Term Phase Ovlp												
Trk Clr Phase												
Hold Phases			3					8				
Exit Phases												
Exit Calls												
Spare												
Term Overlaps	A:			B:			C:			D:		

Active	YES	Ped Dark	
Priority		Ped Active	
Det Lock		Zero PC Time	
Hold Flash		PC Thru Yellow	
Term Ovlp ASAP		Term Phases	

Don't Override Flash	X
Flash all Outputs	
Yellow-Red goes Green	
Enable Max Preempt Time	
Active only During Hold	
No CVM in Flash	
Fast Flash GRN on Hold	
Out of Flash	GREEN

					GRN	YEL	RED
Max Time	55	Duration Time					
Min Hold Time	6	Delay Time		Minimum			
Min Ped Clear		Inhibit Time		Track Clear			
Exit Max		Hld Delay Tim		Hold			

Priority Preemptor 5

Key: (F1)-4-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12
Term Phase Ovlp												
Trk Clr Phase												
Hold Phases				4			7					
Exit Phases												
Exit Calls												
Spare												
Term Overlaps	A:			B:			C:			D:		

Active	YES	Ped Dark	
Priority		Ped Active	
Det Lock		Zero PC Time	
Hold Flash		PC Thru Yellow	
Term Ovlp ASAP		Term Phases	

Don't Override Flash	X
Flash all Outputs	
Yellow-Red goes Green	
Enable Max Preempt Time	
Active only During Hold	
No CVM in Flash	
Fast Flash GRN on Hold	
Out of Flash	GREEN

					GRN	YEL	RED
Max Time	55	Duration Time					
Min Hold Time	6	Delay Time		Minimum			
Min Ped Clear		Inhibit Time		Track Clear			
Exit Max		Hld Delay Tim		Hold			

CITY OF SACRAMENTO

DETECTION SCHEDULE

Norwood Avenue at Bell Avenue

	Phase	Controller Det. Input	Location	Direction	Controller / Detector Type / Function			
					Extend	Delay	Passage	Notes
BIU 1	**Loops or Retrofit Video**							
	Ø1	1	Left	E-N			x	Ø1D2 2 sec delay
	Ø2	2	Front	WB			x	Ø2D4 6 sec delay
	Ø3	3	Left	N-W			x	Ø3D2 2 sec delay
	Ø4	4	Front	SB			x	
	Ø5	5	Left	W-S			x	Ø5D2 2 sec delay
	Ø6	6	Front	EB			x	
	Ø7	7	Left	S-E			x	Ø7D2 2 sec delay
	Ø8	8	Front	NB			x	
	Loops							
	Ø1	9						Ø1D1
	Ø2	10	Rear	WB			x	Ø2D1, D2
	Ø3	11						Ø3D1
	Ø4	12	Rear	SB			x	Ø4D1, D2
	Ø5	13						Ø5D1
	Ø6	14	Rear	EB			x	Ø6D1
	Ø7	15						Ø7D1
	Ø8	16	Rear	NB			x	Ø8D1
	New Video Detection		**BIU 2 (RESERVED)**	**17-32**				
BIU 3	Ø1	33						
	Ø1	34						
	Ø6	35						
	Ø6	36						
	Ø6	37						
	Ø6	38						
	Ø6	39						
	Ø6	40						
	Ø5	41						
	Ø5	42						
	Ø2	43						
	Ø2	44						
	Ø2	45						
	Ø2	46						
	Ø2	47						
	Ø2	48						
BIU 4	Ø3	49						
	Ø3	50						
	Ø8	51						
	Ø8	52						
	Ø8	53						
	Ø8	54						
	Ø8	55						
	Ø8	56						
	Ø7	57						
	Ø7	58						
	Ø4	59						
	Ø4	60						
	Ø4	61						
	Ø4	62						
	Ø4	63						
	Ø4	64						

2070 D4

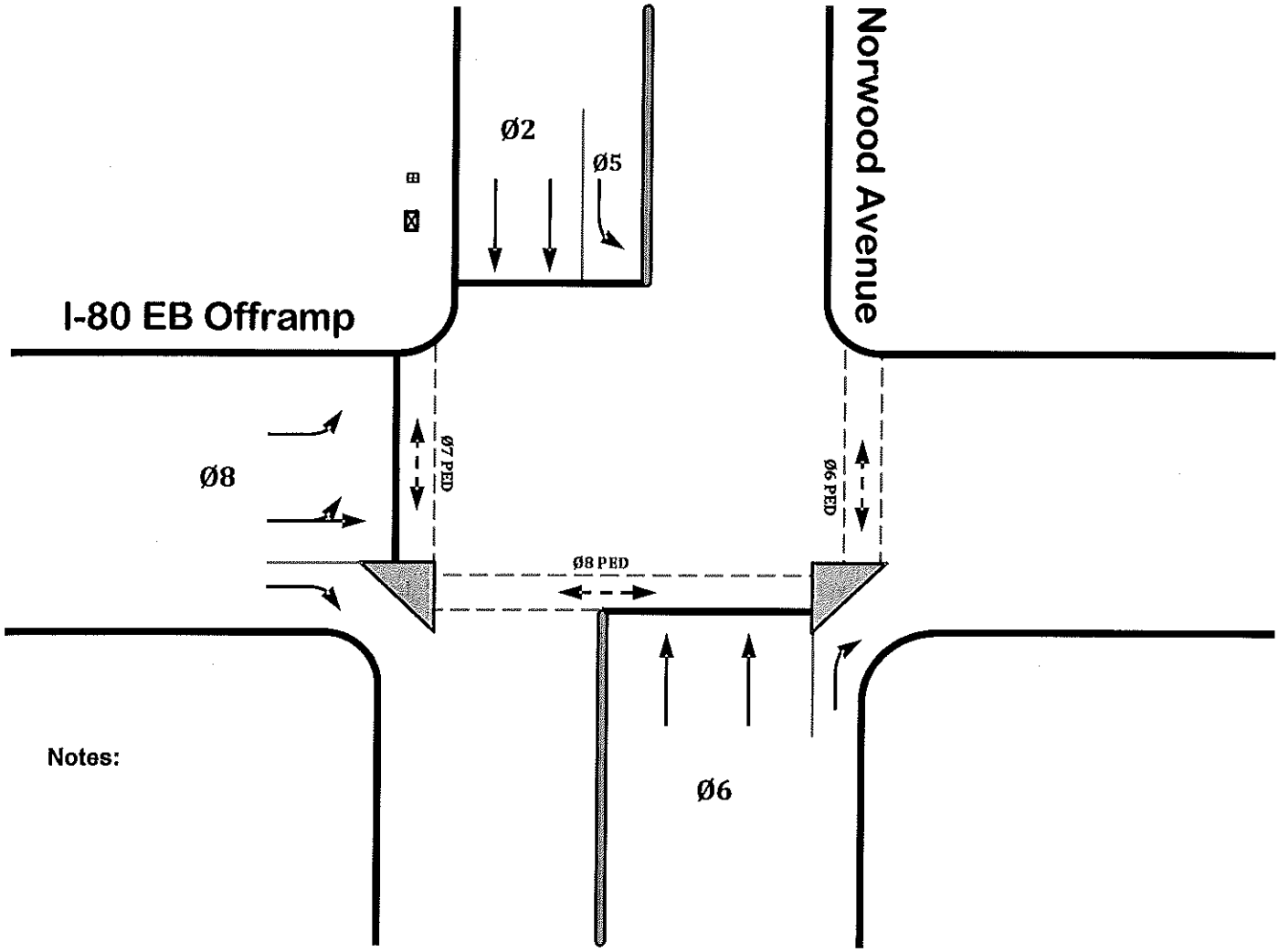
TRAFFIC SIGNAL CONTROLLER PROGRAM CHART

N/S Norwood Avenue **E/W** I-80 EB off ramp

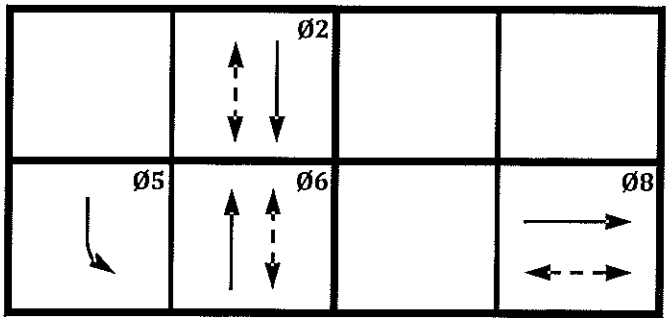
Intersection #: 571 System: _____ IP Address: _____

Device ID: _____ Channel: _____ Drop #: _____

Prepared by: ALL Approved by: _____ Date Implemented: 3-27-14



Notes:



571 - Norwood & I-80 EB offramp

Phase Timing

3/27/2014 11:55:09 AM

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	0	6	0	0	8	6	0	9	0	0	0	0	0	0	0	0
Veh Ext	0.0	2.5	0.0	0.0	2.5	2.5	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Green 1	0	40	0	0	30	40	0	40	0	0	0	0	0	0	0	0
Max Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Green 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	0.0	4.3	0.0	0.0	3.5	4.3	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clr	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk	0	7	0	0	0	7	0	7	0	0	0	0	0	0	0	0
Ped Clr	0	7	0	0	0	6	0	18	0	0	0	0	0	0	0	0
Sol DW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Early Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TTReduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	2.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neg Ped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AP Disc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Ped Clr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Return Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

571 - Norwood & I-80 EB offramp

Phase Options

3/27/2014 11:55:09 AM

Phases	1-8								9-16							
Min Recalls																
Max Recalls																
Ped Recalls																
Soft Recall		2			6											
Dual Entry		2			6											
Red Rest																
Walk Rest																
Walk Expand																
Ped Recycle																
No Simult Gap																
Yel Lock																
Red Lock																
PhaseNext Lock																
No Term Call																
Cond Serv																
CS Enable																
Cond Reserve																
Reserve																
Veh Omit																
Ped Omit																
Perm Phase																
Protect Calls																
Flash Entry																
Flash Exit																
Flash Exit Yel																
Flash Exit Red																
Ped Scramble																
No Min Yel																
No Min Red Rev																
Max Scramble Walk																
Flash Yellow																
CNA 1																
CNA 2																

571 - Norwood & I-80 EB offramp

Phase Startup Options

3/27/2014 11:55:09 AM

Startup Flash	0	Mode	Red->Yel
Startup All Red	6	Yellow	0.0

Phases	1-8							9-16							
Startup Phases		2				6										
Startup Yellow		2				6										
Startup Red																
Startup No Walk																
Startup Next																
No Veh Call																
No Ped Call																

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

571 - Norwood & I-80 EB offramp

Ring Sequence / Conflicting Phases

3/27/2014 11:55:09 AM

Ringgroup 1

Ring 1	1	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0
Ring 2	5	6	7	8	0	0	0	0	0	0	0	0	0	0	0	0

Ringgroup 2

Custom Sequences

Seq 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Conflicting Phases

	1-8	9-16
Phase 1		
Phase 2		
Phase 3		
Phase 4		
Phase 5		
Phase 6		
Phase 7		
Phase 8		
Phase 9		
Phase 10		
Phase 11		
Phase 12		
Phase 13		
Phase 14		
Phase 15		
Phase 16		

571 - Norwood & I-80 EB offramp

MCE Options

3/27/2014 11:55:09 AM

Phases	1-8	9-16
MCE Ped Protect		
MCE Veh Call		
MCE Ped Call		
MCE Veh Omit		
MCE Ped Omit		
MCE Veh Sync		
MCE Ped Sync		
MCE Halt Don't Walk		

LRV Phases	1-8
MCE LRV Term Early	

571 - Norwood & I-80 EB offramp

332/336 Outputs (Connector C1S)

3/27/2014 11:55:09 AM

Output	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
Index	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	4	4	4	4	4	3	3	3
Output	Pin 10	Pin 11	Pin 12	Pin 13	Pin 15	Pin 16	Pin 17	Pin 18
Index	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	2	2	2	2	2	1	1	1
Output	Pin 19	Pin 20	Pin 21	Pin 22	Pin 23	Pin 24	Pin 25	Pin 26
Index	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	8	8	8	8	8	7	7	7
Output	Pin 27	Pin 28	Pin 29	Pin 30	Pin 31	Pin 32	Pin 33	Pin 34
Index	DntWlk	Walk	VehRed	VehYel	VehGrn	VehRed	VehYel	VehGrn
	6	6	6	6	6	5	5	5
Output	Pin 35	Pin 36	Pin 37	Pin 38	Pin 83	Pin 84	Pin 85	Pin 86
Index	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed
	0	0	0	0	0	0	0	0
Output	Pin 87	Pin 88	Pin 89	Pin 90	Pin 91	Pin 93	Pin 94	Pin 95
Index	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed
	0	0	0	0	0	0	0	0
Output	Pin 96	Pin 97	Pin 98	Pin 99	Pin 100	Pin 101	Pin 102	Pin 103
Index	VehRed	VehRed	VehRed	VehRed	VehRed	Flash	VehRed	VehRed
	0	0	0	0	0	1	0	0

332/336 Outputs (Connector C11S)

Output	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
Index	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed	VehRed
	0	0	0	0	0	0	0	0

571 - Norwood & I-80 EB offramp

332/336 Inputs (Connector C1S)

3/27/2014 11:55:09 AM

	Pin 39	Pin 40	Pin 41	Pin 42	Pin 43	Pin 44	Pin 45	Pin 46
Input	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet
Index	2	6	4	8	2	6	4	8
	Pin 47	Pin 48	Pin 49	Pin 50	Pin 51	Pin 52	Pin 53	Pin 54
Input	VehDet	VehDet	VehDet	VehDet	None	None	None	None
Index	2	6	4	8	0	0	0	0
	Pin 55	Pin 56	Pin 57	Pin 58	Pin 59	Pin 60	Pin 61	Pin 62
Input	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet	VehDet
Index	5	1	7	3	5	1	7	3
	Pin 63	Pin 64	Pin 65	Pin 66	Pin 67	Pin 68	Pin 69	Pin 70
Input	VehDet	VehDet	VehDet	VehDet	PedDet	PedDet	PedDet	PedDet
Index	2	6	4	8	2	6	4	8
	Pin 71	Pin 72	Pin 73	Pin 74	Pin 75	Pin 76	Pin 77	Pin 78
Input	Preempt	Preempt	Preempt	Preempt	None	VehDet	VehDet	VehDet
Index	4	2	5	3	0	2	4	6
	Pin 79	Pin 80	Pin 81	Pin 82				
Input	VehDet	None	LocFlash	StopTm				
Index	8	0	1	1				

332/336 Inputs (Connector C11S)

	Pin 10	Pin 11	Pin 12	Pin 13	Pin 15	Pin 16	Pin 17	Pin 18
Input	None	None	None	None	None	None	None	None
Index	0	0	0	0	0	0	0	0
	Pin 19	Pin 20	Pin 21	Pin 22	Pin 23	Pin 24	Pin 25	Pin 26
Input	None	None	None	None	None	None	None	None
Index	0	0	0	0	0	0	0	0
	Pin 27	Pin 28	Pin 29	Pin 30				
Input	None	None	None	None				
Index	0	0	0	0				

571 - Norwood & I-80 EB offramp

Cabinet / MMU Configuration

3/27/2014 11:55:09 AM

Cabinet Type	332/336
MMU Disable	No

MMU Channel Ignore

1-8 9-16

Det BIU 1-No Fail Call

Det BIU 2-No Fail Call

Alt LS Flash

Alt Phase Flash

Alt Overlap Flash

Alt LRV Flash

CMU Channel Ignore

1-8 9-16

17-24 25-32

Det IASM1-Det Diag

1-8 9-16

17-24

Det IASM2-Det Diag

1-8 9-16

17-24

Phase / Overlap Outputs

	Phase	Overlap
1	Normal	Normal
2	Normal	Normal
3	Normal	Normal
4	Normal	Normal
5	Normal	Normal
6	Normal	Normal
7	Normal	Normal
8	Normal	Normal
9	Normal	Normal
10	Normal	Normal
11	Normal	Normal
12	Normal	Normal
13	Normal	Normal
14	Normal	Normal
15	Normal	Normal
16	Normal	Normal

LRV Outputs

	LRV
1	2 Head
2	2 Head
3	2 Head
4	2 Head
5	2 Head
6	2 Head
7	2 Head
8	2 Head

571 - Norwood & I-80 EB offramp

Vehicle Detector 1

3/27/2014 11:55:09 AM

Delay 0.0 Extend 0.0 Carryover 0.0 Queue Limit 0

Mode No Disc Added Disabled System Disabled

Fail Mode None Max Pres 0 No Act 0 Erratic 0 Fail Time 0

Phases	1-8	9-16
Call Phases	1	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	1	
XSwitch Phases		

Vehicle Detector 2

Delay 0.0 Extend 0.0 Carryover 0.0 Queue Limit 0

Mode No Disc Added Disabled System Disabled

Fail Mode None Max Pres 0 No Act 0 Erratic 0 Fail Time 0

Phases	1-8	9-16
Call Phases	2	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	2	
XSwitch Phases		

571 - Norwood & I-80 EB offramp

Vehicle Detector 3

3/27/2014 11:55:09 AM

Delay	Extend	Carryover	Queue Limit
0.0	0.0	0.0	0

Mode	Added	System
No Disc	Disabled	Disabled

Fail Mode	Max Pres	No Act	Erratic	Fail Time
None	0	0	0	0

Phases	1-8	9-16
Call Phases	3	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	3	
XSwitch Phases		

Vehicle Detector 4

Delay	Extend	Carryover	Queue Limit
0.0	0.0	0.0	0

Mode	Added	System
No Disc	Disabled	Disabled

Fail Mode	Max Pres	No Act	Erratic	Fail Time
None	0	0	0	0

Phases	1-8	9-16
Call Phases	4	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	4	
XSwitch Phases		

571 - Norwood & I-80 EB offramp

Vehicle Detector 5

3/27/2014 11:55:09 AM

Delay	2.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0

Phases	1-8	9-16
Call Phases	5	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	5	
XSwitch Phases		

Vehicle Detector 6

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0

Phases	1-8	9-16
Call Phases	6	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	6	
XSwitch Phases		

571 - Norwood & I-80 EB offramp

Vehicle Detector 7

3/27/2014 11:55:09 AM

Delay	Extend	Carryover	Queue Limit
0.0	0.0	0.0	0

Mode	Added	System
No Disc	Disabled	Disabled

Fail Mode	Max Pres	No Act	Erratic	Fail Time
None	0	0	0	0

Phases	1-8	9-16
Call Phases	2	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	2	
XSwitch Phases		

Vehicle Detector 8

Delay	Extend	Carryover	Queue Limit
2.0	0.0	0.0	0

Mode	Added	System
No Disc	Disabled	Disabled

Fail Mode	Max Pres	No Act	Erratic	Fail Time
None	0	0	0	0

Phases	1-8	9-16
Call Phases	8	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	8	
XSwitch Phases		

571 - Norwood & I-80 EB offramp

Pedestrian Detector 1

3/27/2014 11:55:09 AM

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	1	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 2

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	2	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 3

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	3	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 4

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	4	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

571 - Norwood & I-80 EB offramp

Pedestrian Detector 5

3/27/2014 11:55:09 AM

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	5	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 6

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	6	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 7

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	7	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

Pedestrian Detector 8

No Act: 0 | Max Pres: 0 | Erratic: 0 | Fail Mode: None

Phases/Overlaps	1-8	9-16
Call Ped Phases	8	
Call Ped Olaps		
Call Phases		
Locked Call Phases		
Ped Entry Phases		
Olap Ped Entry Phases		
Ped Cascade Phases		

571 - Norwood & I-80 EB offramp

Control / Config

3/27/2014 11:55:09 AM

Pattern Mode: Free

Manual Pattern: 0 Manual Offset: 0

Stop Time Input: Disabled

Aux Switch: None 0

DLS Mode: Off Time Zone: Pac (UTC-8)

Password Timeout: 5

	1-8	9-16
Maint Phs Recalls		
Maint Ped Recalls		

Serial 1 Port Configuration

Broadcast Plan/Sync: Disabled Broadcast Time: 00:00

Serial Rebroadcast: Disabled Response: None

Serial 2 Port Configuration

Broadcast Plan/Sync: Disabled Broadcast Time: 00:00

Ethernet Port Configuration

Broadcast Plan/Sync: Disabled Broadcast Time: 00:00

Serial Rebroadcast: Disabled

Peer Configuration

Peer 1: 0

Peer 2: 0

Peer 3: 0

Peer 4: 0

Peer 5: 0

Peer 6: 0

Peer 7: 0

Peer 8: 0

571 - Norwood & I-80 EB offramp

Logging

3/27/2014 11:55:09 AM

Power On	Disabled	1 of 2 Hits (Det BIU 1)	
Ext Start	Disabled	1 of 2 Hits (Det BIU 2)	
Man Control	Disabled	1 of 2 Hits (Det BIU 3)	
Cabinet Door	Disabled	1 of 2 Hits (Det BIU 4)	
MMU Faults	Disabled	SPmt 1 Req Switch	
BIU Faults	Disabled	SPmt 2 Req Switch	
Det Faults	Disabled	SPmt 3 Req Switch	
Coordination	Disabled	SPmt 4 Req Switch	
Preempt	Disabled	Zone 1 Req Switch	
Soft Preempt	Disabled	Zone 2 Req Switch	
Zone	Disabled	Zone 3 Req Switch	
Speed Traps	Disabled	Zone 4 Req Switch	
		Zone 5 Req Switch	
		Zone 6 Req Switch	
		Zone 7 Req Switch	
		Zone 8 Req Switch	
		Trap Grp 1 Req Switch	
		Trap Grp 2 Req Switch	
		Trap Grp 3 Req Switch	
		Trap Grp 4 Req Switch	

571 - Norwood & I-80 EB offramp

Restricted Data

3/27/2014 11:55:09 AM

(Serial Ports)

Serial Port 1: 4

Baud Rate: 9600 | 8N1 — RTS On: 0 — RTS Off: 0

Serial Port 2: 0

Baud Rate: 9600 | 8N1 — RTS On: 0 — RTS Off: 0

(Ethernet)

IP Address: 160. 72. 44. 1

Netmask: 255. 255. 0. 0

Broadcast Address: 0. 0. 0. 0

Gateway: 192. 167. 4. 1

Port: 161 — Reply Mode: Host

Broadcast Port: 0 — Response: Time/Plan

Time Port: 0

(General)

Controller Address: 1 — Timeout: 0

Peer Address: 0 — Timeout: 0

Remote Calls: Disabled

Remote Preempt: Disabled

Remote Soft Preempt: Disabled

Remote Priority: Disabled

Remote MCE: Disabled — MCE Max: 0

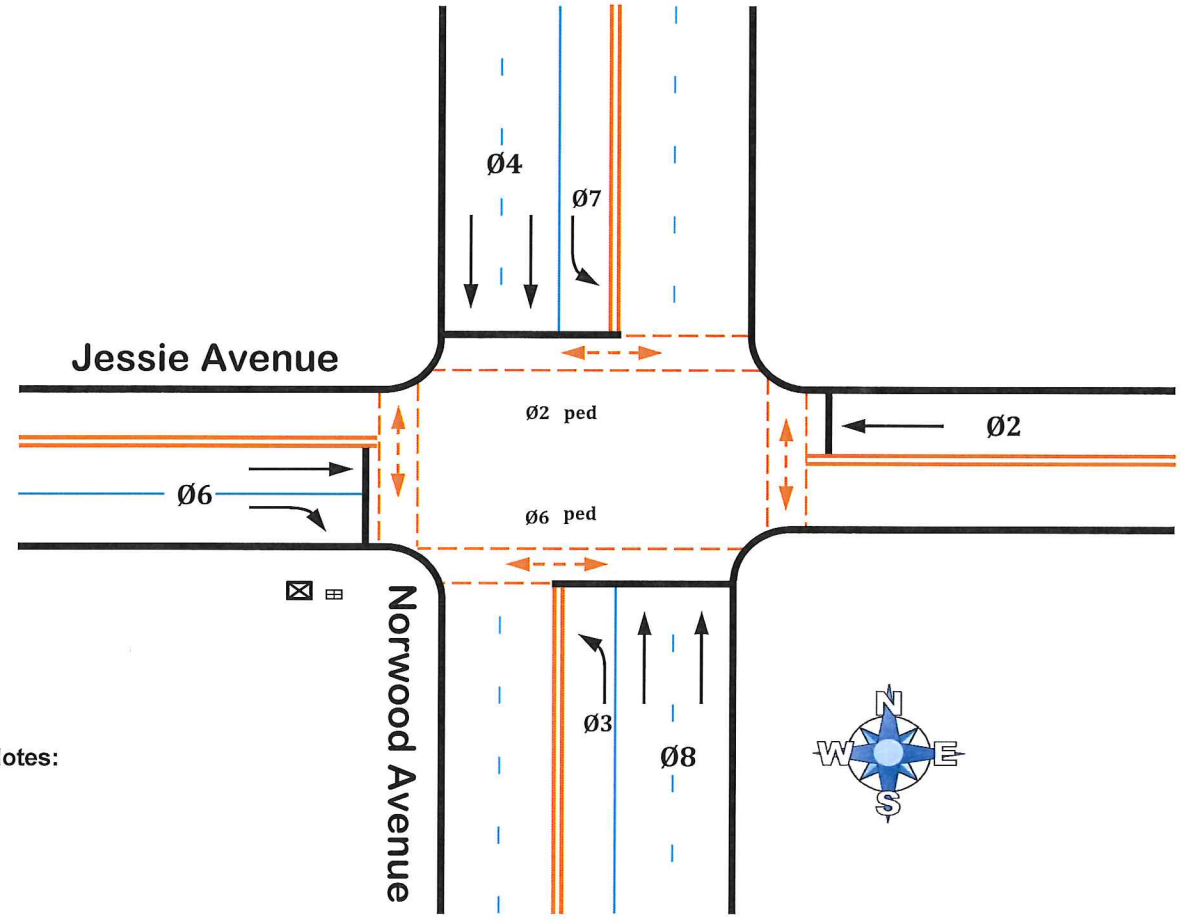
ECONOLITE ASC/3

TRAFFIC SIGNAL CONTROLLER PROGRAM CHART

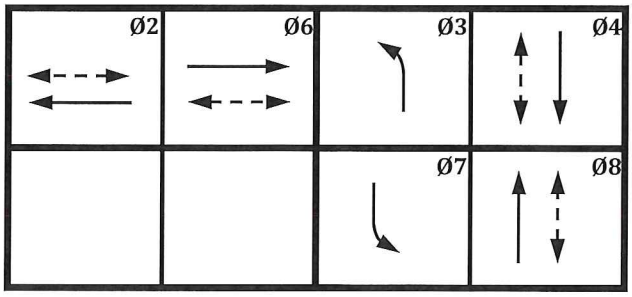
N/S Norwood Avenue **E/W** Jessie Avenue

Intersection #: 576 System: _____ IP Address: _____

Device ID: _____ Channel: _____ Drop #: _____



Notes:



PHASE TIMING

Prepared by: MC Approved by: RJB Date Implemented: 4/16/2015

Controller Timing Data

Key: 2-1

Phase	1	2	3	4	5	6	7	8
Min Green		10	9	6		10	9	7
Walk		7		7		7		7
Ped Clear		18		8		17		9
Yellow		3.5	3.5	4.3		3.5	3.5	4.3
Red Clearance				0.3				0.3
Red Rvt		2.0	2.0	2.0		2.0	2.0	2.0
Vehicle Ext		2.0	2.0	2.0		2.0	2.0	2.0
Max 1		40	30	50		40	30	50
Max 2								
Max 3								
Act B4								
Sec/Act								
Max Ini								
Time B4								
Cars Wt								
Steps to Reduce								
Time to Reduce								
Min Gap								
Bike Green								
CndSrv Min Green								
Delay Green								
Walk 2								
Walk Max								
Ped Clear 2								
Ped Clear Max								
Ped CarryOver								
Vehicle Ext 2								
Dym Green								
Dym Step								
Red Max								

Guaranteed Min Time Data

Key: 2-4

Phase	1	2	3	4	5	6	7	8
Min Green		10	9	6		10	9	7
Walk		7		7		7		7
Ped Clear		18		8		17		9
Yellow Clear		3.5	3.5	4.3		3.5	3.5	4.3
Red Clear				0.3				0.3
Overlap	A	B	C	D	E	F	G	H
Overlap Green								

SET SCREEN FORMAT TO BASIC Key: 1-7-2

Controller Start/Flash Data

Key: 2-5

Phase	1	2	3	4	5	6	7	8	
Phase (Color)				Y				Y	
Overlap									
Flash/Mon	No			Start Flash Time				0	sec
PWR Start Seq	1			All Red				6	sec

Note: Startup phase can be Y, R, G or W

Automatic Flash

Phase	1	2	3	4	5	6	7	8
Entry				4				8
Exit				4				8

Overlap	A	B	C	D	E	F	G	H
Exit	X	X	X	X				

Flash/Mon	No		Exit Flash	W
Min Flash	0	sec	Min Recall	Yes
Cycle Thru Phase	No			

Phase Recall Data

Key: 2-8

Phase	1	2	3	4	5	6	7	8
Lock Det								
Vehicle Recall								
Ped Recall								
Max Recall								
Soft Recall				4				8
No Rest								
Added Initial Calc								

Controller Options

KEY: 2-6-1

Ped Protect	.	Unit Red Revert			.	sec

Phase	1	2	3	4	5	6	7	8
Flashing Green Phase								
Guar Pass								
Non Act I								
Non Act II								
Dual Entry								
Cond Service								
Cond Reservice								
Ped Reservice		2		4		6		8
Rest in Walk								
Flashing Walk								
PED Clear > yellow								
PED Clear > RED								
IG + VEH EXT								

CONFIGURATION

Phase Ring Seq and Assignment — Key: 1-1-1

Controller Sequence									1
Hardware Alternate Sequance Enable									No
Barrier	B		B		B		B		
Ring 1	2	6	3	4	9	10	13	14	
Ring 2			7	8	11	12	15	16	
Ring 3									
Ring 4									

Phase in Use/Exclusive Peds — Key: 1-2

Phase	1	2	3	4	5	6	7	8
Phases in Use		2	3	4		6	7	8
Exclusive Ped								

Load Switch Assign (MMU Chan) — Key: 1-3

CH	PHASE/ OVLP	type	DIMMING R	Y	G	D	FLASH P	A	TGR
1	1	V				+	A	R	
2	2	V				+	A	R	X
3	3	V				+	A	R	
4	4	V				+	A	R	X
5	5	V				-	A	R	
6	6	V				-	A	R	X
7	7	V				-	A	R	
8	8	V				-	A	R	X
9	2	P				+	A		
10	4	P				+	A		
11	1	P				-	A		
12	8	P				-	A		
13	1	O				+	A	R	
14	2	O				-	A	R	X
15	3	O				+	A	R	
16	4	O				-	A	R	X

Display Options — Key: 1-7-2

Key Click Enabled	YES
BackLight Enable	YES
LED Mode	Auto
Main Status Display Mode	Basic
Screen Format	Basic

Ethernet Port Configuration — Key: 1-5-1

IP ADDRESS	
ADDRESS MASK	
DEFAULT GATEWAY ADD	
SEVER IP ADDRESS	
LINK SPEED/DUPLEX	AUTO
DROP-OUT TIME	300

Port 1 (SDLC Options) — Key: 1-4-1

BIU	1	2	3	4	5	6	7	8
TERM & FACILITY	.	.	.	.	.	.	.	.
DETECTOR	.	.	.	.	.	.	.	.

ENABLE TS2/MMU TYPE CABINET	NO
ENABLE MMU EXTENDED STATUS	NO
ENABLE SDLC START TIME	NO
ENABLE 3 CRITICAL RFE'S LOCKUP	YES
MMU TO CU SDLC EXTERNAL START	enabled

Ped Detector Input — Key: 6-3

PED DET ASSIGNMENT MODE								NTCIP
PHASE	1	2	3	4	5	6	7	8
DETECTOR	1	2	3	4	5	6	7	8
PHASE	9	10	11	12	13	14	15	16
DETECTOR	9	10	11	12	13	14	15	16

CONFIGURATION

Simultaneous Gap Phases **Key: 1-1-4**

CHANNEL CAN SERVE WITH

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.		.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
8	.	.	.	X	.	.	.		.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
D	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

MMU Program **Key: 1-4-2**

CHANNEL CAN SERVE WITH

	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.	.	.	.	.				
6	.	.	.	.	.	.	.	.	.	.					
7	.	.	.	.	.	.	.	.	.						
8	.	.	.	.	.	.	.	.							
9	.	.	.	.	.	.	.								
10	.	.	.	.	.	.									
11	.	.	.	.	.										
12	.	.	.	.											
13	.	.	.												
14	.	.													

EV PREEMPT/SCP SUBMENU

Preempt Plan 2 KEY: 4-1

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh						6		
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase						6		
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh		2						
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase		2						
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8
Track Clr V								
Track Clr O								
Ena Trl								
Dwell Veh			3					8
Dwell Ped								
Dwell OL								
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase			3					8
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

Preempt Plan 5

Phase	1	2	3	4	5	6	7	8
Track Clr V								
				4			7	
Cycle Veh								
Cycle Ped								
Cycle OL								
Exit Phase				4			7	
Exit Calls								
Sp Function								

Entrance Times	Walk	Ped Cl	Grn	Yel	Red
	255	255	255	25.5	25.5
Track Clear	Min Gn	Ext Grn	Max G	Yel	Red
	0	0	0	0	0
Dwl/Cyc exit	Min Dwell	Pmt Ext	Mx Tm	Yel	Red
	6	3	55	0	0

Free Dur Prmt	R1	NO	R2	NO	R3	NO	R4	NO

Enable	Yes	Pmt Ovrid	X
Det Lock	X	Delay	0
Override Flash	.	Duration	0
Term Ovlp	NO	PC>Yel	NO
Ped Dark	NO	TC Reserv	NO
Link Pmt	0	Exit Fl Color	GRN
Exit Tm Pln	0	Re-Serv	0
Interlock	NO	Term Ph	NO
Inhibt	0	Dwell Fl	OFF
Clr>Grn	NO	Pmt>Crd	YES
Inhibt Ext Time	0	FLT Type	Hard
Pmt Active Out	OFF	Pmt Active Dwell	OFF
Other-Pri Pmt	OFF	Non-Pri Pmt	OFF

DETECTION SCHEDULE

Norwood Avenue at Jessie Avenue

	Phase	Controller Det. Input	Location	Direction	Controller / Detector Type / Function			
					Extend	Delay	Passage	Notes
BIU 1	**Loops or Retrofit Video**							
	Ø1	1						
	Ø2	2	Front	WB			x	D2, D3
	Ø3	3	Left	N-W			x	D2, D3
	Ø4	4	Front	SB			x	D3, D4
	Ø5	5						
	Ø6	6	Front	EB			x	D2, D3
	Ø7	7	Left	S-E			x	D2, D3
	Ø8	8	Front	NB			x	D3, D4
	Loops							
	Ø2	9	Right	E-S			x	D4
	Ø2	10	Rear	WB			x	D1
	Ø3	11	Rear	N-W			x	D1
	Ø4	12	Rear	SB			x	D1, D2
	Ø6	13	WALK				x	
	Ø6	14	Rear	EB			x	D1
	Ø7	15	Rear	S-E			x	D1
	Ø8	16	Rear	EB			x	D1, D2
	Ø5	-	count	WB			x	D1
	Ø1	-	count	EB			x	D1
	New Video Detection		**BIU 2 (RESERVED) 17-32**					
BIU 3	Ø1	33						
	Ø1	34						
	Ø6	35						
	Ø6	36						
	Ø6	37						
	Ø6	38						
	Ø6	39						
	Ø6	40						
	Ø5	41						
	Ø5	42						
	Ø2	43						
	Ø2	44						
	Ø2	45						
	Ø2	46						
	Ø2	47						
	Ø2	48						
BIU 4	Ø3	49						
	Ø3	50						
	Ø8	51						
	Ø8	52						
	Ø8	53						
	Ø8	54						
	Ø8	55						
	Ø8	56						
	Ø7	57						
	Ø7	58						
	Ø4	59						
	Ø4	60						
	Ø4	61						
	Ø4	62						
	Ø4	63						
	Ø4	64						

Appendix D: Existing Conditions Synchro Reports

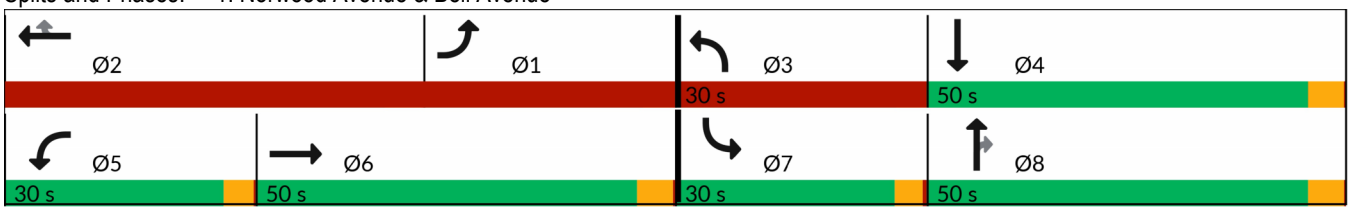
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	122	127	186	72	116	46	320	173	119	513	32
Future Volume (vph)	43	122	127	186	72	116	46	320	173	119	513	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	195		200	70		200	90		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	35			50			70			45		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99	0.97		0.97		0.97	0.99		0.96	0.99	0.99	
Frt		0.923				0.850			0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1694	0	1736	1827	1553	1752	3505	1568	1752	3465	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1694	0	1694	1827	1516	1737	3505	1517	1741	3465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33				116			173		4	
Link Speed (mph)		25			40			40			30	
Link Distance (ft)		958			1056			1318			533	
Travel Time (s)		26.1			18.0			22.5			12.1	
Confl. Peds. (#/hr)	5		19	19		5	4		3	3		4
Confl. Bikes (#/hr)			4			2			2			2
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
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	43	122	127	186	72	116	46	320	173	119	513	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	249	0	186	72	116	46	320	173	119	545	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Detector Phase	1	6		5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	11.0	9.0		11.0	9.0	9.0	10.0	9.0	9.0	11.0	8.0	
Minimum Split (s)	14.8	31.6		14.8	27.6	27.6	13.6	27.6	27.6	14.9	21.6	
Total Split (s)	30.0	50.0		30.0	50.0	50.0	30.0	50.0	50.0	30.0	50.0	
Total Split (%)	18.8%	31.3%		18.8%	31.3%	31.3%	18.8%	31.3%	31.3%	18.8%	31.3%	
Maximum Green (s)	26.2	45.4		26.2	45.4	45.4	26.4	45.4	45.4	26.1	45.4	
Yellow Time (s)	3.5	4.3		3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.3	
All-Red Time (s)	0.3	0.3		0.3	0.3	0.3	0.1	0.3	0.3	0.4	0.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.8	4.6		3.8	4.6	4.6	3.6	4.6	4.6	3.9	4.6	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		20.0			16.0	16.0		16.0	16.0		10.0	
Pedestrian Calls (#/hr)		2			2	2		2	2		2	
Act Effct Green (s)	18.5	16.3		14.8	20.3	20.3	10.5	15.1	15.1	12.7	24.6	
Actuated g/C Ratio	0.24	0.21		0.19	0.26	0.26	0.14	0.20	0.20	0.17	0.32	
v/c Ratio	0.09	0.64		0.55	0.14	0.23	0.19	0.46	0.39	0.41	0.48	
Control Delay (s/veh)	25.6	33.5		37.7	31.7	8.5	38.5	30.9	8.2	38.2	26.0	
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)	25.6	33.5		37.7	31.7	8.5	38.5	30.9	8.2	38.2	26.0	
LOS	C	C		D	C	A	D	C	A	D	C	
Approach Delay (s/veh)		32.4			27.5			24.3			28.2	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	15	90		79	31	0	19	66	0	50	117	
Queue Length 95th (ft)	51	208		183	80	46	66	141	54	132	220	
Internal Link Dist (ft)		878			976			1238			453	
Turn Bay Length (ft)	150			195		200	70		200	90		
Base Capacity (vph)	642	1065		622	1135	985	632	2177	1007	625	2154	
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	0.07	0.23		0.30	0.06	0.12	0.07	0.15	0.17	0.19	0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 76.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay (s/veh): 27.6		Intersection LOS: C	

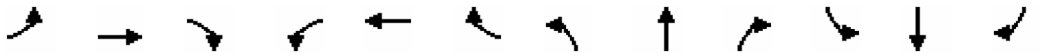
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Norwood Avenue & Bell Avenue



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	43	249	186	72	116	46	320	173	119	545
v/c Ratio	0.09	0.64	0.55	0.14	0.23	0.19	0.46	0.39	0.41	0.48
Control Delay (s/veh)	25.6	33.5	37.7	31.7	8.5	38.5	30.9	8.2	38.2	26.0
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)	25.6	33.5	37.7	31.7	8.5	38.5	30.9	8.2	38.2	26.0
Queue Length 50th (ft)	15	90	79	31	0	19	66	0	50	117
Queue Length 95th (ft)	51	208	183	80	46	66	141	54	132	220
Internal Link Dist (ft)		878		976			1238			453
Turn Bay Length (ft)	150		195		200	70		200	90	
Base Capacity (vph)	642	1065	622	1135	985	632	2177	1007	625	2154
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	0.07	0.23	0.30	0.06	0.12	0.07	0.15	0.17	0.19	0.25

Intersection Summary



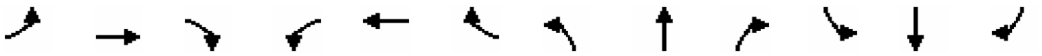
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	122	127	186	72	116	46	320	173	119	513	32
Future Volume (veh/h)	43	122	127	186	72	116	46	320	173	119	513	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.95	1.00		0.96	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	43	122	127	186	72	116	46	320	173	119	513	32
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	373	183	191	305	328	265	157	579	249	278	798	50
Arrive On Green	0.21	0.23	0.23	0.17	0.18	0.18	0.09	0.16	0.16	0.16	0.24	0.24
Sat Flow, veh/h	1795	813	847	1753	1841	1489	1767	3526	1515	1767	3363	209
Grp Volume(v), veh/h	43	0	249	186	72	116	46	320	173	119	268	277
Grp Sat Flow(s),veh/h/ln	1795	0	1660	1753	1841	1489	1767	1763	1515	1767	1763	1810
Q Serve(g_s), s	1.2	0.0	8.3	5.9	2.0	3.1	1.5	5.0	3.7	3.7	8.3	8.3
Cycle Q Clear(g_c), s	1.2	0.0	8.3	5.9	2.0	3.1	1.5	5.0	3.7	3.7	8.3	8.3
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	373	0	374	305	328	265	157	579	249	278	418	430
V/C Ratio(X)	0.12	0.00	0.67	0.61	0.22	0.44	0.29	0.55	0.70	0.43	0.64	0.64
Avail Cap(c_a), veh/h	778	0	1246	759	1382	1117	771	2646	1137	763	1323	1358
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	19.4	0.0	21.3	23.1	21.3	11.7	25.8	23.2	7.7	23.0	20.8	20.8
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.7	0.1	0.4	0.4	0.3	1.3	0.4	0.6	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	3.1	2.3	0.8	1.3	0.6	1.9	2.0	1.5	3.2	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.5	0.0	22.1	23.8	21.4	12.1	26.2	23.5	9.0	23.4	21.4	21.4
LnGrp LOS	B		C	C	C	B	C	C	A	C	C	C
Approach Vol, veh/h		292			374			539			664	
Approach Delay, s/veh		21.7			19.7			19.1			21.7	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	15.4	9.0	19.0	14.3	18.2	13.4	14.5
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	3.2	5.1	3.5	10.3	7.9	10.3	5.7	7.0
Green Ext Time (p_c), s	0.0	0.4	0.0	2.2	0.2	1.2	0.1	1.6

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	20.6
HCM 6th LOS	C

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	122	127	186	72	116	46	320	173	119	513	32
Future Volume (veh/h)	43	122	127	186	72	116	46	320	173	119	513	32
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		0.93	1.00		0.95	1.00		0.96	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	43	122	127	186	72	116	46	320	173	119	513	32
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	373	183	191	305	328	265	157	579	249	278	798	50
Arrive On Green	0.21	0.23	0.23	0.17	0.18	0.18	0.09	0.16	0.16	0.16	0.24	0.24
Sat Flow, veh/h	1795	813	847	1753	1841	1489	1767	3526	1515	1767	3363	209
Grp Volume(v), veh/h	43	0	249	186	72	116	46	320	173	119	268	277
Grp Sat Flow(s),veh/h/ln	1795	0	1660	1753	1841	1489	1767	1763	1515	1767	1763	1810
Q Serve(g_s), s	1.2	0.0	8.3	5.9	2.0	3.1	1.5	5.0	3.7	3.7	8.3	8.3
Cycle Q Clear(g_c), s	1.2	0.0	8.3	5.9	2.0	3.1	1.5	5.0	3.7	3.7	8.3	8.3
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	373	0	374	305	328	265	157	579	249	278	418	430
V/C Ratio(X)	0.12	0.00	0.67	0.61	0.22	0.44	0.29	0.55	0.70	0.43	0.64	0.64
Avail Cap(c_a), veh/h	778	0	1246	759	1382	1117	771	2646	1137	763	1323	1358
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	19.4	0.0	21.3	23.1	21.3	11.7	25.8	23.2	7.7	23.0	20.8	20.8
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.7	0.1	0.4	0.4	0.3	1.3	0.4	0.6	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	3.1	2.3	0.8	1.3	0.6	1.9	2.0	1.5	3.2	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.5	0.0	22.1	23.8	21.4	12.1	26.2	23.5	9.0	23.4	21.4	21.4
LnGrp LOS	B		C	C	C	B	C	C	A	C	C	C
Approach Vol, veh/h		292			374			539			664	
Approach Delay, s/veh		21.7			19.7			19.1			21.7	
Approach LOS		C			B			B			C	

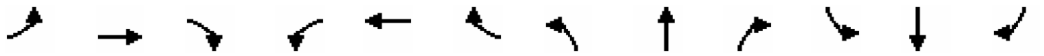
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	15.4	9.0	19.0	14.3	18.2	13.4	14.5
Change Period (Y+Rc), s	* 4.6	* 4.6	3.6	* 4.6	3.8	* 4.6	3.9	* 4.6
Max Green Setting (Gmax), s	* 26	* 45	26.4	* 45	26.2	* 45	26.1	* 45
Max Q Clear Time (g_c+I1), s	3.2	5.1	3.5	10.3	7.9	10.3	5.7	7.0
Green Ext Time (p_c), s	0.0	0.4	0.0	2.2	0.2	1.2	0.1	1.6

Intersection Summary	
HCM 7th Control Delay, s/veh	20.6
HCM 7th LOS	C

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	95	215	194	68	41	137	463	100	51	779	44
Future Volume (vph)	36	95	215	194	68	41	137	463	100	51	779	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		0	120		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			65			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		0.99	0.99		0.98	0.99	
Frt			0.850		0.982			0.973			0.992	
Flt Protected		0.986			0.969		0.950			0.950		
Satd. Flow (prot)	0	1837	1583	0	1742	0	1752	3377	0	1752	3471	0
Flt Permitted		0.986			0.969		0.950			0.950		
Satd. Flow (perm)	0	1822	1583	0	1742	0	1746	3377	0	1724	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			215		5			16			4	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		838			627			712			1318	
Travel Time (s)		19.0			14.3			12.1			30.0	
Confl. Peds. (#/hr)	23					23	2		7	7		2
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	36	95	215	194	68	41	137	463	100	51	779	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	131	215	0	303	0	137	563	0	51	823	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

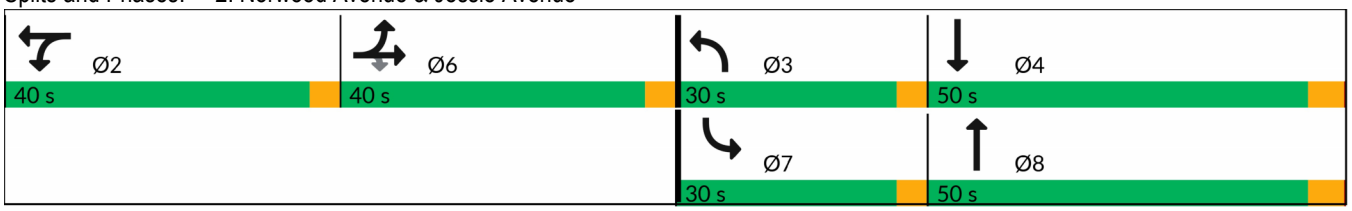


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	6	6		2	2		3	8		7	4	
Permitted Phases			6									
Detector Phase	6	6	6	2	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		9.0	7.0		9.0	6.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5		12.5	20.6		13.5	19.6	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		30.0	50.0		30.0	50.0	
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		18.8%	31.3%		18.8%	31.3%	
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5		26.5	45.4		26.5	45.4	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.3		3.5	4.3	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.3		0.0	0.3	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		3.5	3.5		3.5		3.5	4.6		3.5	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	17.0	17.0	17.0	18.0	18.0			9.0			8.0	
Pedestrian Calls (#/hr)	2	2	2	2	2			2			2	
Act Effct Green (s)		14.2	14.2		23.6		14.0	38.6		10.2	31.1	
Actuated g/C Ratio		0.14	0.14		0.24		0.14	0.39		0.10	0.31	
v/c Ratio		0.49	0.52		0.72		0.55	0.42		0.28	0.75	
Control Delay (s/veh)		51.1	11.4		47.5		54.1	24.7		54.8	37.0	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		51.1	11.4		47.5		54.1	24.7		54.8	37.0	
LOS		D	B		D		D	C		D	D	
Approach Delay (s/veh)		26.5			47.5			30.5			38.1	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)		75	0		166		79	129		29	230	
Queue Length 95th (ft)		178	73		357		192	249		90	435	
Internal Link Dist (ft)		758			547			632			1238	
Turn Bay Length (ft)			100				100			120		
Base Capacity (vph)		725	755		691		502	1710		502	1708	
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		0.18	0.28		0.44		0.27	0.33		0.10	0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 99.1			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay (s/veh): 35.2		Intersection LOS: D	

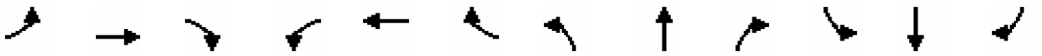
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Norwood Avenue & Jessie Avenue



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	131	215	303	137	563	51	823
v/c Ratio	0.49	0.52	0.72	0.55	0.42	0.28	0.75
Control Delay (s/veh)	51.1	11.4	47.5	54.1	24.7	54.8	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.1	11.4	47.5	54.1	24.7	54.8	37.0
Queue Length 50th (ft)	75	0	166	79	129	29	230
Queue Length 95th (ft)	178	73	357	192	249	90	435
Internal Link Dist (ft)	758		547		632		1238
Turn Bay Length (ft)		100		100		120	
Base Capacity (vph)	725	755	691	502	1710	502	1708
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	0.18	0.28	0.44	0.27	0.33	0.10	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	95	215	194	68	41	137	463	100	51	779	44
Future Volume (veh/h)	36	95	215	194	68	41	137	463	100	51	779	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.97	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	95	215	194	68	41	137	463	100	51	779	44
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	100	263	301	253	89	54	188	899	193	134	960	54
Arrive On Green	0.20	0.20	0.20	0.23	0.23	0.23	0.11	0.31	0.31	0.08	0.28	0.28
Sat Flow, veh/h	507	1338	1530	1119	392	237	1767	2869	615	1767	3390	191
Grp Volume(v), veh/h	131	0	215	303	0	0	137	283	280	51	405	418
Grp Sat Flow(s),veh/h/ln	1845	0	1530	1748	0	0	1767	1763	1721	1767	1763	1818
Q Serve(g_s), s	5.0	0.0	10.6	13.1	0.0	0.0	6.1	10.6	10.8	2.2	17.3	17.3
Cycle Q Clear(g_c), s	5.0	0.0	10.6	13.1	0.0	0.0	6.1	10.6	10.8	2.2	17.3	17.3
Prop In Lane	0.27		1.00	0.64		0.14	1.00		0.36	1.00		0.11
Lane Grp Cap(c), veh/h	363	0	301	396	0	0	188	553	539	134	499	515
V/C Ratio(X)	0.36	0.00	0.71	0.77	0.00	0.00	0.73	0.51	0.52	0.38	0.81	0.81
Avail Cap(c_a), veh/h	835	0	692	791	0	0	581	992	968	581	992	1023
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	28.0	0.0	30.3	29.2	0.0	0.0	34.9	22.6	22.7	35.5	26.9	26.9
Incr Delay (d2), s/veh	0.2	0.0	1.2	1.2	0.0	0.0	2.0	0.3	0.3	0.7	1.2	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	3.8	5.4	0.0	0.0	2.6	4.1	4.1	1.0	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.2	0.0	31.5	30.4	0.0	0.0	36.9	22.9	23.0	36.1	28.1	28.1
LnGrp LOS	C		C	C			D	C	C	D	C	C
Approach Vol, veh/h		346			303			700			874	
Approach Delay, s/veh		30.2			30.4			25.7			28.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.8	12.1	27.4		19.4	9.6	29.9				
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		15.1	8.1	19.3		12.6	4.2	12.8				
Green Ext Time (p_c), s		1.2	0.1	3.6		0.9	0.0	2.1				

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	28.2
HCM 6th LOS	C

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	95	215	194	68	41	137	463	100	51	779	44
Future Volume (veh/h)	36	95	215	194	68	41	137	463	100	51	779	44
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		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	95	215	194	68	41	137	463	100	51	779	44
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	100	263	301	253	89	54	188	899	193	134	960	54
Arrive On Green	0.20	0.20	0.20	0.23	0.23	0.23	0.11	0.31	0.31	0.08	0.28	0.28
Sat Flow, veh/h	507	1338	1530	1119	392	237	1767	2869	615	1767	3390	191
Grp Volume(v), veh/h	131	0	215	303	0	0	137	283	280	51	405	418
Grp Sat Flow(s),veh/h/ln	1845	0	1530	1748	0	0	1767	1763	1721	1767	1763	1818
Q Serve(g_s), s	5.0	0.0	10.6	13.1	0.0	0.0	6.1	10.6	10.8	2.2	17.3	17.3
Cycle Q Clear(g_c), s	5.0	0.0	10.6	13.1	0.0	0.0	6.1	10.6	10.8	2.2	17.3	17.3
Prop In Lane	0.27		1.00	0.64		0.14	1.00		0.36	1.00		0.11
Lane Grp Cap(c), veh/h	363	0	301	396	0	0	188	553	539	134	499	515
V/C Ratio(X)	0.36	0.00	0.71	0.77	0.00	0.00	0.73	0.51	0.52	0.38	0.81	0.81
Avail Cap(c_a), veh/h	835	0	692	791	0	0	581	992	968	581	992	1023
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	28.0	0.0	30.3	29.2	0.0	0.0	34.9	22.6	22.7	35.5	26.9	26.9
Incr Delay (d2), s/veh	0.2	0.0	1.2	1.2	0.0	0.0	2.0	0.3	0.3	0.7	1.2	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	3.8	5.4	0.0	0.0	2.6	4.1	4.1	1.0	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.2	0.0	31.5	30.4	0.0	0.0	36.9	22.9	23.0	36.1	28.1	28.1
LnGrp LOS	C		C	C			D	C	C	D	C	C
Approach Vol, veh/h		346			303			700			874	
Approach Delay, s/veh		30.2			30.4			25.7			28.6	
Approach LOS		C			C			C			C	

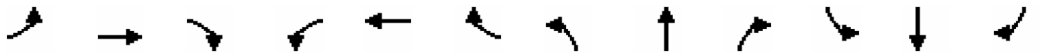
Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	21.8	12.1	27.4	19.4	9.6	29.9
Change Period (Y+Rc), s	3.5	3.5	* 4.6	3.5	3.5	* 4.6
Max Green Setting (Gmax), s	36.5	26.5	* 45	36.5	26.5	* 45
Max Q Clear Time (g_c+I1), s	15.1	8.1	19.3	12.6	4.2	12.8
Green Ext Time (p_c), s	1.2	0.1	3.6	0.9	0.0	2.1

Intersection Summary	
HCM 7th Control Delay, s/veh	28.2
HCM 7th LOS	C

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	291	1	220	258	586	0	0	678	560
Future Volume (vph)	0	0	0	291	1	220	258	586	0	0	678	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		50	200		0	0		75
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			35			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.98	0.99					0.97
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1649	1654	1553	1736	3471	0	0	3539	1583
Flt Permitted				0.950	0.953		0.950					
Satd. Flow (perm)	0	0	0	1649	1654	1532	1733	3471	0	0	3539	1541
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						218						302
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		1264			954			526			712	
Travel Time (s)		28.7			21.7			9.0			16.2	
Confl. Peds. (#/hr)	1					1	1		4	4		1
Confl. Bikes (#/hr)												2
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
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	0	0	0	291	1	220	258	586	0	0	678	560
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	145	147	220	258	586	0	0	678	560
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

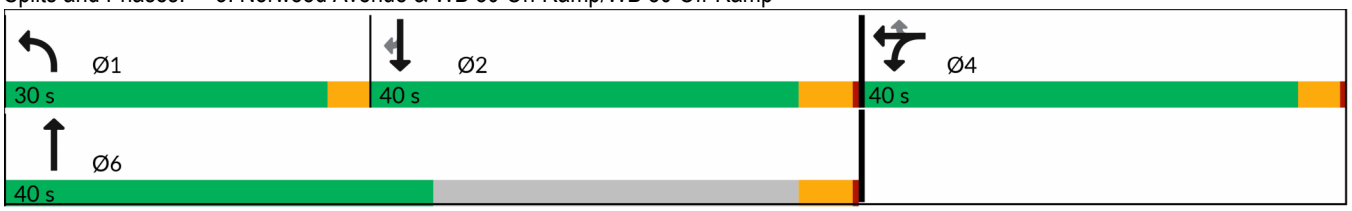


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Detector Phase				4	4	4	1	6			2	2
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	8.0	6.0			6.0	6.0
Minimum Split (s)				29.0	29.0	29.0	11.5	18.8			17.8	17.8
Total Split (s)				40.0	40.0	40.0	30.0	40.0			40.0	40.0
Total Split (%)				36.4%	36.4%	36.4%	27.3%	36.4%			36.4%	36.4%
Maximum Green (s)				36.0	36.0	36.0	26.5	35.2			35.2	35.2
Yellow Time (s)				3.5	3.5	3.5	3.5	4.3			4.3	4.3
All-Red Time (s)				0.5	0.5	0.5	0.0	0.5			0.5	0.5
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.0	4.0	4.0	3.5	4.8			4.8	4.8
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				2.0	2.0	2.0	2.5	2.5			2.5	2.5
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				18.0	18.0	18.0		7.0			6.0	6.0
Pedestrian Calls (#/hr)				2	2	2		2			2	2
Act Effct Green (s)				12.9	12.9	12.9	15.7	43.9			24.4	24.4
Actuated g/C Ratio				0.19	0.19	0.19	0.24	0.66			0.37	0.37
v/c Ratio				0.45	0.45	0.46	0.62	0.25			0.52	0.74
Control Delay (s/veh)				31.9	32.0	8.1	33.0	5.1			19.2	16.0
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay (s/veh)				31.9	32.0	8.1	33.0	5.1			19.2	16.0
LOS				C	C	A	C	A			B	B
Approach Delay (s/veh)					21.8			13.7			17.8	
Approach LOS					C			B			B	
Queue Length 50th (ft)				52	53	1	87	35			100	72
Queue Length 95th (ft)				137	138	57	222	96			230	283
Internal Link Dist (ft)		1184			874			446			632	
Turn Bay Length (ft)						50	200					75
Base Capacity (vph)				976	979	996	756	3116			2049	1019
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	0.15	0.22	0.34	0.19			0.33	0.55

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 66.5			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay (s/veh): 17.2		Intersection LOS: B	

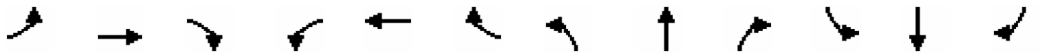
Intersection Capacity Utilization 68.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Norwood Avenue & WB 80 On-Ramp/WB 80 Off-Ramp



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	145	147	220	258	586	678	560
v/c Ratio	0.45	0.45	0.46	0.62	0.25	0.52	0.74
Control Delay (s/veh)	31.9	32.0	8.1	33.0	5.1	19.2	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	31.9	32.0	8.1	33.0	5.1	19.2	16.0
Queue Length 50th (ft)	52	53	1	87	35	100	72
Queue Length 95th (ft)	137	138	57	222	96	230	283
Internal Link Dist (ft)		874			446	632	
Turn Bay Length (ft)			50	200			75
Base Capacity (vph)	976	979	996	756	3116	2049	1019
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	0.15	0.22	0.34	0.19	0.33	0.55

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	291	1	220	258	586	0	0	678	560
Future Volume (veh/h)	0	0	0	291	1	220	258	586	0	0	678	560
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
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				292	0	0	258	586	0	0	678	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				675	0		333	2064	0	0	1115	
Arrive On Green				0.19	0.00	0.00	0.19	0.59	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				292	0	0	258	586	0	0	678	0
Grp Sat Flow(s),veh/h/ln				1753	0	1560	1753	1749	0	0	1777	1585
Q Serve(g_s), s				3.0	0.0	0.0	5.7	3.3	0.0	0.0	6.6	0.0
Cycle Q Clear(g_c), s				3.0	0.0	0.0	5.7	3.3	0.0	0.0	6.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				675	0		333	2064	0	0	1115	
V/C Ratio(X)				0.43	0.00		0.77	0.28	0.00	0.00	0.61	
Avail Cap(c_a), veh/h				3115	0		1147	3039	0	0	3088	
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				14.4	0.0	0.0	15.6	4.1	0.0	0.0	11.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	2.9	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				1.0	0.0	0.0	2.0	0.5	0.0	0.0	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				14.6	0.0	0.0	18.5	4.1	0.0	0.0	12.2	0.0
LnGrp LOS				B			B	A			B	
Approach Vol, veh/h					292			844			678	
Approach Delay, s/veh					14.6			8.5			12.2	
Approach LOS					B			A			B	

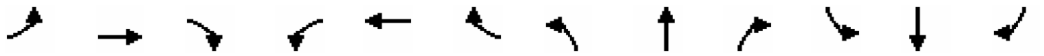
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.2	17.5		11.8		28.7						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	7.7	8.6		5.0		5.3						
Green Ext Time (p_c), s	0.5	4.2		0.5		3.2						

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		10.9
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	291	1	220	258	586	0	0	678	560
Future Volume (veh/h)	0	0	0	291	1	220	258	586	0	0	678	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				292	0	0	258	586	0	0	678	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				675	0		333	2064	0	0	1115	
Arrive On Green				0.19	0.00	0.00	0.19	0.59	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				292	0	0	258	586	0	0	678	0
Grp Sat Flow(s),veh/h/ln				1753	0	1560	1753	1749	0	0	1777	1585
Q Serve(g_s), s				3.0	0.0	0.0	5.7	3.3	0.0	0.0	6.6	0.0
Cycle Q Clear(g_c), s				3.0	0.0	0.0	5.7	3.3	0.0	0.0	6.6	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				675	0		333	2064	0	0	1115	
V/C Ratio(X)				0.43	0.00		0.77	0.28	0.00	0.00	0.61	
Avail Cap(c_a), veh/h				3115	0		1147	3039	0	0	3088	
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				14.4	0.0	0.0	15.6	4.1	0.0	0.0	11.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	2.9	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				1.0	0.0	0.0	2.0	0.5	0.0	0.0	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				14.6	0.0	0.0	18.5	4.1	0.0	0.0	12.2	0.0
LnGrp LOS				B			B	A			B	
Approach Vol, veh/h					292			844			678	
Approach Delay, s/veh					14.6			8.5			12.2	
Approach LOS					B			A			B	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.2	17.5		11.8		28.7						
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	7.7	8.6		5.0		5.3						
Green Ext Time (p_c), s	0.5	4.2		0.5		3.2						

Intersection Summary		
HCM 7th Control Delay, s/veh		10.9
HCM 7th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

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

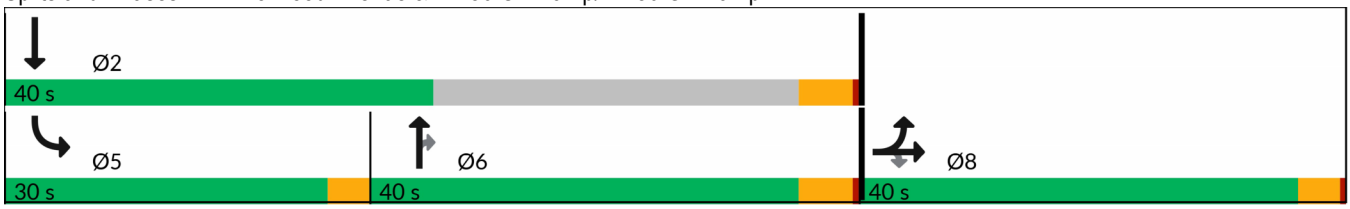
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	274	1	376	0	0	0	0	570	289	367	602	0
Future Volume (vph)	274	1	376	0	0	0	0	570	289	367	602	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		220	180		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			35		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98						0.97	0.99		
Frt			0.850						0.850			
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1633	1638	1538	0	0	0	0	3471	1553	1736	3471	0
Flt Permitted	0.950	0.953								0.950		
Satd. Flow (perm)	1633	1638	1518	0	0	0	0	3471	1517	1728	3471	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			282						289			
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		759			1046			737			526	
Travel Time (s)		17.3			23.8			12.6			12.0	
Confl. Peds. (#/hr)			1	1			7		4	4		7
Confl. Bikes (#/hr)									2			3
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
Heavy Vehicles (%)	5%	5%	5%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	274	1	376	0	0	0	0	570	289	367	602	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	137	138	376	0	0	0	0	570	289	367	602	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Split	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	8	8						6		5	2	
Permitted Phases			8						6			
Detector Phase	8	8	8					6	6	5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0					6.0	6.0	8.0	6.0	
Minimum Split (s)	29.0	29.0	29.0					17.8	17.8	11.5	18.8	
Total Split (s)	40.0	40.0	40.0					40.0	40.0	30.0	40.0	
Total Split (%)	36.4%	36.4%	36.4%					36.4%	36.4%	27.3%	36.4%	
Maximum Green (s)	36.0	36.0	36.0					35.2	35.2	26.5	35.2	
Yellow Time (s)	3.5	3.5	3.5					4.3	4.3	3.5	4.3	
All-Red Time (s)	0.5	0.5	0.5					0.5	0.5	0.0	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0					4.8	4.8	3.5	4.8	
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0	2.0					2.5	2.5	2.5	2.5	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	18.0	18.0	18.0					6.0	6.0		7.0	
Pedestrian Calls (#/hr)	2	2	2					2	2		2	
Act Effct Green (s)	13.3	13.3	13.3					17.6	17.6	20.4	41.8	
Actuated g/C Ratio	0.21	0.21	0.21					0.27	0.27	0.32	0.65	
v/c Ratio	0.40	0.40	0.70					0.60	0.46	0.66	0.26	
Control Delay (s/veh)	28.3	28.4	15.2					24.4	5.8	28.2	5.5	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay (s/veh)	28.3	28.4	15.2					24.4	5.8	28.2	5.5	
LOS	C	C	B					C	A	C	A	
Approach Delay (s/veh)		20.8						18.2			14.1	
Approach LOS		C						B			B	
Queue Length 50th (ft)	48	49	31					95	0	114	37	
Queue Length 95th (ft)	118	120	132					196	57	#295	100	
Internal Link Dist (ft)		679			966			657			446	
Turn Bay Length (ft)			50						220	180		
Base Capacity (vph)	968	971	1014					2012	1001	757	3211	
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	0.14	0.14	0.37					0.28	0.29	0.48	0.19	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 64.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay (s/veh): 17.3		Intersection LOS: B	

Intersection Capacity Utilization 68.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

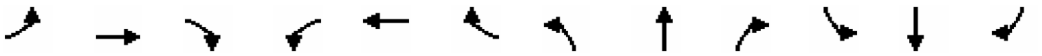
Splits and Phases: 4: Norwood Avenue & EB 80 Off-Ramp/EB 80 On-Ramp



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	137	138	376	570	289	367	602
v/c Ratio	0.40	0.40	0.70	0.60	0.46	0.66	0.26
Control Delay (s/veh)	28.3	28.4	15.2	24.4	5.8	28.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	28.3	28.4	15.2	24.4	5.8	28.2	5.5
Queue Length 50th (ft)	48	49	31	95	0	114	37
Queue Length 95th (ft)	118	120	132	196	57	#295	100
Internal Link Dist (ft)		679		657			446
Turn Bay Length (ft)			50		220	180	
Base Capacity (vph)	968	971	1014	2012	1001	757	3211
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	0.14	0.14	0.37	0.28	0.29	0.48	0.19

Intersection Summary

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

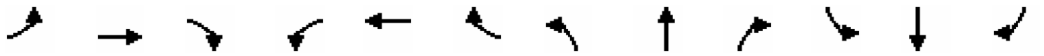


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	1	376	0	0	0	0	570	289	367	602	0
Future Volume (veh/h)	274	1	376	0	0	0	0	570	289	367	602	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
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	275	0	0				0	570	0	367	602	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	698	0					0	915		450	2092	0
Arrive On Green	0.20	0.00	0.00				0.00	0.26	0.00	0.26	0.60	0.00
Sat Flow, veh/h	3478	0	1547				0	3589	1560	1753	3589	0
Grp Volume(v), veh/h	275	0	0				0	570	0	367	602	0
Grp Sat Flow(s),veh/h/ln	1739	0	1547				0	1749	1560	1753	1749	0
Q Serve(g_s), s	3.0	0.0	0.0				0.0	6.3	0.0	8.6	3.7	0.0
Cycle Q Clear(g_c), s	3.0	0.0	0.0				0.0	6.3	0.0	8.6	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	698	0					0	915		450	2092	0
V/C Ratio(X)	0.39	0.00					0.00	0.62		0.82	0.29	0.00
Avail Cap(c_a), veh/h	2862	0					0	2814		1062	2814	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	15.2	0.0	0.0				0.0	14.3	0.0	15.3	4.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0				0.0	0.5	0.0	2.7	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	1.0	0.0	0.0				0.0	2.0	0.0	3.2	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.3	0.0	0.0				0.0	14.8	0.0	18.0	4.3	0.0
LnGrp LOS	B							B		B	A	
Approach Vol, veh/h		275						570			969	
Approach Delay, s/veh		15.3						14.8			9.5	
Approach LOS		B						B			A	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			14.7	16.2		12.8				
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			10.6	8.3		5.0				
Green Ext Time (p_c), s		3.7			0.7	3.1		0.5				

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		12.0
HCM 6th LOS		B

Notes
User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [NBR, EBR] 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)	274	1	376	0	0	0	0	570	289	367	602	0
Future Volume (veh/h)	274	1	376	0	0	0	0	570	289	367	602	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	275	0	0				0	570	0	367	602	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	698	0					0	915		450	2092	0
Arrive On Green	0.20	0.00	0.00				0.00	0.26	0.00	0.26	0.60	0.00
Sat Flow, veh/h	3478	0	1547				0	3589	1560	1753	3589	0
Grp Volume(v), veh/h	275	0	0				0	570	0	367	602	0
Grp Sat Flow(s),veh/h/ln	1739	0	1547				0	1749	1560	1753	1749	0
Q Serve(g_s), s	3.0	0.0	0.0				0.0	6.3	0.0	8.6	3.7	0.0
Cycle Q Clear(g_c), s	3.0	0.0	0.0				0.0	6.3	0.0	8.6	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	698	0					0	915		450	2092	0
V/C Ratio(X)	0.39	0.00					0.00	0.62		0.82	0.29	0.00
Avail Cap(c_a), veh/h	2862	0					0	2814		1062	2814	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	15.2	0.0	0.0				0.0	14.3	0.0	15.3	4.3	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0				0.0	0.5	0.0	2.7	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	1.0	0.0	0.0				0.0	2.0	0.0	3.2	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.3	0.0	0.0				0.0	14.8	0.0	18.0	4.3	0.0
LnGrp LOS	B							B		B	A	
Approach Vol, veh/h		275						570			969	
Approach Delay, s/veh		15.3						14.8			9.5	
Approach LOS		B						B			A	

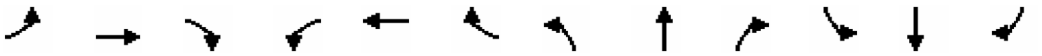
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.0			14.7	16.2		12.8				
Change Period (Y+Rc), s		4.8			3.5	4.8		4.0				
Max Green Setting (Gmax), s		35.2			26.5	35.2		36.0				
Max Q Clear Time (g_c+I1), s		5.7			10.6	8.3		5.0				
Green Ext Time (p_c), s		3.7			0.7	3.1		0.5				

Intersection Summary			
HCM 7th Control Delay, s/veh		12.0	
HCM 7th LOS		B	

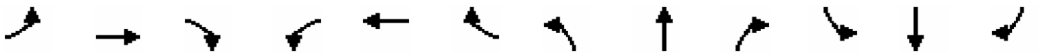
Notes

User approved volume balancing among the lanes for turning movement.

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	13	31	9	26	87	44	665	11	56	623	305
Future Volume (vph)	122	13	31	9	26	87	44	665	11	56	623	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		140	100		0	85		0	110		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			35			40			30		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.97		0.99	0.98	0.99	0.99			0.99	
Frt			0.850			0.850		0.998			0.951	
Flt Protected		0.957			0.987		0.950			0.950		
Satd. Flow (prot)	0	1609	1429	0	1786	1538	1770	3531	0	1736	3272	0
Flt Permitted		0.957			0.987		0.950			0.950		
Satd. Flow (perm)	0	1609	1398	0	1782	1518	1768	3531	0	1736	3272	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			37			87		1			48	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		735			595			331			737	
Travel Time (s)		16.7			13.5			5.6			16.8	
Confl. Peds. (#/hr)			5	5			1					1
Confl. Bikes (#/hr)			1			1			2			2
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
Heavy Vehicles (%)	13%	13%	13%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Adj. Flow (vph)	122	13	31	9	26	87	44	665	11	56	623	305
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	31	0	35	87	44	676	0	56	928	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

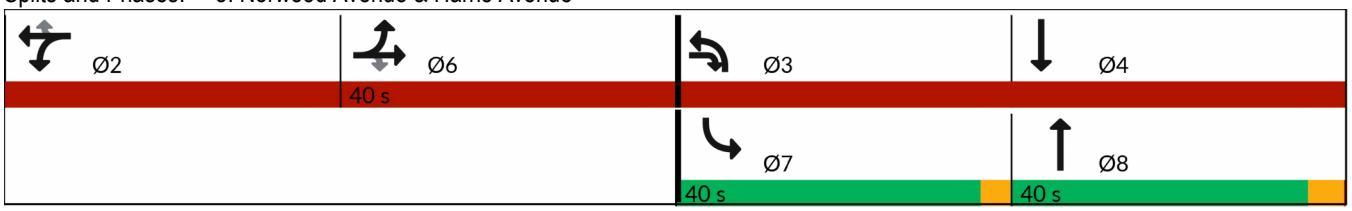


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	6	6	3	2	2		3	8		7	4	
Permitted Phases			6			2						
Detector Phase	6	6	3	2	2	2	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	11.0	11.0	11.0	10.0	7.0		9.0	8.0	
Minimum Split (s)	28.6	28.6	13.5	14.8	14.8	14.8	13.5	19.6		12.5	25.6	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0		40.0	40.0	
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	36.4	36.4	36.5	36.2	36.2	36.2	36.5	35.4		36.5	35.4	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.3		3.5	4.3	
All-Red Time (s)	0.1	0.1	0.0	0.3	0.3	0.3	0.0	0.3		0.0	0.3	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		3.6	3.5		3.8	3.8	3.5	4.6		3.5	4.6	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5		2.0	2.5	
Recall Mode	None	None	None	None	None	None	None	None		None	None	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	18.0	18.0						8.0			14.0	
Pedestrian Calls (#/hr)	2	2						2			2	
Act Effct Green (s)		13.7	24.2		11.5	11.5	10.4	37.4		9.5	36.9	
Actuated g/C Ratio		0.17	0.30		0.14	0.14	0.13	0.47		0.12	0.46	
v/c Ratio		0.49	0.06		0.13	0.29	0.19	0.40		0.27	0.60	
Control Delay (s/veh)		38.7	5.9		36.8	12.0	38.5	18.1		40.6	20.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		38.7	5.9		36.8	12.0	38.5	18.1		40.6	20.6	
LOS		D	A		D	B	D	B		D	C	
Approach Delay (s/veh)		32.6			19.2			19.4			21.8	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		67	0		16	0	21	124		27	186	
Queue Length 95th (ft)		120	15		50	44	60	224		71	324	
Internal Link Dist (ft)		655			515			251			657	
Turn Bay Length (ft)			140				85			110		
Base Capacity (vph)		761	931		840	760	839	1650		823	1531	
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		0.18	0.03		0.04	0.11	0.05	0.41		0.07	0.61	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 80.1			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay (s/veh): 21.7		Intersection LOS: C	

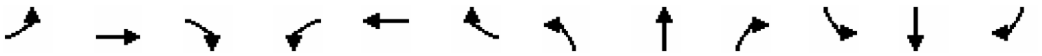
Intersection Capacity Utilization 61.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Norwood Avenue & Harris Avenue



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	135	31	35	87	44	676	56	928
v/c Ratio	0.49	0.06	0.13	0.29	0.19	0.40	0.27	0.60
Control Delay (s/veh)	38.7	5.9	36.8	12.0	38.5	18.1	40.6	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.7	5.9	36.8	12.0	38.5	18.1	40.6	20.6
Queue Length 50th (ft)	67	0	16	0	21	124	27	186
Queue Length 95th (ft)	120	15	50	44	60	224	71	324
Internal Link Dist (ft)	655		515			251		657
Turn Bay Length (ft)		140			85		110	
Base Capacity (vph)	761	931	840	760	839	1650	823	1531
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	0.18	0.03	0.04	0.11	0.05	0.41	0.07	0.61

Intersection Summary



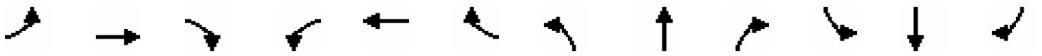
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	13	31	9	26	87	44	665	11	56	623	305
Future Volume (veh/h)	122	13	31	9	26	87	44	665	11	56	623	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.96	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1826	1826	1826	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	122	13	31	9	26	87	44	665	11	56	623	305
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	236	25	350	71	205	229	152	1261	21	156	804	394
Arrive On Green	0.16	0.16	0.16	0.15	0.15	0.15	0.09	0.35	0.35	0.09	0.36	0.36
Sat Flow, veh/h	1476	157	1414	464	1339	1491	1781	3576	59	1753	2255	1104
Grp Volume(v), veh/h	135	0	31	35	0	87	44	330	346	56	483	445
Grp Sat Flow(s),veh/h/ln	1634	0	1414	1803	0	1491	1781	1777	1858	1753	1749	1611
Q Serve(g_s), s	4.8	0.0	1.1	1.1	0.0	3.3	1.5	9.4	9.4	1.9	15.5	15.6
Cycle Q Clear(g_c), s	4.8	0.0	1.1	1.1	0.0	3.3	1.5	9.4	9.4	1.9	15.5	15.6
Prop In Lane	0.90		1.00	0.26		1.00	1.00		0.03	1.00		0.69
Lane Grp Cap(c), veh/h	262	0	350	277	0	229	152	627	655	156	624	574
V/C Ratio(X)	0.52	0.00	0.09	0.13	0.00	0.38	0.29	0.53	0.53	0.36	0.77	0.77
Avail Cap(c_a), veh/h	939	0	936	1030	0	852	1027	993	1039	1010	977	900
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	24.3	0.0	18.4	23.1	0.0	24.1	27.2	16.3	16.3	27.1	18.1	18.1
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.1	0.0	0.4	0.4	0.5	0.5	0.5	1.6	1.7
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	1.8	0.0	0.3	0.4	0.0	1.1	0.6	3.3	3.5	0.8	5.9	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.9	0.0	18.5	23.2	0.0	24.5	27.6	16.8	16.8	27.7	19.7	19.8
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		166			122			720			984	
Approach Delay, s/veh		23.7			24.1			17.5			20.2	
Approach LOS		C			C			B			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.5	8.9	27.2		13.7	9.1	26.9				
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		5.3	3.5	17.6		6.8	3.9	11.4				
Green Ext Time (p_c), s		0.3	0.0	5.0		0.6	0.1	3.1				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			19.7									
HCM 6th LOS			B									

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	13	31	9	26	87	44	665	11	56	623	305
Future Volume (veh/h)	122	13	31	9	26	87	44	665	11	56	623	305
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		0.96	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1826	1826	1826	1870	1870	1870	1841	1841	1841
Adj Flow Rate, veh/h	122	13	31	9	26	87	44	665	11	56	623	305
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	236	25	350	71	205	229	152	1261	21	156	804	394
Arrive On Green	0.16	0.16	0.16	0.15	0.15	0.15	0.09	0.35	0.35	0.09	0.36	0.36
Sat Flow, veh/h	1476	157	1414	464	1339	1491	1781	3576	59	1753	2255	1104
Grp Volume(v), veh/h	135	0	31	35	0	87	44	330	346	56	483	445
Grp Sat Flow(s),veh/h/ln	1634	0	1414	1803	0	1491	1781	1777	1858	1753	1749	1611
Q Serve(g_s), s	4.8	0.0	1.1	1.1	0.0	3.3	1.5	9.4	9.4	1.9	15.5	15.6
Cycle Q Clear(g_c), s	4.8	0.0	1.1	1.1	0.0	3.3	1.5	9.4	9.4	1.9	15.5	15.6
Prop In Lane	0.90		1.00	0.26		1.00	1.00		0.03	1.00		0.69
Lane Grp Cap(c), veh/h	262	0	350	277	0	229	152	627	655	156	624	574
V/C Ratio(X)	0.52	0.00	0.09	0.13	0.00	0.38	0.29	0.53	0.53	0.36	0.77	0.77
Avail Cap(c_a), veh/h	939	0	936	1030	0	852	1027	993	1039	1010	977	900
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	24.3	0.0	18.4	23.1	0.0	24.1	27.2	16.3	16.3	27.1	18.1	18.1
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.1	0.0	0.4	0.4	0.5	0.5	0.5	1.6	1.7
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	1.8	0.0	0.3	0.4	0.0	1.1	0.6	3.3	3.5	0.8	5.9	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.9	0.0	18.5	23.2	0.0	24.5	27.6	16.8	16.8	27.7	19.7	19.8
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		166			122			720			984	
Approach Delay, s/veh		23.7			24.1			17.5			20.2	
Approach LOS		C			C			B			C	

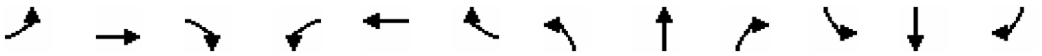
Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	13.5	8.9	27.2	13.7	9.1	26.9
Change Period (Y+Rc), s	3.8	3.5	* 4.6	3.6	3.5	* 4.6
Max Green Setting (Gmax), s	36.2	36.5	* 35	36.4	36.5	* 35
Max Q Clear Time (g_c+I1), s	5.3	3.5	17.6	6.8	3.9	11.4
Green Ext Time (p_c), s	0.3	0.0	5.0	0.6	0.1	3.1

Intersection Summary	
HCM 7th Control Delay, s/veh	19.7
HCM 7th LOS	B

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	74	93	22	84	39	107	547	16	23	465	186
Future Volume (vph)	203	74	93	22	84	39	107	547	16	23	465	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	105		0	0		0	90		0	50		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			35			55		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		0.99	0.99		0.99	0.99	
Frt		0.916			0.952			0.996			0.957	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1641	0	1752	1746	0	1770	3522	0	1752	3324	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1712	1641	0	1748	1746	0	1764	3522	0	1741	3324	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			16			2			45	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		790			308			560			983	
Travel Time (s)		18.0			7.0			9.5			22.3	
Confl. Peds. (#/hr)	3		2	2		3	3		4	4		3
Confl. Bikes (#/hr)			2			2						2
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
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	203	74	93	22	84	39	107	547	16	23	465	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	203	167	0	22	123	0	107	563	0	23	651	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

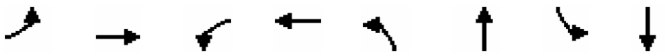


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	9.0		10.0	10.0		9.0	8.0		9.0	8.0	
Minimum Split (s)	13.5	27.9		13.5	27.5		12.5	23.6		12.5	27.6	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	40.0		30.0	40.0	
Total Split (%)	23.1%	23.1%		23.1%	23.1%		23.1%	30.8%		23.1%	30.8%	
Maximum Green (s)	26.5	26.1		26.5	26.5		26.5	35.4		26.5	35.4	
Yellow Time (s)	3.5	3.9		3.5	3.5		3.5	4.3		3.5	4.3	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.3		0.0	0.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.5	3.9		3.5	3.5		3.5	4.6		3.5	4.6	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		17.0			17.0			12.0			16.0	
Pedestrian Calls (#/hr)		2			2			2			2	
Act Effct Green (s)	15.1	27.3		11.0	13.1		11.3	27.2		9.9	20.1	
Actuated g/C Ratio	0.21	0.38		0.15	0.18		0.16	0.38		0.14	0.28	
v/c Ratio	0.56	0.25		0.08	0.37		0.38	0.42		0.09	0.67	
Control Delay (s/veh)	36.5	17.6		37.7	31.1		38.2	19.5		38.7	27.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	36.5	17.6		37.7	31.1		38.2	19.5		38.7	27.1	
LOS	D	B		D	C		D	B		D	C	
Approach Delay (s/veh)		28.0			32.2			22.5			27.6	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	75	31		8	40		41	71		8	114	
Queue Length 95th (ft)	208	119		41	120		128	213		43	264	
Internal Link Dist (ft)		710			228			480			903	
Turn Bay Length (ft)	105						90			50		
Base Capacity (vph)	695	715		708	715		715	1930		708	1816	
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	0.29	0.23		0.03	0.17		0.15	0.29		0.03	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 72.1			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay (s/veh): 26.2		Intersection LOS: C	

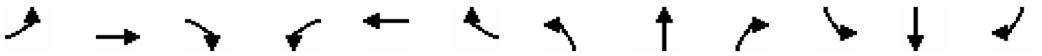
Intersection Capacity Utilization 60.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Norwood Avenue & Silver Eagle Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	203	167	22	123	107	563	23	651
v/c Ratio	0.56	0.25	0.08	0.37	0.38	0.42	0.09	0.67
Control Delay (s/veh)	36.5	17.6	37.7	31.1	38.2	19.5	38.7	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	36.5	17.6	37.7	31.1	38.2	19.5	38.7	27.1
Queue Length 50th (ft)	75	31	8	40	41	71	8	114
Queue Length 95th (ft)	208	119	41	120	128	213	43	264
Internal Link Dist (ft)		710		228		480		903
Turn Bay Length (ft)	105				90		50	
Base Capacity (vph)	695	715	708	715	715	1930	708	1816
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	0.29	0.23	0.03	0.17	0.15	0.29	0.03	0.36

Intersection Summary



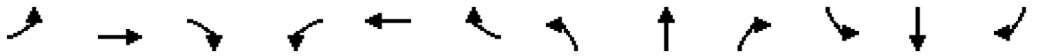
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	74	93	22	84	39	107	547	16	23	465	186
Future Volume (veh/h)	203	74	93	22	84	39	107	547	16	23	465	186
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.99	1.00		0.97
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	203	74	93	22	84	39	107	547	16	23	465	186
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	297	200	252	91	188	87	232	1221	36	85	646	256
Arrive On Green	0.17	0.28	0.28	0.05	0.16	0.16	0.13	0.35	0.35	0.05	0.26	0.26
Sat Flow, veh/h	1739	723	909	1767	1185	550	1781	3525	103	1767	2441	968
Grp Volume(v), veh/h	203	0	167	22	0	123	107	275	288	23	335	316
Grp Sat Flow(s),veh/h/ln	1739	0	1632	1767	0	1735	1781	1777	1851	1767	1763	1646
Q Serve(g_s), s	6.2	0.0	4.6	0.7	0.0	3.6	3.1	6.7	6.7	0.7	9.7	9.8
Cycle Q Clear(g_c), s	6.2	0.0	4.6	0.7	0.0	3.6	3.1	6.7	6.7	0.7	9.7	9.8
Prop In Lane	1.00		0.56	1.00		0.32	1.00		0.06	1.00		0.59
Lane Grp Cap(c), veh/h	297	0	452	91	0	275	232	616	641	85	467	436
V/C Ratio(X)	0.68	0.00	0.37	0.24	0.00	0.45	0.46	0.45	0.45	0.27	0.72	0.73
Avail Cap(c_a), veh/h	821	0	758	834	0	819	841	1120	1167	834	1112	1038
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	21.9	0.0	16.3	25.6	0.0	21.4	22.6	14.2	14.2	25.8	18.7	18.8
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.5	0.0	0.4	0.5	0.2	0.2	0.6	0.8	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	1.6	0.3	0.0	1.4	1.2	2.3	2.4	0.3	3.6	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.9	0.0	16.5	26.1	0.0	21.8	23.1	14.4	14.4	26.4	19.5	19.7
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		370			145			670			674	
Approach Delay, s/veh		20.0			22.5			15.8			19.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	12.8	10.8	19.5	6.4	19.5	6.2	24.1
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	8.2	5.6	5.1	11.8	2.7	6.6	2.7	8.7
Green Ext Time (p_c), s	0.3	0.4	0.1	2.8	0.0	0.6	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	18.6
HCM 6th LOS	B

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	74	93	22	84	39	107	547	16	23	465	186
Future Volume (veh/h)	203	74	93	22	84	39	107	547	16	23	465	186
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		0.97	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	203	74	93	22	84	39	107	547	16	23	465	186
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	297	200	252	91	188	87	232	1221	36	85	646	256
Arrive On Green	0.17	0.28	0.28	0.05	0.16	0.16	0.13	0.35	0.35	0.05	0.26	0.26
Sat Flow, veh/h	1739	723	909	1767	1185	550	1781	3525	103	1767	2441	968
Grp Volume(v), veh/h	203	0	167	22	0	123	107	275	288	23	335	316
Grp Sat Flow(s),veh/h/ln	1739	0	1632	1767	0	1735	1781	1777	1851	1767	1763	1646
Q Serve(g_s), s	6.2	0.0	4.6	0.7	0.0	3.6	3.1	6.7	6.7	0.7	9.7	9.8
Cycle Q Clear(g_c), s	6.2	0.0	4.6	0.7	0.0	3.6	3.1	6.7	6.7	0.7	9.7	9.8
Prop In Lane	1.00		0.56	1.00		0.32	1.00		0.06	1.00		0.59
Lane Grp Cap(c), veh/h	297	0	452	91	0	275	232	616	641	85	467	436
V/C Ratio(X)	0.68	0.00	0.37	0.24	0.00	0.45	0.46	0.45	0.45	0.27	0.72	0.73
Avail Cap(c_a), veh/h	821	0	758	834	0	819	841	1120	1167	834	1112	1038
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	21.9	0.0	16.3	25.6	0.0	21.4	22.6	14.2	14.2	25.8	18.7	18.8
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.5	0.0	0.4	0.5	0.2	0.2	0.6	0.8	0.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	1.6	0.3	0.0	1.4	1.2	2.3	2.4	0.3	3.6	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.9	0.0	16.5	26.1	0.0	21.8	23.1	14.4	14.4	26.4	19.5	19.7
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		370			145			670			674	
Approach Delay, s/veh		20.0			22.5			15.8			19.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	12.8	10.8	19.5	6.4	19.5	6.2	24.1
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	8.2	5.6	5.1	11.8	2.7	6.6	2.7	8.7
Green Ext Time (p_c), s	0.3	0.4	0.1	2.8	0.0	0.6	0.0	2.0

Intersection Summary	
HCM 7th Control Delay, s/veh	18.6
HCM 7th LOS	B

Notes

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

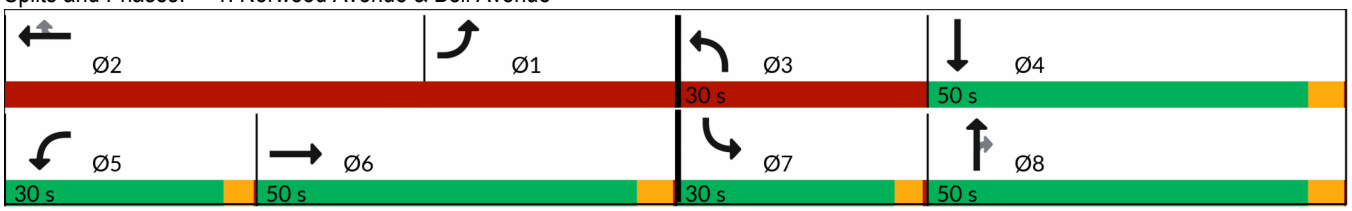
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	51	79	134	60	69	110	382	205	73	395	15
Future Volume (vph)	11	51	79	134	60	69	110	382	205	73	395	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	195		200	70		200	90		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	35			50			70			45		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98		0.99		0.97	0.99		0.97		0.99	
Frt		0.909				0.850			0.850		0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1687	0	1770	1863	1583	1787	3574	1599	1787	3552	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1777	1687	0	1756	1863	1548	1778	3574	1561	1787	3552	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49				69			205		2	
Link Speed (mph)		25			40			40			30	
Link Distance (ft)		958			1056			1318			533	
Travel Time (s)		26.1			18.0			22.5			12.1	
Confl. Peds. (#/hr)	3		5	5		3	2					2
Confl. Bikes (#/hr)			2			5			3			1
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
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	11	51	79	134	60	69	110	382	205	73	395	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	130	0	134	60	69	110	382	205	73	410	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			
Detector Phase	1	6		5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	11.0	9.0		11.0	9.0	9.0	10.0	9.0	9.0	11.0	8.0	
Minimum Split (s)	14.8	31.6		14.8	27.6	27.6	13.6	27.6	27.6	14.9	21.6	
Total Split (s)	30.0	50.0		30.0	50.0	50.0	30.0	50.0	50.0	30.0	50.0	
Total Split (%)	18.8%	31.3%		18.8%	31.3%	31.3%	18.8%	31.3%	31.3%	18.8%	31.3%	
Maximum Green (s)	26.2	45.4		26.2	45.4	45.4	26.4	45.4	45.4	26.1	45.4	
Yellow Time (s)	3.5	4.3		3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.3	
All-Red Time (s)	0.3	0.3		0.3	0.3	0.3	0.1	0.3	0.3	0.4	0.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.8	4.6		3.8	4.6	4.6	3.6	4.6	4.6	3.9	4.6	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		20.0			16.0	16.0		16.0	16.0		10.0	
Pedestrian Calls (#/hr)		2			2	2		2	2		2	
Act Effct Green (s)	13.0	12.2		12.6	21.2	21.2	11.4	13.2	13.2	11.9	13.6	
Actuated g/C Ratio	0.21	0.19		0.20	0.33	0.33	0.18	0.21	0.21	0.19	0.21	
v/c Ratio	0.03	0.35		0.38	0.09	0.12	0.34	0.51	0.42	0.21	0.53	
Control Delay (s/veh)	25.8	19.5		30.6	18.8	7.1	31.2	26.6	7.3	29.9	26.8	
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)	25.8	19.5		30.6	18.8	7.1	31.2	26.6	7.3	29.9	26.8	
LOS	C	B		C	B	A	C	C	A	C	C	
Approach Delay (s/veh)		20.0			21.8			21.7			27.4	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	3	26		42	13	0	35	65	0	22	68	
Queue Length 95th (ft)	20	83		131	61	33	112	147	54	84	163	
Internal Link Dist (ft)		878			976			1238			453	
Turn Bay Length (ft)	150			195		200	70		200	90		
Base Capacity (vph)	790	1278		782	1398	1178	796	2681	1222	787	2666	
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	0.01	0.10		0.17	0.04	0.06	0.14	0.14	0.17	0.09	0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 63.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay (s/veh): 23.3		Intersection LOS: C	

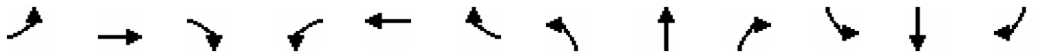
Intersection Capacity Utilization 53.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Norwood Avenue & Bell Avenue



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	130	134	60	69	110	382	205	73	410
v/c Ratio	0.03	0.35	0.38	0.09	0.12	0.34	0.51	0.42	0.21	0.53
Control Delay (s/veh)	25.8	19.5	30.6	18.8	7.1	31.2	26.6	7.3	29.9	26.8
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)	25.8	19.5	30.6	18.8	7.1	31.2	26.6	7.3	29.9	26.8
Queue Length 50th (ft)	3	26	42	13	0	35	65	0	22	68
Queue Length 95th (ft)	20	83	131	61	33	112	147	54	84	163
Internal Link Dist (ft)		878		976			1238			453
Turn Bay Length (ft)	150		195		200	70		200	90	
Base Capacity (vph)	790	1278	782	1398	1178	796	2681	1222	787	2666
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	0.01	0.10	0.17	0.04	0.06	0.14	0.14	0.17	0.09	0.15

Intersection Summary



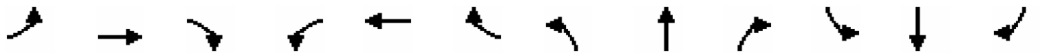
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	51	79	134	60	69	110	382	205	73	395	15
Future Volume (veh/h)	11	51	79	134	60	69	110	382	205	73	395	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	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	11	51	79	134	60	69	110	382	205	73	395	15
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	305	105	162	325	296	244	277	676	292	249	629	24
Arrive On Green	0.17	0.16	0.16	0.18	0.16	0.16	0.15	0.19	0.19	0.14	0.18	0.18
Sat Flow, veh/h	1795	650	1007	1781	1870	1543	1795	3582	1548	1795	3515	133
Grp Volume(v), veh/h	11	0	130	134	60	69	110	382	205	73	201	209
Grp Sat Flow(s),veh/h/ln	1795	0	1657	1781	1870	1543	1795	1791	1548	1795	1791	1857
Q Serve(g_s), s	0.3	0.0	3.7	3.4	1.4	1.3	2.8	5.0	3.6	1.9	5.3	5.4
Cycle Q Clear(g_c), s	0.3	0.0	3.7	3.4	1.4	1.3	2.8	5.0	3.6	1.9	5.3	5.4
Prop In Lane	1.00		0.61	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	305	0	267	325	296	244	277	676	292	249	321	333
V/C Ratio(X)	0.04	0.00	0.49	0.41	0.20	0.28	0.40	0.56	0.70	0.29	0.63	0.63
Avail Cap(c_a), veh/h	915	0	1464	908	1653	1363	922	3165	1368	912	1582	1641
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	17.8	0.0	19.6	18.6	18.8	7.5	19.6	18.9	6.3	19.9	19.5	19.5
Incr Delay (d2), s/veh	0.0	0.0	0.5	0.3	0.1	0.2	0.3	0.3	1.2	0.2	0.8	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.3	1.2	0.5	0.6	1.0	1.8	1.9	0.7	2.1	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.8	0.0	20.1	18.9	18.9	7.7	19.9	19.2	7.5	20.1	20.2	20.2
LnGrp LOS	B		C	B	B	A	B	B	A	C	C	C
Approach Vol, veh/h		141			263			697			483	
Approach Delay, s/veh		19.9			16.0			15.9			20.2	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	12.7	11.5	13.8	13.2	12.9	11.0	14.3
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	2.3	3.4	4.8	7.4	5.4	5.7	3.9	7.0
Green Ext Time (p_c), s	0.0	0.3	0.1	1.6	0.2	0.6	0.1	1.9

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	17.6
HCM 6th LOS	B

Notes

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



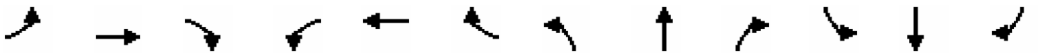
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	51	79	134	60	69	110	382	205	73	395	15
Future Volume (veh/h)	11	51	79	134	60	69	110	382	205	73	395	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	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	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	11	51	79	134	60	69	110	382	205	73	395	15
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	305	105	162	325	296	244	277	676	292	249	629	24
Arrive On Green	0.17	0.16	0.16	0.18	0.16	0.16	0.15	0.19	0.19	0.14	0.18	0.18
Sat Flow, veh/h	1795	650	1007	1781	1870	1543	1795	3582	1548	1795	3515	133
Grp Volume(v), veh/h	11	0	130	134	60	69	110	382	205	73	201	209
Grp Sat Flow(s),veh/h/ln	1795	0	1657	1781	1870	1543	1795	1791	1548	1795	1791	1857
Q Serve(g_s), s	0.3	0.0	3.7	3.4	1.4	1.3	2.8	5.0	3.6	1.9	5.3	5.4
Cycle Q Clear(g_c), s	0.3	0.0	3.7	3.4	1.4	1.3	2.8	5.0	3.6	1.9	5.3	5.4
Prop In Lane	1.00		0.61	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	305	0	267	325	296	244	277	676	292	249	321	333
V/C Ratio(X)	0.04	0.00	0.49	0.41	0.20	0.28	0.40	0.56	0.70	0.29	0.63	0.63
Avail Cap(c_a), veh/h	915	0	1464	908	1653	1363	922	3165	1368	912	1582	1641
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	17.8	0.0	19.6	18.6	18.8	7.5	19.6	18.9	6.3	19.9	19.5	19.5
Incr Delay (d2), s/veh	0.0	0.0	0.5	0.3	0.1	0.2	0.3	0.3	1.2	0.2	0.8	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.3	1.2	0.5	0.6	1.0	1.8	1.9	0.7	2.1	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.8	0.0	20.1	18.9	18.9	7.7	19.9	19.2	7.5	20.1	20.2	20.2
LnGrp LOS	B		C	B	B	A	B	B	A	C	C	C
Approach Vol, veh/h		141			263			697			483	
Approach Delay, s/veh		19.9			16.0			15.9			20.2	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	12.7	11.5	13.8	13.2	12.9	11.0	14.3
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	2.3	3.4	4.8	7.4	5.4	5.7	3.9	7.0
Green Ext Time (p_c), s	0.0	0.3	0.1	1.6	0.2	0.6	0.1	1.9

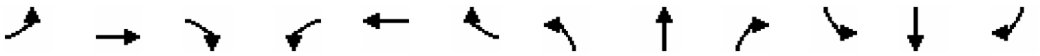
Intersection Summary	
HCM 7th Control Delay, s/veh	17.6
HCM 7th LOS	B

Notes

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	52	163	179	72	35	208	674	140	61	540	17
Future Volume (vph)	32	52	163	179	72	35	208	674	140	61	540	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	100		0	120		0
Storage Lanes	0		1	0		0	1		0	1		0
Taper Length (ft)	25			25			65			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99	0.97		0.99		0.99	0.99		0.99	0.99	
Frt			0.850		0.983			0.974			0.995	
Flt Protected		0.981			0.970		0.950			0.950		
Satd. Flow (prot)	0	1845	1599	0	1787	0	1787	3461	0	1787	3552	0
Flt Permitted		0.981			0.970		0.950			0.950		
Satd. Flow (perm)	0	1837	1563	0	1777	0	1774	3461	0	1781	3552	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163		4			15			2	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		838			627			712			1318	
Travel Time (s)		19.0			14.3			12.1			30.0	
Confl. Peds. (#/hr)	9		5	5		9	3		2	2		3
Confl. Bikes (#/hr)			1			2			3			2
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
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	32	52	163	179	72	35	208	674	140	61	540	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	163	0	286	0	208	814	0	61	557	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2		1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100		20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

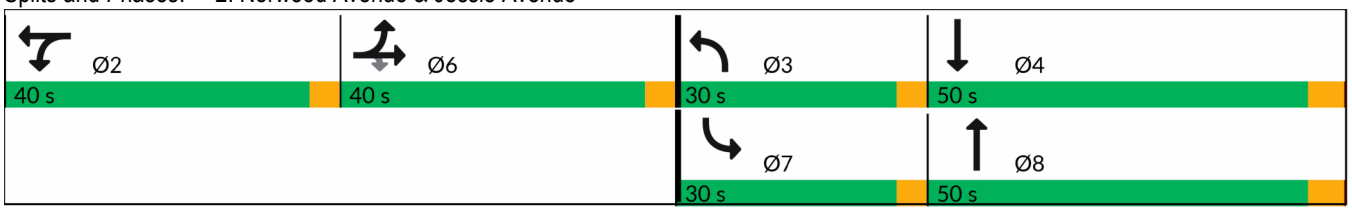


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	6	6		2	2		3	8		7	4	
Permitted Phases			6									
Detector Phase	6	6	6	2	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		9.0	7.0		9.0	6.0	
Minimum Split (s)	28.5	28.5	28.5	28.5	28.5		12.5	20.6		13.5	19.6	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		30.0	50.0		30.0	50.0	
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%		18.8%	31.3%		18.8%	31.3%	
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5		26.5	45.4		26.5	45.4	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	4.3		3.5	4.3	
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.3		0.0	0.3	
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		3.5	3.5		3.5		3.5	4.6		3.5	4.6	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	17.0	17.0	17.0	18.0	18.0			9.0			8.0	
Pedestrian Calls (#/hr)	2	2	2	2	2			2			2	
Act Effct Green (s)		12.8	12.8		20.0		16.2	30.4		10.2	20.7	
Actuated g/C Ratio		0.15	0.15		0.23		0.19	0.35		0.12	0.24	
v/c Ratio		0.30	0.43		0.68		0.61	0.65		0.28	0.65	
Control Delay (s/veh)		41.3	10.9		41.1		43.8	28.0		46.4	35.3	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		41.3	10.9		41.1		43.8	28.0		46.4	35.3	
LOS		D	B		D		D	C		D	D	
Approach Delay (s/veh)		21.3			41.2			31.3			36.4	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)		38	0		125		94	180		28	128	
Queue Length 95th (ft)		111	61		311		242	371		96	285	
Internal Link Dist (ft)		758			547			632			1238	
Turn Bay Length (ft)			100				100			120		
Base Capacity (vph)		841	801		816		591	1968		591	2014	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.10	0.20		0.35		0.35	0.41		0.10	0.28	

Intersection Summary	
Area Type:	Other
Cycle Length: 160	
Actuated Cycle Length: 86	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay (s/veh): 32.9	Intersection LOS: C

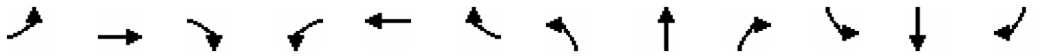
Intersection Capacity Utilization 63.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Norwood Avenue & Jessie Avenue



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	84	163	286	208	814	61	557
v/c Ratio	0.30	0.43	0.68	0.61	0.65	0.28	0.65
Control Delay (s/veh)	41.3	10.9	41.1	43.8	28.0	46.4	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	41.3	10.9	41.1	43.8	28.0	46.4	35.3
Queue Length 50th (ft)	38	0	125	94	180	28	128
Queue Length 95th (ft)	111	61	311	242	371	96	285
Internal Link Dist (ft)	758		547		632		1238
Turn Bay Length (ft)		100		100		120	
Base Capacity (vph)	841	801	816	591	1968	591	2014
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.20	0.35	0.35	0.41	0.10	0.28

Intersection Summary



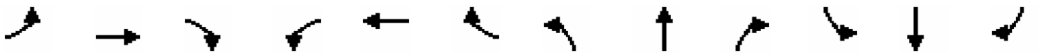
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	52	163	179	72	35	208	674	140	61	540	17
Future Volume (veh/h)	32	52	163	179	72	35	208	674	140	61	540	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	32	52	163	179	72	35	208	674	140	61	540	17
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	120	195	264	237	95	46	257	856	178	166	853	27
Arrive On Green	0.17	0.17	0.17	0.21	0.21	0.21	0.14	0.29	0.29	0.09	0.24	0.24
Sat Flow, veh/h	705	1145	1552	1116	449	218	1795	2936	609	1795	3541	111
Grp Volume(v), veh/h	84	0	163	286	0	0	208	411	403	61	273	284
Grp Sat Flow(s),veh/h/ln	1850	0	1552	1783	0	0	1795	1791	1754	1795	1791	1861
Q Serve(g_s), s	2.6	0.0	6.3	9.7	0.0	0.0	7.3	13.7	13.7	2.1	8.8	8.9
Cycle Q Clear(g_c), s	2.6	0.0	6.3	9.7	0.0	0.0	7.3	13.7	13.7	2.1	8.8	8.9
Prop In Lane	0.38		1.00	0.63		0.12	1.00		0.35	1.00		0.06
Lane Grp Cap(c), veh/h	314	0	264	379	0	0	257	522	512	166	431	448
V/C Ratio(X)	0.27	0.00	0.62	0.75	0.00	0.00	0.81	0.79	0.79	0.37	0.63	0.63
Avail Cap(c_a), veh/h	1043	0	875	1005	0	0	735	1256	1230	735	1256	1305
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	23.4	0.0	24.9	23.9	0.0	0.0	26.9	21.1	21.1	27.6	22.0	22.0
Incr Delay (d2), s/veh	0.2	0.0	0.9	1.2	0.0	0.0	2.3	1.0	1.0	0.5	0.6	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	2.2	4.0	0.0	0.0	3.0	5.1	5.1	0.9	3.5	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.5	0.0	25.8	25.1	0.0	0.0	29.2	22.1	22.1	28.1	22.6	22.6
LnGrp LOS	C		C	C			C	C	C	C	C	C
Approach Vol, veh/h		247			286			1022			618	
Approach Delay, s/veh		25.0			25.1			23.5			23.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		17.3	12.8	20.2		14.5	9.5	23.5				
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	* 45		36.5	26.5	* 45				
Max Q Clear Time (g_c+I1), s		11.7	9.3	10.9		8.3	4.1	15.7				
Green Ext Time (p_c), s		1.1	0.2	2.3		0.6	0.1	3.2				

Intersection Summary												
HCM 6th Ctrl Delay, s/veh			23.8									
HCM 6th LOS			C									

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	52	163	179	72	35	208	674	140	61	540	17
Future Volume (veh/h)	32	52	163	179	72	35	208	674	140	61	540	17
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		0.97	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	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	32	52	163	179	72	35	208	674	140	61	540	17
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	120	195	264	237	95	46	257	856	178	166	853	27
Arrive On Green	0.17	0.17	0.17	0.21	0.21	0.21	0.14	0.29	0.29	0.09	0.24	0.24
Sat Flow, veh/h	705	1145	1552	1116	449	218	1795	2936	609	1795	3541	111
Grp Volume(v), veh/h	84	0	163	286	0	0	208	411	403	61	273	284
Grp Sat Flow(s),veh/h/ln	1850	0	1552	1783	0	0	1795	1791	1754	1795	1791	1861
Q Serve(g_s), s	2.6	0.0	6.3	9.7	0.0	0.0	7.3	13.7	13.7	2.1	8.8	8.9
Cycle Q Clear(g_c), s	2.6	0.0	6.3	9.7	0.0	0.0	7.3	13.7	13.7	2.1	8.8	8.9
Prop In Lane	0.38		1.00	0.63		0.12	1.00		0.35	1.00		0.06
Lane Grp Cap(c), veh/h	314	0	264	379	0	0	257	522	512	166	431	448
V/C Ratio(X)	0.27	0.00	0.62	0.75	0.00	0.00	0.81	0.79	0.79	0.37	0.63	0.63
Avail Cap(c_a), veh/h	1043	0	875	1005	0	0	735	1256	1230	735	1256	1305
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	23.4	0.0	24.9	23.9	0.0	0.0	26.9	21.1	21.1	27.6	22.0	22.0
Incr Delay (d2), s/veh	0.2	0.0	0.9	1.2	0.0	0.0	2.3	1.0	1.0	0.5	0.6	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	2.2	4.0	0.0	0.0	3.0	5.1	5.1	0.9	3.5	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	23.5	0.0	25.8	25.1	0.0	0.0	29.2	22.1	22.1	28.1	22.6	22.6
LnGrp LOS	C		C	C			C	C	C	C	C	C
Approach Vol, veh/h		247			286			1022			618	
Approach Delay, s/veh		25.0			25.1			23.5			23.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	17.3	12.8	20.2	14.5	9.5	23.5
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	* 45	36.5	26.5	* 45
Max Q Clear Time (g_c+I1), s	11.7	9.3	10.9	8.3	4.1	15.7
Green Ext Time (p_c), s	1.1	0.2	2.3	0.6	0.1	3.2

Intersection Summary	
HCM 7th Control Delay, s/veh	23.8
HCM 7th LOS	C

Notes

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

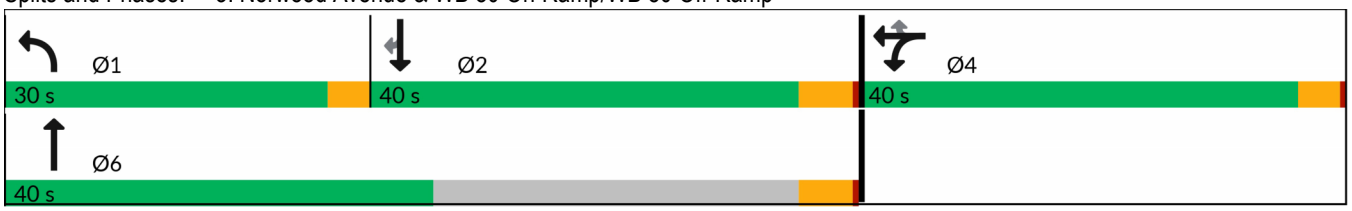
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	251	0	309	324	812	0	0	547	391
Future Volume (vph)	0	0	0	251	0	309	324	812	0	0	547	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		50	200		0	0		75
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			35			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.98	0.98					0.95
Frt						0.850						0.850
Flt Protected				0.950	0.950		0.950					
Satd. Flow (prot)	0	0	0	1698	1698	1599	1787	3574	0	0	3574	1599
Flt Permitted				0.950	0.950		0.950					
Satd. Flow (perm)	0	0	0	1698	1698	1574	1766	3574	0	0	3574	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						174						261
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		1264			954			526			712	
Travel Time (s)		28.7			21.7			9.0			16.2	
Confl. Peds. (#/hr)	3					3	6		9	9		6
Confl. Bikes (#/hr)									4			2
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
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	0	0	0	251	0	309	324	812	0	0	547	391
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	125	126	309	324	812	0	0	547	391
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2	1	1	2			2	1
Detector Template				Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)				20	100	20	20	100			100	20
Trailing Detector (ft)				0	0	0	0	0			0	0
Detector 1 Position(ft)				0	0	0	0	0			0	0
Detector 1 Size(ft)				20	6	20	20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA	Perm	Prot	NA			NA	Perm
Protected Phases				4	4		1	6			2	
Permitted Phases						4						2
Detector Phase				4	4	4	1	6			2	2
Switch Phase												
Minimum Initial (s)				8.0	8.0	8.0	8.0	6.0			6.0	6.0
Minimum Split (s)				29.0	29.0	29.0	11.5	18.8			17.8	17.8
Total Split (s)				40.0	40.0	40.0	30.0	40.0			40.0	40.0
Total Split (%)				36.4%	36.4%	36.4%	27.3%	36.4%			36.4%	36.4%
Maximum Green (s)				36.0	36.0	36.0	26.5	35.2			35.2	35.2
Yellow Time (s)				3.5	3.5	3.5	3.5	4.3			4.3	4.3
All-Red Time (s)				0.5	0.5	0.5	0.0	0.5			0.5	0.5
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				4.0	4.0	4.0	3.5	4.8			4.8	4.8
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				2.0	2.0	2.0	2.5	2.5			2.5	2.5
Recall Mode				None	None	None	None	Min			Min	Min
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)				18.0	18.0	18.0		7.0			6.0	6.0
Pedestrian Calls (#/hr)				2	2	2		2			2	2
Act Effct Green (s)				13.0	13.0	13.0	17.1	39.1			18.1	18.1
Actuated g/C Ratio				0.21	0.21	0.21	0.28	0.63			0.29	0.29
v/c Ratio				0.35	0.35	0.66	0.65	0.35			0.51	0.61
Control Delay (s/veh)				26.4	26.4	18.8	28.9	6.1			21.4	12.4
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay (s/veh)				26.4	26.4	18.8	28.9	6.1			21.4	12.4
LOS				C	C	B	C	A			C	B
Approach Delay (s/veh)					22.3			12.6			17.7	
Approach LOS					C			B			B	
Queue Length 50th (ft)				40	40	41	95	53			79	33
Queue Length 95th (ft)				111	112	149	259	140			186	152
Internal Link Dist (ft)		1184			874			446			632	
Turn Bay Length (ft)						50	200					75
Base Capacity (vph)				1079	1079	1064	836	3359			2222	1046
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				0.12	0.12	0.29	0.39	0.24			0.25	0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 61.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay (s/veh): 16.5		Intersection LOS: B	

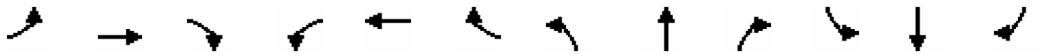
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Norwood Avenue & WB 80 On-Ramp/WB 80 Off-Ramp



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	125	126	309	324	812	547	391
v/c Ratio	0.35	0.35	0.66	0.65	0.35	0.51	0.61
Control Delay (s/veh)	26.4	26.4	18.8	28.9	6.1	21.4	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	26.4	26.4	18.8	28.9	6.1	21.4	12.4
Queue Length 50th (ft)	40	40	41	95	53	79	33
Queue Length 95th (ft)	111	112	149	259	140	186	152
Internal Link Dist (ft)		874			446	632	
Turn Bay Length (ft)			50	200			75
Base Capacity (vph)	1079	1079	1064	836	3359	2222	1046
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	0.12	0.12	0.29	0.39	0.24	0.25	0.37

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	251	0	309	324	812	0	0	547	391
Future Volume (veh/h)	0	0	0	251	0	309	324	812	0	0	547	391
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
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				251	0	0	324	812	0	0	547	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				702	0		411	2093	0	0	959	
Arrive On Green				0.20	0.00	0.00	0.23	0.58	0.00	0.00	0.27	0.00
Sat Flow, veh/h				3591	0	1598	1795	3676	0	0	3676	1598
Grp Volume(v), veh/h				251	0	0	324	812	0	0	547	0
Grp Sat Flow(s),veh/h/ln				1795	0	1598	1795	1791	0	0	1791	1598
Q Serve(g_s), s				2.4	0.0	0.0	6.8	4.9	0.0	0.0	5.3	0.0
Cycle Q Clear(g_c), s				2.4	0.0	0.0	6.8	4.9	0.0	0.0	5.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				702	0		411	2093	0	0	959	
V/C Ratio(X)				0.36	0.00		0.79	0.39	0.00	0.00	0.57	
Avail Cap(c_a), veh/h				3238	0		1192	3158	0	0	3158	
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				13.9	0.0	0.0	14.5	4.5	0.0	0.0	12.6	0.0
Incr Delay (d2), s/veh				0.1	0.0	0.0	2.5	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				0.8	0.0	0.0	2.3	0.7	0.0	0.0	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				14.0	0.0	0.0	17.0	4.5	0.0	0.0	13.0	0.0
LnGrp LOS				B			B	A			B	
Approach Vol, veh/h					251			1136			547	
Approach Delay, s/veh					14.0			8.1			13.0	
Approach LOS					B			A			B	

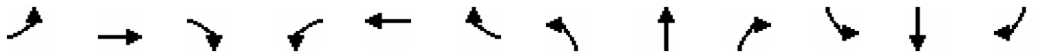
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	12.6	15.5		11.8		28.1						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	8.8	7.3		4.4		6.9						
Green Ext Time (p_c), s	0.6	3.3		0.5		4.7						

Intersection Summary		
HCM 6th Ctrl Delay, s/veh		10.3
HCM 6th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	251	0	309	324	812	0	0	547	391
Future Volume (veh/h)	0	0	0	251	0	309	324	812	0	0	547	391
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				251	0	0	324	812	0	0	547	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				702	0		411	2093	0	0	959	
Arrive On Green				0.20	0.00	0.00	0.23	0.58	0.00	0.00	0.27	0.00
Sat Flow, veh/h				3591	0	1598	1795	3676	0	0	3676	1598
Grp Volume(v), veh/h				251	0	0	324	812	0	0	547	0
Grp Sat Flow(s),veh/h/ln				1795	0	1598	1795	1791	0	0	1791	1598
Q Serve(g_s), s				2.4	0.0	0.0	6.8	4.9	0.0	0.0	5.3	0.0
Cycle Q Clear(g_c), s				2.4	0.0	0.0	6.8	4.9	0.0	0.0	5.3	0.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				702	0		411	2093	0	0	959	
V/C Ratio(X)				0.36	0.00		0.79	0.39	0.00	0.00	0.57	
Avail Cap(c_a), veh/h				3238	0		1192	3158	0	0	3158	
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				13.9	0.0	0.0	14.5	4.5	0.0	0.0	12.6	0.0
Incr Delay (d2), s/veh				0.1	0.0	0.0	2.5	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				0.8	0.0	0.0	2.3	0.7	0.0	0.0	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh				14.0	0.0	0.0	17.0	4.5	0.0	0.0	13.0	0.0
LnGrp LOS				B			B	A			B	
Approach Vol, veh/h					251			1136			547	
Approach Delay, s/veh					14.0			8.1			13.0	
Approach LOS					B			A			B	

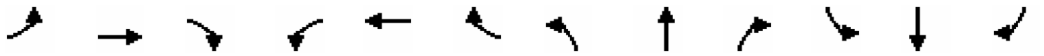
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	12.6	15.5		11.8		28.1						
Change Period (Y+Rc), s	3.5	4.8		4.0		4.8						
Max Green Setting (Gmax), s	26.5	35.2		36.0		35.2						
Max Q Clear Time (g_c+I1), s	8.8	7.3		4.4		6.9						
Green Ext Time (p_c), s	0.6	3.3		0.5		4.7						

Intersection Summary		
HCM 7th Control Delay, s/veh		10.3
HCM 7th LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

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



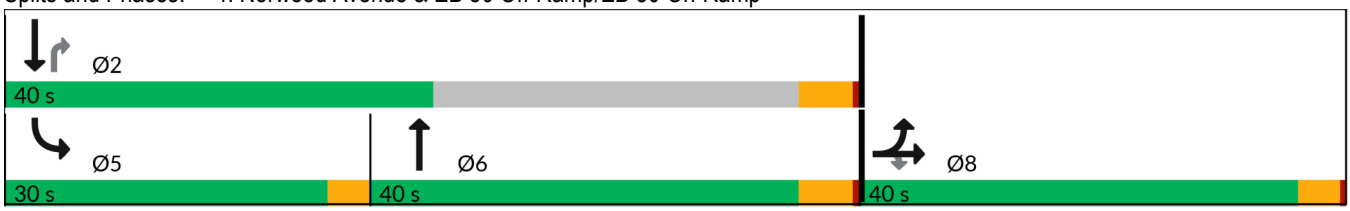
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	466	12	369	0	0	0	0	670	246	264	534	0
Future Volume (vph)	466	12	369	0	0	0	0	670	246	264	534	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		0	0		220	180		0
Storage Lanes	1		1	0		0	0		1	1		0
Taper Length (ft)	25			25			25			35		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98						0.97	0.99		
Frt			0.850						0.850			
Flt Protected	0.950	0.955								0.950		
Satd. Flow (prot)	1665	1674	1568	0	0	0	0	3539	1583	1787	3574	0
Flt Permitted	0.950	0.955								0.950		
Satd. Flow (perm)	1665	1674	1547	0	0	0	0	3539	1540	1776	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			224						246			
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		759			1046			737			526	
Travel Time (s)		17.3			23.8			12.6			12.0	
Confl. Peds. (#/hr)			1	1			8		6	6		8
Confl. Bikes (#/hr)									4			1
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
Heavy Vehicles (%)	3%	3%	3%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	466	12	369	0	0	0	0	670	246	264	534	0
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	238	240	369	0	0	0	0	670	246	264	534	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1					2	1	1	2	
Detector Template	Left	Thru	Right					Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20					100	20	20	100	
Trailing Detector (ft)	0	0	0					0	0	0	0	
Detector 1 Position(ft)	0	0	0					0	0	0	0	
Detector 1 Size(ft)	20	6	20					6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94						94			94	
Detector 2 Size(ft)		6						6			6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0						0.0			0.0	
Turn Type	Split	NA	Perm					NA	custom	Prot	NA	
Protected Phases	8	8						6		5	2	
Permitted Phases			8						2			
Detector Phase	8	8	8					6	2	5	2	
Switch Phase												
Minimum Initial (s)	9.0	9.0	9.0					6.0	6.0	8.0	6.0	
Minimum Split (s)	29.0	29.0	29.0					17.8	18.8	11.5	18.8	
Total Split (s)	40.0	40.0	40.0					40.0	40.0	30.0	40.0	
Total Split (%)	36.4%	36.4%	36.4%					36.4%	36.4%	27.3%	36.4%	
Maximum Green (s)	36.0	36.0	36.0					35.2	35.2	26.5	35.2	
Yellow Time (s)	3.5	3.5	3.5					4.3	4.3	3.5	4.3	
All-Red Time (s)	0.5	0.5	0.5					0.5	0.5	0.0	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0					4.8	4.8	3.5	4.8	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					2.5	2.5	2.5	2.5	
Recall Mode	None	None	None					Min	Min	None	Min	
Walk Time (s)	7.0	7.0	7.0					7.0	7.0		7.0	
Flash Dont Walk (s)	18.0	18.0	18.0					6.0	7.0		7.0	
Pedestrian Calls (#/hr)	2	2	2					2	2		2	
Act Effct Green (s)	16.9	16.9	16.9					19.2	38.6	15.7	38.6	
Actuated g/C Ratio	0.26	0.26	0.26					0.29	0.59	0.24	0.59	
v/c Ratio	0.55	0.55	0.65					0.64	0.24	0.61	0.25	
Control Delay (s/veh)	28.3	28.3	15.8					24.7	1.7	31.3	7.0	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay (s/veh)	28.3	28.3	15.8					24.7	1.7	31.3	7.0	
LOS	C	C	B					C	A	C	A	
Approach Delay (s/veh)		22.9						18.5			15.1	
Approach LOS		C						B			B	
Queue Length 50th (ft)	81	82	44					113	0	89	44	
Queue Length 95th (ft)	203	204	166					243	28	220	97	
Internal Link Dist (ft)		679			966			657			446	
Turn Bay Length (ft)			50						220	180		
Base Capacity (vph)	1001	1007	1020					2082	1425	791	3256	
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	0.24	0.36					0.32	0.17	0.33	0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 65.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay (s/veh): 18.9		Intersection LOS: B	

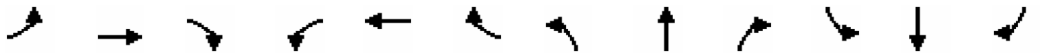
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Norwood Avenue & EB 80 Off-Ramp/EB 80 On-Ramp



Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	238	240	369	670	246	264	534
v/c Ratio	0.55	0.55	0.65	0.64	0.24	0.61	0.25
Control Delay (s/veh)	28.3	28.3	15.8	24.7	1.7	31.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	28.3	28.3	15.8	24.7	1.7	31.3	7.0
Queue Length 50th (ft)	81	82	44	113	0	89	44
Queue Length 95th (ft)	203	204	166	243	28	220	97
Internal Link Dist (ft)		679		657			446
Turn Bay Length (ft)			50		220	180	
Base Capacity (vph)	1001	1007	1020	2082	1425	791	3256
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	0.24	0.36	0.32	0.17	0.33	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	466	12	369	0	0	0	0	670	246	264	534	0
Future Volume (veh/h)	466	12	369	0	0	0	0	670	246	264	534	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
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	475	0	0				0	670	0	264	534	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	765	0					0	1064		342	2054	0
Arrive On Green	0.22	0.00	0.00				0.00	0.30	0.00	0.19	0.57	0.00
Sat Flow, veh/h	3534	0	1572				0	3647	1585	1795	3676	0
Grp Volume(v), veh/h	475	0	0				0	670	0	264	534	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1777	1585	1795	1791	0
Q Serve(g_s), s	5.1	0.0	0.0				0.0	6.8	0.0	5.8	3.1	0.0
Cycle Q Clear(g_c), s	5.1	0.0	0.0				0.0	6.8	0.0	5.8	3.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	765	0					0	1064		342	2054	0
V/C Ratio(X)	0.62	0.00					0.00	0.63		0.77	0.26	0.00
Avail Cap(c_a), veh/h	3039	0					0	2987		1136	3011	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	14.9	0.0	0.0				0.0	12.7	0.0	16.1	4.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0				0.0	0.5	0.0	2.8	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0				0.0	2.1	0.0	2.3	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.2	0.0	0.0				0.0	13.1	0.0	18.9	4.5	0.0
LnGrp LOS	B							B		B	A	
Approach Vol, veh/h		475						670			798	
Approach Delay, s/veh		15.2						13.1			9.3	
Approach LOS		B						B			A	

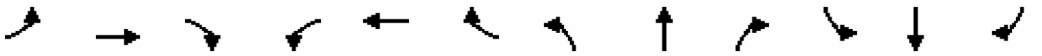
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		28.8			11.5	17.3		13.1				
Change Period (Y+Rc), s		4.8			3.5	4.8		4.0				
Max Green Setting (Gmax), s		35.2			26.5	35.2		36.0				
Max Q Clear Time (g_c+I1), s		5.1			7.8	8.8		7.1				
Green Ext Time (p_c), s		3.2			0.5	3.7		0.9				

Intersection Summary			
HCM 6th Ctrl Delay, s/veh		12.0	
HCM 6th LOS		B	

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, EBR] 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)	466	12	369	0	0	0	0	670	246	264	534	0
Future Volume (veh/h)	466	12	369	0	0	0	0	670	246	264	534	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	475	0	0				0	670	0	264	534	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	765	0					0	1064		342	2054	0
Arrive On Green	0.22	0.00	0.00				0.00	0.30	0.00	0.19	0.57	0.00
Sat Flow, veh/h	3534	0	1572				0	3647	1585	1795	3676	0
Grp Volume(v), veh/h	475	0	0				0	670	0	264	534	0
Grp Sat Flow(s),veh/h/ln	1767	0	1572				0	1777	1585	1795	1791	0
Q Serve(g_s), s	5.1	0.0	0.0				0.0	6.8	0.0	5.8	3.1	0.0
Cycle Q Clear(g_c), s	5.1	0.0	0.0				0.0	6.8	0.0	5.8	3.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	765	0					0	1064		342	2054	0
V/C Ratio(X)	0.62	0.00					0.00	0.63		0.77	0.26	0.00
Avail Cap(c_a), veh/h	3039	0					0	2987		1136	3011	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	14.9	0.0	0.0				0.0	12.7	0.0	16.1	4.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0				0.0	0.5	0.0	2.8	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0				0.0	2.1	0.0	2.3	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	15.2	0.0	0.0				0.0	13.1	0.0	18.9	4.5	0.0
LnGrp LOS	B							B		B	A	
Approach Vol, veh/h		475						670			798	
Approach Delay, s/veh		15.2						13.1			9.3	
Approach LOS		B						B			A	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		28.8			11.5	17.3		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		5.1			7.8	8.8		7.1				
Green Ext Time (p_c), s		3.2			0.5	3.7		0.9				

Intersection Summary			
HCM 7th Control Delay, s/veh		12.0	
HCM 7th LOS		B	

Notes

User approved volume balancing among the lanes for turning movement.

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

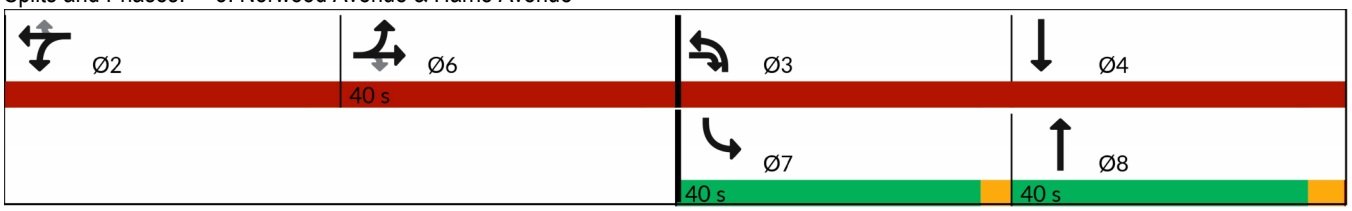
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	14	39	17	6	93	17	602	14	56	736	105
Future Volume (vph)	230	14	39	17	6	93	17	602	14	56	736	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		140	100		0	85		0	110		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			35			40			30		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.97		0.99	0.98	0.98	0.99		0.99	0.99	
Frt			0.850			0.850		0.997			0.981	
Flt Protected		0.955			0.964		0.950			0.950		
Satd. Flow (prot)	0	1762	1568	0	1778	1568	1787	3559	0	1752	3415	0
Flt Permitted		0.955			0.964		0.950			0.950		
Satd. Flow (perm)	0	1762	1533	0	1769	1546	1768	3559	0	1737	3415	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39			93		1			9	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		735			595			331			737	
Travel Time (s)		16.7			13.5			5.6			16.8	
Confl. Peds. (#/hr)			5	5			9		4	4		9
Confl. Bikes (#/hr)			2			2			7			1
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	230	14	39	17	6	93	17	602	14	56	736	105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	244	39	0	23	93	17	616	0	56	841	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	pm+ov	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	6	6	3	2	2		3	8		7	4	
Permitted Phases			6			2						
Detector Phase	6	6	3	2	2	2	3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	11.0	11.0	11.0	10.0	7.0		9.0	8.0	
Minimum Split (s)	28.6	28.6	13.5	14.8	14.8	14.8	13.5	19.6		12.5	25.6	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0		40.0	40.0	
Total Split (%)	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	36.4	36.4	36.5	36.2	36.2	36.2	36.5	35.4		36.5	35.4	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.3		3.5	4.3	
All-Red Time (s)	0.1	0.1	0.0	0.3	0.3	0.3	0.0	0.3		0.0	0.3	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		3.6	3.5		3.8	3.8	3.5	4.6		3.5	4.6	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes				Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5		2.0	2.5	
Recall Mode	None	None	None	None	None	None	None	None		None	None	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	18.0	18.0						8.0			14.0	
Pedestrian Calls (#/hr)	2	2						2			2	
Act Effct Green (s)		16.7	27.2		11.5	11.5	10.5	37.5		9.7	37.0	
Actuated g/C Ratio		0.20	0.33		0.14	0.14	0.13	0.45		0.12	0.45	
v/c Ratio		0.69	0.07		0.09	0.31	0.07	0.38		0.27	0.55	
Control Delay (s/veh)		43.4	6.5		37.7	12.1	38.5	19.4		42.1	21.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		43.4	6.5		37.7	12.1	38.5	19.4		42.1	21.9	
LOS		D	A		D	B	D	B		D	C	
Approach Delay (s/veh)		38.4			17.2			19.9			23.2	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		130	0		12	0	9	124		29	188	
Queue Length 95th (ft)		208	20		37	46	30	204		71	292	
Internal Link Dist (ft)		655			515			251			657	
Turn Bay Length (ft)			140				85			110		
Base Capacity (vph)		806	1043		809	754	820	1610		804	1526	
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		0.30	0.04		0.03	0.12	0.02	0.38		0.07	0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 83.1			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay (s/veh): 24.0		Intersection LOS: C	

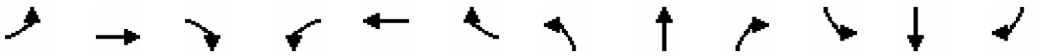
Intersection Capacity Utilization 62.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Norwood Avenue & Harris Avenue



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	244	39	23	93	17	616	56	841
v/c Ratio	0.69	0.07	0.09	0.31	0.07	0.38	0.27	0.55
Control Delay (s/veh)	43.4	6.5	37.7	12.1	38.5	19.4	42.1	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.4	6.5	37.7	12.1	38.5	19.4	42.1	21.9
Queue Length 50th (ft)	130	0	12	0	9	124	29	188
Queue Length 95th (ft)	208	20	37	46	30	204	71	292
Internal Link Dist (ft)	655		515			251		657
Turn Bay Length (ft)		140			85		110	
Base Capacity (vph)	806	1043	809	754	820	1610	804	1526
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	0.30	0.04	0.03	0.12	0.02	0.38	0.07	0.55

Intersection Summary



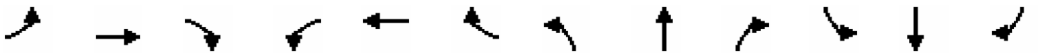
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	14	39	17	6	93	17	602	14	56	736	105
Future Volume (veh/h)	230	14	39	17	6	93	17	602	14	56	736	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.96	1.00		0.95	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	14	39	17	6	93	17	602	14	56	736	105
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	319	19	359	216	76	247	74	995	23	165	1017	145
Arrive On Green	0.19	0.19	0.19	0.16	0.16	0.16	0.04	0.28	0.28	0.09	0.33	0.33
Sat Flow, veh/h	1670	102	1538	1323	467	1515	1795	3573	83	1767	3081	439
Grp Volume(v), veh/h	244	0	39	23	0	93	17	301	315	56	421	420
Grp Sat Flow(s),veh/h/ln	1772	0	1538	1789	0	1515	1795	1791	1866	1767	1763	1758
Q Serve(g_s), s	7.3	0.0	1.1	0.6	0.0	3.1	0.5	8.2	8.3	1.7	11.9	11.9
Cycle Q Clear(g_c), s	7.3	0.0	1.1	0.6	0.0	3.1	0.5	8.2	8.3	1.7	11.9	11.9
Prop In Lane	0.94		1.00	0.74		1.00	1.00		0.04	1.00		0.25
Lane Grp Cap(c), veh/h	338	0	359	292	0	247	74	499	519	165	582	580
V/C Ratio(X)	0.72	0.00	0.11	0.08	0.00	0.38	0.23	0.60	0.61	0.34	0.72	0.72
Avail Cap(c_a), veh/h	1142	0	1057	1147	0	971	1161	1123	1170	1142	1105	1102
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	21.4	0.0	17.1	20.0	0.0	21.1	26.2	17.7	17.7	24.0	16.6	16.7
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.0	0.0	0.4	0.6	0.9	0.8	0.5	1.3	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	2.9	0.0	0.4	0.2	0.0	1.0	0.2	3.0	3.1	0.7	4.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.5	0.0	17.1	20.1	0.0	21.4	26.8	18.6	18.5	24.4	17.9	17.9
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		283			116			633			897	
Approach Delay, s/veh		21.8			21.1			18.8			18.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.0	5.8	23.2		14.4	8.8	20.3				
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		5.1	2.5	13.9		9.3	3.7	10.3				
Green Ext Time (p_c), s		0.2	0.0	4.6		1.0	0.1	2.8				

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	19.2
HCM 6th LOS	B

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	14	39	17	6	93	17	602	14	56	736	105
Future Volume (veh/h)	230	14	39	17	6	93	17	602	14	56	736	105
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		0.96	1.00		0.95	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	14	39	17	6	93	17	602	14	56	736	105
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	319	19	359	216	76	247	74	995	23	165	1017	145
Arrive On Green	0.19	0.19	0.19	0.16	0.16	0.16	0.04	0.28	0.28	0.09	0.33	0.33
Sat Flow, veh/h	1670	102	1538	1323	467	1515	1795	3573	83	1767	3081	439
Grp Volume(v), veh/h	244	0	39	23	0	93	17	301	315	56	421	420
Grp Sat Flow(s),veh/h/ln	1772	0	1538	1789	0	1515	1795	1791	1866	1767	1763	1758
Q Serve(g_s), s	7.3	0.0	1.1	0.6	0.0	3.1	0.5	8.2	8.3	1.7	11.9	11.9
Cycle Q Clear(g_c), s	7.3	0.0	1.1	0.6	0.0	3.1	0.5	8.2	8.3	1.7	11.9	11.9
Prop In Lane	0.94		1.00	0.74		1.00	1.00		0.04	1.00		0.25
Lane Grp Cap(c), veh/h	338	0	359	292	0	247	74	499	519	165	582	580
V/C Ratio(X)	0.72	0.00	0.11	0.08	0.00	0.38	0.23	0.60	0.61	0.34	0.72	0.72
Avail Cap(c_a), veh/h	1142	0	1057	1147	0	971	1161	1123	1170	1142	1105	1102
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	21.4	0.0	17.1	20.0	0.0	21.1	26.2	17.7	17.7	24.0	16.6	16.7
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.0	0.0	0.4	0.6	0.9	0.8	0.5	1.3	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	2.9	0.0	0.4	0.2	0.0	1.0	0.2	3.0	3.1	0.7	4.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.5	0.0	17.1	20.1	0.0	21.4	26.8	18.6	18.5	24.4	17.9	17.9
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		283			116			633			897	
Approach Delay, s/veh		21.8			21.1			18.8			18.3	
Approach LOS		C			C			B			B	

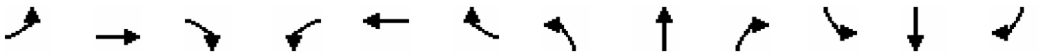
Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	13.0	5.8	23.2	14.4	8.8	20.3
Change Period (Y+Rc), s	3.8	3.5	* 4.6	3.6	3.5	* 4.6
Max Green Setting (Gmax), s	36.2	36.5	* 35	36.4	36.5	* 35
Max Q Clear Time (g_c+I1), s	5.1	2.5	13.9	9.3	3.7	10.3
Green Ext Time (p_c), s	0.2	0.0	4.6	1.0	0.1	2.8

Intersection Summary	
HCM 7th Control Delay, s/veh	19.2
HCM 7th LOS	B

Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	113	9	74	36	85	426	16	41	457	187
Future Volume (vph)	225	110	113	9	74	36	85	426	16	41	457	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	105		0	0		0	90		0	50		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			35			55		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		0.99			0.99		0.99	0.99		0.98	0.99	
Frt		0.924			0.951			0.995			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1726	0	1787	1781	0	1770	3515	0	1787	3388	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	1726	0	1787	1781	0	1768	3515	0	1764	3388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			17			3			47	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		790			308			560			983	
Travel Time (s)		18.0			7.0			9.5			22.3	
Confl. Peds. (#/hr)							1		7	7		1
Confl. Bikes (#/hr)			2			1			3			5
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
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	225	110	113	9	74	36	85	426	16	41	457	187
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	223	0	9	110	0	85	442	0	41	644	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

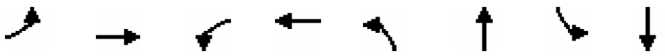


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	9.0		10.0	10.0		9.0	8.0		9.0	8.0	
Minimum Split (s)	13.5	27.9		13.5	27.5		12.5	23.6		12.5	27.6	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	40.0		30.0	40.0	
Total Split (%)	23.1%	23.1%		23.1%	23.1%		23.1%	30.8%		23.1%	30.8%	
Maximum Green (s)	26.5	26.1		26.5	26.5		26.5	35.4		26.5	35.4	
Yellow Time (s)	3.5	3.9		3.5	3.5		3.5	4.3		3.5	4.3	
All-Red Time (s)	0.0	0.0		0.0	0.0		0.0	0.3		0.0	0.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.5	3.9		3.5	3.5		3.5	4.6		3.5	4.6	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		17.0			17.0			12.0			16.0	
Pedestrian Calls (#/hr)		2			2			2			2	
Act Effct Green (s)	16.3	25.9		12.2	14.0		11.7	22.8		11.1	19.4	
Actuated g/C Ratio	0.24	0.39		0.18	0.21		0.17	0.34		0.17	0.29	
v/c Ratio	0.52	0.32		0.02	0.28		0.27	0.36		0.13	0.63	
Control Delay (s/veh)	32.8	16.3		36.5	28.1		36.0	20.9		36.5	25.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)	32.8	16.3		36.5	28.1		36.0	20.9		36.5	25.4	
LOS	C	B		D	C		D	C		D	C	
Approach Delay (s/veh)		24.6			28.7			23.4			26.1	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	82	48		3	34		31	76		15	111	
Queue Length 95th (ft)	219	159		22	104		105	169		63	255	
Internal Link Dist (ft)		710			228			480			903	
Turn Bay Length (ft)	105						90			50		
Base Capacity (vph)	857	896		857	863		849	2065		857	2009	
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	0.26	0.25		0.01	0.13		0.10	0.21		0.05	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 67.2			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay (s/veh): 25.1		Intersection LOS: C	

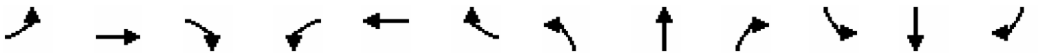
Intersection Capacity Utilization 55.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Norwood Avenue & Silver Eagle Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	223	9	110	85	442	41	644
v/c Ratio	0.52	0.32	0.02	0.28	0.27	0.36	0.13	0.63
Control Delay (s/veh)	32.8	16.3	36.5	28.1	36.0	20.9	36.5	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	32.8	16.3	36.5	28.1	36.0	20.9	36.5	25.4
Queue Length 50th (ft)	82	48	3	34	31	76	15	111
Queue Length 95th (ft)	219	159	22	104	105	169	63	255
Internal Link Dist (ft)		710		228		480		903
Turn Bay Length (ft)	105				90		50	
Base Capacity (vph)	857	896	857	863	849	2065	857	2009
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	0.26	0.25	0.01	0.13	0.10	0.21	0.05	0.32

Intersection Summary



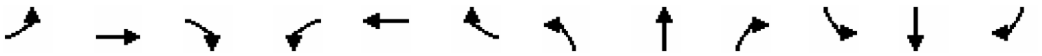
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	110	113	9	74	36	85	426	16	41	457	187
Future Volume (veh/h)	225	110	113	9	74	36	85	426	16	41	457	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	225	110	113	9	74	36	85	426	16	41	457	187
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	320	256	263	42	177	86	214	1081	40	137	654	265
Arrive On Green	0.18	0.30	0.30	0.02	0.15	0.15	0.12	0.31	0.31	0.08	0.27	0.27
Sat Flow, veh/h	1795	842	865	1795	1188	578	1781	3487	131	1795	2454	994
Grp Volume(v), veh/h	225	0	223	9	0	110	85	217	225	41	332	312
Grp Sat Flow(s),veh/h/ln	1795	0	1706	1795	0	1766	1781	1777	1841	1795	1791	1658
Q Serve(g_s), s	6.4	0.0	5.7	0.3	0.0	3.1	2.4	5.2	5.2	1.2	9.1	9.2
Cycle Q Clear(g_c), s	6.4	0.0	5.7	0.3	0.0	3.1	2.4	5.2	5.2	1.2	9.1	9.2
Prop In Lane	1.00		0.51	1.00		0.33	1.00		0.07	1.00		0.60
Lane Grp Cap(c), veh/h	320	0	519	42	0	264	214	551	571	137	477	442
V/C Ratio(X)	0.70	0.00	0.43	0.21	0.00	0.42	0.40	0.39	0.40	0.30	0.70	0.71
Avail Cap(c_a), veh/h	878	0	822	878	0	864	871	1161	1203	878	1170	1083
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	20.9	0.0	15.1	26.0	0.0	20.9	22.0	14.7	14.7	23.6	17.9	18.0
Incr Delay (d2), s/veh	1.1	0.0	0.2	0.9	0.0	0.4	0.4	0.2	0.2	0.4	0.7	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	2.5	0.0	2.0	0.1	0.0	1.2	0.9	1.8	1.8	0.5	3.4	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.0	0.0	15.3	26.9	0.0	21.3	22.5	14.9	14.9	24.1	18.6	18.7
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		448			119			527			685	
Approach Delay, s/veh		18.6			21.7			16.1			19.0	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	12.0	10.0	19.0	4.8	20.4	7.6	21.4
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	8.4	5.1	4.4	11.2	2.3	7.7	3.2	7.2
Green Ext Time (p_c), s	0.3	0.3	0.1	2.8	0.0	0.8	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay, s/veh	18.2
HCM 6th LOS	B

Notes

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	110	113	9	74	36	85	426	16	41	457	187
Future Volume (veh/h)	225	110	113	9	74	36	85	426	16	41	457	187
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		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	225	110	113	9	74	36	85	426	16	41	457	187
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	320	256	263	42	177	86	214	1081	40	137	654	265
Arrive On Green	0.18	0.30	0.30	0.02	0.15	0.15	0.12	0.31	0.31	0.08	0.27	0.27
Sat Flow, veh/h	1795	842	865	1795	1188	578	1781	3487	131	1795	2454	994
Grp Volume(v), veh/h	225	0	223	9	0	110	85	217	225	41	332	312
Grp Sat Flow(s),veh/h/ln	1795	0	1706	1795	0	1766	1781	1777	1841	1795	1791	1658
Q Serve(g_s), s	6.4	0.0	5.7	0.3	0.0	3.1	2.4	5.2	5.2	1.2	9.1	9.2
Cycle Q Clear(g_c), s	6.4	0.0	5.7	0.3	0.0	3.1	2.4	5.2	5.2	1.2	9.1	9.2
Prop In Lane	1.00		0.51	1.00		0.33	1.00		0.07	1.00		0.60
Lane Grp Cap(c), veh/h	320	0	519	42	0	264	214	551	571	137	477	442
V/C Ratio(X)	0.70	0.00	0.43	0.21	0.00	0.42	0.40	0.39	0.40	0.30	0.70	0.71
Avail Cap(c_a), veh/h	878	0	822	878	0	864	871	1161	1203	878	1170	1083
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	20.9	0.0	15.1	26.0	0.0	20.9	22.0	14.7	14.7	23.6	17.9	18.0
Incr Delay (d2), s/veh	1.1	0.0	0.2	0.9	0.0	0.4	0.4	0.2	0.2	0.4	0.7	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	2.5	0.0	2.0	0.1	0.0	1.2	0.9	1.8	1.8	0.5	3.4	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.0	0.0	15.3	26.9	0.0	21.3	22.5	14.9	14.9	24.1	18.6	18.7
LnGrp LOS	C		B	C		C	C	B	B	C	B	B
Approach Vol, veh/h		448			119			527			685	
Approach Delay, s/veh		18.6			21.7			16.1			19.0	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	12.0	10.0	19.0	4.8	20.4	7.6	21.4
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	8.4	5.1	4.4	11.2	2.3	7.7	3.2	7.2
Green Ext Time (p_c), s	0.3	0.3	0.1	2.8	0.0	0.8	0.0	1.5

Intersection Summary	
HCM 7th Control Delay, s/veh	18.2
HCM 7th LOS	B

Notes

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

Appendix E: Community Survey Results & Comments

Entry #	Q1. What is your zip code?	Q2. Daily	Q2. Some Days	Q2. Weekly	Q2. Every Couple of Weeks	Q2. Monthly	Q2. Rarely	Q3. Driving in a Personal Vehicle	Q3. Riding in a Personal Vehicle	Q3. Public Transit	Q3. Paratransit	Q3. Walking/Rolling	Q3. Bicycling	Q3. Scooting	Q3. Rider-Sharing	Q3. Other
1	95828	YES										YES				
2	95831						YES									CAR
3	95815	YES						YES								
4	95815		YES					YES								
5	95825	YES						YES								
6	95815	YES										YES	YES			
7	95834		YES	YES				YES				YES				
8	95838	YES						YES		YES		YES				
9	95833	YES						YES		YES		YES				
10	95838	YES						YES								
11	9532	YES							YES	YES						
12	95838		YES					YES								
13	95815	YES						YES								
14	95838	YES						YES								
15	958608				YES			YES								
16	95838	YES						YES								
17	95811	YES						YES								
18	95673	YES						YES		YES						
19	95815	YES						YES								
20	95838	YES									YES					
21	95838	YES						YES								
22	95838	YES	YES									YES			YES	
23	958115	YES						YES								
24	95838				YES			YES		YES		YES				
25	95815	YES										YES				YES
26	95673						YES	YES								
27	95888	YES								YES					YES	
28	95833	YES														
29	95823	YES						YES		YES						
30	95838	YES						YES	YES	YES	YES	YES	YES	YES	YES	
31	95838	YES								YES		YES	YES			
32	95838	YES											YES			
33	95838	YES						YES								
34	95815	YES						YES								
35	95815	YES						YES	YES							
36	95815	YES						YES								
37	95834	YES						YES					YES			
38	8538	YES						YES	YES	YES		YES				

39	95838		YES			YES						
40	95815	YES				YES		YES				
41	95815	YES				YES						
42	95838	YES				YES					YES	
1	95838	1				1	1					
2	95838	1				1						
3	95815	1				1	1			1	1	
4	95835			1		1						
5					1	1	1		1	1		
6	95815	1				1						
7	95838	1				1	1			1	1	1

Q4. 1	Q4. 2	Q4. 3	Q4. 4	Q4. 5	Q5. 1	Q5. 2	Q5. 3	Q5. 4	Q5. 5	Q6. 1	Q6. 2	Q6. 3	Q6. 4	Q6. 5	Q7. 1	Q7. 2	Q7. 3	Q7. 4	Q7. 5	Q8. 1
			YES					YES				YES						YES		
				YES					YES					YES					YES	
		YES				YES							YES				YES			
				YES					YES					YES				YES		
	YES					YES					YES					YES				
				YES			YES							YES					YES	
			YES					YES					YES					YES		
				YES					YES					YES					YES	
		YES					YES							YES					YES	
				YES			YES							YES					YES	
				YES					YES					YES					YES	
				YES					YES					YES					YES	
				YES					YES					YES					YES	
YES					YES					YES					YES					YES
				YES					YES					YES					YES	
		YES							YES					YES				YES		
				YES			YES							YES					YES	
				YES			YES					YES					YES			
				YES					YES					YES					YES	
				YES					YES					YES					YES	
				YES					YES					YES					YES	
		YES						YES			YES						YES			
				YES					YES					YES			YES			
				YES					YES					YES					YES	
			YES			YES						YES			YES					
				YES					YES					YES					YES	
				YES					YES					YES					YES	
				YES					YES					YES					YES	
				YES					YES					YES					YES	
YES									YES					YES						
				YES			YES					YES					YES			
			YES					YES					YES						YES	
			YES						YES					YES					YES	
				YES					YES					YES					YES	
		YES							YES					YES					YES	
YES									YES				YES			YES				

				YES				YES				YES					YES		
				YES				YES				YES					YES		
				YES				YES							YES				
				YES				YES				YES					YES		
					1				1				1						1
					1				1				1						1
			1						1			1					1		
					1				1				1						1
	1								1				1						1
					1				1				1						1
		1						1				1					1		

Q8. 2	Q8. 3	Q8. 4	Q8. 5	Q9. 1	Q9. 2	Q9. 3	Q9. 4	Q9. 5	Q10. 1	Q10. 2	Q10. 3	Q10. 4	Q10. 5	Q11. Asian	Q11. Black	Q11. Hispanic	Q11. Middle Eastern	Q11. Native	Q11. Pacific Islander	Q11. White
			YES				YES							YES						
	YES					YES					YES					YES				
	YES					YES					YES					YES		YES		
			YES					YES					YES							
YES					YES					YES					YES					
			YES					YES					YES			YES		YES		
YES					YES							YES		YES	YES					
			YES					YES					YES			YES				
		YES						YES				YES			YES					
			YES					YES							YES					
			YES					YES												YES
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		1					1	Center mediums. Ways to slow down vehiclar t				1			
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		1					1	Keep lanes narrow and only one lane in each direction. This					1		

Q11. Prefer not to say	Q11. Other	Q12. <18	Q12. 18 to 24	Q12. 25 to 34	Q12.35 to 44	Q12.45 to 64	Q12.65 to 84	Q12. 85 to 99	Q12. 100+	Q13. Yes	Q13. No	Q13. Prefer not to say
				YES						YES		
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Comments
CROSSWALKS
NEED MORE PUBLIC HELP AROUND AREA FOR KIDS AND ELDERLY, MAYBE SECURITY
NEED MORE ORDER ON THE ROAD
ROAD REPAIR
RRFB
GOOD
PREGNANCY A LITTLE BIT HARDER TO GET AROUND ON PUBLIC TRANSPORTATION PREGNANT WITH KIDS
CROSSWALK HELP
MORE HELP PLEASE
ANOTHER STOP LIGHT
ADDITIONAL STOP LIGHT, RED LIGHT CAM ON LIGHT ON NORWOOD +GRAND
GRAND/RIO LINDA,STREET TRANSPORTATION IS STILL AROUND?
ACCIDENTS ON NORWOOD, INCLUDING ME REAR ENDED
*SPANISH
WIDER BIKE LANES
SHOULD BE ABLE TO HAVE MORE DESTINATION TO GO TO THEN HAVE TO WALK OR TAKE TRAIN
ACROSS FROM PARK, 15MPH COVERED BY TREE. PEOPLE ARE SPEEDING. MORE TRANSPORTATION SERVICE AND
PEOPLE NEED TO LEARN HOW TO LET THE PEDESTRIANS WALK ALL THE WAY ACROSS BECAUSE I ALMOST GOT HIT
PLEASE LOOK INTO ROBLA ELEMENTARY SCHOOL. THE SCHOOL NEED SIDEWALK FOR THE KIDS AND FAMILIES. WE SPOKE WITH THE DISTRICT AND THEY THERE NO ARE FUNDS! PLEASE CONSIDER FOR THE SAFETY OF THE
Center mediums. Ways to slow down vehiclar traffic. Vehicles routinely speed over 40 mph. Add a traffic signal light
Post no parking signs on both sides of the street by the Viva Market.
Keep lanes narrow and only one lane in each direction. This will keep the speed down. There’s not actually that much traffic, so one lane is enough. Use roundabouts. Use them at each intersection and the major shopping entrances. Don’t use traffic lights. The cars back up waiting for the lights to change when there’s no oncoming traffic. Roundabouts prevent this. Separate pedestrian traffic with a parallel protected bike path. Don’t put side walks on either side of the road, use protected bike/pedestrian paths. Reducing to one lane will free up plenty of space for this. Plant trees in the protection buffer.