Comox Valley REGIONAL DISTRICT

Staff Report

DATE: February 9, 2023

FILE: 5330-20/SSCP

TO: Chair and Members
Sewage Commission

FROM: Russell Dyson
Chief Administrative Officer

Supported by Russell Dyson
Chief Administrative Officer

R. Dyson

RE: **Sewer System Conveyance Project – Traffic Management Strategy**

Purpose
To provide the final Traffic Management Strategy (TMS) completed as part of the Sewer System Conveyance Project (SSCP) and summary of the stakeholder consultation.

Recommendation from the Chief Administrative Officer:
For information purposes only.

Executive Summary
Due to the extent and anticipated duration of construction for the SSCP, the project will have significant impacts to traffic throughout the course of construction. As such, traffic impacts have been identified as a key project risk and a TMS has been developed by Urban Systems with input from stakeholders and project partners.

The TMS is intended to outline the proposed traffic management strategies for each portion of the project that result in the least disturbance, but does not provide the details for how or when (for the most part) construction must occur. The TMS provides the guidelines that the contractor must comply with when developing their own traffic management plans. The actual construction schedule and details for when work will be occurring throughout the project alignment will be informed by the contractor's own schedules and traffic management plans, which will be completed later in spring 2023. The final TMS is attached as Appendix A and key recommendations are summarized below:

- The length of the construction zone and resulting single lane alternating traffic has been shown to significantly impact traffic capacity and resulting delays on Comox Road and Comox Avenue. In a comprehensive review of options, it was determined that unidirectional westbound traffic has a number of benefits over single lane alternating and should be implemented during construction. This option includes:
    - Free-flowing westbound traffic through construction zones on Comox Road/Avenue from Rodello Street to the 17th Street Bridge.
    - Eastbound traffic would detour into Comox through Ryan Road and Lerwick Road. Detoured traffic is generally making right turns which minimizes the impact on traffic performance.
    - Unidirectional traffic does not limit the length of the contractors working zone, increasing efficiency of construction and ultimately decreasing construction duration along Comox Road and Avenue.
    - Access for emergency vehicles in both directions will be ensured at all times.
    - Two-way pedestrian and cyclist access along the corridor can be accommodated and will be required.

  - For some sections along Comox Road, full night-time shutdowns during off-peak hours will be accommodated to facilitate construction.
  - Due to the two-contract nature of this project, construction will be occurring at different times on different sections of Comox Road, impacting the extent of the unidirectional traffic. Eastbound traffic will be allowed along sections of Comox Road that are not under construction. Significant signage and communications will be required to coordinate between the two contract working zones.
- Construction closures through the Town of Comox local road network should be limited to a maximum of two blocks at a time and will need to include access considerations for all residences and businesses.
- Back Road will be discouraged from being used as a detour route and traffic calming measures will be considered to reduce speeds and traffic loads.
- No construction work within the Town of Comox or on Comox Road for three days prior to or during Nautical Days festival.
- No full or partial closures to the Comox boat launch or the marina from May 1 to October 1 annually.

In development of the TMS, meetings, presentations and surveys have been completed with varying stakeholder groups to provide an overview of the project, discuss traffic impacts and solicit feedback. Engagement included meetings with key stakeholder groups such as emergency services, BC Transit and the School District, presentations to Town and City Councils and downtown business associations, and engagement through a survey for other private utilities and stakeholders. During the development of the TMS, all stakeholders were provided the opportunity to comment on the draft TMS and every comment received has been reviewed and follow-up responses provided.

The Comox Valley Regional District understands that keeping the public properly informed about traffic impacts will be key to managing traffic flows during the project and to maintaining public trust in the process. The project team is committed to keeping the public informed about this project and has hired a dedicated communication role for the SSCP to ensure open and consistent communications with partners, stakeholders and the public leading up to and during project construction. More details about planned project communication and engagement will be provided at subsequent Sewage Commission meetings.

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Government and Community Interests Distribution (Upon Agenda Publication)

City of Courtenay	✔
Town of Comox	✔
K'ómoks First Nation	✔

Attachments: Appendix A – "Sewer Conveyance Project, Traffic Management Strategy," Urban Systems, January 2023

URBAN SYSTEMS

Sewer Conveyance Project
Traffic Management Strategy

Prepared for
Comox Valley Regional District

January 2023

File no.
3023.0019.01

URBAN SYSTEMS

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1.0 Overview

The Comox Valley Sewer Conveyance Project is a multi-year construction project that will replace the conveyance pipe and upgrade the pump stations that move more than 14,000 cubic metres of raw sewage each day to the sewage treatment plant on Brent Road. This new system will route sewer pipes further inland away from the foreshore and provide increased capacity in the system.

The project scope includes upgrades to existing infrastructure and new piping infrastructure that will be installed between the Courtenay Pump Station on Comox Road and the Comox Valley Water Pollution Control Centre (CVWPCC). The conveyance route, outlined in **Fig 1.1**, moves through the lands under jurisdiction by the City of Courtenay, the Comox Valley Regional District, K'ómoks First Nation, and the Town of Comox.

Figure 1.1 – Sewer Conveyance Project Alignment

Construction will include traditional trenching ('cut and cover') pipe installation along Comox (Dyke) Road, Comox Hill, Comox Avenue (to Rodello Street), Beaufort Avenue, Stewart Street, Balmoral Avenue and Morland Road. The pipe will be tunneled from Lazo Road to Morland Road and will cross through Lazo Marsh to the treatment plant. The project will also include a new, relocated, Courtenay Pump Station and upgrades to the K'ómoks Pump Station in IR#1 and Comox Pump Station located at Jane Place in the Town of Comox.

The Comox Valley Sewer Conveyance Project will be constructed and funded in one phase but will include two separate construction contracts. One contract will be delivered as a Design-Build contract noted by the purple and orange alignments in **Fig 1.1** with the second

contract being a conventional Design-Bid-Build (DBB) contract for works generally through the Town of Comox.

The CVRD is working with the K'ómoks First Nation to protect archaeologically sensitive areas during construction to preserve cultural heritage sites, ancestral burial places and artifacts. It is also collaborating with the Town of Comox to ensure smooth and efficient delivery of the project that will see planned infrastructure improvements for the Town delivered in conjunction with the sewer project to minimize disruption to homes and businesses along the route.

1.1 Traffic Strategy Purpose

The conveyance route and surface works comprising the project will have significant impacts to traffic movements in vicinity of the works, and the greater roadway network. The purpose of the Traffic Management Strategy is to understand the impact that the construction of the new infrastructure will have on all modes of travel and to identify a proactive strategy for mitigating community impacts to the greatest extent possible. Mitigation strategies range from traffic management, to travel demand management and strategic communications. The strategy is intended to address concerns identified by the project team and impacted users and is intended to be refined through on-going discussions.

It is expected that this strategy, along with contract specifications will help guide construction in a way that can minimize disruptions to traffic, residents and other corridor users. The recommendations of this strategy will ultimately support the contractors in preparing detailed Traffic Management Plans for the project. As such, much of the strategy is focused on project level traffic impacts through the corridor and the wider network. While localized impacts are noted, and mitigations are recommended for all project sections, many of the localized management opportunities should be implemented through project specific needs and consideration for local bylaws and determined with conversations with the eventual contractors for these works.

The recommendations in this report are based on the anticipated construction approach and resulting traffic management requirements. However, the recommendations in this Traffic Management Strategy will likely be refined in conjunction with the successful contractors and implementation will be subject to the contractors' work plans.

2.0 Construction Parameters

The following sections highlight several project parameters that have been considered with respect to preparing a thorough and specific traffic management strategy for the project corridor.

2.1 Construction Sequencing

As noted above, the project is being delivered in two contracts. The expectation is that both contracts will be advancing at the same time at various locations along the construction corridor. The Traffic Management Strategy, and ultimate Traffic Management Plans, will need to consider that more than one (or two) construction zones may be impacting traffic at the same time at different locations. It will be important that communications during construction and schedules prepared by the various contractors take this into account.

2.2 Project Timing

The work is anticipated to start in mid 2023 and take upwards of 24 months to complete. Timing will ultimately depend on the final extent of the rehabilitation works and the approach to construction phasing proposed by the contractors.

It is not expected that the contractors will be expected to follow a prescribed schedule for works along the corridor. This will impact traffic as the closures noted in this strategy could be implemented at any time or at various times during the contract period. Again, this will require significant communication during construction and schedules prepared by the various contractors will need to take this into account.

2.3 Surface Roadway Improvements

As part of the project there are several roadway improvements that are also planned which are intended to greatly improve traffic circulation. These upgrades include:

- A new roundabout located at the intersection of Glacier View Drive and Comox Avenue within the Town of Comox.
- A new roundabout located at the intersection of Comox Avenue and Rodello Street within the Town of Comox; and
- Roadway corridor improvements on Beaufort Avenue from Ellis Street to Stewart Street within the Town of Comox.
- Roadway corridor improvements on Balmoral Avenue from Stewart Street to Pritchard Street and Donovan Drive to Albatross within the Town of Comox

These roadway improvements are expected to be completed after the initial sewer conveyance line has been installed but within the same contract.

2.4 Construction Corridor Expectations

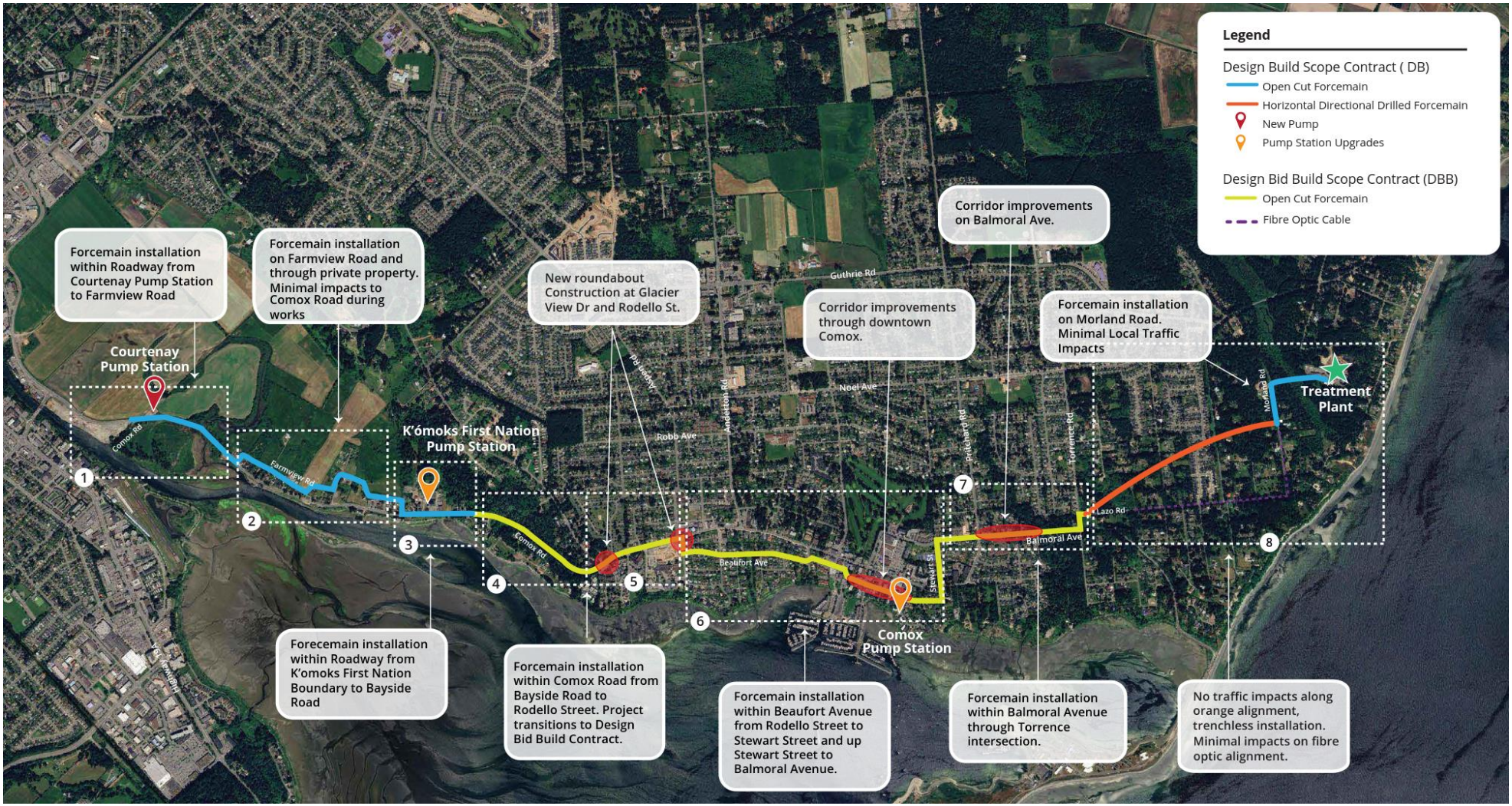
The CVRD has been working closely with project partners and design teams to identify expected construction impacts based on the proposed upgrades. The ultimate designs are still being completed, and phasing and construction means will be the responsibility of the contractors.

The installation of the sewer main has been designed to follow existing roadways for most of the alignment. In general, it is expected that the installation of the sewer main throughout the Comox Road corridor can be completed while still maintaining one lane of traffic, and space for people who walk and cycle. There are localized exceptions to this which are discussed further in the strategy. As the project moves into the Town of Comox and off Comox Road it is expected that localized road closures will be required along Beaufort Avenue and Stewart Street. Closures of Balmoral Avenue are also expected to facilitate the sewer construction. Beyond Balmoral Avenue the installation changes to trenchless means which will minimize impacts to traffic. Overall, the expected general construction impacts are shown on **Fig 2.1**. For communications purposes we have broken down the construction corridor into 8 separate sections which each have their own unique considerations and challenges. These sections are further discussed in **Section 5**.

Due to the length of the project, and the two-contract approach, it is also expected that more than one construction zone will be active at any given time throughout the project timeframe. That is to say that at any given time during construction road users may encounter no traffic impacts within the construction corridor or could encounter multiple construction zones through the corridor.

The strategy has been prepared based on the expectation that long sections of the construction corridor may be impacted at one time.

Figure 2.1 – Project Construction Impacts



3.0 Existing Traffic Conditions

The current traffic conditions and travel patterns along the Comox Road corridor and through the Town of Comox, including daily traffic profiles, typical congestion, and travel times near various locations along the construction route have been reviewed and are summarized in the sections below.

The information presented in this report has been compiled from several sources. We appreciate the cooperation of the project partners in providing critical information to better inform the strategy. These sources are:

1) The Town of Comox Traffic Model,
2) The City of Courtenay Traffic Model,
3) The Town of Comox 2020 Transportation Master Plan Update; and
4) Traffic data received via StreetLight Data, which gathers digital data from cellular and navigation systems to provide mobility patterns.

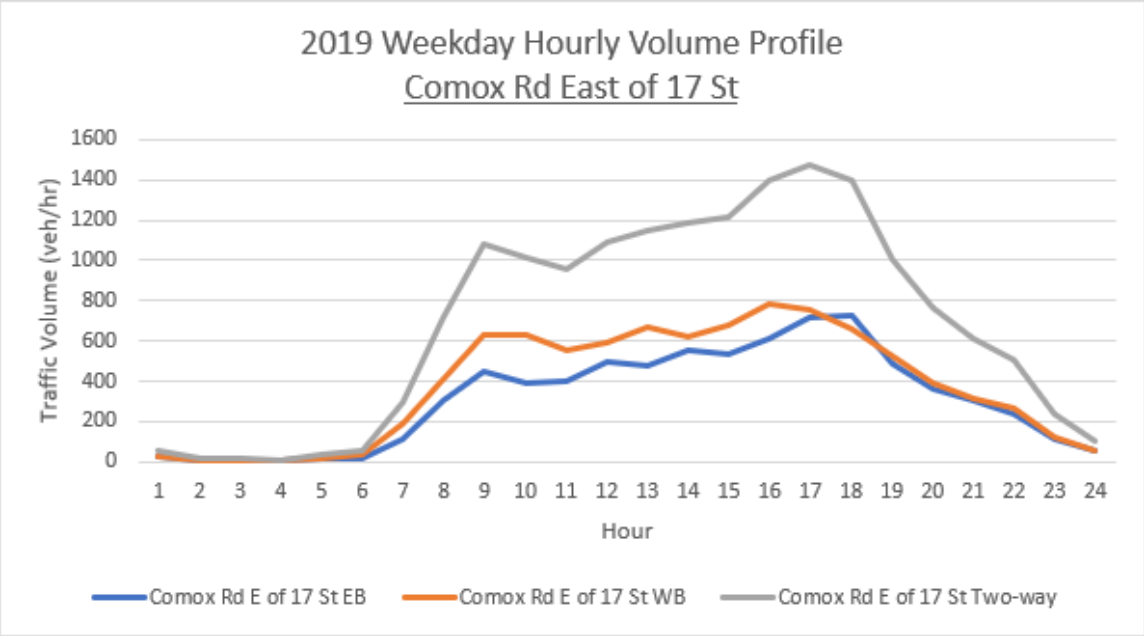
It should be noted that for the traffic analysis we have generally used 2019 data as this coincides with traffic data prepared for the Town of Comox Transportation Master Plan, as well as it does not risk impacts to traffic patterns through the year due to COVID restrictions that have periodically been in place over the last few years.

3.1 Daily Traffic Profile

The traffic along the Comox Road Corridor generally reaches a morning peak around 9 a.m. and then continuously builds throughout the day and reaches the afternoon peak at between 4 pm and 5 pm as shown by the 24-hour traffic profile in **Fig 3.1**.

The directional traffic on the corridor is slightly higher westbound throughout the day than it is eastbound. During the PM peak hour directional traffic volumes vary from 600 to 900 vehicles per day. Additionally, the traffic volumes on the corridor are highest between the 17th Street bridge and Glacier View Drive and decline as you head east into the urban core of the Town of Comox.

Figure 3.1 - 24-Hour Traffic Volume Profile (Comox Road E of 17th Street Bridge)



3.2 Seasonal Traffic Variations

There is minimal seasonal variation in the traffic volumes on Comox Road. The summer weekday traffic volume is within 10% of the annual average daily traffic as shown in **Table 3.1**, below.

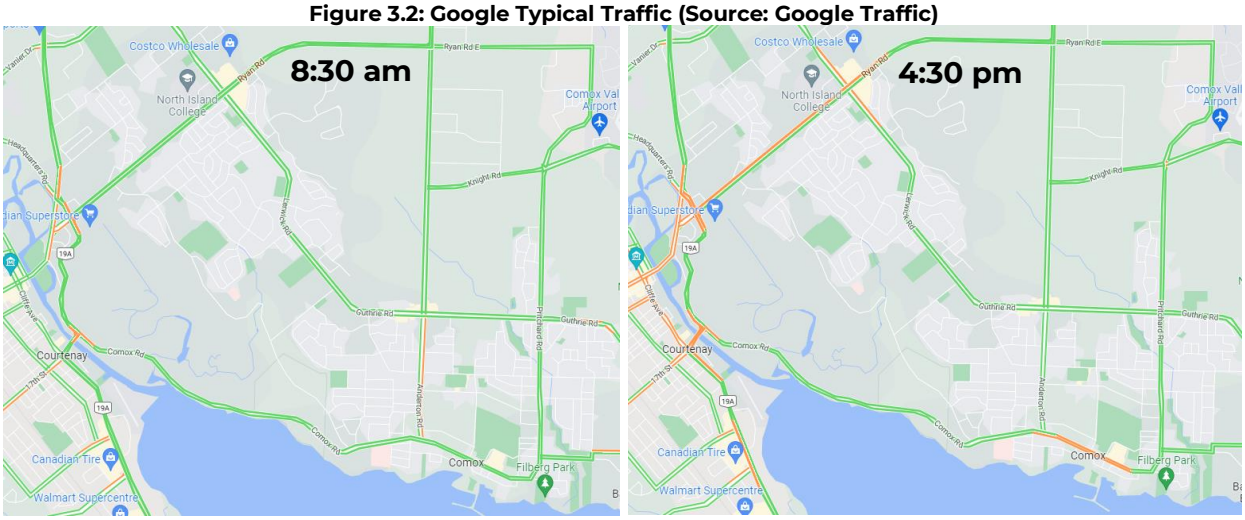
Table 3.1: Comox Road Seasonal Traffic Comparison

	East of 17th Street Bridge	West of Rodello Street
Annual Average Daily Traffic (AADT)	15,700	13,800
Summer Weekday Daily Traffic	16,700	14,800
Variation (%)	6%	7%

3.3 Typical Traffic Condition

Google Typical Traffic indicates that afternoon traffic conditions are typically worse than morning conditions. Traffic pressure is generally concentrated around the 17th Street Bridge, Ryan Road and the town core on Comox Road as shown on **Fig 3.2**, below. Green indicates light traffic, while orange and red indicate heavier traffic or congestion. On certain days, actual traffic performance is worse than Google Typical Traffic's long-term average.

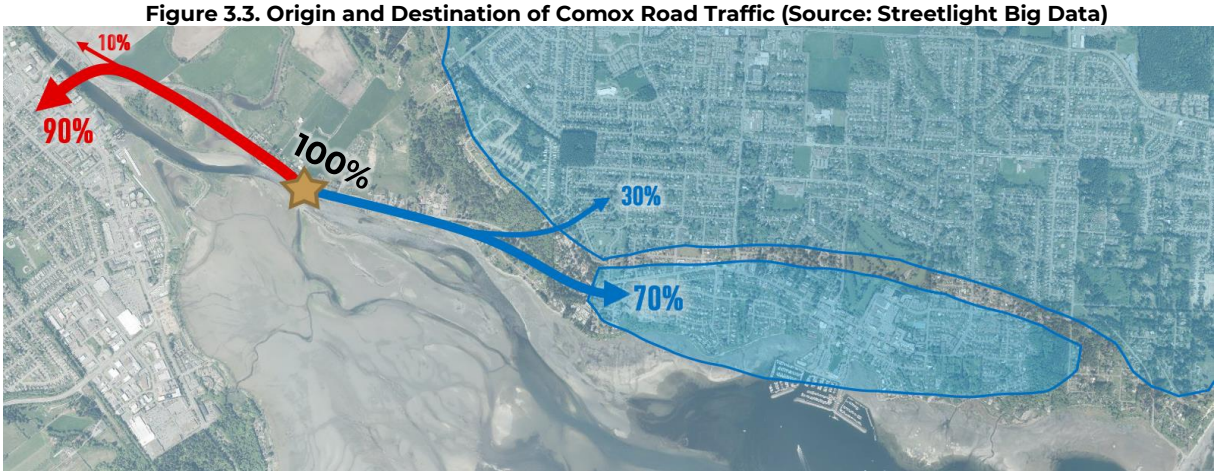
Figure 3.2: Google Typical Traffic (Source: Google Traffic)



3.4 Travel Pattern (Origin and Destination)

Origins and destinations of the Comox Road traffic is illustrated in **Figure 3.33**. The majority of vehicles using Comox Road are travelling between the 17th Street Bridge and areas in the core of the town near Comox Road. Approximately 90% of the traffic on Comox Road crosses the 17th Street Bridge.

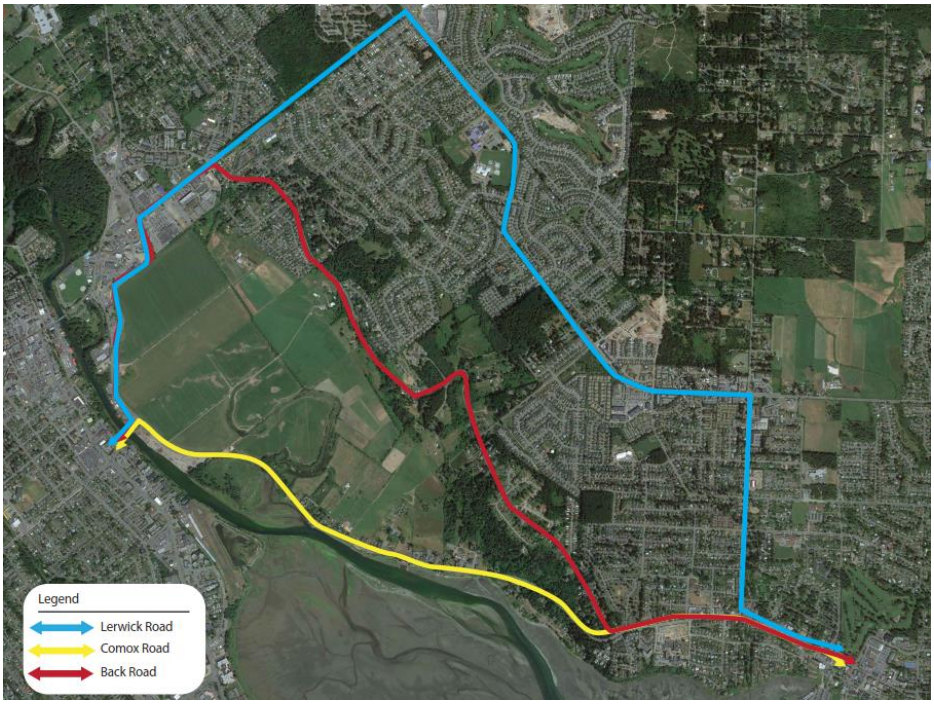
Figure 3.3. Origin and Destination of Comox Road Traffic (Source: Streetlight Big Data)



3.5 Travel Time

There are three main options to travel between the 17th Street Bridge and the Town of Comox core, as shown in **Figure 3.44**. Generally, the travel distance via Comox Road is much less compared to using Back Road or Lerwick Road, which requires circuitous routing.

Figure 3.4. Travel Route Options



Travel times along the three routes during a typical weekday PM peak hour have been estimated using Google Typical Traffic information and transportation model data. **Table 3.2** summarizes the typical travel time and distance of the three routes illustrated above.

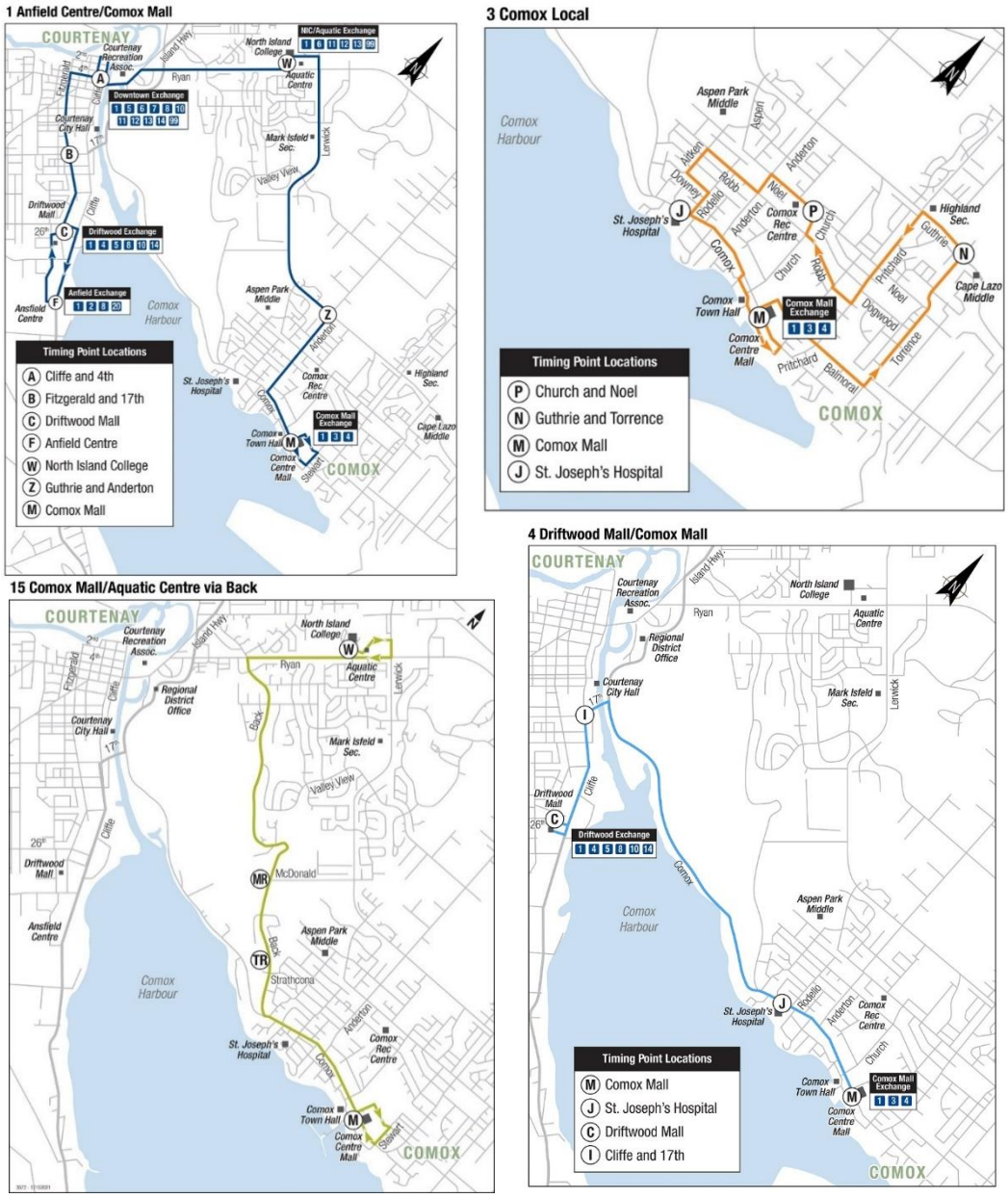
Table 3.2. Google Travel Time between 17th Street and Comox Mall

	Comox Road		Back Road		Lerwick Road	
	Distance (km)	Travel Time	Distance (km)	Travel Time	Distance (km)	Travel Time
From 17th Street to Comox Mall	5.5 km	7-10 min	8.6 km	12-18 min	10 km	12-22 min
From Comox Mall to 17th Street		7-14 min		12-20 min		14-24 min

3.6 Transit

The project corridor is used extensively by BC Transit to provide transit services to the project areas and beyond. Under current conditions BC Transit operates 4 routes (Route 1, 3, 4 and 15) that will be impacted by traffic disruptions. Other routes also have the potential to be impacted if traffic detours from the construction zones to other corridors within the network. The transit routes are noted in **Fig 3.5** and are impacted by various locations of construction.

Figure 3.5 – Impacted Transit Routes



3.7 Pedestrians and Cyclists

The construction corridor is extensively used by pedestrians and cyclists. Facilities include sidewalks within the Town of Comox as well as dedicated cycling facilities along Comox Avenue and Comox Road. Comox Road is used by commuter bike traffic connecting between Comox and Courtenay while local road networks provide commuter and recreational cycling routes. Beaufort Avenue for instance is signed a local cycling greenway between Rodello Street and Ellis Street.

For all sections of the corridor, providing pedestrian and cyclist facilities for individuals to safely navigate the corridor during the construction phase is crucial. Good connectivity for pedestrians and cyclists will not only support the users' safety but also encourage individuals to choose walking or cycling instead of driving and help reduce congestion.

Communications, encouragement, and advertisements of other cycling routes beyond the immediate project zones should also form part of the overall traffic strategy. Existing cycling routes through Crown Isle, northwest Comox and the Hobson Ave. corridor could provide alternatives to Comox Road, Back Road and Lerwick Road during detours. The Comox Valley Cycling Coalition maintains a detailed map of cycling routes throughout the valley and could also be engaged to support cycling communications during construction.

4.0 Traffic Conditions - During Construction

The following describes how the planned construction works will impact traffic. This includes both the impacts on the transportation function of the construction corridor, as well as the impact on local and network-wide traffic conditions.

Traffic modelling and analysis has been completed to understand the impact of construction on Comox Road, local roads through the Town of Comox and the broader network. The forcemain alignment is split between lower volume roads (collector or below) and collector and arterial sections of Comox Road. For lower volume sections, the impacts from construction are generally expected to be limited to localized traffic impacts. These impacts are described in **Section 5** as part of the Traffic Management Strategy. However, for sections of Comox Road/Comox Avenue, there are three sections of forcemain that will have significant impacts: Courtenay Pump Station to Farmview Road, west boundary of IR #1 to Glacier View Drive, and Glacier View Drive to Rodello Street.

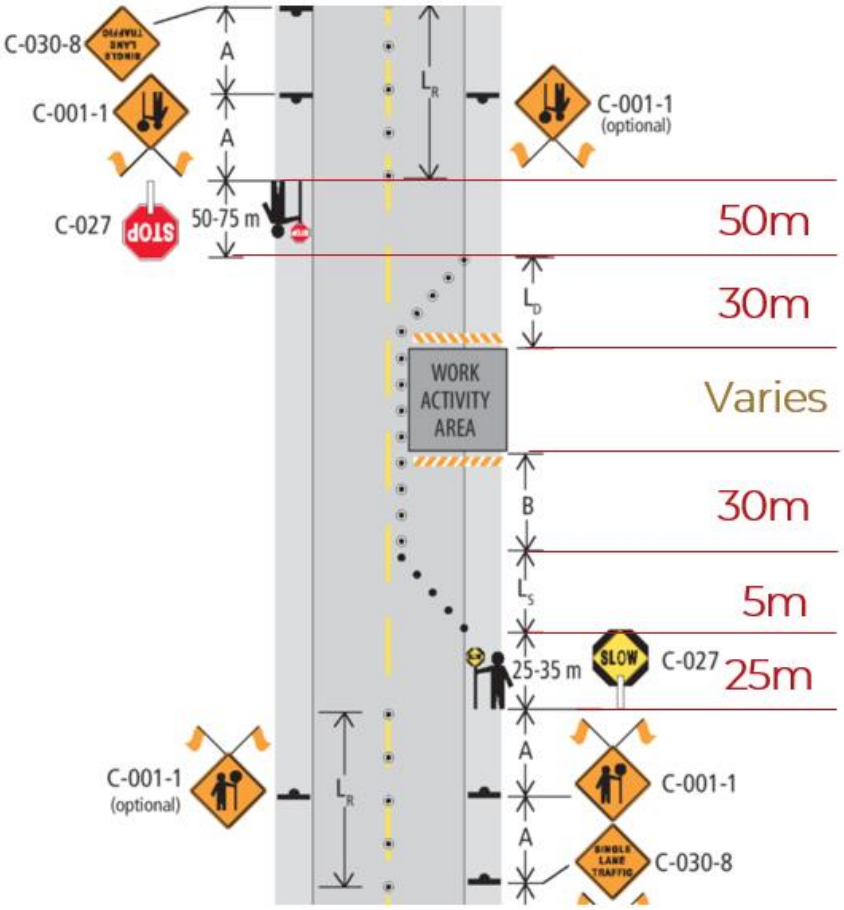
Along Comox Road from the Courtenay Pump Station site to Rodello Street, a variety of different traffic management options were considered to understand the potential traffic impacts of having a single lane available for traffic. These options included: short single lane alternating (SLAT) segments, longer SLAT segments, full road closures, and unidirectional traffic flows. These potential scenarios for traffic movement along Comox Road are summarized in **Table 4.2**.

In addition to the traffic considerations, each option has different impacts on the contractors' efforts and how effectively and efficiently they can complete the required work. Selection of the preferred Traffic Management Strategy requires balancing traffic impacts, community impacts and whether the constraints posed by the Traffic Management Strategy are overly onerous for the contractors and will, therefore, impact how efficiently they can complete the work.

4.1 Considerations for Single Lane Alternating Traffic

Single Lane Alternating Traffic (SLAT) is a typical mitigation measure that would be used for navigating a single lane of traffic. Implementation of SLAT requires space for buffers, cone tapers, traffic control people/temporary signals in addition to the construction or work activity area as shown in Error! Reference source not found.. For example, a 50 m construction area requires 190 m of SLAT while a 100 m construction area requires 240 m of SLAT.

Figure 4.1: Single Lane Alternating Traffic Space Requirements



The length of the single lane alternating segment has a significant impact on the roadway capacity and the resulting delays. This is largely related to the time required to clear the traffic and transition to traffic travelling in the opposite direction (i.e., the "All Red" time). **Table 4.1**, below, summarizes the roadway capacity for four different length scenarios that were reviewed for Comox Road. A construction area of 50 m to 100 m has a capacity of 400 to 500 vehicles per hour whereas increasing the construction area length to 220m results in a 50% reduction in capacity. Moving beyond a 250 m construction zone starts to significantly impact the capacity of the corridor. Increasing the construction zone to 450 m or 750 m, which aligns with potential sections of Comox Road reduces the capacity further to a point where the SLAT severely impacts the overall network.

Table 4.1: Single Lane Alternating Traffic Capacity Comparison

Construction Area	100 m	250 m	450 m	750 m
SLAT Length	240 m	390 m	590 m	890 m
"All Red" Time	35 s	52 s	1.5 min	2 min
Capacity (in each drxn)	415 veh/h	220 veh/h	150 veh/h	<100 veh/h

Based on corridor widths and constructability, it is understood that limiting the work zone to a 100 m or 250 m construction area would be difficult and restrictive for the segment of Comox Road from the Courtenay Pump Station to Farmview Road, as well as the section of roadway between the west boundary of IR #1and Rodello Street. The short length SLAT (i.e., 100m to 250m) impacts the contractor's ability to efficiently complete the required work and would result in longer overall construction duration and increased costs and therefore short length SLAT scenarios have not been brought forward as viable options.

Traffic impacts have been modelled within the network for a 450 m work zone and a 750 m work zone which coincides with the length between Glacier View Drive and Rodello Street and the length between the Courtenay Pump Station and Farmview Road. If these zones were to operate as SLAT, the corridor volumes reduce to a point where less than 150 vehicles per hour could navigate the zones with cycle times in the 4 to 5-minute range. Modeling suggests that, under these scenarios, traffic does not clear through every cycle and significant queues form at each end of the work zone. Based on the construction zone lengths, the corridor operating in a SLAT scenario of 450 m to 750 m would be operating in a similar way to a fully closed scenario and would have major network impacts.

As short SLAT (~100 m to ~250 m) was found to not be viable since it was too short for the contractor to work efficiently and longer SLAT was found to not be viable due to the traffic impacts, alternative configurations for Comox Road, including unidirectional traffic were considered. All the potential Comox Road traffic scenarios are summarized below in **Section 4.2.**

4.2 Comox Road Traffic Scenarios

Based on the above, all the potential traffic scenarios that would enable the contractor to effectively complete the required work have been modelled and reviewed for major sections along Comox Road with the goal of identifying the scenario that is the least impactful. These are summarized in **Table 4.2**, below. Note unidirectional traffic implies traffic in one direction only.

Table 4.2 - Comox Road Traffic Scenarios

Scenario	Description	Traffic Considerations/Impacts
Full Closure	Full Closure of Comox Road between Courtenay Pump Station and Glacier View Drive. Local Access only from Glacier View Drive to Rodello Street.	• **Network wide congestion/gridlock.** • Network wide transit impacts. • Need to enable local property/IR #1 access.
Full Night Closures	Full Closures at night to facilitate work with other traffic scenario during the day.	• **Nigh closures can be accommodated with minimal network impacts.** • Closures should be limited to off-peak hours (8pm to 6am). • Full closures will require a fully signed and communicated detour.
Long SLAT (650 m to 750 m Construction -Full Length)	Longer Sections of SLAT traffic through construction zones. Likely more than one construction zone at one time. Example: SLAT from Courtenay Pump Station to Farmview Road.	• **Essentially same impacts as full closure.** • **Network wide congestion/gridlock.** • Requires 4.5 min cycle length, results in capacity 100 veh/h or less. • Delays/queues could be problematic for site access. • Network wide transit impacts. • Need to enable local property access.

Long SLAT (450 m Construction -Full Length)	Shorter sections of SLAT traffic through construction zones. Likely more than one construction zone at one time. Example: SLAT from Glacier View Drive to Rodello Street.	• **Network wide congestion/gridlock.** • 4.0 min cycle length, results in capacity of ~150 veh/h. • Delays/queues could be problematic for site access. • Could allow transit and local access. • Need to restrict/manage access to Comox Road from side roads/driveways.
Comox Road Unidirectional Westbound	Unidirectional traffic westbound from Rodello Street to the 17th Street Bridge. Detour route eastbound into Comox through Ryan Road / Lerwick Road	• **No significant delays/congestion/queues.** • Bypass would increase travel times eastbound into Comox due to the longer travel distance. • Traffic generally clears every cycle at the signalized intersections with signal optimization. • Detoured traffic (eastbound) is generally making right-turns which minimizes the impact on the traffic performance.
Comox Road Unidirectional Eastbound	Unidirectional traffic eastbound from the 17th Street Bridge to Rodello Street. Detour route westbound into Courtenay through Lerwick Road / Ryan Road	• **Negative network impacts** as westbound traffic volumes are higher than eastbound and therefore requires more traffic to detour than westbound unidirectional on Comox Road. • Also requires the detoured traffic to make left-turns on the detour route which has a significant impact on the traffic performance.
Comox Road Unidirectional Westbound / Back Road Unidirectional Eastbound	Unidirectional traffic westbound from Rodello Street to the 17th Street Bridge. Detour through unidirectional eastbound traffic on Back Road.	• Back Road Eastbound provides no benefits to traffic performance. • Back Road/Glacier View Road are collectors and, therefore, not a desirable route to encourage as a detour.

Overall, based on the construction parameters and the above modelled scenarios operating Comox Road in a unidirectional westbound configuration provides the least impact to traffic flows along the construction corridor and the greater network. No other reviewed option would be able to be implemented without significant negative impacts to the traffic network. This option is also expected to be the least impactful from a schedule and costs perspective as it allows flexibility for the contractors to work within a large zone of the construction corridor and traffic management should be less intensive than SLAT or full closure scenarios.

4.3 Work Through the Town of Comox

As the project progresses past Rodello Street onto local roads within the Town of Comox traffic impacts shift from network considerations to local traffic and neighborhood impacts. Construction along Beaufort Street, Stewart Street and Balmoral Avenue will have less impact to the greater network but will impact residents and businesses.

The proposed mitigation impacts for local road are highlighted in Section 5 and are generally following best practices for working within a local road network. For local traffic concerns, the mitigations measures in this strategy are high level and it is likely they will not identify all considerations. The construction efforts and contractor's traffic management plans will need to consistently monitor traffic impacts on a local scale and adjust as necessary based on actual impacts. More specific considerations are discussed in more detail in **Section 5**.

4.4 Impacts to Transit

As noted, the work on Comox Road, Comox Avenue and the corridor through the Town of Comox will have impacts to existing transit routes. To date there have been discussions with BC Transit and the local transit provider to minimize these impacts and the CVRD will continue to actively work with BC Transit and their team to provide mitigations where possible. Based on the current transit routes, the following are expected impacts to the existing routes noted previously in **Fig 3.5**.

4.4.1 Route 1 – Comox Mall / Anfield Center

Route 1 runs between the Comox Mall and the Anfield Center via North Island College. There will be a minor impact to Route 1 from the construction. Route 1 uses Stewart Street as a circular turn around to access the transit exchange at the Comox Mall. Stewart Street will need to be closed to traffic during the installation of the forcemain which will require transit vehicles to detour around this section. It is expected that Pritchard Road can accommodate

this detour. Construction sequencing will need to ensure this detour is open to transit during Stewart Street Closures.

The route may also see impacts from increased general traffic along the route, specifically on Anderton Road, Guthrie Road / Lerwick Road and Ryan Road. The CVRD is working with BC Transit to quantify these travel time changes.

4.4.2 Route 3 – Comox Local

Route 3 is a circular route within the Town of Comox. The route will be impacted at several locations throughout the Town of Comox due to the construction works. These impacts include:

Comox Avenue and Rodello Street - The route runs south on Rodello Street and turns left onto Comox Avenue. Forcemain and surface works will have an impact on this intersection and could cause delays to transit. It is expected that transit vehicle can still be accommodated through this intersection during construction. It is recommended that the traffic management plans should ensure this movement for transit vehicles is maintained.

Beaufort Avenue between Ellis Street and Stewart Street – Beaufort Avenue and Stewart Street will experience rolling closures during the installation of the forcemain and the surface works. Transit vehicles will be required to detour around these closures during construction.

Balmoral Avenue – The route runs east on Balmoral Avenue and turns northbound on Torrence Road. For the forcemain installation and surface improvements it is expected that there will be periods of full closures as well as periods of SLAT. During times of full closures transit will need to detour around the construction zone.

4.4.3 Route 4 – Driftwood Mall / Comox Mall

Route 4 will be significantly impacted by the proposed change of traffic flow along Comox Road between the 17th Street Bridge and Rodello Street. The current route includes travel westbound and eastbound along Comox Road between the Comox Mall and the 17th Street Bridge. In the unidirectional traffic scenario transit will not be able to run eastbound along Comox Road as it does now. Transit vehicles would still be able to run westbound, with traffic, along the route but the eastbound direction would need to be rerouted via the detour or other routes.

Options were modelled where transit was provided priority eastbound through the construction zones on Comox Road, however, it was found that this caused significant impacts to the network as well as provided inconsistent travel timings for transit through the

construction corridor. Based on this, it is recommended that Comox Road and Comox Avenue between the 17th Street Bridge and Rodello Street be closed to eastbound transit vehicles.

4.4.4 Route 15 – Comox Mall / Aquatics Center Via Back Road

Route 15 will be impacted through the proposed change of traffic flow along Comox Avenue between the Glacier View Drive and Rodello Street. Currently transit vehicles travel eastbound and westbound along Back Road / Glacier View Drive to Comox Avenue and along Comox Avenue to the Comox Mall. The proposed unidirectional traffic scenario will restrict the eastbound route between Rodello Street and Glacier View Drive.

Route 15 also uses Stewart Street as a circular turn around to access the transit exchange at the Comox Mall. Stewart Street will need to be closed to traffic during the installation of the forcemain which will require transit vehicles to detour around this section. It is expected that Pritchard Road can accommodate this detour. Construction sequencing will need to ensure this detour is open to transit during Stewart Street Closures.

4.4.5 School District 71 Bus Routing

There is a school district bus route that serves the KFN community on Comox Road and Back Road. Bus route 850 is a dedicated route that travels from Courtenay eastbound on Comox Road, picks up children at KFN and travels eastbound into Comox and along Glacier View Drive and Back Road to bring children to various schools.

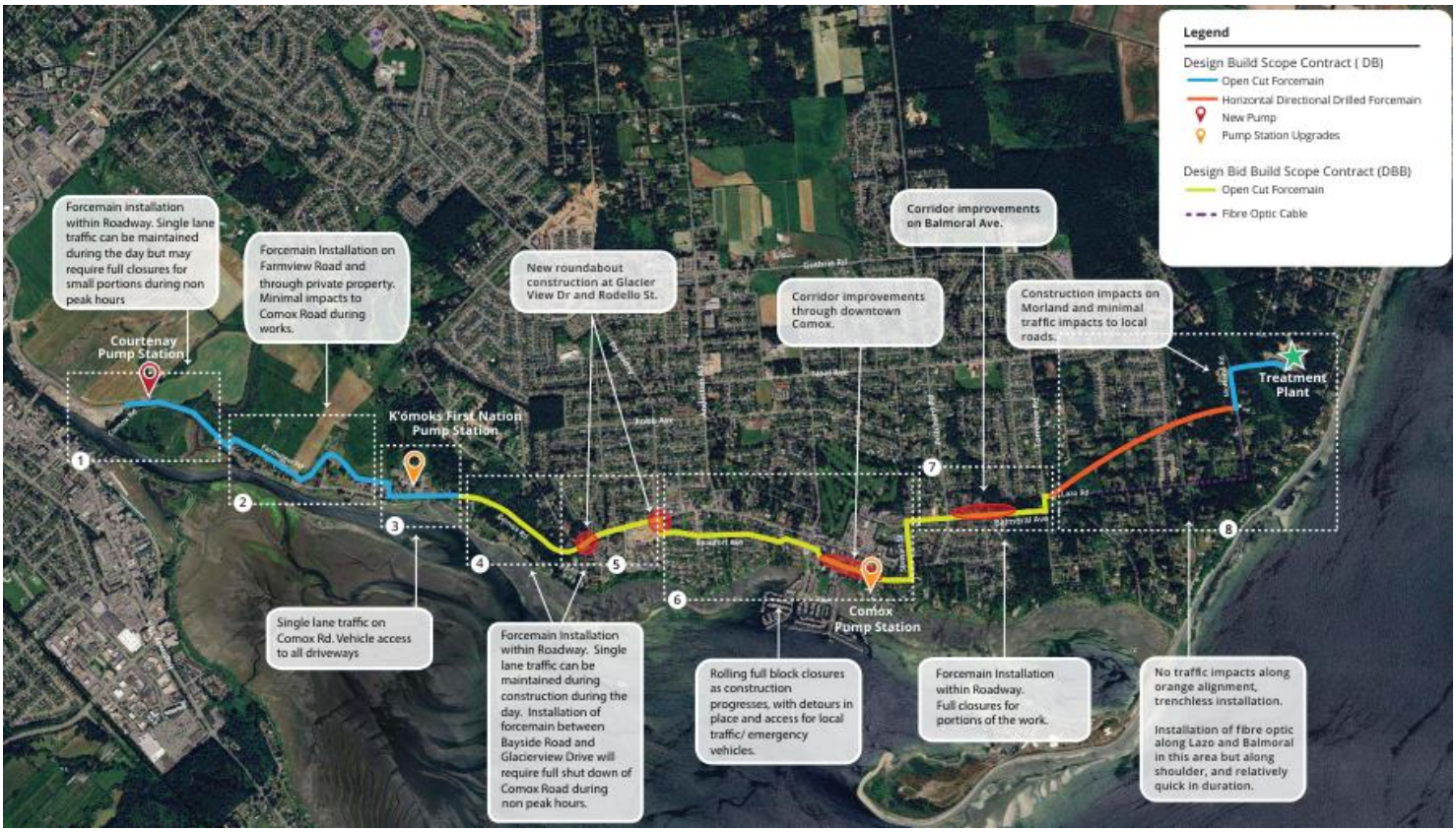
This route will be impacted due to the proposed traffic changes. The CVRD should inform and initiate discussions with the School District and KFN regarding this route and possible detours or other considerations for this bus route.

5.0 Traffic Management Strategy

Based on review of traffic data, modelled traffic scenarios and constructability constraints, we can provide the following consideration and recommendations with respect to a proposed traffic strategy for project construction. These considerations and recommendation should be included and built upon in project specific traffic management plans for the project that will provide specific means and methods for implementing the recommendations of the strategy. **Figure 5.1** includes a general summary of the impacts.

While the analysis and background has narrowed in on the Comox Road corridor, localized impacts are equally as important, specifically through residential areas within the Town of Comox.

Figure 5.1 – Traffic Strategy Overview



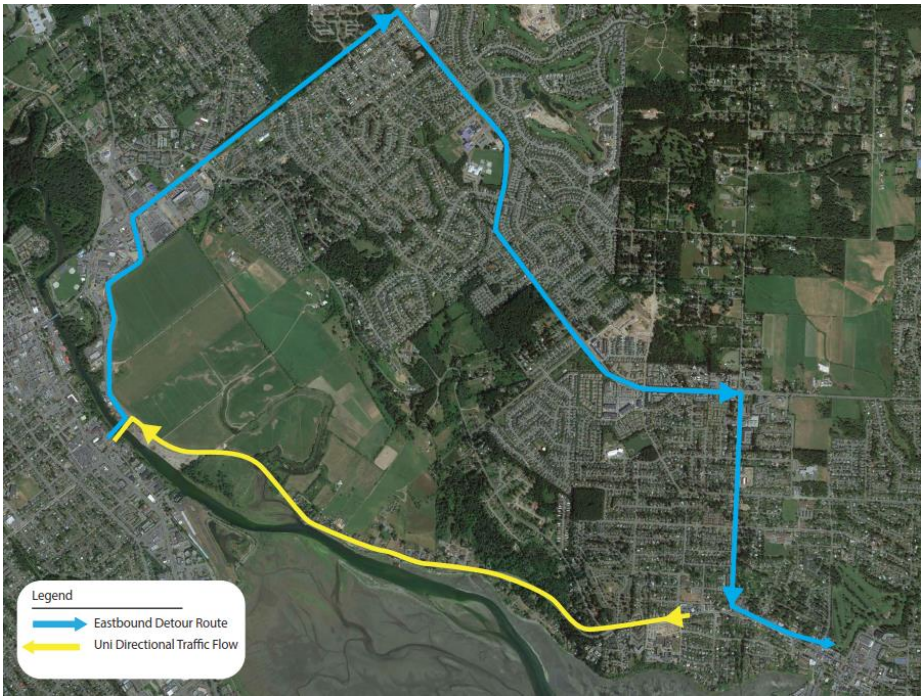
5.1 General Traffic Movements

Based on the network traffic analysis results, a review of stakeholder input, and through discussions with the project partners, the recommended Comox Road traffic management option is to operate Comox Road as a unidirectional westbound only route during periods of time when forcemain installation requires single lane traffic on Comox Road. It is recommended that the unidirectional traffic control would be in place 24 hours per day, except when a night work requires a full closure of Comox Road.

This option minimizes the traffic impacts on the network while also enabling the contractor to complete the project reasonably efficiently since there is no limitation on the length of the construction zone/excavation. It also provides flexibility between the two contractors as multiple construction zones can operate concurrently within this configuration. This will involve a level of communication and planning between the two contracts, but this would be necessary with all traffic pattern changes.

The official signed detour route for eastbound traffic would be via Ryan Road, Lerwick Road and Anderton Road. Some traffic will likely choose to use Back Road and Glacier View Drive; however, this will be actively discouraged as an official detour route as it is a residential collector road. Back Road traffic management considerations are discussed further in **Section 5.4**, below. The general flow and detour route configuration are shown in **Fig 5.2.**

Figure 5.2 - Comox Road and Detour Traffic Route



As the eastbound traffic using Comox Road / Comox Avenue will divert via the assigned detour route, the eastbound travel time for the diverting traffic is anticipated to increase due to this being a less direct route. However, traffic analysis indicates that the overall travel time changes for the detour routes are generally comparable to pre-construction conditions despite the change in travel patterns. This is partially due to traffic at certain locations, namely the northbound left turn at the 17th Street and Comox Road intersection, experiencing less delays without eastbound traffic compared to today. The reduction of delays at various locations offset the slightly increased delays along the remaining detour routes on Ryan Road, Lerwick Road and Anderton Road. The impacts of the detour are also minimized as the detour has vehicles making right hand turns for most of the route. In short, the eastbound travelers that use Comox Road / Comox Avenue today will experience longer travel time mainly due to longer travel distance. The travel time of detour routes will be similar to the existing conditions illustrated in **Table 3.2**, which means travel times of 5 to 12 minutes more when diverting through the detour for vehicles traveling from the 17th Street Bridge into the Town of Comox. General traffic using Ryan Road and Lerwick Road travelling to other destinations will see increased traffic, but the intersections are able to accommodate this increase and travel times are not noticeably longer within the greater network.

However, to best accommodate the diversion of eastbound travel through the detour route, several signalized intersections require signal re-timing. The timing of these intersections to provide additional volume in movements along the detour is critical to a balanced network and keeping similar travel times to existing. Based on the modeling, below is a list of the signals that require signal timing adjustments by priority.

High priority

- 17th Street & Comox Road
- Island Highway & Ryan Road
- Ryan Road & Sandwick Road
- Ryan Road & Back Road

Medium Priority

- Cliffe Avenue & 17th Street
- Ryan Road & North Island Highway
- Ryan Road & Lerwick Road
- Guthrie Road & Aspen Road
- Guthrie Road & Anderton Road
- Anderton Road & Noel Avenue
- Comox Avenue & Anderton Road

Low Priority

- Remaining signals in Comox and Courtenay

Locations ranked as high priority indicate that the signal timings would require to be re-timed to ensure the detour traffic can flow through the detour route efficiently. Locations ranked as a medium priority mean that these locations will likely require signal re-timing to best accommodate the traffic patterns at a network level. Locations ranked as low priority indicate that these locations will not likely require immediate signal re-timing but should be monitored throughout the construction phase on an as-needed basis.

We recommend that the CVRD open discussions with the various jurisdictions and confirm the ability to and process for reviewing and revising signal timing of these intersections during construction.

5.2 Emergency Vehicle Access

Based on the recommended scenario, portions of Comox Road would be greatly impacted from access by emergency vehicles. In a westbound traffic scenario, it is recommended that provisions in the traffic management plans be made to accommodate emergency vehicle access from both westbound and eastbound points at any location along Comox Road and the works zones. Depending on the location of the works, the set up of the work zones and traffic flows, this would be expected to be supported by either traffic management personnel, traffic lights with emergency pre-emption or other means of providing immediate westbound and eastbound emergency vehicle access against eastbound flowing general traffic.

Beyond Comox Road, throughout the project corridor access for emergency vehicles is a priority for all residences and buildings. All construction corridors through the site day and night will have plans in place to always accommodate emergency vehicles during the project works. Emergency service providers should also have the chance to review submitted traffic management plans for the works.

5.3 Considerations for Full Closures on Comox Road

As noted, there are sections of the corridor that require a full shut down to traffic to facilitate the installation of the forcemain (Section 1 and portions of Section 4 – **Fig 2.1**). For these sections, it is recommended that if a full shut down of Comox Road is required, that it occur at off-peak travel times to reduce impacts to the network. For full shutdowns of traffic, the detour for westbound traffic should follow the detour being proposed for eastbound traffic (via Anderton Road, Lerwick Road and Ryan Road). Any shutdowns and detour routes will need to be adequately signed, communicated to the public and all impacted users of the corridor and considerations for local emergency vehicle access would need to be confirmed.

Based on the volume patterns on the corridor we would recommend that any full shutdowns occur between 8 p.m. and 6 a.m. Project partners should be consulted regarding any timing of shutdowns. Also, for emergency access considerations Section 1 and Section 4 (**Fig 5.1**) for the corridor should not be closed to traffic at the same time as to allow access to both ends of any construction zones.

For areas outside the above noted corridor section, accommodation of night work is not recommended based on the proximity to homes and residential neighbourhoods. However, there may be some extremely limited circumstances where night work outside of the specified corridor section may be necessary.

5.4 Back Road Traffic Management Considerations

The official detour route for eastbound traffic will be via Ryan Road, Lerwick Road and Anderton Road since these roads are arterials and designed to accommodate higher traffic volumes. All communications and signage will encourage motorists to use this route. However, some motorists who are familiar with the area may use Back Road and Glacier View Drive. These roads are classified as collector roads with residential fronting the roadway.

The two key potential issues associated with detour traffic using Back Road and Glacier View Drive are excessive traffic volumes and excessive speed, both of which can contribute to safety issues. A series of escalating traffic calming measures can be implemented to discourage use of the route as a detour and support motorists in selecting an appropriate speed.

Potential traffic calming measures for Back Road include:

1. speed reader boards,
2. temporary curb extensions using Traffic Calming Curbs[1] at pedestrian crossing desire lines.
3. speed humps; and

While these measures can help discourage use of this corridor as a detour route, these measures and speed humps, in particular, are often not universally supported by local residents. Therefore, the benefits of traffic calming should be weighed against the impact on residents and an appropriate balance sought. Increased police enforcement can also support the use of appropriate speeds. Based on the need for reduced traffic flows on Back Road we

[1] Traffic Calming Curbs: https://www.calgary.ca/roads/safety/traffic-calming-curbs.html

would recommend that the above three noted measures are considered and included in the initial traffic management plans for the project.

Should the above measures not be sufficient to discourage use of Back Road as a detour route, a barricade could be added such that Back Road is temporarily no longer a through route with local access considerations. Allowing Back Road to only flow in a westerly direction for certain sections could also be considered. These options would have a significant impact on accessibility for residents and emergency services and therefore it is only recommended as a last resort after further engagement with residents and emergency services. The closure would also need to be designed to accommodate a turnaround for vehicles on either side of the barrier.

Existing average traffic volumes for Back Road are in the 2,000 to 2,500 veh/day range. Traffic volumes during construction can be monitored against these existing conditions to support consideration for escalating measures during construction.

5.5 Cyclist and Pedestrian Accommodations

Providing pedestrian and cyclist facilities for individuals to safely navigate during the construction phase is crucial. Good connectivity for pedestrians and cyclists will not only support users' safety but also encourage individuals to choose walking or cycling instead of driving and help reduce congestion.

It is recommended that, for portions of Comox Road from Rodello Street to the 17th Street Bridge, access for pedestrians and cyclists is maintained during construction apart from periods of full closures. The following considerations are desirable to accommodate two-way cyclists. Of note, the below assumes that travel lane minimums are 3.3 m which is typically accepted as a reduced travel lane that will accommodate transit buses. Additionally, all of these dimensions are to the edge of the work zone and it is assumed that the contractor will provide the any required barriers and setback from the barrier within their work zone.

Bike accommodation options through the construction site should generally follow the following dimensions:

- **Unidirectional bike lanes (all same side of excavation)**
  - 1.5 m westbound bike lane
  - 3.3 m westbound vehicle lane
  - 1.5 m eastbound bike lane
  - **TOTAL 6.3 m (minimum)**

- **Westbound bike share vehicle lane through construction zone**
  - 3.3 m westbound vehicle lane (westbound bikes will be instructed to take the lane)

- 1.5 m eastbound bike lane
- **TOTAL 4.8 m (minimum)**

A bi-directional bike facility is not recommended since it requires the cyclists to cross the vehicle lane to access the facility and then cross back to continue their journey at the end of the work zone. Additionally, the minimum recommended width for a bi-directional bike facility is 3.0 m. Therefore, a bi-directional bike facility provides no space savings compared to two 1.5 m unidirectional bike lanes. Additionally, motorists are often not expecting bi-directional cyclists which can increase safety risks.

For the section of Comox Road from the Courtenay Pump Station to Farmview Road it is understood that there will be a total of 5.9 m[2] available to accommodate all modes through the construction site while there is a total of 5.3 m[3] available from Bayside Road to Glacier View Drive. Based on the required dimensions, outlined above, the recommended approach for both segments is to provide an eastbound bike lane with westbound bikes instructed to take the vehicle lane through the construction zone. This has the added benefit of not needing to have cyclists' cross traffic at the end of the zones as would be the case with a single shared lane on one side. With the limited space available the eastbound bike lane will need to also accommodate pedestrian traffic. The lane should be signed accordingly to communicate this to cycling traffic.

For Comox Road from the IR #1 west boundary to Bayside Road there is additional width available. provision of unidirectional bike lanes in both directions plus a 3.3 m westbound vehicle travel lane is recommended.

With respect to pedestrians, the entire corridor is used by pedestrians. On Comox Road, the westbound shoulder should be maintained as a pedestrian corridor through the construction zone and access to various properties on the east side of Comox Road will need to be accommodated in traffic management plans.

5.6 Section Specific Traffic Management Considerations

Further to the above project considerations, the Traffic Management Strategy has been broken down into eight traffic mitigation sections as per **Fig 5.1**. Each section is discussed in greater detail below.

[2] 5.9 m is based on the contractor's work zone extending to the center line. This leaves 5.9 m from the center line to edge of pavement.
[3] 5.3 m is based on the contractor's work zone extending to the center line. This leaves 5.3 m from the center line to the asphalt curb.

5.7 Section 1 -Comox Road (Courtenay Pump Station to Farmview Road)

Section 1 involves approximately 650 m of forcemain installation within Comox Road from the Courtenay Pump Station to Farmview Road. To facilitate the construction works on Comox Road, single lane westbound traffic should be in place during the construction within the roadway.

Construction at the Courtenay Pump Station site is expected to have minimal traffic impacts as the work is occurring off Comox Road. However, traffic control should be provided on Comox Road, as necessary, to facilitate safe access to the site for construction vehicles and material deliveries.

Figure 5.3 – Section 1 Traffic Mitigation Plan

Other mitigation measures for Section 1 that should be addressed in a traffic management plan include:

- Ensuring adequate signage and notice for the traffic impacts;
- Ensuring emergency access through and beyond the construction zone (eastbound and westbound); and
- Providing accommodation for pedestrian and cyclists through the construction zone.

Based on the location, there could be the opportunity to have full closures during off peak times as per **Section 5.3** without major impacts to residents and homes. Any shutdowns

would need to be signed and communicated and considerations for emergency vehicle access would need to be confirmed.

Access for pedestrian and cyclists through this section, as per **Section 5.5**, should be always maintained, except during periods of full closures during off peak times.

5.8 Section 2 -Farmview Road and Agricultural Land

Section 2 involves installation of the forcemain along a section of Farmview Road, north of Comox Road, a portion of Scott Road and through agricultural land. The traffic impacts for work along this segment are expected to be minimal beyond local impacts. Mitigation measures for Section 2 that should be addressed in a traffic management plan include:

- The work will impede the access to several homes and cross several driveways along Farmview Road. Planning of work will need to consider access for residents.
- The work along Scott Road will impact access to homes. A local access should be maintained during the work for these residents.
- It is expected that construction traffic will need to enter and exit Farmview Road and Scott Road off Comox Road. Traffic control means should be provided to accommodate construction traffic accessing the site.
- Access for emergency vehicles will need to be accommodated to all residences.

Figure 5.4 – Section 2 Traffic Mitigation Plan

5.9 Section 3 – Comox Road (IR #1 West Boundary to Bayside Road)

Section 3 involves 650 m of forcemain installation within Comox Road from the K'ómoks First Nation IR #1 west boundary to Bayside Road. This is the last section of the Design-Build Scope on Comox Road.

To facilitate the construction works on Comox Road, single lane westbound traffic should be in place during the construction within the roadway. Opportunities to maintain localized 2-way traffic to provide a connection for local access to homes and the K'ómoks First Nation Administration Buildings could be considered, but feasibility of this would need to be confirmed with the contractor.

Local traffic access to Queneesh Road and Bayside Road should always be maintained during construction with a specific access plan or local bypass in place for the forcemain crossings at each intersection.

Like other segments, access through the corridor should be maintained for pedestrian and cyclists for the duration of the works, as per **Section 5.5**.

Figure 5.5 – Section 3 Traffic Mitigation Plan

5.10 Section 4 – Comox Road (Bayside Road to West of Glacier View Drive)

Section 4 includes a section of Comox Road from Bayside Road to west of Glacier View Drive.

Based on the general traffic recommendations, Section 4 should be operated as westbound single lane unidirectional traffic during construction in the roadway that require single lane traffic.

It has been noted that a full closure to traffic is required to accommodate the force main installation on Comox Road between Bayside Road and Glacier View Drive. Full closures should only be accommodated at night and follow the recommendations noted in Section 5.3 and be minimized where possible. This section does have driveways on the south side of Comox Road that will need to be accommodated for access. It is recommended that discussions should be had with these residents regarding any restrictions or full shutdowns.

Other traffic mitigation recommendations for this corridor are included in **Fig 5.6**.

Figure 5.6 – Section 4 Traffic Mitigation Plan

5.11 Section 5 – Comox Avenue (Glacier View Drive to Rodello Street)

Section 5 includes the section of Comox Avenue from Glacier View Drive to Rodello Street and includes the Glacier View Drive and Rodello Street intersections, both of which are being significantly improved with roundabouts after initial installation of the forcemain. Note that for the purposes of this report Comox Road changes to Comox Avenue at the Town of Comox boundary located west of the Glacier View Drive intersection.

Based on the general traffic recommendations, Section 5 should be operated as westbound single lane unidirectional traffic during construction in the roadway that require single lane traffic.

Under a unidirectional traffic pattern, access to Glacier View Drive from Comox Avenue will be important to remain open during construction. Glacier View Drive will provide a return access point to the local network for vehicles and will act as an offramp for vehicles entering from the south side of Comox Avenue. For instance, residents of Manor Drive would be able to turn left on Comox Avenue and right on Glacier View Drive allowing them back into Comox rather than being required to continue west on Comox Road. Local neighborhood traffic calming, and measures noted in Section 5.4, and signage should be implemented for Glacier View Drive and the local network to discourage unnecessary traffic trying to detour around the construction zones.

Once the forcemain installation is complete through this section, it is expected that unidirectional traffic or shorter SLAT segments will be used during the construction of the surface works at the Glacier View Drive and Rodello Street intersections. Discussions with the design team and eventual contractor should confirm if this is achievable from a constructability perspective.

Other traffic impacts a mitigation recommendation for this corridor are included in **Fig 5.7**.

Figure 5.7 – Section 5 Traffic Mitigation Plan

5.12 Section 6 – Beaufort Avenue/Stewart Street (Rodello Street to Balmoral Avenue)

Section 6 includes portions of Rodello Street and Beaufort Road through the Town of Comox to Stewart Street and northbound to Balmoral Avenue. The forcemain in this corridor will be installed within the existing roadway, which will require closure of the roadway for most sections. When roadway closures are required, contractors should work one or two blocks at a time with rolling single/double block closures to traffic to minimize impacts. Double block closures should be minimized and only accommodated where shown to be necessary. Local access to homes and businesses will need to be accommodated and communicated with the property owners. At a minimum, pedestrian access to all homes and businesses should be always maintained.

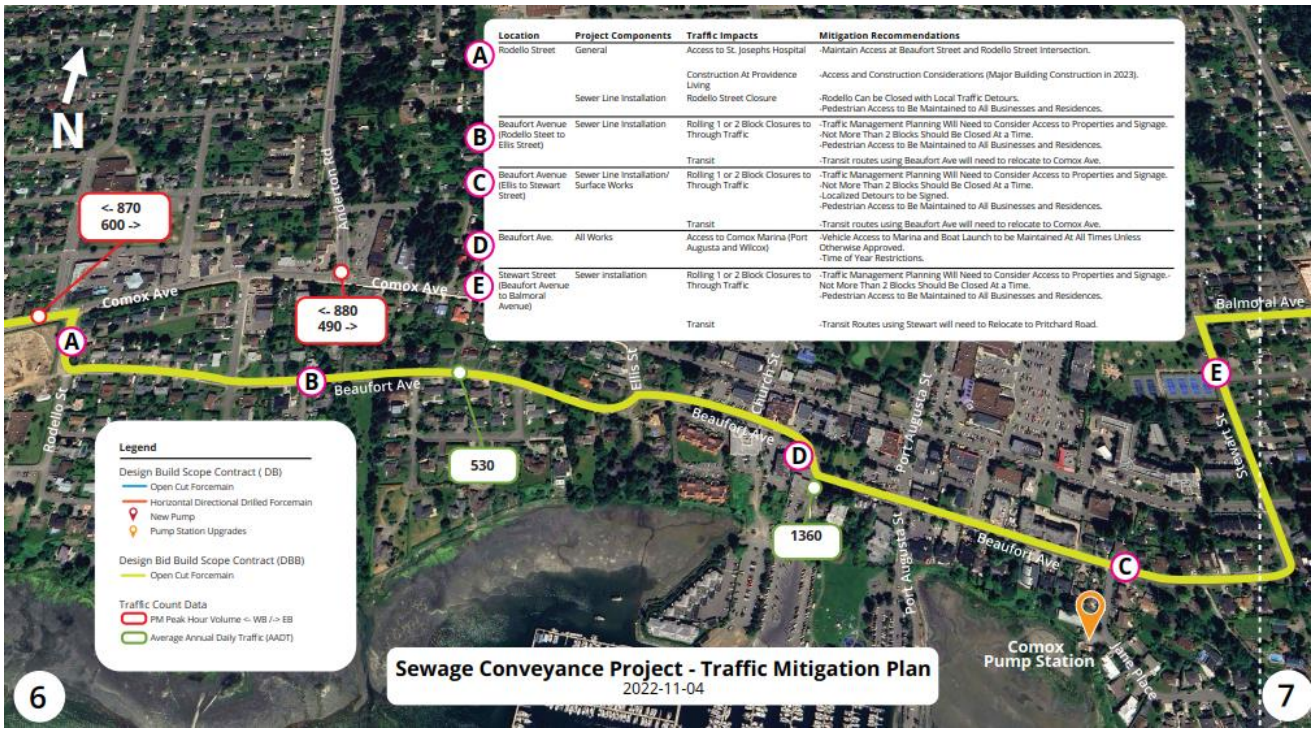
This corridor includes access points to the Town of Comox Marina and boat launch. It has been agreed to with the Town of Comox that no full or partial access closures to the boat launch will be accommodated between May 1st and October 1st as to not restrict boat access.

The Town of Comox marina also hosts “Nautical Days” which is typically held on the BC Day long weekend. It has been agreed to with the Town of Comox that construction must not

impact Comox Road and any roads within the Town of Comox boundary three days prior to, or during the Nautical Days festival. This should be included and confirmed in the traffic management plans for the project.

Additional traffic Impacts and mitigation recommendations are included in **Fig 5.8** for this corridor.

Figure 5.8 – Section 6 Traffic Mitigation Plan



5.13 Section 7 -Balmoral Avenue (Stewart Street to Torrence Road)

Section 7 includes a section of Balmoral Road between Stewart Street and Torrence Road. The forcemain in this corridor will be installed within the existing roadway, which will require either full closures or a reduction to single lane traffic. When roadway closures are required, contractors should work one or two blocks at a time to minimize impacts. A signed detour route should be in place during closures. There are local detours using Noel Avenue or Guthrie Road that are available without major impacts to the network. Other localized network detours are available to various destinations beyond the construction zone as well.

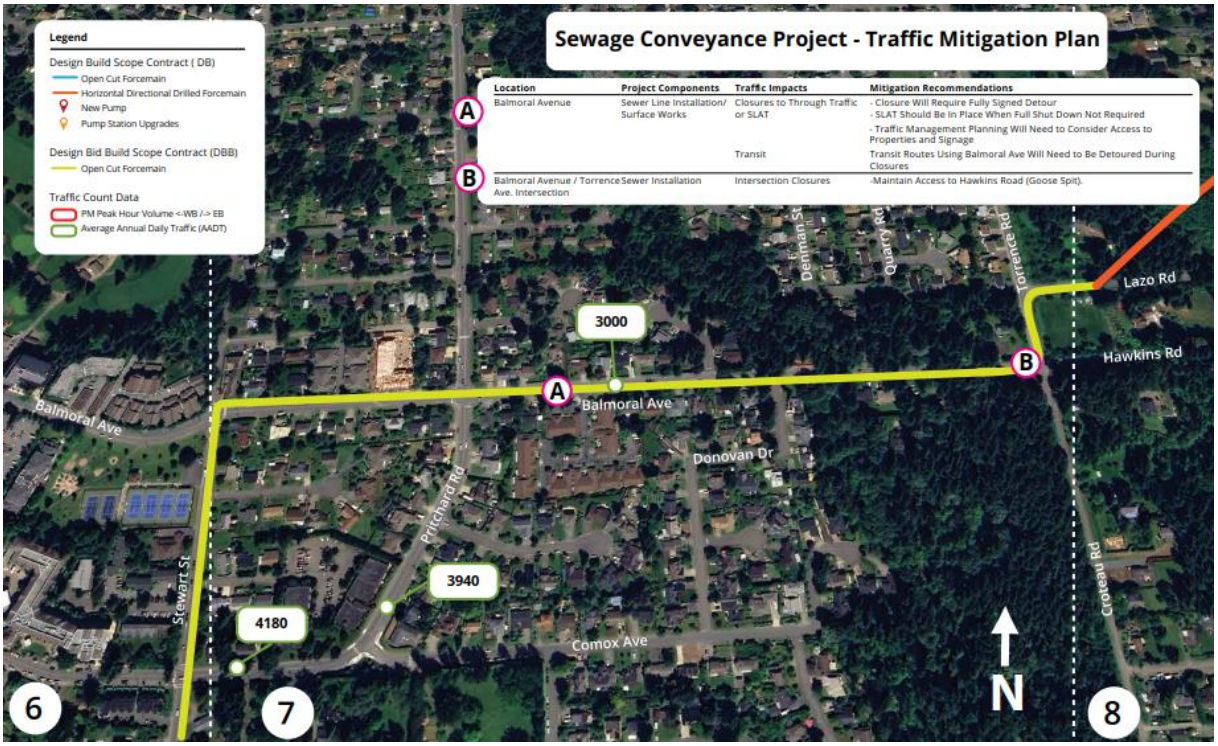
Local access to homes will need to be accommodated and communicated with the property owners. At a minimum, pedestrian access to all homes and businesses should be always maintained.

When one lane can be utilized for traffic, due to the lower volume of traffic within the corridor, we recommend that SLAT can be implemented through the construction zone during construction. Based on the traffic volumes, we would recommend that initially SLAT zones are maximized at 200 m to maintain a minimum level of traffic through the work zone. It is expected that a percentage of local traffic would detour where practical, which will minimize traffic through the corridor.

While Stewart Street is closed to traffic, transit is expected to use Pritchard Road to access Balmoral Road. Routes will then either turn westbound or eastbound on Balmoral Ave. Based on this, while Stewart Street is closed to traffic, Pritchard Road and Balmoral Road intersections will need to be open to transit and general traffic. Once work is completed on Stewart Street it should be opened back up to traffic and transit prior to commencing the any work on Balmoral Ave. that would impact the Pritchard Road and Balmoral Ave. intersection.

The Torrence Road and Lazo Road Intersection includes connection points to Hawkins Road (Goose Spit) and Croteau Road. This intersection is the only access to these areas and will need to be maintained during installation of the forcemain through the intersection.

Figure 5.9 – Section 7 Traffic Mitigation Plan



5.14 Section 8 – Trenchless Installation to Morland Road

The final section includes areas around the final trenchless installation of the forcemain and the final connection to the treatment plant.

Construction at the trenchless site off Lazo Road is expected to have minimal traffic impacts as the work is occurring off Torrence Road or Lazo Road. However, traffic control should be provided, as necessary, to facilitate safe access to the site for construction vehicles and material deliveries. Tie in of the forcemain to the trenchless section, however, will require a full closure of Lazo Road for a brief period (2 to 3 days). During this shut down a local detour will need to be put in place to route traffic around the construction.

As part of the project, fiber optic cable will be installed from the Lazo Road and Torrence Road intersection along Lazo Road and up Morland Road. While this cable will be installed within the shoulder, there may be minor traffic impacts during the installation. It would be expected that SLAT at a minimum would be maintained to maintain access to the area.

On the plant side of the installation there is a minor section of open cut trench that may impact access for residents on Morland Road. The contractor should ensure that access to all homes is maintained during the installation of the forcemain.

Figure 5.10 – Section 8 Traffic Mitigation Plan

6.0 Transportation Demand Management

The Traffic Management Strategy recommendations do have an impact to travel routes within the Comox Valley and do increase travel times between the City of Courtenay and The Town of Comox. As well, the project will increase traffic and travel times on other routes within the network. Based on this demand, management should be considered. Transportation Demand Management (TDM) refers to strategies that influence travel behavior. Opportunities to use TDM approaches to address challenges during construction are explored in the following sections, both in terms of shifting travel demand to mode/options that are less impacted and shifting travel demand to off-peak periods.

6.1 Mode Shift

Several opportunities to facilitate and support shifting travel to modes that are less impacted by the construction works have been identified. In general, it is very difficult to gauge the effectiveness and eventual use of mode shift opportunities. Mode shift opportunities are typically oriented toward commuter traffic and typically there needs to be a very large impact to travel times or routes to have commuters or general traffic shift travel habits. However, if opportunities are available without significant investment or disruption, they can be a great incentive to local commuters.

6.1.1 Park-and-Ride

Park-and-Ride requires establishing and promoting parking locations available to commuters throughout the construction period. These could be located in both downtown/west Courtenay and east Courtenay, or downtown Comox to facilitate park-and-ride activities in both directions. Typical target parking areas may include public facilities or commercial sites with under-utilized parking supply.

There are three travel options that may be considered for transporting individuals between identified park-and-ride parking areas and key end destinations such as downtown Courtenay, Downtown Comox, North Island College, and North Island Hospital. Important for all options is that they result in greater convenience and/or reduced travel time as compared to a single-occupant vehicle.

The three options are as follows:

1) **Transit** – Encourage use of existing transit routes. Route No.1 (Comox Mall / Anfield Centre) or other routes in east or west Courtenay that might access dedicated parking areas. Increased communication and an education campaign could be useful in attracting and promoting transit ridership and a park-and-ride system.

This approach has the benefit of utilizing an existing service and potentially exposing new users to transit which may encourage increased Transit use post construction.

2) **Rideshare** – Targeted communications could be used to encourage ridesharing and reduce the number of vehicles on the road. Creation of dedicated parking spaces at key end-point in Downtown Comox, North Island College (outside peak semesters such as summer months) and some of the commercial areas in West Courtenay or along Ryan Road could also support rideshare. Rideshare can either be informal (involving individuals who already have a pre-existing relationship) or through a more formal ride matching program. One example of a rideshare program is the Kootenay Rideshare[4]; it facilitates shared transportation which reduces congestion and carbon emissions while being free to use for drivers and passengers.

   The parking spaces for rideshare will be subject to interest and cooperation from the property owners, including issues of liability. Temporary signage and information would need to be made available clarifying which areas of identified parking are available for rideshare and the conditions of using the parking area. For example, a maximum stay of 10 to 12 hours and rideshare activities only.

3) **Shuttle** – Consideration may be given to operating a shuttle service during the construction period operating between identified park-and-ride locations and key destinations. For this to be an appealing option, the shuttle must operate throughout the day (or timed to align with key shift start/end time) and have high enough frequency to be comparable with driving. This approach may be challenging to justify given the considerable operating cost over the project life and unknown demand. In many cases it might be more cost effective to provide a transit subsidy rather than operate a separate shuttle.

Based on the proposed traffic movements and the proposed detour route during unidirectional traffic flows, we feel there is likely limited advantages to mode shift beyond the opportunities to use and encourage transit ridership. Individuals typically choose their travel mode based on optimizing travel time, cost, and safety in alignment with their personal values and circumstances[5]. Often the greatest opportunity for mode shift or TDM is created when a new travel option such as new bike facilities, high occupancy vehicle lanes or a new transit route/increased frequency is introduced since this can alter an individual's assessment of their optimal travel mode. Without dedicated high occupancy lanes or detour efficiencies there is limited opportunities to entice drivers away from driving in the context of this

[4] Kootenay Rideshare: https://kootenay.ride-share.org/
[5] Personal values and circumstances can include a variety of factors such as: access to a vehicle, need to transport children/bulky items, environmental considerations, etc.

project. Broader community efforts to support TDM measures can be perused independent of the Sewage Conveyance Project. Based on initial discussions Park and Ride programs will not be explored at this time.

6.2 Encouraging Cycling

As noted previously, providing opportunities for cyclists to navigate the construction zone effortlessly is imperative. The Comox Road corridor is already used as a commuter cycling route and this should be encouraged and accommodated (in both directions) throughout the construction.

Along with providing the facilities, communication and advertisement of this option should be brought forward. Based on the traffic patterns and proposed mitigations, cycling could provide the greatest opportunity for demand management as it does provide opportunity to bypass detour routes and possibly reduce travel times for those that are able to commute via bicycle.

Collaboration with the Comox Valley Cycling Coalition could also bring forward other opportunities and to promote and encourage cycling.

7.0 Closing

The Traffic Management Strategy for the Sewer Conveyance Project has been prepared to identify and evaluate various traffic management scenarios and develop a recommended strategy for the project impacts. The goals of this strategy are to provide a safe environment for all road users during the construction phase while minimizing impacts to the public, businesses, and priority vehicles (transit, emergency services, etc.). The recommendations are intended to be used by the Comox Valley Regional District to communicate both internally and externally as well as forming the basis of the contractor's Traffic Management Plans.

The recommendations in this report are based on the anticipated construction approach and resulting traffic management requirements. However, the recommendations in this Traffic Management Strategy will likely be refined in conjunction with the successful contractor and implementation will be subject to the contractor's work plan and the available budget.

Overall, the following general mitigation recommendations have been included in the strategy:

1. Comox Road / Comox Avenue should be operated in a unidirectional westbound configuration for periods of time where two-way traffic cannot be maintained along the corridor.
2. An eastbound detour route using Ryan Road, Lerwick Road / Guthrie Road and Anderton Road into the Town of Comox should be signed and communicated during times of westbound unidirectional traffic on Comox Road/Comox Avenue.
3. Eastbound and westbound access for emergency vehicles must be always maintained for each construction zone. This would include the ability to stop westbound traffic and provide eastbound access to emergency vehicles.
4. For sections noted, full shutdowns can be accommodated at off peak hours with signed detours and communications in place.
5. Where feasible transit movements should be prioritized. This could include means for transit vehicles to be prioritized through SLAT sections or other non-unidirectional traffic-controlled sections of the project.
6. Space for cyclist and pedestrians needs to always be accommodated throughout the corridor.
7. Back Road should be discouraged from being used as a detour route and traffic calming measures should be put in place to reduce speeds and traffic loads.
8. Construction closures through Town of Comox local road network should be limited to two blocks at a time and include access considerations for all residences and businesses; and
9. Other mitigation measures as noted.

Based on the recommendations of the strategy we would suggest the following next steps with respect to implementation.

1) The Traffic Management Strategy should be distributed and reviewed by project partners and impacted user groups to ensure the recommendations of the strategy are achievable and can be supported by all interested groups.
2) The recommendations should be considered and added to the contract specification for implementation into the two separate construction contracts.
3) Continued dialogue with BC Transit should be advanced with respect to mitigations for transit route impacts and opportunities to support and encourage transit ridership during construction.
4) Continued Dialogue with KFN should be advanced regarding mitigation for works within IR#1 on Comox Road and for and the proposed level of traffic calming measures proposed through IR#1 on Back Road during construction.
5) Strategic and timely communications will be an important mitigation effort to assist in minimizing impacts to the community. Proactive communications should continue with respect to information being provided to the travelling public and the broader community