

PREPARED FOR: Committee of the Whole
FROM: Stephen Rennick, Manager of Engineering Services
MEETING DATE: June 20, 2022
SUBJECT: McNeill Avenue Traffic Calming

RECOMMENDATION(S)

THAT the report titled “McNeill Avenue Traffic Calming”, authored by Stephen Rennick, Manager of Engineering Services, dated June 20, 2022 be received.

And that the Committee consider the following staff recommendation(s):

THAT the Committee recommend to Council that a detailed design of traffic calming improvements on McNeill Avenue be completed, to be constructed as part of the 2023 Capital program.

Alternatively, staff await another direction.

EXECUTIVE SUMMARY OF REPORT

This report presents options for the Committee's consideration, relating to the road design on McNeill Avenue. The intent of the proposed changes is to better incorporate cyclist connections to City of Victoria, improve pedestrian safety at crossing locations, and improve safety for travelling vehicles and parked cars.

BACKGROUND/HISTORIC CONTEXT

Active Transportation in Oak Bay

There are two main documents that guide the selection of Active Transportation projects in Oak Bay - the Active Transportation Strategy (Boulevard Group, 2011) and the Official Community Plan (2014 OCP.) The 2011 report identified a network that consisted of four types of routes: Multi-Use Trails, Commuter Bike Routes, Scenic Bike Routes, and Neighbourhood Bike Routes. This proposed network was copied into the 2014 OCP as Figure 5.2, and several of the Transportation Policies speak to developing this network.

In 2018 the District constructed dedicated bike lanes on Cadboro Bay Road from Foul Bay Road to Bowker Avenue. These bike lanes form part of one of the Commuter Bike Routes as identified in the 2011 and 2014 documents, specifically route 4.3a, which is meant to extend along Cadboro Bay Road to Cedar Hill Cross Road.

McNeill Avenue/Richardson Street

McNeill Avenue is designated by the 2014 OCP as a Collector. Within Oak Bay's road network, Collector roads are the second highest volume roads. Their function is to collect

vehicles from the local roads, and direct them towards the higher speeds and volumes of arterials. In the case of McNeill Avenue, it provides connections to Foul Bay Road (which is an arterial) and to other collectors such as Victoria Avenue, Monterey Avenue, and Newport Avenue. McNeill Avenue is one of the primary east-west routes through South Oak Bay, as it provides a route for vehicles to access the City of Victoria via its continuation as Richardson Street.

In 2021 the City of Victoria undertook traffic calming on Richardson Street to re-designate this road as a cyclist and pedestrian friendly route. Richardson Street was essentially changed from a collector road to a local road. One of the changes that was implemented by City of Victoria was the closure of Richardson Street at Foul Bay Road, thus requiring cars exiting Oak Bay on McNeill Avenue to either turn north or south onto Foul Bay Road.

McNeill Avenue is also identified in the 2011 Active Transportation Strategy as a Commuter Bike Route, route 4.3e. Policy T9 of the Official Community Plan states "Support and encourage the development of Oak Bay's pedestrian and cycling networks as part of an interconnected multi-modal transportation system within Oak Bay and to adjacent jurisdictions, consistent with the District's Active Transportation Plan." Staff is bringing forward a discussion on McNeill Avenue in alignment with this policy. McNeill Avenue is part of the Active Transportation Strategy and its connection to Victoria's network factors into the discussion.

Resident Concerns with McNeill Avenue and Traffic Calming Study

Engineering Services has received feedback from residents on McNeill Avenue with respect to driver behaviour. Some of the issues that have been identified include the following:

- The road is narrow, and parked cars have been damaged by passing cars (scrapes on sides of vehicles, broken side mirrors, etc.)
- Vehicle speeds are high
- There is no dedicated accommodation for cyclists

The District of Oak Bay commissioned a traffic calming options report for McNeill Avenue in 2021. One of the primary requirements for the study was that a 40 km/hr design speed for the road would be maintained. McNeill Avenue's status as a Collector road that sees approximately 4,500 vehicles per day matches its current design speed. The consultant was not directed to consider design options that would encourage drivers to travel at 30 km/hr because this would represent a shift in the type and purpose of the road. Should Council wish for drivers on McNeill to travel at speeds closer to 30 km/hr, more significant changes would need to be made to the roadway to slow vehicle traffic. The impact of increased traffic volumes on alternative routes such as Central, Windsor, and Oak Bay Avenue would also need to be assessed.

The report completed by Watt Consulting Group, entitled McNeill Avenue Traffic Calming Review and dated September 24, 2021, is attached to this report.

Report Summary

Vehicle speed and volume data was collected at three locations along McNeill Avenue for one week in April, 2021. The consultant noted that there was a "low contact/stay at home" order in place from the provincial government during this period, which may have slightly depressed the volume data. The 85th percentile speed that was observed was on average 40-44 km/hr depending on the location. This means that based on the current design of the road, most drivers feel comfortable driving between 40-44 km/hr along that stretch. Notably, the school zones near Monterey Avenue and Transit Road each had 85th percentile speeds of 40 km/hr despite the school zone signage. These driver behaviours match the data collected in the lead up to the District's Speed Limit Study in 2016, and the 40 km/h speed limit of that road matches Council's direction on speed limits in the District.

Parking utilization data was also analyzed as part of the study. Parking data was collected over a 3-day period so as to capture parking use during the midday, evening, weekday, and weekend times. The data illustrated that most of McNeill Avenue has below 50% parking utilization, which provides a wider driving surface and thus encourages vehicles to drive more quickly than they would if parked cars were present.

The road cross-section was measured and found to be approximately 8.6 m from curb to curb. The road is too narrow to support two-way travel, parking on both sides, and bike lanes. Typical lane widths are 2.0 m for a parking space and 3.0-3.3 m for a travel lane. If two vehicles are parked directly opposite each other (thus taking up 4.0 m,) there is only 4.6 m of asphalt left, which essentially turns the road into a one-lane, two-way road. The report concludes that the road is not designed to accommodate all of the requirements currently imposed on it.

The consultant separated the corridor into two sections - the higher vehicle volume section west of Victoria Avenue, and the lower vehicle volume section east of Victoria Avenue. Two concepts were prepared for each section. These will be discussed in more detail in the Analysis section of this report.

ANALYSIS

Signage Adjustments

The existing road design is such that most drivers feel comfortable driving slightly faster than the posted 40 km/hr speed limit. Staff is recommending changes to the roadway that will affect driver speeds, such as mid-block traffic calming islands and curb extensions. These changes are expected to bring most driver speeds down to the 40 km/hr limit. There are two school zones along the corridor which have been historically ineffective, since no other changes were made to the roadway to ensure drivers were compelled to slow down. Our design consultants recommend removing the school zone signs because they are not as effective unless they are immediately adjacent to a school. Staff agree with the recommendation to remove the signs but only when the corridor improvements are constructed.

The new design of the road is still meant to achieve the OCP intent for the road, which is a collector road with traffic volumes consistent with historical data and traffic speeds under 40 km/hr. The corridor improvements proposed by this report will have a greater impact on pedestrian safety than the current school zone signage. The crossing distances will be shortened for students crossing the road at Victoria, Monterey, and Oliver. Driver

speeds will be slower, which will increase driver reaction time. If the desired outcome for this area is to encourage drivers to keep speeds closer to 30 km/hr, the design intent of the road would need to be changed and further traffic calming measures would need to be investigated and proposed.

East of Victoria Avenue Improvements

Traffic Calming Concept 1 consists of mid-block traffic calming by narrowing the roadway, and converting the crosswalks at Monterey Avenue and Victoria Avenue to raised crosswalks. The crosswalk at Oliver Street would receive curb bump-outs on both sides of the road to shorten the crossing distance.

Traffic Calming Concept 2 consists of the same mid-block traffic calming by narrowing the roadway. It also consists of constructing curb extensions at the crosswalks at Monterey Avenue, Victoria Avenue, and Oliver Street. Both concepts are illustrated in the attachments to this report.

Both treatments deliver similar benefits. The mid-block traffic calming curbs will take away parking spaces, but these blocks have very low parking utilization. Pedestrian safety would be improved at the crosswalks under both concepts. The advantage of curb extensions is that they shorten the crossing distance for pedestrians, and the advantage of raised crosswalks is that they act as speed bumps and force drivers to slow down. A raised crosswalk treatment costs approximately \$60,000, and a curb extension treatment costs approximately \$20,000.

Staff recommends that Council consider Concept 2. Drivers in Oak Bay are more familiar with curb extensions as a means of traffic calming, and they can be installed at a lower cost, with less disruption to the road during construction.

West of Victoria Avenue Improvements

Traffic Calming Concept A consists of a 1.8 m wide bike lane on westbound McNeill Avenue, and painted sharrows on Eastbound McNeill Avenue. In order to accommodate a painted bike lane, parking would be removed from both sides of McNeill Avenue.

Traffic Calming Concept B consists of 3.35 m wide lanes on for each direction, with painted sharrows and traffic calming curbs. To accommodate this treatment, parking would need to be removed from one side of McNeill Avenue. The consultant has proposed alternating which side of the street has the parking spaces. Both concepts are illustrated in the attachments to this report.

Staff recommends that Council consider Concept A. Concept A delivers a bike lane for the uphill section of McNeill Avenue, where there is the greatest speed difference between vehicles at 40 km/hr, and cyclists. This would deliver greater cyclist comfort as they would not feel that they are impeding a vehicle as they climb the hill. It would also connect McNeill Avenue to the improvements that City of Victoria has made on Richardson Street, and would allow cyclists to connect from South Oak Bay to downtown Victoria, using either dedicated bike lanes or traffic calmed streets.

Concept A comes at the expense of the parking spaces along McNeill Avenue. The consultant did not survey parking availability on the side streets (such as Runnymede Place, Falkland Road, or Victoria Avenue). However, all single-family zoned homes in Oak Bay must provide a minimum of two off-street parking spaces. Oak Bay's *Parking Facilities Bylaw* in its current form assumes that most residents should be able to accommodate their vehicle parking needs on private property. Parking for trades or delivery vehicles would be a potential challenge if Council endorses Concept A; there are, however, no businesses along this portion of McNeill Avenue.

Concept B improves on the existing conditions by introducing sharrows for both directions. The lanes would be wide enough that vehicles would no longer need to cross the center line to get around parked cars. A total of 22 parking spaces would remain along the corridor, which is an advantage over Concept A. This option is considered a compromise that tries to address too many needs at once, and is therefore not effective in addressing any of the real concerns raised by residents.

Neighbourhood Consultation

Staff carried out an informal consultation process with residents in the vicinity of McNeill Avenue between Foul Bay Road and Victoria Avenue. A project page was hosted on the Connect Oak Bay Public Engagement site, and letters were mailed to all addresses within 50 m of McNeill Avenue (a total of 104 letters.) Letter recipients were asked to email the Engineering Services with their feedback. All emails received are included in the correspondence package attached to this report.

The proposed changes east of Victoria Avenue are minor, whereas the proposed changes west of Victoria Avenue will be more significant and have greater tradeoffs. The consultation was limited to the proposed changes west of Victoria Avenue.

As of the writing of this report, a total of 24 separate pieces of feedback have been received. They roughly categorize as follows:

Prefer Option A	9
Prefer Option B	9
Don't Change Anything	1
Would prefer a different concept	5

The 5 emails that could be categorized as "Would prefer a different concept" were generally proposing greater traffic calming elements - e.g., making the speed limit 30 km/hr, introducing a four-way stop at Falkland Road, introducing speed bumps, etc. Staff's concept for this work was to preserve McNeill Avenue's status as a collector road as outlined in the OCP; greater shifts for the character of McNeill Avenue were not contemplated as part of the work completed.

Several of the pieces of feedback suggested widening the road to make more room for bikes while still allowing cars to park. Relocating the curbs would greatly increase the cost, scope and complexity of the project. Such a project could be done but the increased requirements for consultation and design mean that construction would likely be pushed to 2024.

Summary

Staff is recommending the following changes be made to McNeill Avenue, to be designed in detail in 2022 and installed in 2023:

- Construction of curb extensions at the crosswalks at Monterey Avenue, Oliver Street, and Victoria Avenue
- Narrowing the roadway with traffic calming curbs at 4 locations between St. David Street and Victoria Avenue
- Implementing a westbound bike lane between Victoria Avenue and Foul Bay Road, including the removal of all on-street parking.
- Removal of unneeded school zone signage once the improvements have been constructed.

STRATEGIC PRIORITY SUPPORTED

Enhance and promote quality of life and sense of place

FINANCIAL IMPACT

All of the proposed traffic calming options in this report can be completed within the approved capital program budgets for Transportation Safety Improvements and Active Transportation, spread over 2022/2023. The staff recommended options are expected to cost \$100,000.

IAP2 FRAMEWORK ENGAGEMENT

☐ **INFORM** ☒ **CONSULT** ☐ **INVOLVE** ☐ **COLLABORATE**

TIMELINE/PROCESS/NEXT STEPS

Should Council support one of the concepts from the report, Staff will proceed to detailed design, and will plan to construct the traffic calming improvements in 2023 as part of that year's Capital program.

OPTIONS

THAT the report titled "McNeill Avenue Traffic Calming", authored by Stephen Rennick, Manager of Engineering Services, dated June 20, 2022 be received.

And that the Committee consider the following staff recommendation(s):

THAT the Committee recommend to Council that a detailed design of traffic calming improvements on McNeill Avenue be completed, to be constructed as part of the 2023 Capital program.

Alternatively, staff await another direction.

Respectfully submitted,

Stephen Rennick, Manager of Engineering Services

With respect to the Financial Impact described in this report, I concur with the staff recommendation.

Christopher Paine

Christopher Paine, Director of Financial Services

I have read and consider staff's recommendation to be supportable for Council's consideration.

Selina Williams

Selina Williams, Chief Administrative Officer

ATTACHMENTS(S):

[McNeill Options Slides](#)

[McNeill Traffic Calming Report Final Report - 2021-09-24 signed](#)

East of Victoria Avenue – Concept 1



East of Victoria Avenue – Concept 2



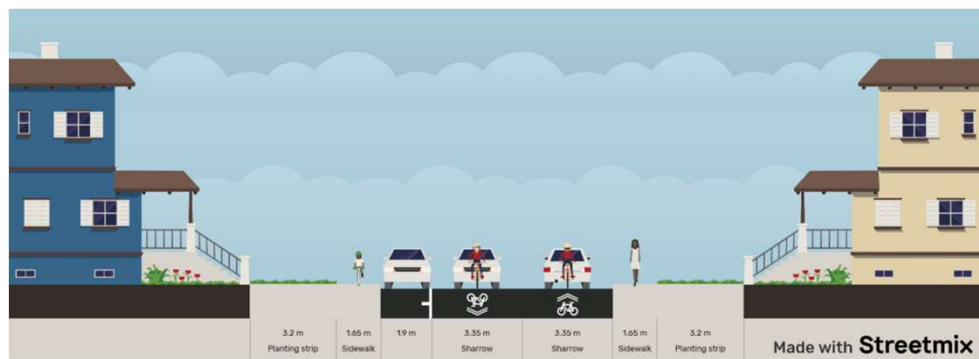
West of Victoria Avenue – Concept A



Pro – Bike lane on the steep uphill section

Con – No on street parking

West of Victoria Avenue – Concept B



Pro – Conserves 22 parking stalls

Con – Doesn't provide as much cyclist accommodation

McNeill Avenue Traffic Calming Review Final Report

District of Oak Bay



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MCNEILL AVENUE

Traffic Calming Review Final Report



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2021-09-24

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Reviewer:

Date: September 24, 2021

File No.: 3027.B01



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1.0 INTRODUCTION

Watt Consulting Group was retained to undertake an assessment of current traffic conditions on McNeill Avenue in Oak Bay, BC. This assessment will review existing conditions (traffic speeds, volumes, active transportation accommodation) on the corridor from Foul Bay Road to Newport but will focus on the section west of Transit Road. Then assess the need for traffic calming devices and identify the type and placement of signs, devices, and pavement markings (if any). The review will also include an assessment of the existing centerline (that is in some places), on-street parking use, and placement of school zone signs on the corridor.

2.0 SITE CONTEXT

McNeill Avenue is an east-west urbanized road through a detached single-family neighbourhood connecting to Victoria and Foul Bay Road in the west with Newport Avenue at the east extent. See **Figure 1** for an overview map. There are two schools south of McNeill Avenue (St. Michaels Junior School [K-5] & Monterey Middle School [6-8]). The route has an urbanized cross-section with curb and gutter and parking on either side of the road. The Oak Bay Active Transportation Strategy defines McNeill Avenue as a commuter bike route connecting residents from south Oak Bay to Richardson Street in Victoria. There are also two bus routes that use a portion of McNeill Avenue, Route 1: Downtown / South Oak Bay and Route 2: James Bay / South Oak Bay / Willows. The road is used by locals, school traffic (vehicle, bike, pedestrian), and commuter cyclists.

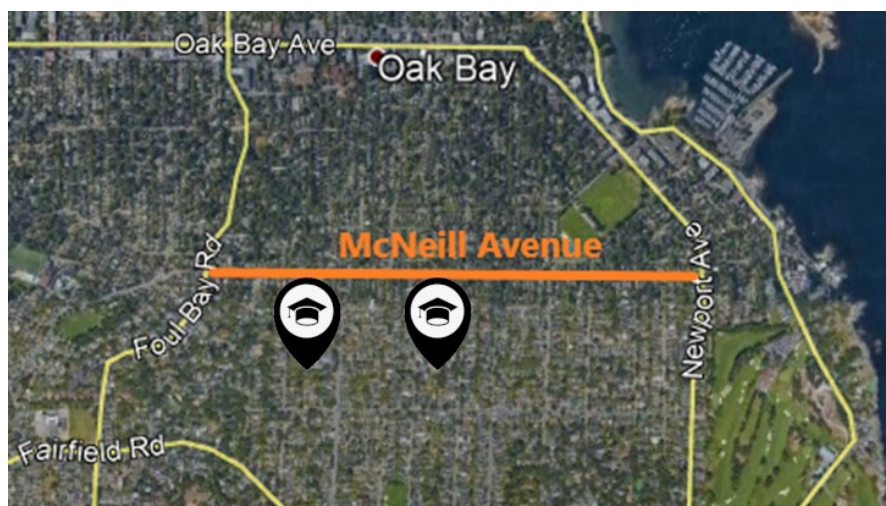


Figure 1: Overview



3.0 DATA COLLECTION

Data was collected by WATT to determine if volumes and / or speeds are an issue. A parking count was also conducted to determine utilization and if installed traffic calming measured will affect parking supply in a meaningful way. Road tubes were installed at three locations of interest as shown in **Figure 2**. The specific locations from west to east are:

- McNeill Avenue between Runnymede Place and Falkland Road;
- McNeill Avenue between Hampshire Road and Monterey Avenue; and
- McNeill Avenue between St. David Street and Transit Rd.



Figure 2: Tube Counter Locations



Data was collected during the week from April 6 to April 13, 2021. At the time of the count, the province of British Columbia was under a provincial health order to limit contact outside of your immediate family in order to reduce the spread of COVID-19. Although schools were in session, no gathering of large groups was permitted, and restaurants were open for takeout or patio dining only. Traffic volumes counted may be slightly depressed from regular non-COVID-19 rates. Speed data is not expected to be affected.

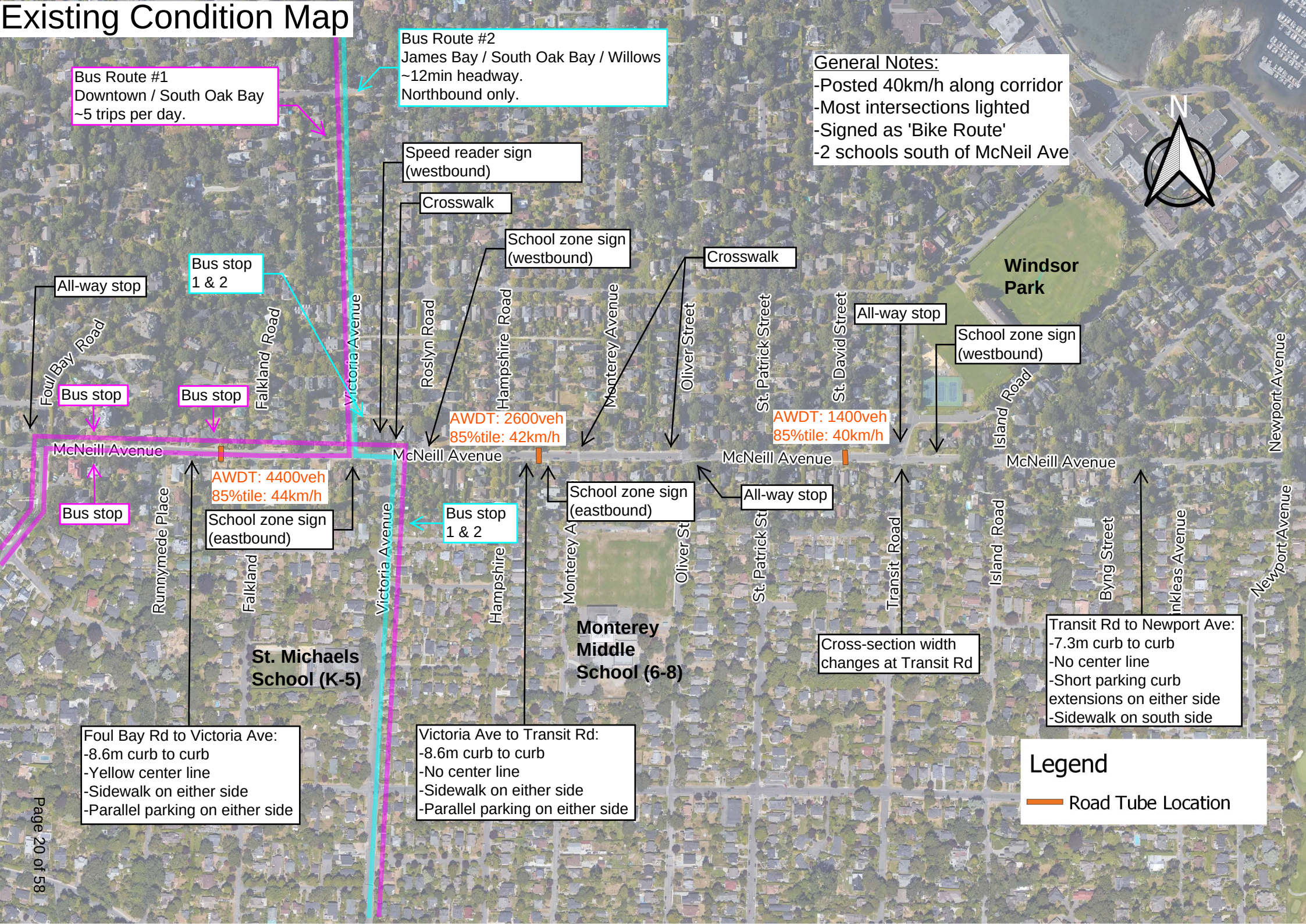
One week of data was collected at the two eastern most count locations, and only one full day of data was obtained from the western most counter between Runnymede Place and Falkland Road. Unfortunately, this tube counter had an issue, and the data was considered invalid past the first day. This is not an issue however, as one full day of data was collected during a weekday, which is when the corridor experiences it's heaviest volumes.

Parking data was collected over a 3-day period to understand parking utilization for a week and weekend day during the midday and nighttime periods.

4.0 EXISTING CONDITIONS AND ANALYSIS

An overview Existing Condition Map (**Figure 3**) has been developed as a summary of the following subsections on McNeill Avenue's characteristics.

Existing Condition Map





4.1 SPEED

Speed data separated by time of day was analyzed for the corridor. McNeill Avenue has a 40km/h posted speed limit and two 30km/h school zones along the route to accommodate children crossing the road at crosswalks. These crosswalks are located at the intersections of McNeil Avenue / Victoria Avenue, McNeill Avenue / Monterey Avenue, and McNeil Avenue / Oliver Street. There is also a vehicle activated speed sign westbound at Victoria Avenue. The route has free flowing traffic between Foul Bay Road and Transit Road which are both all-way stop controlled. See **Table 1** for 85th percentile speed data. It is generally recognized that the 85th percentile speed is the comfortable running speed for a given route and is the typical metric for vehicle speed analysis.

TABLE 1: 85TH PERCENTILE SPEED COUNTER DATA

Location	8:00am to 5:00pm	5:01pm to 7:59am	Day Average
West of Falkland Rd	44km/h	46km/h	44km/h
West of Monterey Ave	40km/h*	44km/h	42km/h
West of Transit Rd	40km/h*	41km/h	40km/h

*30km/h posted school zone

Table 1 breaks down the speed by time of day to extract the vehicle speeds during and outside of the 30km/h school zone. Regardless of direction (east or westbound) speeds were consistent and generally in line with the posted 40km/h speed limit. However, the posted 30km/h school zone did not see a significant lowering of speed. Vehicles slowed down 1-4km/hr but were still 10km/h over the 30km/h school zone speed limit. Given that the schools are not located on this road, school zone signage may not be the correct treatment. Signage alone is often not a sufficient deterrent for drivers to slow down. If a driver feels comfortable travelling at a higher speed, generally they will do so.



Traffic calming can play a large factor in reducing vehicle speeds via traffic calming techniques such as horizontal (curb extension) and vertical (speed hump) deflections.

A previous study was conducted as part of the 2015 District of Oak Bay Speed Limit Review and at their collection point (west of Falkland Road) vehicle speeds remain very similar.

There is an existing vehicle activated speed sign westbound near Victoria Avenue. As the data shows, speeds remain 10km/h higher than the school zone's 30km/h limit. Again, this can be helpful to remind motorists what speed they are travelling but these signs are often ignored if the road geometry allows. Further traffic calming measures should be explored to lower vehicle speeds in these areas and at zebra crosswalks to protect pedestrians.

The speeds collected would be considered high if this was to be designated as All Ages, All Abilities (AAA) bikeway, where cyclists are expected to share the lane with vehicles. Given it is a commuter bikeway, this may be deemed as satisfactory, however, if the District is to consider making this an All Ages, All Abilities (AAA) cycling facility, additional measures should be taken to lower the running speed along the corridor closer to 30km/h or consider adding dedicated space for bicycles.



4.2 VOLUME

Volumes along the corridor have been separated by average daily traffic and average weekday traffic. See **Table 2** for a summary of collected data.

TABLE 2: VEHICLE VOLUME COUNTER DATA

Location	Avg Daily Traffic (ADT)	Avg Week-day Traffic (AWDT)	Heavy Vehicle % (Single Unit Truck or Bus)
West of Falkland Rd	- *	4439	3%
West of Monterey Ave	2437	2662	3%
West of Transit Rd	1328	1434	2%

*Only one day of data collected due to tube counter issue

Some of the traffic volume is associated with the two schools south of McNeill Avenue. The weekdays have higher volumes due to school traffic and commuting. East and westbound volume by direction is fairly balanced as well.

The volume on McNeill Avenue is heaviest at the west end and decreases substantially near the intersection of Transit Road. What this tells us is that this is not a major thoroughfare from one end of McNeill Avenue to the other as west of Transit Road only has 1/3rd of the volume of that west of Falkland Road. However, the substantial increase in volume towards the west end of McNeill Avenue can be viewed as potential shortcutting by residents to avoid the busy Oak Bay Avenue that has various crosswalks, signals and a less direct route to downtown Victoria. Oak Bay Avenue has a higher road classification and should be the preferred route for longer trips. If horizontal and vertical traffic calming measures were implemented on McNeill Avenue, it would discourage this behavior.



The City of Victoria is slated to upgrade Richardson Street to a AAA cycling facility. Richardson Street is the continuation of McNeill Avenue west of Foul Bay Road in the City of Victoria. As part of their upgrade, traffic calming in the form of diversion is planned. This will have a positive effect on McNeill Avenue as traffic volumes will most likely decrease a bit.

4.2.1 VEHICLE CLASSIFICATION

The tube counts are able to classify vehicle type based on their respective wheelbase. Reviewing this data, it is found that the corridor has very little heavy vehicle traffic. 97-98% of vehicles were car or motorcycle. The 2-3% includes transit buses and single axle trucks. No semi-trailer trucks were countered. Heavy vehicles are not an issue on this corridor.

4.3 PARKING

A parking count was conducted to determine utilization and help ensure that any installed traffic calming measures would not affect parking supply in a meaningful way. Parking data was collected over a 3-day period to understand parking utilization for weekday and weekend during the midday and nighttime periods. See **Figure 4** for the parking utilization map for the McNeill corridor.

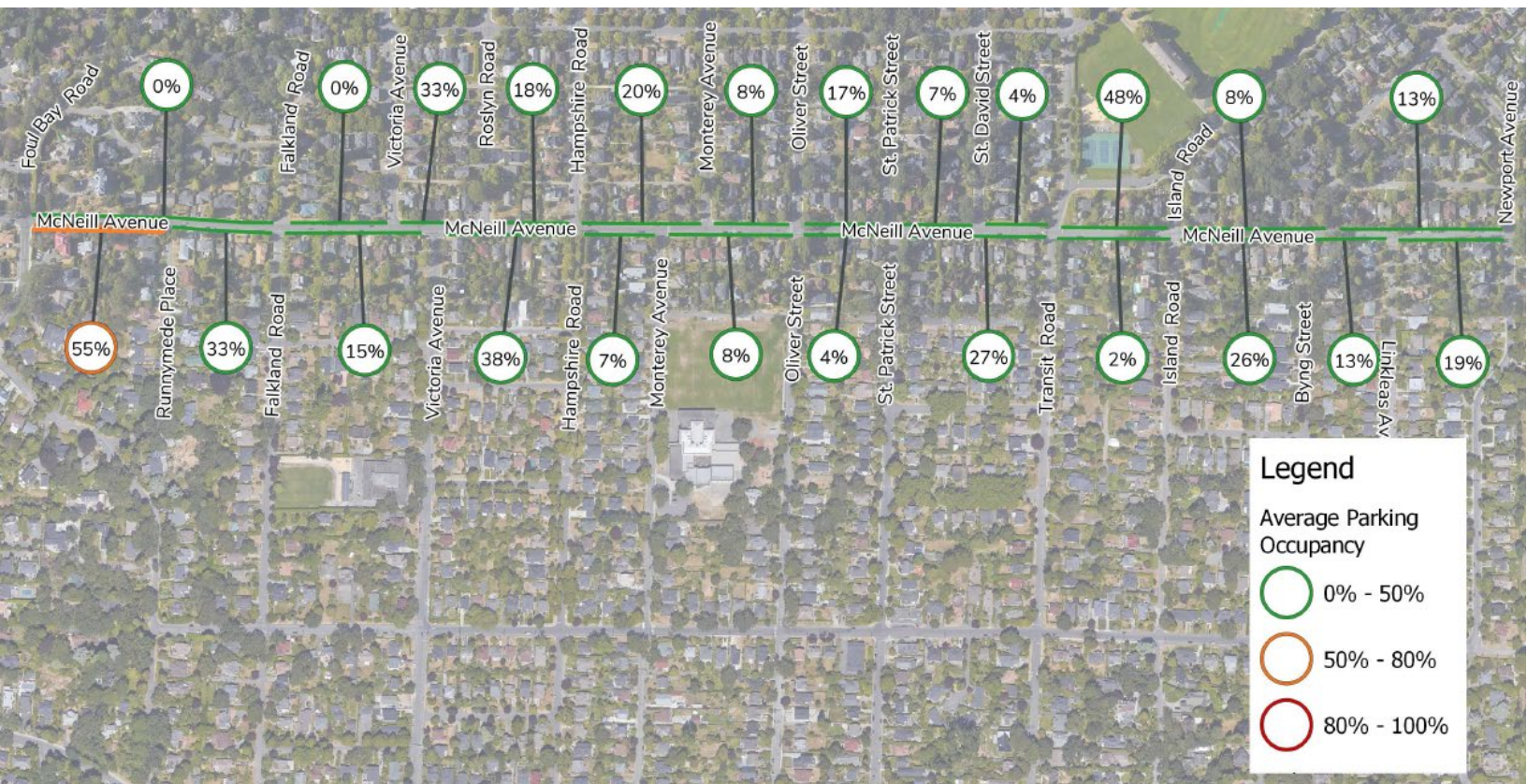


Figure 4: Parking Utilization

Most of the corridor has very low parking demand. The only section with a medium (50-80%) level of parking demand is the south side on McNeill between Foul Bay Road and Runnymede Place. Typically, parallel parking along a roadway can be considered a traffic calming measure. This is due to a decrease in travel lane width when a parked vehicle is present. This benefit may not be fully realized as there is not enough street parking demand to take advantage of this technique. With utilization so low, it acts counter to the above point and provides a wider travel lane for which vehicles feel comfortable driving at a higher speed. In the absence of heavy parking demand, horizontal (curb extension) and vertical (speed hump) traffic calming measures should be looked at in areas of concern.



4.4 CROSS-SECTION AND GEOMETRY

McNeill Avenue is a straight east / west road with no sightline issues. See **Table 3** for a summary table.

TABLE 3: GEOMETRY SUMMARY

Location	Cross-section (Curb-to-Curb)	Centerline?	Parallel Parking?	Continuous Sidewalk?	Alignment?	Vertical Grade?
Foul Bay Rd to Victoria Ave	8.4-8.6m	Yes	Mostly on South Side	North / South Sides	Straight	~3.5%
Victoria Ave to Monterey Ave	8.6m	No	Both Sides	North / South Sides	Straight	Flat
Monterey Ave to Transit Rd	8.6m	No	Both Sides	North / South Sides	Straight	Flat
Transit Rd to Newport Ave	7.3m	No	Both Sides in Parking Pockets	South Side	Straight	Flat

Looking at the cross-section width curb to curb for the whole corridor, there is not enough width available for the inclusion of bike lanes without removing parking on both sides of the road. This route is currently designated as a commuter cycling route, and many houses are fronting McNeill Avenue. The removal of parking on both sides is not recommended at this time. Further, the addition of bike lanes on both sides of the road does not take up the same cross-section width as parking, and as such, vehicles would feel more comfortable speeding with wider drive lanes. See **Figure 5** for the general cross-section of the roadway between Victoria Avenue and Transit Road.



Figure 5: McNeill Ave Near Victoria Ave Looking East

There is sidewalk provided on each side of the road between Foul Bay Road and Transit Road. East of Transit Road only has a continuous sidewalk on the south side of the road. Pedestrians are well accommodated in the area with dedicated space on either side of the travelled roadway.

The road is relatively flat with a bit of an incline between the Runnymede Avenue and Foul Bay Road intersections. In this section, the road has a 3.5% longitudinal grade up towards Foul Bay Road. This grade would slow down a cyclist substantially and create a more substantial speed differential between commuting cyclists and vehicles.

4.4.1 YELLOW CENTERLINE

As part of this report, the District asked WATT to review the existing yellow centerline on McNeill Avenue. There is a centerline located between Foul Bay Road and Victoria Avenue. This section of McNeill has the highest traffic volume (4500 veh/day) while also supporting parallel parking on both sides of the road on a narrow cross-section (8.4-



8.6m). See **Figure 6** for a top down view of typical vehicle maneuvers in and around this area.

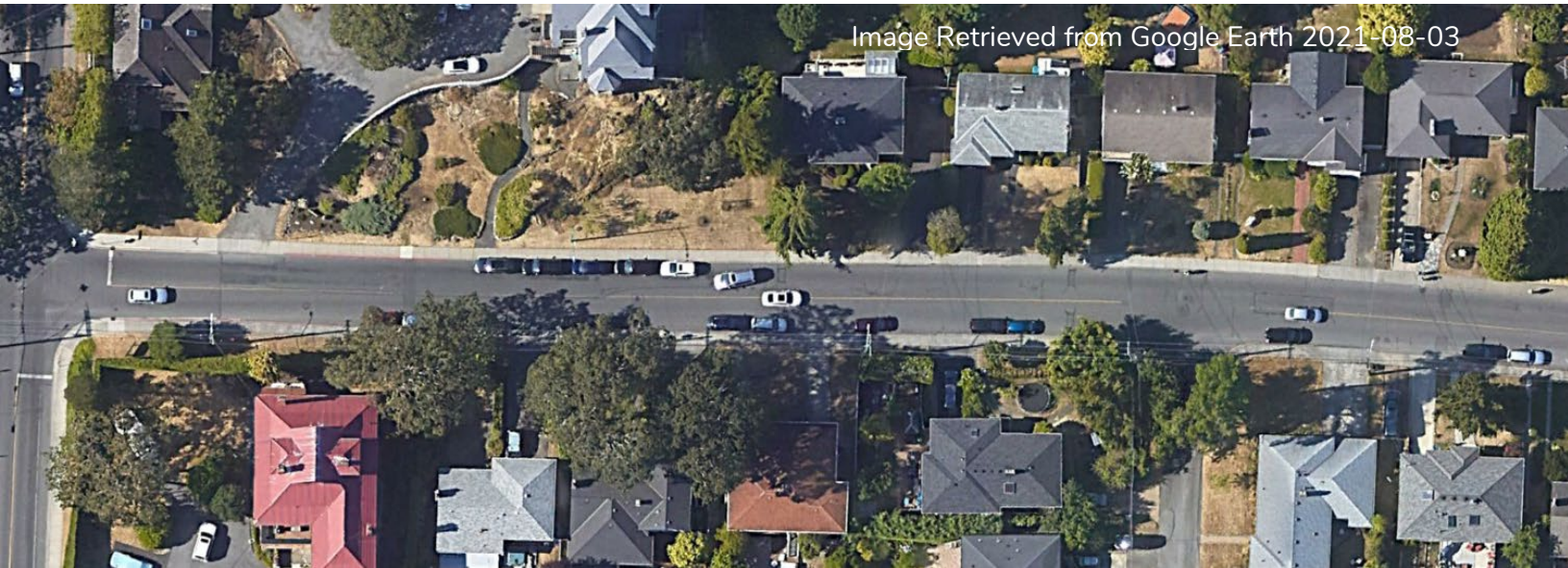


Figure 6: Parking and Vehicle Maneuvers – Foul Bay Road to Runnymede Place

Two of the eastbound vehicles are travelling over the centerline, and a westbound vehicle is queued to let an eastbound vehicle pass. The 8.6m cross-section width is roughly broken down as follows:

- 2.0m Parallel Parking
- 2.3m Drive Lane
- Center Line
- 2.3m Drive Lane
- 2.0m Parallel Parking

3.0m is generally the minimum lane width that is accepted by municipalities. Anything less than that and the roadway is put into a shared bi-directional lane situation which is typically more appropriate on lower volume roads without a centerline. Thus, the roadway should not have a painted centerline when only 4.6m is dedicated for both directions of vehicle traffic. McNeill between Foul Bay Road and Victoria Avenue is too



busy to support parallel parking on both sides while having a painted yellow centerline on the narrow cross-section. There has been reports of vehicle's mirrors being hit on this section which echoes the need for adjustment for this section.

Near the crest of McNeill Avenue near Foul Bay Road the cross-section narrows slightly to 8.4m. The width is too narrow for vehicles to feel comfortable parking on the north side of the road with the painted centerline. This creates a ~4.2m lane width, which likely makes vehicles feel more comfortable travelling at a higher rate of speed. The 85% speed was measured to be faster in the westbound direction.

The remainder of the route does not have a centerline except for ~20m on either side of the all-way stop at the McNeill Avenue / Transit Road intersection. On slower, less busy roadways, such as further east on McNeill between Victoria Avenue and Transit Road, not having a centerline can be an effective traffic calming technique if the combined vehicle travel lane is 4.0 – 5.5m. The cross-section here is 8.6m, resulting in a combined lane width of ~4.6m with parallel parking on either side.

4.5 ROAD CLASSIFICATION

Based on vehicle speeds, volumes, and cross-section width it is possible to classify the roadway to better determine its function. Once its function is classified, appropriate traffic calming measures can be identified. See **Table 4** below for TAC road classification.



TABLE 4: TAC ROAD CLASSIFICATION

Location	85th %tile Average	AWDT	Cross section (Curb-to-Curb)	TAC Road Classification
Foul Bay Rd to Victoria Ave	44km/h	4500veh	8.6m	Residential Collector
Victoria Ave to Monterey Ave	42km/h	2700veh	8.6m	Residential Collector
Monterey Ave to Transit Rd	40km/h	1500veh	8.6m	Residential Collector
Transit Rd to Newport Ave	-	<1500veh	7.3m	Residential Collector

* AWDT volumes rounded up to the nearest 100

The Transportation Association of Canada (TAC) gives a recommendation for road classification based on many factors. The critical ones in the case of McNeill Avenue include vehicle volume and roadway travel speed. TAC states, a residential collector has a typical operating speed of 30-70 km/h and a volume of less than 8000veh/day. A local residential road has a typical operating speed of 20-40 km/h and a volume of less than 1000veh/day. McNeill Avenue between Foul Bay Road and Newport Avenue falls into the lower end of the collector category with it operating more like a local residential road further east. TAC defines a residential collector road's function as traffic movement and land access having equal importance. In the case of McNeill Avenue, it is desirable to create conditions that reduce both the volume and the speed along it, to make it safer for pedestrians crossing the road at crosswalks and cyclists travelling on McNeill Avenue. This would include traffic calming measures such as horizontal and vertical deflections.



4.6 BUS ROUTES

There are also two bus routes that use a portion of McNeill Avenue, Route 1: Downtown / South Oak Bay and Route 2: James Bay / South Oak Bay / Willows. See **Figure 2** (Existing Condition Map) for exact route locations.

Route #1 has ~5 trips per day, whereas route #2 has a rapid ~12min headway throughout the day.

Any traffic calming measures that are proposed must take the required bus travel width (3.35m) and turning radius into consideration. Also, transit buses life cycle is likely impacted by negotiating vertical deflection (speed humps) on a regular basis.

4.7 CRITICAL PEDESTRIAN CROSSINGS

There are three zebra crosswalks along the corridor, which likely demarcate walking routes that access the schools on the south side of McNeill Avenue. A 30km/h school zone has been posted at each of these crossings in an effort to make the crossings safer for pedestrians and more visible to vehicles. These signs have proved ineffective as the 85th percentile speed of motorists is still above 40km/h during school hours. More substantial traffic calming measures should be considered to reduce the 85 % vehicle speeds in these locations. These measures could include curb extensions to reduce the crossing length while narrowing the travel lane to lower widths and slowing vehicle speeds or vertical deflection measures such as a raised crosswalk at the intersection or speed humps located in the midblock to slow vehicles approaching and entering the



intersections with zebra crosswalks. **Figure 7** shows an example of the zebra crossings available on McNeill Avenue.



Figure 7: An Example of the Crosswalks Provided on McNeill Ave (Monterey Ave)



4.8 CYCLING

The Oak Bay Active Transportation Strategy published in 2012, defines McNeill Avenue as a commuter bike route connecting residents from south Oak Bay to Richardson Street in Victoria. It is recommended that McNeill Avenue include paint markings (i.e. “sharrows”) indicating the appropriate bicycle travel location and signage identifying McNeill Avenue as a bike route. It is intersected by the planned Central Oak Bay Neighborhood Bikeway route on Oliver Street.

If the District were to implement the McNeill Avenue commuter bike route using the treatments identified in the Oak Bay Active Transportation Strategy, it would operate like a bicycle boulevard, also referred to as neighbourhood bikeways. TAC defines this as a shared roadway that provides a continuous corridor of suitable operating conditions for cyclists, including limiting exposure to motor vehicle traffic and designing for low motor vehicle speeds.¹ The BC Active Transportation Guide provides further distinction of these facilities into three levels of treatment:

- Level 1 treatments include signage and pavement markings.
- Level 2 treatments include traffic calming. The desired average daily traffic on a AAA bicycle boulevard is 500 motor vehicles per day or less and the maximum average daily traffic is 1,000 vehicles.
- Level 3 treatments include traffic diversions, which refer to devices that restrict motor vehicle movements at intersection while allowing unrestricted movements for people walking and cycling. They reduce motor vehicle volumes on bike boulevards.²

¹ Transportation Association of Canada. (2017). *Geometric Design Guide for Canadian Roads: Chapter 5 – Bicycle Integrated Design*.

² BC Active Transportation Design Guide, Chapter D2 – Neighbourhood Bikeways. Available online at: https://www2.gov.bc.ca/assets/gov/driving-and-transportation/funding-engagement-permits/grants-funding/cycling-infrastructure-funding/active-transportation-guide-low-res/2019-06-14_bcatdg_section_d_rfs.pdf

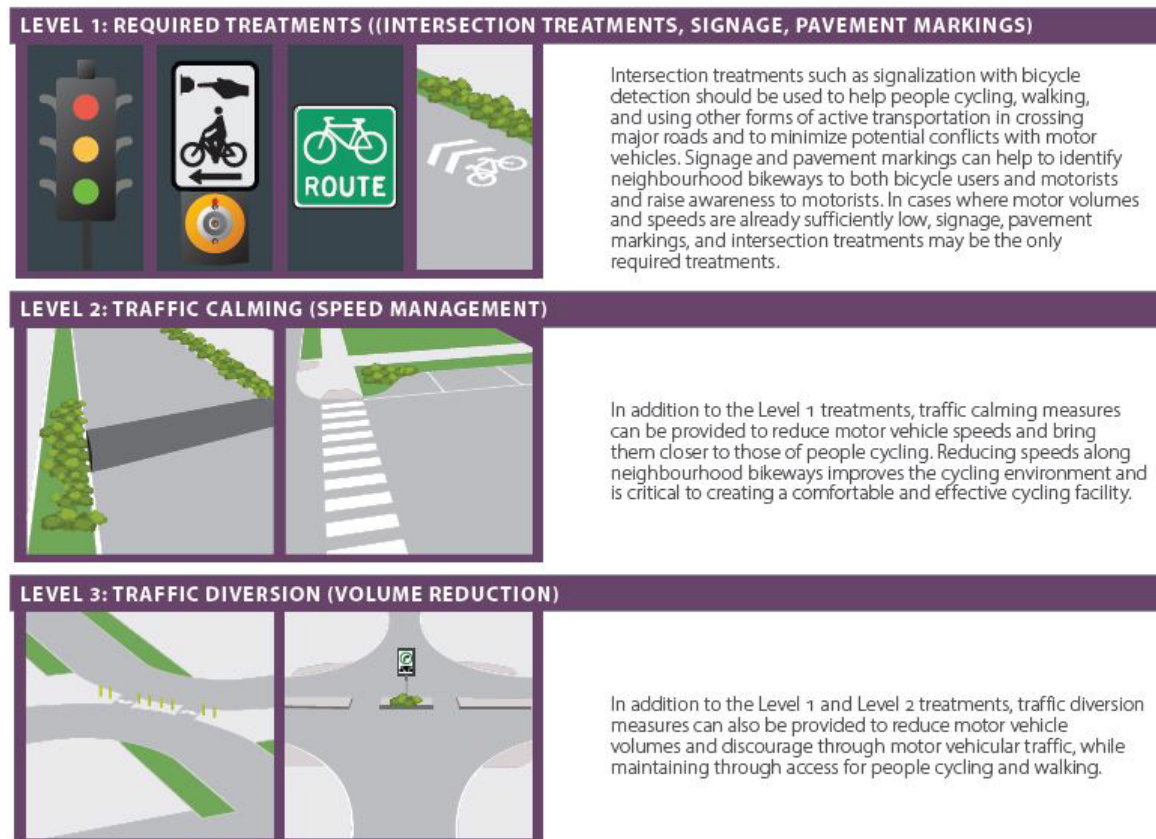


Figure 8: BC Active Transportation Design Guide Bike Boulevard Treatment Levels

Based on best practices and the BC Active Transportation Design Guide, the previously proposed treatments for McNeill Avenue would generally meet the definition of a Level 1 treatment of a bicycle boulevard, even though they do not provide intersection treatments such as bicycle signal detection and signalized crossings at busier roads.

Bicycle Boulevards can be installed on higher volume roads; however, it would not be considered AAA and would require further investigation for higher levels of treatment (e.g., traffic diversion measures). The desired clear width—referring to the road’s operating space—on a bicycle boulevard is between 4.0m and 5.5m, which provides ideal width to allow motor vehicles and bicycles to comfortably share the road, while helping to ensure that bicycle and motor vehicles travel at similar speeds. This is currently achieved along the whole corridor, where parking is currently allowed.



Given the speeds and volumes collected are considered outside the threshold of an AAA Bike Boulevard facility, if the District's goal is to consider making this an AAA cycling facility in the future, additional measures would be required to lower the operating speeds and traffic volumes along the corridor through the inclusion of diversion and directional closures – measures that are not supported by District staff at this time.

McNeill Avenue is well suited for cycling overall but the section between Foul Bay Road and Victoria Avenue should have some additional review put towards it to enhance safety and comfort for cyclists. The factors that make this section problematic include higher volumes (4500veh/day), speeds (44km/h), part of the road is on a bus route, and a relatively steep grade. The grade is ~3.5% upwards in the westbound direction between Runnymede Place and Foul Bay Road. In the uphill direction (westbound), enhanced cyclist facilities should be considered due to the higher volumes and speed differential between uphill cyclist traffic and vehicle traffic.

5.0 EXISTING CONDITIONS SUMMARY

McNeill Avenue is a candidate for traffic calming based on the existing conditions analysis undertaken. Current issues the roadway faces are as follows:

- Ineffective 30km/hr school zone signage at three critical pedestrian zebra crosswalks for McNeill Avenue. School children use these crossings.
- The centerline between Foul Bay Road and Victoria Avenue creates problems as the corridor is too narrow and high volume in this section to support both parallel parking on either side of the road and a centerline.
- Parking demand is the lowest between Victoria Avenue and Transit Road, which creates a very wide straight stretch for vehicle travel, resulting in higher vehicle speeds.
- The Oak Bay Active Transportation Strategy lists McNeill Avenue as a commuter bike route. Improvements should be made to increase safety on the Foul Bay Road to Victoria Avenue section, as it is higher volume (4500 veh/day) and has a



hill in the westbound direction, which increases the speed differential between vehicle and bike traffic.

Traffic calming efforts should be made to reduce vehicle speeds on McNeill Avenue which will make the roadway safer for pedestrians crossing the road and for cyclists traveling along the corridor.

6.0 OPTIONS

The following sections provide information on various traffic calming and speed management measures that could be applied on McNeill Avenue. More information and design guidance can be found in the Transportation Association of Canada (TAC) Canadian Guide to Traffic Calming 2nd Ed (2018).

Multiple traffic calming options have been prepared. Concepts 1 and 2 focus on the section of McNeill Avenue east of Victoria Avenue. Whereas Concepts A and B focus on the section of McNeill Avenue west of Victoria Avenue. **Appendix A** contains high level concept drawings that provide more detail than the figure overview in each subsection.

All options provide traffic calming benefits, and the District can choose a preferred combination. There is also the possibility of mixing and matching different elements from the concepts to customize a preferred concept. This customization could be discussed at a later date.

6.1 SIGNAGE

Regardless of the concepts chosen, signage suggestions remain constant with all of the options.

The road is currently posted for 40km/h with separate 30km/h school zones provided for each of the zebra crosswalks. The data suggests they are ineffective at lowering vehicle operating speeds on McNeill Avenue, given that the school zones are not adjacent to their associated schools. As suggested in the sections below, it is proposed to implement traffic calming measures, which should lower the operating speed while maintaining the same posted speed limit to 40km/h for the full length of McNeill

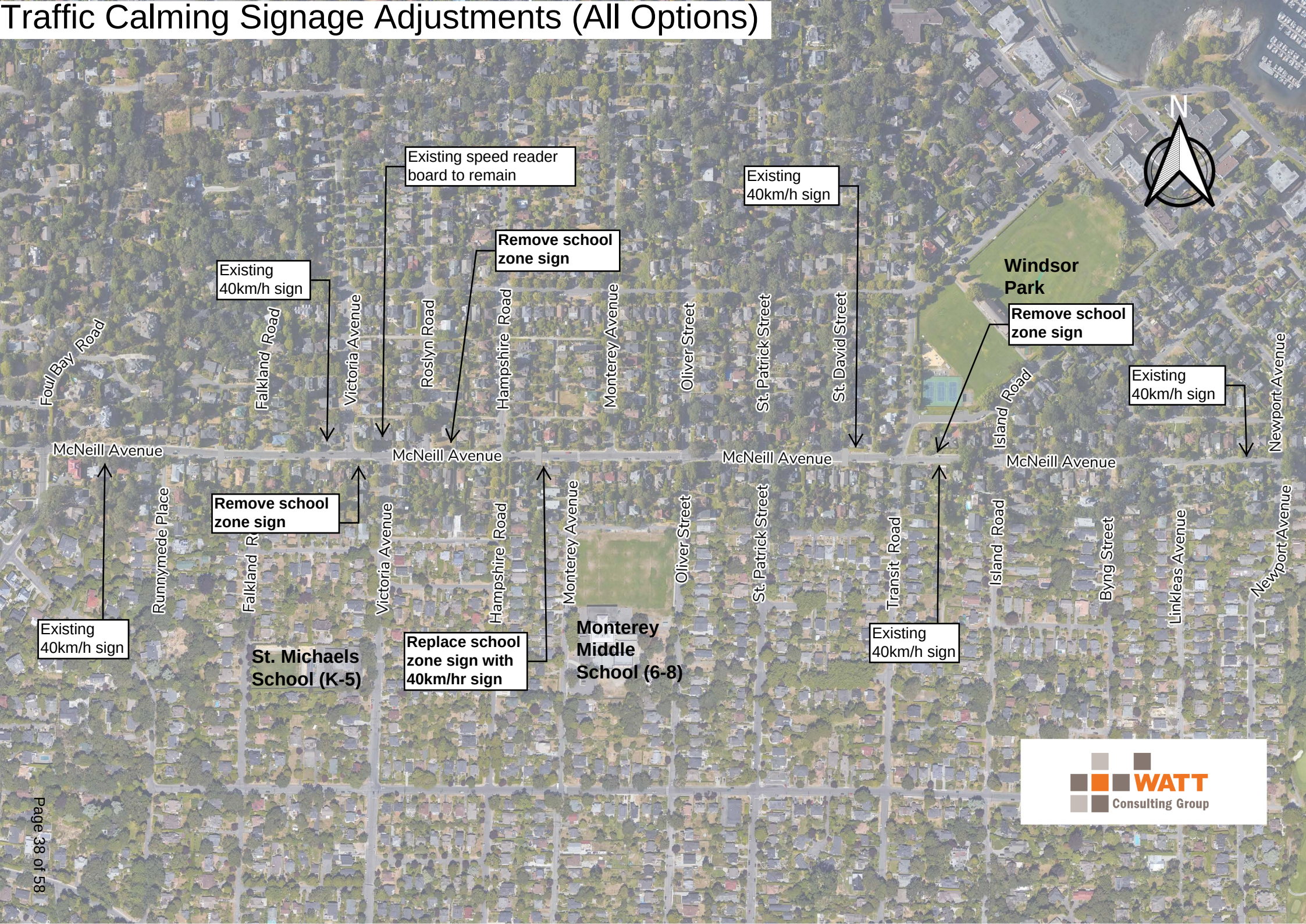


Avenue. See **Figure 9: Traffic Calming Signage Adjustments** on the following page for a visual showing the removal of school zones. For the concept where raised crosswalks are considered, installing a WA-50 speed hump sign with a 30km/h tab should be provided and a substitute for the school zone signage.

Surrounding the site, Foul Bay Road has a posted 30km/h speed limit and Newport Avenue has a 35km/h speed limit.

It is of note that the City of Victoria is currently in the process of implementing a city-wide default 30km/hr speed limit. If this is successfully piloted by Victoria, it is expected that this change would follow through to Oak Bay as the to municipalities are well integrated at the border. A 30km/hr speed limit would also be acceptable on McNeill Avenue with the given traffic calming measures.

Traffic Calming Signage Adjustments (All Options)





6.2 EAST OF VICTORIA AVENUE CONCEPTS (1, 2, & 3)

East of Victoria Avenue is characterized by low volumes (2700 veh/day), and the need for crosswalks for school children accessing the two schools south of McNeill Avenue. The 85 percentile is high (40km/h) for a street controlled by 30km/hr school zones. Efforts should be made to reduce the comfortable operating speed of the road to make the crossings safer while providing safety benefits to all the transportation users along McNeill Avenue.

6.2.1 CONCEPT 1 (EAST OF VICTORIA AVENUE)

Raised crosswalks are the main feature of Concept 1. These raised crosswalks are in the same locations of the existing crossings. The raised crossings (75mm height) are well spaced and aim to slow vehicle traffic at the crossing locations all while providing more visibility to crossing pedestrians. The raised crosswalk creates a difference in road elevation to reduce vehicle speeds, see **Figure 10** for example. Drivers who travel at higher speeds are forced to slow down, regardless of whether a pedestrian is present, as the devices cause an uncomfortable upward motion to the vehicles travelling above the design speed of raised crosswalk. A WA-50 speed hump sign with a 30km/h tab should also be provided at the approach for each direction of travel. The raised crossings should ramp down at the sidewalk letdown to allow for accessibility and drainage. Curb extensions are proposed at the Oliver Street all-way stop on the NW and SW corners to reduce the zebra crosswalk crossing distance. The curb extensions can be constructed out of poured concrete, Traffic Calming Curb (TCC) or a flexible delineator posts. TCC and delineator posts can be a permanent material or used as an interim material to pilot the traffic calming measure before installing permanent concrete curbing. Drainage concerns should be addressed as a part of the detailed design process and layout of these temporary traffic calming measures.

There are no transit routes on this section of McNeill Avenue and thus, transit buses are not affected by the installation of raised crosswalks in the specified locations. Parking should be removed within 20 meters of the crossings on either side to improve sightlines.



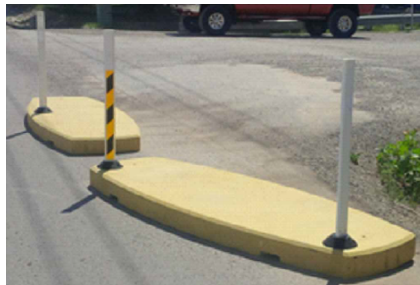
Figure 10: Raised Crosswalk Example

Parking utilization is low east of Victoria Avenue. At four locations midblock between the treatment intersections, road narrowing (curb extensions) are proposed. It is suggested to create these curb extensions with TCC as a measure that can be adjusted as need be. The option to convert the traffic calming curbs to poured concrete is an option in the future. The key is to narrow the shared road width to 5.5m between the TCCs while allowing a clear ~0.5m width along the gutter line for drainage. The 5.5m width is based on recommendations from the BC AT Design Guide for bike boulevards. This should allow enough space for vehicles and bikes to mix while also serving as a traffic calming measure to slow down vehicle traffic. A yellow centerline is not recommended as the travelling width is not wide enough for dedicated east/westbound lanes. The lack of a centerline also functions as a traffic calming measure on this low volume section of roadway. See **Figure 11: Concept 1** on the following page.

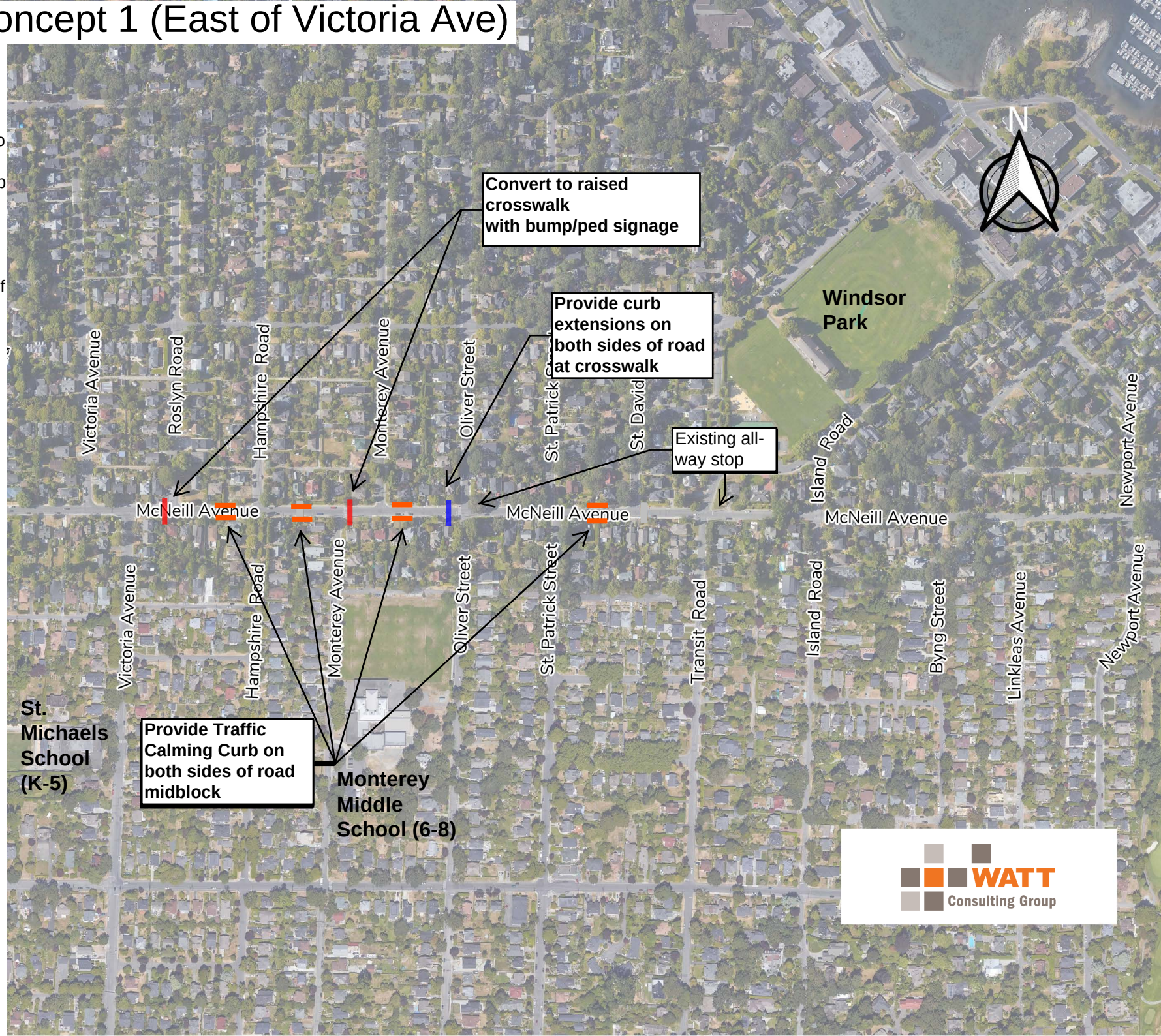
Traffic Calming Concept 1 (East of Victoria Ave)

Concept 1 Summary:

- Provide raised zebra crosswalks at two western most crosswalks.
- Provide curb extensions at all-way stop crosswalk (flexible delineator posts, Traffic Calming Curbs, or curb & gutter).
- Narrow roadway midblock with 4 sets of Traffic Calming Curb on both sides of road. Position to provide 5.5m shared vehicle lane.
- No centerline.
- 40km/h posted speed along corridor with 30km/h 'bump' warning signage at raised crosswalks.
- Remove school zone signage.



Traffic Calming Curb





6.2.2 CONCEPT 2 (EAST OF VICTORIA AVENUE)

Curb extensions are the main feature of Concept 2. These curb extensions are in the same locations as the existing crossings and provide a shorter crossing distance for pedestrians while providing a physical narrowing of the roadway and a visual cue to vehicles to slow down and watch for pedestrians at the enhanced crossings. See **Figure 12** for an example. The curb extensions can be constructed out of poured concrete, Traffic Calming Curb (TCC) or flexible delineator posts. TCC and delineator posts can be a permanent material or used as an interim material to pilot the traffic calming measure before installing permanent concrete curbing. Drainage concerns should be addressed as a part of the detailed design process and layout of these temporary traffic calming measures. See **Figure 13** on the following page, which shows an example of new mid-block curb alignments being trialled in Kelowna, BC.



Figure 12: Curb Extension Example

Parking utilization is low east of Victoria Avenue. At four locations midblock between the treatment intersections, road narrowing (curb extensions) are proposed. It is suggested to create these curb extensions with TCC as a measure that can be adjusted as need be. The option to convert the traffic calming curbs to poured concrete is an



option in the future. The key is to narrow the shared road width to 5.5m between the TCCs while allowing a clear ~0.5m width along the gutter line for drainage. The 5.5m width is based on recommendations from the BC AT Design Guide for bike boulevards. This should allow enough space for vehicles and bikes to mix while also serving as a traffic calming measure to slow down vehicle traffic. A yellow centerline is not recommended as the travelling width is not wide enough for dedicated east/westbound lanes. The lack of a centerline also functions as a traffic calming measure on this low volume section of roadway. See **Figure 14: Concept 2** on the following page.

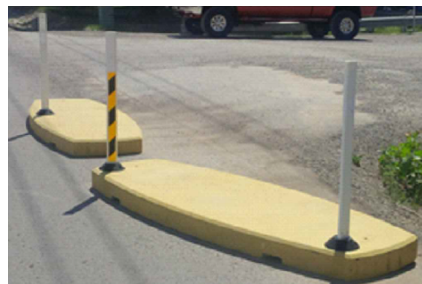


Figure 13: Temporary Traffic Calming Curbs in Kelowna, BC

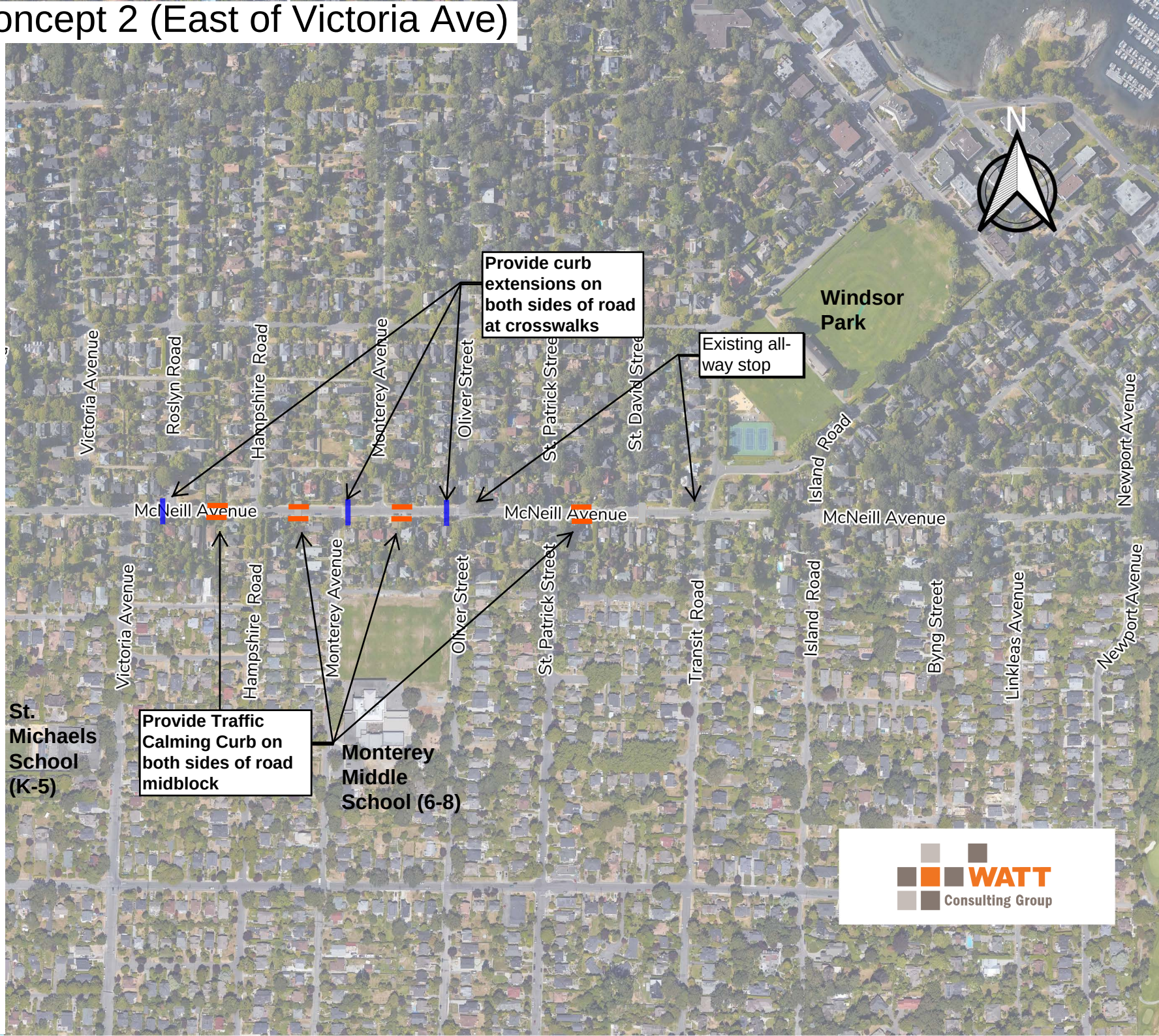
Traffic Calming Concept 2 (East of Victoria Ave)

Concept 2 Summary:

- Provide curb extensions at existing zebra crosswalks @ 3 locations (flexible delineator posts, Traffic Calming Curbs, or curb & gutter)
- Narrow roadway midblock with 4 sets of Traffic Calming Curb on both sides of road. Position to provide 5.5m shared vehicle lane.
- No centerline.
- 40km/h posted speed along corridor.
- Remove school zone signage.



Traffic Calming Curb





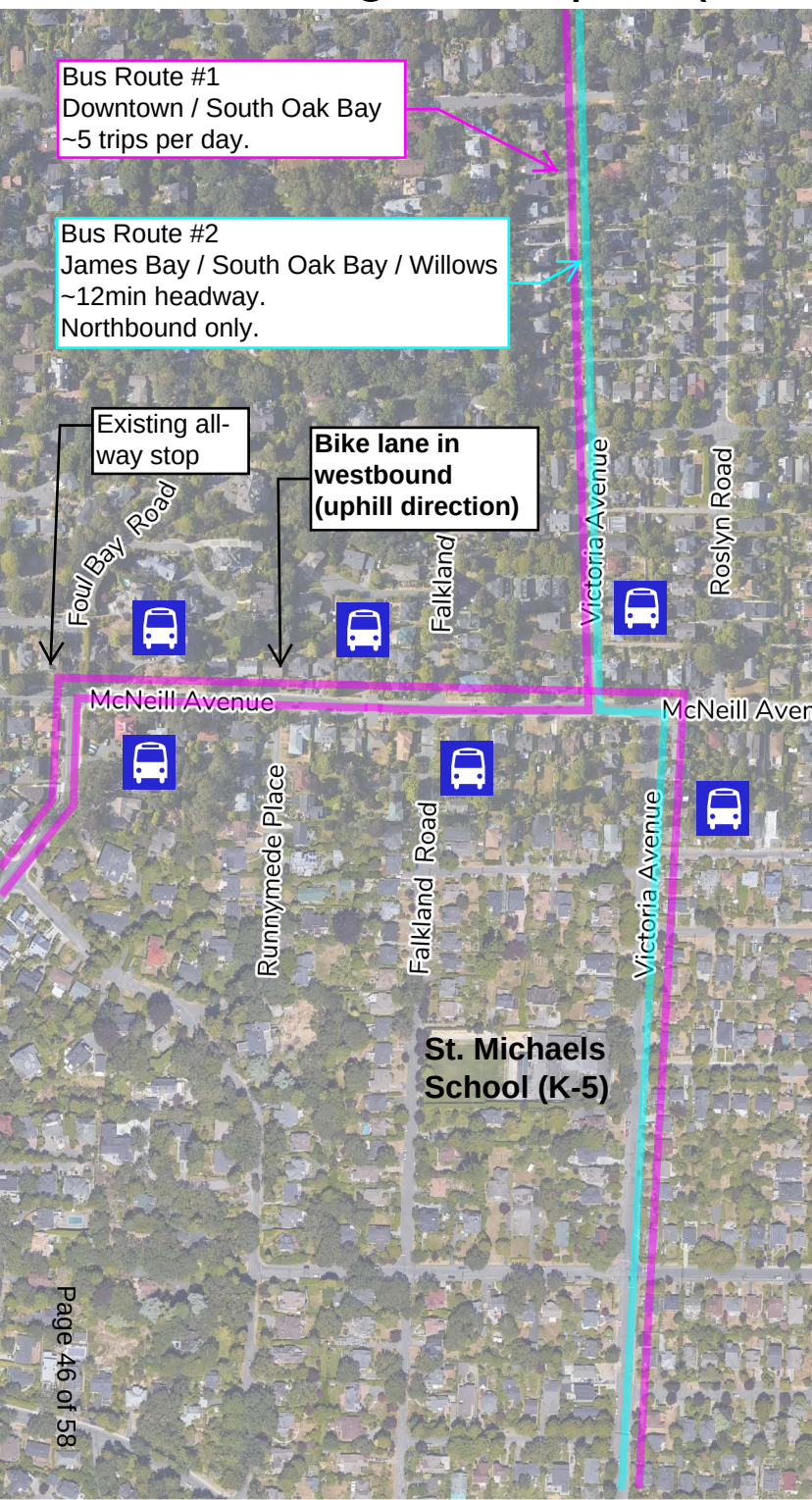
6.3 WEST OF VICTORIA AVENUE CONCEPTS (A & B)

West of Victoria Avenue is characterized by medium volumes (4500 veh/day), parking demand on the south side of the road, having a bus route (~5 trips per day), and uphill grade (~3.5%) in the westbound direction. The higher vehicle volumes with the narrow cross-section results in competing priorities between vehicles, parking, and cyclists. The 85 percentile is high (44km/h) given the mixing between cyclists and vehicles controlled by the current 40km/hr signage. Efforts should be made to reduce the comfortable operating speed of the road or perhaps provide a dedicated cyclist space to improve safety on this the busiest portion of McNeill Avenue.

6.3.1 CONCEPT A (WEST OF VICTORIA AVENUE)

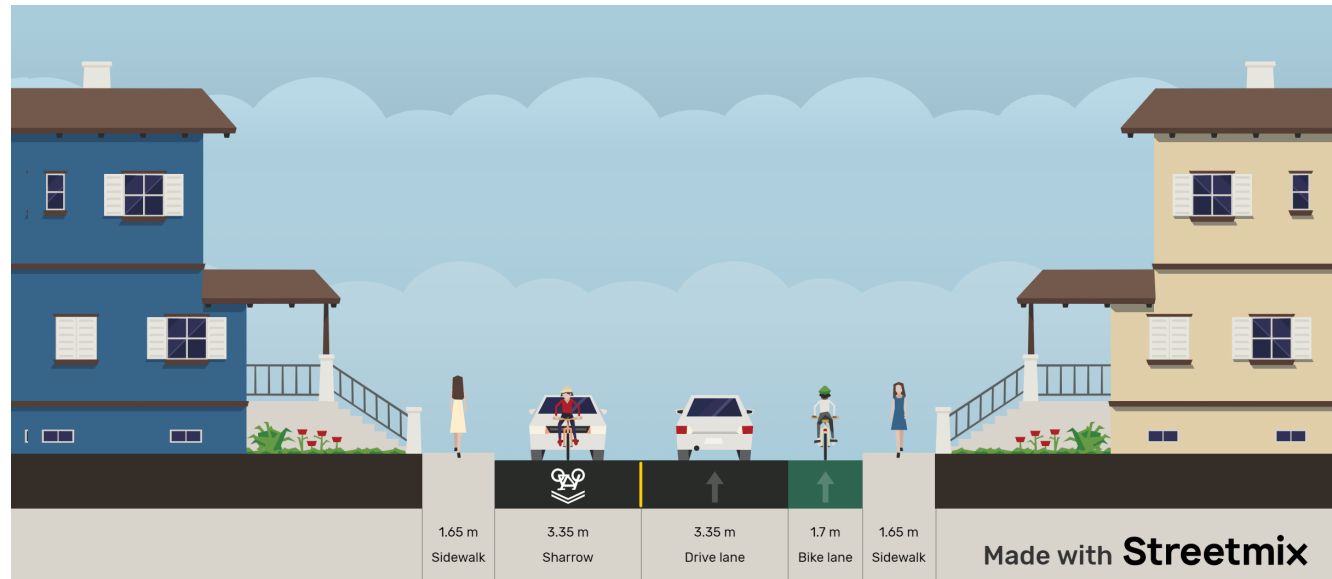
A revised cross-section is the main feature of Concept A. This revised cross-section provides a bike lane in the westbound (uphill direction). The ~3.5% uphill grade here results in a significant speed differential between westbound vehicles and cyclists. A dedicated bike lane is proposed westbound while the eastbound travel lane is shared between vehicles and cyclists. As eastbound vehicles travel downhill, the speed differential should be less and cyclists are encouraged to take the lane where the sharrows symbols are located. The drawback to this concept is that on-street parallel parking is eliminated from this stretch of road in an area with medium utilization (50-80%, 13 parking spots) on the south side of the road. Reviewing this concern, we see that the parking situation of the surrounding network is alleviated by parking capacity on the side streets of Runnymede Place, Falkland Road, and Victoria Avenue. The proposed 3.35m vehicle lanes accommodate transit buses on this portion of McNeill Avenue and a centerline is provided. This is narrower than the existing condition as vehicles currently do not park on the north side of the road due to perceived limited lane width. See **Figure 15: Concept A** on the following page.

Traffic Calming Concept A (West of Victoria Ave)



Concept A Summary:

- Revise cross-section between Foul Bay Rd & Victoria Ave:
3.35m lane (shared), 3.35m lane, 1.7-1.9m bike (westbound-uphill).
- No on-street parking.
- Yellow centerline.
- Bike symbols and signage.



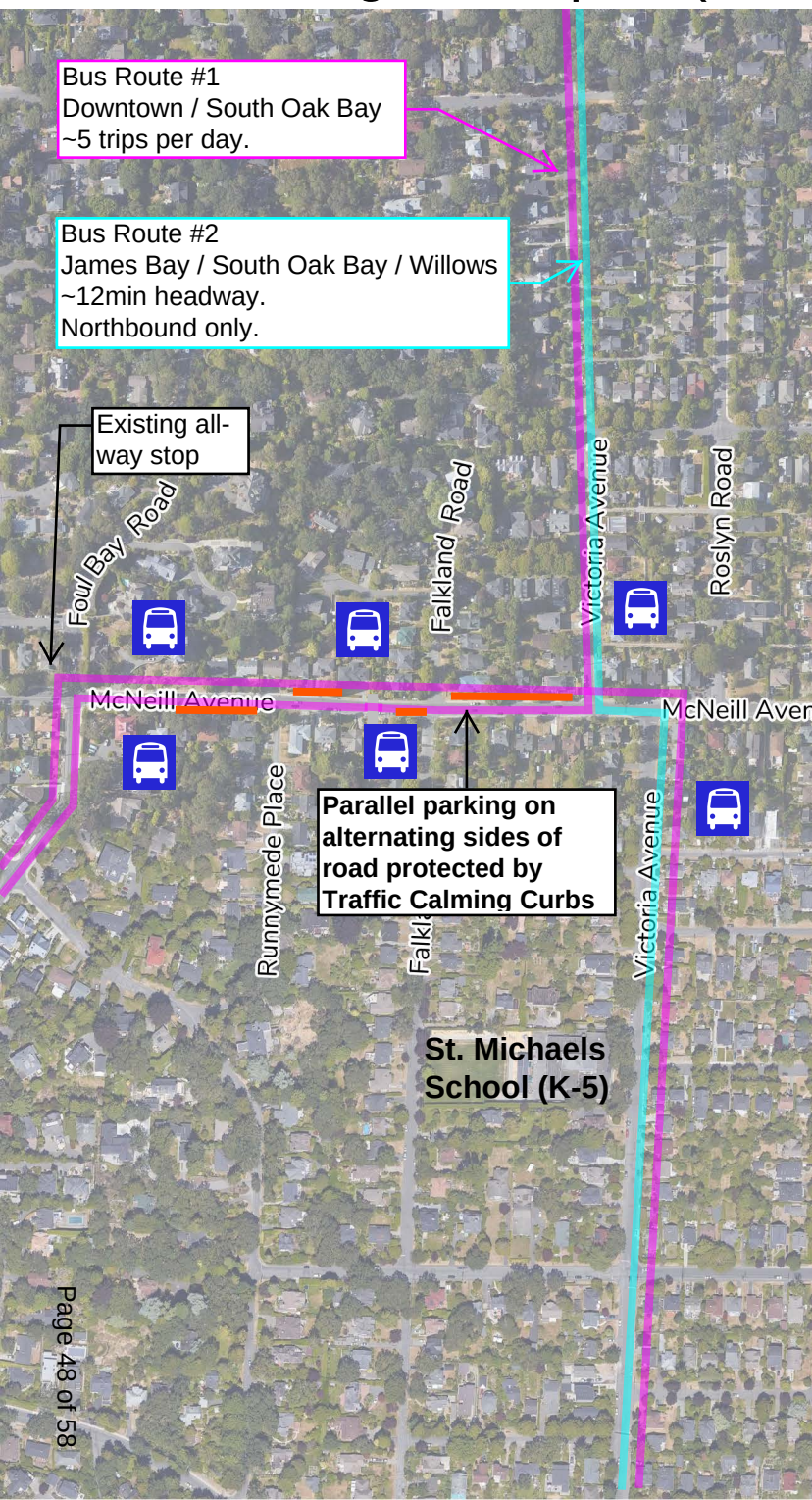


6.3.2 CONCEPT B (WEST OF VICTORIA AVENUE)

A revised cross-section with a focus on maintaining parking is the main feature of Concept B. This revised cross-section provides parallel parking on alternating sides of the roadway protected by curb extensions. These curb extensions are composed of Traffic Calming Curb (TCC) which would be bolted down in sections 1m wide and 2m long, see **Figure 16: Concept B** for a photo example. Care must be taken when locating the TCC along this stretch so that they do not affect bus stops or interfere with driveway access to the single-family housing along the road. They should also be placed in such a way that allows cyclists to ride on the curbside of them if they so choose. Curb extensions and parallel parking on the alternating side of the road will lower operating speed for vehicles on the roadway by physically narrowing the roadway and creating a lateral shift in the road alignment that causes drivers to lower speeds to move around these measures.

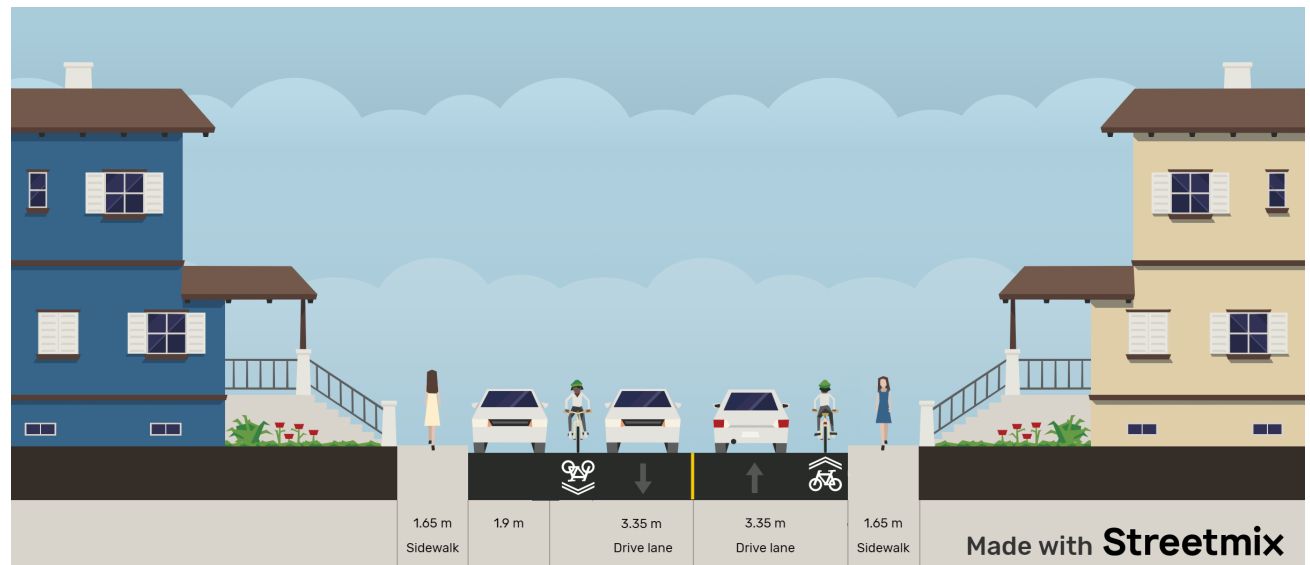
Transit buses and bus stops on this portion of McNeill Avenue are accommodated by the proposed 3.35m vehicle lanes with painted yellow centerline. This treatment is not ideal for cyclists as the travel lanes are shared on this medium volume road. Sharrows are provided at the recommended cyclist location in both directions. See **Figure 16: Concept B** on the following page.

Traffic Calming Concept B (West of Victoria Ave)



Concept B Summary:

- On-street parking on alternating sides of road controlled by 'No Parking' signage. See cross-section below.
- Provide traffic calming curbs as start and end of parallel parking areas. See below for example.
- Centerline provided but no white lines.
- Bike sharrow symbols and signage in both directions.





7.0 CONCLUSIONS & RECOMMENDATIONS

McNeill Avenue can be improved for all road users be in vehicle, bike, or pedestrian if traffic calming measures are implemented.

The existing operating speeds and volumes on McNeill Avenue are consistent for a collector roadway with a posted speed limit of 40 km/h. The measures proposed focus on areas where we have crossing school children and existing cycling usage on the McNeill commuter bike route. It is recommended to implement traffic calming measures for the length of McNeill Avenue between Foul Bay Road and Transit Road. **Section 6.0** details possible measures to be implemented and are divided by Concepts (A & B) west of Victoria Avenue and Concepts (1 & 2), east of Victoria Avenue.

Removing the improperly placed school zone signs, correcting centerline issues, and implementing traffic calming measures that lower the operating speed closer to the 40 km/ h posted speed limit on McNeill Avenue should provide a safer and more comfortable experience for all road users.

Please don't hesitate to contact the undersigned with any questions or concerns you may have, as traffic calming design can be an iterative process.



APPENDIX A: CONCEPT DRAWINGS



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TITLE:

McNEILL AVE TRAFFIC CALMING
CONCEPT 1
(EAST OF VICTORIA AVE)

WATT

Consulting Group

Calgary, Edmonton, Lloydminster,
Okanagan, Vancouver, Victoria

WATTCONSULTINGGROUP.COM

PROJECT: V:\Project_Files\3027 - McNeill Ave Traffic Calming - Oak Bay\5 - Design\3027 McNeill TC - Revised.dwg
These Design Documents are prepared solely for the use by the party with whom the Design Professional has entered into a contract, and there are no representations of any kind made by the Design Professional to any party with whom the Design Professional has not entered into contract.
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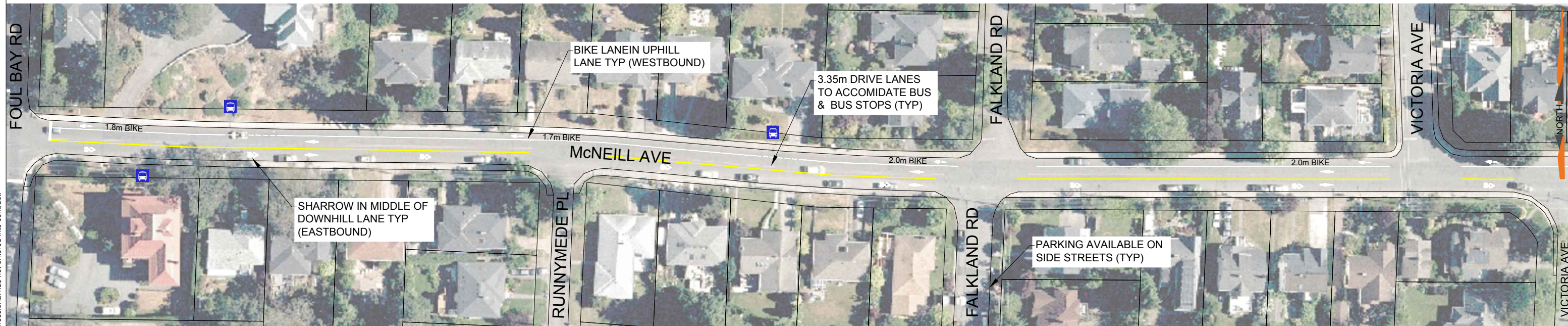
McNEILL AVE TRAFFIC CALMING
CONCEPT 2
(EAST OF VICTORIA AVE)



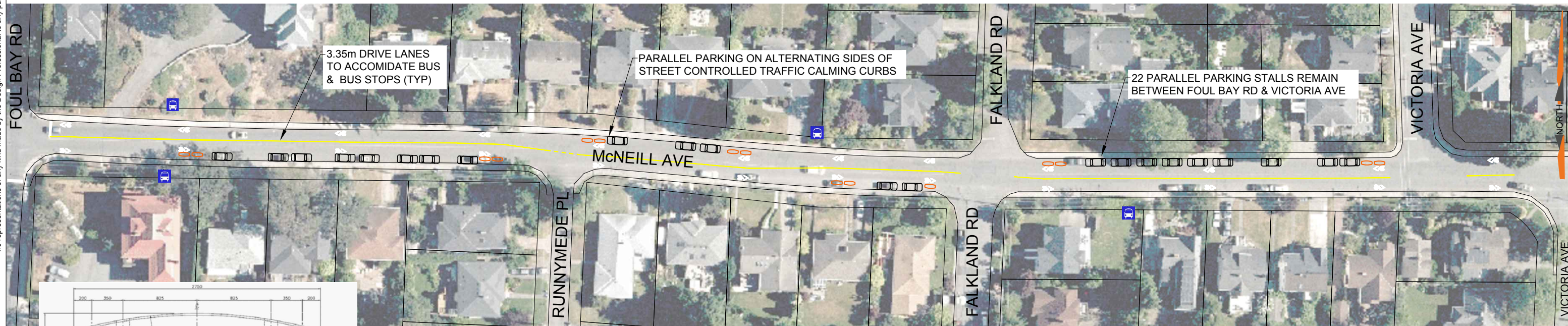
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Consulting Group

Calgary, Edmonton, Lloydminster,
Okanagan, Vancouver, Victoria

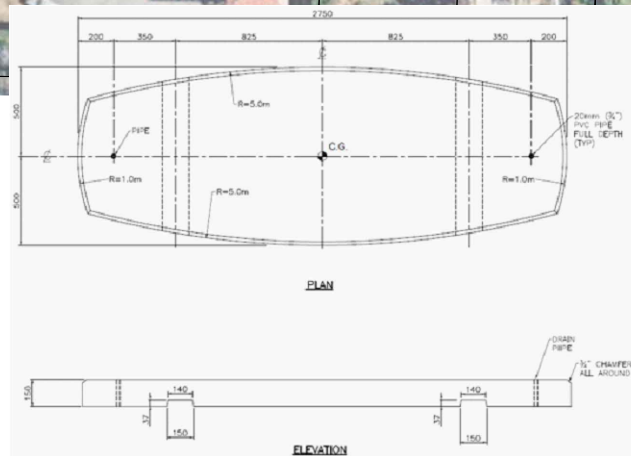
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CONCEPT A (BIKE LANE)



CONCEPT B (ALTERNATING SIDE PARALLEL PARKING)



TRAFFIC CALMING CURB DETAIL



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	TITLE: McNEILL AVE TRAFFIC CALMING CONCEPT A & B (WEST OF VICTORIA AVE)
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APPENDIX B: COUNT DATA

Road Tube Count Summary Sheet
Runnymede Place <-> Falkland Road

April 6, 2021



Runnymede Place <-> Falkland Road	
Average Daily Traffic (ADT)	4439
% Heavy Vehicles	2.75%
85th percentile speed (KM/H)	44

ADT Summary			
Day	Westbound	Eastbound	Total
April 6, 2021	2029	2410	4439
AWDT	2029	2410	4439
	45.71%	54.29%	



Weekday General Peak Hour Summary

Classification Summary		
	Two Way Total	
	Vehicles	%
Passenger Vehicles	4148	93.44%
Buses	26	0.59%
Single Unit Trucks	96	2.16%
Semi-Trailer Trucks	0	0.00%
Motorcycles	169	3.81%

AM General Peak Hour			
	8:00	to	9:00
Start Time	Westbound	Eastbound	Total
8:00	89	55	144
8:15	52	61	113
8:30	57	64	121
8:45	62	50	112
Total	260	230	490

PM General Peak Hour			
	16:00	to	17:00
Start Time	Westbound	Eastbound	Total
16:00	35	67	102
16:15	46	57	103
16:30	41	71	112
16:45	42	44	86
Total	164	239	403

Speed Summary

Two Way Total																
BINS (km/h)																
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70- 80	80+	Total
	Total Vehicles	0	0	16	86	112	258	790	1332	1155	507	166	15	2	0	4439
	% of Total	0.0%	0.0%	0.4%	1.9%	2.5%	5.8%	17.8%	30.0%	26.0%	11.4%	3.7%	0.3%	0.0%	0.0%	
	Cumulative %	0.0%	0.0%	0.4%	2.3%	4.8%	10.6%	28.4%	58.4%	84.5%	95.9%	99.6%	100.0%	100.0%	100.0%	

85th Percentile Speed Range: 45-50

Westbound																
BINS (km/h)																
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70- 80	80+	Total
	Total Vehicles	0	0	14	71	66	93	292	666	702	355	137	12	2	0	2410
	% of Total	0.0%	0.0%	0.6%	2.9%	2.7%	3.9%	12.1%	27.6%	29.1%	14.7%	5.7%	0.5%	0.1%	0.0%	
	Cumulative %	0.0%	0.0%	0.6%	3.5%	6.3%	10.1%	22.2%	49.9%	79.0%	93.7%	99.4%	99.9%	100.0%	100.0%	

85th Percentile Speed Range: 45-50

Eastbound																
BINS (km/h)																
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70- 80	80+	Total
	Total Vehicles	0	0	2	15	46	165	498	666	453	152	29	3	0	0	2029
	% of Total	0.0%	0.0%	0.1%	0.7%	2.3%	8.1%	24.5%	32.8%	22.3%	7.5%	1.4%	0.1%	0.0%	0.0%	
	Cumulative %	0.0%	0.0%	0.1%	0.8%	3.1%	11.2%	35.8%	68.6%	90.9%	98.4%	99.9%	100.0%	100.0%	100.0%	

85th Percentile Speed Range: 40-45

Road Tube Count Summary Sheet
Hampshire Road <-> Monterey Avenue

April 6, 2021

to

April 13, 2021



Hampshire Road <-> Monterey Avenue	
Average Daily Traffic (ADT)	2437
Average Weekday Daily Traffic (AWDT)	2662
% Heavy Vehicles	2.72%
85th percentile speed (KM/H)	42

ADT Summary			
Day	Eastbound	Westbound	Total
April 6, 2021	1304	1281	2585
April 7, 2021	1323	1238	2561
April 8, 2021	1438	1398	2836
April 9, 2021	1366	1331	2697
April 10, 2021	1016	1061	2077
April 11, 2021	838	837	1675
April 12, 2021	1325	1304	2629
ADT	1230	1207	2437
	50.47%	49.53%	
AWDT	1351	1310	2662
	50.77%	49.23%	



Weekday General Peak Hour Summary

Classification Summary		
	Two Way Total	
	Vehicles	%
Passenger Vehicles	16205	94.99%
Buses	58	0.34%
Single Unit Trucks	405	2.37%
Semi-Trailer Trucks	1	0.01%
Motorcycles	391	2.29%

AM General Peak Hour			
	8:00	to	9:00
Start Time	Eastbound	Westbound	Total
8:00	34	24	59
8:15	35	29	64
8:30	26	27	53
8:45	31	26	57
Total	126	107	233

PM General Peak Hour			
	16:00	to	17:00
Start Time	Eastbound	Westbound	Total
16:00	24	26	50
16:15	26	25	50
16:30	25	26	51
16:45	22	23	45
Total	97	99	196

Speed Summary

Two Way Total																
BINS (km/h)																
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80+	Total
	Total Vehicles	0	0	72	248	621	2142	4736	5130	2908	948	245	9	0	1	17060
	% of Total	0.0%	0.0%	0.4%	1.5%	3.6%	12.6%	27.8%	30.1%	17.0%	5.6%	1.4%	0.1%	0.0%	0.0%	
	Cumulative %	0.0%	0.0%	0.4%	1.9%	5.5%	18.1%	45.8%	75.9%	92.9%	98.5%	99.9%	100.0%	100.0%	100.0%	

85th Percentile Speed Range: 40-45

Westbound																
BINS (km/h)																
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80+	Total
	Total Vehicles	0	0	22	49	199	923	2249	2714	1606	536	145	6	0	1	8450
	% of Total	0.0%	0.0%	0.3%	0.6%	2.4%	10.9%	26.6%	32.1%	19.0%	6.3%	1.7%	0.1%	0.0%	0.0%	
	Cumulative %	0.0%	0.0%	0.3%	0.8%	3.2%	14.1%	40.7%	72.9%	91.9%	98.2%	99.9%	100.0%	100.0%	100.0%	

85th Percentile Speed Range: 40-45

Eastbound																
BINS (km/h)																
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80+	Total
	Total Vehicles	0	0	50	199	422	1219	2487	2416	1302	412	100	3	0	0	8610
	% of Total	0.0%	0.0%	0.6%	2.3%	4.9%	14.2%	28.9%	28.1%	15.1%	4.8%	1.2%	0.0%	0.0%	0.0%	
	Cumulative %	0.0%	0.0%	0.6%	2.9%	7.8%	22.0%	50.8%	78.9%	94.0%	98.8%	100.0%	100.0%	100.0%	100.0%	

85th Percentile Speed Range: 40-45

Road Tube Count Summary Sheet
St. David Street<->Transit Road

April 6, 2021

to

April 13, 2021



St. David Street<->Transit Road	
Average Daily Traffic (ADT)	1328
Average Weekday Daily Traffic (AWDT)	1434
% Heavy Vehicles	2.25%
85th percentile speed (KM/H)	40

ADT Summary			
Day	Eastbound	Westbound	Total
April 6, 2021	699	700	1399
April 7, 2021	695	671	1366
April 8, 2021	750	763	1513
April 9, 2021	751	685	1436
April 10, 2021	554	542	1096
April 11, 2021	529	504	1033
April 12, 2021	720	734	1454
ADT	671 50.53%	657 49.47%	1328
AWDT	723 50.43%	711 49.57%	1434



Weekday General Peak Hour Summary

Classification Summary		
	Two Way Total	
	Vehicles	%
Passenger Vehicles	8923	95.98%
Buses	46	0.49%
Single Unit Trucks	163	1.75%
Semi-Trailer Trucks	0	0.00%
Motorcycles	165	1.77%

AM General Peak Hour			
	8:00	to	9:00
Start Time	Eastbound	Westbound	Total
8:00	12	13	26
8:15	11	17	28
8:30	14	17	31
8:45	13	12	25
Total	51	59	110

PM General Peak Hour			
	16:00	to	17:00
Start Time	Eastbound	Westbound	Total
16:00	15	14	28
16:15	14	13	27
16:30	17	16	33
16:45	12	14	26
Total	57	57	114

Speed Summary

Two Way Total BINS (km/h)															
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80+
Total Vehicles		0	0	35	205	458	1203	2848	2993	1271	242	41	1	0	0
% of Total		0.0%	0.0%	0.4%	2.2%	4.9%	12.9%	30.6%	32.2%	13.7%	2.6%	0.4%	0.0%	0.0%	0.0%
Cumulative %		0.0%	0.0%	0.4%	2.6%	7.5%	20.4%	51.1%	83.3%	96.9%	99.5%	100.0%	100.0%	100.0%	100.0%

85th Percentile Speed Range: 40-45

Westbound BINS (km/h)															
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80+
Total Vehicles		0	0	0	14	129	277	720	1448	1365	547	84	14	1	0
% of Total		0.0%	0.0%	0.0%	0.3%	2.8%	6.0%	15.7%	31.5%	29.7%	11.9%	1.8%	0.3%	0.0%	0.0%
Cumulative %		0.0%	0.0%	0.0%	0.3%	3.1%	9.1%	24.8%	56.3%	86.0%	97.8%	99.7%	100.0%	100.0%	100.0%

85th Percentile Speed Range: 40-45

Eastbound BINS (km/h)															
Lane	Speed	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-60	60-70	70-80	80+
Total Vehicles		0	0	21	76	181	483	1400	1628	724	158	27	0	0	0
% of Total		0.0%	0.0%	0.4%	1.6%	3.9%	10.3%	29.8%	34.7%	15.4%	3.4%	0.6%	0.0%	0.0%	0.0%
Cumulative %		0.0%	0.0%	0.4%	2.1%	5.9%	16.2%	46.0%	80.7%	96.1%	99.4%	100.0%	100.0%	100.0%	100.0%

85th Percentile Speed Range: 40-45

McNeil Avenue On-Street Parking										
Street	Segment	Side	Parkable Distance (M)	Available	12:30-13:00 06 April 2021		21:00-22:00 06 April 2021		12:30-13:00 10 April 2021	
					Observed	%	Observed	%	Observed	%
McNeil Avenue	Foul Bay Road-Falkland Road	N	134	21	0	0.00%	0	0.00%	0	0.00%
	Foul Bay Road-Runnymede Place	S	70	11	6	54.55%	7	63.64%	5	45.45%
	Runnymede Place-Falkland Road	S	70	11	3	27.27%	5	45.45%	3	27.27%
	Falkland Road-Victoria Ave	N	75	12	0	0.00%	0	0.00%	0	0.00%
	Victoria Ave-Roslyn Road	S	67	11	2	18.18%	1	9.09%	2	18.18%
	Roslyn Road	N	31	5	1	20.00%	2	40.00%	2	40.00%
	Roslyn Road-Hampshire Road	N	66	11	2	18.18%	0	0.00%	4	36.36%
	Victoria Ave-Hampshire Road	S	82	13	6	46.15%	6	46.15%	3	23.08%
	Hampshire Road-Monterey	N	97	15	3	20.00%	3	20.00%	3	20.00%
	Monterey Ave-Oliver Street	S	55	9	1	11.11%	0	0.00%	1	11.11%
	Oliver Street	N	57	9	2	22.22%	2	22.22%	2	22.22%
	Oliver Street	S	77	12	0	0.00%	2	16.67%	1	8.33%
	Patrick St	N	59	10	2	20.00%	1	10.00%	2	20.00%
	Patrick St	S	51	8	0	0.00%	1	12.50%	0	0.00%
	St. Patrick-St. David	N	60	10	1	10.00%	1	10.00%	0	0.00%
	St. David - Transit Road	N	49	8	1	12.50%	0	0.00%	0	0.00%
	St. Patrick - Transit Road	S	98	16	4	25.00%	5	31.25%	4	25.00%
	Transit Road-Island Road	N	45	7	3	42.86%	4	57.14%	3	42.86%
	Island Road	S	91	14	1	7.14%	0	0.00%	0	0.00%
	Island Road-Byng Street	S	58	9	3	33.33%	2	22.22%	2	22.22%
	Island Road-St. Louis Street	N	102	16	2	12.50%	0	0.00%	2	12.50%
	Byng Street-Linkleas Ave	S	49	8	2	25.00%	1	12.50%	0	0.00%
	St. Louis Street-NewPort Ave	N	115	18	3	16.67%	2	11.11%	2	11.11%
	Linkleas Ave-Newport Ave	S	57	9	0	0.00%	3	33.33%	2	22.22%
Totals				273	48	18%	48	18%	43	16%