



CITY OF NELSON

NELSON – FAIRVIEW NEIGHBOURHOOD TRAFFIC STUDY

MAY 12, 2023

FINAL



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FINAL

PROJECT NO.: 221-02815-00
DATE: MAY 12, 2023

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1 EXECUTIVE SUMMARY

The City of Nelson (Nelson) has retained WSP Canada Inc. (WSP) to prepare a Traffic Study to evaluate the short-term and long-term traffic operations of several key intersections located in the Fairview neighbourhood based on the cumulative impacts of multiple developments that are currently in various stages of planning, approval and construction within the area. Focus on the future development impacts to the area include understanding these impacts from the perspective of all transportation modes, including active transportation systems. Where operational failures are identified, identifiable triggers such as horizon year, modal split or specific development will be identified. This traffic study has been prepared in collaboration with the Ministry of Transportation and Infrastructure (MoTI), who provided insight into background traffic conditions along Highway 3A.

Approximately five (5) specific development sites within the Fairview neighbourhood were identified by the City of Nelson for evaluation, as outlined in the table below. The properties identified below are based on large vacant lands in the Fairview neighbourhood with development potential. The City has estimated the potential development time frames and maximum densities based on current and future zonal potential. However, the time frame and densities for development will be driven primarily by private industry and, therefore, may vary from the below table. As such, the table should be reassessed for accuracy every five (5) years.

Site #	Acres	Potential Max Density / Anticipated Density	Anticipated Time Horizon
1	5.36	60 Residential units	50% in 1-5 years 50% in 5-10 years
2	6.52	120 Residential units	100% in 10-15 years
3	7.4	75 Long-Term Care Beds 29,000 SF of Community Health Services	100% in 1-5 years
4	0.69	25 Residential units	100% in 1-5 years
5	11.67	265 Residential units 5,380 SF Office space 21,530 SF Commercial space	50% in 15 years

The trip generation potential for these anticipated land uses was estimated for each of the two horizon years analyzed (5-year and 15-year) based on the anticipated scale of development noted above. Based on discussions with the City and MoTI, existing traffic on the roadway network was collected for both the weekday AM Peak Hour and PM Peak Hour periods at key study intersections to document both volumes and travel patterns. Study intersections within the Fairview neighbourhood were also identified based on expected travel patterns from the anticipated development areas. Therefore, study intersections were identified as follows:

- Highway 3A & Kokanee Avenue
- Highway 3A & Elwyn Street
- 3rd Street & Elwyn Street
- 5th Street & Davies Street
- 5th Street & Cottonwood Street
- 5th Street & Gordon Street
- 7th Street & Gordon Street
- 10th Street & Fell Street
- 8th Street & Elwyn Street
- Highway 3A & Behnsen Street

- 3rd Street & Behnsen Street
- 10th Street & Elwyn Street
- 5th Street & Elwyn Street
- 3rd Street & Kokanee Avenue

Traffic operational analyses were undertaken using Trafficware's *Synchro*, Version 11, the industry standard software for undertaking traffic analyses. Analyses of the study intersections were undertaken for the AM and PM peak hour periods at both the 5-year and 15-year horizon periods. Analyses were undertaken for the existing conditions to establish a base line of current operations. Analyses were first conducted for the 5-year and 15-year horizons assuming the same multi-modal splits that exist today in the Fairview neighbourhood. The results of that analysis indicates all study intersections are expected to generally operate acceptably in the 5-year horizon, with some increases in vehicular delay at the Highway 3A & Kokanee Avenue, Highway 3A & Elwyn Street and Highway 3A & Behnsen Street intersections on the unsignalized approaches. This is not unexpected considering the higher volumes along the Highway 3A corridor and that all three of the above-noted intersections operate with stop-control measures on the side street and free-flow conditions along Highway 3A. As a result, the side street traffic require gaps in northbound and southbound traffic along Highway 3A in order to turn, which are expected to diminish over time as volumes along Highway 3A increase. This in-turn leads to increased delays on these side streets, however in the 5-year horizon period, the expected delays are not expected to warrant improvements or mitigation measures.

By the 15-year horizon, with no changes to the current multi-modal splits, traffic operations are expected to degrade further and trigger the need for improvements at the same three critical intersections noted above (Highway 3A & Kokanee Avenue, Highway 3A & Elwyn Street and Highway 3A & Behnsen Street). Multiple mitigation improvements were identified to potentially either partially or comprehensively improve network operations. Among the partial improvements identified include creating separate dedicated left-turn and right-turn lanes on the side street approaches of these intersections. This could be accomplished by restriping the approaches however a more detailed investigation is required to assess if there is adequate right-of-way or obtainable right-of-way. The partial improvement would only benefit the operations of right-turning vehicles at these intersections. The left-turning vehicles would continue to experience long-delays. As the three locations are under the jurisdictional control of MoTI, current MoTI policy indicates roundabouts should be considered before alternative improvements such as traffic signalization. Roundabouts may require additional right-of-way to accommodate the full geometric requirements of a roundabout. Signalization while maintaining the existing geometry is expected to result in significantly improved operations, however would also require significant financial investment and would introduce delays to traffic along Highway 3A where traffic is not currently required to stop. Vehicles idling at traffic lights are also recognized as increasing CO₂ and greenhouse gas emissions, negatively impacting the environment and counter to the environmental policies and practices of the City of Nelson and the Province. Alternatively, achieving a 20-25% multi-modal split increase by the 15-year horizon could potentially mitigate or delay the need for signalization or for roadway improvements. This would also align with the City's Strategic Plan, *Our Vision for the Future* and the City's *Nelson Next*, by strengthening and building healthy neighbourhoods. Similar modal share targets are being established for communities across Canada such as the Town of Canmore, where a mode split target of 60% vehicular / 40% Active Modes & Transit by the year 2030 has been established to mitigate vehicular traffic impacts and avoid costly infrastructure upgrades.

Improving the neighbourhood's multi-modal usage requires supporting bylaws and policies to collaborate with future developers to achieve these objectives. This can include adaptive policies, parking maximums rather than minimums, and requirements for Class 1 (bicycle parking stall in a secured or controlled areas) and Class 2 (bicycle parking stall in an unsecured or uncontrolled area) bicycle parking requirements on-site. This can augment the City's Off-street Parking and Landscaping Bylaw and the City's Active Transportation Plan implementation strategy. Education and public awareness campaigns to promote active transportation modes, and the implementation of protected bicycle facilities on major corridors within the Fairview neighbourhood that complete the active modes network can increase the comfort, safety and attractiveness of non-vehicular travel modes. This can further achieve the City's sustainability and climate initiatives and support the City in achieving a more balanced transportation system.

2 INTRODUCTION

The City of Nelson (City) has experienced steady growth over the years, as new developments have progressed and undeveloped lands are expected to progress over the next +15 years. As growth continues, the cumulative developments are expected to impact vehicular, pedestrians and cyclist traffic within the Fairview neighbourhood. Specifically, the City has identified five (5) specific development areas that are expected to put pressure on the transportation network. To assess these impacts, the City has retained WSP Canada Inc. (WSP) to prepare a Traffic Study to evaluate the short-term and long-term transportation operations of several key intersections located in the Fairview neighbourhood based on the cumulative impacts of these development areas that are currently in various stages of planning, approval and construction within the area. This assessment will be used to identify potential mitigation strategies that may be required to maintain acceptable traffic operations for vehicular, pedestrian and cyclist travel throughout the community.

2.1 PROJECT OBJECTIVES

The project objectives as defined in the City's Request for Qualifications (RFQ) are as follows:

- Assess the existing capacity and planned future road network in the study area considering multi-modal transportation options;
- Assess the impact of the potential additional development trips and infrastructure in the study area on the performance of the transportation network;
- Identify triggers when network modifications will be required to mitigate the impact on network performance.

As a key stakeholder, the Ministry of Transportation & Infrastructure (MoTI) should be consulted. In the original RFQ, the City indicated a planning horizon period of 30-years. During the initial kick-off stages of the project, this horizon period was identified as potentially too far into the future. Longer horizons can present greater uncertainty in both analysis results and underlying assumptions. Over a 30-year horizon, this can potentially include compounded excessive traffic growth that accumulates over time, technological advances such as autonomous and connected vehicles, as well as social and behavioural changes such as car sharing programs, micro-mobility and other non-vehicular mobility options. In addition, it was acknowledged a shorter horizon period should be considered to identify more immediate transportation improvements that may be required. As a result, the 5-year and a 15-year horizon periods were selected, with the 15-year horizon period selected as the "long-term" analysis period.

2.2 PROJECT SCOPING AND TERMS OF REFERENCE

The project scope included collaboration between the City and MoTI, both in defining the study area, providing background data and information, and guiding elements of the network study. This was achieved through a series of bi-weekly project meetings that included both parties. The bi-weekly meetings were also utilized as opportunities to discuss the results of the traffic data collection including volumes and travel patterns, and preliminary analysis findings and recommendations.

At the project initiation stage, a Terms of Reference (ToR) for the Traffic Study was undertaken. The ToR was used to identify the afore-mentioned 5-year and 15-year horizon periods, traffic growth rate assumptions and study intersections. In addition, specific details of the future development sites including land use, density and build-out periods were defined.

2.2.1 ANALYSIS PERIODS

Analysis periods were defined as the 5-year and 15-year horizon period. In addition, the weekday AM Peak Hour and weekday PM Peak Hour were identified as key time periods for the traffic analysis. The weekday AM Peak Hour period is defined as the four highest consecutive 15-minute intervals generally occurring between the hours of 7:00 am and 9:00 am. Similarly, the weekday PM Peak Hour period is defined as the four highest consecutive 15-minute intervals generally occurring between the hours of 4:00 pm and 6:00 pm. These time periods are also often referred to as “rush hour” periods. It is industry practice to evaluate these time periods for operational performance as they typically represent the highest periods of traffic during the week, and therefore represent the most consistently congested travel periods over the course of a calendar year. Seasonal variations may also occur that result in higher traffic volumes and congestion, with summer and winter periods as well as long weekends and special events that can result in even higher volumes. However, these other periods are not typically evaluated for operational performance for the purposes of identifying long-term network improvements due to their more inconsistent occurrence over the calendar year duration. Transportation network improvements often become part of the City’s permanent infrastructure, and over-building can lead to increased maintenance costs, speeding on roadways, safety concerns and mobility imbalances that discourage users from choosing more sustainable transportation modes such as walking, biking and riding transit.

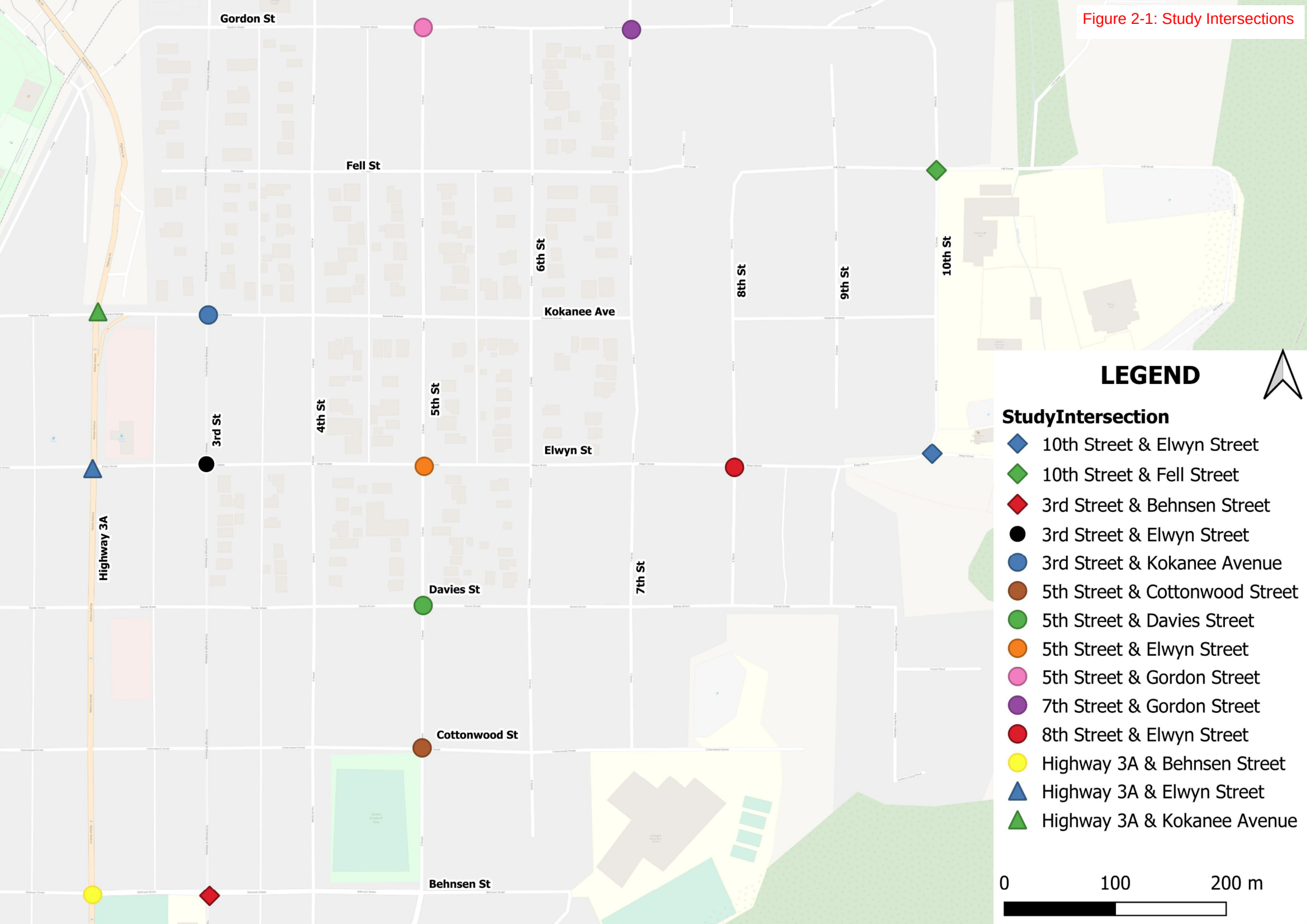
2.2.2 STUDY INTERSECTIONS

A total of 12 study intersections were initially identified as part of the initial ToR, however through further discussions with the City and MoTI, an additional two (2) intersections were also included. The 14 intersections were identified based on surrounding land uses, proximity to the future development areas and the travel routes most likely to be used by new traffic generated, and historical concerns identified by the City and MoTI. Therefore, study intersections were identified as follows:

- Highway 3A & Kokanee Avenue
- Highway 3A & Elwyn Street
- 3rd Street & Elwyn Street
- 5th Street & Davies Street
- 5th Street & Cottonwood Street
- 5th Street & Gordon Street
- 7th Street & Gordon Street
- 10th Street & Fell Street
- 8th Street & Elwyn Street
- Highway 3A & Behnsen Street
- 3rd Street & Behnsen Street
- 10th Street & Elwyn Street
- 5th Street & Elwyn Street
- 3rd Street & Kokanee Avenue

Figure 2-1 illustrates the study intersections.

Figure 2-1: Study Intersections



3 DEVELOPMENT SITES CONTEXT

3.1 SITE LOCATIONS

The City has identified five (5) specific current and future development sites as part of the RFQ that are expected to have traffic impacts to the Fairview neighbourhood in both the short-term and long-term horizon periods. The proposed developments and anticipated growth patterns are noted below in **Table 3-1**:

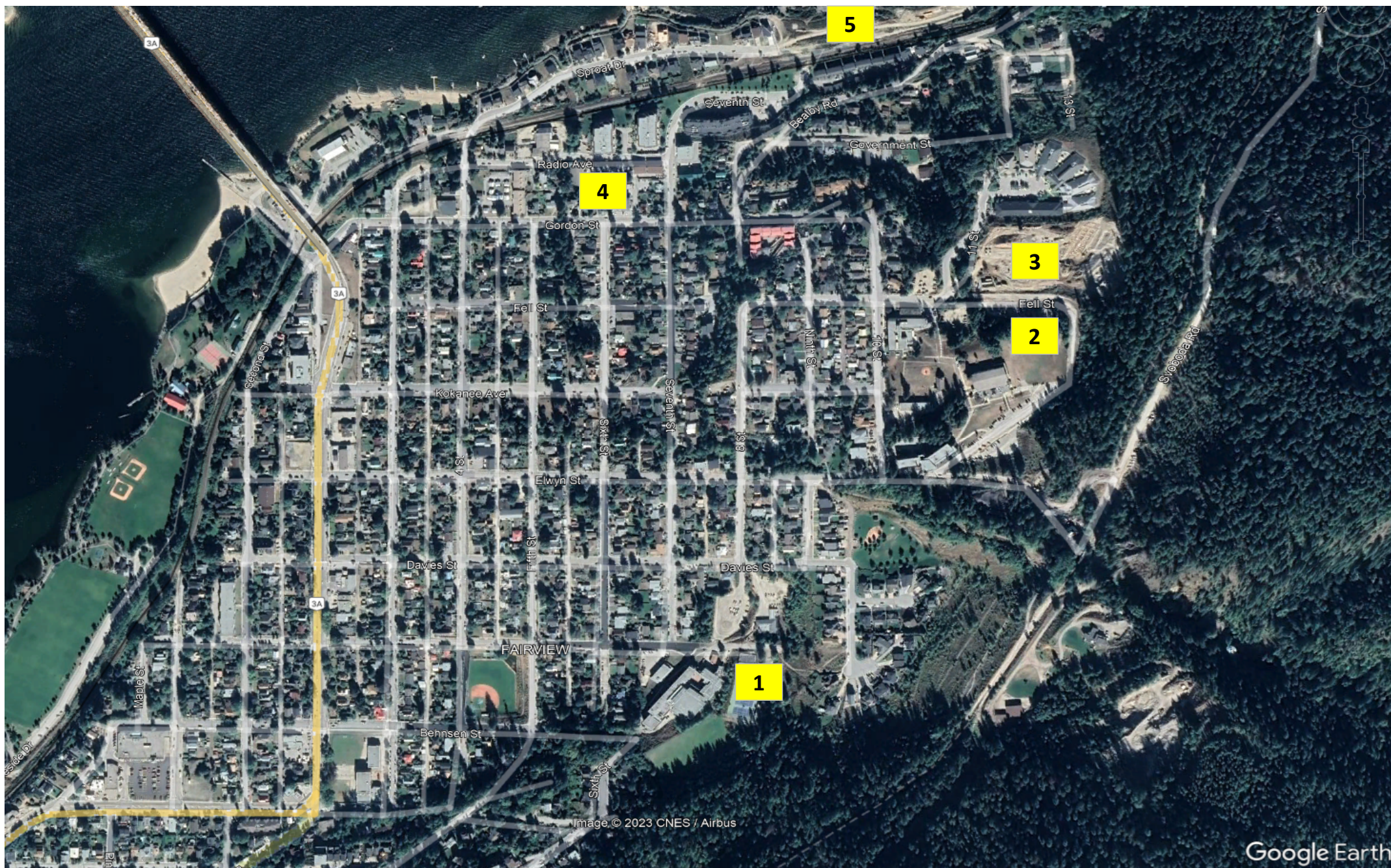
Table 3-1 – Potential Development Land Uses

Site #	Acres	Potential Max Density / Anticipated Density	Anticipated Time Horizon
1	5.36	60 Residential units	50% in 1-5 years 50% in 5-10 years
2	6.52	120 Residential units	100% in 10-15 years
3	7.4	75 Long-Term Care Beds 29,000 SF of Community Health Services	100% in 1-5 years
4	0.69	25 Residential units	100% in 1-5 years
5	11.67	265 Residential units 5,380 SF Office space 21,530 SF Commercial space	50% in 15 years

The proposed development areas are illustrated in **Figure 3-1**.

It is recognized that in addition to the specific development sites identified in Table 3-1, additional traffic growth may occur both locally and regionally over time. Based on discussions with the City and MoTI, traffic growth rates were assumed for both the short-term and long-term horizons and for the general roadway network and along Highway 3A specifically. The traffic growth rates utilized in this Traffic Study are discussed in more detail in **Section 5.2**.

Figure 3-1: Future Development Areas



4 LOCAL TRANSPORTATION NETWORK

4.1 ROAD NETWORK

The existing road network hierarchy and current classification for the Fairview neighbourhood is shown below in **Figure 4-1** as outlined in the City's Official Community Plan (OCP).

The roadways within the Fairview neighbourhood are generally classified as either Arterial, Collector or Local.

Arterials are generally considered major roadways that have a functional intent to move vehicular traffic between communities and major destinations and collect traffic from other classified roadways to other street types. Arterials also support the goods movement network. Traffic volumes on arterials are typically higher (20,000 to 35,000 vehicles per day) compared to collectors and local roadways.

Collector roadways function to gather and distribute traffic between local streets and arterial streets, and often provide connectivity for all travel modes (pedestrians, cyclists, transit and vehicular). Collector roadways can also support the local transit network. Collectors can be expected to carry higher traffic volumes (approximately 8,000 – 15,000 vehicles per day) compared to local roadways but less than arterial roadways.

Local roadways, often referred to as residential streets, typically provide direct access to residential dwelling units and provide connectivity for vehicles, pedestrians and cyclists. Transit services are typically not provided on local streets. Local roadways typically have low traffic volumes (generally <2,000 vehicles per day).

As noted in the OCP, Highway 3A is classified as an Arterial and under the jurisdiction of MoTI. In addition, a number of roadways within the community are classified as Collector including:

- Davies Street from Highway 3A to Hampton Gray Place
- Gordan Street from Fifth Street to Tenth Street
- Kokanee Avenue from Eighth Street to Tenth Street
- Fifth Street from Gordan Street to Behnsen Street
- Eighth Street from Kokanee Avenue to Davies Street
- Tenth Street from Gordan Street to Kokanee Avenue

The remaining roadways within the Fairview Neighbourhood are classified as Local roadways.

Illustrated in **Figure 4-2** are the traffic control measures at the study intersections analyzed in this report. Included in **Appendix A** are the existing grades for roadways within the Fairview neighbourhood.

Figure 4-1: Fairview Roadway Network and Classification

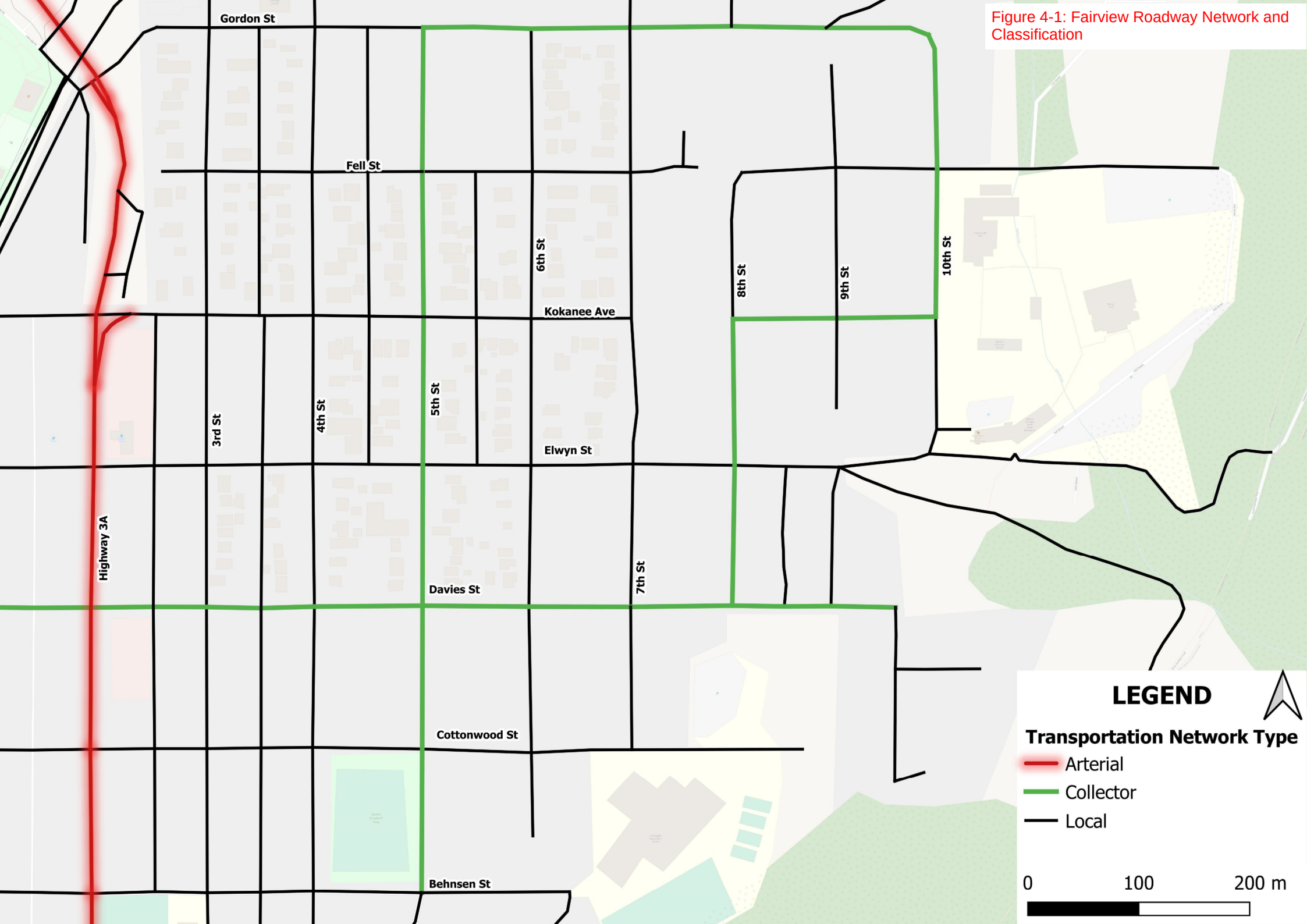


Figure 4-2: Proposed Laning Configuration and Traffic Control

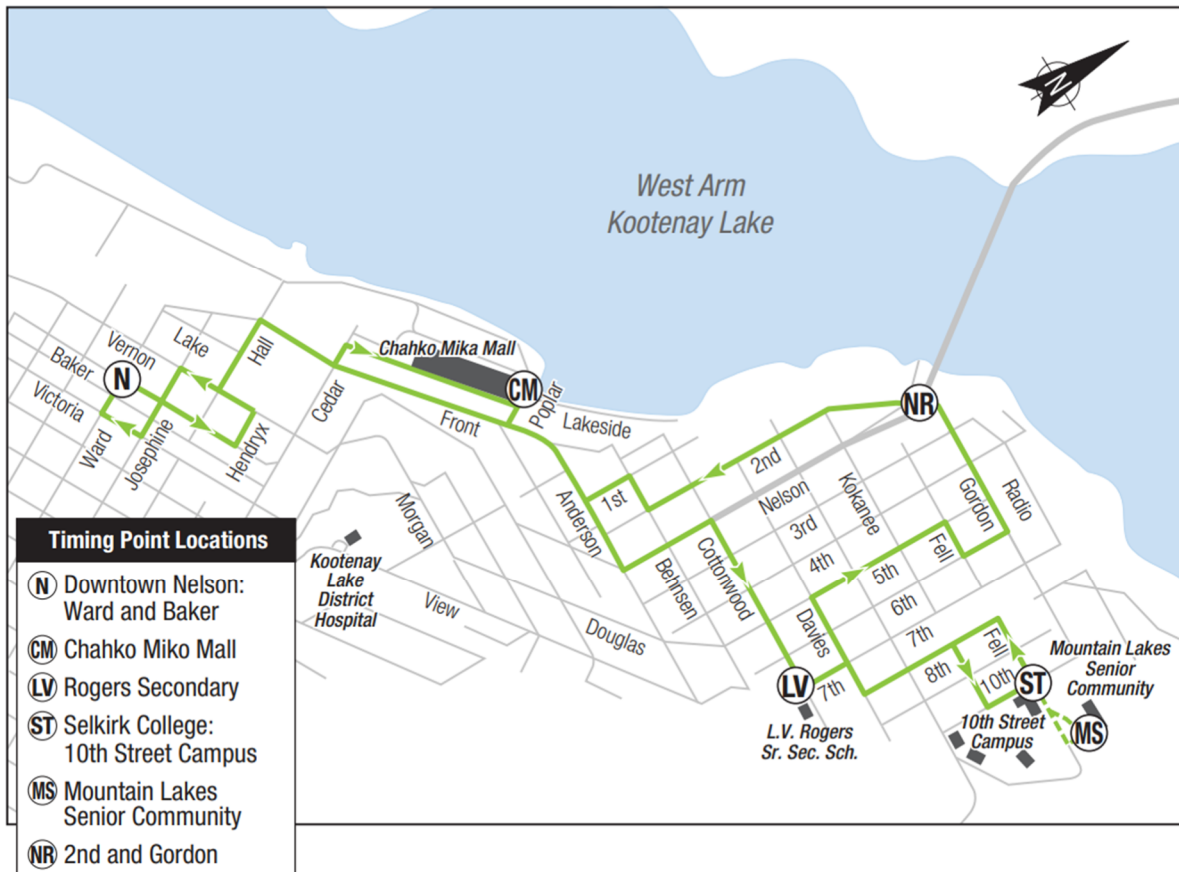


4.1.1 BC TRANSIT SERVICE

A high-level review of the current BC Transit service through the Fairview neighbourhood was also conducted, primarily focused on the current routes through the community. As noted in **Figure 4-3**, an existing BC Transit route (Route 2) currently completes a loop that connects to several major destinations.

Figure 4-3 – Existing BC Transit Service – Fairview Neighbourhood

2 Fairview



5 TRAFFIC VOLUMES

5.1 EXISTING TRAFFIC VOLUMES

It is standard traffic engineering practice that traffic analyses are undertaken for the weekday morning and afternoon peak periods, often referred to as the AM Peak Hour and PM Peak Hour, respectively. These time periods typically represent the highest set of routine roadway volumes on the network and generally occur between 7:00am and 9:00am and between 4:00pm and 6:00pm. The peak hour is a technical industry term that is defined as the highest four (4) consecutive 15-minute intervals that occur during the data collection periods (7:00am – 9:00am and 4:00pm – 6:00pm).

To quantify the existing network operations, traffic data collection was undertaken at each of the study intersections for both the weekday morning and afternoon peak periods. This data collection was undertaken on the following dates summarized in **Table 5.1**.

Table 5-1 – Intersection Data Collection Dates

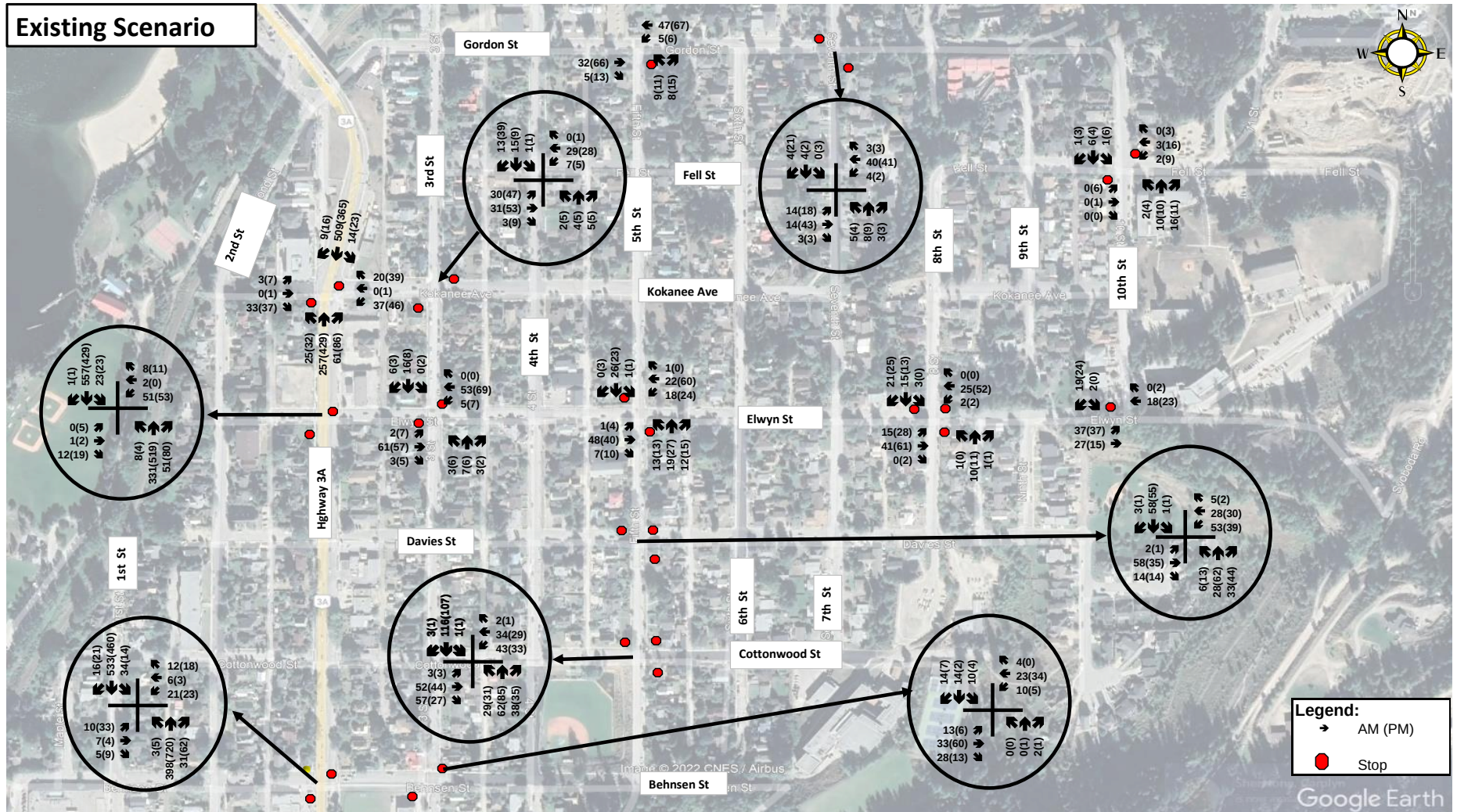
Intersection	Data Collection Date
Highway 3A & Kokanee Avenue	Wednesday, May 25, 2022
Highway 3A & Elwyn Street	Wednesday, May 25, 2022
3 rd Street & Elwyn Street	Wednesday, May 25, 2022
5 th Street & Davies Street	Wednesday, May 25, 2022
5 th Street & Cottonwood Street	Wednesday, May 25, 2022
5 th Street & Gordon Street	Thursday, May 26, 2022
7 th Street & Gordon Street	Thursday, May 26, 2022
10 th Street & Fell Street	Thursday, May 26, 2022
8 th Street & Elwyn Street	Thursday, May 26, 2022
Highway 3A & Behnsen Street	Tuesday, June 21, 2022
3 rd Street & Behnsen Street	Tuesday, June 21, 2022
10 th Street & Elwyn Street	Tuesday, June 21, 2022
5 th Street & Elwyn Street	Wednesday, June 22, 2022
3 rd Street & Kokanee Avenue	Wednesday, June 22, 2022

Data collection was undertaken in two phases. The initial phase included nine locations that were initially identified by both WSP and the City as critical intersections. This data was conducted and reviewed for traffic volumes and travel patterns, and overlaid with the expected development area's generated trips to identify any additional intersections that may warrant review and analysis. Based upon this initial review, an additional five (5) intersections were identified by WSP and discussed with the City before proceeding with traffic data collection, increasing the total number of study intersections to 14 as part of this study.

Data was collected using MioVision cameras, which uses video technology to document all modes of travel – passenger vehicles, single and multi-axle trucks, transit vehicles, cyclists and pedestrians – for both travel direction, time of day and quantified. Cameras were deployed at each of the study intersections and volumes for each mode were documented into 15-minute intervals.

The existing weekday AM Peak Hour and PM Peak Hour traffic volumes collected are illustrated in **Figure 5-1**.

Figure 5-1: 2022 Existing Traffic Volumes



As illustrated in the existing traffic volumes, the highest peak hour volumes were observed along Highway 3A. As the regional Arterial roadway connecting the Fairview neighbourhood to the overall region and core downtown and commercial areas, the higher volumes are expected, and traffic volumes are observed coming to / from the community streets during the peak hour periods. Higher traffic volumes are also observed along Fifth Street, a North-South Collector roadway, and along Elwyn Street, Davies Street and Cottonwood Street. While Davies Street is also classified as a Collector roadway, Elwyn Street and Cottonwood Street are both classified as Local Roads. This results in higher-than-expected volumes on Elwyn Street and Cottonwood Street at the Fifth Street intersection. In addition, elevated volumes are noted at the intersections of Highway 3A and Elwyn Street and Kokanee Avenue, with the traffic to / from Highway 3A turning at Third Street to / from areas to the north of the community. This indicates while Davies Street is the only east-west Collector roadway in the community, other roadways are functionally carrying similar volumes of traffic during the two peak hour periods. However, while the volumes are higher than a typical residential roadway standard (approximately 2,000 vehicles per day), the volumes are below for a typical collector roadway standard (approximately up to 8,000 – 10,000 vehicles per day). As such, changes to these roadways are not required.

5.2 TRIP GENERATION ESTIMATES

The trip generation potential for the anticipated 5-year and 15-year densities identified in Table 3-1 were estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition), the industry standard for estimating trip generation potential for various land uses. These trips were then assigned to the study intersections and roadway network based on both existing travel patterns observed from the existing traffic counts for each of the peak hour periods, the proposed land use types and anticipated origins and destinations within the broader City of Nelson context. Outlined in **Table 5-2** are the land use categories and trip generation formulas that were applied to the various development sites. **Table 5-3** is the estimated 5-year and 15-year trip generation potential for the five (5) development sites identified in Table 3-1.

Table 5-2 – Potential Development Land Uses

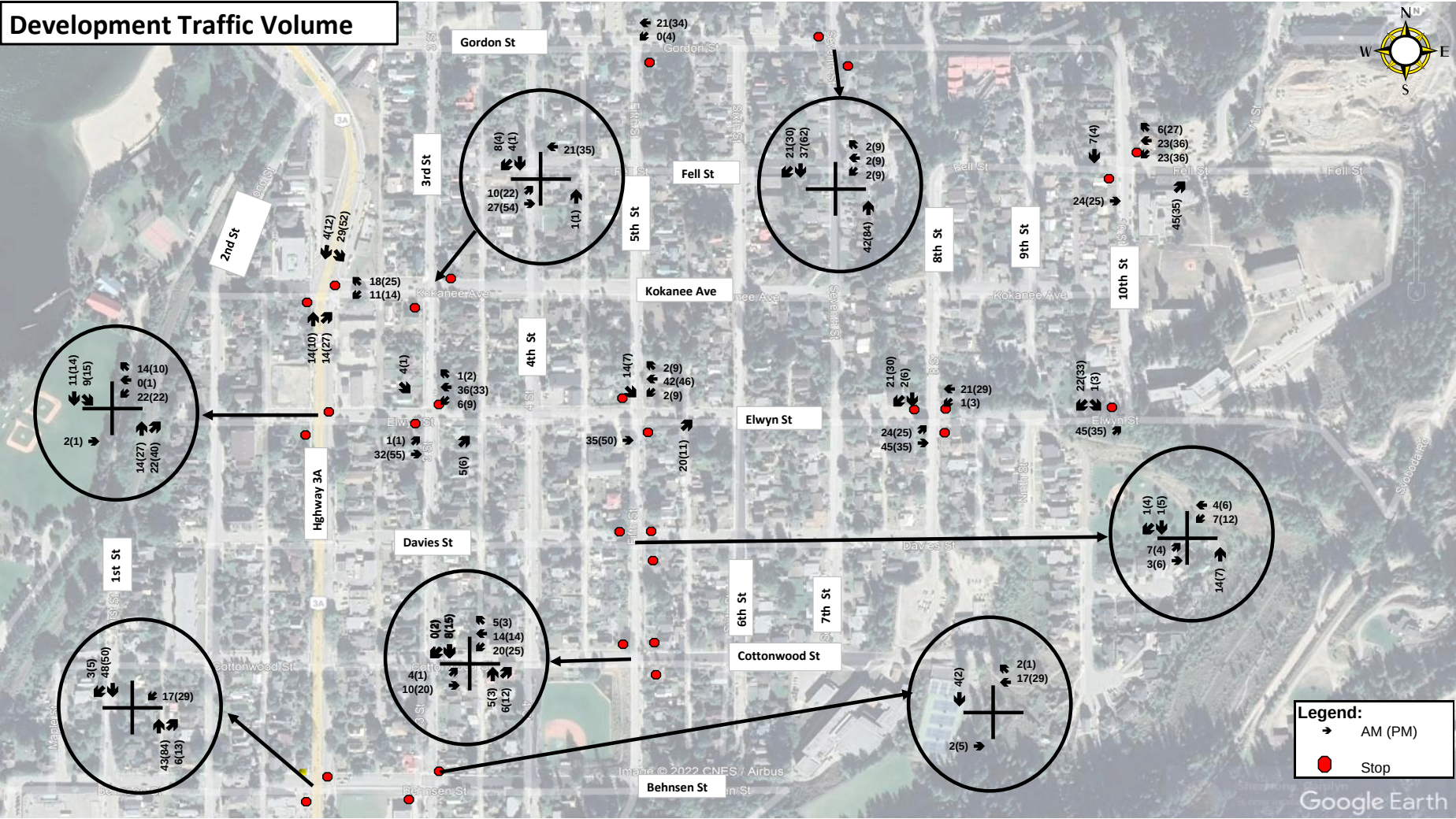
Area	Land Use Category	ITE Land Use Code	5-Year Horizon		15-Year Horizon	
			# of Units	1000 sq ft	# of Units	1000 sq ft
1	Single Family	215	30		60	
2	Multifamily Housing (Mid Rise)	221	0		120	
3	Long Term Care	620	75		75	
	Community Health Service	630		29		29
4	Multifamily Housing (Mid Rise)	221	25		25	
5	Single-Family Attached Housing	215	27		133	
	Small Office Building	712		0		5.38
	Strip Retail Plaza	822		0		21.53

Illustrated in **Figure 5-2** are the distributed development traffic volumes on the roadway network and through the study intersections. It should be noted that these proposed development sites are located along the existing BC Transit Route 2 and generally within walking distance to the service. This provides an opportunity to promote transit usage for these new developments to help mitigate their vehicular traffic impacts without the need to add new routes or modify existing transit routes.

Table 5-3: Potential Development Trips

					5-Year Horizon										15-Year Horizon							
Area	Land Use Category	ITE Land Use Code	# of Units	1000 Sq Ft	AM Rate	AM Trips	AM Inbound		AM Outbound		PM Rate PM Trips		PM Inbound		PM Outbound		AM Trips	AM Inbound	AM Outbound	PM Trips	PM Inbound	PM Outbound
							Distribution	Trips	Distribution	Trips			Distribution	Trips	Distribution	Trips		Trips	Trips		Trips	
1	Single- Family Attached Housing	215	30		0.48	14	31%	4	69%	10	0.57	17	57%	10	43%	7	29	9	20	34	19	15
2	Multifamily Housing (Mid Rise)	221	0		0.37	0	23%	0	77%	0	0.39	0	61%	0	39%	0	44	10	34	47	29	18
3	Long Term Care	620	75		0.14	11	72%	8	28%	3	0.14	11	33%	3	67%	7	11	8	3	11	3	7
	Community Health Service	630		29	2.49	72	81%	58	19%	14	3.63	105	30%	32	70%	74	72	58	14	105	32	74
4	Multifamily Housing (Mid Rise)	221	25		0.37	9	23%	2	77%	7	0.39	10	61%	6	39%	4	9	2	7	10	6	4
5	Single-Family Attached Housing	215	27		0.48	13	31%	4	69%	9	0.57	15	57%	9	43%	7	64	20	44	76	43	33
	Small Office Building	712		0	1.67	0	82%	0	18%	0	2.16	0	34%	0	66%	0	9	7	2	12	4	8
	Strip Retail Plaza	822		0	2.36	0	60%	0	40%	0	6.59	0	50%	0	50%	0	51	30	20	142	71	71

Figure 5-2: Anticipated Development Traffic Volumes



5.3 HORIZON YEARS TRAFFIC VOLUMES

In addition to the five (5) identified development sites, it is recognized that area-wide traffic growth is expected to occur over time as a result of population growth and the regional traffic draw to the area. Through discussions with the City and MoTI, it was identified that separate traffic growth rates would likely occur along City roads and along Highway 3A.

The City provided a recommendation to use a 1.4% annual traffic growth rate for the 5-year horizon. MoTI provided a recommendation to use a 2.0% annual traffic growth rate for Highway 3A volumes over the same 5-year horizon. These rates were applied to the existing volumes at the applicable study intersections and approaches.

However, as these growth rates become compounded over longer time periods, they can increase with no upper limit and become a larger percentage of the total intersection volumes. Therefore over a longer period, this can create a greater uncertainty to the future operations of an intersection, as it assumes both a steady increase in volumes but no events or social changes that change a community's mobility choices. Examples of social changes that can impact the long-term traffic growth includes emphasis on sustainable transportation modes in response to the climate crisis, impacts on vehicular usage due to rising prices of fossil fuels and motor vehicle costs as well as reduced demand for vehicle ownership, and the permanency of company policies such as Work From Home (WFH) that can dramatically shift how and when employees travel to and from work. As such, it is appropriate to both reconsider the long-term traffic growth rates and apply a lower rate, and undertake a future interim assessment to re-evaluate future traffic operations. As such, for the 15-year horizon, based on discussions with the City and MoTI, a 1.0% annual traffic growth rate was applied to all study intersections.

Illustrated in **Figure 5-3** are the 2027 horizon year traffic volumes. Illustrated in **Figure 5-4** are the 2037 horizon year traffic volumes.

Figure 5-3: 2027 Forecast Traffic Volumes

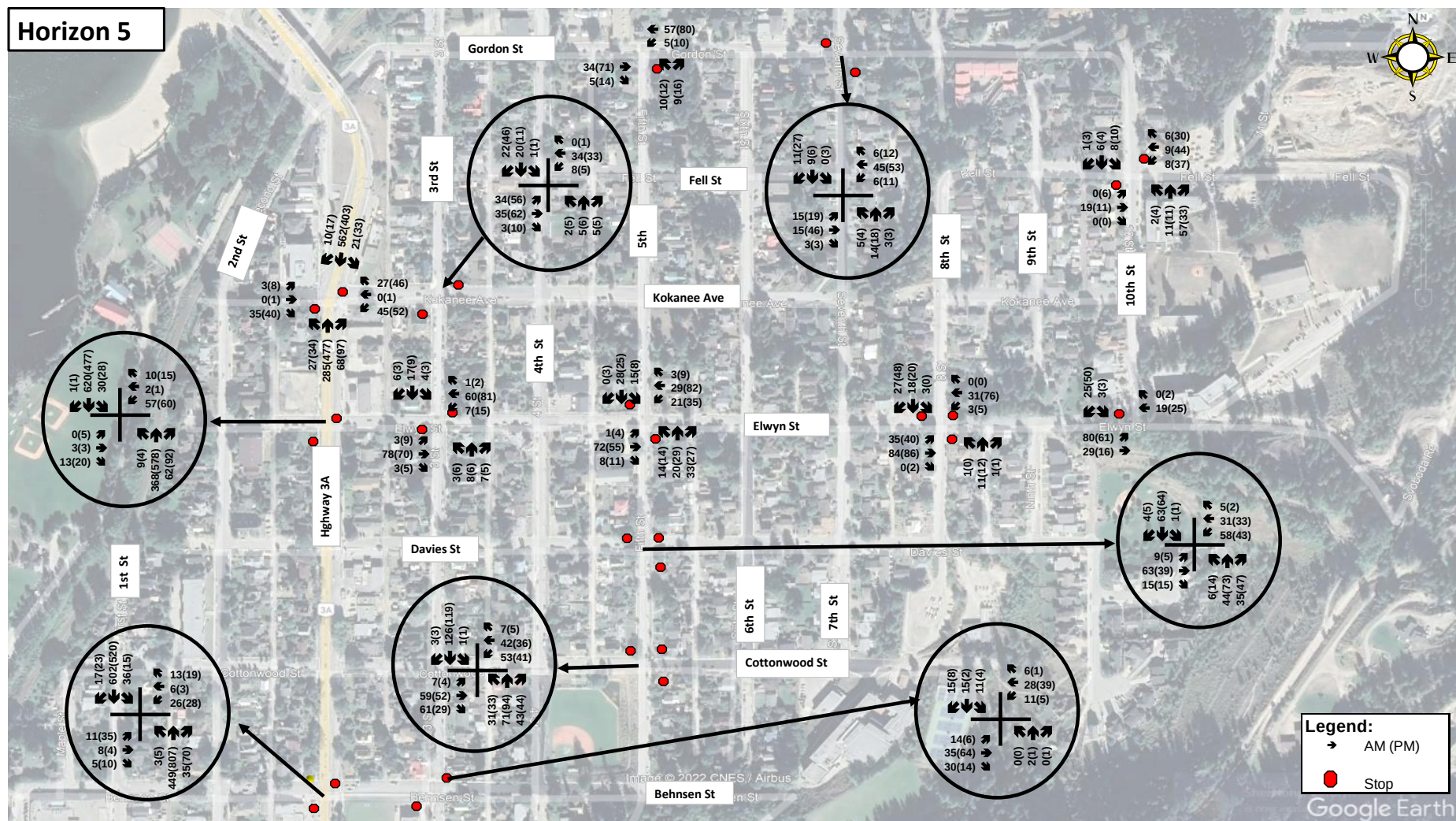
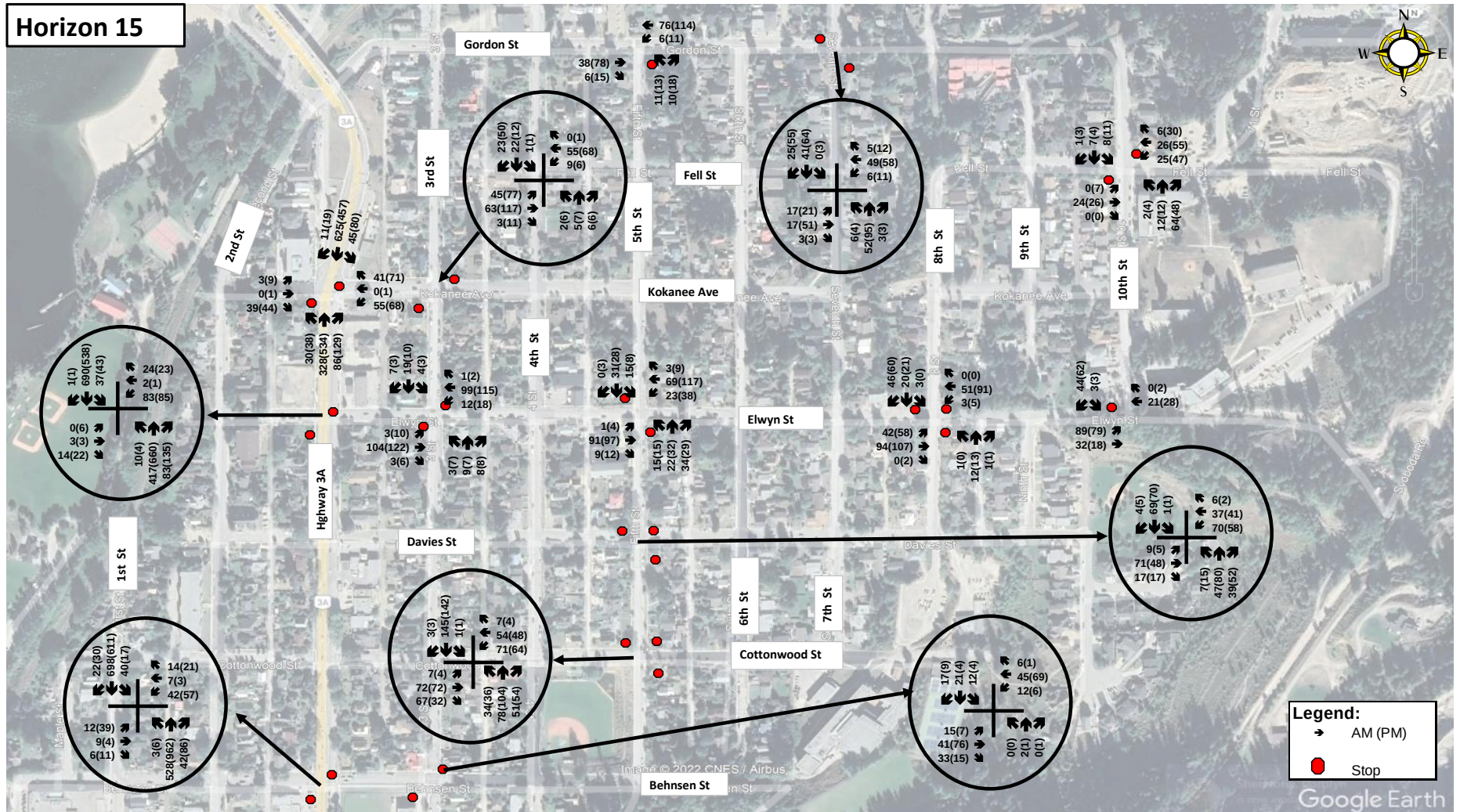


Figure 5-4: 2037 Forecast Traffic Volumes



6 TRAFFIC ANALYSIS

6.1 TRAFFIC ANALYSIS METHODOLOGY

Existing intersection geometry and traffic control were modeled using Trafficware's Synchro 11 software for the study intersections. Synchro follows the *Highway Capacity Manual 2010 (HCM 2010)* Level-of-service (LOS) criteria as summarized in **Table 6-1**. The Highway Capacity Manual is an international resource document for practitioners for undertaking transportation capacity analysis and utilizes standardized methodologies for qualitatively assessing intersection operations using key metrics and quantitative data.

There are four (4) key metrics that are typically evaluated to assess intersection operations, that were applied to the existing conditions, 5-year horizon and 15-year horizon analyses:

Level-of-Service (LOS): LOS is a measure of delay. The LOS for an intersection provides an indication of the quality of traffic operations and relates to the delay being experienced by vehicles. Intersection LOS denoted by letter grades 'A' through 'D' indicates a satisfactory level of operations, with 'A' being free flow and level 'D' representing conditions approaching congestion. Levels designated 'E' and 'F' represent increasingly congested traffic conditions.

Table 6-1 - Level of Service Criteria for Intersections (HCM)

SIGNALIZED CONTROL DELAY (s)	UNSIGNALIZED CONTROL DELAY (s)	LOS BY VOLUME-TO-CAPACITY RATIO	
		$v/c \leq 1.0$	$v/c > 1.0$
≤ 10	≤ 10	A	F
> 10 and ≤ 20	> 10 and ≤ 15	B	F
> 20 and ≤ 35	> 15 and ≤ 25	C	F
> 35 and ≤ 55	> 25 and ≤ 35	D	F
> 55 and ≤ 80	> 35 and ≤ 50	E	F
> 80	> 50	F	F

Volume-to-Capacity (v/c) Ratio: An intersection capacity analysis provides an indication of traffic operations based on calculations of volume-to-capacity (v/c) ratio and delays for individual movements at an intersection. The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. As the v/c ratio approaches 1.00, traffic flow may become unstable resulting in delay and queuing. Once the demand exceeds the capacity (i.e., a v/c ratio greater than 1.00), traffic flow is unstable and excessive delay and queuing is expected.

As a target or design parameter, the following criteria are considered acceptable threshold for the study area:

- v/c ratio of 0.85 and LOS D for the overall intersections; and,
- v/c ratio of 0.90 for individual movements.

Vehicle Delay: Measured in seconds per vehicle, vehicular delay during the peak hour periods is used to determine which LOS is appropriate for assessing the intersection operations. It represents the typical delay that a vehicle can expect during the peak hour and is reported on a movement-by-movement basis.

95th Percentile Queue: The 95th Percentile Queue is a calculated value of a potential queue, and is usually reported in meters. The 95th Percentile Queue values indicate that "95% of the time, the observable queue should be that length or less." Longer queues have the potential to block nearby property access driveways, can block vehicles from accessing a turning lane at an intersection or potentially block adjacent intersections where closely-spaced intersections are present. The 95th Percentile Queue is not a direct indicator of operational failure but can be used to evaluate access management in areas.

6.2 EXISTING CONDITIONS ASSESSMENT

The weekday a.m. and p.m. peak hour conditions were analyzed using the 2022 existing traffic volumes and lane configuration. The traffic analysis results of the existing conditions indicates that all the movements at the study intersections generally operate at an acceptable LOS D or better, with three notable exceptions. For each of these locations, the 95th Percentile Queues and v/c ratios were noted as operating acceptably or within reasonable tolerances, however the poorer operations were a result of the longer vehicular delays.

Nelson Avenue / Highway 3A & Kokanee Avenue | The stop-controlled westbound approach was noted as operating at LOS E during the PM Peak Hour period. This is largely due to the single shared lane approach for making a westbound left-turn, a westbound through or a westbound right-turn, combined with the need for left-turning and through vehicles requiring a simultaneous gap in traffic along Highway 3A. As a result, vehicles may experience longer delays, with all right-turning vehicles essentially stuck in a queue behind left-turning and through vehicles. However, the v/c ratio for this movement is only 0.51, indicating that the approach has sufficient capacity, and the 95th Percentile Queue is calculated as approximately 20m. As such, the movement may experience periods of congestion and longer delays, but improvements are not required to mitigate these conditions.

Nelson Avenue / Highway 3A & Elwyn Street | Similar to the Kokanee Avenue intersection, the stop-controlled westbound approach was noted as operating at LOS E during both the AM Peak Hour and PM Peak Hour periods. However, the v/c ratio for this movement is only 0.50, indicating that the approach has sufficient capacity, and the 95th Percentile Queue is calculated as approximately 18-19m. As such, the movement may experience periods of congestion and longer delays, but improvements are not required to mitigate these conditions.

Nelson Avenue / Highway 3A & Behnsen Avenue | This is an unusual intersection that is stop-controlled on both the eastbound and westbound approaches but includes pedestrian-activated crossing signals that can stop traffic traveling along Highway 3A. The intersection was noted as operating at LOS E during both the AM Peak Hour and PM Peak Hour period, and operating at a LOS F for the eastbound approach during the PM Peak Hour period. However, the v/c ratio for these movements range between 0.26 to 0.44, indicating that the approaches have sufficient capacity, and the 95th Percentile Queue is calculated as ranging between approximately 8m to 15m. As such, the movement may experience periods of congestion and longer delays, but improvements are not required to mitigate these conditions.

Table 6-2 summarizes the performance of the study intersections under existing conditions. Synchro outputs are provided in **Appendix B**.

TABLE 6-2: EXISTING CONDITIONS SUMMARY

INTERSECTION NAME	EXISTING_AM						EXISTING_PM					
	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th
Highway 3A & Kokanee Avenue	EBL	3	C	17	0.15	4	EBL	7	C	18	0.18	5
	EBT	0					EBT	1				
	EBR	33					EBR	37				
	WBL	37	D	28	0.32	10	WBL	46	E	38	0.51	20
	WBT	0					WBT	1				
	WBR	20					WBR	39				
	NBL	25	A	9	0.06	1	NBL	32	A	9	0.04	1
	NBT	257	A	0	0.20	0	NBT	429	A	0	0.27	0
	NBR	61	A	0	0.04	0	NBR	86	A	0	0.06	0
	SBL	14	A	8	0.01	0	SBL	23	A	8	0.03	1
	SBT	509	A	0	0.39	0	SBT	365	A	0	0.29	0
	SBR	9					SBR	16				
	OVERALL		A	3	0.39		OVERALL		A	5	0.51	
Highway 3A & Elwyn Street	EBL	0	C	16	0.06	1	EBL	5	C	20	0.16	4
	EBT	1					EBT	2				
	EBR	12					EBR	19				
	WBL	51	E	45	0.51	19	WBL	53	E	46	0.50	18
	WBT	2					WBT	0				
	WBR	8					WBR	11				
	NBL	8	A	9	0.02	0	NBL	4	A	9	0.01	0
	NBT	331	A	0	0.22	0	NBT	519	A	0	0.33	0
	NBR	51	A	0	0.04	0	NBR	80	A	0	0.05	0
	SBL	23	A	8	0.03	1	SBL	23	A	9	0.04	1
	SBT	557	A	0	0.41	0	SBT	429	A	0	0.31	0
	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0
	OVERALL		A	4	0.51		OVERALL		A	4	0.50	
3rd Street & Elwyn Street	EBL	2	B	10	0.10	3	EBL	7	B	10	0.13	4
	EBT	61					EBT	57				
	EBR	3					EBR	5				
	WBL	5	B	10	0.10	3	WBL	7	B	10	0.12	3
	WBT	53					WBT	69				
	WBR	0					WBR	0				
	NBL	3	A	3	0.01	0	NBL	6	A	4	0.01	0
	NBT	7					NBT	6				
	NBR	3					NBR	2				
	SBL	0	A	0	0.00	0	SBL	2	A	1	0.00	0
	SBT	16					SBT	8				
	SBR	6					SBR	3				
	OVERALL		A	8	0.10		OVERALL		A	8	0.13	
5th Street & Davies Street	EBL	2	A	0			EBL	1	A	0		1
	EBT	58	A	0			EBT	35	A	0		
	EBR	14	A	0			EBR	14	A	0		
	WBL	53	A	5		20	WBL	39	A	5		16
	WBT	28	A	5			WBT	30	A	5		
	WBR	5	A	3			WBR	2	A	3		
	NBL	6	A	6		13	NBL	13	A	5		13
	NBT	28	A	6			NBT	62	A	6		
	NBR	33	A	5			NBR	44	A	4		
	SBL	1	A	0		13	SBL	1	A	6		14
	SBT	58	A	6			SBT	55	A	6		
	SBR	3	A	3			SBR	1	A	0		
	OVERALL		A	4			OVERALL		A	4		
5th Street & Cottonwood Street	EBL	3	A	1			EBL	3	A	0		2
	EBT	52	A	0			EBT	44	A	0		
	EBR	57	A	0			EBR	27	A	0		
	WBL	43	A	5		14	WBL	33	A	5		16
	WBT	34	A	5			WBT	29	A	5		
	WBR	2	A	4			WBR	1	A	2		
	NBL	29	A	4		15	NBL	31	A	5		18
	NBT	62	A	5			NBT	85	A	5		
	NBR	38	A	3			NBR	35	A	3		
	SBL	1	A	0		25	SBL	1	A	9		15
	SBT	116	A	7			SBT	107	A	6		
	SBR	3	A	5			SBR	1	A	0		
	OVERALL		A	4			OVERALL		A	4		
5th Street & Gordon Street	EBT	32	A	0	0.03	0	EBT	66	A	0	0.06	0
	EBR	5					EBR	13				
	WBL	5					WBL	6				
	WBT	47	A	1	0.01	0	WBT	67	A	1	0.01	0
	NBL	9					NBL	11				
	NBR	8					NBR	15				
	OVERALL		A	3	0.04		OVERALL		A	3	0.06	
7th Street & Gordon Street	EBL	14	A	4	0.02	0	EBL	18	A	2	0.02	0
	EBT	14					EBT	43				
	EBR	3					EBR	3				
	WBL	4	A	2	0.01	0	WBL	2	A	1	0.01	0
	WBT	40					WBT	41				
	WBR	3					WBR	3				
	NBL	5	A	10	0.03	1	NBL	4	B	10	0.04	1
	NBT	8					NBT	9				
	NBR	3					NBR	3				
	SBL	0	A	10	0.02	1	SBL	3	A	10	0.05	1
	SBT	4					SBT	2				
	SBR	4					SBR	21				
	OVERALL		A	4	0.03		OVERALL		A	4	0.05	

TABLE 6-2: EXISTING CONDITIONS SUMMARY

Intersection Name	EXISTING_AM						EXISTING_PM					
	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th
10th Street & Fell Street	EBL	0	A	0	0.00	0	EBL	6	A	10	0.02	1
	EBT	0					EBT	1				
	EBR	0					EBR	0				
	WBL	2	A	9	0.02	0	WBL	9	A	10	0.06	2
	WBT	3					WBT	16				
	WBR	0					WBR	3				
	NBL	2	A	1	0.00	0	NBL	4	A	1	0.01	0
	NBT	10					NBT	10				
	NBR	16					NBR	11				
	SBL	1	A	1	0.00	0	SBL	6	A	3	0.01	0
	SBT	6					SBT	4				
	SBR	1					SBR	3				
	OVERALL		A	2	0.02		OVERALL		A	6	0.06	
8th Street & Elwyn Street	EBL	15	A	0		12	EBL	28	A	0		15
	EBT	41	A	0			EBT	61	A	0		
	EBR	0	A	0			EBR	2	A	0		
	WBL	2	A	4			WBL	2	A	7		
	WBT	25	A	4			WBT	52	A	5		
	WBR	0	A	0			WBR	0	A	0		
	NBL	1	A	4		10	NBL	0	A	0		15
	NBT	10	A	5			NBT	11	A	5		
	NBR	1	A	0			NBR	1	A	3		
	SBL	3	A	5		19	SBL	0	A	0		15
	SBT	15	A	5			SBT	13	A	5		
	SBR	21	A	3			SBR	25	A	3		
	OVERALL		A	3			OVERALL		A	2		
3rd Street & Behnsen Street	EBL	13	B	13	0.19	5	EBL	6	A	10	0.13	3
	EBT	33					EBT	60				
	EBR	28					EBR	13				
	WBL	10	B	12	0.11	3	WBL	5	A	10	0.06	2
	WBT	23					WBT	34				
	WBR	4					WBR	0				
	NBL	0	A	0	0.00	0	NBL	0	A	0	0.00	0
	NBT	0					NBT	1				
	NBR	2					NBR	1				
	SBL	10	A	2	0.01	0	SBL	4	A	2	0.00	0
	SBT	14					SBT	2				
	SBR	14					SBR	7				
	OVERALL		A	9	0.19		OVERALL		A	9	0.13	
10th Street & Elwyn Street	EBL	37	A	4	0.03	1	EBL	37	A	5	0.04	1
	EBT	27					EBT	15				
	WBT	18	A	0	0.01	0	WBT	23	A	0	0.02	0
	WBR	0					WBR	2				
	SBL	2	A	9	0.03	1	SBL	0	A	9	0.04	1
	SBR	19					SBR	24				
	OVERALL		A	4	0.03		OVERALL		A	5	0.04	
5th Street & Elwyn Street	EBL	1	A	0	0.00	0	EBL	4	A	1	0.01	0
	EBT	48					EBT	40				
	EBR	7					EBR	10				
	WBL	18	A	3	0.01	0	WBL	24	A	3	0.03	1
	WBT	22					WBT	60				
	WBR	1					WBR	0				
	NBL	13	A	10	0.09	2	NBL	13	B	11	0.14	4
	NBT	19					NBT	27				
	NBR	12					NBR	15				
	SBL	1	B	10	0.05	1	SBL	1	B	11	0.08	2
	SBT	26					SBT	23				
	SBR	0					SBR	3				
OVERALL		A	6	0.09		OVERALL		A	6	0.14		
3rd Street & Kokanee Avenue	EBL	30	A	10	0.13	3	EBL	47	B	11	0.19	5
	EBT	31					EBT	53				
	EBR	3					EBR	9				
	WBL	7	A	10	0.06	1	WBL	5	B	10	0.10	3
	WBT	29					WBT	28				
	WBR	0					WBR	1				
	NBL	2	A	2	0.00	0	NBL	5	A	2	0.01	0
	NBT	4					NBT	5				
	NBR	5					NBR	5				
	SBL	1	A	1	0.00	0	SBL	1	A	0	0.00	0
	SBT	15					SBT	9				
	SBR	13					SBR	39				
OVERALL		A	7	0.13		OVERALL		A	7	0.19		
Highway 3A & Behnsen Street	EBL	10	D	33	0.26	8	EBL	33	F	53	0.44	15
	EBT	7					EBT	4				
	EBR	5					EBR	9				
	WBL	21	E	36	0.36	12	WBL	23	E	40	0.34	11
	WBT	6					WBT	3				
	WBR	12					WBR	18				
	NBL	3	A	5	0.01	1	NBL	5	A	4	0.01	1
	NBT	398	A	5	0.28	45	NBT	720	A	6	0.48	102
	NBR	31	A	2	0.04	1	NBR	62	A	2	0.05	4
	SBL	34	A	5	0.09	4	SBL	14	A	4	0.03	3
	SBT	533	A	5	0.36	63	SBT	460	A	4	0.33	53
	SBR	16	A	0	0.02	0	SBR	21	A	2	0.03	1
OVERALL		A	5	0.36		OVERALL		A	5	0.48		

6.3 FIVE-YEAR HORIZON CONDITIONS ASSESSMENT

The five-year forecasted traffic volumes for the weekday AM and PM Peak Hour periods were analyzed using the existing lane configuration and traffic control measures. It was noted by the City over the course of this study that several temporary pilot projects were under consideration for 2023 within the Fairview neighbourhood that are intended to educate drivers of other network options. However as these are not currently anticipated to be permanent changes to the network, the existing lane configurations and traffic control measures were determined to be appropriate for analysis purposes for the five-year horizon.

Similar to the existing conditions assessment, the results of the five-year horizon analysis indicate that all movements at the study intersections are anticipated to operate at an acceptable LOS D or better with the same three notable exceptions:

Nelson Avenue / Highway 3A & Kokanee Avenue | A degradation to the stop-controlled westbound approach was noted with operations expected at LOS E during the AM Peak Hour period and LOS F during the PM Peak Hour period. Similar to the existing conditions, this is largely due to the single shared lane approach for making a westbound left-turn, a westbound through or a westbound right-turn, combined with the need for left-turning and through vehicles requiring a simultaneous gap in traffic along Highway 3A. As a result, vehicles may experience longer delays, with all right-turning vehicles essentially stuck in a queue behind the left-turning and through vehicles. As traffic volumes along Highway 3A increase in the future due to general traffic growth (growth rates applied) and the anticipated traffic from new developments within the area, the number of gaps in traffic will further decrease and therefore make it more challenging for side street vehicles to find acceptable gaps. However, the v/c ratio for this movement is only expected to range between 0.49 to 0.73, indicating that the approach has sufficient capacity, and the 95th Percentile Queue is calculated as ranging between approximately 18m to 35m. As such, the movement may experience periods of congestion and longer delays, but improvements are not anticipated to be required to mitigate these conditions.

Nelson Avenue / Highway 3A & Elwyn Street | Similar to the Kokanee Avenue intersection, the stop-controlled westbound approach was noted as operating at LOS F during both the AM Peak Hour and PM Peak Hour periods. However, the v/c ratio for this movement is only 0.75, indicating that the approach has sufficient capacity, and the 95th Percentile Queue is calculated as approximately 33-34m. As such, the movement may experience periods of congestion and longer delays, but improvements are not anticipated to be required to mitigate these conditions.

Nelson Avenue / Highway 3A & Behnsen Avenue | The intersection is expected to operate with a LOS E and a LOS F on the eastbound approach for the AM Peak Hour and PM Peak Hour, respectively. The westbound approach is expected to operate at a LOS F for the westbound approach for both Peak Hour periods. However, the v/c ratio for these movements range between 0.38 to 0.64, indicating that the approaches have sufficient capacity, and the 95th Percentile Queue is calculated as ranging between approximately 12m to 24m. As such, the movement may experience periods of congestion and longer delays, but improvements are not anticipated to be required to mitigate these conditions.

Table 6-3 summarizes the expected performance of the study intersections for the five-year horizon. Synchro outputs are provided in **Appendix B**.

Table 6-3: 2027 HORIZON YEAR (5-YEAR HORIZON)

INTERSECTION NAME	HORIZON_5_AM						HORIZON_5_PM					
	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th
Highway 3A & Kokanee Avenue	EBL	3	C	20	0.18	5	EBL	8	C	23	0.24	7
	EBT	0					EBT	1				
	EBR	35					EBR	40				
	WBL	45	E	39	0.49	18	WBL	52	F	67	0.73	35
	WBT	0					WBT	1				
	WBR	27					WBR	46				
	NBL	27	A	9	0.06	2	NBL	34	A	9	0.05	1
	NBT	285	A	0	0.22	0	NBT	477	A	0	0.30	0
	NBR	68	A	0	0.05	0	NBR	97	A	0	0.07	0
	SBL	21	A	8	0.02	1	SBL	33	A	9	0.04	1
	SBT	562	A	0	0.43	0	SBT	403	A	0	0.32	0
	SBR	10					SBR	17				
	Overall		A	4	0.49		Overall		A	7	0.73	
Highway 3A & Elwyn Street	EBL	0	C	23	0.13	3	EBL	5	D	25	0.21	6
	EBT	3					EBT	3				
	EBR	13					EBR	20				
	WBL	57	F	87	0.75	33	WBL	60	F	85	0.75	34
	WBT	2	F	87	0.75	33	WBT	1	F	85	0.75	34
	WBR	10	F	87	0.75	33	WBR	15	F	85	0.75	34
	NBL	9	A	9	0.02	1	NBL	4	A	9	0.01	0
	NBT	368	A	0	0.24	0	NBT	578	A	0	0.37	0
	NBR	62	A	0	0.04	0	NBR	92	A	0	0.06	0
	SBL	30	A	9	0.03	1	SBL	28	A	10	0.05	1
	SBT	620	A	0	0.46	0	SBT	477	A	0	0.35	0
	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0
	Overall		A	7	0.75		Overall		A	7	0.75	
3rd Street & Elwyn Street	EBL	3	B	11	0.14	4	EBL	9	B	10	0.16	5
	EBT	78					EBT	70				
	EBR	3					EBR	5				
	WBL	7	B	11	0.13	4	WBL	15	B	11	0.18	5
	WBT	60					WBT	81				
	WBR	1					WBR	2				
	NBL	3	A	2	0.01	0	NBL	6	A	4	0.01	0
	NBT	8					NBT	6				
	NBR	7					NBR	5				
	SBL	4	A	2	0.01	0	SBL	3	A	1	0.00	0
	SBT	17					SBT	9				
	SBR	6					SBR	3				
	Overall		A	8	0.14		Overall		A	9	0.18	
5th Street & Davies Street	EBL	9	A	0		0	EBL	5	A	0		0
	EBT	63	A	0			EBT	39	A	0		
	EBR	15	A	0			EBR	15	A	0		
	WBL	58	A	5		21	WBL	43	A	4		19
	WBT	31	A	5			WBT	33	A	5		
	WBR	5	A	3			WBR	2	A	3		
	NBL	6	A	5		15	NBL	14	A	6		17
	NBT	44	A	6			NBT	73	A	6		
	NBR	35	A	5			NBR	47	A	4		
	SBL	1	A	0		14	SBL	1	A	0		12
	SBT	63	A	6			SBT	64	A	6		
	SBR	4	A	3			SBR	5	A	4		
	OVERALL		A	4			OVERALL		A	4		
5th Street & Cottonwood Street	EBL	7	A	0		0	EBL	4	A	0		9
	EBT	59	A	1			EBT	52	A	0		
	EBR	61	A	0			EBR	29	A	0		
	WBL	53	A	6		16	WBL	41	A	5		18
	WBT	42	A	6			WBT	36	A	5		
	WBR	7	A	3			WBR	5	A	3		
	NBL	31	A	5		19	NBL	33	A	4		21
	NBT	71	A	6			NBT	94	A	6		
	NBR	43	A	4			NBR	44	A	4		
	SBL	1	A	0		21	SBL	1	A	0		18
	SBT	126	A	7			SBT	119	A	7		
	SBR	3	A	6			SBR	3	A	7		
	OVERALL		A	5			OVERALL		A	5		
5th Street & Gordon Street	EBT	34	A	0	0.03	0	EBT	71	A	0	0.06	0
	EBR	5					EBR	14				
	WBL	5	A	1	0.01	0	WBL	10	A	2	0.02	0
	WBT	57					WBT	80				
	NBL	10	A	9	0.04	1	NBL	12	A	10	0.07	2
	NBR	9					NBR	16				
	Overall		A	3	0.04		Overall		A	3	0.07	
7th Street & Gordon Street	EBL	15	A	4	0.02	0	EBL	19	A	3	0.02	1
	EBT	15					EBT	46				
	EBR	3					EBR	3				
	WBL	6	A	2	0.01	0	WBL	11	A	2	0.03	1
	WBT	45					WBT	53				
	WBR	6					WBR	12				
	NBL	5	B	10	0.04	1	NBL	4	B	11	0.07	2
	NBT	14					NBT	18				
	NBR	3					NBR	3				
	SBL	0	A	10	0.05	1	SBL	3	B	11	0.09	2
	SBT	9					SBT	6				
	SBR	11					SBR	27				
	Overall		A	5	0.05		Overall		A	5	0.09	

Table 6-3: 2027 HORIZON YEAR (5-YEAR HORIZON)

INTERSECTION NAME	HORIZON_5_AM						HORIZON_5_PM					
	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th
10th Street & Fell Street	EBL	0	B	11	0.11	3	EBL	6	B	11	0.08	2
	EBT	19					EBT	11				
	EBR	0					EBR	0				
	WBL	8	B	10	0.10	3	WBL	37	B	11	0.23	7
	WBT	9					WBT	44				
	WBR	6					WBR	30				
	NBL	2	A	0	0.00	0	NBL	4	A	1	0.01	0
	NBT	11					NBT	11				
	NBR	57					NBR	33				
	SBL	8	A	5	0.02	1	SBL	10	A	4	0.01	0
	SBT	6					SBT	4				
	SBR	1					SBR	3				
	Overall		A	6	0.11		Overall		A	8	0.23	
8th Street & Elwyn Street	EBL	35	A	0		0	EBL	40	A	0		0
	EBT	84	A	1			EBT	86	A	0		
	EBR	0	A	0			EBR	2	A	1		
	WBL	3	A	5		13	WBL	5	A	3		14
	WBT	31	A	3			WBT	76	A	5		
	WBR	0	A	0			WBR	0	A	0		
	NBL	1	A	4		14	NBL	0	A	0		14
	NBT	11	A	5			NBT	12	A	6		
	NBR	1	A	5			NBR	1	A	2		
	SBL	3	A	0		20	SBL	0	A	0		17
	SBT	18	A	5			SBT	20	A	6		
	SBR	27	A	3			SBR	48	A	3		
	OVERALL		A	2			OVERALL		A	3		
3rd Street & Behnsen Street	EBL	14	B	13	0.21	6	EBL	6	A	10	0.13	4
	EBT	35					EBT	64				
	EBR	30					EBR	14				
	WBL	11	B	12	0.13	4	WBL	5	A	10	0.08	2
	WBT	28					WBT	39				
	WBR	6					WBR	1				
	NBL	0	A	0	0.00	0	NBL	0	A	0	0.00	0
	NBT	2					NBT	1				
	NBR	0					NBR	1				
	SBL	11	A	2	0.01	0	SBL	4	A	2	0.00	0
	SBT	15					SBT	2				
	SBR	15					SBR	8				
	Overall		A	10	0.21		Overall		A	9	0.13	
10th Street & Elwyn Street	EBL	80	A	5	0.07	2	EBL	61	A	6	0.06	2
	EBT	29					EBT	16				
	WBT	19					WBT	25				
	WBR	0	A	0	0.01	0	WBR	2	A	0	0.02	0
	SBL	3	A	9	0.04	1	SBL	3	A	9	0.10	3
	SBR	25					SBR	50				
	Overall		A	5	0.07		Overall		A	6	0.10	
5th Street & Elwyn Street	EBL	1	A	0	0.00	0	EBL	4	A	1	0.01	0
	EBT	72					EBT	55				
	EBR	8					EBR	11				
	WBL	21	A	3	0.02	0	WBL	35	A	3	0.04	1
	WBT	29					WBT	82				
	WBR	3					WBR	9				
	NBL	14	B	10	0.16	4	NBL	14	B	12	0.19	5
	NBT	20					NBT	29				
	NBR	33					NBR	27				
	SBL	15	B	12	0.16	4	SBL	8	B	13	0.16	4
	SBT	28					SBT	25				
	SBR	0					SBR	3				
	Overall		A	7	0.16		Overall		A	6	0.19	
3rd Street & Kokanee Avenue	EBL	34	B	10	0.15	4	EBL	56	B	11	0.23	7
	EBT	35					EBT	62				
	EBR	3					EBR	10				
	WBL	8	B	10	0.07	2	WBL	5	B	11	0.12	3
	WBT	34					WBT	33				
	WBR	0					WBR	1				
	NBL	2	A	1	0.00	0	NBL	5	A	2	0.01	0
	NBT	5	A				NBT	6				
	NBR	5	A				NBR	5				
	SBL	1	A	1	0.00	0	SBL	1	A	0	0.00	0
	SBT	20	A				SBT	11				
	SBR	22	A				SBR	46				
	Overall		A	7	0.15		Overall		A	8	0.23	
Highway 3A & Behnsen Street	EBL	11	E	49	0.38	12	EBL	35	F	96	0.64	24
	EBT	8					EBT	4				
	EBR	5					EBR	10				
	WBL	26	F	65	0.57	22	WBL	28	F	70	0.53	19
	WBT	6					WBT	3				
	WBR	13					WBR	19				
	NBL	3	A	5	0.01	1	NBL	5	A	4	0.01	1
	NBT	449	A	5	0.32	52	NBT	807	A	7	0.54	126
	NBR	35	A	2	0.04	1	NBR	70	A	2	0.06	5
	SBL	36	A	5	0.10	5	SBL	15	A	5	0.04	3
	SBT	602	A	5	0.40	76	SBT	520	A	5	0.37	62
	SBR	17	A	0	0.02	0	SBR	23	A	2	0.03	1
	Overall		A	5	0.40		Overall		A	6	0.54	

6.4 FIFTEEN-YEAR HORIZON CONDITIONS ASSESSMENT (NO IMPROVEMENTS)

The 15-year forecasted traffic volumes for the weekday AM and PM Peak Hour periods were analyzed using the existing lane configuration and traffic control measures. The results of the 15-year horizon analysis indicate that all movements at the study intersections are anticipated to operate at an acceptable LOS D or better with the same three notable exceptions. Over this time period, operational concerns include both long 95th Percentile Queues, v/c ratios that approach or exceed 1.00 as well as longer vehicular delays.

Nelson Avenue / Highway 3A & Kokanee Avenue | Further degradation between the five-year and 15-year horizons to the stop-controlled westbound approach was noted with operations expected at LOS E during the AM Peak Hour period and LOS F during the PM Peak Hour period. Similar to the existing and five-year horizon conditions, this is largely due to the single shared lane approach for making a westbound left-turn, a westbound through or a westbound right-turn, combined with the need for left-turning and through vehicles requiring a simultaneous gap in traffic along Highway 3A. As a result, vehicles may experience longer delays, with all right-turning vehicles essentially stuck in a queue behind the left-turning and through vehicles. As traffic volumes along Highway 3A increase in the future due to general traffic growth (growth rates applied) and the anticipated traffic from new developments within the area, the number of gaps in traffic will further decrease and therefore make it more challenging for side street vehicles to find acceptable gaps. However, the v/c ratio for this movement is now expected to approach 0.87 during the AM Peak Hour (near capacity conditions) and 1.54 (exceeding capacity) during the PM Peak Hour period. In addition, the longer 95th Percentile Queues (45m – 99m) may extend to the point that queued vehicles may potentially impact local accesses and traffic operations by blocking accesses.

Nelson Avenue / Highway 3A & Elwyn Street | Similar to the Kokanee Avenue intersection, the stop-controlled westbound approach was noted as operating at LOS F during both the AM Peak Hour and PM Peak Hour periods. However, the v/c ratio for this movement is anticipated to be between 1.46 and 1.53, indicating that the approach has exceeded capacity. In addition, the longer 95th Percentile Queues (86m) may extend to the point that queued vehicles may potentially impact local accesses and traffic operations by blocking accesses.

Nelson Avenue / Highway 3A & Behnsen Avenue | The intersection is expected to operate with a LOS F on both the eastbound and westbound approaches for the AM Peak Hour and PM Peak Hour periods. However, the v/c ratio for these movements range between 0.65 to 1.78, indicating that the approaches over 1.00 will exceed capacity, and the 95th Percentile Queue is calculated as ranging between approximately 23m to 70m. In addition, the longer 95th Percentile Queues may extend to the point that queued vehicles may potentially impact local accesses and traffic operations by blocking accesses.

Table 6-4 summarizes the expected performance of the study intersections for the 15-year horizon. Synchro outputs are provided in **Appendix B**.

TABLE 6-4: 2037 HORIZON YEAR (15-YEAR HORIZON)

INTERSECTION NAME	HORIZON_15_AM						HORIZON_15_PM					
	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th
Highway 3A & Kokanee Avenue	EBL	3	C	24	0.25	7	EBL	9	E	41	0.42	15
	EBT	0					EBT	1				
	EBR	39					EBR	44				
	WBL	55	F	100	0.87	45	WBL	68	F	348	1.54	99
	WBT	0					WBT	1				
	WBR	41					WBR	71				
	NBL	30	A	10	0.08	2	NBL	38	A	9	0.05	1
	NBT	328	A	0	0.25	0	NBT	534	A	0	0.34	0
	NBR	86	A	0	0.06	0	NBR	129	A	0	0.09	0
	SBL	45	A	9	0.05	1	SBL	80	A	9	0.11	3
	SBT	625	A	0	0.48	0	SBT	457	A	0	0.36	0
	SBR	11					SBR	19				
	Overall		A	10	0.87		Overall		E	38	1.54	
Highway 3A & Elwyn Street	EBL	0	D	28	0.17	4	EBL	6	E	39	0.33	10
	EBT	3					EBT	3				
	EBR	14					EBR	22				
	WBL	83	F	326	1.46	86	WBL	85	F	363	1.53	86
	WBT	2					WBT	1				
	WBR	24					WBR	23				
	NBL	10	A	10	0.03	1	NBL	4	A	9	0.01	0
	NBT	417	A	0	0.27	0	NBT	660	A	0	0.42	0
	NBR	83	A	0	0.06	0	NBR	135	A	0	0.09	0
	SBL	37	A	9	0.05	1	SBL	43	B	10	0.08	2
	SBT	690	A	0	0.51	0	SBT	538	A	0	0.39	0
	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0
	Overall		D	31	1.46		Overall		D	31	1.53	
3rd Street & Elwyn Street	EBL	3	B	11	0.18	5	EBL	10	B	11	0.27	8
	EBT	104					EBT	122				
	EBR	3					EBR	6				
	WBL	12	B	12	0.22	7	WBL	18	B	12	0.26	8
	WBT	99					WBT	115				
	WBR	1					WBR	2				
	NBL	3	A	2	0.01	0	NBL	7	A	3	0.01	0
	NBT	9					NBT	7				
	NBR	8					NBR	8				
	SBL	4	A	2	0.01	0	SBL	3	A	1	0.00	0
	SBT	19					SBT	10				
	SBR	7					SBR	3				
	Overall		A	9	0.22		Overall		A	10	0.27	
5th Street & Davies Street	EBL	9	A	0		0	EBL	5	A	0		0
	EBT	71	A	0			EBT	48	A	0		
	EBR	17	A	0			EBR	17	A	0		
	WBL	70	A	5		19	WBL	58	A	5		17
	WBT	37	A	5			WBT	41	A	5		
	WBR	6	A	3			WBR	2	A	0		
	NBL	7	A	5		13	NBL	15	A	6		17
	NBT	47	A	6			NBT	80	A	6		
	NBR	39	A	5			NBR	52	A	4		
	SBL	1	A	0		19	SBL	1				14
	SBT	69	A	6			SBT	70	A	5		
	SBR	4	A	3			SBR	5	A	4		
	OVERALL		A	4			OVERALL		A	5		
5th Street & Cottonwood Street	EBL	7	A	0		4	EBL	4	A	0		3
	EBT	72	A	1			EBT	72	A	0		
	EBR	67	A	0			EBR	32	A	0		
	WBL	71	A	6		17	WBL	64	A	5		15
	WBT	54	A	5			WBT	48	A	6		
	WBR	7	A	3			WBR	4	A	3		
	NBL	34	A	7		19	NBL	36	A	6		27
	NBT	78	A	6			NBT	104	A	7		
	NBR	51	A	4			NBR	54	A	5		
	SBL	1	A	0		23	SBL	1	A	0		24
	SBT	145	A	8			SBT	142	A	7		
	SBR	3	A	6			SBR	3	A	4		
	OVERALL		A	5			OVERALL		A	5		
5th Street & Gordon Street	EBT	38	A	0	0.04	0	EBT	78	A	0	0.00	0
	EBR	6					EBR	15				
	WBL	6					WBL	11				
	WBT	76	A	1	0.01	0	WBT	114	A	1	0.02	1
	NBL	11					NBL	13				
	NBR	10					NBR	18				
	Overall		A	2	0.05		Overall		A	2	0.08	
7th Street & Gordon Street	EBL	17	A	4	0.02	0	EBL	21	A	3	0.02	1
	EBT	17					EBT	51				
	EBR	3					EBR	3				
	WBL	6	A	2	0.01	0	WBL	11	A	2	0.03	1
	WBT	49					WBT	58				
	WBR	5					WBR	12				
	NBL	6	B	11	0.10	3	NBL	4	B	15	0.28	9
	NBT	52					NBT	95				
	NBR	3					NBR	3				
	SBL	0	B	11	0.18	5	SBL	3	C	18	0.54	24
	SBT	41					SBT	64				
	SBR	25					SBR	55				
	Overall		A	8	0.18		Overall		B	12	0.54	

TABLE 6-4: 2037 HORIZON YEAR (15-YEAR HORIZON)

INTERSECTION NAME	HORIZON_15_AM						HORIZON_15_PM					
	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th
10th Street & Fell Street	EBL	0	B	11	0.15	4	EBL	7	B	11	0.17	5
	EBT	24					EBT	26				
	EBR	0					EBR	0				
	WBL	25	B	12	0.28	9	WBL	47	B	12	0.30	10
	WBT	26					WBT	55				
	WBR	6					WBR	30				
	NBL	2	A	0	0.00	0	NBL	4	A	1	0.01	0
	NBT	12					NBT	12				
	NBR	64					NBR	48				
	SBL	8	A	5	0.02	1	SBL	11	A	4	0.01	0
	SBT	7					SBT	4				
	SBR	1					SBR	3				
	Overall		A	8	0.28		Overall		A	9	0.30	
8th Street & Elwyn Street	EBL	42	A	0		2	EBL	58	A	0		0
	EBT	94	A	0			EBT	107	A	0		
	EBR	0	A	0			EBR	2	A	1		
	WBL	3	A	3		14	WBL	5	A	4		12
	WBT	51	A	4			WBT	91	A	5		
	WBR	0	A	0			WBR	0	A	0		
	NBL	1	A	4		13	NBL	0	A	0		15
	NBT	12	A	5			NBT	13	A	5		
	NBR	1	A	2			NBR	1	A	0		
	SBL	3				19	SBL	0				18
	SBT	20	A	6			SBT	21	A	6		
	SBR	46	A	3			SBR	60	A	3		
	OVERALL		A	2			OVERALL		A	3		
3rd Street & Behnsen Street	EBL	15	B	13	0.24	7	EBL	7	B	10	0.16	4
	EBT	41					EBT	76				
	EBR	33					EBR	15				
	WBL	12	B	13	0.19	5	WBL	6	B	10	0.12	3
	WBT	45					WBT	69				
	WBR	6					WBR	1				
	NBL	0	A	0	0.00	0	NBL	0	A	0	0.00	0
	NBT	2					NBT	1				
	NBR	0					NBR	1				
	SBL	12	A	2	0.01	0	SBL	4	A	2	0.00	0
	SBT	21					SBT	4				
	SBR	17					SBR	9				
	Overall		A	10	0.24		Overall		A	9	0.16	
10th Street & Elwyn Street	EBL	89	A	5	0.07	2	EBL	79	A	6	0.08	2
	EBT	32					EBT	18				
	WBT	21	A	0	0.02	0	WBT	28	A	0	0.03	0
	WBR	0					WBR	2				
	SBL	3	A	9	0.07	2	SBL	3	A	10	0.13	3
	SBR	44					SBR	62				
	Overall		A	6	0.07		Overall		A	7	0.13	
5th Street & Elwyn Street	EBL	1	A	0	0.00	0	EBL	4	A	0	0.01	0
	EBT	91					EBT	97				
	EBR	9					EBR	12				
	WBL	23	A	2	0.02	0	WBL	38	A	2	0.05	1
	WBT	69					WBT	117				
	WBR	3					WBR	9				
	NBL	15	B	11	0.18	5	NBL	15	B	14	0.24	7
	NBT	22					NBT	32				
	NBR	34					NBR	29				
	SBL	15	B	13	0.19	5	SBL	8	C	16	0.21	6
	SBT	31					SBT	28				
	SBR	0					SBR	3				
	Overall		A	6	0.19		Overall		A	6	0.24	
3rd Street & Kokanee Avenue	EBL	45	B	11	0.24	7	EBL	77	B	14	0.41	15
	EBT	63					EBT	117				
	EBR	3					EBR	11				
	WBL	9	B	10	0.10	3	WBL	6	B	12	0.25	8
	WBT	55					WBT	68				
	WBR	0					WBR	1				
	NBL	2	A	1	0.00	0	NBL	6	A	2	0.01	0
	NBT	5					NBT	7				
	NBR	6					NBR	6				
	SBL	1	A	0	0.00	0	SBL	1	A	0	0.00	0
	SBT	22					SBT	12				
	SBR	23					SBR	50				
	Overall		A	8	0.24		Overall		B	10	0.41	
Highway 3A & Behnsen Street	EBL	12	F	104	0.65	23	EBL	39	F	355	1.30	46
	EBT	9					EBT	4				
	EBR	6					EBR	11				
	WBL	42	F	369	1.46	66	WBL	57	F	538	1.78	70
	WBT	7					WBT	3				
	WBR	14					WBR	21				
	NBL	3	A	5	0.01	1	NBL	6	A	5	0.02	1
	NBT	528	A	5	0.38	65	NBT	962	A	9	0.65	190
	NBR	42	A	2	0.05	1	NBR	86	A	2	0.07	6
	SBL	40	A	5	0.13	5	SBL	17	A	5	0.05	3
	SBT	698	A	6	0.47	96	SBT	611	A	5	0.43	79
	SBR	22	A	0	0.02	0	SBR	30	A	2	0.04	1
	Overall		A	5	0.47		Overall		A	7	0.65	

6.5 FIFTEEN-YEAR HORIZON CONDITIONS ASSESSMENT (WITH ROADWAY IMPROVEMENTS)

As noted earlier in this report, the 15-year horizon performance is significantly influenced by forecasted traffic growth and assumptions of both steady traffic growth and no changes to social behaviour including modal splits. As such, these conditions represent what may occur in the future if today's modal splits were to remain as-is and the assumed vehicular traffic growth were to occur. The City has made firm commitments through their Strategic Plan, *Our Vision for the Future* and the City's *Nelson Next* to strengthen and build healthy, interconnected neighbourhoods. As such, these results represent a worst-case scenario. Applying these assumptions, three potential mitigation considerations were initially identified to assess which, if any, could mitigate these future operating conditions. As operational concerns were only identified at the Nelson Avenue / Highway 3A & Kokanee Avenue, Nelson Avenue / Highway 3A & Elwyn Street and Nelson Avenue / Highway 3A & Behnsen Street intersections, improvements were only evaluated for these study intersections. A total of three potential mitigation strategies were identified:

6.5.1 SCENARIO 1: SEPARATED LEFT-THROUGH AND RIGHT-TURN LANES ON SIDE-STREET APPROACHES

Under this scenario, it was assumed that a separate shared left-turn lane and through lane, and a dedicated right-turn lane could be accommodated on the eastbound and westbound approaches at each of the three intersections noted above. This would primarily only benefit the right-turning vehicles on these approaches, as these vehicles would no longer be stuck behind a left-turning or through vehicle. Right-turning vehicles would only require a gap in traffic from one direction on Highway 3A in order to complete the turn. As such, the expected operational results indicate the following:

Nelson Avenue / Highway 3A & Kokanee Avenue | The eastbound and westbound approaches would still experience a LOS F with v/c ratios that indicate overcapacity conditions and a v/c ratio on the westbound approach ranging between 0.75 to 1.37, an improvement from the 0.87 to 1.54 that was expected with no improvements. The 95th Percentile Queues are expected to remain long. Therefore, this improvement alone is not sufficient to mitigate the expected poor operations of the intersection.

Nelson Avenue / Highway 3A & Elwyn Street | The eastbound and westbound approaches would also still operate with a LOS F and v/c ratios that indicate overcapacity conditions, ranging between 1.40 and 1.44 (westbound approach), an improvement from the 1.46 to 1.53 that was expected with no improvements. Due to the volume splits on the eastbound approach with more traffic turning right than left or through, separated lanes may actually degrade the eastbound approach slightly as the lane would now be calculated independently from the right-turning movement. The 95th Percentile Queues are expected to remain long. Therefore, this improvement alone is also not sufficient to mitigate the expected poor operations of the intersection.

Nelson Avenue / Highway 3A & Behnsen Avenue | The eastbound and westbound approaches are also expected to continue to operate with a LOS F and v/c ratios that indicated overcapacity conditions, ranging between 0.62 and 1.69, an improvement from the 0.64 to 1.77 that was expected with no improvements. The 95th Percentile Queues are expected to remain long. Therefore, this improvement alone is not sufficient to mitigate the expected poor operations of the intersection.

In conclusion, separated lanes on the side street approaches were not sufficient alone to improve the operations of these intersections in the 15-year horizon period back to acceptable operations, though they did make a measurable improvement to vehicle delays and v/c ratios.

6.5.2 SCENARIO 2: SIGNALIZATION OR ROUNDABOUTS

Under this scenario, it was assumed that the existing geometry and traffic control measures of the three intersections could be modified into signalized intersections or modified into roundabouts. As signalized intersections, the results of the analysis indicate all three intersections would improve to operate at a LOS B or better with acceptable v/c ratios and relatively short 95th Percentile Queues. A high-level roundabout operational analysis was not undertaken. However, based on a review of the anticipated traffic volumes, two-lane roundabouts are expected to similarly operate acceptably at each location. Traffic signals would primarily benefit the side street approaches by introducing a dedicated phase that would allow side street traffic a protected phase to clear each intersection. It would also introduce a minor delay to the northbound and southbound traffic along Highway 3A which currently operate as free-flow conditions. As the highest volumes at these intersections are along Highway 3A, the primary beneficiaries of a traffic signal are the lower volume roadways. Consideration should be given to the value and cost of the improvements relative to the low number of traffic volumes that would benefit. In addition, the introduction of traffic signals will also introduce vehicle idling along Highway 3A at these intersections, potentially increasing greenhouse gas emissions and may be contrary to the sustainability and environmental stewardship objectives of the City. Roundabouts do not have the same negative impacts associated with idling vehicles and delays, however it is expected that the roundabouts would need to include two-circulating lanes. Roundabouts generally require large footprints, which may require land acquisition on all four corners of each intersection, which can carry a significant cost.

6.5.3 SCENARIO 3: PARALLEL ROUTES AND MODAL SPLIT CHANGES

Under this scenario, consideration was given to the improved modal splits and traffic re-routing on to other roadways such as Fifth Street, classified as a Collector roadway and expected to carry a higher volume of traffic. Modal shifts include increase walking, cycling and transit usage as alternatives to personal vehicle usage. The City's Active Transportation Plan Implementation Strategy identifies 3rd Street as part of the primary bike route. For analysis purposes, an operational analysis of the three intersections noted below was undertaken assuming that the re-routing of network traffic to Fifth Street and increased bicycle usage can result in a 20% reduction to intersection volumes. In this assessment, the intersections were assumed to remain in their existing condition as free-flow along Highway 3A and stop-controlled on the side street approaches. The expected operational results indicate the following:

Nelson Avenue / Highway 3A & Kokanee Avenue | The westbound approach would still experience a LOS F during the PM Peak Hour period only, with a v/c ratio of 0.73 indicating under capacity conditions. The 95th Percentile Queues are expected to remain manageable at approximately 36m.

Nelson Avenue / Highway 3A & Elwyn Street | The westbound approach would also still operate with a LOS F during both the AM Peak Hour and PM Peak Hour, however the v/c ratios, ranging between 0.69 and 0.72 indicate under capacity conditions. The 95th Percentile Queues are expected to remain manageable at approximately 33m.

Nelson Avenue / Highway 3A & Behnsen Avenue | The westbound approach is expected to continue to operate with a LOS F during the AM Peak Hour and PM Peak Hour, and the eastbound approach would operate at a LOS F only during the PM Peak Hour period. However the v/c ratios for both approaches are expected to operate between 0.47 and 0.67, indicating under capacity conditions. The 95th Percentile Queues are expected to remain manageable at approximately 16m to 27m.

The comparative results for all three of these scenarios to the unimproved 15-year horizon scenario is provided in **Table 6-5**. Collectively, these results indicate that while longer vehicular delays may persist, the potential vehicular shifts to Fifth Street and increased bicycle usage will improve the v/c ratios to acceptable levels and shorten the 95th Percentile Queue lengths to more manageable levels.

TABLE 6-5: 2037 HORIZON YEAR (15-YEAR HORIZON)

Intersection Name		HORIZON_15_AM										HORIZON_15_PM										Scenario 1 - (Dedicated right turn and Shared left thru movement for EB and WB)										Scenario 2 - (Signal Actd-Unctrl - Perm Protected turn - Cycle length - 60s)										Scenario 3 - (20% deduction in traffic)									
		Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th	Type	Volume	LOS	Delay	V/C	Q. len 95th								
Highway 3A & Kokanee Avenue	EBL	3					EBL	9				EBL	3				EBL	9			EBL	3			EBL	9				EBL	2				EBL	7				EBL	7										
	EBT	0	C	24	0.25	7	EBT	1		E	41	0.42	15	EBT	0	F	58	0.11	3	EBT	1	F	85	0.31	9	EBT	0	A	1	0.19	0	EBT	1	B	12	0.24	0	EBT	0	C	16	0.13	3	EBT	1	C	22	0.21	6		
	EBR	39					EBR	44				EBR	39	C	16	0.14	4	EBR	44	B	14	0.11	3	EBR	39		EBR	44				EBR	31				EBR	35				EBR	35								
	WBL	55					WBL	68				WBL	55	F	132	0.75	28	WBL	68	F	341	1.37	58	WBL	55		WBL	68		A	8	0.42	0	WBL	44	D	30	0.43	15	WBL	54	F	62	0.73	36						
	WBT	0	F	100	0.87	45	WBT	1		F	348	1.54	99	WBT	0			WBT	1	F	341	1.37	58	WBT	0		WBT	1		A	8	0.42	0	WBT	1	C	25	0.60	2	WBT	0			WBT	1						
	WBR	41					WBR	71				WBR	41	B	12	0.12	3	WBR	71	B	14	0.17	5	WBR	41		WBR	71				WBR	33			WBR	33			WBR	57				WBR	57					
	NBL	30	A	10	0.08	2	NBL	38	A	9	0.05	1	NBL	30	A	10	0.08	2	NBL	38	A	9	0.05	1	NBL	30	A	5	0.08	2	NBL	38	A	6	0.14	4	NBL	24	A	9	0.05	1	NBL	30	A	9	0.04	1			
	NBT	328	A	0	0.25	0	NBT	534	A	0	0.34	0	NBT	328	A	0	0.25	0	NBT	534	A	0	0.34	0	NBT	328	A	8	0.25	0	NBT	534	B	14	0.56	71	NBT	262	A	0	0.20	0	NBT	427	A	0	0.27	0			
	NBR	86	A	0	0.06	0	NBR	129	A	0	0.09	0	NBR	86	A	0	0.06	0	NBR	129	A	0	0.09	0	NBR	86	A	1	0.06	0	NBR	129	A	2	0.17	5	NBR	69	A	0	0.05	0	NBR	103	A	0	0.08	0			
	SBL	45	A	9	0.05	1	SBL	80	A	9	0.11	3	SBL	45	A	9	0.05	1	SBL	80	A	9	0.11	3	SBL	45	A	4	0.10	4	SBL	80	A	8	0.28	7	SBL	36	A	8	0.04	1	SBL	64	A	9	0.08	2			
	SBT	625	A	0	0.48	0	SBT	457				SBT	625	A	0	0.48	0	SBT	457			SBT	625			SBT	457		A	13	0.68	80	SBT	457	B	13	0.57	60	SBT	500			SBT	366	A	0	0.29	0			
	SBR	11					SBR	19				SBR	11				SBR	19			SBR	11			SBR	19				A	0	0.39	0	SBR	9			SBR	15			SBR	15								
	Overall	A	10	0.87			Overall	E	38	1.54		Overall	A	7	0.75		Overall	C	21	1.37		Overall	A	10	0.68		Overall	B	13	0.60		Overall	A	4	0.43		Overall	A	8	0.73		Overall	A	8	0.73		Overall	A	8	0.73	
Highway 3A & Elwyn Street	EBL	0					EBL	6				EBL	0	E	44	0.11	3	EBL	6	F	68	0.26	7	EBL	0		EBL	6		B	15	0.12	1	EBL	0			EBL	5				EBL	5							
	EBT	3	D	28	0.17	4	EBT	3		E	39	0.33	10	EBT	3	F	68	0.26	7	EBT	3	F	68	0.26	7	EBT	3		B	15	0.12	1	EBT	3	B	15	0.20	4	EBT	2	C	19	0.08	2	EBT	2	C	22	0.17	5	
	EBR	14				EBR	22				EBR	14	C	16	0.05	1	EBR	22	B	13	0.07	2	EBR	14		EBR	22				EBR	11			EBR	11			EBR	18				EBR	18						
	WBL	83				WBL	85				WBL	83	F	326	1.40	70	WBL	85			WBL	83	F	355	1.44	66	WBL	83				WBL	85			WBL	66			WBL	66			WBL	68						
	WBT	2	F	326	1.46	86	WBT	1		F	363	1.53	86	WBT	2			WBT	1	F	355	1.44	66	WBT	2		WBT	1		D	44	0.73	6	WBT	2	D	44	0.73	6	WBT	2	F	61	0.69	32	WBT	1	F	68	0.72	33
	WBR	24				WBR	23				WBR	24	B	11	0.06	2	WBR	23	B	14	0.1	3	WBR	24		WBR	23				WBR	19			WBR	19			WBR	18				WBR	18						
	NBL	10	A	10	0.03	1	NBL	4	A	9	0.01	0	NBL	10	A	10	0.03	1	NBL	4	A	9	0.01	0	NBL	10	A	5	0.08	1	NBL	4	A	4	0.03	1	NBL	8	A	9	0.02	0	NBL	3	A	9	0.01	0			
	NBT	417	A	0	0.27	0	NBT	660	A	0	0.42	0	NBT	417	A	0	0.27	0	NBT	660	A	0	0.42	0	NBT	417	A	10	0.45	51	NBT	334	A	0	0.22	0	NBT	334	A	0	0.22	0	NBT	528	A	0	0.34	0			
	NBR	83	A	0	0.06	0	NBR	135	A	0	0.09	0	NBR	83	A	0	0.06	0	NBR	135	A	0	0.09	0	NBR	83	A	1	0.11	1	NBR	135	A	2	0.15	5	NBR	66	A	0	0.05	0	NBR	108	A	0	0.07	0			
	SBL	37	A	9	0.05	1	SBL	43	B	10	0.08	2	SBL	37	A	9	0.05	1	SBL	43	B	10	0.08	2	SBL	37	A	4	0.08	3	SBL	43	A	5	0.17	4	SBL	30	A	8	0.03	1	SBL	34	A	9	0.05	1			
	SBT	690	A	0	0.51	0	SBT	538	A	0	0.39	0	SBT	690	A	0	0.51	0	SBT	538	A	0	0.39	0	SBT	690	B	16	0.77	122	SBT	538	A	9	0.53	66	SBT	552	A	0	0.41	0	SBT	430	A	0	0.31	0			
	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0	SBR	1	A	0	0	0	SBR	1	A	0	0	0	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0	SBR	1	A	0	0.00	0			
	Overall	D	31	1.46			Overall	D	31	1.53		Overall	C	24	1.4		Overall	C	23	1.44		Overall	B	16	0.77		Overall	B	12	0.64		Overall	A	6	0.69		Overall	A	7	0.72		Overall	A	7	0.72		Overall	A	7	0.72	
Highway 3A & Behnsen Street	EBL	12				EBL	39				EBL	12	F	115	0.62	21	EBL	39			EBL	12			EBL	12			C	21	0.23	4	EBL	39			EBL	10			EBL	31				EBL	31				
	EBT	9	F	104	0.65	23	EBT	4		F	355	1.30	46	EBT	9			EBT	4			EBT	9		EBT	9		C	21	0.23	4	EBT	4	C	25	0.35	15	EBT	7	E	36	0.28	8	EBT	3	F	64	0.47	16		
	EBR	6				EBR	11				EBR	6	B	14	0.02	1	EBR	11	B	13	0.03	1	EBR	6		EBR	11				EBR	5			EBR	5			EBR	9				EBR	9						
	WBL	42				WBL	57				WBL	42	F	379	1.43	57	WBL	57			WBL	42	F	541	1.7	57	WBL	42				WBL	57			WBL	34			WBL	46				WBL	46					
	WBT	7	F	369	1.46	66	WBT	3		F	538	1.78	70	WBT	7			WBT	3			WBT	7		WBT	3		C	29	0.47	11	WBT	3	C	34	0.55	16	WBT	6	F	56	0.57	22	WBT	2	F	86	0.67	27		
	WBR	14				WBR	21				WBR	14	B	12	0.04	1	WBR	21	C	19	0.08	2	WBR	14		WBR	21				WBR	11			WBR	11			WBR	17				WBR	17						
	NBL	3	A	5	0.01	1	NBL	6	A	5	0.02	1	NBL	3	A	5	0.01	1	NBL	6	A	5	0.02	1	NBL	3	A	4	0.02	1	NBL	6	A	4	0.02	1	NBL	2	A	5	0.01	1	NBL	5	A	4	0.01	1			
	NBT	528	A	5	0.38	65	NBT	962	A	9	0.65	190	NBT	528	A	5	0.38	65	NBT	962	A	9	0.65	190	NBT	528	B	11	0.53	63	NBT	962	B	16	0.78	189	NBT	422	A	5	0.30	48	NBT	770	A	6	0.52	115			
	NBR	42	A	2	0.05	1	NBR	86	A	2	0.07	6	NBR	42	A	2	0.05	1	NBR	86	A	2	0.07	6	NBR	42	A	0	0.07	0	NBR	86	A	1	0.09	1	NBR	34	A	2	0.04	1	NBR	69	A	2	0				
	SBL	40	A	5	0.13	5	SBL	17	A	5	0.05	3	SBL	40	A	5	0.13	5	SBL	17	A	5	0.05	3	SBL	40	A	5	0.19	3	SBL	17	A	5	0.10	2	SBL	32	A	5	0.09	4	SBL	14	A	5	0.03	3			
	SBT	698	A	6	0.47	96	SBT	611	A	5	0.43	79	SBT	698	A	6	0.47	96	SBT	611	A	5	0.43	79	SBT	698	B	10	0.59	94	SBT	611	A	9	0.53	78	SBT	558	A	5	0.38	68	SBT	489	A	5	0.35	57			
	SBR	22	A	0	0.02	0	SBR	30	A	2	0.04	1	SBR	22	A	0	0.02	0	SBR	30	A	2	0.04	1	SBR	22	A	0	0.03	0	SBR	30	A	0	0.04	0	SBR	18	A	0	0.02	0	SBR	24	A	2	0.03	1			
	Overall	A</																																																	

6.5.4 ADDITIONAL CONSIDERATIONS

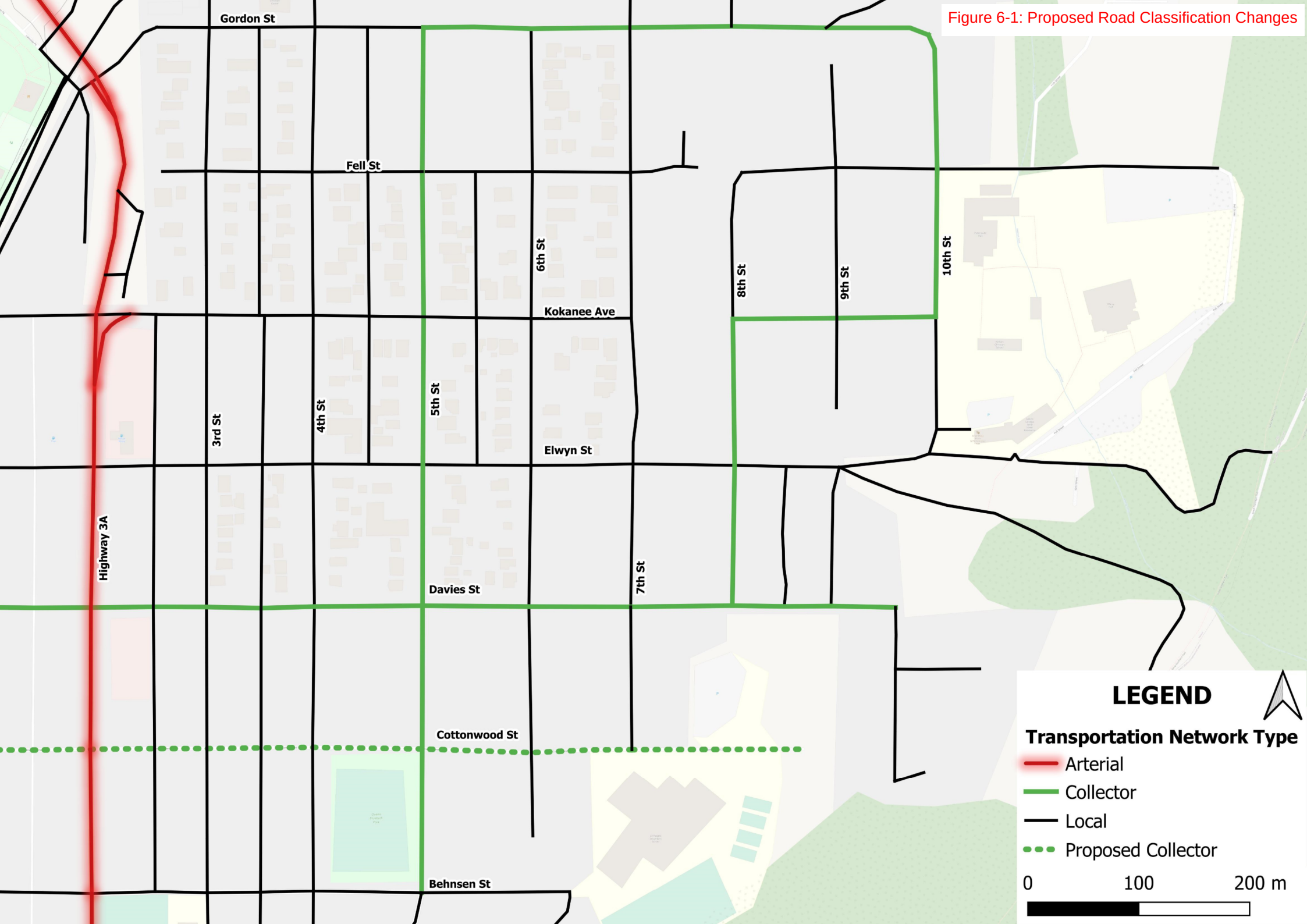
Collectively, the modal shifts and usage of Fifth Street as an alternative route (Scenario 3) would result in operations more similar to either existing or the five-year horizon. This would result in maintaining a quality of life more similar to what roadway users experience currently. To achieve this scenario, continued buildout of the City's active transportation network, and education and public awareness campaigns to promote the usage of active transportation modes should be continued. In addition, promotion of transit usage, including for the future proposed developments, should be considered and can further reduce vehicular demand.

The increased usage of Fifth Street for vehicular travel may require consideration of the existing stop-controls along the corridor and the corridor grades, which could result in Fifth Street operating similar to a couplet system with Highway 3A, though with significantly lower volumes as primarily local traffic would be expected to use Fifth Street. This may also require consideration for traffic calming measures on adjacent or parallel routes to re-direct traffic volumes to Fifth Street.

It should also be noted that these operational conditions are only expected to occur for the weekday AM Peak Hour and PM Peak Hour period. During non-peak periods, it is anticipated that the intersections will operate more acceptably. As such, another consideration could be to introduce timed restrictions for left turns from the side streets in the future for the AM and PM Peak Hour periods only. This could result in more traffic circulation on local roadways within the Fairview neighbourhood during these time periods. On the east side of Highway 3A, this could result in more traffic traveling south on Fifth Street due to the left-turn restrictions. On the west side of Highway 3A, this could result in vehicles distributing to other nearby intersections to find shorter delays trying to travel north on Highway 3A.

While the volumes along Elwyn Street (Local), Davies Street (Collector) and Cottonwood Street (Local) were relatively comparable, it is recommended that Davies Street continue to remain classified as a Collector and Elwyn Street remain classified as a Local roadway. However, consideration should be given to modifying Cottonwood Street's classification to a Collector roadway in the future. Cottonwood Street currently includes transit service, which is typically provided on roadways classified as Collector and above. Combined with the higher traffic volumes along the corridor, Cottonwood Street also provides connectivity across Highway 3A to nearby commercial land uses and recreational uses within the Fairview neighbourhood. These characteristics suggest Cottonwood Street is more functionally aligned with a Collector roadway classification. **Figure 6-1** illustrates the proposed changes to the roadway classifications within the Fairview neighbourhood, with only Cottonwood Street modified from a Local roadway to a Collector roadway.

Figure 6-1: Proposed Road Classification Changes



7 FUTURE STUDIES

As indicated in this study, a number of assumptions have been applied in the evaluation of the long-term (15-year) horizon period for when mitigation measures have been identified. If these assumptions should vary in the future, this could impact both the timing and need for the improvements. It is therefore recommended that an update to this traffic study should be completed in approximately five years (2027) to assess if the 2027 operating conditions align with this traffic study's expectations. At that time, a new five-year or alternate short-term horizon period should be analyzed along with another 15-year or alternate long-term horizon period to assess if the projected traffic trends continue. This should also include if modal shifts occur in the future to increase active transportation usage.

In addition, if geometric improvements to the Highway 3A corridor such as a roundabout(s) or signalization are to be considered, it is recommended that a functional planning review of the Highway 3A corridor through the Fairview neighbourhood be undertaken to identify which location(s) are to be upgraded and any corresponding impacts to adjacent intersections. As the Highway 3A corridor is under the jurisdictional authority of MoTI, it is assumed that MoTI would undertake this evaluation.

8 CONCLUSION AND RECOMMENDATIONS

The findings of this traffic study indicate study intersections currently operate acceptably and are expected to continue to do so in the five-year horizon with the anticipated traffic to be generated by the future development areas within this time period and forecasted traffic growth. A number of assumptions were made in the projection of the five-year and 15-year horizon periods. Analysis of the 15-year horizon indicates potential capacity and operational concerns at three particular study intersections:

- Nelson Avenue / Highway 3A & Kokanee Street
- Nelson Avenue / Highway 3A & Elwyn Street
- Nelson Avenue / Highway 3A & Behnsen Street

At each of these intersections, the operational issues are expected to occur on the minor side streets that are stop-controlled. This is largely due to increased traffic along Highway 3A that will reduce the number of available gaps in traffic for eastbound and westbound left-turn and through movements, that require simultaneous gaps in both directions in order for vehicles to cross or make a left-turn.

Potential mitigation measures were considered to improve the operations of these intersections. The most effective solutions identified were signalization of one of these intersections or future conversion to roundabouts with two-circulating lanes. However, signalization would introduce delays to the major street where volumes are highest and vehicles currently operate as free-flow, negatively impacting greenhouse gas emissions. This would also be contrary to the City's sustainability initiatives. Roundabouts are not expected to have these same concerns, however roundabouts have a significantly larger footprint and may require land acquisition on all quadrants of each intersection. If geometric changes are to be considered, it is recommended that MoTI undertake a functional planning review of the Highway 3A corridor to identify which intersection(s) are modified, if a roundabout or signalization is preferred, and what corresponding impacts there may be to adjacent intersections.

Alternatively, if traffic volumes could be reduced by approximately 20% through a combination of modal split changes and transit ridership, with increased active transportation usage along with some local traffic being re-directed to use Fifth Street (a Collector roadway), the operations of the three intersections are expected to improve to approximately existing year or the five-year horizon conditions. As a result, geometric changes to these intersections may not be required. To achieve this scenario, continued buildout of the City's active transportation network, and education and public awareness campaigns to promote the usage of active transportation and transit should be continued.

The increased usage of Fifth Street for vehicular travel may require consideration of the existing stop-controls along the corridor and the corridor grades, which could result in Fifth Street operating similar to a couplet system with Highway 3A, though with significantly lower volumes as primarily local traffic would be expected to use Fifth Street. This may also require consideration for traffic calming measures on adjacent or parallel routes to re-direct traffic volumes to Fifth Street.

While the volumes along Elwyn Street (Local), Davies Street (Collector) and Cottonwood Street (Local) were relatively comparable, it is recommended that Davies Street continue to remain classified as a Collector and Elwyn Street remain classified as a Local roadway. However, consideration should be given to modifying Cottonwood Street's classification to a Collector roadway in the future. Cottonwood Street currently includes transit service, which is typically provided on roadways classified as Collector and above. Combined with the higher traffic volumes along the corridor, Cottonwood Street also provides connectivity across Highway 3A to nearby commercial land uses and recreational uses within the Fairview neighbourhood. These characteristics suggest Cottonwood Street is more aligned with a Collector roadway classification.

In addition, it should be noted that these operational conditions are only expected during the weekday AM Peak Hour and PM Peak Hour. Non-peak periods are expected to operate more acceptably. As such, a potential

consideration could be the introduction of timed left-turn restrictions for these peak periods. This could result in local traffic east of Highway 3A using Fifth Street as an alternative to Highway 3A, however traffic on the west side of Highway 3A may circulate on the local roadways searching for shorter queues and delays to travel north on Highway 3A.

Given the number of assumptions associated with the 15-year horizon, it is therefore recommended that an update to this traffic study should be completed in approximately five years (2027) to assess if the 2027 operating conditions align with this traffic study's expectations. At that time, a new five-year or alternate short-term horizon period should be analyzed along with another 15-year or alternate long-term horizon period to assess if the projected traffic trends continue. This should also include if modal shifts occur in the future to increase active transportation usage.

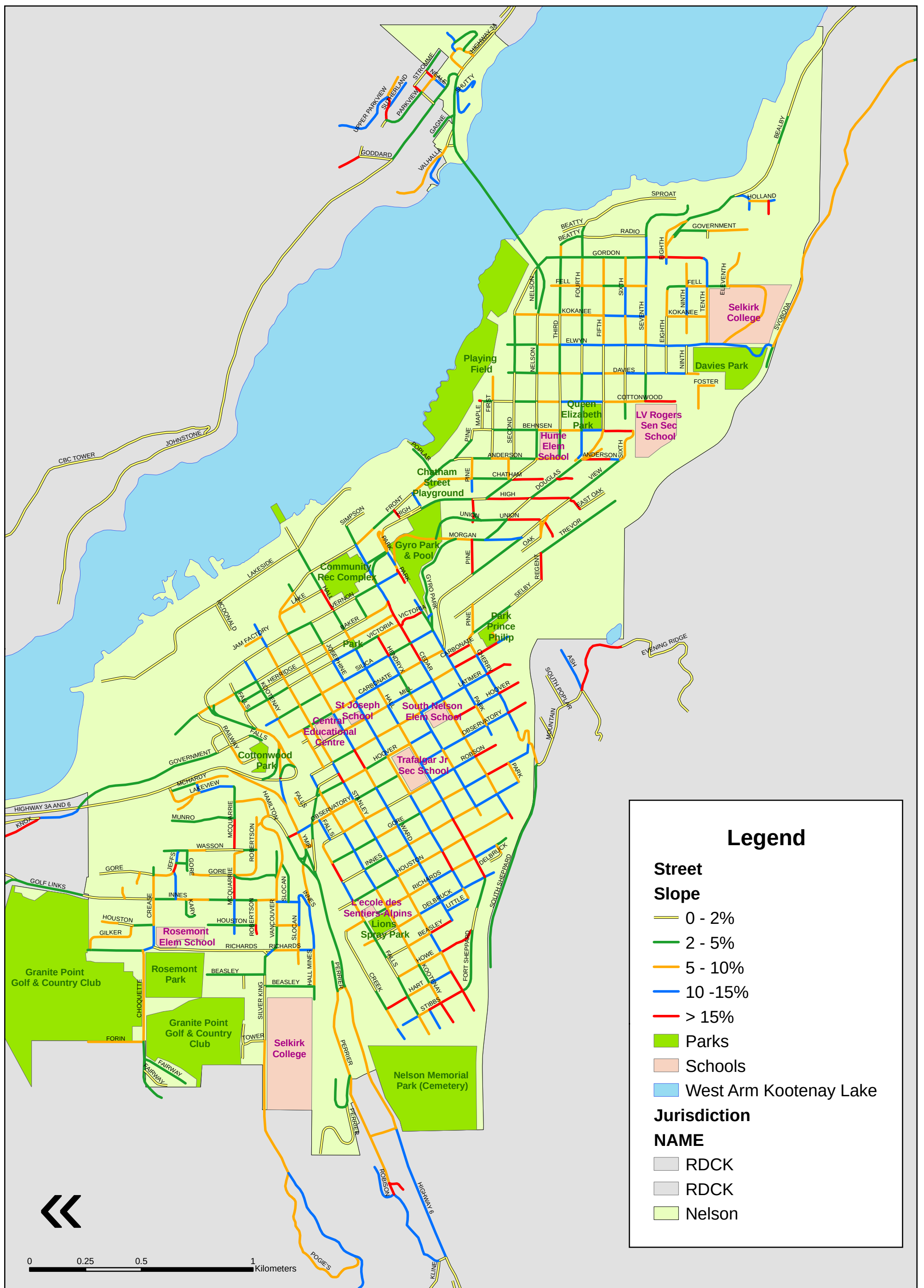
New developments should contribute funds towards increasing the modal split in Nelson. By encouraging more people to use active transportation modes and public transit, the City can reduce vehicular traffic demand on the highway and local roads, making travel more efficient for all users of the transportation network.

To meet the Nelson Next targets, the City needs to prioritize sustainable transportation options. This means investing in infrastructure for active transportation and public transit, as well as encouraging developers to contribute to these initiatives through development cost charges (DCCs). By incorporating contributions to overall traffic improvements on local roads into DCCs, the City can reduce the number of single occupancy vehicles on the road and increase the modal split.

While a traffic signal at one intersection along Highway 3A in Fairview could be considered within the long-term time frame horizon, the City should explore alternatives to reduce the need for one. Appropriate investment in modal splits can help postpone or avoid the need for a traffic signal altogether. This can be achieved through strategic planning and contributions from new developments for new infrastructure that supports sustainable modes of transportation, as well as incentives to encourage residents and visitors to use these modes. By doing so, the City can create an overall more efficient and sustainable transportation system.

APPENDIX

A FAIRVIEW ROAD GRADES



APPENDIX

B SYNCHRO OUTPUTS



HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Traffic Volume (veh/h)	3	0	33	37	0	20	25	257	61	14	509	9									
Future Volume (Veh/h)	3	0	33	37	0	20	25	257	61	14	509	9									
Sign Control	Stop			Stop			Free			Free											
Grade	0%			0%			0%			0%											
Peak Hour Factor	0.38	0.25	0.75	0.93	0.25	0.56	0.48	0.77	0.85	0.88	0.79	0.38									
Hourly flow rate (vph)	8	0	44	40	0	36	52	334	72	16	644	24									
Pedestrians	5						5														
Lane Width (m)	3.6						3.6														
Walking Speed (m/s)	1.1						1.1														
Percent Blockage	0						0														
Right turn flare (veh)																					
Median type							None			None											
Median storage (veh)																					
Upstream signal (m)																					
pX, platoon unblocked																					
vC, conflicting volume	1167	1131	666	1163	1143	334	673				334										
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	1167	1131	666	1163	1143	334	673				334										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.3										
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.4										
p0 queue free %	95	100	90	73	100	95	94				99										
cM capacity (veh/h)	153	188	452	147	185	701	923				1122										
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2														
Volume Total	52	76	52	334	72	16	668														
Volume Left	8	40	52	0	0	16	0														
Volume Right	44	36	0	0	72	0	24														
cSH	348	235	923	1700	1700	1122	1700														
Volume to Capacity	0.15	0.32	0.06	0.20	0.04	0.01	0.39														
Queue Length 95th (m)	4.0	10.2	1.4	0.0	0.0	0.3	0.0														
Control Delay (s)	17.2	27.5	9.1	0.0	0.0	8.3	0.0														
Lane LOS	C	D	A				A														
Approach Delay (s)	17.2	27.5	1.0				0.2														
Approach LOS	C	D																			
Intersection Summary																					
Average Delay				2.8																	
Intersection Capacity Utilization				43.9%	ICU Level of Service				A												
Analysis Period (min)				15																	

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	0	1	12	51	2	8	8	331	51	23	557	1								
Future Volume (Veh/h)	0	1	12	51	2	8	8	331	51	23	557	1								
Sign Control	Stop			Stop			Free			Free										
Grade	0%			0%			0%			0%										
Peak Hour Factor	0.25	0.25	0.75	0.75	0.25	0.67	0.50	0.90	0.85	0.82	0.80	0.25								
Hourly flow rate (vph)	0	4	16	68	8	12	16	368	60	28	696	4								
Pedestrians	1			3			1													
Lane Width (m)	3.6			3.6			3.6													
Walking Speed (m/s)	1.1			1.1			1.1													
Percent Blockage	0			0			0													
Right turn flare (veh)																				
Median type							None			None										
Median storage (veh)																				
Upstream signal (m)	379																			
pX, platoon unblocked																				
vC, conflicting volume	1169	1216	698	1174	1160	371	701				431									
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	1169	1216	698	1174	1160	371	701				431									
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1									
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2									
p0 queue free %	100	98	96	55	96	98	98				97									
cM capacity (veh/h)	156	174	443	152	188	677	905				1110									
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3												
Volume Total	20	88	16	368	60	28	696	4												
Volume Left	0	68	16	0	0	28	0	0												
Volume Right	16	12	0	0	60	0	0	4												
cSH	339	174	905	1700	1700	1110	1700	1700												
Volume to Capacity	0.06	0.51	0.02	0.22	0.04	0.03	0.41	0.00												
Queue Length 95th (m)	1.4	19.0	0.4	0.0	0.0	0.6	0.0	0.0												
Control Delay (s)	16.3	45.3	9.1	0.0	0.0	8.3	0.0	0.0												
Lane LOS	C	E	A					A												
Approach Delay (s)	16.3	45.3	0.3					0.3												
Approach LOS	C	E																		
Intersection Summary																				
Average Delay	3.7																			
Intersection Capacity Utilization	46.1%			ICU Level of Service					A											
Analysis Period (min)	15																			

HCM Unsignalized Intersection Capacity Analysis

3: 3rd St. & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	61	3	5	53	0	3	7	3	0	16	6
Future Volume (Veh/h)	2	61	3	5	53	0	3	7	3	0	16	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.90	0.38	0.42	0.78	0.25	0.38	0.58	0.75	0.25	0.57	0.50
Hourly flow rate (vph)	4	68	8	12	68	0	8	12	4	0	28	12
Pedestrians		13			11							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.1			1.1							
Percent Blockage		1			1							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	111	90	47	117	94	25	53			27		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	111	90	47	117	94	25	53			27		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	91	99	98	91	100	99			100		
cM capacity (veh/h)	787	775	1016	776	771	1041	1547			1571		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	80	80	24	40								
Volume Left	4	12	8	0								
Volume Right	8	0	4	12								
cSH	794	772	1547	1571								
Volume to Capacity	0.10	0.10	0.01	0.00								
Queue Length 95th (m)	2.5	2.6	0.1	0.0								
Control Delay (s)	10.0	10.2	2.5	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	10.0	10.2	2.5	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			7.5									
Intersection Capacity Utilization			18.6%		ICU Level of Service				A			
Analysis Period (min)			15									

5: 5th Street & Cottonwood St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Total Del/Veh (s)	0.7	0.2	0.3	5.3	5.2	3.7	4.4	5.4	3.0	6.9	5.1	4.1

Intersection: 5: 5th Street & Cottonwood St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	16.8	17.2	41.9
Average Queue (m)	10.1	10.5	12.9
95th Queue (m)	14.0	15.2	24.5
Link Distance (m)	319.5	51.9	111.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

4: 5th Street & Davies St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.3	0.1	0.1	5.0	4.7	3.1	5.6	6.1	4.5	5.6	3.4	3.9

Intersection: 4: 5th Street & Davies St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	26.6	9.3	9.4
Average Queue (m)	12.4	8.0	8.0
95th Queue (m)	20.3	13.1	13.1
Link Distance (m)		111.0	107.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

6: 5th Street & Gordon St.

02-28-2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	32	5	5	47	9	8
Future Volume (Veh/h)	32	5	5	47	9	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.62	0.62	0.90	0.38	0.67
Hourly flow rate (vph)	48	8	8	52	24	12
Pedestrians				5	3	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			59		123	60
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			59		123	60
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			1554		870	1004
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	56	60	36			
Volume Left	0	8	24			
Volume Right	8	0	12			
cSH	1700	1554	910			
Volume to Capacity	0.03	0.01	0.04			
Queue Length 95th (m)	0.0	0.1	0.9			
Control Delay (s)	0.0	1.0	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			18.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: 7th St. & Gordon St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	14	3	4	40	3	5	8	3	0	4	4
Future Volume (Veh/h)	14	14	3	4	40	3	5	8	3	0	4	4
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.58	0.70	0.38	0.33	0.91	0.75	0.62	1.00	0.75	0.25	0.50	0.50
Hourly flow rate (vph)	24	20	8	12	44	4	8	8	4	0	8	8
Pedestrians	1			1			1			10		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	58			29			156	155	26	161	157	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	58			29			156	155	26	161	157	57
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.2	3.3
p0 queue free %	98			99			99	99	100	100	99	99
cM capacity (veh/h)	1545			1596			780	716	1054	767	672	1005
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	52	60	20	16								
Volume Left	24	12	8	0								
Volume Right	8	4	4	8								
cSH	1545	1596	793	806								
Volume to Capacity	0.02	0.01	0.03	0.02								
Queue Length 95th (m)	0.4	0.2	0.6	0.5								
Control Delay (s)	3.5	1.5	9.7	9.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	3.5	1.5	9.7	9.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			18.3%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 8: 10th St. & Fell St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	2	3	0	2	10	16	1	6	1
Future Volume (Veh/h)	0	0	0	2	3	0	2	10	16	1	6	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.25	0.25	0.38	0.25	0.50	0.42	0.67	0.25	0.38	0.25
Hourly flow rate (vph)	0	0	0	8	8	0	4	24	24	4	16	4
Pedestrians					3							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.1							
Percent Blockage					0							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	75	85	18	73	75	40	20				51	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75	85	18	73	75	40	20				51	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7				2.2	
p0 queue free %	100	100	100	99	99	100	100				100	
cM capacity (veh/h)	902	798	1061	914	812	1028	1334				1564	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	16	52	24								
Volume Left	0	8	4	4								
Volume Right	0	0	24	4								
cSH	1700	860	1334	1564								
Volume to Capacity	0.00	0.02	0.00	0.00								
Queue Length 95th (m)	0.0	0.4	0.1	0.1								
Control Delay (s)	0.0	9.3	0.6	1.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.0	9.3	0.6	1.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			14.6%	ICU Level of Service					A			
Analysis Period (min)			15									

9: Elwyn St. & 8th St. Performance by movement

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Total Del/Veh (s)	0.0	0.1	3.8	3.7	3.6	5.3	4.6	4.6	3.0	2.5

Intersection: 9: Elwyn St. & 8th St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	8.8	15.4	22.2
Average Queue (m)	5.5	2.7	9.7
95th Queue (m)	12.3	9.9	18.6
Link Distance (m)	70.4		247.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis 11: 3rd St. & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	33	28	10	23	4	0	0	2	10	14	14
Future Volume (Veh/h)	13	33	28	10	23	4	0	0	2	10	14	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.82	0.54	0.50	0.64	0.33	0.25	0.25	0.50	0.62	0.44	0.70
Hourly flow rate (vph)	20	40	52	20	36	12	0	0	4	16	32	20
Pedestrians		134			6			56			24	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		12			1			5			2	
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	264	218	232	210	226	32	186				10	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264	218	232	210	226	32	186				10	
tC, single (s)	7.5	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.9	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	96	93	92	96	94	99	100				99	
cM capacity (veh/h)	450	591	669	557	585	1019	1219				1614	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	112	68	4	68								
Volume Left	20	20	0	16								
Volume Right	52	12	4	20								
cSH	590	623	1219	1614								
Volume to Capacity	0.19	0.11	0.00	0.01								
Queue Length 95th (m)	5.3	2.8	0.0	0.2								
Control Delay (s)	12.5	11.5	0.0	1.8								
Lane LOS	B	B		A								
Approach Delay (s)	12.5	11.5	0.0	1.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay				9.1								
Intersection Capacity Utilization				32.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 12: Elwyn St. & 10th St.

02-28-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	27	18	0	2	19
Future Volume (Veh/h)	37	27	18	0	2	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.61	0.75	0.25	0.50	0.79
Hourly flow rate (vph)	48	44	24	0	4	24
Pedestrians		5			4	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	28				168	33
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	28				168	33
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	97				99	98
cM capacity (veh/h)	1593				699	1038
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	92	24	28			
Volume Left	48	0	4			
Volume Right	0	0	24			
cSH	1593	1700	971			
Volume to Capacity	0.03	0.01	0.03			
Queue Length 95th (m)	0.7	0.0	0.7			
Control Delay (s)	3.9	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	3.9	0.0	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			21.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: 5th Street & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	48	7	18	22	1	13	19	12	1	26	0
Future Volume (Veh/h)	1	48	7	18	22	1	13	19	12	1	26	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.86	0.88	0.90	0.79	0.25	0.81	0.59	0.43	0.25	0.72	0.25
Hourly flow rate (vph)	4	56	8	20	28	4	16	32	28	4	36	0
Pedestrians	3			4			2			3		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	35				66				161	145	66	189
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35				66				161	145	66	189
tC, single (s)	4.1				4.2				7.1	6.6	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.3				3.5	4.1	3.3	3.5
p0 queue free %	100				99				98	96	97	99
cM capacity (veh/h)	1585				1508				763	715	998	712
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	52	76	40								
Volume Left	4	20	16	4								
Volume Right	8	4	28	0								
cSH	1585	1508	811	731								
Volume to Capacity	0.00	0.01	0.09	0.05								
Queue Length 95th (m)	0.1	0.3	2.4	1.3								
Control Delay (s)	0.4	2.9	9.9	10.2								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.4	2.9	9.9	10.2								
Approach LOS				A	B							
Intersection Summary												
Average Delay				5.7								
Intersection Capacity Utilization				24.9%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 14: 3rd St. & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	31	3	7	29	0	2	4	5	1	15	13
Future Volume (Veh/h)	30	31	3	7	29	0	2	4	5	1	15	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.55	0.38	0.58	0.91	0.25	0.50	0.50	0.62	0.25	0.75	0.65
Hourly flow rate (vph)	44	56	8	12	32	0	4	8	8	4	20	20
Pedestrians		3			10			1				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	77	75	34	105	81	22	43			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	77	75	34	105	81	22	43			26		
tC, single (s)	7.1	6.5	6.5	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.6	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	95	93	99	99	96	100	100			100		
cM capacity (veh/h)	866	798	951	807	786	1046	1574			1587		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	108	44	20	44								
Volume Left	44	12	4	4								
Volume Right	8	0	8	20								
cSH	834	792	1574	1587								
Volume to Capacity	0.13	0.06	0.00	0.00								
Queue Length 95th (m)	3.4	1.3	0.1	0.1								
Control Delay (s)	10.0	9.8	1.5	0.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	10.0	9.8	1.5	0.7								
Approach LOS	A	A										
Intersection Summary												
Average Delay			7.3									
Intersection Capacity Utilization			20.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 30: Nelson Ave / Hwy 3A & Behnsen St.

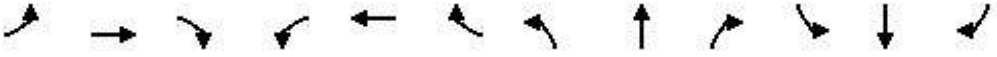
02-28-2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	10	7	5	21	6	12	3	398	31	34	533	16								
Future Volume (Veh/h)	10	7	5	21	6	12	3	398	31	34	533	16								
Sign Control	Stop			Stop			Free			Free										
Grade	0%			0%			0%			0%										
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67								
Hourly flow rate (vph)	16	20	8	36	12	16	8	433	52	68	573	24								
Pedestrians																				
Lane Width (m)																				
Walking Speed (m/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type							None			None										
Median storage veh																				
Upstream signal (m)												102								
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91													
vC, conflicting volume	1180	1210	573	1176	1182	433	597	485												
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	1149	1182	484	1145	1151	433	510	485												
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1	4.2												
tC, 2 stage (s)																				
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2	2.3												
p0 queue free %	88	88	99	74	93	97	99	93												
cM capacity (veh/h)	134	161	536	137	168	627	972	1014												
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3												
Volume Total	44	64	8	433	52	68	573	24												
Volume Left	16	36	8	0	0	68	0	0												
Volume Right	8	16	0	0	52	0	0	24												
cSH	170	178	972	1700	1700	1014	1700	1700												
Volume to Capacity	0.26	0.36	0.01	0.25	0.03	0.07	0.34	0.01												
Queue Length 95th (m)	7.5	11.6	0.2	0.0	0.0	1.6	0.0	0.0												
Control Delay (s)	33.3	36.2	8.7	0.0	0.0	8.8	0.0	0.0												
Lane LOS	D	E	A					A												
Approach Delay (s)	33.3	36.2	0.1					0.9												
Approach LOS	D	E																		
Intersection Summary																				
Average Delay	3.5																			
Intersection Capacity Utilization	38.3%				ICU Level of Service				A											
Analysis Period (min)	15																			

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	3	398	31	34	533	16
Future Volume (vph)	0	0	0	0	0	0	3	398	31	34	533	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1776	1553	1570	1863	1615
Flt Permitted							0.437			0.511		
Satd. Flow (perm)	0	0	0	0	0	0	828	1776	1553	844	1863	1573
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									52			94
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			30				9					9
Confl. Bikes (#/hr)	1		1				4					4
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	4%	15%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	433	52	68	573	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	433	52	68	573	24
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Free
Protected Phases								2			2	
Permitted Phases							2		2	2		Free

Existing Conditions Summary

Synchro 11 Report

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (%)							65.7%	65.7%	65.7%	65.7%	65.7%	
Maximum Green (s)							40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	
Recall Mode							Ped	Ped	Ped	Ped	Ped	
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	
Pedestrian Calls (#/hr)							0	0	0	0	0	
Act Effct Green (s)							60.6	60.6	60.6	60.6	60.6	70.6
Actuated g/C Ratio							0.86	0.86	0.86	0.86	0.86	1.00
v/c Ratio							0.01	0.28	0.04	0.09	0.36	0.02
Control Delay							4.7	4.5	1.8	4.5	5.0	0.0
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.7	4.5	1.8	4.5	5.0	0.0
LOS							A	A	A	A	A	A
Approach Delay								4.2			4.8	
Approach LOS								A			A	
90th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
70th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
50th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
30th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
10th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
Stops (vph)							1	96	4	9	138	0
Fuel Used(l)							0	7	0	1	18	0
CO Emissions (g/hr)							1	138	8	21	334	7
NOx Emissions (g/hr)							0	27	2	4	64	1
VOC Emissions (g/hr)							0	32	2	5	77	2
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							0.7	44.8	1.3	4.4	63.1	0.0
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							711	1525	1341	725	1600	1573
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.28	0.04	0.09	0.36	0.02

Existing Conditions Summary

Synchro 11 Report

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 4.5

Intersection LOS: A

Intersection Capacity Utilization 38.3%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 85

70th %ile Actuated Cycle: 85

50th %ile Actuated Cycle: 61

30th %ile Actuated Cycle: 61

10th %ile Actuated Cycle: 61

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	34%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	7	1	37	46	1	39	32	429	86	23	365	16								
Future Volume (Veh/h)	7	1	37	46	1	39	32	429	86	23	365	16								
Sign Control	Stop			Stop			Free			Free										
Grade	0%			0%			0%			0%										
Peak Hour Factor	0.58	0.25	0.84	0.77	0.25	0.81	0.73	0.92	0.80	0.72	0.77	0.80								
Hourly flow rate (vph)	12	4	44	60	4	48	44	466	108	32	474	20								
Pedestrians	8			2			19			1										
Lane Width (m)	3.6			3.6			3.6			3.6										
Walking Speed (m/s)	1.1			1.1			1.1			1.1										
Percent Blockage	1			0			2			0										
Right turn flare (veh)																				
Median type							None			None										
Median storage (veh)																				
Upstream signal (m)																				
pX, platoon unblocked																				
vC, conflicting volume	1161	1112	511	1159	1122	469	502				468									
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	1161	1112	511	1159	1122	469	502				468									
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1									
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2									
p0 queue free %	92	98	92	59	98	92	96				97									
cM capacity (veh/h)	147	194	553	146	191	591	1065				1076									
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2													
Volume Total	60	112	44	466	108	32	494													
Volume Left	12	60	44	0	0	32	0													
Volume Right	44	48	0	0	108	0	20													
cSH	330	218	1065	1700	1700	1076	1700													
Volume to Capacity	0.18	0.51	0.04	0.27	0.06	0.03	0.29													
Queue Length 95th (m)	5.0	20.1	1.0	0.0	0.0	0.7	0.0													
Control Delay (s)	18.3	37.8	8.5	0.0	0.0	8.4	0.0													
Lane LOS	C	E	A				A													
Approach Delay (s)	18.3	37.8	0.6				0.5													
Approach LOS	C	E																		
Intersection Summary																				
Average Delay				4.5																
Intersection Capacity Utilization				45.0%	ICU Level of Service				A											
Analysis Period (min)				15																

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	19	53	0	11	4	519	80	23	429	1
Future Volume (Veh/h)	5	2	19	53	0	11	4	519	80	23	429	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.50	0.68	0.83	0.25	0.55	0.33	0.92	0.87	0.72	0.81	0.25
Hourly flow rate (vph)	12	4	28	64	0	20	12	564	92	32	530	4
Pedestrians		1			8			3				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								379				
pX, platoon unblocked												
vC, conflicting volume	1203	1283	534	1223	1195	572	535			664		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1203	1283	534	1223	1195	572	535			664		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	97	95	54	100	96	99			96		
cM capacity (veh/h)	150	158	548	139	178	520	1042			904		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	44	84	12	564	92	32	530	4				
Volume Left	12	64	12	0	0	32	0	0				
Volume Right	28	20	0	0	92	0	0	4				
cSH	281	169	1042	1700	1700	904	1700	1700				
Volume to Capacity	0.16	0.50	0.01	0.33	0.05	0.04	0.31	0.00				
Queue Length 95th (m)	4.2	18.4	0.3	0.0	0.0	0.8	0.0	0.0				
Control Delay (s)	20.2	45.9	8.5	0.0	0.0	9.1	0.0	0.0				
Lane LOS	C	E	A			A						
Approach Delay (s)	20.2	45.9	0.2			0.5						
Approach LOS	C	E										
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			44.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: 3rd St. & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	57	5	7	69	0	6	6	2	2	8	3
Future Volume (Veh/h)	7	57	5	7	69	0	6	6	2	2	8	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.68	0.42	0.35	0.91	0.25	0.38	0.75	0.50	0.50	0.40	0.38
Hourly flow rate (vph)	12	84	12	20	76	0	16	8	4	4	20	8
Pedestrians		4			3			6			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	120	83	34	137	85	17	32			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120	83	34	137	85	17	32			15		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	89	99	97	90	100	99			100		
cM capacity (veh/h)	780	796	1036	745	794	1055	1587			1612		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	108	96	28	32								
Volume Left	12	20	16	4								
Volume Right	12	0	4	8								
cSH	815	783	1587	1612								
Volume to Capacity	0.13	0.12	0.01	0.00								
Queue Length 95th (m)	3.5	3.2	0.2	0.1								
Control Delay (s)	10.1	10.2	4.2	0.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.1	10.2	4.2	0.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			17.8%	ICU Level of Service						A		
Analysis Period (min)			15									

4: 5th Street & Davies St. Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.0	0.0	4.6	5.1	2.5	4.8	5.9	4.1	5.5	5.6	4.2

Intersection: 4: 5th Street & Davies St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	20.5	16.1	15.1
Average Queue (m)	10.5	9.3	8.1
95th Queue (m)	16.4	13.2	13.7
Link Distance (m)		111.0	107.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

5: 5th Street & Cottonwood St. Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.0	0.0	0.1
Total Del/Veh (s)	0.1	0.0	4.7	5.1	2.3	4.8	5.1	2.7	8.8	6.2	4.4

Intersection: 5: 5th Street & Cottonwood St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	6.5	20.5	16.8	15.9
Average Queue (m)	0.2	9.3	12.3	9.9
95th Queue (m)	2.2	16.4	18.4	14.8
Link Distance (m)	139.3	319.5	51.9	111.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Unsignalized Intersection Capacity Analysis

6: 5th Street & Gordon St.

02-28-2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	66	13	6	67	11	15
Future Volume (Veh/h)	66	13	6	67	11	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.65	0.38	0.80	0.55	0.47
Hourly flow rate (vph)	76	20	16	84	20	32
Pedestrians	2			1	5	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			101		209	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			101		209	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	97
cM capacity (veh/h)			1497		771	966
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	96	100	52			
Volume Left	0	16	20			
Volume Right	20	0	32			
cSH	1700	1497	880			
Volume to Capacity	0.06	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.4			
Control Delay (s)	0.0	1.3	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.3	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: 7th St. & Gordon St.

02-28-2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	18	43	3	2	41	3	4	9	3	3	2	21	
Future Volume (Veh/h)	18	43	3	2	41	3	4	9	3	3	2	21	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.64	0.83	0.38	0.25	0.73	0.38	0.33	0.75	0.38	0.38	0.25	0.88	
Hourly flow rate (vph)	28	52	8	8	56	8	12	12	8	8	8	24	
Pedestrians		1						4			3		
Lane Width (m)		3.6						3.6			3.6		
Walking Speed (m/s)		1.1						1.1			1.1		
Percent Blockage		0						0			0		
Right turn flare (veh)													
Median type		None			None								
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	67				64				221	199	60	205	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	67				64				221	199	60	205	
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	
tC, 2 stage (s)													
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	
p0 queue free %	98				99				98	98	99	99	
cM capacity (veh/h)	1543				1546				696	680	1007	722	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	88	72	32	40									
Volume Left	28	8	12	8									
Volume Right	8	8	8	24									
cSH	1543	1546	747	849									
Volume to Capacity	0.02	0.01	0.04	0.05									
Queue Length 95th (m)	0.4	0.1	1.0	1.1									
Control Delay (s)	2.4	0.9	10.0	9.5									
Lane LOS	A	A	B	A									
Approach Delay (s)	2.4	0.9	10.0	9.5									
Approach LOS				B	A								
Intersection Summary													
Average Delay				4.2									
Intersection Capacity Utilization				20.9%	ICU Level of Service				A				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis 8: 10th St. & Fell St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1	0	9	16	3	4	10	11	6	4	3
Future Volume (Veh/h)	6	1	0	9	16	3	4	10	11	6	4	3
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.50	0.25	0.25	0.75	0.44	0.75	0.50	0.50	0.69	0.50	0.50	0.38
Hourly flow rate (vph)	12	4	0	12	36	4	8	20	16	12	8	8
Pedestrians					1					5		
Lane Width (m)					3.6					3.6		
Walking Speed (m/s)					1.1					1.1		
Percent Blockage					0					0		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	107	89	17	88	85	34	16				37	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	107	89	17	88	85	34	16				37	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	99	99	100	99	95	100	99				99	
cM capacity (veh/h)	831	794	1057	884	798	1039	1464				1585	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	16	52	44	28								
Volume Left	12	12	8	12								
Volume Right	0	4	16	8								
cSH	821	831	1464	1585								
Volume to Capacity	0.02	0.06	0.01	0.01								
Queue Length 95th (m)	0.5	1.5	0.1	0.2								
Control Delay (s)	9.5	9.6	1.4	3.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.5	9.6	1.4	3.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay				5.7								
Intersection Capacity Utilization				15.2%	ICU Level of Service				A			
Analysis Period (min)				15								

9: Elwyn St. & 8th St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	0.1	0.2	0.3	6.7	4.7	4.6	2.5	5.1	2.7	2.3

Intersection: 9: Elwyn St. & 8th St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	15.0	16.4	16.4
Average Queue (m)	6.7	5.8	7.4
95th Queue (m)	14.5	15.4	14.8
Link Distance (m)	70.4		247.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

11: 3rd St. & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	60	13	5	34	0	0	1	1	4	2	7
Future Volume (Veh/h)	6	60	13	5	34	0	0	1	1	4	2	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.79	0.65	0.42	0.85	0.25	0.25	0.25	0.25	0.50	0.50	0.58
Hourly flow rate (vph)	12	76	20	12	40	0	0	4	4	8	4	12
Pedestrians		14			5			8			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	68	53	32	103	57	13	30			13		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	68	53	32	103	57	13	30			13		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	91	98	98	95	100	100			100		
cM capacity (veh/h)	867	824	1027	781	814	1066	1563			1611		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	108	52	8	24								
Volume Left	12	12	0	8								
Volume Right	20	0	4	12								
cSH	860	806	1563	1611								
Volume to Capacity	0.13	0.06	0.00	0.00								
Queue Length 95th (m)	3.3	1.6	0.0	0.1								
Control Delay (s)	9.8	9.8	0.0	2.4								
Lane LOS	A	A		A								
Approach Delay (s)	9.8	9.8	0.0	2.4								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.5									
Intersection Capacity Utilization			21.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

12: Elwyn St. & 10th St.

02-28-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	15	23	2	0	24
Future Volume (Veh/h)	37	15	23	2	0	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.62	0.54	0.72	0.50	0.25	0.60
Hourly flow rate (vph)	60	28	32	4	0	40
Pedestrians		11			11	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		1			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	47				193	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	47				193	56
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	96				100	96
cM capacity (veh/h)	1558				665	996
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	88	36	40			
Volume Left	60	0	0			
Volume Right	0	4	40			
cSH	1558	1700	996			
Volume to Capacity	0.04	0.02	0.04			
Queue Length 95th (m)	0.9	0.0	1.0			
Control Delay (s)	5.1	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	5.1	0.0	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay		4.9				
Intersection Capacity Utilization		22.6%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

13: 5th Street & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	40	10	24	60	0	13	27	15	1	23	3
Future Volume (Veh/h)	4	40	10	24	60	0	13	27	15	1	23	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.62	0.50	0.60	0.79	0.25	0.65	0.56	0.62	0.25	0.57	0.38
Hourly flow rate (vph)	8	65	20	40	76	0	20	48	24	4	40	8
Pedestrians					3			5			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	79			90			280	255	83	301	265	79
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	79			90			280	255	83	301	265	79
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			97			97	92	97	99	93	99
cM capacity (veh/h)	1528			1480			601	620	956	580	611	984
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	93	116	92	52								
Volume Left	8	40	20	4								
Volume Right	20	0	24	8								
cSH	1528	1480	677	646								
Volume to Capacity	0.01	0.03	0.14	0.08								
Queue Length 95th (m)	0.1	0.6	3.6	2.0								
Control Delay (s)	0.7	2.7	11.1	11.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.7	2.7	11.1	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			26.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

14: 3rd St. & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	53	9	5	28	1	5	5	5	1	9	39
Future Volume (Veh/h)	47	53	9	5	28	1	5	5	5	1	9	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.66	0.75	0.62	0.41	0.25	0.62	0.62	0.42	0.25	0.56	0.61
Hourly flow rate (vph)	60	80	12	8	68	4	8	8	12	4	16	64
Pedestrians		1			4			10			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	127	97	59	152	123	20	81			24		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	127	97	59	152	123	20	81			24		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	90	99	99	91	100	99			100		
cM capacity (veh/h)	780	783	1002	730	754	1058	1528			1598		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	152	80	28	84								
Volume Left	60	8	8	4								
Volume Right	12	4	12	64								
cSH	796	763	1528	1598								
Volume to Capacity	0.19	0.10	0.01	0.00								
Queue Length 95th (m)	5.3	2.7	0.1	0.1								
Control Delay (s)	10.6	10.3	2.1	0.4								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.6	10.3	2.1	0.4								
Approach LOS	B	B										
Intersection Summary												
Average Delay			7.3									
Intersection Capacity Utilization			24.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	4	9	23	3	18	5	720	62	14	460	21
Future Volume (Veh/h)	33	4	9	23	3	18	5	720	62	14	460	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Hourly flow rate (vph)	40	4	12	28	4	20	8	783	76	16	529	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												102
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1382	1436	529	1374	1396	783	565	859				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1373	1431	454	1364	1388	783	492	859				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	62	97	98	74	97	95	99	98				
cM capacity (veh/h)	105	122	567	109	130	397	1004	791				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	56	52	8	783	76	16	529	36				
Volume Left	40	28	8	0	0	16	0	0				
Volume Right	12	20	0	0	76	0	0	36				
cSH	128	154	1004	1700	1700	791	1700	1700				
Volume to Capacity	0.44	0.34	0.01	0.46	0.04	0.02	0.31	0.02				
Queue Length 95th (m)	14.6	10.5	0.2	0.0	0.0	0.5	0.0	0.0				
Control Delay (s)	53.1	39.8	8.6	0.0	0.0	9.6	0.0	0.0				
Lane LOS	F	E	A	A								
Approach Delay (s)	53.1	39.8	0.1	0.3								
Approach LOS	F	E										
Intersection Summary												
Average Delay	3.4											
Intersection Capacity Utilization	48.2%			ICU Level of Service					A			
Analysis Period (min)	15											

Lanes, Volumes, Timings
10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	720	62	14	460	21
Future Volume (vph)	0	0	0	0	0	0	5	720	62	14	460	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1863	1615	1805	1863	1615
Flt Permitted							0.462			0.331		
Satd. Flow (perm)	0	0	0	0	0	0	877	1863	1615	629	1863	1574
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									64			36
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			20				3					3
Confl. Bikes (#/hr)			3				4					4
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	783	76	16	529	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	783	76	16	529	36
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	97		97	24		97	97		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Perm
Protected Phases								2			2	
Permitted Phases							2		2	2		2

Existing Conditions Summary

Synchro 11 Report

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (%)							68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
Maximum Green (s)							46.0	46.0	46.0	46.0	46.0	46.0
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode							Max	Max	Max	Max	Max	Max
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)							0	0	0	0	0	0
Act Effct Green (s)							66.5	66.5	66.5	66.5	66.5	66.5
Actuated g/C Ratio							0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio							0.01	0.48	0.05	0.03	0.33	0.03
Control Delay							4.4	6.0	1.8	4.4	4.4	1.9
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.4	6.0	1.8	4.4	4.4	1.9
LOS							A	A	A	A	A	A
Approach Delay								5.6			4.3	
Approach LOS								A			A	
90th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
70th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
Stops (vph)							2	211	7	4	106	2
Fuel Used(l)							0	15	1	0	15	1
CO Emissions (g/hr)							2	279	16	9	279	11
NOx Emissions (g/hr)							0	54	3	2	54	2
VOC Emissions (g/hr)							0	64	4	2	64	2
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							1.2	101.9	3.8	2.8	52.8	1.1
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							761	1617	1410	546	1617	1371
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.48	0.05	0.03	0.33	0.03

Existing Conditions Summary

Synchro 11 Report

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 76

Actuated Cycle Length: 76.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 5.1

Intersection LOS: A

Intersection Capacity Utilization 46.7%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 91

70th %ile Actuated Cycle: 91

50th %ile Actuated Cycle: 67

30th %ile Actuated Cycle: 67

10th %ile Actuated Cycle: 67

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	32%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	35	45	0	27	27	285	68	21	562	10
Future Volume (Veh/h)	3	0	35	45	0	27	27	285	68	21	562	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.25	0.75	0.93	0.25	0.56	0.48	0.77	0.85	0.88	0.79	0.38
Hourly flow rate (vph)	8	0	47	48	0	48	56	370	80	24	711	26
Pedestrians		5						5				
Lane Width (m)		3.6						3.6				
Walking Speed (m/s)		1.1						1.1				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1307	1259	734	1293	1272	370	742			370		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1307	1259	734	1293	1272	370	742			370		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.3		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.4		
p0 queue free %	93	100	89	59	100	93	94			98		
cM capacity (veh/h)	119	155	413	116	153	669	870			1087		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	55	96	56	370	80	24	737					
Volume Left	8	48	56	0	0	24	0					
Volume Right	47	48	0	0	80	0	26					
cSH	304	198	870	1700	1700	1087	1700					
Volume to Capacity	0.18	0.49	0.06	0.22	0.05	0.02	0.43					
Queue Length 95th (m)	4.9	18.1	1.6	0.0	0.0	0.5	0.0					
Control Delay (s)	19.5	39.3	9.4	0.0	0.0	8.4	0.0					
Lane LOS	C	E	A			A						
Approach Delay (s)	19.5	39.3	1.0			0.3						
Approach LOS	C	E										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			47.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	3	13	57	2	10	9	368	62	30	620	1
Future Volume (Veh/h)	0	3	13	57	2	10	9	368	62	30	620	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.75	0.75	0.25	0.67	0.50	0.90	0.85	0.82	0.80	0.25
Hourly flow rate (vph)	0	12	17	76	8	15	18	409	73	37	775	4
Pedestrians		1			3			1				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (m)	379											
pX, platoon unblocked												
vC, conflicting volume	1314	1371	777	1321	1302	412	780				485	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1314	1371	777	1321	1302	412	780				485	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	91	96	33	95	98	98				97	
cM capacity (veh/h)	121	139	399	113	153	643	845				1060	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	29	99	18	409	73	37	775	4				
Volume Left	0	76	18	0	0	37	0	0				
Volume Right	17	15	0	0	73	0	0	4				
cSH	225	132	845	1700	1700	1060	1700	1700				
Volume to Capacity	0.13	0.75	0.02	0.24	0.04	0.03	0.46	0.00				
Queue Length 95th (m)	3.3	33.2	0.5	0.0	0.0	0.8	0.0	0.0				
Control Delay (s)	23.4	87.3	9.4	0.0	0.0	8.5	0.0	0.0				
Lane LOS	C	F	A				A					
Approach Delay (s)	23.4	87.3	0.3				0.4					
Approach LOS	C	F										
Intersection Summary												
Average Delay	6.8											
Intersection Capacity Utilization	49.8%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

3: 3rd St. & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	78	3	7	60	1	3	8	7	4	17	6
Future Volume (Veh/h)	3	78	3	7	60	1	3	8	7	4	17	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.90	0.38	0.42	0.78	0.25	0.38	0.58	0.75	0.25	0.57	0.50
Hourly flow rate (vph)	6	87	8	17	77	4	8	14	9	16	30	12
Pedestrians		13			11							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.1			1.1							
Percent Blockage		1			1							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	158	131	49	165	132	30	55			34		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158	131	49	165	132	30	55			34		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	88	99	98	89	100	99			99		
cM capacity (veh/h)	715	728	1013	698	727	1035	1545			1562		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	101	98	31	58								
Volume Left	6	17	8	16								
Volume Right	8	4	9	12								
cSH	744	730	1545	1562								
Volume to Capacity	0.14	0.13	0.01	0.01								
Queue Length 95th (m)	3.6	3.5	0.1	0.2								
Control Delay (s)	10.6	10.7	1.9	2.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.6	10.7	1.9	2.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			8.0									
Intersection Capacity Utilization			19.7%		ICU Level of Service				A			
Analysis Period (min)			15									

5: 5th Street & Cottonwood St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.0	0.0	0.1
Total Del/Veh (s)	0.3	0.8	0.2	6.2	5.5	2.6	5.3	6.3	3.5	7.1	6.0	4.5

Intersection: 5: 5th Street & Cottonwood St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	22.0	22.2	27.4
Average Queue (m)	10.5	12.2	12.7
95th Queue (m)	15.7	18.9	21.0
Link Distance (m)	319.5	51.9	111.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

4: 5th Street & Davies St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.5	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.2	0.1	0.2	4.7	5.0	3.1	4.9	6.3	4.9	5.8	3.3	4.0

Intersection: 4: 5th Street & Davies St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	21.6	15.8	15.0
Average Queue (m)	12.5	9.8	8.1
95th Queue (m)	20.6	14.5	13.7
Link Distance (m)		111.0	107.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

6: 5th Street & Gordon St.

02-28-2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	34	5	5	57	10	9
Future Volume (Veh/h)	34	5	5	57	10	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.62	0.62	0.90	0.38	0.67
Hourly flow rate (vph)	51	8	8	63	26	13
Pedestrians				5	3	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			62		137	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			62		137	63
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			1550		854	1000
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	59	71	39			
Volume Left	0	8	26			
Volume Right	8	0	13			
cSH	1700	1550	898			
Volume to Capacity	0.03	0.01	0.04			
Queue Length 95th (m)	0.0	0.1	1.0			
Control Delay (s)	0.0	0.9	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.9	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: 7th St. & Gordon St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	15	3	6	45	6	5	14	3	0	9	11
Future Volume (Veh/h)	15	15	3	6	45	6	5	14	3	0	9	11
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.58	0.70	0.38	0.33	0.91	0.75	0.62	1.00	0.75	0.25	0.50	0.50
Hourly flow rate (vph)	26	21	8	18	49	8	8	14	4	0	18	22
Pedestrians	1			1			1			10		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	67			30			199	181	27	188	181	64
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			30			199	181	27	188	181	64
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.2	3.3
p0 queue free %	98			99			99	98	100	100	97	98
cM capacity (veh/h)	1533			1594			709	689	1052	728	648	996
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	55	75	26	40								
Volume Left	26	18	8	0								
Volume Right	8	8	4	22								
cSH	1533	1594	735	802								
Volume to Capacity	0.02	0.01	0.04	0.05								
Queue Length 95th (m)	0.4	0.3	0.8	1.2								
Control Delay (s)	3.6	1.8	10.1	9.7								
Lane LOS	A	A	B	A								
Approach Delay (s)	3.6	1.8	10.1	9.7								
Approach LOS			B	A								
Intersection Summary												
Average Delay				5.0								
Intersection Capacity Utilization				18.5%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 8: 10th St. & Fell St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	19	0	8	9	6	2	11	57	8	6	1
Future Volume (Veh/h)	0	19	0	8	9	6	2	11	57	8	6	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.38	0.25	0.50	0.42	0.67	0.25	0.38	0.25
Hourly flow rate (vph)	0	76	0	32	24	24	4	26	85	32	16	4
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.1						1.1	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	196	204	18	200	164	72	20			114		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196	204	18	200	164	72	20			114		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	100	89	100	95	97	98	100			98		
cM capacity (veh/h)	710	674	1061	681	713	986	1334			1484		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	76	80	115	52								
Volume Left	0	32	4	32								
Volume Right	0	24	85	4								
cSH	674	762	1334	1484								
Volume to Capacity	0.11	0.10	0.00	0.02								
Queue Length 95th (m)	2.9	2.7	0.1	0.5								
Control Delay (s)	11.0	10.3	0.3	4.7								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.0	10.3	0.3	4.7								
Approach LOS	B	B										
Intersection Summary												
Average Delay			6.0									
Intersection Capacity Utilization			20.1%	ICU Level of Service						A		
Analysis Period (min)			15									

9: Elwyn St. & 8th St. Performance by movement

Movement	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
Total Del/Veh (s)	0.1	0.5	4.7	3.1	3.5	4.6	4.6	4.8	2.7	1.9

Intersection: 9: Elwyn St. & 8th St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	8.9	16.4	20.3
Average Queue (m)	6.3	5.8	10.0
95th Queue (m)	12.6	14.1	19.8
Link Distance (m)	70.4		247.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

11: 3rd St. & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	35	30	11	28	6	0	0	2	11	15	15
Future Volume (Veh/h)	14	35	30	11	28	6	0	0	2	11	15	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.82	0.54	0.50	0.64	0.33	0.25	0.25	0.50	0.62	0.44	0.70
Hourly flow rate (vph)	22	43	56	22	44	18	0	0	4	18	34	21
Pedestrians		134			6			56			24	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		12			1			5			2	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	280	224	234	222	233	32	189			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280	224	234	222	233	32	189			10		
tC, single (s)	7.5	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.9	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	93	92	96	92	98	100			99		
cM capacity (veh/h)	430	586	666	540	579	1019	1216			1614		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	121	84	4	73								
Volume Left	22	22	0	18								
Volume Right	56	18	4	21								
cSH	580	625	1216	1614								
Volume to Capacity	0.21	0.13	0.00	0.01								
Queue Length 95th (m)	5.9	3.5	0.0	0.3								
Control Delay (s)	12.8	11.6	0.0	1.9								
Lane LOS	B	B		A								
Approach Delay (s)	12.8	11.6	0.0	1.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			9.5									
Intersection Capacity Utilization			32.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

12: Elwyn St. & 10th St.

02-28-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↱	↰		↴	↵
Traffic Volume (veh/h)	80	29	19	0	3	25
Future Volume (Veh/h)	80	29	19	0	3	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.61	0.75	0.25	0.50	0.79
Hourly flow rate (vph)	104	48	25	0	6	32
Pedestrians		5			4	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	29				285	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	29				285	34
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	93				99	97
cM capacity (veh/h)	1591				572	1036
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	152	25	38			
Volume Left	104	0	6			
Volume Right	0	0	32			
cSH	1591	1700	919			
Volume to Capacity	0.07	0.01	0.04			
Queue Length 95th (m)	1.6	0.0	1.0			
Control Delay (s)	5.2	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	5.2	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			24.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: 5th Street & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	72	8	21	29	3	14	20	33	15	28	0
Future Volume (Veh/h)	1	72	8	21	29	3	14	20	33	15	28	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.86	0.88	0.90	0.79	0.25	0.81	0.59	0.43	0.25	0.72	0.25
Hourly flow rate (vph)	4	84	9	23	37	12	17	34	77	60	39	0
Pedestrians		3			4			2			3	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	52			95			210	196	94	286	195	49
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52			95			210	196	94	286	195	49
tC, single (s)	4.1			4.2			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.1	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	95	92	90	94	100
cM capacity (veh/h)	1563			1471			703	668	963	578	688	1014
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	97	72	128	99								
Volume Left	4	23	17	60								
Volume Right	9	12	77	0								
cSH	1563	1471	825	617								
Volume to Capacity	0.00	0.02	0.16	0.16								
Queue Length 95th (m)	0.1	0.4	4.2	4.3								
Control Delay (s)	0.3	2.5	10.2	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	2.5	10.2	11.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			6.8									
Intersection Capacity Utilization			22.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 14: 3rd St. & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	35	3	8	34	0	2	5	5	1	20	22
Future Volume (Veh/h)	34	35	3	8	34	0	2	5	5	1	20	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.55	0.38	0.58	0.91	0.25	0.50	0.50	0.62	0.25	0.75	0.65
Hourly flow rate (vph)	50	64	8	14	37	0	4	10	8	4	27	34
Pedestrians		3			10			1				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	96	91	48	125	104	24	64			28		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96	91	48	125	104	24	64			28		
tC, single (s)	7.1	6.5	6.5	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.6	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	94	92	99	98	95	100	100			100		
cM capacity (veh/h)	837	782	934	775	764	1043	1547			1584		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	122	51	22	65								
Volume Left	50	14	4	4								
Volume Right	8	0	8	34								
cSH	812	767	1547	1584								
Volume to Capacity	0.15	0.07	0.00	0.00								
Queue Length 95th (m)	4.0	1.6	0.1	0.1								
Control Delay (s)	10.2	10.0	1.3	0.5								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.2	10.0	1.3	0.5								
Approach LOS	B	B										
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			21.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	8	5	26	6	13	3	449	35	36	602	17
Future Volume (Veh/h)	11	8	5	26	6	13	3	449	35	36	602	17
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Hourly flow rate (vph)	18	23	8	45	12	17	8	488	58	72	647	25
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												102
pX, platoon unblocked	0.89	0.89	0.89	0.89	0.89		0.89					
vC, conflicting volume	1318	1353	647	1314	1320	488	672	546				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1295	1334	539	1291	1297	488	567	546				
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1	4.2				
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2	2.3				
p0 queue free %	82	82	98	55	91	97	99	93				
cM capacity (veh/h)	101	126	485	100	133	584	901	961				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	49	74	8	488	58	72	647	25				
Volume Left	18	45	8	0	0	72	0	0				
Volume Right	8	17	0	0	58	0	0	25				
cSH	130	130	901	1700	1700	961	1700	1700				
Volume to Capacity	0.38	0.57	0.01	0.29	0.03	0.07	0.38	0.01				
Queue Length 95th (m)	12.0	21.5	0.2	0.0	0.0	1.8	0.0	0.0				
Control Delay (s)	48.6	64.5	9.0	0.0	0.0	9.0	0.0	0.0				
Lane LOS	E	F	A					A				
Approach Delay (s)	48.6	64.5	0.1	0.9								
Approach LOS	E	F										
Intersection Summary												
Average Delay	5.5											
Intersection Capacity Utilization	41.9%			ICU Level of Service					A			
Analysis Period (min)	15											

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	3	449	35	36	602	17
Future Volume (vph)	0	0	0	0	0	0	3	449	35	36	602	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1776	1553	1570	1863	1615
Flt Permitted							0.397			0.486		
Satd. Flow (perm)	0	0	0	0	0	0	752	1776	1553	803	1863	1573
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									58			94
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			30				9					9
Confl. Bikes (#/hr)	1		1				4					4
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	4%	15%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	488	58	72	647	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	488	58	72	647	25
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Free
Protected Phases								2			2	
Permitted Phases							2		2	2		Free

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (%)							65.7%	65.7%	65.7%	65.7%	65.7%	
Maximum Green (s)							40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	
Recall Mode							Ped	Ped	Ped	Ped	Ped	
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	
Pedestrian Calls (#/hr)							0	0	0	0	0	
Act Effct Green (s)							60.6	60.6	60.6	60.6	60.6	70.6
Actuated g/C Ratio							0.86	0.86	0.86	0.86	0.86	1.00
v/c Ratio							0.01	0.32	0.04	0.10	0.40	0.02
Control Delay							4.7	4.8	1.8	4.6	5.4	0.0
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.7	4.8	1.8	4.6	5.4	0.0
LOS							A	A	A	A	A	A
Approach Delay								4.5			5.2	
Approach LOS								A			A	
90th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
70th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
50th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
30th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
10th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
Stops (vph)							1	112	4	9	167	0
Fuel Used(l)							0	9	0	1	21	0
CO Emissions (g/hr)							1	158	9	22	386	8
NOx Emissions (g/hr)							0	31	2	4	74	1
VOC Emissions (g/hr)							0	37	2	5	89	2
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							0.7	52.4	1.4	4.6	75.5	0.0
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							646	1525	1342	689	1600	1573
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.32	0.04	0.10	0.40	0.02

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.40

Intersection Signal Delay: 4.9

Intersection LOS: A

Intersection Capacity Utilization 38.3%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 85

70th %ile Actuated Cycle: 85

50th %ile Actuated Cycle: 61

30th %ile Actuated Cycle: 61

10th %ile Actuated Cycle: 61

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	34%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Lane Configurations																								
Traffic Volume (veh/h)	8	1	40	52	1	46	34	477	97	33	403	17												
Future Volume (Veh/h)	8	1	40	52	1	46	34	477	97	33	403	17												
Sign Control	Stop			Stop			Free			Free														
Grade	0%			0%			0%			0%														
Peak Hour Factor	0.58	0.25	0.84	0.77	0.25	0.81	0.73	0.92	0.80	0.72	0.77	0.80												
Hourly flow rate (vph)	14	4	48	68	4	57	47	518	121	46	523	21												
Pedestrians	8			2			19			1														
Lane Width (m)	3.6			3.6			3.6			3.6														
Walking Speed (m/s)	1.1			1.1			1.1			1.1														
Percent Blockage	1			0			2			0														
Right turn flare (veh)																								
Median type							None			None														
Median storage (veh)																								
Upstream signal (m)																								
pX, platoon unblocked																								
vC, conflicting volume	1306	1248	560	1298	1258	521	552				520													
vC1, stage 1 conf vol																								
vC2, stage 2 conf vol																								
vCu, unblocked vol	1306	1248	560	1298	1258	521	552				520													
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1													
tC, 2 stage (s)																								
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2													
p0 queue free %	87	97	91	40	97	90	95				96													
cM capacity (veh/h)	112	158	518	113	156	552	1021				1029													
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2																	
Volume Total	66	129	47	518	121	46	544																	
Volume Left	14	68	47	0	0	46	0																	
Volume Right	48	57	0	0	121	0	21																	
cSH	271	177	1021	1700	1700	1029	1700																	
Volume to Capacity	0.24	0.73	0.05	0.30	0.07	0.04	0.32																	
Queue Length 95th (m)	7.1	34.8	1.1	0.0	0.0	1.1	0.0																	
Control Delay (s)	22.5	66.5	8.7	0.0	0.0	8.7	0.0																	
Lane LOS	C	F	A				A																	
Approach Delay (s)	22.5	66.5	0.6				0.7																	
Approach LOS	C	F																						
Intersection Summary																								
Average Delay				7.4																				
Intersection Capacity Utilization				47.4%	ICU Level of Service				A															
Analysis Period (min)				15																				

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	3	20	60	1	15	4	578	92	28	477	1
Future Volume (Veh/h)	5	3	20	60	1	15	4	578	92	28	477	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.42	0.50	0.68	0.83	0.25	0.55	0.33	0.92	0.87	0.72	0.81	0.25
Hourly flow rate (vph)	12	6	29	72	4	27	12	628	106	39	589	4
Pedestrians	1			8			3					
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0			1			0					
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)	379											
pX, platoon unblocked												
vC, conflicting volume	1349	1434	593	1362	1332	636	594				742	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1349	1434	593	1362	1332	636	594				742	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	89	95	94	33	97	94	99				95	
cM capacity (veh/h)	113	126	507	108	145	478	991				845	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	47	103	12	628	106	39	589	4				
Volume Left	12	72	12	0	0	39	0	0				
Volume Right	29	27	0	0	106	0	0	4				
cSH	223	137	991	1700	1700	845	1700	1700				
Volume to Capacity	0.21	0.75	0.01	0.37	0.06	0.05	0.35	0.00				
Queue Length 95th (m)	5.9	33.7	0.3	0.0	0.0	1.1	0.0	0.0				
Control Delay (s)	25.4	84.6	8.7	0.0	0.0	9.5	0.0	0.0				
Lane LOS	D	F	A				A					
Approach Delay (s)	25.4	84.6	0.1	0.6								
Approach LOS	D	F										
Intersection Summary												
Average Delay	6.8											
Intersection Capacity Utilization	48.0%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

3: 3rd St. & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	70	5	15	81	2	6	6	5	3	9	3
Future Volume (Veh/h)	9	70	5	15	81	2	6	6	5	3	9	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.68	0.42	0.35	0.91	0.25	0.38	0.75	0.50	0.50	0.40	0.38
Hourly flow rate (vph)	16	103	12	43	89	8	16	8	10	6	22	8
Pedestrians		4			3			6			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	144	95	36	156	94	20	34			21		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	144	95	36	156	94	20	34			21		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	87	99	94	89	99	99			100		
cM capacity (veh/h)	736	783	1033	708	784	1051	1585			1604		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	131	140	34	36								
Volume Left	16	43	16	6								
Volume Right	12	8	10	8								
cSH	794	770	1585	1604								
Volume to Capacity	0.16	0.18	0.01	0.00								
Queue Length 95th (m)	4.5	5.0	0.2	0.1								
Control Delay (s)	10.4	10.7	3.5	1.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.4	10.7	3.5	1.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			8.9									
Intersection Capacity Utilization			19.7%	ICU Level of Service						A		
Analysis Period (min)			15									

4: 5th Street & Davies St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.2	0.2	0.1	4.4	5.1	2.9	5.6	6.2	4.2	5.5	3.5	4.4

Intersection: 4: 5th Street & Davies St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	23.8	24.5	9.4
Average Queue (m)	10.2	10.5	8.8
95th Queue (m)	18.6	17.1	11.6
Link Distance (m)		111.0	107.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

5: 5th Street & Cottonwood St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.3	0.2	0.0	0.0	0.1
Total Del/Veh (s)	0.0	0.3	0.4	5.0	5.4	2.8	4.2	5.8	3.9	6.5	7.0	4.6

Intersection: 5: 5th Street & Cottonwood St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	22.8	23.7	22.5	22.2
Average Queue (m)	1.3	11.6	13.5	11.4
95th Queue (m)	8.7	18.1	20.9	17.8
Link Distance (m)	139.3	319.5	51.9	111.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Unsignalized Intersection Capacity Analysis

6: 5th Street & Gordon St.

02-28-2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	71	14	10	80	12	16
Future Volume (Veh/h)	71	14	10	80	12	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.65	0.38	0.80	0.55	0.47
Hourly flow rate (vph)	82	22	26	100	22	34
Pedestrians	2			1	5	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			109		252	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			109		252	99
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	96
cM capacity (veh/h)			1487		723	957
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	104	126	56			
Volume Left	0	26	22			
Volume Right	22	0	34			
cSH	1700	1487	849			
Volume to Capacity	0.06	0.02	0.07			
Queue Length 95th (m)	0.0	0.4	1.6			
Control Delay (s)	0.0	1.7	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.7	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			21.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: 7th St. & Gordon St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	46	3	11	53	12	4	18	3	3	6	27
Future Volume (Veh/h)	19	46	3	11	53	12	4	18	3	3	6	27
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.64	0.83	0.38	0.25	0.73	0.38	0.33	0.75	0.38	0.38	0.25	0.88
Hourly flow rate (vph)	30	55	8	44	73	32	12	24	8	8	24	31
Pedestrians	1						4			3		
Lane Width (m)	3.6						3.6			3.6		
Walking Speed (m/s)	1.1						1.1			1.1		
Percent Blockage	0						0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	108			67			344	319	63	319	307	93
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	108			67			344	319	63	319	307	93
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			98	96	99	99	96	97
cM capacity (veh/h)	1491			1542			549	568	1004	585	577	952
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	93	149	44	63								
Volume Left	30	44	12	8								
Volume Right	8	32	8	31								
cSH	1491	1542	611	718								
Volume to Capacity	0.02	0.03	0.07	0.09								
Queue Length 95th (m)	0.5	0.7	1.8	2.2								
Control Delay (s)	2.5	2.3	11.4	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	2.5	2.3	11.4	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay				5.0								
Intersection Capacity Utilization				17.7%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 8: 10th St. & Fell St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	11	0	37	44	30	4	11	33	10	4	3
Future Volume (Veh/h)	6	11	0	37	44	30	4	11	33	10	4	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.25	0.25	0.75	0.44	0.75	0.50	0.50	0.69	0.50	0.50	0.38
Hourly flow rate (vph)	12	44	0	49	100	40	8	22	48	20	8	8
Pedestrians					1			5			5	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	209	139	17	142	119	52	16			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209	139	17	142	119	52	16			71		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.4			2.2		
p0 queue free %	98	94	100	94	87	96	99			99		
cM capacity (veh/h)	638	741	1057	779	760	1016	1464			1541		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	56	189	78	36								
Volume Left	12	49	8	20								
Volume Right	0	40	48	8								
cSH	716	808	1464	1541								
Volume to Capacity	0.08	0.23	0.01	0.01								
Queue Length 95th (m)	1.9	6.9	0.1	0.3								
Control Delay (s)	10.5	10.8	0.8	4.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.5	10.8	0.8	4.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			19.5%	ICU Level of Service						A		
Analysis Period (min)			15									

9: Elwyn St. & 8th St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1
Total Del/Veh (s)	0.2	0.3	0.6	3.2	5.0	5.6	2.4	5.6	2.9	2.6

Intersection: 9: Elwyn St. & 8th St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	15.2	20.2	21.3
Average Queue (m)	9.2	4.0	10.1
95th Queue (m)	13.6	13.5	17.0
Link Distance (m)	70.4		247.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

11: 3rd St. & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	64	14	5	39	1	0	1	1	4	2	8
Future Volume (Veh/h)	6	64	14	5	39	1	0	1	1	4	2	8
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.50	0.79	0.65	0.42	0.85	0.25	0.25	0.25	0.25	0.50	0.50	0.58
Hourly flow rate (vph)	12	81	22	12	46	4	0	4	4	8	4	14
Pedestrians	14			5			8			2		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	1			0			1			0		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	76	54	33	108	59	13	32				13	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76	54	33	108	59	13	32				13	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	90	98	98	94	100	100				100	
cM capacity (veh/h)	848	823	1025	769	812	1066	1560				1611	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	115	62	8	26								
Volume Left	12	12	0	8								
Volume Right	22	4	4	14								
cSH	858	816	1560	1611								
Volume to Capacity	0.13	0.08	0.00	0.00								
Queue Length 95th (m)	3.5	1.9	0.0	0.1								
Control Delay (s)	9.8	9.8	0.0	2.3								
Lane LOS	A	A		A								
Approach Delay (s)	9.8	9.8	0.0	2.3								
Approach LOS	A	A										
Intersection Summary												
Average Delay				8.5								
Intersection Capacity Utilization				22.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

12: Elwyn St. & 10th St.

02-28-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	16	25	2	3	50
Future Volume (Veh/h)	61	16	25	2	3	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.62	0.54	0.72	0.50	0.25	0.60
Hourly flow rate (vph)	98	30	35	4	12	83
Pedestrians		11			11	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		1			1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	50				274	59
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	50				274	59
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	94				98	92
cM capacity (veh/h)	1554				579	992
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	128	39	95			
Volume Left	98	0	12			
Volume Right	0	4	83			
cSH	1554	1700	910			
Volume to Capacity	0.06	0.02	0.10			
Queue Length 95th (m)	1.5	0.0	2.6			
Control Delay (s)	5.8	0.0	9.4			
Lane LOS	A		A			
Approach Delay (s)	5.8	0.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			24.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: 5th Street & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	55	11	35	82	9	14	29	27	8	25	3
Future Volume (Veh/h)	4	55	11	35	82	9	14	29	27	8	25	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.62	0.50	0.60	0.79	0.25	0.65	0.56	0.62	0.25	0.57	0.38
Hourly flow rate (vph)	8	89	22	58	104	36	22	52	44	32	44	8
Pedestrians					3			5			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	143			116			389	380	108	430	373	125
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143			116			389	380	108	430	373	125
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			96			96	90	95	93	92	99
cM capacity (veh/h)	1448			1448			496	521	926	453	524	928
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	119	198	118	84								
Volume Left	8	58	22	32								
Volume Right	22	36	44	8								
cSH	1448	1448	615	514								
Volume to Capacity	0.01	0.04	0.19	0.16								
Queue Length 95th (m)	0.1	1.0	5.3	4.4								
Control Delay (s)	0.5	2.5	12.2	13.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.5	2.5	12.2	13.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			6.0									
Intersection Capacity Utilization			26.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

14: 3rd St. & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	62	10	5	33	1	5	6	5	1	11	46
Future Volume (Veh/h)	56	62	10	5	33	1	5	6	5	1	11	46
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.78	0.66	0.75	0.62	0.41	0.25	0.62	0.62	0.42	0.25	0.56	0.61
Hourly flow rate (vph)	72	94	13	8	80	4	8	10	12	4	20	75
Pedestrians	1			4			10			2		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			1			0		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	144	108	68	172	140	22	96				26	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	144	108	68	172	140	22	96				26	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	90	88	99	99	89	100	99				100	
cM capacity (veh/h)	748	772	990	697	738	1055	1509				1595	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	179	92	30	99								
Volume Left	72	8	8	4								
Volume Right	13	4	12	75								
cSH	775	744	1509	1595								
Volume to Capacity	0.23	0.12	0.01	0.00								
Queue Length 95th (m)	6.8	3.2	0.1	0.1								
Control Delay (s)	11.0	10.5	2.0	0.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.0	10.5	2.0	0.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay				7.6								
Intersection Capacity Utilization				25.6%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

30: Nelson Ave / Hwy 3A & Behnsen St.

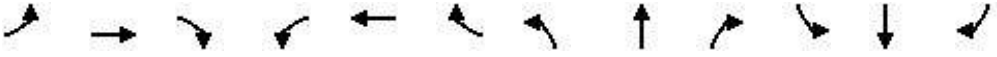
02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	4	10	28	3	19	5	807	70	15	520	23
Future Volume (Veh/h)	35	4	10	28	3	19	5	807	70	15	520	23
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Hourly flow rate (vph)	43	4	13	34	4	21	8	877	85	17	598	40
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												102
pX, platoon unblocked	0.91	0.91	0.91	0.91	0.91		0.91					
vC, conflicting volume	1548	1610	598	1540	1565	877	638	962				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1553	1621	505	1544	1572	877	549	962				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	43	96	97	57	96	94	99	98				
cM capacity (veh/h)	75	91	518	79	98	351	934	724				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	60	59	8	877	85	17	598	40				
Volume Left	43	34	8	0	0	17	0	0				
Volume Right	13	21	0	0	85	0	0	40				
cSH	94	111	934	1700	1700	724	1700	1700				
Volume to Capacity	0.64	0.53	0.01	0.52	0.05	0.02	0.35	0.02				
Queue Length 95th (m)	23.5	18.8	0.2	0.0	0.0	0.5	0.0	0.0				
Control Delay (s)	95.6	69.5	8.9	0.0	0.0	10.1	0.0	0.0				
Lane LOS	F	F	A	B								
Approach Delay (s)	95.6	69.5	0.1	0.3								
Approach LOS	F	F										
Intersection Summary												
Average Delay	5.8											
Intersection Capacity Utilization	52.9%			ICU Level of Service					A			
Analysis Period (min)	15											

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	807	70	15	520	23
Future Volume (vph)	0	0	0	0	0	0	5	807	70	15	520	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1863	1615	1805	1863	1615
Flt Permitted							0.424			0.288		
Satd. Flow (perm)	0	0	0	0	0	0	805	1863	1615	547	1863	1574
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									64			40
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			20				3					3
Confl. Bikes (#/hr)			3				4					4
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	877	85	17	598	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	877	85	17	598	40
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	97		97	24		97	97		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Perm
Protected Phases								2			2	
Permitted Phases							2		2	2		2

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (%)							68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
Maximum Green (s)							46.0	46.0	46.0	46.0	46.0	46.0
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode							Max	Max	Max	Max	Max	Max
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)							0	0	0	0	0	0
Act Effct Green (s)							66.5	66.5	66.5	66.5	66.5	66.5
Actuated g/C Ratio							0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio							0.01	0.54	0.06	0.04	0.37	0.03
Control Delay							4.4	6.8	1.9	4.5	4.8	1.8
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.4	6.8	1.9	4.5	4.8	1.8
LOS							A	A	A	A	A	A
Approach Delay								6.4			4.6	
Approach LOS								A			A	
90th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
70th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
Stops (vph)							2	266	7	4	128	2
Fuel Used(l)							0	18	1	1	17	1
CO Emissions (g/hr)							2	335	18	9	321	12
NOx Emissions (g/hr)							0	65	3	2	62	2
VOC Emissions (g/hr)							0	77	4	2	74	3
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							1.2	126.2	4.5	3.0	62.3	1.1
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							699	1617	1410	475	1617	1372
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.54	0.06	0.04	0.37	0.03

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 76

Actuated Cycle Length: 76.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 5.7

Intersection LOS: A

Intersection Capacity Utilization 47.5%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 91

70th %ile Actuated Cycle: 91

50th %ile Actuated Cycle: 67

30th %ile Actuated Cycle: 67

10th %ile Actuated Cycle: 67

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	32%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Traffic Volume (veh/h)	3	0	39	55	0	41	30	328	86	45	625	11									
Future Volume (Veh/h)	3	0	39	55	0	41	30	328	86	45	625	11									
Sign Control	Stop			Stop			Free			Free											
Grade	0%			0%			0%			0%											
Peak Hour Factor	0.38	0.25	0.75	0.93	0.25	0.56	0.48	0.77	0.85	0.88	0.79	0.38									
Hourly flow rate (vph)	8	0	52	59	0	73	62	426	101	51	791	29									
Pedestrians	5						5														
Lane Width (m)	3.6						3.6														
Walking Speed (m/s)	1.1						1.1														
Percent Blockage	0						0														
Right turn flare (veh)																					
Median type							None			None											
Median storage (veh)																					
Upstream signal (m)																					
pX, platoon unblocked																					
vC, conflicting volume	1536	1462	816	1500	1477	426	825				426										
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	1536	1462	816	1500	1477	426	825				426										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.3										
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.4										
p0 queue free %	89	100	86	25	100	88	92				95										
cM capacity (veh/h)	76	112	371	78	110	622	810				1034										
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2														
Volume Total	60	132	62	426	101	51	820														
Volume Left	8	59	62	0	0	51	0														
Volume Right	52	73	0	0	101	0	29														
cSH	244	152	810	1700	1700	1034	1700														
Volume to Capacity	0.25	0.87	0.08	0.25	0.06	0.05	0.48														
Queue Length 95th (m)	7.1	44.9	1.9	0.0	0.0	1.2	0.0														
Control Delay (s)	24.4	100.0	9.8	0.0	0.0	8.7	0.0														
Lane LOS	C	F	A				A														
Approach Delay (s)	24.4	100.0	1.0				0.5														
Approach LOS	C	F																			
Intersection Summary																					
Average Delay				9.5																	
Intersection Capacity Utilization				56.3%	ICU Level of Service				B												
Analysis Period (min)				15																	

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	3	14	83	2	24	10	417	83	37	690	1
Future Volume (Veh/h)	0	3	14	83	2	24	10	417	83	37	690	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.75	0.75	0.25	0.67	0.50	0.90	0.85	0.82	0.80	0.25
Hourly flow rate (vph)	0	12	19	111	8	36	20	463	98	45	862	4
Pedestrians		1			3			1				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								379				
pX, platoon unblocked												
vC, conflicting volume	1496	1557	864	1484	1463	466	867			564		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1496	1557	864	1484	1463	466	867			564		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	89	95	0	93	94	97			95		
cM capacity (veh/h)	85	105	356	83	120	599	785			990		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	31	155	20	463	98	45	862	4				
Volume Left	0	111	20	0	0	45	0	0				
Volume Right	19	36	0	0	98	0	0	4				
cSH	185	106	785	1700	1700	990	1700	1700				
Volume to Capacity	0.17	1.46	0.03	0.27	0.06	0.05	0.51	0.00				
Queue Length 95th (m)	4.4	85.8	0.6	0.0	0.0	1.1	0.0	0.0				
Control Delay (s)	28.3	326.3	9.7	0.0	0.0	8.8	0.0	0.0				
Lane LOS	D	F	A			A						
Approach Delay (s)	28.3	326.3	0.3			0.4						
Approach LOS	D	F										
Intersection Summary												
Average Delay			31.0									
Intersection Capacity Utilization			55.8%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: 3rd St. & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	104	3	12	99	1	3	9	8	4	19	7
Future Volume (Veh/h)	3	104	3	12	99	1	3	9	8	4	19	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.90	0.38	0.42	0.78	0.25	0.38	0.58	0.75	0.25	0.57	0.50
Hourly flow rate (vph)	6	116	8	29	127	4	8	16	11	16	33	14
Pedestrians		13			11							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.1			1.1							
Percent Blockage		1			1							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	190	139	53	186	140	32	60			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190	139	53	186	140	32	60			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	84	99	96	82	100	99			99		
cM capacity (veh/h)	641	721	1008	652	719	1031	1538			1557		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	130	160	35	63								
Volume Left	6	29	8	16								
Volume Right	8	4	11	14								
cSH	729	711	1538	1557								
Volume to Capacity	0.18	0.22	0.01	0.01								
Queue Length 95th (m)	4.9	6.5	0.1	0.2								
Control Delay (s)	11.0	11.5	1.7	1.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.0	11.5	1.7	1.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay		8.9										
Intersection Capacity Utilization		24.6%	ICU Level of Service	A								
Analysis Period (min)		15										

4: 5th Street & Davies St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.1
Total Del/Veh (s)	0.0	0.3	0.1	4.7	5.2	2.7	4.9	6.1	4.5	6.4	2.9	3.9

Intersection: 4: 5th Street & Davies St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	26.9	15.8	23.1
Average Queue (m)	12.4	9.3	10.4
95th Queue (m)	19.4	13.1	18.6
Link Distance (m)		111.0	107.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

5: 5th Street & Cottonwood St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	0.1	0.5	0.4	6.4	5.3	3.3	6.6	5.7	3.6	7.5	5.6	4.6

Intersection: 5: 5th Street & Cottonwood St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.2	22.0	22.8	33.5
Average Queue (m)	0.5	11.0	12.6	13.9
95th Queue (m)	3.9	16.7	18.9	22.7
Link Distance (m)	139.3	319.5	51.9	111.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Unsignalized Intersection Capacity Analysis

6: 5th Street & Gordon St.

02-28-2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	38	6	6	76	11	10
Future Volume (Veh/h)	38	6	6	76	11	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.67	0.62	0.62	0.90	0.38	0.67
Hourly flow rate (vph)	57	10	10	84	29	15
Pedestrians				5	3	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			70		169	70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			70		169	70
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		96	98
cM capacity (veh/h)			1539		818	991
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	67	94	44			
Volume Left	0	10	29			
Volume Right	10	0	15			
cSH	1700	1539	870			
Volume to Capacity	0.04	0.01	0.05			
Queue Length 95th (m)	0.0	0.1	1.2			
Control Delay (s)	0.0	0.8	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.8	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			20.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 7: 7th St. & Gordon St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	17	3	6	49	5	6	52	3	0	41	25
Future Volume (Veh/h)	17	17	3	6	49	5	6	52	3	0	41	25
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.58	0.70	0.38	0.33	0.91	0.75	0.62	1.00	0.75	0.25	0.50	0.50
Hourly flow rate (vph)	29	24	8	18	54	7	10	52	4	0	82	50
Pedestrians	1			1			1			10		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	71			33			272	194	30	220	194	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	71			33			272	194	30	220	194	68
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.2	3.3
p0 queue free %	98			99			98	92	100	100	87	95
cM capacity (veh/h)	1528			1591			567	677	1048	662	635	990
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	61	79	66	132								
Volume Left	29	18	10	0								
Volume Right	8	7	4	50								
cSH	1528	1591	671	735								
Volume to Capacity	0.02	0.01	0.10	0.18								
Queue Length 95th (m)	0.4	0.3	2.5	4.9								
Control Delay (s)	3.6	1.7	10.9	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.6	1.7	10.9	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay				7.5								
Intersection Capacity Utilization				21.2%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 8: 10th St. & Fell St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	24	0	25	26	6	2	12	64	8	7	1
Future Volume (Veh/h)	0	24	0	25	26	6	2	12	64	8	7	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.38	0.25	0.50	0.42	0.67	0.25	0.38	0.25
Hourly flow rate (vph)	0	96	0	100	68	24	4	29	96	32	18	4
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.1						1.1	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	228	220	20	220	174	81	22			128		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228	220	20	220	174	81	22			128		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.6			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.7			2.2		
p0 queue free %	100	85	100	84	90	98	100			98		
cM capacity (veh/h)	643	660	1058	642	703	975	1332			1466		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	96	192	129	54								
Volume Left	0	100	4	32								
Volume Right	0	24	96	4								
cSH	660	693	1332	1466								
Volume to Capacity	0.15	0.28	0.00	0.02								
Queue Length 95th (m)	3.9	8.6	0.1	0.5								
Control Delay (s)	11.4	12.2	0.3	4.5								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.4	12.2	0.3	4.5								
Approach LOS	B	B										
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			22.3%		ICU Level of Service				A			
Analysis Period (min)			15									

9: Elwyn St. & 8th St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	0.1	0.2	0.3	6.7	4.7	4.6	2.5	5.1	2.7	2.3

Intersection: 9: Elwyn St. & 8th St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	15.0	16.4	16.4
Average Queue (m)	6.7	5.8	7.4
95th Queue (m)	14.5	15.4	14.8
Link Distance (m)	70.4		247.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis11: 3rd St. & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	41	33	12	45	6	0	0	2	12	21	17
Future Volume (Veh/h)	15	41	33	12	45	6	0	0	2	12	21	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.65	0.82	0.54	0.50	0.64	0.33	0.25	0.25	0.50	0.62	0.44	0.70
Hourly flow rate (vph)	23	50	61	24	70	18	0	0	4	19	48	24
Pedestrians		134			6			56			24	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		12			1			5			2	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	311	242	250	248	252	32	206			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311	242	250	248	252	32	206			10		
tC, single (s)	7.5	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.9	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	91	91	95	88	98	100			99		
cM capacity (veh/h)	394	572	653	508	565	1019	1199			1614		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	112	4	91								
Volume Left	23	24	0	19								
Volume Right	61	18	4	24								
cSH	560	593	1199	1614								
Volume to Capacity	0.24	0.19	0.00	0.01								
Queue Length 95th (m)	7.0	5.2	0.0	0.3								
Control Delay (s)	13.4	12.5	0.0	1.6								
Lane LOS	B	B		A								
Approach Delay (s)	13.4	12.5	0.0	1.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay			9.8									
Intersection Capacity Utilization			32.5%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 12: Elwyn St. & 10th St.

02-28-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	89	32	21	0	3	44
Future Volume (Veh/h)	89	32	21	0	3	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.61	0.75	0.25	0.50	0.79
Hourly flow rate (vph)	116	52	28	0	6	56
Pedestrians		5			4	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	32				316	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	32				316	37
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	93				99	95
cM capacity (veh/h)	1587				544	1033
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	168	28	62			
Volume Left	116	0	6			
Volume Right	0	0	56			
cSH	1587	1700	950			
Volume to Capacity	0.07	0.02	0.07			
Queue Length 95th (m)	1.8	0.0	1.6			
Control Delay (s)	5.3	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	5.3	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			24.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: 5th Street & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	91	9	23	69	3	15	22	34	15	31	0
Future Volume (Veh/h)	1	91	9	23	69	3	15	22	34	15	31	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.86	0.88	0.90	0.79	0.25	0.81	0.59	0.43	0.25	0.72	0.25
Hourly flow rate (vph)	4	106	10	26	87	12	19	37	79	60	43	0
Pedestrians	3			4			2			3		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	102			118			290	275	117	368	274	99
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102			118			290	275	117	368	274	99
tC, single (s)	4.1			4.2			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.1	3.3	3.5	4.0	3.3
p0 queue free %	100			98			97	94	92	88	93	100
cM capacity (veh/h)	1499			1443			616	602	935	503	621	952
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	125	135	103								
Volume Left	4	26	19	60								
Volume Right	10	12	79	0								
cSH	1499	1443	764	546								
Volume to Capacity	0.00	0.02	0.18	0.19								
Queue Length 95th (m)	0.1	0.4	4.9	5.2								
Control Delay (s)	0.3	1.7	10.7	13.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	1.7	10.7	13.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay				6.3								
Intersection Capacity Utilization				24.6%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

14: 3rd St. & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	63	3	9	55	0	2	5	6	1	22	23
Future Volume (Veh/h)	45	63	3	9	55	0	2	5	6	1	22	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.55	0.38	0.58	0.91	0.25	0.50	0.50	0.62	0.25	0.75	0.65
Hourly flow rate (vph)	66	115	8	16	60	0	4	10	10	4	29	35
Pedestrians		3			10			1				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	110	96	50	154	108	25	67			30		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	96	50	154	108	25	67			30		
tC, single (s)	7.1	6.5	6.5	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.6	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	92	85	99	98	92	100	100			100		
cM capacity (veh/h)	798	777	931	702	760	1042	1543			1581		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	189	76	24	68								
Volume Left	66	16	4	4								
Volume Right	8	0	10	35								
cSH	790	747	1543	1581								
Volume to Capacity	0.24	0.10	0.00	0.00								
Queue Length 95th (m)	7.1	2.6	0.1	0.1								
Control Delay (s)	11.0	10.4	1.2	0.4								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.0	10.4	1.2	0.4								
Approach LOS	B	B										
Intersection Summary												
Average Delay		8.2										
Intersection Capacity Utilization		25.5%	ICU Level of Service	A								
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

30: Nelson Ave / Hwy 3A & Behnsen St.

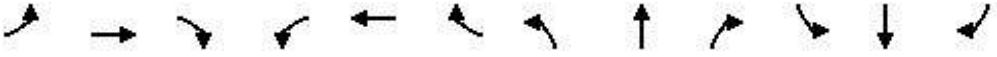
02-28-2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	12	9	6	42	7	14	3	528	42	40	698	22								
Future Volume (Veh/h)	12	9	6	42	7	14	3	528	42	40	698	22								
Sign Control	Stop			Stop			Free			Free										
Grade	0%			0%			0%			0%										
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67								
Hourly flow rate (vph)	19	26	10	72	14	19	8	574	70	80	751	33								
Pedestrians																				
Lane Width (m)																				
Walking Speed (m/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type							None			None										
Median storage (veh)																				
Upstream signal (m)												102								
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85													
vC, conflicting volume	1527	1571	751	1524	1534	574	784	644												
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	1532	1584	618	1528	1540	574	657	644												
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1	4.2												
tC, 2 stage (s)																				
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2	2.3												
p0 queue free %	69	69	98	0	84	96	99	91												
cM capacity (veh/h)	61	84	419	57	89	522	799	882												
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3												
Volume Total	55	105	8	574	70	80	751	33												
Volume Left	19	72	8	0	0	80	0	0												
Volume Right	10	19	0	0	70	0	0	33												
cSH	85	72	799	1700	1700	882	1700	1700												
Volume to Capacity	0.65	1.46	0.01	0.34	0.04	0.09	0.44	0.02												
Queue Length 95th (m)	23.0	66.0	0.2	0.0	0.0	2.3	0.0	0.0												
Control Delay (s)	104.1	369.0	9.6	0.0	0.0	9.5	0.0	0.0												
Lane LOS	F	F	A				A													
Approach Delay (s)	104.1	369.0	0.1				0.9													
Approach LOS	F	F																		
Intersection Summary																				
Average Delay	27.0																			
Intersection Capacity Utilization	48.8%			ICU Level of Service					A											
Analysis Period (min)	15																			

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	3	528	42	40	698	22
Future Volume (vph)	0	0	0	0	0	0	3	528	42	40	698	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1776	1553	1570	1863	1615
Flt Permitted							0.344			0.437		
Satd. Flow (perm)	0	0	0	0	0	0	652	1776	1553	722	1863	1573
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									70			94
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			30				9					9
Confl. Bikes (#/hr)	1		1				4					4
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	4%	15%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	574	70	80	751	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	574	70	80	751	33
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Free
Protected Phases								2			2	
Permitted Phases							2		2	2		Free

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (%)							65.7%	65.7%	65.7%	65.7%	65.7%	
Maximum Green (s)							40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	
Recall Mode							Ped	Ped	Ped	Ped	Ped	
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	
Pedestrian Calls (#/hr)							0	0	0	0	0	
Act Effct Green (s)							60.6	60.6	60.6	60.6	60.6	70.6
Actuated g/C Ratio							0.86	0.86	0.86	0.86	0.86	1.00
v/c Ratio							0.01	0.38	0.05	0.13	0.47	0.02
Control Delay							4.7	5.2	1.6	4.9	6.2	0.0
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.7	5.2	1.6	4.9	6.2	0.0
LOS							A	A	A	A	A	A
Approach Delay								4.8			5.8	
Approach LOS								A			A	
90th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
70th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
50th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
30th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
10th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
Stops (vph)							1	141	4	11	215	0
Fuel Used(l)							0	10	1	1	25	1
CO Emissions (g/hr)							1	194	10	25	463	10
NOx Emissions (g/hr)							0	37	2	5	89	2
VOC Emissions (g/hr)							0	45	2	6	107	2
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							0.7	65.4	1.3	5.1	96.4	0.0
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							560	1525	1343	620	1600	1573
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.38	0.05	0.13	0.47	0.02

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 5.4

Intersection LOS: A

Intersection Capacity Utilization 41.7%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 85

70th %ile Actuated Cycle: 85

50th %ile Actuated Cycle: 61

30th %ile Actuated Cycle: 61

10th %ile Actuated Cycle: 61

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	34%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	9	1	44	68	1	71	38	534	129	80	457	19								
Future Volume (Veh/h)	9	1	44	68	1	71	38	534	129	80	457	19								
Sign Control	Stop			Stop			Free			Free										
Grade	0%			0%			0%			0%										
Peak Hour Factor	0.58	0.25	0.84	0.77	0.25	0.81	0.73	0.92	0.80	0.72	0.77	0.80								
Hourly flow rate (vph)	16	4	52	88	4	88	52	580	161	111	594	24								
Pedestrians	8			2			19			1										
Lane Width (m)	3.6			3.6			3.6			3.6										
Walking Speed (m/s)	1.1			1.1			1.1			1.1										
Percent Blockage	1			0			2			0										
Right turn flare (veh)																				
Median type							None			None										
Median storage (veh)																				
Upstream signal (m)																				
pX, platoon unblocked																				
vC, conflicting volume	1611	1522	633	1575	1534	583	626				582									
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	1611	1522	633	1575	1534	583	626				582									
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1									
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2									
p0 queue free %	73	96	89	0	96	83	95				89									
cM capacity (veh/h)	59	99	472	66	98	509	958				976									
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2													
Volume Total	72	180	52	580	161	111	618													
Volume Left	16	88	52	0	0	111	0													
Volume Right	52	88	0	0	161	0	24													
cSH	170	117	958	1700	1700	976	1700													
Volume to Capacity	0.42	1.54	0.05	0.34	0.09	0.11	0.36													
Queue Length 95th (m)	14.5	99.3	1.3	0.0	0.0	2.9	0.0													
Control Delay (s)	40.8	348.2	9.0	0.0	0.0	9.2	0.0													
Lane LOS	E	F	A				A													
Approach Delay (s)	40.8	348.2	0.6				1.4													
Approach LOS	E	F																		
Intersection Summary																				
Average Delay				37.8																
Intersection Capacity Utilization				57.4%	ICU Level of Service				B											
Analysis Period (min)				15																

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	3	22	85	1	23	4	660	135	43	538	1
Future Volume (Veh/h)	6	3	22	85	1	23	4	660	135	43	538	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.42	0.50	0.68	0.83	0.25	0.55	0.33	0.92	0.87	0.72	0.81	0.25
Hourly flow rate (vph)	14	6	32	102	4	42	12	717	155	60	664	4
Pedestrians	1			8			3					
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0			1			0					
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)	379											
pX, platoon unblocked												
vC, conflicting volume	1570	1689	668	1571	1538	725	669				880	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1570	1689	668	1571	1538	725	669				880	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	81	93	93	0	96	90	99				92	
cM capacity (veh/h)	73	85	460	73	105	425	930				750	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	52	148	12	717	155	60	664	4				
Volume Left	14	102	12	0	0	60	0	0				
Volume Right	32	42	0	0	155	0	0	4				
cSH	157	96	930	1700	1700	750	1700	1700				
Volume to Capacity	0.33	1.53	0.01	0.42	0.09	0.08	0.39	0.00				
Queue Length 95th (m)	10.2	86.2	0.3	0.0	0.0	2.0	0.0	0.0				
Control Delay (s)	38.9	363.1	8.9	0.0	0.0	10.2	0.0	0.0				
Lane LOS	E	F	A					B				
Approach Delay (s)	38.9	363.1	0.1	0.8								
Approach LOS	E	F										
Intersection Summary												
Average Delay	31.2											
Intersection Capacity Utilization	55.2%			ICU Level of Service					B			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

3: 3rd St. & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	122	6	18	115	2	7	7	8	3	10	3
Future Volume (Veh/h)	10	122	6	18	115	2	7	7	8	3	10	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.58	0.68	0.42	0.35	0.91	0.25	0.38	0.75	0.50	0.50	0.40	0.38
Hourly flow rate (vph)	17	179	14	51	126	8	18	9	16	6	25	8
Pedestrians		4			3			6			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	173	109	39	206	105	24	37			28		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	173	109	39	206	105	24	37			28		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	77	99	91	84	99	99			100		
cM capacity (veh/h)	674	768	1029	597	772	1046	1581			1594		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	210	185	43	39								
Volume Left	17	51	18	6								
Volume Right	14	8	16	8								
cSH	772	722	1581	1594								
Volume to Capacity	0.27	0.26	0.01	0.00								
Queue Length 95th (m)	8.4	7.7	0.3	0.1								
Control Delay (s)	11.4	11.7	3.1	1.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.4	11.7	3.1	1.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			9.9									
Intersection Capacity Utilization			22.9%		ICU Level of Service				A			
Analysis Period (min)			15									

4: 5th Street & Davies St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1
Total Del/Veh (s)	0.0	0.2	0.1	4.7	5.3	5.7	6.4	4.1	5.4	4.2	4.5

Intersection: 4: 5th Street & Davies St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	23.9	22.2	16.9
Average Queue (m)	10.8	10.5	8.2
95th Queue (m)	16.6	16.9	14.0
Link Distance (m)		111.0	107.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

5: 5th Street & Cottonwood St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.0	0.0	0.2
Total Del/Veh (s)	0.0	0.3	0.3	5.0	5.5	3.4	5.6	6.8	4.5	7.1	4.2	4.9

Intersection: 5: 5th Street & Cottonwood St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.2	16.6	42.7	30.3
Average Queue (m)	0.3	10.6	15.7	13.1
95th Queue (m)	3.0	15.1	26.8	23.5
Link Distance (m)	139.3	319.5	51.9	111.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Unsignalized Intersection Capacity Analysis

6: 5th Street & Gordon St.

02-28-2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	78	15	11	114	13	18
Future Volume (Veh/h)	78	15	11	114	13	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.65	0.38	0.80	0.55	0.47
Hourly flow rate (vph)	90	23	29	142	24	38
Pedestrians	2			1	5	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			118		308	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			118		308	108
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	96
cM capacity (veh/h)			1476		670	947
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	113	171	62			
Volume Left	0	29	24			
Volume Right	23	0	38			
cSH	1700	1476	816			
Volume to Capacity	0.07	0.02	0.08			
Queue Length 95th (m)	0.0	0.5	1.9			
Control Delay (s)	0.0	1.4	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.4	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			23.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: 7th St. & Gordon St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	51	3	11	58	12	4	95	3	3	64	55
Future Volume (Veh/h)	21	51	3	11	58	12	4	95	3	3	64	55
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.64	0.83	0.38	0.25	0.73	0.38	0.33	0.75	0.38	0.38	0.25	0.88
Hourly flow rate (vph)	33	61	8	44	79	32	12	127	8	8	256	62
Pedestrians	1						4			3		
Lane Width (m)	3.6						3.6			3.6		
Walking Speed (m/s)	1.1						1.1			1.1		
Percent Blockage	0						0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114			73			509	337	69	388	325	99
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			73			509	337	69	388	325	99
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			96	77	99	98	55	93
cM capacity (veh/h)	1484			1534			275	554	996	448	563	945
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	102	155	147	326								
Volume Left	33	44	12	8								
Volume Right	8	32	8	62								
cSH	1484	1534	523	606								
Volume to Capacity	0.02	0.03	0.28	0.54								
Queue Length 95th (m)	0.5	0.7	8.7	24.4								
Control Delay (s)	2.5	2.3	14.5	17.7								
Lane LOS	A	A	B	C								
Approach Delay (s)	2.5	2.3	14.5	17.7								
Approach LOS			B	C								
Intersection Summary												
Average Delay				11.7								
Intersection Capacity Utilization				22.9%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis 8: 10th St. & Fell St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	26	0	47	55	30	4	12	48	11	4	3
Future Volume (Veh/h)	7	26	0	47	55	30	4	12	48	11	4	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.25	0.25	0.75	0.44	0.75	0.50	0.50	0.69	0.50	0.50	0.38
Hourly flow rate (vph)	14	104	0	63	125	40	8	24	70	22	8	8
Pedestrians					1			5			5	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	238	167	17	189	136	65	16			95		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238	167	17	189	136	65	16			95		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.4			2.2		
p0 queue free %	98	85	100	91	83	96	99			99		
cM capacity (veh/h)	590	714	1057	675	743	999	1464			1510		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	118	228	102	38								
Volume Left	14	63	8	22								
Volume Right	0	40	70	8								
cSH	697	756	1464	1510								
Volume to Capacity	0.17	0.30	0.01	0.01								
Queue Length 95th (m)	4.6	9.7	0.1	0.3								
Control Delay (s)	11.2	11.8	0.6	4.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.2	11.8	0.6	4.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay			8.7									
Intersection Capacity Utilization			24.2%	ICU Level of Service						A		
Analysis Period (min)			15									

9: Elwyn St. & 8th St. Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	0.3	0.4	1.1	3.7	5.0	4.7	5.9	3.2	2.5

Intersection: 9: Elwyn St. & 8th St.

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	15.8	16.3	20.4
Average Queue (m)	9.2	4.8	11.0
95th Queue (m)	12.1	14.5	18.1
Link Distance (m)	70.4		247.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

11: 3rd St. & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	76	15	6	69	1	0	1	1	4	4	9
Future Volume (Veh/h)	7	76	15	6	69	1	0	1	1	4	4	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.79	0.65	0.42	0.85	0.25	0.25	0.25	0.25	0.50	0.50	0.58
Hourly flow rate (vph)	14	96	23	14	81	4	0	4	4	8	8	16
Pedestrians		14			5			8			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		1			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	98	59	38	122	65	13	38			13		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98	59	38	122	65	13	38			13		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	88	98	98	90	100	100			100		
cM capacity (veh/h)	792	817	1019	741	806	1066	1552			1611		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	133	99	8	32								
Volume Left	14	14	0	8								
Volume Right	23	4	4	16								
cSH	843	804	1552	1611								
Volume to Capacity	0.16	0.12	0.00	0.00								
Queue Length 95th (m)	4.2	3.2	0.0	0.1								
Control Delay (s)	10.1	10.1	0.0	1.8								
Lane LOS	B	B		A								
Approach Delay (s)	10.1	10.1	0.0	1.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay			8.8									
Intersection Capacity Utilization			23.3%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

12: Elwyn St. & 10th St.

02-28-2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	18	28	2	3	62
Future Volume (Veh/h)	79	18	28	2	3	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.62	0.54	0.72	0.50	0.25	0.60
Hourly flow rate (vph)	127	33	39	4	12	103
Pedestrians		11			11	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.1			1.1	
Percent Blockage		1			1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	54				339	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54				339	63
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	92				98	90
cM capacity (veh/h)	1549				518	987
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	160	43	115			
Volume Left	127	0	12			
Volume Right	0	4	103			
cSH	1549	1700	902			
Volume to Capacity	0.08	0.03	0.13			
Queue Length 95th (m)	2.0	0.0	3.3			
Control Delay (s)	6.1	0.0	9.6			
Lane LOS	A		A			
Approach Delay (s)	6.1	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay		6.5				
Intersection Capacity Utilization		26.3%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

13: 5th Street & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	97	12	38	117	9	15	32	29	8	28	3
Future Volume (Veh/h)	4	97	12	38	117	9	15	32	29	8	28	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.62	0.50	0.60	0.79	0.25	0.65	0.56	0.62	0.25	0.57	0.38
Hourly flow rate (vph)	8	156	24	63	148	36	23	57	47	32	49	8
Pedestrians					3			5			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.1			1.1			1.1	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	187			185			514	502	176	558	496	169
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	187			185			514	502	176	558	496	169
tC, single (s)	4.1			4.1			7.2	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			95			94	87	94	91	89	99
cM capacity (veh/h)	1396			1366			399	441	848	359	443	878
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	188	247	127	89								
Volume Left	8	63	23	32								
Volume Right	24	36	47	8								
cSH	1396	1366	524	426								
Volume to Capacity	0.01	0.05	0.24	0.21								
Queue Length 95th (m)	0.1	1.1	7.2	5.9								
Control Delay (s)	0.4	2.3	14.1	15.7								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.4	2.3	14.1	15.7								
Approach LOS			B	C								
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization			28.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 14: 3rd St. & Kokanee Ave.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	117	11	6	68	1	6	7	6	1	12	50
Future Volume (Veh/h)	77	117	11	6	68	1	6	7	6	1	12	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.66	0.75	0.62	0.41	0.25	0.62	0.62	0.42	0.25	0.56	0.61
Hourly flow rate (vph)	99	177	15	10	166	4	10	11	14	4	21	82
Pedestrians		1			4			10			2	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	198	120	73	226	154	24	104			29		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198	120	73	226	154	24	104			29		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	77	98	98	77	100	99			100		
cM capacity (veh/h)	620	760	985	580	724	1053	1499			1591		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	291	180	35	107								
Volume Left	99	10	10	4								
Volume Right	15	4	14	82								
cSH	713	719	1499	1591								
Volume to Capacity	0.41	0.25	0.01	0.00								
Queue Length 95th (m)	15.1	7.5	0.2	0.1								
Control Delay (s)	13.5	11.7	2.2	0.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	13.5	11.7	2.2	0.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay			10.0									
Intersection Capacity Utilization			30.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

30: Nelson Ave / Hwy 3A & Behnsen St.

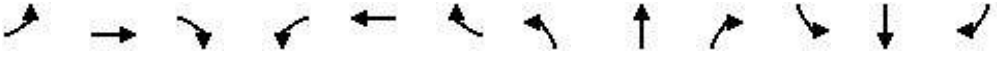
02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	4	11	57	3	21	6	962	86	17	611	30
Future Volume (Veh/h)	39	4	11	57	3	21	6	962	86	17	611	30
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Hourly flow rate (vph)	48	4	15	70	4	23	10	1046	105	19	702	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												102
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1831	1911	702	1823	1858	1046	754			1151		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1880	1971	585	1870	1911	1046	644			1151		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	92	97	0	93	92	99			97		
cM capacity (veh/h)	40	53	449	43	58	280	829			614		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	67	97	10	1046	105	19	702	52				
Volume Left	48	70	10	0	0	19	0	0				
Volume Right	15	23	0	0	105	0	0	52				
cSH	52	54	829	1700	1700	614	1700	1700				
Volume to Capacity	1.30	1.78	0.01	0.62	0.06	0.03	0.41	0.03				
Queue Length 95th (m)	46.1	70.4	0.3	0.0	0.0	0.7	0.0	0.0				
Control Delay (s)	355.2	537.8	9.4	0.0	0.0	11.0	0.0	0.0				
Lane LOS	F	F	A			B						
Approach Delay (s)	355.2	537.8	0.1			0.3						
Approach LOS												
F F												
Intersection Summary												
Average Delay			36.4									
Intersection Capacity Utilization			62.5%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	6	962	86	17	611	30
Future Volume (vph)	0	0	0	0	0	0	6	962	86	17	611	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1863	1615	1805	1863	1615
Flt Permitted							0.371			0.213		
Satd. Flow (perm)	0	0	0	0	0	0	704	1863	1615	405	1863	1574
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									66			52
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			20				3					3
Confl. Bikes (#/hr)			3				4					4
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	10	1046	105	19	702	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	10	1046	105	19	702	52
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	97		97	24		97	97		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Perm
Protected Phases								2			2	
Permitted Phases							2		2	2		2

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (%)							68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
Maximum Green (s)							46.0	46.0	46.0	46.0	46.0	46.0
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode							Max	Max	Max	Max	Max	Max
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)							0	0	0	0	0	0
Act Effct Green (s)							66.5	66.5	66.5	66.5	66.5	66.5
Actuated g/C Ratio							0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio							0.02	0.65	0.07	0.05	0.43	0.04
Control Delay							4.5	9.2	2.1	4.8	5.4	1.6
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.5	9.2	2.1	4.8	5.4	1.6
LOS							A	A	A	A	A	A
Approach Delay								8.5			5.1	
Approach LOS								A			A	
90th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
70th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
Stops (vph)							2	373	11	5	164	3
Fuel Used(l)							0	25	1	1	21	1
CO Emissions (g/hr)							2	456	23	11	389	15
NOx Emissions (g/hr)							0	88	4	2	75	3
VOC Emissions (g/hr)							1	105	5	3	90	4
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							1.4	189.6	5.8	3.3	79.1	1.1
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							611	1617	1411	351	1617	1373
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.02	0.65	0.07	0.05	0.43	0.04

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 76

Actuated Cycle Length: 76.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 7.2

Intersection LOS: A

Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 91

70th %ile Actuated Cycle: 91

50th %ile Actuated Cycle: 67

30th %ile Actuated Cycle: 67

10th %ile Actuated Cycle: 67

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lanes, Volumes, Timings
10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	32%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Traffic Volume (veh/h)	3	0	39	55	0	41	30	328	86	45	625	11									
Future Volume (Veh/h)	3	0	39	55	0	41	30	328	86	45	625	11									
Sign Control	Stop			Stop			Free			Free											
Grade	0%			0%			0%			0%											
Peak Hour Factor	0.38	0.25	0.75	0.93	0.25	0.56	0.48	0.77	0.85	0.88	0.79	0.38									
Hourly flow rate (vph)	8	0	52	59	0	73	62	426	101	51	791	29									
Pedestrians	5						5														
Lane Width (m)	3.6						3.6														
Walking Speed (m/s)	1.1						1.1														
Percent Blockage	0						0														
Right turn flare (veh)																					
Median type							None			None											
Median storage (veh)																					
Upstream signal (m)																					
pX, platoon unblocked																					
vC, conflicting volume	1536	1462	816	1500	1477	426	825				426										
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	1536	1462	816	1500	1477	426	825				426										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.3										
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.4										
p0 queue free %	89	100	86	25	100	88	92				95										
cM capacity (veh/h)	76	112	371	78	110	622	810				1034										
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2												
Volume Total	8	52	59	73	62	426	101	51	820												
Volume Left	8	0	59	0	62	0	0	51	0												
Volume Right	0	52	0	73	0	0	101	0	29												
cSH	76	371	78	622	810	1700	1700	1034	1700												
Volume to Capacity	0.11	0.14	0.75	0.12	0.08	0.25	0.06	0.05	0.48												
Queue Length 95th (m)	2.6	3.7	27.7	3.0	1.9	0.0	0.0	1.2	0.0												
Control Delay (s)	57.8	16.3	131.7	11.6	9.8	0.0	0.0	8.7	0.0												
Lane LOS	F	C	F	B	A				A												
Approach Delay (s)	21.8	65.2		1.0			0.5														
Approach LOS	C	F																			
Intersection Summary																					
Average Delay	6.6																				
Intersection Capacity Utilization	53.8%			ICU Level of Service					A												
Analysis Period (min)	15																				

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	3	14	83	2	24	10	417	83	37	690	1
Future Volume (Veh/h)	0	3	14	83	2	24	10	417	83	37	690	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.75	0.75	0.25	0.67	0.50	0.90	0.85	0.82	0.80	0.25
Hourly flow rate (vph)	0	12	19	111	8	36	20	463	98	45	862	4
Pedestrians	1			3			1					
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0			0			0					
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)							379					
pX, platoon unblocked												
vC, conflicting volume	1496	1557	864	1484	1463	466	867				564	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1496	1557	864	1484	1463	466	867				564	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	89	95	0	93	94	97				95	
cM capacity (veh/h)	85	105	356	83	120	599	785				990	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	12	19	119	36	20	463	98	45	862	4		
Volume Left	0	0	111	0	20	0	0	45	0	0		
Volume Right	0	19	0	36	0	0	98	0	0	4		
cSH	105	356	85	599	785	1700	1700	990	1700	1700		
Volume to Capacity	0.11	0.05	1.40	0.06	0.03	0.27	0.06	0.05	0.51	0.00		
Queue Length 95th (m)	2.8	1.3	69.6	1.5	0.6	0.0	0.0	1.1	0.0	0.0		
Control Delay (s)	43.5	15.7	326.1	11.4	9.7	0.0	0.0	8.8	0.0	0.0		
Lane LOS	E	C	F	B	A				A			
Approach Delay (s)	26.4			253.0			0.3			0.4		
Approach LOS	D			F								
Intersection Summary												
Average Delay	24.2											
Intersection Capacity Utilization	54.7%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	9	6	42	7	14	3	528	42	40	698	22
Future Volume (Veh/h)	12	9	6	42	7	14	3	528	42	40	698	22
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Hourly flow rate (vph)	19	26	10	72	14	19	8	574	70	80	751	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												102
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85					
vC, conflicting volume	1527	1571	751	1524	1534	574	784	644				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1532	1584	618	1528	1540	574	657	644				
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1	4.2				
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2	2.3				
p0 queue free %	69	69	98	0	84	96	99	91				
cM capacity (veh/h)	61	84	419	57	89	522	799	882				
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	45	10	86	19	8	574	70	80	751	33		
Volume Left	19	0	72	0	8	0	0	80	0	0		
Volume Right	0	10	0	19	0	0	70	0	0	33		
cSH	72	419	60	522	799	1700	1700	882	1700	1700		
Volume to Capacity	0.62	0.02	1.43	0.04	0.01	0.34	0.04	0.09	0.44	0.02		
Queue Length 95th (m)	20.8	0.6	57.1	0.9	0.2	0.0	0.0	2.3	0.0	0.0		
Control Delay (s)	115.2	13.8	378.9	12.2	9.6	0.0	0.0	9.5	0.0	0.0		
Lane LOS	F	B	F	B	A	A						
Approach Delay (s)	96.7		312.6		0.1	0.9						
Approach LOS	F		F									
Intersection Summary												
Average Delay	23.3											
Intersection Capacity Utilization	53.4%			ICU Level of Service					A			
Analysis Period (min)	15											

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	3	528	42	40	698	22
Future Volume (vph)	0	0	0	0	0	0	3	528	42	40	698	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1776	1553	1570	1863	1615
Flt Permitted							0.344			0.437		
Satd. Flow (perm)	0	0	0	0	0	0	652	1776	1553	722	1863	1573
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									70			94
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			30				9					9
Confl. Bikes (#/hr)	1		1				4					4
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	4%	15%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	574	70	80	751	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	574	70	80	751	33
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Free
Protected Phases								2			2	
Permitted Phases							2		2	2		Free

Scenario 1 - (Dedicated right turn and Shared left thru movement for EB and WB) - AM

Synchro 11 Report

Page 1

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (%)							65.7%	65.7%	65.7%	65.7%	65.7%	
Maximum Green (s)							40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	
Recall Mode							Ped	Ped	Ped	Ped	Ped	
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	
Pedestrian Calls (#/hr)							0	0	0	0	0	
Act Effct Green (s)							60.6	60.6	60.6	60.6	60.6	70.6
Actuated g/C Ratio							0.86	0.86	0.86	0.86	0.86	1.00
v/c Ratio							0.01	0.38	0.05	0.13	0.47	0.02
Control Delay							4.7	5.2	1.6	4.9	6.2	0.0
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.7	5.2	1.6	4.9	6.2	0.0
LOS							A	A	A	A	A	A
Approach Delay								4.8			5.8	
Approach LOS								A			A	
90th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
70th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
50th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
30th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
10th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
Stops (vph)							1	141	4	11	215	0
Fuel Used(l)							0	10	1	1	25	1
CO Emissions (g/hr)							1	194	10	25	463	10
NOx Emissions (g/hr)							0	37	2	5	89	2
VOC Emissions (g/hr)							0	45	2	6	107	2
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							0.7	65.4	1.3	5.1	96.4	0.0
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							560	1525	1343	620	1600	1573
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.38	0.05	0.13	0.47	0.02

Scenario 1 - (Dedicated right turn and Shared left thru movement for EB and WB) - AM

Synchro 11 Report

Page 3

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 5.4

Intersection LOS: A

Intersection Capacity Utilization 41.7%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 85

70th %ile Actuated Cycle: 85

50th %ile Actuated Cycle: 61

30th %ile Actuated Cycle: 61

10th %ile Actuated Cycle: 61

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	34%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Lane Configurations																								
Traffic Volume (veh/h)	9	1	44	68	1	71	38	534	129	80	457	19												
Future Volume (Veh/h)	9	1	44	68	1	71	38	534	129	80	457	19												
Sign Control	Stop			Stop			Free			Free														
Grade	0%			0%			0%			0%														
Peak Hour Factor	0.58	0.25	0.84	0.77	0.25	0.81	0.73	0.92	0.80	0.72	0.77	0.80												
Hourly flow rate (vph)	16	4	52	88	4	88	52	580	161	111	594	24												
Pedestrians	8			2			19			1														
Lane Width (m)	3.6			3.6			3.6			3.6														
Walking Speed (m/s)	1.1			1.1			1.1			1.1														
Percent Blockage	1			0			2			0														
Right turn flare (veh)																								
Median type							None			None														
Median storage (veh)																								
Upstream signal (m)																								
pX, platoon unblocked																								
vC, conflicting volume	1611	1522	633	1575	1534	583	626				582													
vC1, stage 1 conf vol																								
vC2, stage 2 conf vol																								
vCu, unblocked vol	1611	1522	633	1575	1534	583	626				582													
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1													
tC, 2 stage (s)																								
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2													
p0 queue free %	73	96	89	0	96	83	95				89													
cM capacity (veh/h)	59	99	472	66	98	509	958				976													
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2															
Volume Total	20	52	92	88	52	580	161	111	618															
Volume Left	16	0	88	0	52	0	0	111	0															
Volume Right	0	52	0	88	0	0	161	0	24															
cSH	64	472	67	509	958	1700	1700	976	1700															
Volume to Capacity	0.31	0.11	1.37	0.17	0.05	0.34	0.09	0.11	0.36															
Queue Length 95th (m)	8.6	2.8	57.9	4.7	1.3	0.0	0.0	2.9	0.0															
Control Delay (s)	85.0	13.6	341.4	13.5	9.0	0.0	0.0	9.2	0.0															
Lane LOS	F	B	F	B	A				A															
Approach Delay (s)	33.4			181.1			0.6			1.4														
Approach LOS	D			F																				
Intersection Summary																								
Average Delay				20.6																				
Intersection Capacity Utilization				53.1%	ICU Level of Service				A															
Analysis Period (min)				15																				

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	6	3	22	85	1	23	4	660	135	43	538	1	
Future Volume (Veh/h)	6	3	22	85	1	23	4	660	135	43	538	1	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.42	0.50	0.68	0.83	0.25	0.55	0.33	0.92	0.87	0.72	0.81	0.25	
Hourly flow rate (vph)	14	6	32	102	4	42	12	717	155	60	664	4	
Pedestrians	1			8			3						
Lane Width (m)	3.6			3.6			3.6						
Walking Speed (m/s)	1.1			1.1			1.1						
Percent Blockage	0			1			0						
Right turn flare (veh)													
Median type							None			None			
Median storage (veh)													
Upstream signal (m)	379												
pX, platoon unblocked													
vC, conflicting volume	1570	1689	668	1571	1538	725	669				880		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1570	1689	668	1571	1538	725	669				880		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1		
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2		
p0 queue free %	81	93	93	0	96	90	99				92		
cM capacity (veh/h)	73	85	460	73	105	425	930				750		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3			
Volume Total	20	32	106	42	12	717	155	60	664	4			
Volume Left	14	0	102	0	12	0	0	60	0	0			
Volume Right	0	32	0	42	0	0	155	0	0	4			
cSH	76	460	74	425	930	1700	1700	750	1700	1700			
Volume to Capacity	0.26	0.07	1.44	0.10	0.01	0.42	0.09	0.08	0.39	0.00			
Queue Length 95th (m)	7.1	1.7	65.6	2.5	0.3	0.0	0.0	2.0	0.0	0.0			
Control Delay (s)	68.0	13.4	354.5	14.4	8.9	0.0	0.0	10.2	0.0	0.0			
Lane LOS	F	B	F	B	A				B				
Approach Delay (s)	34.4			258.0			0.1	0.8					
Approach LOS	D			F									
Intersection Summary													
Average Delay				22.5									
Intersection Capacity Utilization				53.8%	ICU Level of Service					A			
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

30: Nelson Ave / Hwy 3A & Behnsen St.

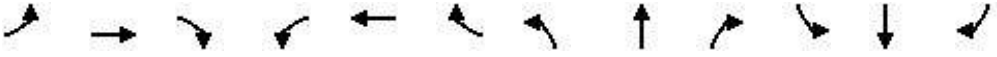
02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	4	11	57	3	21	6	962	86	17	611	30
Future Volume (Veh/h)	39	4	11	57	3	21	6	962	86	17	611	30
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Hourly flow rate (vph)	48	4	15	70	4	23	10	1046	105	19	702	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												102
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1831	1911	702	1823	1858	1046	754	1151				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1879	1971	586	1870	1910	1046	646	1151				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	0	92	97	0	93	92	99	97				
cM capacity (veh/h)	40	53	449	43	58	280	829	614				
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	52	15	74	23	10	1046	105	19	702	52		
Volume Left	48	0	70	0	10	0	0	19	0	0		
Volume Right	0	15	0	23	0	0	105	0	0	52		
cSH	41	449	44	280	829	1700	1700	614	1700	1700		
Volume to Capacity	1.26	0.03	1.70	0.08	0.01	0.62	0.06	0.03	0.41	0.03		
Queue Length 95th (m)	39.1	0.8	57.0	2.0	0.3	0.0	0.0	0.7	0.0	0.0		
Control Delay (s)	382.4	13.3	540.9	19.0	9.4	0.0	0.0	11.0	0.0	0.0		
Lane LOS	F	B	F	C	A	B						
Approach Delay (s)	299.8		417.1		0.1	0.3						
Approach LOS	F		F									
Intersection Summary												
Average Delay	29.0											
Intersection Capacity Utilization	67.3%			ICU Level of Service					C			
Analysis Period (min)	15											

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	6	962	86	17	608	30
Future Volume (vph)	0	0	0	0	0	0	6	962	86	17	608	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1863	1615	1805	1863	1615
Flt Permitted							0.372			0.213		
Satd. Flow (perm)	0	0	0	0	0	0	706	1863	1615	405	1863	1574
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									66			52
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			20				3					3
Confl. Bikes (#/hr)			3				4					4
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	10	1046	105	19	699	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	10	1046	105	19	699	52
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	97		97	24		97	97		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Perm
Protected Phases								2			2	
Permitted Phases							2		2	2		2

Scenario 1 - (Dedicated right turn and Shared left thru movement for EB and WB) - PM

Synchro 11 Report

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (%)							68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
Maximum Green (s)							46.0	46.0	46.0	46.0	46.0	46.0
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode							Max	Max	Max	Max	Max	Max
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)							0	0	0	0	0	0
Act Effct Green (s)							66.5	66.5	66.5	66.5	66.5	66.5
Actuated g/C Ratio							0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio							0.02	0.65	0.07	0.05	0.43	0.04
Control Delay							4.5	9.2	2.1	4.8	5.4	1.6
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.5	9.2	2.1	4.8	5.4	1.6
LOS							A	A	A	A	A	A
Approach Delay								8.5			5.1	
Approach LOS								A			A	
90th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
70th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
Stops (vph)							2	373	11	5	163	3
Fuel Used(l)							0	25	1	1	21	1
CO Emissions (g/hr)							2	456	23	11	386	15
NOx Emissions (g/hr)							0	88	4	2	75	3
VOC Emissions (g/hr)							1	105	5	3	89	4
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							1.4	189.6	5.8	3.3	79.0	1.1
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							613	1617	1411	351	1617	1373
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.02	0.65	0.07	0.05	0.43	0.04

Scenario 1 - (Dedicated right turn and Shared left thru movement for EB and WB) - PM

Synchro 11 Report

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 76

Actuated Cycle Length: 76.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 7.2

Intersection LOS: A

Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 91

70th %ile Actuated Cycle: 91

50th %ile Actuated Cycle: 67

30th %ile Actuated Cycle: 67

10th %ile Actuated Cycle: 67

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	32%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↑	↔	↔	↔	↔
Traffic Volume (vph)	3	0	39	55	0	41	30	328	86	45	625	11
Future Volume (vph)	3	0	39	55	0	41	30	328	86	45	625	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	41.0		90.0	42.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			2.5		
Lane Util. 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
Ped Bike Factor		0.95			0.99		1.00		0.98		1.00	
Frt		0.883			0.925				0.850		0.995	
Flt Protected		0.993			0.978		0.950			0.950		
Satd. Flow (prot)	0	1533	0	0	1673	0	1805	1776	1538	1480	1835	0
Flt Permitted		0.963			0.828		0.202			0.494		
Satd. Flow (perm)	0	1487	0	0	1401	0	383	1776	1500	769	1835	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		164			164				164		5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		107.6			100.5			132.9			279.8	
Travel Time (s)		9.7			9.0			9.6			20.1	
Confl. Peds. (#/hr)			5	5			5					5
Confl. Bikes (#/hr)			3	3			8		7	7		8
Peak Hour Factor	0.38	0.25	0.75	0.93	0.25	0.56	0.48	0.77	0.85	0.88	0.79	0.38
Heavy Vehicles (%)	0%	2%	4%	0%	2%	5%	0%	7%	5%	22%	3%	0%
Adj. Flow (vph)	8	0	52	59	0	73	63	426	101	51	791	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	60	0	0	132	0	63	426	101	51	820	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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			1.6	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	30.5		6.1	30.5		6.1	10.0	6.1	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	1.8		6.1	1.8		6.1	0.6	6.1	2.0	0.6	
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(m)		28.7			28.7			9.4			9.4	
Detector 2 Size(m)		1.8			1.8			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		

Scenario 2 - (Signal Actd-Uncrd - Perm Protected turn - Cycle length - 60s) - AM

Synchro 11 Report

Page 1

Lanes, Volumes, Timings

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Total Split (s)	12.0	12.0		12.0	12.0		8.0	40.0	40.0	8.0	40.0	
Total Split (%)	20.0%	20.0%		20.0%	20.0%		13.3%	66.7%	66.7%	13.3%	66.7%	
Maximum Green (s)	6.0	6.0		6.0	6.0		2.0	34.0	34.0	2.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	Min	Min	None	Min	
Act Effect Green (s)		6.0			6.0		32.0	33.0	33.0	32.0	33.0	
Actuated g/C Ratio		0.12			0.12		0.64	0.66	0.66	0.64	0.66	
v/c Ratio		0.19			0.42		0.21	0.37	0.10	0.10	0.68	
Control Delay		1.3			8.1		4.9	7.7	0.6	3.6	13.1	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		1.3			8.1		4.9	7.7	0.6	3.6	13.1	
LOS		A			A		A	A	A	A	B	
Approach Delay		1.3			8.1			6.2			12.5	
Approach LOS		A			A			A			B	
90th %ile Green (s)	6.0	6.0		6.0	6.0		2.0	34.0	34.0	2.0	34.0	
90th %ile Term Code	Hold	Hold		Max	Max		Max	Hold	Hold	Max	Max	
70th %ile Green (s)	6.0	6.0		6.0	6.0		2.0	34.0	34.0	2.0	34.0	
70th %ile Term Code	Hold	Hold		Max	Max		Max	Hold	Hold	Max	Max	
50th %ile Green (s)	5.5	5.5		5.5	5.5		2.0	29.8	29.8	2.0	29.8	
50th %ile Term Code	Gap	Gap		Gap	Gap		Max	Hold	Hold	Max	Gap	
30th %ile Green (s)	5.5	5.5		5.5	5.5		0.0	27.4	27.4	0.0	27.4	
30th %ile Term Code	Hold	Hold		Gap	Gap		Skip	Dwell	Dwell	Skip	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell	Dwell	Skip	Dwell	
Stops (vph)		0			14		10	156	3	15	406	
Fuel Used(l)		1			2		1	10	1	2	32	
CO Emissions (g/hr)		10			34		13	178	22	31	603	
NOx Emissions (g/hr)		2			7		3	34	4	6	116	
VOC Emissions (g/hr)		2			8		3	41	5	7	139	
Dilemma Vehicles (#)		0			0		0	0	0	0	0	
Queue Length 50th (m)		0.0			0.0		1.6	23.1	0.0	1.3	60.6	
Queue Length 95th (m)		0.0			0.0		2.1	32.0	1.4	3.5	80.3	
Internal Link Dist (m)		83.6			76.5			108.9			255.8	
Turn Bay Length (m)							41.0		90.0	42.0		
Base Capacity (vph)		332			321		304	1245	1100	521	1288	
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			0.41		0.21	0.34	0.09	0.10	0.64	

Intersection Summary

Area Type: Other

Cycle Length: 60

Lanes, Volumes, Timings

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

Actuated Cycle Length: 50.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 59.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

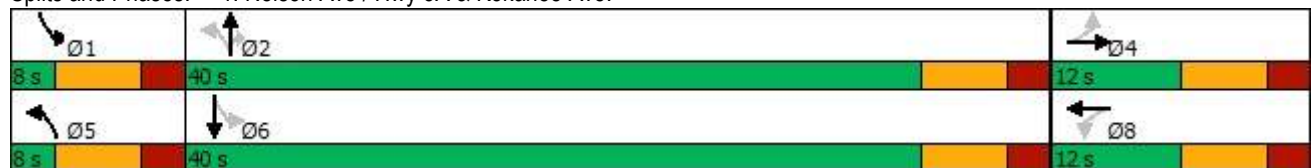
70th %ile Actuated Cycle: 60

50th %ile Actuated Cycle: 55.3

30th %ile Actuated Cycle: 44.9

10th %ile Actuated Cycle: 31

Splits and Phases: 1: Nelson Ave / Hwy 3A & Kokanee Ave.



Lanes, Volumes, Timings

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	3	14	83	2	24	10	417	83	37	690	1
Future Volume (vph)	0	3	14	83	2	24	10	417	83	37	690	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		34.0	44.0		52.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Ped Bike Factor		0.99			0.99		1.00		0.97	1.00		0.97
Frt		0.917			0.969				0.850			0.850
Flt Protected					0.965		0.950			0.950		
Satd. Flow (prot)	0	1717	0	0	1718	0	1805	1810	1524	1719	1845	1615
Flt Permitted					0.768		0.159			0.438		
Satd. Flow (perm)	0	1717	0	0	1364	0	302	1810	1483	792	1845	1573
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			21				164			164
Link Speed (k/h)		50			40			50			50	
Link Distance (m)		115.3			100.5			125.8			132.9	
Travel Time (s)		8.3			9.0			9.1			9.6	
Confl. Peds. (#/hr)			1	1			1		3	3		1
Confl. Bikes (#/hr)	1					1	7		5	5		7
Peak Hour Factor	0.25	0.25	0.75	0.75	0.25	0.67	0.50	0.90	0.85	0.82	0.80	0.25
Heavy Vehicles (%)	2%	0%	0%	4%	0%	0%	0%	5%	6%	5%	3%	0%
Adj. Flow (vph)	0	12	19	111	8	36	20	463	98	45	863	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	0	0	155	0	20	463	98	45	863	4
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
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(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6

Scenario 2 - (Signal Actd-Uncrd - Perm Protected turn - Cycle length - 60s) - AM

Synchro 11 Report

Page 4

Lanes, Volumes, Timings

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Total Split (s)	14.0	14.0		14.0	14.0		9.0	37.0	37.0	9.0	37.0	37.0
Total Split (%)	23.3%	23.3%		23.3%	23.3%		15.0%	61.7%	61.7%	15.0%	61.7%	61.7%
Maximum Green (s)	8.0	8.0		8.0	8.0		3.0	31.0	31.0	3.0	31.0	31.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	None	Min	Min
Act Effect Green (s)		7.8			7.8		32.8	31.6	31.6	34.1	33.6	33.6
Actuated g/C Ratio		0.14			0.14		0.60	0.57	0.57	0.62	0.61	0.61
v/c Ratio		0.12			0.73		0.08	0.45	0.11	0.08	0.77	0.00
Control Delay		14.7			43.5		4.6	9.7	0.7	4.2	16.1	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	1.0	0.0
Total Delay		14.7			43.5		4.6	9.7	0.7	4.2	17.0	0.0
LOS		B			D		A	A	A	A	B	A
Approach Delay		14.7			43.5			8.0			16.3	
Approach LOS		B			D			A			B	
90th %ile Green (s)	8.0	8.0		8.0	8.0		3.0	31.0	31.0	3.0	31.0	31.0
90th %ile Term Code	Hold	Hold		Max	Max		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	22.0	22.0	3.0	31.0	31.0
70th %ile Term Code	Hold	Hold		Max	Max		Skip	Hold	Hold	Max	Max	Max
50th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	33.4	33.4	0.0	33.4	33.4
50th %ile Term Code	Hold	Hold		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
30th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	37.3	37.3	0.0	37.3	37.3
30th %ile Term Code	Hold	Hold		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
10th %ile Green (s)	7.1	7.1		7.1	7.1		0.0	34.8	34.8	0.0	34.8	34.8
10th %ile Term Code	Hold	Hold		Gap	Gap		Skip	Dwell	Dwell	Skip	Dwell	Dwell
Stops (vph)		10			78		5	236	3	14	437	0
Fuel Used(l)		1			6		0	13	1	1	27	0
CO Emissions (g/hr)		11			110		5	249	21	17	503	0
NOx Emissions (g/hr)		2			21		1	48	4	3	97	0
VOC Emissions (g/hr)		3			25		1	57	5	4	116	0
Dilemma Vehicles (#)		0			0		0	0	0	0	0	0
Queue Length 50th (m)		1.0			12.4		0.6	18.4	0.0	1.4	48.0	0.0
Queue Length 95th (m)		0.7			5.9		1.2	50.9	1.3	3.4	#121.5	0.0
Internal Link Dist (m)		91.3			76.5			101.8			108.9	
Turn Bay Length (m)							30.0		34.0	44.0		52.0
Base Capacity (vph)		266			216		262	1103	967	541	1124	1022
Starvation Cap Reductn		0			0		0	0	0	0	88	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		0.12			0.72		0.08	0.42	0.10	0.08	0.83	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Lanes, Volumes, Timings

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

Actuated Cycle Length: 55.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 15.9

Intersection LOS: B

Intersection Capacity Utilization 59.2%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

70th %ile Actuated Cycle: 51

50th %ile Actuated Cycle: 53.4

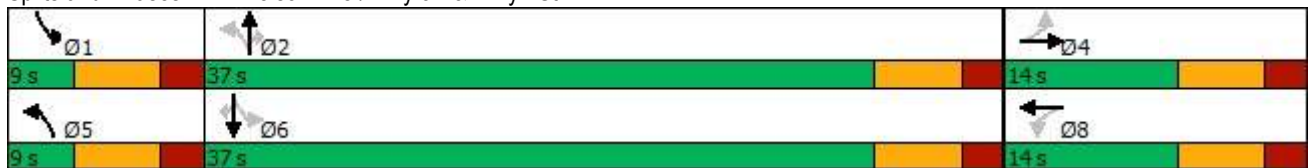
30th %ile Actuated Cycle: 57.3

10th %ile Actuated Cycle: 53.9

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Nelson Ave / Hwy 3A & Elwyn St.



Lanes, Volumes, Timings

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	9	6	42	7	14	3	528	42	40	697	22
Future Volume (vph)	12	9	6	42	7	14	3	528	42	40	697	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. 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
Frt		0.975			0.976				0.850			0.850
Flt Protected		0.983			0.967		0.950			0.950		
Satd. Flow (prot)	0	1760	0	0	1793	0	1805	1776	1553	1570	1863	1615
Flt Permitted		0.868			0.761		0.252			0.356		
Satd. Flow (perm)	0	1554	0	0	1411	0	479	1776	1553	588	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			15				164			164
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		52.2			64.2			70.0			102.2	
Travel Time (s)		4.7			5.8			5.0			7.4	
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	4%	15%	2%	0%
Adj. Flow (vph)	19	26	10	72	14	19	8	574	70	80	749	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	105	0	8	574	70	80	749	33
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
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(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0

Scenario 2 - (Signal Actd-Uncrd - Perm Protected turn - Cycle length - 60s) - AM

Synchro 11 Report

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Lanes, Volumes, Timings

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Total Split (s)	13.0	13.0		13.0	13.0		8.0	39.0	39.0	8.0	39.0	39.0
Total Split (%)	21.7%	21.7%		21.7%	21.7%		13.3%	65.0%	65.0%	13.3%	65.0%	65.0%
Maximum Green (s)	7.0	7.0		7.0	7.0		2.0	33.0	33.0	2.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	None	Min	Min
Act Effect Green (s)		6.9			7.0		28.1	28.9	28.9	30.4	32.0	32.0
Actuated g/C Ratio		0.15			0.15		0.59	0.61	0.61	0.64	0.68	0.68
v/c Ratio		0.23			0.47		0.02	0.53	0.07	0.19	0.59	0.03
Control Delay		21.3			28.9		3.7	11.0	0.1	5.0	9.6	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.4	0.0
Total Delay		21.3			28.9		3.7	11.0	0.1	5.0	10.0	0.0
LOS		C			C		A	B	A	A	B	A
Approach Delay		21.3			28.9			9.8			9.2	
Approach LOS		C			C			A			A	
90th %ile Green (s)	7.0	7.0		7.0	7.0		2.0	33.0	33.0	2.0	33.0	33.0
90th %ile Term Code	Max	Max		Max	Max		Max	Hold	Hold	Max	Max	Max
70th %ile Green (s)	7.0	7.0		7.0	7.0		0.0	24.4	24.4	2.0	32.4	32.4
70th %ile Term Code	Max	Max		Max	Max		Skip	Gap	Gap	Max	Hold	Hold
50th %ile Green (s)	7.0	7.0		7.0	7.0		0.0	19.5	19.5	2.0	27.5	27.5
50th %ile Term Code	Hold	Hold		Max	Max		Skip	Gap	Gap	Max	Hold	Hold
30th %ile Green (s)	7.0	7.0		7.0	7.0		0.0	29.7	29.7	0.0	29.7	29.7
30th %ile Term Code	Hold	Hold		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	23.7	23.7	0.0	23.7	23.7
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell	Dwell	Skip	Dwell	Dwell
Stops (vph)		22			47		2	326	0	15	403	0
Fuel Used(l)		1			3		0	15	0	1	21	0
CO Emissions (g/hr)		17			47		1	285	5	16	390	4
NOx Emissions (g/hr)		3			9		0	55	1	3	75	1
VOC Emissions (g/hr)		4			11		0	66	1	4	90	1
Dilemma Vehicles (#)		0			0		0	0	0	0	0	0
Queue Length 50th (m)		3.3			6.8		0.3	37.6	0.0	2.3	34.4	0.0
Queue Length 95th (m)		4.3			11.0		0.5	63.4	0.0	2.8	93.6	0.0
Internal Link Dist (m)		28.2			40.2			46.0			78.2	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)		251			233		343	1271	1158	421	1333	1202
Starvation Cap Reductn		0			0		0	0	0	0	194	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		0.22			0.45		0.02	0.45	0.06	0.19	0.66	0.03

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 47.3

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 52.1%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

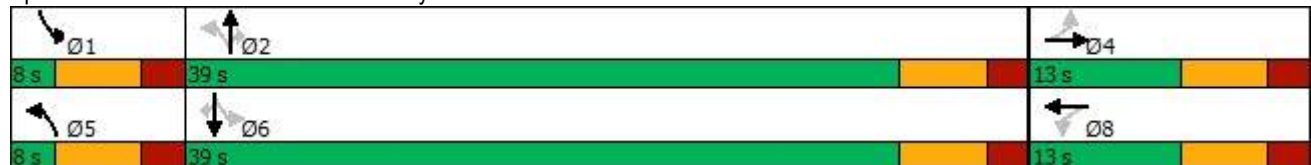
70th %ile Actuated Cycle: 51.4

50th %ile Actuated Cycle: 46.5

30th %ile Actuated Cycle: 48.7

10th %ile Actuated Cycle: 29.7

Splits and Phases: 30: Nelson Ave / Hwy 3A & Behnsen St.



Lanes, Volumes, Timings

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1	44	68	1	71	38	534	129	80	457	19
Future Volume (vph)	9	1	44	68	1	71	38	534	129	80	457	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	41.0		90.0	42.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			2.5		
Lane Util. 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
Ped Bike Factor		0.94			0.96		1.00		0.98	1.00	1.00	
Frt		0.902			0.934				0.850		0.994	
Flt Protected		0.989			0.976		0.950			0.950		
Satd. Flow (prot)	0	1602	0	0	1684	0	1805	1863	1615	1719	1816	0
Flt Permitted		0.901			0.808		0.317			0.330		
Satd. Flow (perm)	0	1459	0	0	1359	0	601	1863	1575	597	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		52			69				164		5	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		107.6			100.5			132.9			279.8	
Travel Time (s)		9.7			9.0			9.6			20.1	
Confl. Peds. (#/hr)	1		19	19		1	8		2	2		8
Confl. Bikes (#/hr)	2					2	6		4	4		6
Peak Hour Factor	0.58	0.25	0.84	0.77	0.25	0.81	0.73	0.92	0.80	0.72	0.77	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	0%	3%	0%	2%	0%	5%	4%	0%
Adj. Flow (vph)	16	4	52	88	4	88	52	580	161	111	594	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	72	0	0	180	0	52	580	161	111	618	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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			1.6	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	30.5		6.1	30.5		6.1	10.0	6.1	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	1.8		6.1	1.8		6.1	0.6	6.1	2.0	0.6	
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(m)		28.7			28.7			9.4			9.4	
Detector 2 Size(m)		1.8			1.8			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		

Scenario 2 - (Signal Actd-Uncrd - Perm Protected turn - Cycle length - 60s) - AM

Synchro 11 Report

Page 1

Lanes, Volumes, Timings

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Total Split (s)	16.0	16.0		16.0	16.0		8.0	36.0	36.0	8.0	36.0	
Total Split (%)	26.7%	26.7%		26.7%	26.7%		13.3%	60.0%	60.0%	13.3%	60.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		2.0	30.0	30.0	2.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		None	Min	Min	None	Min	
Act Effect Green (s)		8.6			8.7		26.8	27.2	27.2	28.1	29.0	
Actuated g/C Ratio		0.18			0.18		0.55	0.56	0.56	0.57	0.59	
v/c Ratio		0.24			0.60		0.14	0.56	0.17	0.28	0.57	
Control Delay		12.3			24.7		5.6	13.5	2.2	7.5	13.0	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		12.3			24.7		5.6	13.5	2.2	7.5	13.0	
LOS		B			C		A	B	A	A	B	
Approach Delay		12.3			24.7			10.7			12.2	
Approach LOS		B			C			B			B	
90th %ile Green (s)	10.0	10.0		10.0	10.0		2.0	30.0	30.0	2.0	30.0	
90th %ile Term Code	Hold	Hold		Max	Max		Max	Max	Max	Max	Max	
70th %ile Green (s)	10.0	10.0		10.0	10.0		2.0	27.6	27.6	2.0	27.6	
70th %ile Term Code	Hold	Hold		Max	Max		Max	Hold	Hold	Max	Gap	
50th %ile Green (s)	10.0	10.0		10.0	10.0		2.0	22.1	22.1	2.0	22.1	
50th %ile Term Code	Hold	Hold		Max	Max		Max	Hold	Hold	Max	Gap	
30th %ile Green (s)	7.6	7.6		7.6	7.6		0.0	16.2	16.2	2.0	24.2	
30th %ile Term Code	Hold	Hold		Gap	Gap		Skip	Gap	Gap	Max	Hold	
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	25.6	25.6	0.0	25.6	
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell	Dwell	Skip	Dwell	
Stops (vph)		23			78		18	361	14	37	316	
Fuel Used(l)		1			5		1	20	2	3	25	
CO Emissions (g/hr)		27			98		19	379	40	64	456	
NOx Emissions (g/hr)		5			19		4	73	8	12	88	
VOC Emissions (g/hr)		6			23		4	87	9	15	105	
Dilemma Vehicles (#)		0			0		0	0	0	0	0	
Queue Length 50th (m)		1.6			9.2		1.8	42.7	0.0	4.0	47.1	
Queue Length 95th (m)		0.0			1.8		3.8	70.9	5.1	6.6	60.0	
Internal Link Dist (m)		83.6			76.5			108.9			255.8	
Turn Bay Length (m)							41.0		90.0	42.0		
Base Capacity (vph)		355			346		380	1203	1075	391	1175	
Starvation Cap Reductn		0			0		0	17	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		0.20			0.52		0.14	0.49	0.15	0.28	0.53	

Intersection Summary

Area Type: Other

Cycle Length: 60

Lanes, Volumes, Timings

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

Actuated Cycle Length: 49

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 12.8

Intersection LOS: B

Intersection Capacity Utilization 62.4%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

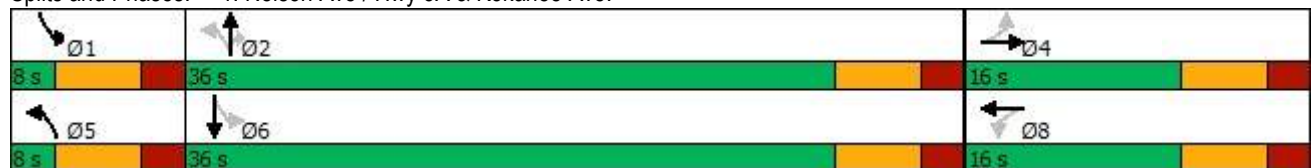
70th %ile Actuated Cycle: 57.6

50th %ile Actuated Cycle: 52.1

30th %ile Actuated Cycle: 43.8

10th %ile Actuated Cycle: 31.6

Splits and Phases: 1: Nelson Ave / Hwy 3A & Kokanee Ave.



Lanes, Volumes, Timings

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	3	22	85	1	23	4	660	135	43	538	1
Future Volume (vph)	6	3	22	85	1	23	4	660	135	43	538	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		34.0	44.0		52.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. 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
Ped Bike Factor		0.98			0.99		1.00		0.97	1.00		0.98
Frt		0.917			0.962				0.850			0.850
Flt Protected		0.987			0.967		0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	1767	0	1805	1863	1615	1719	1845	1615
Flt Permitted		0.905			0.762		0.318			0.258		
Satd. Flow (perm)	0	1547	0	0	1383	0	604	1863	1565	466	1845	1577
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			27				164			164
Link Speed (k/h)		50			40			50			50	
Link Distance (m)		115.3			100.5			125.8			132.9	
Travel Time (s)		8.3			9.0			9.1			9.6	
Confl. Peds. (#/hr)			3	3			1		8	8		1
Confl. Bikes (#/hr)							4		5	5		4
Peak Hour Factor	0.42	0.50	0.68	0.83	0.25	0.55	0.33	0.92	0.87	0.72	0.81	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	5%	3%	0%
Adj. Flow (vph)	14	6	32	102	4	42	12	717	155	60	664	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	0	0	148	0	12	717	155	60	664	4
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	6.1
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(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6

Scenario 2 - (Signal Actd-Uncrd - Perm Protected turn - Cycle length - 60s) - AM

Synchro 11 Report

Page 4

Lanes, Volumes, Timings

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Total Split (s)	14.0	14.0		14.0	14.0		8.0	38.0	38.0	8.0	38.0	38.0
Total Split (%)	23.3%	23.3%		23.3%	23.3%		13.3%	63.3%	63.3%	13.3%	63.3%	63.3%
Maximum Green (s)	8.0	8.0		8.0	8.0		2.0	32.0	32.0	2.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	None	Min	Min
Act Effect Green (s)		7.6			7.8		31.4	32.2	32.2	33.5	35.0	35.0
Actuated g/C Ratio		0.15			0.15		0.61	0.63	0.63	0.65	0.68	0.68
v/c Ratio		0.20			0.64		0.03	0.61	0.15	0.17	0.53	0.00
Control Delay		15.4			35.9		4.0	12.5	1.8	4.9	8.8	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.2	0.0
Total Delay		15.4			35.9		4.0	12.5	1.8	4.9	9.0	0.0
LOS		B			D		A	B	A	A	A	A
Approach Delay		15.4			35.9			10.5			8.6	
Approach LOS		B			D			B			A	
90th %ile Green (s)	8.0	8.0		8.0	8.0		2.0	32.0	32.0	2.0	32.0	32.0
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Max	Max	Max
70th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	32.0	32.0	2.0	40.0	40.0
70th %ile Term Code	Hold	Hold		Max	Max		Skip	Max	Max	Max	Hold	Hold
50th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	27.5	27.5	2.0	35.5	35.5
50th %ile Term Code	Hold	Hold		Max	Max		Skip	Gap	Gap	Max	Hold	Hold
30th %ile Green (s)	8.0	8.0		8.0	8.0		0.0	26.8	26.8	0.0	26.8	26.8
30th %ile Term Code	Hold	Hold		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	28.1	28.1	0.0	28.1	28.1
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell	Dwell	Skip	Dwell	Dwell
Stops (vph)		16			74		2	432	13	15	283	0
Fuel Used(l)		1			5		0	24	2	1	17	0
CO Emissions (g/hr)		20			97		2	444	39	19	312	0
NOx Emissions (g/hr)		4			19		0	86	8	4	60	0
VOC Emissions (g/hr)		5			22		0	102	9	4	72	0
Dilemma Vehicles (#)		0			0		0	0	0	0	0	0
Queue Length 50th (m)		1.8			11.6		0.4	54.3	0.0	1.9	30.6	0.0
Queue Length 95th (m)		4.0			4.9		0.6	90.6	5.4	3.6	66.3	0.0
Internal Link Dist (m)		91.3			76.5			101.8			108.9	
Turn Bay Length (m)							30.0		34.0	44.0		52.0
Base Capacity (vph)		279			248		419	1216	1078	355	1277	1142
Starvation Cap Reductn		0			0		0	0	0	0	140	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		0.19			0.60		0.03	0.59	0.14	0.17	0.58	0.00

Intersection Summary

Area Type: Other

Cycle Length: 60

Lanes, Volumes, Timings

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

Actuated Cycle Length: 51.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 11.9

Intersection LOS: B

Intersection Capacity Utilization 58.6%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

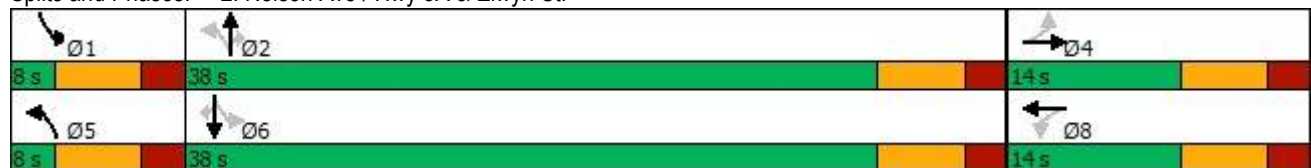
70th %ile Actuated Cycle: 60

50th %ile Actuated Cycle: 55.5

30th %ile Actuated Cycle: 46.8

10th %ile Actuated Cycle: 34.1

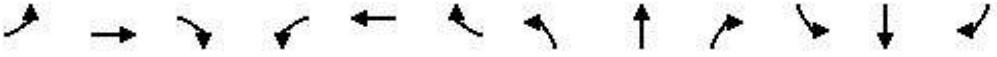
Splits and Phases: 2: Nelson Ave / Hwy 3A & Elwyn St.



Lanes, Volumes, Timings

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↖	↗	↗	↖	↖
Traffic Volume (vph)	39	4	11	57	3	21	6	962	86	17	611	30
Future Volume (vph)	39	4	11	57	3	21	6	962	86	17	611	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. 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
Frt		0.970			0.968				0.850			0.850
Flt Protected		0.965			0.965		0.950			0.950		
Satd. Flow (prot)	0	1778	0	0	1775	0	1805	1863	1615	1805	1863	1615
Flt Permitted		0.835			0.744		0.307			0.098		
Satd. Flow (perm)	0	1539	0	0	1368	0	583	1863	1615	186	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			21				164			164
Link Speed (k/h)		40			40			50			40	
Link Distance (m)		52.2			64.2			70.0			102.2	
Travel Time (s)		4.7			5.8			5.0			9.2	
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	48	4	15	70	4	23	10	1046	105	19	702	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	0	0	97	0	10	1046	105	19	702	52
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
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 (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
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(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0

Scenario 2 - (Signal Actd-Uncrd - Perm Protected turn - Cycle length - 60s) - AM

Synchro 11 Report

Page 7

Lanes, Volumes, Timings

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Total Split (s)	13.0	13.0		13.0	13.0		8.0	39.0	39.0	8.0	39.0	39.0
Total Split (%)	21.7%	21.7%		21.7%	21.7%		13.3%	65.0%	65.0%	13.3%	65.0%	65.0%
Maximum Green (s)	7.0	7.0		7.0	7.0		2.0	33.0	33.0	2.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min	Min	None	Min	Min
Act Effect Green (s)		6.7			6.7		41.0	41.9	41.9	41.0	41.9	41.9
Actuated g/C Ratio		0.11			0.11		0.70	0.72	0.72	0.70	0.72	0.72
v/c Ratio		0.35			0.55		0.02	0.78	0.09	0.10	0.53	0.04
Control Delay		25.1			33.7		3.5	15.7	0.7	4.5	8.0	0.1
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.8	0.0
Total Delay		25.1			33.7		3.5	15.7	0.7	4.5	8.8	0.1
LOS		C			C		A	B	A	A	A	A
Approach Delay		25.1			33.7			14.2			8.1	
Approach LOS		C			C			B			A	
90th %ile Green (s)	7.0	7.0		7.0	7.0		2.0	33.0	33.0	2.0	33.0	33.0
90th %ile Term Code	Max	Max		Max	Max		Max	Max	Max	Max	Max	Max
70th %ile Green (s)	7.0	7.0		7.0	7.0		0.0	34.8	34.8	0.0	34.8	34.8
70th %ile Term Code	Max	Max		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
50th %ile Green (s)	7.0	7.0		7.0	7.0		0.0	38.9	38.9	0.0	38.9	38.9
50th %ile Term Code	Max	Max		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
30th %ile Green (s)	7.0	7.0		7.0	7.0		0.0	48.0	48.0	0.0	48.0	48.0
30th %ile Term Code	Hold	Hold		Max	Max		Skip	Dwell	Dwell	Skip	Dwell	Dwell
10th %ile Green (s)	0.0	0.0		0.0	0.0		0.0	48.0	48.0	0.0	48.0	48.0
10th %ile Term Code	Skip	Skip		Skip	Skip		Skip	Dwell	Dwell	Skip	Dwell	Dwell
Stops (vph)		43			60		3	555	3	6	309	0
Fuel Used(l)		2			4		0	30	1	0	15	0
CO Emissions (g/hr)		37			65		2	566	13	6	276	6
NOx Emissions (g/hr)		7			13		0	109	2	1	53	1
VOC Emissions (g/hr)		9			15		1	131	3	1	64	1
Dilemma Vehicles (#)		0			0		0	0	0	0	0	0
Queue Length 50th (m)		5.1			7.6		0.3	65.7	0.0	0.5	30.9	0.0
Queue Length 95th (m)		15.2			16.2		0.9	#189.3	1.4	1.9	78.2	0.0
Internal Link Dist (m)		28.2			40.2			46.0			78.2	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)		198			183		450	1335	1204	186	1335	1204
Starvation Cap Reductn		0			0		0	0	0	0	330	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		0.34			0.53		0.02	0.78	0.09	0.10	0.70	0.04

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 58.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Lanes, Volumes, Timings

30: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 13.2

Intersection LOS: B

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 60

70th %ile Actuated Cycle: 53.8

50th %ile Actuated Cycle: 57.9

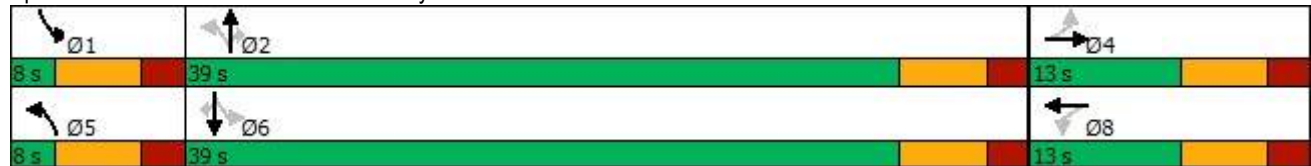
30th %ile Actuated Cycle: 67

10th %ile Actuated Cycle: 54

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

Queue shown is maximum after two cycles.

Splits and Phases: 30: Nelson Ave / Hwy 3A & Behnsen St.



HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																					
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR									
Lane Configurations																					
Traffic Volume (veh/h)	2	0	31	44	0	33	24	262	69	36	500	9									
Future Volume (Veh/h)	2	0	31	44	0	33	24	262	69	36	500	9									
Sign Control	Stop			Stop			Free			Free											
Grade	0%			0%			0%			0%											
Peak Hour Factor	0.38	0.25	0.75	0.93	0.25	0.56	0.48	0.77	0.85	0.88	0.79	0.38									
Hourly flow rate (vph)	5	0	41	47	0	59	50	340	81	41	633	24									
Pedestrians	5						5														
Lane Width (m)	3.6						3.6														
Walking Speed (m/s)	1.1						1.1														
Percent Blockage	0						0														
Right turn flare (veh)																					
Median type							None			None											
Median storage (veh)																					
Upstream signal (m)																					
pX, platoon unblocked																					
vC, conflicting volume	1231	1172	655	1201	1184	340	662				340										
vC1, stage 1 conf vol																					
vC2, stage 2 conf vol																					
vCu, unblocked vol	1231	1172	655	1201	1184	340	662				340										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.3										
tC, 2 stage (s)																					
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.4										
p0 queue free %	96	100	91	66	100	92	95				96										
cM capacity (veh/h)	132	174	458	137	172	696	932				1116										
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2														
Volume Total	46	106	50	340	81	41	657														
Volume Left	5	47	50	0	0	41	0														
Volume Right	41	59	0	0	81	0	24														
cSH	361	248	932	1700	1700	1116	1700														
Volume to Capacity	0.13	0.43	0.05	0.20	0.05	0.04	0.39														
Queue Length 95th (m)	3.3	15.3	1.3	0.0	0.0	0.9	0.0														
Control Delay (s)	16.4	29.9	9.1	0.0	0.0	8.4	0.0														
Lane LOS	C	D	A				A														
Approach Delay (s)	16.4	29.9	1.0				0.5														
Approach LOS	C	D																			
Intersection Summary																					
Average Delay				3.6																	
Intersection Capacity Utilization				47.7%	ICU Level of Service				A												
Analysis Period (min)				15																	

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	0	2	11	66	2	19	8	334	66	30	552	1								
Future Volume (Veh/h)	0	2	11	66	2	19	8	334	66	30	552	1								
Sign Control	Stop			Stop			Free			Free										
Grade	0%			0%			0%			0%										
Peak Hour Factor	0.25	0.25	0.75	0.75	0.25	0.67	0.50	0.90	0.85	0.82	0.80	0.25								
Hourly flow rate (vph)	0	8	15	88	8	28	16	371	78	37	690	4								
Pedestrians	1			3			1													
Lane Width (m)	3.6			3.6			3.6													
Walking Speed (m/s)	1.1			1.1			1.1													
Percent Blockage	0			0			0													
Right turn flare (veh)																				
Median type							None			None										
Median storage (veh)																				
Upstream signal (m)	379																			
pX, platoon unblocked																				
vC, conflicting volume	1200	1249	692	1190	1175	374	695				452									
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	1200	1249	692	1190	1175	374	695				452									
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1									
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2									
p0 queue free %	100	95	97	39	96	96	98				97									
cM capacity (veh/h)	144	165	447	145	183	675	909				1090									
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3												
Volume Total	23	124	16	371	78	37	690	4												
Volume Left	0	88	16	0	0	37	0	0												
Volume Right	15	28	0	0	78	0	0	4												
cSH	280	179	909	1700	1700	1090	1700	1700												
Volume to Capacity	0.08	0.69	0.02	0.22	0.05	0.03	0.41	0.00												
Queue Length 95th (m)	2.0	31.9	0.4	0.0	0.0	0.8	0.0	0.0												
Control Delay (s)	19.0	61.1	9.0	0.0	0.0	8.4	0.0	0.0												
Lane LOS	C	F	A					A												
Approach Delay (s)	19.0	61.1	0.3					0.4												
Approach LOS	C	F																		
Intersection Summary																				
Average Delay	6.3																			
Intersection Capacity Utilization	47.3%			ICU Level of Service					A											
Analysis Period (min)	15																			

HCM Unsignalized Intersection Capacity Analysis 30: Nelson Ave / Hwy 3A & Behnsen St.

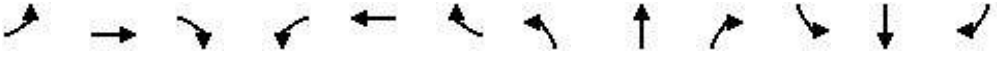
02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	7	5	34	6	11	2	422	34	32	558	18
Future Volume (Veh/h)	10	7	5	34	6	11	2	422	34	32	558	18
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Hourly flow rate (vph)	16	20	8	59	12	15	5	459	57	64	600	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												102
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1218	1254	600	1215	1224	459	627				516	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1188	1228	503	1184	1194	459	533				516	
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1				4.2	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.3	
p0 queue free %	87	87	98	53	92	98	99				94	
cM capacity (veh/h)	125	151	517	127	158	606	943				987	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	44	86	5	459	57	64	600	27				
Volume Left	16	59	5	0	0	64	0	0				
Volume Right	8	15	0	0	57	0	0	27				
cSH	159	152	943	1700	1700	987	1700	1700				
Volume to Capacity	0.28	0.57	0.01	0.27	0.03	0.06	0.35	0.02				
Queue Length 95th (m)	8.1	22.0	0.1	0.0	0.0	1.6	0.0	0.0				
Control Delay (s)	36.0	55.8	8.8	0.0	0.0	8.9	0.0	0.0				
Lane LOS	E	F	A				A					
Approach Delay (s)	36.0	55.8	0.1				0.8					
Approach LOS	E	F										
Intersection Summary												
Average Delay	5.2											
Intersection Capacity Utilization	40.4%			ICU Level of Service					A			
Analysis Period (min)	15											

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	2	422	34	32	558	18
Future Volume (vph)	0	0	0	0	0	0	2	422	34	32	558	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1776	1553	1570	1863	1615
Flt Permitted							0.422			0.499		
Satd. Flow (perm)	0	0	0	0	0	0	799	1776	1553	824	1863	1573
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									57			94
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			30				9					9
Confl. Bikes (#/hr)	1		1				4					4
Peak Hour Factor	0.62	0.35	0.62	0.58	0.50	0.75	0.38	0.92	0.60	0.50	0.93	0.67
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	7%	4%	15%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	5	459	57	64	600	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	5	459	57	64	600	27
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	24		14	24		14	24		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Free
Protected Phases								2			2	
Permitted Phases							2		2	2		Free

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	
Minimum Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (s)							46.0	46.0	46.0	46.0	46.0	
Total Split (%)							65.7%	65.7%	65.7%	65.7%	65.7%	
Maximum Green (s)							40.0	40.0	40.0	40.0	40.0	
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	
Recall Mode							Ped	Ped	Ped	Ped	Ped	
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	
Pedestrian Calls (#/hr)							0	0	0	0	0	
Act Effct Green (s)							60.6	60.6	60.6	60.6	60.6	70.6
Actuated g/C Ratio							0.86	0.86	0.86	0.86	0.86	1.00
v/c Ratio							0.01	0.30	0.04	0.09	0.38	0.02
Control Delay							5.0	4.6	1.8	4.5	5.2	0.0
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							5.0	4.6	1.8	4.5	5.2	0.0
LOS							A	A	A	A	A	A
Approach Delay								4.3			4.9	
Approach LOS								A			A	
90th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
70th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
50th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
30th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
10th %ile Green (s)							55.0	55.0	55.0	55.0	55.0	
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	
Stops (vph)							1	102	4	9	148	0
Fuel Used(l)							0	8	0	1	19	0
CO Emissions (g/hr)							1	147	9	20	352	8
NOx Emissions (g/hr)							0	28	2	4	68	2
VOC Emissions (g/hr)							0	34	2	5	81	2
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							0.6	48.2	1.4	4.2	67.6	0.0
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							686	1525	1342	708	1600	1573
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.30	0.04	0.09	0.38	0.02

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 70.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 4.6

Intersection LOS: A

Intersection Capacity Utilization 38.3%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 85

70th %ile Actuated Cycle: 85

50th %ile Actuated Cycle: 61

30th %ile Actuated Cycle: 61

10th %ile Actuated Cycle: 61

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	34%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	30
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

HCM Unsignalized Intersection Capacity Analysis

1: Nelson Ave / Hwy 3A & Kokanee Ave.

02-28-2023

																								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Lane Configurations																								
Traffic Volume (veh/h)	7	1	35	54	1	57	30	427	103	64	366	15												
Future Volume (Veh/h)	7	1	35	54	1	57	30	427	103	64	366	15												
Sign Control	Stop			Stop			Free			Free														
Grade	0%			0%			0%			0%														
Peak Hour Factor	0.58	0.25	0.84	0.77	0.25	0.81	0.73	0.92	0.80	0.72	0.77	0.80												
Hourly flow rate (vph)	12	4	42	70	4	70	41	464	129	89	475	19												
Pedestrians	8			2			19			1														
Lane Width (m)	3.6			3.6			3.6			3.6														
Walking Speed (m/s)	1.1			1.1			1.1			1.1														
Percent Blockage	1			0			2			0														
Right turn flare (veh)																								
Median type							None			None														
Median storage (veh)																								
Upstream signal (m)																								
pX, platoon unblocked																								
vC, conflicting volume	1290	1218	512	1264	1228	467	502				466													
vC1, stage 1 conf vol																								
vC2, stage 2 conf vol																								
vCu, unblocked vol	1290	1218	512	1264	1228	467	502				466													
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1													
tC, 2 stage (s)																								
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2													
p0 queue free %	89	97	92	41	97	88	96				92													
cM capacity (veh/h)	110	159	552	119	157	592	1065				1078													
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2																	
Volume Total	58	144	41	464	129	89	494																	
Volume Left	12	70	41	0	0	89	0																	
Volume Right	42	70	0	0	129	0	19																	
cSH	276	196	1065	1700	1700	1078	1700																	
Volume to Capacity	0.21	0.73	0.04	0.27	0.08	0.08	0.29																	
Queue Length 95th (m)	5.9	36.3	0.9	0.0	0.0	2.0	0.0																	
Control Delay (s)	21.5	61.6	8.5	0.0	0.0	8.6	0.0																	
Lane LOS	C	F	A				A																	
Approach Delay (s)	21.5	61.6	0.6				1.3																	
Approach LOS	C	F																						
Intersection Summary																								
Average Delay				7.9																				
Intersection Capacity Utilization				49.3%	ICU Level of Service				A															
Analysis Period (min)				15																				

HCM Unsignalized Intersection Capacity Analysis

2: Nelson Ave / Hwy 3A & Elwyn St.

02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	18	68	1	18	3	528	108	34	430	1
Future Volume (Veh/h)	5	2	18	68	1	18	3	528	108	34	430	1
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.42	0.50	0.68	0.83	0.25	0.55	0.33	0.92	0.87	0.72	0.81	0.25
Hourly flow rate (vph)	12	4	26	82	4	33	9	574	124	47	531	4
Pedestrians	1			8			3					
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0			1			0					
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)	379											
pX, platoon unblocked												
vC, conflicting volume	1253	1350	535	1256	1230	582	536				706	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1253	1350	535	1256	1230	582	536				706	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	91	97	95	37	98	94	99				95	
cM capacity (veh/h)	131	141	547	131	167	513	1041				872	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	42	119	9	574	124	47	531	4				
Volume Left	12	82	9	0	0	47	0	0				
Volume Right	26	33	0	0	124	0	0	4				
cSH	250	166	1041	1700	1700	872	1700	1700				
Volume to Capacity	0.17	0.72	0.01	0.34	0.07	0.05	0.31	0.00				
Queue Length 95th (m)	4.5	33.1	0.2	0.0	0.0	1.3	0.0	0.0				
Control Delay (s)	22.2	67.9	8.5	0.0	0.0	9.4	0.0	0.0				
Lane LOS	C	F	A					A				
Approach Delay (s)	22.2	67.9	0.1	0.8								
Approach LOS	C	F										
Intersection Summary												
Average Delay	6.6											
Intersection Capacity Utilization	46.5%			ICU Level of Service				A				
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 30: Nelson Ave / Hwy 3A & Behnsen St.

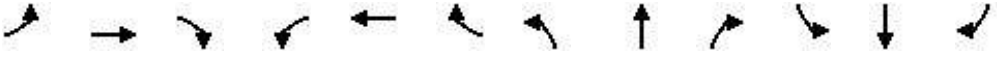
02-28-2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	3	9	46	2	17	5	770	69	14	489	24
Future Volume (Veh/h)	31	3	9	46	2	17	5	770	69	14	489	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Hourly flow rate (vph)	38	3	12	56	3	19	8	837	84	16	562	41
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (m)	102											
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	1468	1531	562	1460	1488	837	603	921				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1465	1534	479	1457	1487	837	523	921				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	58	97	98	40	97	95	99	98				
cM capacity (veh/h)	90	105	543	93	112	370	968	750				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3				
Volume Total	53	78	8	837	84	16	562	41				
Volume Left	38	56	8	0	0	16	0	0				
Volume Right	12	19	0	0	84	0	0	41				
cSH	112	115	968	1700	1700	750	1700	1700				
Volume to Capacity	0.47	0.68	0.01	0.49	0.05	0.02	0.33	0.02				
Queue Length 95th (m)	16.0	27.1	0.2	0.0	0.0	0.5	0.0	0.0				
Control Delay (s)	63.5	85.5	8.8	0.0	0.0	9.9	0.0	0.0				
Lane LOS	F	F	A	A								
Approach Delay (s)	63.5	85.5	0.1	0.3								
Approach LOS	F	F										
Intersection Summary												
Average Delay	6.1											
Intersection Capacity Utilization	51.3%			ICU Level of Service					A			
Analysis Period (min)	15											

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	5	770	69	14	489	24
Future Volume (vph)	0	0	0	0	0	0	5	770	69	14	489	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	43.0		34.0	35.0		38.0
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (m)	7.6			2.5			2.5			7.6		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt									0.850			0.850
Flt Protected							0.950			0.950		
Satd. Flow (prot)	0	0	0	0	0	0	1805	1863	1615	1805	1863	1615
Flt Permitted							0.444			0.306		
Satd. Flow (perm)	0	0	0	0	0	0	843	1863	1615	581	1863	1574
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									66			41
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		121.5			34.4			102.2			253.0	
Travel Time (s)		10.9			3.1			7.4			18.2	
Confl. Peds. (#/hr)			20				3					3
Confl. Bikes (#/hr)			3				4					4
Peak Hour Factor	0.82	1.00	0.75	0.82	0.75	0.90	0.62	0.92	0.82	0.88	0.87	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	0	0	0	0	0	8	837	84	16	562	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	8	837	84	16	562	41
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(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			1.6			1.6			4.9	
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 (k/h)	24		14	97		97	24		97	97		14
Number of Detectors							1	2	1	1	2	1
Detector Template							Left	Thru	Right	Left	Thru	Right
Leading Detector (m)							2.0	10.0	2.0	2.0	10.0	6.1
Trailing Detector (m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)							0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)							2.0	0.6	2.0	2.0	0.6	6.1
Detector 1 Type							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
Detector 1 Queue (s)							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
Detector 2 Position(m)								9.4			9.4	
Detector 2 Size(m)								0.6			0.6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type							Perm	NA	Perm	Perm	NA	Perm
Protected Phases								2			2	
Permitted Phases							2		2	2		2

Lane Group	Ø4
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (m)	
Storage Lanes	
Taper Length (m)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (k/h)	
Link Distance (m)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(m)	
Link Offset(m)	
Crosswalk Width(m)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (k/h)	
Number of Detectors	
Detector Template	
Leading Detector (m)	
Trailing Detector (m)	
Detector 1 Position(m)	
Detector 1 Size(m)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(m)	
Detector 2 Size(m)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	4
Permitted Phases	

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase							2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)							1.0	1.0	1.0	1.0	1.0	1.0
Minimum Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (s)							52.0	52.0	52.0	52.0	52.0	52.0
Total Split (%)							68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
Maximum Green (s)							46.0	46.0	46.0	46.0	46.0	46.0
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)							0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)							6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)							3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode							Max	Max	Max	Max	Max	Max
Walk Time (s)							35.0	35.0	35.0	35.0	35.0	35.0
Flash Dont Walk (s)							5.0	5.0	5.0	5.0	5.0	5.0
Pedestrian Calls (#/hr)							0	0	0	0	0	0
Act Effct Green (s)							66.5	66.5	66.5	66.5	66.5	66.5
Actuated g/C Ratio							0.87	0.87	0.87	0.87	0.87	0.87
v/c Ratio							0.01	0.52	0.06	0.03	0.35	0.03
Control Delay							4.4	6.4	1.9	4.5	4.6	1.8
Queue Delay							0.0	0.0	0.0	0.0	0.0	0.0
Total Delay							4.4	6.4	1.9	4.5	4.6	1.8
LOS							A	A	A	A	A	A
Approach Delay								6.0			4.4	
Approach LOS								A			A	
90th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
90th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
70th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
70th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
50th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
30th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)							61.0	61.0	61.0	61.0	61.0	61.0
10th %ile Term Code							Dwell	Dwell	Dwell	Dwell	Dwell	Dwell
Stops (vph)							2	241	7	4	116	2
Fuel Used(l)							0	17	1	0	16	1
CO Emissions (g/hr)							2	310	17	9	299	12
NOx Emissions (g/hr)							0	60	3	2	58	2
VOC Emissions (g/hr)							0	72	4	2	69	3
Dilemma Vehicles (#)							0	0	0	0	0	0
Queue Length 50th (m)							0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)							1.2	114.9	4.3	2.8	57.1	1.1
Internal Link Dist (m)		97.5			10.4			78.2			229.0	
Turn Bay Length (m)							43.0		34.0	35.0		38.0
Base Capacity (vph)							732	1617	1411	504	1617	1372
Starvation Cap Reductn							0	0	0	0	0	0
Spillback Cap Reductn							0	0	0	0	0	0
Storage Cap Reductn							0	0	0	0	0	0
Reduced v/c Ratio							0.01	0.52	0.06	0.03	0.35	0.03

Lanes, Volumes, Timings

10: Nelson Ave / Hwy 3A & Behnsen St.

02-28-2023

Intersection Summary

Area Type: Other

Cycle Length: 76

Actuated Cycle Length: 76.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 5.4

Intersection LOS: A

Intersection Capacity Utilization 46.7%

ICU Level of Service A

Analysis Period (min) 15

90th %ile Actuated Cycle: 91

70th %ile Actuated Cycle: 91

50th %ile Actuated Cycle: 67

30th %ile Actuated Cycle: 67

10th %ile Actuated Cycle: 67

Splits and Phases: 10: Nelson Ave / Hwy 3A & Behnsen St.



Lane Group	Ø4
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	32%
Maximum Green (s)	21.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	20
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	21.0
70th %ile Term Code	Ped
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(l)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary
