

POLICY REPORT

Report Date:September 24, 2019Contact:Lon LaClaireContact No.:604.873.7336RTS No.:12872VanRIMS No.:08-2000-20Meeting Date:October 1, 2019

TO:	Vancouver City Council	
FROM:	General Manager of Engineering Services	
SUBJECT:	False Creek Flats Grade-Separated Road Alignment	

RECOMMENDATION

A. THAT Council support grade-separating the Burrard Inlet Rail Line with an underpass along the Prior/Venables Street alignment at no cost to the City;

FURTHER THAT Council endorse that the Prior/Venables Street underpass include an all-ages-and-abilities route for the Adanac Bikeway, provide accessible walking connections, facilitate access to local businesses via Raymur Avenue, and be integrated with public spaces and an enjoyable public realm.

- B. THAT Council direct staff to work with the neighbourhood to design "great street" treatments (e.g. wider sidewalks, green infrastructure, street trees, curb bulges, etc.) on Prior/Venables Street to reduce vehicle speeds; improve walkability and access to the park; and enhance the public realm, walking, and cycling connections throughout the neighbourhood, as outlined in this report; and that staff report back on a funding and implementation strategy as part of the capital planning process to pursue improvements in the near-term before the Prior/Venables Street underpass is completed.
- C. THAT Council recommend any changes to park boundary due to the Prior/Venables Street underpass result in a net increase of permanent park space to Strathcona Park by exchanging portions of existing street right-of-way and park land.

CONSIDERATION:

Council could consider the following proposals in addition to staff's recommendations:

- D. THAT Prior/Venables Street be downgraded to a collector street, with a 30km/h speed limit near Strathcona Park.
- E. THAT staff implement a pilot to reduce traffic volumes and speeds on Prior/Venables Street with low cost initiatives in the near term, such as all-day parking on both sides and temporary curb bulges, with the intention of restricting traffic to one traffic lane in each direction; and that staff monitor travel time and reliability impacts to transit and emergency services, shortcutting on local residential streets, and traffic and safety impacts on other neighbourhoods; and that this will inform the future street and underpass design, which is intended to be one general purpose through-traffic lane in each direction.
- F. THAT staff work with the Strathcona neighbourhood to prepare a summary of capital investment priorities for the next 10-15 years, including investments in community facilities, and parks and open spaces, and report back to Council in mid-2020.

REPORT SUMMARY

Across the region, there are significant investments being made to move goods more sustainably by rail, rather than truck, and to address the community impacts of goods movement. Staff anticipate that freight rail activity will increase on the Burrard Inlet Rail Line (BI Line) running between the Port of Vancouver and the False Creek Flats railyards, as there are investments being made to expand the Port and double-track the rail line. As goods and people will need to continue travelling east-west between downtown and communities in east Vancouver to access important regional destinations like the proposed new St. Paul's Hospital (subject to Council approval through a separate rezoning application and public hearing process), there is a growing urgency to advance the second phase of the False Creek Flats Rail Corridor Strategy (2008) to grade-separate the rail crossing from the arterial currently located on Prior/Venables Street. Grade separation of the rail line would also address the safety risks of at-grade rail crossings, such as serious injuries or fatal train incidents for people walking, cycling or driving, as well as improve the reliability of transit service and emergency response.

Grade-separation also presents an opportunity to reconsider the alignment of the arterial that is currently on Prior/Venables Street. Staff have been advancing this work since the rail corridor strategy, and in 2015, Council directed staff to explore alternate alignments in order to address Strathcona residents' concerns about traffic-related impacts on their community. Over the past 5 years, staff have engaged stakeholders and the public in a comprehensive study of route options, through both the False Creek Flats Area planning process and the Flats Arterial Community Panel. Staff developed conceptual designs and assessed numerous options and their variations on the Malkin, William, and National corridors, including alignments proposed by the community itself.

However, in an urban context, determining an alternate road alignment for grade-separation requires careful consideration of the impact to local communities, parks, businesses, landowners, and essential services. It also requires consideration of

the long-term benefits of each route option for local, city-wide, and regional residents, as well as the cost and feasibility of the project. Not surprisingly, there is no easy choice for an alternate arterial route and throughout the comprehensive study and engagement on the route options, all participants wrestled with the challenge and complexity of this decision.

After a thorough exploration of alternate arterial alignments to replace Prior/Venables Street, staff cannot recommend an alternate route that is both supported by the community and stakeholders impacted by the decision, and that does not place an undue fiscal burden on the City. A summary of the rationale is as follows:

- William Route options on William were strongly opposed by many community members, primarily park users and residents. A route on William would have major implications to Strathcona Park that would require Vancouver Park Board approval. The cost of mitigating park impacts, as well as the incremental costs of a William overpass as compared to grade-separating the existing route, would likely be borne by the City. As such, staff does not recommend Prior/Venables Street with a new route on William Street and through Strathcona Park.
- Malkin Although Malkin Avenue was once assumed for over a decade to be the likely route due to its historic wide street right-of-way, all of the Malkin options (North, Central, South variations) would have major impacts to food-related businesses and employment lands of high importance to the City, as per the False Creek Flats Area Plan (2017). Route options on Malkin were strongly opposed by many community members, including many businesses, Produce Row, BC Trucking Association and other goods movement stakeholders, and the Cottonwood Community Gardens. The cost of mitigating business impacts, as well as the incremental costs of a Malkin overpass as compared to grade-separating the existing arterial, would likely be borne by the City. As such, staff do not recommend replacing Prior/Venables Street with a new route on Malkin.
- National Route options on National, primarily the National-Charles Overpass
 recommended by the Community Panel, are supported by many residents, but
 are not supported by many stakeholders or other impacted businesses and
 residents. Potential project partners have not expressed support for the NationalCharles Overpass, rather they support the most cost-effective grade-separation
 solution. As the incremental cost of the National-Charles route (estimated to be
 over \$280 million) would likely be borne by the City, staff do not recommend
 replacing Prior/Venables Street with a new route on National.

Although staff cannot recommend an alternate arterial alignment, grade-separating Prior/Venables Street, while concurrently addressing traffic impacts, is needed to manage increasing rail activity and resulting concerns around safety and the connectivity and reliability of our street network. The Prior/Venables Underpass was the second-most supported option by the Community Panel, and staff have received letters expressing support for the route from numerous stakeholders including some residents and local businesses, and project partners, such as the Port of Vancouver and CN.

An underpass on Prior/Venables Street is preferred over an overpass for many reasons, including that it is more comfortable and accessible for people walking and cycling, would allow for better access to the industrial area, could be integrated with a

people-friendly urban design, including the Adanac Bikeway, and could provide better connections to Strathcona Park. The design of an underpass also does not encourage people driving to pick up speed as they drive down into the neighbourhood.

Prior/Venables Street would continue to provide good connectivity and high quality transit service to residents, but would not fulfil the longstanding residents' desire to downgrade Prior Street to a local-serving street. Although some of the traffic-related impacts of living near an arterial street are unavoidable without broader shifts in how we travel and move goods city-wide, there are immediate and longer-term improvements that can be made to enhance traffic safety and public realm along Prior Street.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

The False Creek Flats Arterial Grade-Separation has been informed and developed following a number of Council directives.

- In January 2007, Council authorized the City to enter into a contribution agreement with Transport Canada to complete the False Creek Flats Rail Corridor Strategy Study. The study identified a strategy to fully grade-separate the Burrard Inlet Rail Line, including grade-separated crossings for the arterial streets (Powell Street and Prior/Venables Street) in order to address the safety and traffic impacts of the rail corridor on nearby communities while supporting Vancouver's role in gateway trade.
- In February 2009, Council provided its support in principle to proceed with the Powell Street Grade Separation Project, the first phase of the False Creek Flats Rail Corridor Strategy. In 2012, funding agreements were reached with Transport Canada, the Port of Vancouver, CPR and TransLink, and construction of the Powell Street Overpass was completed in 2014.
- In October 2015, as part of the Georgia and Dunsmuir Viaducts replacement process, Council direction was received as follows:

THAT Council immediately approve downgrading of Prior Street to a local-serving street upon the completion of a new east/west arterial alignment to be determined through an accelerated planning process; and to direct staff to immediately pursue funding opportunities from senior governments and other partners with the objective of completing construction of the new replacement arterial as soon as possible, ideally, before or concurrently with the construction of the viaducts replacement street network.

FURTHER THAT Council direct the General Manager of Engineering Services to continue to pursue near-term improvements along Prior Street to continue to address community concerns about traffic-related safety.

• In May 2017, Council approved the False Creek Flats Area Plan. During the area planning process, staff worked closely with community partners to identify the grade-separated arterial route to replace Prior/Venables Street. Through extensive public and stakeholder engagement, it became clear that all of the replacement arterial options on Malkin, National, and William had challenges, and no route

preference emerged. A process was identified for a deeper conversation of the community values and trade-offs inherent in selecting a preferred route.

 In February 2018, as part of the Northeast False Creek Area Plan process, Council reaffirmed previous decisions as follows:

THAT Council reaffirm its decision to make Prior Street a "neighourhood" street, its support for food production and distribution in the Strathcona Park/Malkin area, its commitment to working with the Park Board and its commitment to the process that was established by staff to create a community panel to provide recommendations on a new east west arterial.

 In April 2019, Council received the report of the Flats Arterial Community Panel, which included the order of evaluation factors ranked by importance, the advantages and drawbacks of the arterial routes, and the recommendation for the National-Charles Overpass route determined through a voting process.

Other Council approved policies that have guided the overall planning process include:

- New St. Paul's Hospital and Health Campus Policy Statement (2017)
- Northeast False Creek Plan (2018)
- Transportation 2040 Plan (2012)

GENERAL MANAGER'S COMMENTS

Council directed staff to explore alternate alignments that could allow Prior/Venables Street to be downgraded. After five years of comprehensive study and engagement, staff are unable to recommend an alternate arterial alignment to replace Prior/Venables Street that is both supported by the community and that would not place an undue fiscal burden on the City. Given there is no alternate route, by default ,the arterial would remain on Prior/Venables Street and staff recommend we pursue grade-separation with our project partners at no cost to the City.

As this report explains, an underpass on Prior/Venables Street best meets our City goals of providing good connectivity across the rail corridor, safe and accessible routes for walking and cycling, and integration with the public realm. There is also an important opportunity to work with the community on near-term design changes to help address on-going concerns related to the impact of traffic on Prior/Venables Street.

Nevertheless, we appreciate that for many residents in Strathcona there is a longstanding need to downgrade and calm Prior/Venables Street.

At this time, we recommend that Prior/Venables Street remain an arterial because our transportation analysis suggests it is needed to provide effective access to the local neighbourhood, industrial businesses in the Flats, downtown and in the future the proposed new St. Paul's hospital. Currently, Prior Street is a two-lane street 84% of the time and only in peak periods does an additional lane open to provide more capacity. It is at these times when the arterial network as a whole is the most congested, and when most traffic short-cutting in neighbourhoods occurs.

However, Council has recently declared a Climate Emergency and set ambitious targets in a number of areas. By achieving the transportation targets in the Climate Emergency Response, staff anticipate lower vehicle volumes on all streets across the city; therefore it is prudent to right-size street designs to provide wide sidewalks, comfortable bike lanes, transit priority, and minimize the number of traffic lanes for general purpose vehicles across the City.

If directed, staff could support and implement a pilot to test the feasibility of one traffic lane in each direction at all times, through low cost initiatives, such as all-day parking on both sides of the street and temporary curb bulges to enhance pedestrian crossings. The pilot could be successful; peak hour vehicle trips could decline, or transition to other modes or streets without significant impacts. The pilot could also result in unintended and negative impacts, such as an increased delays and shortcutting on neighbouring streets. Through additional measures, negative impacts may be able to be resolved and the pilot made permanent. The results of the pilot would inform the future street and underpass design. TransLink would be consulted for any short-term and long-term implications for transit service, the designated Truck Route, and other arterial streets that are on the Major Road Network.

REPORT

Background/Context

As part of the Asia-Pacific Gateway, rail goods movement in Vancouver is vital to the national and local economies. The Port of Vancouver is expanding trade capacity in the South Shore Trade Area, and freight rail activity has begun to increase along the Burrard Inlet Rail Line (BI Line) that travels through the Strathcona neighbourhood to connect with railyards in the False Creek Flats and the Grandview Cut. Although it is more environmentally sustainable to transport goods by rail than by truck and doing so can support the achievement of Climate Emergency targets, freight rail that is not grade-separated can be disruptive to the street network and nearby communities.

In 2008, the City of Vancouver partnered with trade and goods movement stakeholders to develop the False Creek Flats Rail Corridor Strategy, which recommended fully grade-separating the Bl Line from the street network to address the safety of at-grade rail crossings, and maintain a more reliable transportation network. In 2014, the City partnered with the Port of Vancouver, Transport Canada, Canadian Pacific Railway, and TransLink to construct the Powell Street Overpass and complete the first phase of the strategy.

The at-grade rail crossing on Prior/Venables street requires grade-separation to address safety risks of the crossings, and to maintain a reliable route for transit, emergency vehicles, goods movement, as well as people walking, cycling and driving. In addition, a grade-separated street is needed to connect communities on both sides of the rail tracks and provide access to Strathcona, False Creek Flats, and other major destinations such as the proposed new St. Paul's Hospital, the Engineering works yards that provide essential core services across the City, and 'Produce Row' and other light industrial businesses.

After CN resumed more frequent, Port-serving rail service on the BI Line in January 2017, rail disruptions on Prior/Venables Street have reduced the reliability of transit service and emergency response, and increased the number of vehicles shortcutting on residential streets using the overpass at Hastings Street. Pedestrians and cyclists have also been observed climbing over stopped train cars due to long delays. Based on the current rail activity and the number of people driving, walking, and cycling across the at-grade rail crossing, the rail exposure index of Prior/Venables Street is 367,500 (when considering the Adanac Bikeway as a combined east-west corridor), which exceeds the industry standard threshold of 200,000 for considering grade-separation¹. Considering the significant planned investments towards increasing rail capacity at the Port of Vancouver and CN's plans to double-track the BI Line, there is a growing need to grade-separate Prior/Venables Street.

In addition, residents in Strathcona have expressed concerns about feeling unsafe crossing or walking along Prior Street, as well as coping with the noise and air pollution impacts that are typical of living near an arterial. In general, Prior Street is perceived by residents as a barrier between the majority of the community (north of Prior Street) and Strathcona Park. In 2015, an independent *In-service Road Safety Review* and a *Livability Assessment* was completed, concluding that the type and frequency of collisions on Prior and Venables Streets compares with other similar arterial corridors in the City, and that "there is nothing inherent in the engineering design or operation of the street that would be considered a safety concern". The studies recommended various improvements to Prior Street and many of the recommended improvements have been implemented, such as: replacing signs and signal heads to improve visibility, installing pedestrian countdown timers and increasing crossing times, implementing turn restrictions, and installing speed reader boards to encourage slower vehicle speeds.

In response to Strathcona residents' concerns related to living on or near an arterial, and concerns that traffic would increase on Prior Street with the planned replacement of the Viaducts with a better-connected street network, Council directed staff to explore alternate arterial alignments that could allow Prior Street to be downgraded to a local-serving street. Because any alternate arterial alignment would need an overpass to cross the rail yards, the need for grade-separation also presented an opportunity to reconsider the long-term alignment of the arterial.

Although Council direction, as part of the Northeast False Creek planning process in 2015, was to determine an alternate arterial route and to ideally construct the grade-separation before or concurrently with the construction of the planned Viaducts replacement street network, the need for a route decision and timing of grade-separation is independent of the timing of replacing the Viaducts with a better-connected street network. The need for a grade-separated arterial is due to the reasons mentioned above – the increasing activity of the rail corridor that is going to be double-tracked, and the

¹ Based on TRAINFO data collected at the Prior/Venables St rail crossing from March 2017 to January 2018, an average of 12-13 trains per day cross Prior/Venables St. The numbers of trains varies based on the Port activity and on low activity days, approximately 5-8 trains are observed, whereas 17-20 trains are often observed on high activity days. Based on an average daily vehicle volume of 25,000 vehicles, the rail exposure at the Prior/Venables rail crossing is 312,500, and when considering and 4,400 cyclists at Union Street on the Adanac Bikeway, the combined rail exposure index of the Prior/Venables St and Union St crossings (considered as one east-west corridor), is 367,500, which is well above the industry standard threshold. This calculation has not included 450 pedestrians per day.

necessity of providing a safe and reliable east-west connection between communities and to access major destinations, such as the proposed new St. Paul's Hospital.

Strategic Analysis

A. Community Engagement and Exploration of Alternate Arterial Alignments

In an urban context, a new road alignment requires careful consideration of a range of factors, including the effectiveness of the future street and costs of the project, as well as the impacts to local residents, parks, businesses, landowners, and essential services.

Staff comprehensively explored a long list of potential alternate alignments that could be grade-separated at the rail tracks and could also allow Prior Street to be downgraded to a local-serving street. The community, local businesses, and other stakeholders have played a significant role in identifying and evaluating route options through both the False Creek Flats Area Planning Process and the Flats Arterial Community Panel. The intensive and in-depth work of the Community Panel also helped clarify community priorities and narrow the routes under consideration. A summary of the extensive engagement and exploration of alternate alignment options is shown in **Figure 1** and described in the following sections. (See **Appendix A** for a comprehensive guide of all the options and variations considered by the Community Panel)



Figure 1 - Summary of extensive engagement and exploration of alternate arterial alignments

1) False Creek Flats Rail Corridor Strategy

In 2008, staff developed the False Creek Flats Rail Corridor Strategy in partnership with Transport Canada, Port of Vancouver, Greater Vancouver Gateway Council and railway companies, TransLink, Vancouver Area Cycling Coalition, and Better Environmentally Sound Transportation.

The strategy laid out a plan to address the safety, community, and traffic impacts of the entire rail corridor, including the existing at-grade rail crossing at Prior/Venables Street. As grade-separation could present the opportunity to relocate the arterial, the Malkin corridor was identified as a potential opportunity for grade-separation along an alternate arterial route, given the wide historic street right-of-way.

2) False Creek Flats Area Planning Process

During the False Creek Flats Area Planning process (2015-2017), staff engaged the community through several rounds of stakeholder workshops and public open houses on alternate routes that could replace Prior/Venables Street. In addition to the Malkin corridor, other route options on William and National were also considered. The most impacted stakeholders, including Providence Health Care, were involved in exploring different variations that could mitigate property impacts, where possible.

Despite extensive work and consultation, it became apparent that all of the alternate routes that were being explored had significant challenges that could not easily be mitigated. In March 2016, staff presented the Malkin and National options as the two leading options. Public feedback on the routes was split roughly in thirds across the three preferences of Malkin (34%), National (28%), and 'previously considered' options (34%) that included the William option, keeping the arterial on Prior Street, and a northern variation of Malkin. A strong desire to reconsider the William option was heard from many stakeholders, including the BC Trucking Association, Greater Vancouver Board of Trade, Produce Row businesses, and Cottonwood Community Gardens.

As no one route emerged as the preferred option after two years of studies and engagement, the area plan was approved by Council without a determination of the grade-separated arterial alignment.

3) Flats Arterial Community Panel

In January 2019, the Flats Arterial Community Panel was convened and facilitated by an independent consultant, to allow for a more in-depth discussion of community values and trade-offs between the routes. The 42 panelists² were tasked with representing the local neighbourhood, business community, and city-wide residents in evaluating and recommending a route for the grade separated arterial.

Reconsidering route options explored during the area planning process, the Community Panel evaluated a long-list of nine options that included variations along Malkin, National, William, as well as on Prior/Venables (see **Appendix A** for a comprehensive guide of all the options and variations considered by the Community Panel).

² 42 panelists were selected from a volunteer pool of approximately 200 applicants. In the end, 37 panelists participated in the full Community Panel process.

With respect to Prior/Venables, overpass and underpass options were evaluated by the Community Panel for two reasons. First, in evaluating alternative route options it is important to make comparisons with the existing arterial, which is on Prior/Venables Street. Senior government funding requests require due diligence to consider lower cost options, and the panel's rationale for preferring an alternate route could support the business case for a more costly route. Second, Prior/Venables Street would need to remain as the arterial until a replacement route could be approved by Council and Park Board, funded by project partners, and implemented. It was important for the Panel to consider the possibility that Prior Street could remain as the arterial for an indefinite period of time.

The nine options also included two variations that were generated by the Strathcona Residents' Association before the Community Panel was convened: the National-Civic Overpass and the National-Charles Overpass. Staff conducted technical analysis of these options and provided enough information for its comparison as part of the nine options for consideration.

Throughout eight full-day sessions, the Panel learned about each route, the important factors to consider, and heard different perspectives from various stakeholders. The panel completed an evaluation and prioritization of each option's advantages and drawbacks, with input from the broader community at two public meetings. However, similar to earlier phases of engagement, none of the routes could easily address all the factors that were important to the panel or the broader community that they were tasked with representing.

To support their decision-making, the Panel prioritized six 'key factors' in the following order of importance:

- 1. Impacts on residents and the local neighbourhood.
- 2. Impacts on parks, recreation, community gardens, and other green spaces.
- 3. Impacts on the movement of people and goods in the area.
- 4. Impacts on businesses locally and throughout the region.
- 5. Considerations of cost and constructability.
- 6. Impacts on public-serving civic facilities in the area.

Given that the panelists were not likely to recommend an arterial route by consensus, the panel used multiple rounds of ranked choice voting, accompanied by deliberation, to come to their final recommendation. This method of voting identified the options with the most support among all of the panelists – even if a particular route was not the first choice of most individual panelists. Importantly, the voting method also showed which routes had the least support among the panel.

In the first round of voting, the five options with the most support from the Panel were:

- National-Charles Overpass
- National-Civic Facilities Overpass
- National-Grant Overpass
- Prior/Venables Underpass
- Malkin North Overpass

After four rounds of voting, 67.6% of panel members were in favour of the National-Charles Overpass while 32.4% were in favour of the Prior/Venables Underpass. The Panel's evaluation and voting on the preferred routes suggested the following:

- There was low support for routes that would have significant impacts to parks, community gardens, and businesses. These factors were ranked as important to the panel and after the first round of voting, the William option and two of the Malkin variations all of which would have significant impacts to parks, community gardens and businesses were not included in the panel's top five route options.
- The National route options were highly preferred by many panelists because they did not have the same scale of impacts on businesses or parks and would allow for Prior Street to be downgraded and for arterial traffic to be further away from Strathcona residents. The National-Charles Overpass was the panel's preferred variation of the National route options, with the perception it could be the least costly of the National variations.
- The Prior/Venables route was preferred by a minority of panelists because it would also minimize impacts to parks and businesses, but was the lowest cost option and could provide better transit for local residents and emergency access for the proposed new St. Paul's Hospital. Panelists preferred an underpass compared to an overpass because it could reduce vehicle speeds and provide better connections and comfort for walking and cycling.

The Community Panel's work significantly guided the subsequent staff analysis of the final shortlist of route options: the recommended option, National-Charles Overpass, and the second-most supported, Prior/Venables Underpass option. Staff conducted an in-depth assessment of the design, cost estimates and external funding contributions, and potential mitigations for traffic impacts and public realm for these route options, as noted in a Council memo in June 2019, which was also shared with panellists, stakeholders, and the public. (See **Appendix B** for public realm observations and streetscape renderings for both the National-Charles Overpass and Prior/Venables Underpass options; **Appendix C** for a multi-criteria comparison between the two routes; and **Appendix F** for a discussion of Vancouver Fire Rescue Services considerations)

B. Major Challenges of the Alternate Route Options

All of the alternate routes that were explored by the community have significant challenges that cannot be easily mitigated. After considering the stakeholder and public feedback alongside the engineering analysis and cost estimates conducted over five years, staff are unable to recommend an alternate route to replace Prior/Venables Street that is both supported by the community and would not place an undue fiscal burden on the City.

The rationale of why none of the alternate alignments are recommended to replace Prior/Venables Street is discussed as follows.

1) Analysis of the Malkin Overpass Options

Although Malkin was originally identified as a potential route option due to the wide historic street right-of-way, it became evident through the Area Plan engagement and Community Panel that there is low overall community support for this route. In fact, when staff proposed Malkin as a leading option in 2016, numerous stakeholders were strongly opposed and requested that other options, including William, be reconsidered. The Malkin North variation, which was the most supported variation by the Community Panel, could reduce the most significant impacts of the Malkin option on Produce Row and other industrial businesses. However, it would still require mitigations for all of the businesses on Malkin Avenue and Charles Street, including changes to access and loading restrictions, building modifications, and/or relocation of businesses. Aside from the businesses themselves, other stakeholders including the BC Trucking Association and Greater Vancouver Gateway Council, have also expressed concerns about the disruption of the food distribution supply chain that distributes about \$700 million of produce across Metro Vancouver annually.

Malkin North would also have the greatest environmental impact of all alternate arterial alignments, requiring the removal of the largest and greatest number of trees in the local area, both within the Cottonwood Community Gardens planted in the street right-of-way and within Strathcona Park boundaries. These natural assets are highly valued by the community.

In addition to the strong community opposition, the cost of mitigating business impacts and constructing an overpass structure spanning 11 rail tracks is estimated to be more than double the cost of the most cost-effective grade-separation solution.

(See **Appendix A** for analysis of the Malkin variations and cost comparison across all options).

2) Analysis on the William Overpass Option

The William option was identified as a potential route in the early phases of the Area Plan, but was removed from consideration due to the significant park impact and low community support. It was later reconsidered by the Community Panel as a way to mitigate the most significant impacts that the Malkin options would have on business and the Cottonwood Community Gardens, but was not shortlisted within the top five of the nine options.

The William alignment option would fragment Strathcona Park and impact existing amenities and future flexibility of the park. An extensive park planning and community engagement process would be needed to determine if the significant impacts could be appropriately mitigated, and would require Park Board approval of permanent park boundary changes.

Throughout all phases of engagement, there was low support from the community and Park Board for considering an alternate arterial alignment on William running through Strathcona Park.

(See **Appendix A** for analysis of the William option and cost comparison across all options).

3) Analysis of the National Overpass Options

Throughout the engagement process, the National-Charles Overpass emerged as the preferred variation for the National options and was recommended by the Community Panel. Following the Community Panel, staff examined how to address the most significant drawbacks of the National-Charles Overpass, including refining the

conceptual design, working with independent consultants to validate property values and cost estimates, and exploring the potential funding contribution from potential project partners.

Despite being the most strongly supported option by the Community Panel and the Strathcona Residents' Association, the National-Charles Overpass has significant disadvantages that cannot be overlooked.

Of all alternate options, the National-Charles Overpass is the least effective as an arterial street and would reduce transit service for Strathcona residents. It is farthest away from many local destinations, and residents and businesses would rely on a single intersection at Chess Street for access to their homes and businesses. By rerouting transit to National-Charles, many Strathcona residents would need to walk more than 900m to reach a bus stop, which is more than double the distance recommended by TransLink's Transit Service Guidelines. Many sections along the National-Charles alignment would feel isolated and similar to a highway environment.

Because the route curves and backtracks, it is less direct and would result in longer transit travel times, and slower emergency response times and performance metrics, including for Fire Hall No. 1 located on Prior Street. Taking this into consideration, staff would need to be able to demonstrate that National-Charles provides equivalent or improved capacity for the movement of people and goods within the Flats and to downtown, in order for TransLink to approve removing the existing truck route from Prior/Venables Street to facilitate its downgrading.

Most significantly, the National-Charles Overpass is the highest cost of all alternate arterial options. As local streets would need to be widened and a new street right-of-way would be needed for the arterial alignment, several Produce Row businesses and industrial businesses along Charles St would need to be relocated, the Fire Training and Heavy Urban Search and Rescue (HUSAR) Facility would need to be relocated, and the National Works Yards would need to be reconfigured. Independent property valuation and cost estimates have confirmed that property acquisition and business mitigation costs would be approximately \$249 million (note that this cost excludes impacts to Civic properties, unless the impact is so great that it requires replacement of the relevant property). Including the cost of constructing the overpass itself, estimated to be \$160-168 million (depending on the type of grade-separation for the Adanac Bikeway), preliminary capital cost estimates indicate that the National-Charles Overpass would cost \$409-417 million³.

Delivering the National-Charles Overpass would exceed the four-year 2019-2022 transportation capital plan budget of \$160 million towards new city-wide infrastructure to improve transportation safety, and expand walking, cycling and support transit capacity. Although external funding could be secured for a portion of the project, several project partners have expressed that their contribution value would be based on the most cost-effective grade-separation solution (see **Appendix E** for letters from project partners). Thus, a majority of the project cost would likely be borne by the City.

³ Class D Capital Cost Estimate prepared in 2019 dollars and rounded to the closest million. Estimate has not included construction cost escalation if the project is not constructed for several years. Property costs reflect current market value and are subject to change. Cost range indicates the varying cost for an underpass or an overpass for the Adanac Bikeway grade-separation.

(See **Appendix A** for analysis of the National variations and cost comparison with other options, and **Appendix C** for further analysis and costing of the National-Charles Overpass variation)

C. Addressing Rail Grade-Separation on Prior/Venables Street

As staff are unable to recommend an alternate alignment that is both supported by the community and would not place an undue fiscal burden on the City, the existing arterial would remain on Prior/Venables Street.

Staff recommend that grade-separation be achieved with an underpass, rather than an overpass. Staff have identified principles to guide the future design of the underpass to include an all-ages-and-abilities cycling route for the Adanac Bikeway, integration with public spaces, parks, and local context, and to enhance the public realm on the Prior/Venables Street corridor.

1) Benefits of providing grade-separation on Prior/Venables Street

Although many residents' are concerned with the noise and air pollution impacts that are typical of living near an arterial, Prior/Venables Street is a well-functioning street that serves the collective needs of local residents, businesses, the city and the region.

All Strathcona residents are within a 400m walk to transit service⁴ on Prior/Venables, which is the most direct and reliable route of all the alternate options considered. As the most direct east-west route, it is the most effective and reliable connection for emergency response from Fire Hall No. 1, to the proposed future St. Paul's Hospital, and for any other emergency vehicles travelling east-west across the rail tracks. Prior/Venables Street is also centrally aligned between the residents and businesses in the Strathcona and Kiwassa areas, and the businesses and essential city services in the False Creek Flats. As a result, the alignment provides direct and efficient local access to all of the destinations in the neighbourhood. The grade-separation on Prior/Venables Street also provides convenient local connections between residents and businesses on either side of the rail tracks, who would otherwise need to detour to other overpasses on Hastings Street or Terminal Avenue.

Staff have heard from many residents that they feel unsafe crossing or walking along Prior/Venables Street. However, an independent *In Service Road Safety Review* in 2015 concluded that "there is nothing inherent in the engineering design or operation of the street that would be considered a safety concern". Although the sidewalks on Prior/Venables Street are narrow and are not buffered from peak period traffic, there are many features that contribute to the vitality of the street and create an enjoyable walking experience. The mature tree canopy, residential homes, and the adjacency to Strathcona Park are highly valued by the community. Prior/Venables Street also has a high intersection density and there are many signalized crossings that provide safe connections across the street. These crossings could be potentially enhanced to make the crossing experience feel more safe and pleasant.

⁴ For the type of transit service on Prior/Venables Street, 400m is the maximum walk distance recommended based on TransLink's Transit Service Guidelines.

Furthermore, because Prior/Venables Street provides the highest quality transit service, and is the most direct route for local access and through-trips, the existing alignment would have the lowest total vehicle-kilometres-travelled (VKT) as compared to all alternate arterial route options. For these reasons, grade-separation on Prior/Venables Street best supports Vancouver's Climate Emergency Response.

2) Grade-separating the rail crossing with an underpass (road under rail)

As the existing street would still require grade-separation to address the safety risks and traffic disruptions of increasing rail activity on the BI Line, staff recommend that it be achieved with an underpass, rather than an overpass. (See **Figure 2**)

The Community Panel compared the underpass and overpass variations on Prior/Venables Street among the nine grade-separated route options. After deliberations and multiple rounds of voting, the Prior/Venables Underpass emerged as the second-most supported route by the Community Panel. Panelists preferred the underpass more than the overpass for two main reasons:

- An underpass would reduce the tendency for vehicles to speed along Prior/Venables Street. The momentum gained from travelling downhill on the underpass would be absorbed going back uphill. However, with an overpass, westbound vehicles approaching the residential area would gain speed descending the overpass ramp, creating a condition similar to the Georgia Viaduct off-ramp.
- The underpass would provide better connections for the local community, including both businesses and residents. The underpass allows for Prior/Venables Street to intersect with the south leg of Raymur Avenue, whereas the overpass would not. This provides better access for all commercial vehicles and trucks serving the industrial area on Raymur Avenue, and would reduce vehicle volumes on Hawks Avenue. This allows for more opportunities to enhance walking, cycling and green infrastructure along more edges of Strathcona Park, while maintaining access for redundancy, and therefore resiliency, for the essential city services located in the False Creek Flats. With fewer vehicles turning at the intersection of Prior Street and Hawks Avenue, it could become a more enjoyable connection for residents to walk or bike to Strathcona Park.

Grade-separating Prior/Venables Street would also provide a grade-separated crossing for the Adanac Bikeway as part of a single structure and forego the City building a completely separate pedestrian/cycling grade-separated structure on its own. Walking and cycling on the underpass would be more accessible and comfortable than on an overpass, as the sidewalk and bikeway would be 4-5m below the rail tracks in comparison to about 9-10m above the railyard for the overpass. The underpass would be easier to use for cyclists of all ages and abilities, as first going downhill would create momentum for the ascent on the other side. The sidewalk and bikeway on the underpass would not only be physically protected from vehicles, but would also be raised 2m above the traffic lanes. Both the physical and grade separation from vehicles considerably improves the experience for people walking and cycling, and reduces their exposure to dust and particulates from vehicles.

Furthermore, the underpass could be more easily integrated with the public spaces, parks, and urban design of the neighbourhood. Prior/Venables Street transitions from a

residential area to a light industrial business area at the underpass. The underpass could be designed as a gateway to celebrate and link the unique characters of both the Strathcona and False Creek Flats neighbourhoods. Activated by people walking and cycling, retail and transparent frontages along new developments, landscaping and green infrastructure that transitions into the edges of Strathcona Park, the underpass could become a dynamic and inviting public space. (See **Figure 3**)

Thoughtful public realm design could weave the structural and roadway elements into the urban fabric of the neighbourhood and activate the area (see **Figure 4**, and **Figure 5**). For example, key components of the design could include:

- murals and other public art to enliven retaining walls;
- colourful and interactive lighting to brighten the sidewalk and bikeway; (see **Figure 6**)
- planting and art could along fences, railings, or other safety barriers;
- a new plaza, green space, or other public gathering spaces on the walking and cycling approaches;
- trees, landscaping, and green infrastructure could to manage rainwater while also buffering the community from the noise of rail activity and creating a more inviting space; and
- storefronts and frontages at the new sidewalk level of new developments, whereas
 existing developments could connect to the underpass with wide stairs, stepped
 gardens or green walls.

As the design and delivery of the Prior/Venables Underpass rail bridge would be led by the railway company (CN or BNSF), who would also own and maintain the structure, staff would work with project partners in the future design stages to accommodate truck access to the industrial area via Raymur Avenue, provide an all-ages-and-abilities route for the Adanac Bikeway, provide wide and accessible sidewalks, and include landscaping, public art, green infrastructure, lighting, active building frontages, and other design elements that respect both the residential and industrial characters of the area.



Figure 2 – Conceptual illustration of the Prior/Venables Underpass and Adanac Bikeway looking southeast

Note: Drawings are illustrative only, and subject to discussion between City and Park Board staff. Any proposed changes to park boundaries require Council and Park Board approval.





Note: Drawings are illustrative only, and subject to discussion between City and Park Board staff. Any proposed changes to park boundaries require Council and Park Board approval.

Figure 4 – Conceptual illustration of the underpass with potential green space, looking east at the rail bridge



Figure 5 – Conceptual illustration of the underpass with potential retail space, looking east at the rail bridge



Figure 6 – Conceptual illustration of the potential underpass lighting at night, looking east at the rail bridge

3) Enhancing the Prior/Venables Corridor and Neighbourhood

Maintaining the arterial on Prior/Venables Street would not fulfil the longstanding residents' need to downgrade Prior Street to a local-serving collector street. However, some concerns expressed by residents can be mitigated by the grade-separation itself (some of the shortcutting observed on Campbell Avenue and Glen Drive is caused by trains blocking the rail crossing), as well as enhancing the public realm, improving walking and cycling connections, and from changes to the Northeast False Creek neighbourhood and street network.

By replacing the highway-like Georgia and Dunsmuir Viaducts with a more complete and urbanized street, lower vehicle speeds are anticipated and would contribute to improving safety on Prior Street. Entering the neighbourhood from downtown Vancouver and Northeast False Creek, Prior Street west of Jackson / Malkin Avenue could be animated with store fronts and the proposed new St. Paul's Hospital, bringing many more people walking and cycling, and crossing at new signalized intersections. The street would seamlessly connect with the planned 'great street' on Pacific Boulevard, with new sidewalks that would be much wider than today and buffered from vehicles by new landscaping, treed boulevards, and protected bike lanes for people of all ages and abilities. (See **Figure 7**)

Safety and public realm improvements at intersections along Prior St could reconnect the community with parks and green space. The entire corridor along Hawks Avenue could be enhanced as a greenway that connects the Portside Greenway on Alexander Street, MacLean Park, Strathcona Linear Park, and Strathcona Park. On Hawks in particular, curb bulges, landscaping and green infrastructure could be explored along the edges of Strathcona Park to better link both parts of the park, while maintaining access to businesses and Produce Row. (See **Figure 8**)



Figure 7 – Conceptual Illustration of potential enhancements on Prior Street, looking west towards the viaducts that are planned to be removed

Figure 8 – Conceptual Illustration of potential enhancements at Hawks Ave, looking south to Strathcona Park



Note: Drawings are illustrative only, and subject to discussion between City and Park Board staff. Any proposed changes to park boundaries require Council and Park Board approval.

In some sections along Prior St, such as alongside Strathcona Park, sidewalks could be widened and/or buffered by street trees and landscaping, while maintaining the mature tree canopy and minimizing impacts to existing homes. New pedestrian and bike signals are already planned to be installed at Vernon Drive, and could also be installed at Heatley Avenue.

In order to enhance walking and cycling along Prior Street and the underpass, about 0.5 acres of Strathcona Park, which has a total area of 21.5 acres, may be affected. In Park Board staff's assessment, the underpass would have relatively minor impact on Strathcona Park. Should Council endorse the staff recommendations, city staff would work with the community and Park Board staff to explore strategies to mitigate the impacts of the underpass, and other opportunities to enhance park space and facilities, improve access, and increase the tree canopy. These mitigation approaches would seek to expand the total size of Strathcona Park, and could include exchanging portions of existing street right-of-way and park land. The portions of Trillium Park North that are currently being preserved for the replacement arterial routes, including the National-Charles Overpass, could be utilized as park space. Staff would work with Park Board staff on the mitigation and enhancement strategy, and seek Park Board approval; Strathcona Park is a "permanent park" and would require a 2/3 vote of the Vancouver Park Board and City Council to approve changes.

With certainty that the route remains on Prior/Venables Street, staff could immediately begin working with the Vancouver Park Board and the community to develop a vision and plan for the future transportation connections, public space, parks, urban design, and public realm improvements for the Prior/Venables Street corridor, with consideration as well for the broader neighbourhood (**Recommendation A** and **C**).

Draft guiding principles of the reimagined corridor and neighbourhood enhancements include:

- Integrate the underpass (e.g. retaining walls, bridge structure) with Strathcona Park and existing and new developments through new public spaces, landscaping, public art, green infrastructure, lighting, active building frontages, and other design elements that respect both the residential and industrial characters of the area;
- Improve the safety and intersections of Prior and Venables Street, particularly at key walking and cycling crossings including Hawks Ave, Campbell Ave, and Vernon Dr;
- Improve the walkability and public realm along Prior Street, by widening sidewalks and creating landscaped boulevards to buffer the vehicle lane from sidewalks, where possible;
- Work with TransLink to improve bus stop amenities and shelters for route 22;
- Minimize impacts to the mature tree canopy; and
- Minimize impacts to existing homes on Prior Street.

Furthermore, once the transportation and public realm improvements are identified, staff could implement improvements in the near-term, before the underpass is completed. Some of the transportation and public realm opportunities in the broader neighbourhood that could be implemented in conjunction with the Prior/Venables Underpass are shown in **Figure 9**. Further discussion of potential public realm opportunities is provided in **Appendix B**.



Figure 9 – Potential transportation and public realm improvements to be explored along Prior/Venables Street and the broader neighbourhood

Public/Civic Agency Input

Grade-separation and the exploration of alternate alignments have significant implications for a broad spectrum of individuals, stakeholders groups, and agencies. Staff extensively engaged the community over five years, through workshops, advisory groups, public open houses, and surveys during the False Creek Flats Area Planning Process, the Flats Arterial Community Panel, and other events (see **Appendix D** for a summary of key engagement metrics).

Throughout the process, many participants acknowledged the complexity of balancing competing priorities and perspectives towards a collective need for the community, city, and region.

Following the Community Panel's evaluation of the options and recommendation of the National-Charles Overpass, panellists, stakeholders, and the public were informed that staff were no longer advancing the William or Malkin options. Staff then conducted a final phase of assessment and stakeholder outreach on the National-Charles Overpass and the Prior/Venables Underpass.

Support for the National-Charles Overpass was heard from some residents, including the Strathcona Residents' Association and Grandview-Woodland Area Council.

Support for the Prior/Venables Underpass was received from the Greater Vancouver Gateway Council, Port of Vancouver, CN, British Columbia Trucking Association, TransLink, Providence Health Care, several businesses along Produce Row and Charles Street, and residents in the Citygate neighbourhood. The main reasons why stakeholders support the Prior/Venables Underpass include that it:

- Is cost-effective, allowing for taxpayer dollars to be used towards other transportation priorities and facility upgrades across the city;
- Would minimize shifting traffic impacts onto other streets and residential areas;
- Provides the most direct access for emergency vehicles and St. Paul's Hospital;
- Would provide higher quality transit service, and maintain service coverage in the neighbourhood;
- Provides a preferable roadway geometry for commercial vehicles, and would likely reduce greenhouse gas emissions, noise, and the likelihood of collisions;
- Would have less impact on Produce Row businesses and the regional food distribution supply chain and economy; and
- Would provide the most overall benefits at the least cost of options considered.

The letters received from community groups, stakeholders, and project partners are provided in **Appendix E**.

Considering the feedback staff have heard over the last 5 years from the public and stakeholders, staff cannot recommend an alternate arterial alignment to replace Prior/Venables Street.

Implications/Related Issues/Risk

Financial Implications

1) Grade-Separation Project: Capital Component

The cost to implement the recommended grade-separation option along the Prior/Venable alignment, as described in this report and referenced in **Recommendation A**, is estimated to be approximately \$125 million (refer to **Table 1** for details).

Table 1: Class D Capital Cost Estimate of Prior/Venables Underpass

Category	Key Elements	Capital Cost (in \$millions)
Property Acquisition	Property acquisition, access changes and building modifications, business mitigations and other fees or compensation. Further details are provided in Appendix C.	45
Streets	Roadway construction including base, surface, traffic signals, traffic management, utility relocations, railings, landscaping, and public realm	8
Structural	Excavation of the underpass, bridge deck structure, piers, abutments, pedestrian/cyclist approaches, retaining walls, underpass drainage system including pumping room and mechanical systems	38
Construction Soft Costs	Project management, preliminary and detailed design, engineering costs	16
Construction Contingency	30% of hard and soft costs for unknown elements in the conceptual design phase	18
Transportation, Parks, and Public Realm Enhancements	Other transportation, public realm, public space, and parks improvements in the neighbourhood, to be determined in future project stages	TBD
Total Capital Cost (Class D Estimate)		\$125 M + neighbourhood improvements TBD

Note: Figures rounded to the closest million. All cost estimates were prepared in 2019. Construction costs do not have a cost allowance for escalation if the project is not constructed for several years. Property costs reflect current market value. Costs do not include components within the proposed New St. Paul's Hospital site that would be part of the cost-sharing arrangement that would be determined through the separate rezoning and public hearing process, which will be subject to Council approval. Aside from an underpass with an all-ages-abilities cycling route, wide sidewalks, and landscaping at the underpass and along Prior/Venables Street, costs do not include other transportation, public realm, public space, and park improvements in the neighbourhood. The recommended funding strategy is to seek partnership funding to implement this project at no cost to the City, because the Port of Vancouver and CN are the prime beneficiaries of the project. Because this project is identified in the *Greater Vancouver Gateway 2030* plan, CN and the Port can seek Federal and/or Provincial infrastructure funding. As a recent example in Vancouver, Transport Canada contributed \$18.5 million towards the \$50 million Powell Street Overpass.

2) Grade-Separation Project: Operations and Maintenance Component

The operations and maintenance (O&M) costs of the rail bridge would be the railway's responsibility, while the City would be responsible for the O&M costs associated with the roadway, bikeway, and walking infrastructure (e.g. surfaces, drainage, retaining walls, lighting, landscaping). The City's O&M costs are anticipated to be similar to the costs for other arterial streets and bikeways across the City.

3) Enhancing Prior/Venable Corridor and Strathcona Neighbourhood: Capital and O&M components

The cost to implement possible enhancements along Prior/Venables Street and in the Strathcona neighbourhood, as identified in this report (refer to **Figure 9** for details) and referenced in **Recommendation B**, is unknown as this time. After a project list has been finalized, staff will report back to Council with capital and O&M costs, a funding strategy which includes potential partnership funding, and an implementation strategy that identifies the project timing and integration as part of the City's capital planning process.

Other

St. Paul's Hospital and Health Campus

Both the existing arterial and a new alignment would require land dedications from the proposed new St. Paul's Hospital site through the rezoning process. The St. Paul's rezoning application submitted in August 2018 follows the street network set out in the Policy Statement (May 2017), which supports any of the replacement arterial alignments, including the National-Charles Overpass option. However, as a result of the uncertainty of the grade-separated road alignment decision and timing for implementation, the proposed rezoning conditions for the separate St. Paul's Hospital site rezoning application will provide options for either alignment outcome. For the Prior/Venables Underpass option, the rezoning conditions, subject to Council approval, would include provisions for land dedications along the northern edge of the site to enable public realm enhancements along Prior Street, and for a street network for local access. The total area of land to be dedicated for the street network would be less with grade-separation on Prior/Venables Street, and not replacing it with a new route through the St. Paul's Hospital site.

Although Council's future consideration of the St. Paul's Hospital site rezoning application and decision does not require that the Flats Arterial alignment be determined in advance, certainty of the alignment will become critical for Providence Health Care to continue advancing the design-build phase and make effective use of the site. A gradeseparated street is essential to providing reliable emergency vehicle response and public access to the major regional health campus, anticipated to open in 2026.

CONCLUSION

Over the past five years, residents, businesses, and other stakeholders have contributed significantly to the grade-separated arterial planning process. Although staff have explored routes that could replace Prior/Venables Street, none of the alternate options are both cost-effective and broadly supported by community and stakeholders, given their impacts businesses, parks, and community gardens. Staff recommend grade-separation on Prior/Venables Street and that grade-separation be achieved with an underpass rather than an overpass. The Prior/Venables Underpass would be the most cost-effective grade-separation option that best meets the collective needs of the community, city and region.

Overall, many community members, stakeholders, and project partners are supportive of the maintaining the arterial on Prior/Venables Street and grade-separating the rail crossing with an underpass. The Prior/Venables Underpass would continue to provide high quality transit to Strathcona residents, convenient local access to businesses and residents, and a direct and reliable route for goods movement and emergency response. Many Strathcona residents would prefer downgrading Prior/Venables Street to a local-serving street. While staff do not recommend that approach, staff support a pilot to test the impacts of downgrading Prior/Venables Street to a collector and implementing measures to slow traffic, as outlined in the Considerations included within this report. Many of the residents' safety and livability concerns regarding the street could be lessened by enhancing the public realm, upgrading walking and cycling connections, and would also be reduced over time as more people walk, cycle, take transit, and convert to electric vehicles.

Council endorsement of the Prior/Venables Underpass would have no immediate financial consequence, but would prepare the City to support project partners when grade-separation is initiated and it would also help achieve grade-separation for the Adanac Bikeway. There is a growing urgency to grade-separate the rail crossing on Prior/Venables Street as freight rail activity and the associated safety risks increase. The grade-separation of the arterial on Prior/Venables Street is also important to provide reliable emergency and public access to the proposed new St. Paul's Hospital, anticipated to open in 2026.

* * * * *

FLATS ARTERIAL COMMUNITY PANEL

CITY RESOURCE GUIDE

CONTENTS

- 1 PRIOR/VENABLES TODAY Existing conditions in the study area
- 2 OVERVIEW OF OPTIONS Overview of the route options and variations
- 3 PRIOR/VENABLES GUIDE Key aspects of the Prior/Venables route
- 4 WILLIAM GUIDE Key aspects of the William route
- 5 MALKIN GUIDE Key aspects of the Malkin route
- 6 NATIONAL GUIDE Key aspects of the National route
- PROJECT COSTS
 Potential cost ranges and key cost categories of arterial routes

TRUCKS ROUTES

PRIOR/VENABLES STREET TODAY

Prior and Venables Street, between Gore Ave and Clark Dr is an arterial and truck route in the City's network of streets. It serves a dual role of providing local access to residents and businesses, as well as playing a regional role to efficiently and reliably move people and goods between downtown and the east. Prior/Venables St also intersects with routes on the Major Road Network (MRN), a network of regionally important routes that are comanaged by the City and TransLink.

Prior/Venables St currently crosses the Burrard Inlet Rail Line at-grade. Different types of train operations occur between the Port and the rail yard, and result in the street crossing being blocked for different durations of time throughout each day. On an average day, approximately 13 trains cross Prior/Venables St and take about 7-8 minutes per train. Train activity is lower during the peak hours in the morning and afternoon, and is higher during the mid-day, evenings and during the night.

Data for this guide was provided by the following sources:

- All train information based on TRAINfo data, 2017.
- All transit information based on 2017 TransLink Transit Service Performance Review.
- All traffic information based on traffic counts in 2015, 2016, and 2017.
- All cycling information based on bike counts in 2018 (summer includes July and August, winter includes November and December).

MOVING THROUGH - NETWORK CONNECTIONS

As part of the City's truck route and arterial street network, Prior/Venables St carries about 25,000 vehicles per day. About 4,400 people take transit on Route 22 through this segment, travelling between downtown Vancouver, Chinatown, and along the Clark-Knight corridor each day.

The Adanac Bikeway on Union St provides an allages-and-abilities cycling route running parallel to Prior/Venables St. About 4,500 people bike through the area on Union St on a summer day, and about 1,800 people bike on a winter day. Other parallel east-west routes serve more of the regional trips. Over 160,000 people take transit on the Expo SkyTrain and the Hastings bus routes, including the 95 B-Line. Because the arterial street on Venables ends at Victoria Dr while Hastings St and Terminal/E 1st Ave connect directly to Highway 1, these parallel arterial streets tend to serve longerdistance and regional trips.

Emergency services also rely on a connected network of arterial streets to quickly respond to incidents across the City.

Although the volume of vehicles on Prior/Venables St fluctuates throughout the day, the travel patterns of eastbound and westbound traffic is similar in the morning and afternoon peak periods.

At Gore Ave, the majority of vehicles travel to and from the Dunsmuir and Georgia Viaducts.

At Clark Dr, about 50% of vehicles are travelling east-west on Venables St. About 20% of vehicles travel to/from the north and about 30% of vehicles travel to/from the south on Clark Dr.

PRIOR/VENABLES TODAY

MOVING TO - LOCAL ACCESS

Prior/Venables St also provides key access to parks, community amenities, local businesses and residences in the Strathcona and Grandview-Woodland neighbourhood; and the industrial and employment lands in the False Creek Flats.

There are about 1,200 transit riders each day, boarding and alighting at the bus stops on Prior/ Venables St and Clark Dr.

The level of local access for emergency services, vehicles and trucks varies for different parts of the area due to barriers such as the rail lines, land uses along long blocks, and traffic calming

Access to properties east of the rail tracks

- Access to/from the Strathcona and False Creek Flats communities from Glen Dr and Vernon Dr, as well as numerous local streets that access Clark Dr.
- The Grandview-Woodland community accesses Prior St via Venables St east of Clark Dr,

including from north-south streets on Odlum Dr, McLean Dr, Woodland Dr, and Commercial Dr.

Access to properties west of the rail tracks

- Access to/from the Strathcona community from local streets on Gore Ave, Dunlevy Ave, Jackson Ave, Princess Ave, Heatley Ave, Campbell Ave and Raymur Ave. There is traffic calming throughout the neighbourhood including street closures and diverters that discourage vehicles from driving directly through the community, but the area has good access to other arterial streets including Main St and Hastings St.
- Access to/from the False Creek Flats from local streets on Malkin Ave, Hawks Ave, or Raymur Ave. There are limited access points to the area, due to large blocks and the rail yards east of Glen Dr and south of National Ave. The majority of trucks accessing the area are coming from Clark Dr.

EXISTING CROSS-SECTION ON PRIOR/VENABLES STREET

Today, Prior/Venables St has a typical cross-section similar to many other arterial streets in the City. The right-of-way is approximately 20.5m. The road surface is about 13.5m wide with four travel lanes (two in each direction). The curb lanes provide parking in the off-peak periods on weekdays and weekends. On both sides of the street there are sidewalks along the curb, and trees. Within this 3.5m space on each sides, there are street lights, utilities, and bus stops. There are no cycling facilities on Prior/Venables St, but traffic has been calmed to provide a local street bikeway on Union St.

Although no two streets are identical in the City, we can draw comparisons between Prior/Venables St and other streets that may have similar traffic volumes, play a similar arterial/regional role in the network through a residential area, or have similar constrained cross-sections. Some of these include E 12th Ave and W 16th Ave

Vehicle Volume: ~25,000 vpd Lanes: 2 per direction Parking: Peak hour restrictions

Public Realm: 1.2m curbwalk with street trees

E 12TH AVE | MAIN ST TO FRASER ST

Vehicle Volume: ~30,000 vpd Lanes: 2 per direction Parking: No parking at all times Public Realm: 1.3m sidewalk with tree boulevard

W 16TH AVE | FIR ST TO ARBUTUS ST

Vehicle Volume: ~25,000 vpd Lanes: 2 per direction Parking: Peak hour restrictions

Public Realm: 1.5m sidewalk with tree boulevard

SAFETY

At the Rail Crossing

Safety is top of mind at the existing at-grade rail crossings on both Prior/Venables St and Union St. When trains are on the tracks at Prior/Venables St, the gates close - vehicle traffic is stopped and people cannot walk or bike across the rail line. Due to frequency of trains blocking crossings, pedestrians and cyclists have become frustrated and make unsafe maneuvers like climbing through the train cars. Similarly, drivers have become frustrated and make unsafe maneuvers like U-turns on Prior/Venables St and short-cutting through the neighbourhood.

Along the Corridor

In 2015, an In-Service Safety Review was conducted for the Prior/Venables St corridor, using a standard approach by the Transportation Association of Canada (TAC). The study used site observations, community input, traffic characteristics, and collision data to understand

LIVABILITY

In 2015, a Livability Assessment was conducted to understand some of the factors impacting the livability of the street as well as the surrounding neighbourhoods in comparison with other neighbourhoods across the city. The Livability Assessment included community feedback from residents in Strathcona and Grandview-Woodland, including residents on Prior/Venables St.

Factors related to traffic are seen as the most negative influence on local livability

the safety conditions at intersections and along the entire corridor, behaviour of people driving, and vulnerable road users including people walking, cycling, and using other non-motorized modes.

The study identified various safety improvements that have been implemented by the City over the past several years. These included

- installing pedestrian countdown timers,
- increasing walking times at signals,
- installing more visible traffic signal heads,
- replacing traffic signs,
- left-turn bans, and
- increased speeding enforcement.

Although the experience of walking on Prior/ Venables St is not optimal, the review concluded that the type and frequency of collisions along the Prior/Venables St corridor generally compares with other similar routes within the City.

Community Feedback on Livability

The community feedback collected through surveys and public events from the study found that:

- Factors related to traffic, including vehicle volumes and speed, are seen as the most negative influence on local livability.
- Residents living directly on Prior/Venables St have a more negative view of the livability of the neighbourhood than respondents in other parts of the community.
- The most positive factors influencing the livability of the neighbourhood are location and access to downtown, transportation options to get around, as well as the overall sense of community and the great people that live in the neighbourhood.
- Respondents from the larger community found their neighbourhood quite livable and these respondents reported greater levels of livability than respondents living directly on Prior/Venables St.

PRIOR/VENABLES TODAY

Air Quality

Air quality studies from 2003 and 2010 assessed the different types of air pollution that are generated by motor vehicle traffic, the impact of distance on exposure and the concentrations of some pollutants across the city (nitrogen oxides NOx and nitrogen dioxide NO2). People living and

PRIOR/VENABLES ST NOISE LEVELS

walking in close proximity to Prior/Venables St are exposed to higher levels of pollutants than those living on local or collector streets. Similar levels of exposure are also occurring at major streets throughout the City of Vancouver and the Metro Vancouver region, with even higher concentrations of both pollutants in the downtown core.

Noise Levels

Traffic noise levels are rarely constant and vary throughout the day, hour, and even by the minute. A citywide noise study was conducted in 2003 and found that noise levels on Prior/Venables St ranged between 52 and 73 dBA. The highest noise levels along the corridor were at the Clark Dr intersection. The noise levels along Prior/Venables St are higher than expected for the type of arterial (for urban residential environments, noise levels are typically 60-65 dBA on arterials, and 65-75 dBA on major arterials). However, the noise levels are similar, if not lower, than other arterial corridors within the city including those with adjacent residential uses. Although this study is from 2003 and does not represent conditions today, vehicle volumes have been decreasing, suggesting that noise levels from arterial traffic today may be lower than in 2003. However, noise from trains was not captured in this study.

ADJACENT LAND USES



ADJACENT LAND USES



ADJACENT RESIDENTS

Many residents live adjacent to the current arterial running along Prior/Venables St and along potential future alignments near Malkin Ave.



CIVIC FACILITIES

Fire Hall #1, Fire Training Facility, Heavy Urban Search and Rescue (HUSAR) Facility, Animal Services Facility and National Works Yard are all located in the study area. Any changes to the arterial need to ensure emergency services can continue to be delivered at existing levels of service. In some cases new facility locations or redevelopment may be required.



COMMUNITY GARDENS

There are two community gardens that could be impacted: Strathcona Community Garden and Cottonwood Community Garden. The latter is located partially within the street right of way. The northern portion of Trillium Park includes an environmental art and community learning garden area.



INDUSTRIAL BUSINESSES

To construct a grade separation on any alignment would impact a number of businesses between Raymur Ave at Clark Drive, and Union/Adanac at Terminal Ave/E 1st Ave.



NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

The site is owned by Providence Health Care and will be the location of the new St. Paul's Hospital and Health Centre. A new street network is planned as part of the site development.



PARKS

There are significant public parks within the study area. Strathcona Park is 21 acres (excluding Cottonwood Garden) and Trillium Park combined with the northern portion is 7.5 acres.



PRODUCE ROW

Currently, six of the City's nine produce wholesalers are found along Malkin Ave, representing approximately 450 local jobs. These businesses combined receive approximately 4,000 truck deliveries a week, and often block traffic on Malkin Ave while manoeuvering.







OVERVIEW

To identify a way to grade-separate the rail crossing on an arterial, one must consider the best general route, the type of grade-separation, variations on the alignment, and detailed design that will occur in a later design phase.

ROUTE OPTIONS

There are four general routes that can provide an arterial connection between Main St and Clark Dr. Each of the routes have alignment variations that can impact the lands adjacent to the street differently, but have the same general characteristics and role as part of the overall street network.

All routes connect either to the viaducts or the replacement street network (Pacific Blvd) at Gore Ave to the west. The routes that are not on Prior Street have the same alignment through the new St. Paul's Hospital site between Main St and a new local street on the west side of Trillium Park, and would 'T' into Clark Dr, meaning that there is no through route to or from Grandview-Woodland.

PRIOR/ VENABLES	The Prior/Venables route runs along Prior St and Venables St as it does today, connecting at Main St to the west and continuing east past Clark Dr. The route spans a rail line with two tracks.
WILLIAM	The William route runs along the northern portion of the new St. Paul's Hospital site, along the northern edge of Trillium Park and the existing Malkin Ave between Trillium Park and Hawks Ave. From the intersection of Malkin Ave and Hawks Ave, the route continues east through Strathcona Park and connects with William St east of the rail tracks, and 'T's into Clark Dr. The route spans a rail yard with four rail tracks.
MALKIN	The Malkin route runs along the northern portion of the new St. Paul's Hospital site, along the northern edge of Trillium Park and the existing Malkin Ave between Trillium Park and the rail tracks, connecting with Charles St east of the rail tracks, and 'T's into Clark Dr. The route spans a rail yard with 11 rail tracks.
NATIONAL	The National route runs along the northern portion of the new St. Paul's Hospital site, an S-Curve along the northern edge of Trillium Park and the existing Thornton St and National Ave between Malkin Ave and Chess St. It passes through the Fire Training facilities and over the rail tracks, connecting with Grant St or Charles St east of the rail tracks and 'T's into Clark Dr. The route spans a rail yard with 14 rail tracks, and a curved track connecting with Pacific Central Station.

OVERVIEW OF OPTIONS

GRADE SEPARATION TYPES

The arterial street can be grade-separated from the rail line in two ways – either passing over or under it. The height of an overpass is defined by the clearance over the rail tracks required by Transport Canada (about 7m), and the depth of the underpass is defined by the clearance for a truck to drive underneath (about 5m) and for people for walk or bike underneath (about 3m).

There are many considerations in deciding whether or not an overpass or underpass is feasible for a route, including analysis of the length of the rail crossing, the elevation of the rail tracks and the ground at each end of the structure, and the geotechnical conditions. On all the routes south of Prior/Venables St, which includes William, Malkin, and National, only an overpass structure is feasible. This is primarily due to the distance of the rail yards that need to be crossed, and the topography - the grade difference between the western end of the structure (near Raymur Ave) is much lower in elevation than at the eastern end at Clark Drive.

On Prior/Venables St, both an underpass and overpass structure are feasible. This is primarily due to the shorter distance of the rail tracks that need to be crossed, and the similar elevation on either ends of the structure that enable an underpass to be feasible.

ALIGNMENT VARIATIONS

The alignment along a specific route can also vary, as a trade-off between impacts on either side of the route. This trade-off can range from a major impact to one side of the arterial with no impact to the other side; to a balanced impact between the two sides. In later detailed designs stages, the alignments will be further refined and the actual impacts will be determined. To support the decision of a route at a planning level, several variations with distinct differences have been identified by City staff and have also been suggested by members of the community.

Including the consideration of grade-separation type and major alignment variations, the route options include:

PRIOR/VENABLES

- OVERPASS
- UNDERPASS

WILLIAM

OVERPASS

MALKIN

- (NORTH) OVERPASS
- (SOUTH) OVERPASS
- (CENTRAL) OVERPASS

NATIONAL

- OVERPASS
- CIVIC FACILITIES OVERPASS
- NATIONAL-CHARLES OVERPASS



MALKIN VARIATIONS

There are three distinct variations on Malkin Ave with different impacts between Hawks Ave and Raymur Ave. This segment of the corridor is constrained because of the Cottonwood Community Gardens that are located within the street right-of-way, and Produce Row businesses with shallow forecourts that are improperly utilizing the street for manoeuvering trucks and loading. The distinct variations include:

Malkin (North) Overpass – A northerly alignment through this section could preserve Produce Row business operations as they are today by providing a service lane that continues to support truck manoeuvers. However, it would significantly impact the Cottonwood Gardens.

Malkin (South) Overpass – A southerly alignment through this section could preserve Cottonwood Community Gardens in their current location but would impact buildings, properties and truck operations significantly.

Malkin (Central) Overpass – A central alignment through this section could balance the impacts to both the Cottonwood Community Gardens and Produce Row businesses.



NATIONAL VARIATIONS

There are two variations of the National route that have been suggested by members of the community, including:

Civic Facilities Overpass – A variation of the National route to address the challenges of an S-Curve around Trillium Park and the National Works Yards would include a gentler road curvature by significantly impacting the northern portion of Trillium Park and the National Works Yards. This structure spans the rail yards at Grant St and crosses 14 rail tracks.

National-Charles Overpass – A variation of the National route would include an overpass that connects to Charles rather than Grant, to address the challenges of a long structure and proximity to the E 1st Ave intersection at Clark Dr. This structure spans the rail yards at Charles St and crosses 11 rail tracks.



PLANNING PHASE OF THE PROJECT

We are currently in the "**Planning Phase**" of the project. The goal of the planning phase is to evaluate feasible ways to solve the challenge, then select one route to design and construct. During the planning phase, the drawings that are developed are only concepts to test for feasibility. Assumptions are made based on available information and professional experience. The concepts help identify the general scale of impacts so that a decision can be made about the route. Concept drawings help identify the key design principles, and areas that will need further study and consultation in order to refine in the "**Design Phase**".

Examples of the decisions and refinements that would occur in the design phase include:

Overall vertical profile of the roadway

In order to clear over the rail tracks, the profile and height of the roadway depends on the structure and the allowable grades for vehicles and for universal accessibility. This impacts the overall footprint - the steeper the roadway grade, the shorter the structure; the shallower the roadway grade, the longer the structure. This also impacts other streets that would need to be raised or lowered to either intersect with the arterial or pass under the overpass.

Overall road geometry and route alignment

The road alignment and geometry would need to be further designed and refined. In some areas, the curb can be shifted to the north or to the south, depending on factors such as the desire to retain existing trees, the effect on adjacent properties and the ability to mitigate impacts, and the safety of the road alignment.

Structure type and characteristics

The type of overpass or underpass structure that can be constructed depends on factors such as the longest distance it needs to span, the number of spans, and the weight it needs to support. Some typical types of bridge structures include a girder, steel truss, cable-stay, or arch. The type of structure also impacts the depth and height, which impact the vertical profile of the roadway. All these factors significantly impact the cost.

DESIGN PHASE OF THE PROJECT

After a route is selected, we enter the "**Design Phase**". The goal of the design phase is to refine the details of the street design for construction. This occurs through an iterative process of identifying a possible design, consulting with others and understanding the benefits and challenges of it, refining the design, consulting again and so on. There are usually competing needs and interests that the design needs to respond to. The goal is to find the design solution that provides the most overall benefit and minimizes negative impacts.

Through these refinements, the design can considerably change the level of impacts of the route.

Type, placement, and width of street elements

In general, the street includes vehicle travel lanes, on-street parking, sidewalks, cycling facilities, and boulevards for utilities, trees and landscaping. There are a variety of standards, guidelines, and best practices that influence and are adapted for the unique conditions of a street corridor. As such, the street elements may vary along the length of a corridor. While the paved road surface from curb to curb has defined standards for an arterial street, there is flexibility in designing the public realm. Some of the future refinements may include:

- The width and type of boulevard, such as a single or double row of the trees, the size of trees and width needed, and whether or not a center treed median is provided.
- Selecting either uni-directional or bidirectional bike lanes on a specific side.
- The type and width of buffer between walking and cycling facilities.

Intersection elements and design

The footprint of an intersection and the approaches are dependent on many detailed factors, such as:

- The volume and movement of vehicles, pedestrians and cyclists;
- Permitted turns and size of vehicles turning;
- Whether or not left-turn or right-turn bays are needed, and the length;
- Safety and protection for people walking and cycling;
- Signal timing; and
- Bus stops.





Mitigating business impacts

The City takes significant care and effort to support business continuity for any private business operations and/or their properties that are affected by Council decisions. The City helps pay for mitigations or building alterations and works with each business individually to take into account the unique conditions. The end goal is to leave a business in a better state, and not worse. As the needs of each business are unique, the appropriate mitigation would be identified on a case by case basis.

Urban design and integrating buildings with the overpass or underpass

An overpass or underpass can create aesthetic impacts to the street. However, there are opportunities to improve the public realm and urban design that would be explored. Similar to the overpass on Hastings St, building entrances can be located directly on the structure to create a continuous frontage with access directly from the structure. We can also look to other cities where rail lines operate in the urban centre to design underpasses or overpasses that are secure, interesting, and enjoyable for people walking and cycling. For example, the City of Calgary has a Downtown Underpass Urban Design Guideline and an Underpass Enhancement Program.

MITIGATION STRATEGIES

In addition to the detailed design refinements that would occur in the design phase, there are major mitigation strategies and opportunities that need to be considered.

Mitigation strategies and opportunities that are unique to each route are provided in the guide for each route, whereas the ones listed below apply to all routes.

Mitigating concerns about neighbourhood shortcutting

An overpass or underpass at the rail crossing would reduce the shortcutting that occurs through Strathcona today. To mitigate neighbourhood shortcutting through Grandview-Woodland in the future, the routes on William, Malkin, and National would end at Clark Dr. Once an arterial route is identified, the broader street network would be reviewed to ensure that it encourages people driving to choose the arterial streets, and that street designs that encourage people to drive slowly and mindfully on local streets.

Mitigating for traffic-related air pollution and noise

The most effective ways to reduce traffic-related air pollution and noise are to reduce the reliance on vehicles and to increase the use of more environmentally-friendly vehicles. The City's Transportation 2040 Plan includes policies to encourage more walking, cycling and transit trips, and improve the integration between land use and transportation. These actions reduce the number of trips and distance traveled by vehicles. Localized air pollution and noise can also be improved through street design by providing vegetation and landscaping.



PRIOR/ VENABLES

PRIOR/VENABLES

Notes:



ARTERIAL DESCRIPTION

The arterial street along Prior and Venables Street would connect at Main St to the west and continue east past Clark Dr, connecting through to Grandview-Woodland on Venables St as it does today.

There are two options for grade separation on Prior/Venables St at the railway tracks – an overpass or an underpass.

An overpass would begin ramping up from the intersection with Campbell Ave to the west, pass over Raymur Ave, the railway tracks and Glen Dr, and then intersect with Vernon St at street level and continue to Clark Dr.

An underpass would begin ramping down from the intersection with Campbell Ave to the west, connect with the south leg of Raymur Ave, pass under the railway tracks, and then intersect with Vernon St at street level and continue to Clark Dr.

This option maintains the arterial street where it is today and seeks to minimize the overall land impacts.

Please Note:

This arterial option has two variations: an overpass and an underpass. The impacts of these two variations are generally similar but where they differ, efforts have been made to highlight these differences.

KEY BENEFITS, CHALLENGES AND OPPORTUNITIES

- Overpass: Shortest structure with most stable soil conditions, leading to lowest capital and maintenance costs, ease of constructability, and higher resiliency.
- Underpass: Creates less visual impact compared to an overpass and less noise from vehicle traffic.
- Underpass: Walking and cycling is more accessible due to a gentle grade and decline.
- Structure can also provide a grade-separated crossing for the Adanac Bikeway.
- Provides a reliable and connected street network, with balanced spacing between the other arterial streets (Hastings St and Terminal Ave).
- The arterial street continues to be located between residents in Strathcona and Strathcona Park.
- Transit service can remain on Prior/Venables St and the majority of Grandview-Woodland and Strathcona residents, businesses, and parks are within a 5 min walk to transit.
- Traffic patterns remain the same as today at Clark Dr, allowing all movements including through traffic on Venables St to Grandview-Woodland.
- Avoids direct land impacts to Cottonwood Community Gardens, Strathcona Community Gardens, Trillium Park, Produce Row businesses, National Works Yard, and the Fire Training and Heavy Urban Search and Rescue facility.
- Moderate impacts and loss of park land to the northern edge of Strathcona Park, including impacts to large, mature trees.
- Impacts to businesses on Venables St, between Raymur Ave and Clark Dr would need to be mitigated.

TRANSPORTATION CONSIDERATIONS

PRIOR/VENABLES

NETWORK CONNECTIVITY

- Prior/Venables St provides a grid street network with a relatively equal spacing between the other arterials on E Hastings St and E 1st Ave.
- The route between downtown and east Vancouver is direct. All movements (through, right-turns, and left-turns) can be accommodated at the intersection of Venables St and Clark Dr without increasing neighbourhood shortcutting through Grandview-Woodland.
- Relatively good reliability with low total travel times and queues.



LOCAL VEHICLE ACCESS

- Access from Prior/Venables St to the local area would be similar to today, with some changes near the structure.
- On-street parking would be similar to today (curb parking outside of peak hours on Prior St, and on many local streets). Changes to parking would need to be determined, and would consider the best needs for the surrounding neighbourhood so they can be shared amongst many users throughout the day.
- For properties east of the rail tracks The area north of Venables can be accessed via Vernon Dr or from Clark Dr. The area south of Venables can be accessed via George St and Vernon Dr as well as from Clark Dr.
- For properties west of the rail tracks -

Overpass: The area north of Prior would be accessed via Campbell and other local streets to the west. The area south of Prior would be accessed via Hawks Ave and Malkin Ave or via Campbell Ave, Union St, and Raymur Ave which would connect under the overpass.

Underpass: The area north of Prior would be accessed via Campbell and other local streets to the west. The area south of Prior would be accessed from the underpass via Raymur Ave or at Hawks Ave.









WALKING AND CYCLING

- The Adanac Bikeway on Union St would continue to provide an all-agesand-abilities (AAA) cycling route. No additional cycling facilities would be provided on Prior/Venables St.
- There is opportunity to combine the walking, cycling, and driving route into one structure, which would reduce property impacts and costs. The Adanac Bikeway would be rerouted at the crossing.
- The walking experience on Prior/ Venables St would be similar to today (distance to cross the street is short and there are many large street trees). Opportunities to provide new signalized crossings, widen sidewalks and increase the buffer between moving vehicles and the public realm can be explored.
- Streets that connect to Prior/Venables St would need to be upgraded to provide accessible sidewalks and cycling connections (e.g. Raymur Ave, Hawks Ave, and Malkin Ave).
- Overpass: Overpass would be at an incline that meets universal accessible guidelines, but would need further consideration to mitigate the long incline distance.
- Underpass: Underpass is more accessible for pedestrians and cyclists due to the decline, gentle slope, and less change in elevation than an overpass.

TRANSIT

- Bus service would likely remain on Prior/ Venables St. The majority of bus stop locations could be maintained.
- The majority of Strathcona and Grandview-Woodland residents and businesses are within a 5 min walk to transit on the arterial and to services along Hastings St.
- All future transit routing and service would be determined by TransLink.

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





COMMUNITY IMPACTS

ADJACENT RESIDENTS

- Generally no property impact to Strathcona residents including on Atlantic Ave and Prior St, depending on provision of public realm improvements.
- No property impact to the Villa Cathay Care Home and access will be maintained.

CIVIC FACILITIES

- No impacts to National Works Yard.
- No Impacts to Fire Training and Heavy Urban Search and Rescue facilities.
- No impacts to Animal Services Facility.
- No impacts to Fire Hall #1.

COMMUNITY GARDENS

- No impacts to Cottonwood Community Gardens.
- No impacts to Strathcona Community Gardens.
- No impact to Trillium Park environmental art and community learning garden area.

INDUSTRIAL BUSINESSES

 Local businesses on Venables St between Raymur Ave and Clark Dr would be impacted. Appropriate mitigation measures would be determined on a case by case basis.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Compatible with new street network for new St. Paul's Hospital but requires some modification to the network identified in the Policy Statement (2017).

PARKS

- Some impacts to the northern edge of Strathcona Park between Campbell Ave and Raymur Ave to accommodate the overpass ramp, including loss of park land and several large trees.
- Requires change to Strathcona Park boundaries.
- Highest impact on neighbourhood connectivity and access to Strathcona Park from east of Campbell Ave.
- No direct or adjacent impacts to Trillium Park.

PRODUCE ROW

 No impact to properties on Produce Row. Businesses can continue to operate and manoeuver trucks on Malkin Ave.

PRIOR/VENABLES

CONSTRUCTABILITY

- Soil conditions on Prior/Venables St are good and stable at a shallow depth. The roadway and structure would be more seismically resilient and stable foundations can be provided at a lower cost than other routes.
- Shorter construction schedule than other routes, as there are no major facilities that require relocation and reconstruction.
- A traffic management plan for construction would be developed to ensure that local access is maintained and traffic is appropriately rerouted to other arterial streets.
- Overpass: Overpass structure length is shortest compared to all other overpass locations. The rail line is only two tracks wide at this location.
- Overpass: Raymur Ave would be lowered slightly to connect under the overpass, and George St would be raised by about 2m to intersect with Prior.
- Underpass: Underpass has a slightly shorter structural footprint due to lower clearance heights.
- Underpass: Underpass flooding and utilities relocation would need to be considered in the design, as well as constructability of supporting the rail line to maintain rail operations during construction.
- Underpass: The north side of Raymur Ave would be maintained to provide access to the Villa Cathay building. The south side of Raymur Ave would be lowered by 4-5m to intersect with the underpass. George St would be lowered by about 1m to intersect with Prior.

PROJECT COST CONSIDERATIONS

Potential project cost ranges are provided separately.

Overpass

- Lowest cost due to shortest structure length, and least amount of impact mitigation required.
- Lowest long-term maintenance cost due to shortest structure length.

Underpass

- Higher cost than an overpass at the same location, due to the utility relocations, mechanical and drainage systems. Cost is lower than other overpass locations due to the shorter structure length and improved soil conditions.
- Long-term maintenance costs of an underpass would be similar to an overpass, but would require maintenance of mechanical systems for storm water pumping.





Enhance the safety and walking experience along Prior and increase opportunities to cross Prior

The City conducted a safety study and a livability assessment in 2015. The studies concluded that although there are improvements that could be made, the safety and livability of Prior/Venables St is comparable to other similar arterial streets. With a corridor project, public realm and safety upgrades could be explored, such as new pedestrian-bike crossing signals, and other enhancements to the walking experience. These would come at a trade-off with other uses in the existing right-of-way and would require further discussion with adjacent property owners.

Combined structure with Adanac Bikeway

The Prior/Venables St structure could include all-ages-and-abilities cycling facilities to connect with the Adanac Bikeway, and reduce the need for a separate walking and cycling structure on Union Street. Due to the long spacing between Prior St and Terminal Ave (780 m), there may a longer-term need for a separate walking and cycling structure near William St or Malkin Ave.

Underpass: Lighting and good urban design to mitigate safety and security concerns of an underpass

The covered portion of the underpass would be minimized (only at the rail crossing), and there are numerous best-practice solutions to create safe, secure and high quality public realm for pedestrians and cyclists that can be integrated with an underpass design.

MITIGATION STRATEGIES AND OPPORTUNITIES

In later stages of the project, the City will seek opportunities and strategies to mitigate the impacts and challenges. Potential considerations specific to this option include:

Explore opportunities to enhance and integrate with Strathcona Park

Through further consultation and study, we can explore further opportunities to provide connections across Prior/Venables St to access Strathcona Park. The overpass or underpass could be integrated with the north edge of the park and opportunities to enhance the public space and mitigate the impacts of the structure to the park could be explored.

Explore opportunities to avoid net loss of park space

Through further consultation and study, the City and Park Board could explore opportunities to offset the loss park land on the northeast corner of Strathcona Park by securing new park land. Other opportunities to plant trees, replace vegetation and modify facilities can also be explored.



WILLIAM



Notes:



ARTERIAL DESCRIPTION

The William Street option connects the arterial street from Main St to the west to Clark Dr to the east. The arterial would end at Clark Dr, with no through route to or from Grandview-Woodland. The overpass would start at Raymur Ave to the west, pass over top of Glen Dr, the rail yard and Vernon Dr and connect to Clark Dr. People could still travel under the overpass on Glen Dr and Vernon Dr. The existing section of Malkin Ave between Chess St and Glen Dr would become an access road that continues to serve Produce Row businesses.

This option seeks to minimize impacts to Cottonwood Community Gardens, Produce Row and the City's National Works Yard and Fire Training Facility. It would do so by running north of the gardens and through Strathcona Park, connecting the intersection of Malkin Ave and Hawks St to the intersection of William St and Raymur Ave.

KEY BENEFITS, CHALLENGES AND OPPORTUNITIES

- Provides a reliable and connected street network, with relatively balanced spacing between the other arterial streets (Hastings St and Terminal Ave).
- Transit service would likely be rerouted to William St. Many residents and businesses from Grandview-Woodland and Strathcona are not within a 5 min walk to William St but are within a 5 min walk to services on Hastings St.
- Preserves the majority of Cottonwood Community Gardens and would secure the portion in street right-of-way, but may have some impacts in order to provide access to Produce Row businesses.
- Fragments Strathcona Park by introducing an arterial street between the park and Cottonwood Community Gardens. Significant impacts to Strathcona Park that would require further study, consultation, and a Park Board decision on whether or not the opportunities to replace lost park space and reconfigure facilities is possible.
- High impact to existing tree canopy and habitats of large, mature trees.
- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Avoids direct land impacts to National Works Yard, the Fire Training Facility, the Heavy Urban Search and Rescue Facility, and the Animal Services Facility.
- Generally reduces impact to Produce Row businesses between Chess St and Raymur Ave but there are some impacts in order to provide access.
- Impacts to businesses on William St, between Raymur Ave and Clark Dr would need to be mitigated.

TRANSPORTATION CONSIDERATIONS

WILLIAM

NETWORK CONNECTIVITY

- William St has relatively equal spacing between the other arterials at E Hastings St and E 1st Ave.
- The route between downtown and east Vancouver is somewhat direct. To reduce neighbourhood shortcutting, all vehicles travelling east-west across Clark Dr need to turn right or left to continue on other arterials.
- Relatively good reliability with low total travel times and manageable queue lengths. Reliability would also depend on the intersection design and operations at Clark Dr.



LOCAL VEHICLE ACCESS

- Access from William St to the local area would be updated. Depending on mitigation options (such as closure on Hawks Ave) access is reduced and the network is less redundant and reliable.
- Although Prior/Venables St will no longer be an arterial, the street will be critical for local access for residents and emergency services between Gore Ave and Raymur Ave.
- Properties east of the rail tracks could access the areas north and south of William St via Clark Dr and will be connected by Vernon Dr.
- Properties west of the rail tracks can access the area north of William St via Raymur Ave or Hawks Ave (if not closed as mitigation measure) or Gore Ave and potential new streets in the St. Paul's Hospital area. The area south of William St could be accessed via Chess St or Thornton St.
- On-street parking on the arterial would be similar to on Prior/Venables St today (curb parking outside of peak hours on Prior/Venables St). Changes to parking would need to be determined, and would consider the best needs for the surrounding neighbourhood so they can be shared amongst many users throughout the day. Parking on local streets such as Raymur Ave may be impacted by the role the play in accessing the arterial street.









WALKING AND CYCLING

- New protected cycling facilities would be provided on William St. Route would continue on William St east of Clark Dr, which has a reasonable slope to connect with the cycling network at Mclean Dr.
- Opportunity to better integrate walking and cycling facilities with Strathcona Park through further study with the Park Board. Crossings at Chess St and Raymur Ave would be provided to connect Cottonwood Community Gardens and Strathcona Park.
- The Adanac Bikeway on Union St would continue to provide an all-ages-andabilities (AAA) cycling route, with an overpass or underpass on Union St or Prior/Venables St.
- Overpass would be at an incline that meets universal accessible guidelines, but would need further consideration to mitigate the long incline distance.
- Connecting streets would need to be upgraded to provide accessible sidewalks and cycling connections (e.g. Raymur Ave and Hawks Ave).

TRANSIT

- Bus service would likely be rerouted from Prior/Venables St onto William St. New bus stops would be provided.
- Many residents and businesses from Grandview-Woodland and Strathcona residents would no longer be within a 5 min walk to transit on the arterial. However they would remain within a 5 min walk to other routes on Hastings St.
- All future transit routing and service would be determined by TransLink.

WILLIAM

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





ADJACENT RESIDENTS

- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Arterial is located further from residents on Prior St, but is closer to residents on Atlantic Ave that would be buffered by a berm and vegetation.
- No property impact to residents.

CIVIC FACILITIES

- No impacts to National Works Yard.
- No Impacts to Fire Training and Heavy Urban Search and Rescue facilities.
- No impacts to Animal Services Facility.
- No impacts to Fire Hall #1.

COMMUNITY GARDENS

- Generally preserves Cottonwood Community Gardens in its current location, but is disconnected from Strathcona Park and is surrounded by road on all sides. Potential impacts to the south west corner near Chess St, depending on how access to Produce Row businesses is provided.
- No land impact to Strathcona Community Gardens in its current location, but user experience is changed based on the arterial location.
- The environmental learning art and community learning garden area in Trillium Park would be adjacent to the arterial

INDUSTRIAL BUSINESSES

 Local businesses on William St between Raymur Ave and Clark Dr are impacted and appropriate mitigation measures would be determined on a case by case basis.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Compatible with new street network for St. Paul's Hospital in the Council approved Policy Statement (2017).

PARKS

- Significant impact to Strathcona Park and loss of park land, including impacts to the track and field, fieldhouse, walking path and open space. New arterial street between Strathcona Park and Cottonwood Community Gardens.
- Fragments and changes the shape of Strathcona Park,

impacting existing facilities and the types of future facilities that could be accommodated.

- High impact to the urban forest canopy and ecosystem from removal of large, mature trees that have high wildlife habitat. Impact is similar to Malkin Central variation, and between the Malkin North and South variations.
- Requires updating existing park boundaries and a Park Board decision on whether the boundary change and mitigation measures are amenable.
- Impacts north edge of Trillium Park. Minimal loss of park land on north edge where park design anticipated potential street right-of-way.

PRODUCE ROW

- For businesses west of Chess St, existing truck movements would need to be accommodated on private property. The arterial street would provide driveway access. Truck operations are impacted and appropriate mitigation measures would be determined on a case by case basis. On-site mitigation measures could allow continued semi-trailer manoeuvers with minor to moderate disruption.
- For businesses east of Chess St, truck operations could continue on the existing stretch of Malkin Ave with some property and/or operational adjustments to provide access from William St.
- Further study and consultation is needed to address property and operational impacts, neighbourhood impacts and street parking, and construction impacts.

WILLIAM

CONSTRUCTABILITY

- Overpass structure length is moderate (approx. 400m) and spans a rail yard of about five tracks.
- Soil conditions are worse than Prior, similar to Malkin, and better than National. Moderate thickness of poor quality fill and marine deposit, and moderate depth to competent soils (approx. 5-6 m). Relatively deep foundations and remediation required (similar to Malkin). Soil is potentially susceptible to liquefaction.
- North-south streets would need to be regraded. Raymur Ave would be raised by about 2-3m to intersect with Malkin, while Glen Dr and Vernon Dr would be lowered by about 1 m to maintain access under the overpass.
- Construction schedule would be longer than Prior, but shorter than Malkin and National, as park mitigations and reconstruction could be completed after roadway construction.
- A traffic management plan for construction would be developed to ensure that local access is maintained and traffic is appropriately rerouted to other arterial streets.

PROJECT COST CONSIDERATIONS

Potential project cost ranges are provided separately.

- Moderate long-term maintenance costs as compared to other structure lengths.
- Order of magnitude of the construction cost is similar to Malkin. Cost may be higher than Malkin dependent on the type and scale of park mitigations.
- Costs for land acquisition and impact mitigations will be highly dependent on the type and scale of mitigations for Strathcona Park.





Explore opportunities to replace lost park space and enhance facilities in Strathcona Park

To reduce net loss of park space, we could net out the property requirements for the new roadway by potentially closing Hawks Ave to vehicles and formalizing the street right-ofway that is currently occupied by Cottonwood Community Gardens. Further consultation and study by the Park Board would be needed through a Park Master Plan process to identify whether or not the impacts can be appropriately mitigated, and how the park could be changed.

Explore opportunities to improve walking and cycling, and integrate facilities with Strathcona Park

Rather than placing a sidewalk and bike lane adjacent to the vehicle lanes, they could be buffered by traffic with more landscaping or they could be routed through a southern portion of the park. Further consultation and study by the Park Board would be needed to explore these opportunities. Further work could also explore integration with the ramp and structure, and public space features.

MITIGATION STRATEGIES AND OPPORTUNITIES

In later stages of the project, the City will seek opportunities and strategies to mitigate the impacts and challenges. Potential considerations specific to this option include:

Explore ability to increase vehicle access north of William St

If Hawks Ave is closed to vehicles to become park space, local access would be reduced and the street network would be less resilient. This places a greater emphasis on the need for new street connections at the new St. Paul's Hospital to connect with Prior St. There is otherwise 1 km spacing between Gore Ave and Raymur Ave, and traffic disruptions could greatly reduce reliability and local access.

Explore opportunities to enhance the walking and cycling experience on Prior St upon downgrading Prior from an arterial to a localserving collector street

Improvements such as wider sidewalks, landscaping, and all-day parking could be implemented on Prior St. However, it would continue to be an important through-route for local access and emergency services due to the closures and diverters in Strathcona. Improvements would need to balance the need to maintain local connectivity while reducing shortcutting. Union Street would continue to be a preferred bike route due to the gentler slope and the connections west of Main St and east of Clark Dr. Venables St would continue to be an important collector street between Clark Dr and Commercial Dr.



MALKIN



Notes:



ARTERIAL DESCRIPTION

The Malkin Avenue option connects the arterial street from Main St to the west and Clark Dr to the east. The arterial would end at Clark Dr, with no through route to or from Grandview-Woodland. The overpass would start at Raymur St, pass overtop of Glen Dr, the rail yard and Vernon Dr, and align with Charles St. People could still travel under the overpass Glen Dr and Vernon Dr.

There are three variations to the Malkin Option with different impacts between Hawks Ave and Raymur Ave. This segment of the corridor is constrained because of the Cottonwood Community Gardens are located within the street right-of-way, and Produce Row businesses have shallow areas in front of their businesses and are using the street for manoeuvering trucks and loading.

The variations include:

Malkin (North) Overpass: This option seeks to accommodate and minimize impacts to Produce Row businesses by providing a service road to support continued truck movements needed for access, and would hence significantly impact Cottonwood Community Garden plots and the south edge of Strathcona Park.

Malkin (South) Overpass: The south option seeks to minimize impacts to the existing Cottonwood Community Gardens in street right-of-way and would hence significantly impact the truck operations, properties, and buildings for Produce Row businesses.

Malkin (Central) Overpass: The central option seeks to balance the impacts to both the Cottonwood Community Gardens and Produce Row businesses. It would be generally within the existing street right-of-way and would not impact the Strathcona Park boundary.

Please Note:

This arterial option has three variations: The Malkin (North) Overpass, Malkin (South) Overpass and Malkin (Central) Overpass. The impacts of these three variations are similar in many ways but where they differ, efforts have been made to highlight these differences.

KEY BENEFITS, CHALLENGES AND OPPORTUNITIES

- Provides a reliable and connected street network, with relatively balanced spacing between the other arterial streets (Hastings St and Terminal Ave).
- Transit service would likely be rerouted to Malkin. Many residents and businesses from Grandview-Woodland and Strathcona are not within a 5 min walk to Malkin Ave but are within a 5 min walk to services on Hastings St.
- Avoids direct land impacts to National Works Yard, the Fire Training Facility, and Heavy Urban Search and Rescue Facility.
- Impacts to businesses on Malkin Ave and Charles St (between Raymur Ave and Clark Dr) would need to be mitigated.
- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Direct trade-off of impacts between Hawks Ave and Raymur Ave. Impacts range between no-impact to significant-impact for Cottonwood Community Gardens, and Produce Row businesses. Some route variations impact Strathcona Park boundary.
- Degree of impact to Animal Services Facility varies depending on the route variation.



TRANSPORTATION CONSIDERATIONS

MALKIN

NETWORK CONNECTIVITY

- Malkin Ave would have a relatively equal spacing between the other arterials at E Hastings St and E 1st Ave.
- The route between downtown and east Vancouver is somewhat direct. To reduce neighbourhood shortcutting, all vehicles travelling east-west across Clark Dr would need to turn right or left to continue on other arterials.
- Relatively good reliability with low total travel times and manageable queue lengths. Reliability would also depend on the intersection design and operations at Clark Dr.



LOCAL VEHICLE ACCESS

- Access from Malkin Ave to the local area would be reconfigured. Although Prior/Venables St would no longer be an arterial, the street would be critical for local access for residents and emergency services between Gore Ave and Raymur Ave.
- Properties east of the rail tracks could access the areas north and south of Charles St via Clark Dr and will be connected by Vernon Dr.
- Properties west of the rail tracks and north of Malkin Ave could be accessed via Raymur Ave, Hawks Ave, or Gore Ave and potential new streets in the St. Paul's Hospital area.
- Properties west of the rail tracks and south of Malkin Ave could be accessed via Chess St or Thornton St.
- Access for Produce Row businesses between Chess St and Glen Dr would be provided either directly from Malkin Ave or by a parallel service road.









WALKING AND CYCLING

- New protected cycling facilities would be provided on Malkin Ave. Route would continue on Charles St east of Clark Dr, which has a reasonable slope to connect with the cycling network at McLean Dr.
- The Adanac Bikeway on Union St would continue to provide an all-ages-andabilities (AAA) cycling route, with an overpass or underpass on Union St or Prior St.
- Overpass would be at an incline that meets universal accessible guidelines, but would need further consideration to mitigate the long incline distance.
- Connecting streets would need to be upgraded to provide accessible sidewalks and cycling connections (e.g. Raymur Ave, Hawks Ave).
- Malkin (North) Overpass: Due to the parallel service road to access Produce Row businesses, the walking and cycling experience between Chess St and Raymur Ave would be less enjoyable.

TRANSIT

- Bus service would likely be rerouted from Prior/Venables St on Malkin Ave. New bus stops would be provided.
- Many residents and businesses from Grandview-Woodland and Strathcona residents would no longer be within a 5 min walk to transit on the arterial. However they would remain within a 5 min walk to other routes on Hastings St.
- All future transit routing and service would be determined by TransLink.

COMMUNITY IMPACTS

MALKIN

MALKIN (NORTH) OVERPASS

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





MALKIN (NORTH) OVERPASS

SAME FOR ALL MALKIN VARIATIONS

ADJACENT RESIDENTS

- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Arterial is located further from residents on Prior St, but is closer to residents on Atlantic Ave that would be buffered by a berm and vegetation.
- No property impact to residents.

INDUSTRIAL BUSINESSES

 Local businesses on Malkin Ave and Charles St between Raymur Ave and Clark Dr are impacted and appropriate mitigation measures would be determined on a case by case basis.

CIVIC FACILITIES

- Impacts the Animal Services Facility, which would require land acquisition and building modifications.
- No impacts to National Works Yard.
- No Impacts to Fire Training and Heavy Urban Search and Rescue facilities.
- No impacts to Fire Hall #1.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Compatible with new street network for St. Paul's Hospital in the Council approved Policy Statement (2017).

PRODUCE ROW

- For businesses east of Chess St, truck operations could continue via a service road running parallel to the arterial. Some operational impacts depending on the access and configuration of the service road.
- For businesses west of Chess St, the arterial would provide driveway access but truck movements would need to be accommodated on private property. Appropriate mitigation measures would be determined on a case by case basis and on-site mitigation measures could allow continued semi-trailer manoeuvers with minor to moderate disruption.
- Further study and consultation would be needed to address property, operational, parking and construction impacts.

COMMUNITY GARDENS

- Removes large portion of Cottonwood Community Garden plots located within the street right-of-way and on the south edge of Strathcona Park. Does not impact the Cottonwood Community Garden plots near Raymur Ave.
- Minor impact to south east corner of Strathcona Community Gardens.
- The environmental learning art and community learning garden area in Trillium Park would be adjacent to the arterial

PARKS

- Significant impact and land loss to the southern edge of Strathcona Park, impacting the fieldhouse and ball diamond.
- Significant impact to the urban forest canopy and ecosystem from removal of large, mature trees that have high wildlife habitat.
 Highest impact as compared to William and other Malkin variations.
- Requires updating existing park boundaries and a Park Board decision on whether the boundary change and mitigation measures are amenable.
- Impacts north edge of Trillium Park. Minimal loss of park land on north edge where park design anticipated potential street right-of-way.

COMMUNITY IMPACTS

MALKIN

MALKIN (SOUTH) OVERPASS

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.




MALKIN (SOUTH) OVERPASS

SAME FOR ALL MALKIN VARIATIONS

ADJACENT RESIDENTS

- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Arterial is located further from residents on Prior St, but is closer to residents on Atlantic Ave that would be buffered by a berm and vegetation.
- No property impact to residents.

INDUSTRIAL BUSINESSES

• Local businesses on Malkin Ave and Charles St between Raymur Ave and Clark Dr are impacted and appropriate mitigation measures would be determined on a case by case basis.

CIVIC FACILITIES

- Impacts the Animal Services Facility, which would require land acquisition and building modifications.
- No impacts to National Works Yard.
- No Impacts to Fire Training and Heavy Urban Search and Rescue facilities.
- No impacts to Fire Hall #1.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Compatible with new street network for St. Paul's Hospital in the Council approved Policy Statement (2017).

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PRODUCE ROW

- The arterial would provide driveway access for all businesses but truck movements would need to be accommodated on private property.
- For businesses east of Chess St, properties would be significantly impacted and would require modifications to the buildings to support new loading and operations.
- For businesses west of Chess St, the arterial would provide driveway access but truck movements would need to be accommodated on private property. Appropriate mitigation measures would be determined on a case by case basis and on-site mitigation measures could allow continued semi-trailer manoeuvers with minor to moderate disruption.
- Further study and consultation is needed to address property, operational, parking and construction impacts.

COMMUNITY GARDENS

- No impact to Cottonwood Community Gardens. Preserves community garden plots within the street rightof-way.
- No impact to Strathcona Community Gardens.
- The environmental learning art and community learning garden area in Trillium Park would be adjacent to the arterial

PARKS

- No impacts to Strathcona Park boundaries and no loss of park land.
- Moderate impact to the urban forest canopy and ecosystem from removal of large, mature trees that have high wildlife habitat. Least impact as compared to William and other Malkin variations.
- Impacts north edge of Trillium Park. Minimal loss of park land on north edge where park design anticipated potential street right-of-way.

MALKIN

MALKIN (CENTRAL) OVERPASS

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





MALKIN (CENTRAL) OVERPASS

SAME FOR ALL MALKIN VARIATIONS

ADJACENT RESIDENTS

- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Arterial is located further from residents on Prior St, but is closer to residents on Atlantic Ave that would be buffered by a berm and vegetation.
- No property impact to residents.

INDUSTRIAL BUSINESSES

 Local businesses on Malkin Ave and Charles St between Raymur Ave and Clark Dr are impacted and appropriate mitigation measures would be determined on a case by case basis.

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CIVIC FACILITIES

- Impacts the Animal Services Facility, which would require land acquisition and building modifications.
- No impacts to National Works Yard.
- No Impacts to Fire Training and Heavy Urban Search and Rescue facilities.
- No impacts to Fire Hall #1.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Compatible with new street network for St. Paul's Hospital in the Council approved Policy Statement (2017).

PRODUCE ROW

- The arterial would provide driveway access for all businesses but truck movements would need to be accommodated on private property.
- For businesses east of Chess St, properties would be impacted and truck operations would need to be modified. On-site mitigation measures may not support semi-trailers operations and would be disruptive to operations. Modifications may include a combination of operational changes, reconfiguring the forecourt, building modifications and other strategies.
- For businesses west of Chess St, truck operations would be impacted and appropriate mitigation measures would be determined on a case by case basis. Mitigation measures could allow continued semitrailer manoeuvers on-site with minor to moderate disruption.
- Further study and consultation would be needed to address property, operational, parking and construction impacts.

COMMUNITY GARDENS

- Impacts some of the Cottonwood Community Garden plots located within street right-of-way, but also preserves some of the garden plots within street rightof-way and the area within Strathcona Park.
- No impact to Strathcona Community Gardens.
- The environmental learning art and community learning garden area in Trillium Park would be adjacent to the arterial

PARKS

- No impacts to Strathcona Park boundaries.
- High impact to urban forest canopy and ecosystem from removal of large, mature trees that have high wildlife habitat. Impact is similar to William option, and between other Malkin variations.
- Impacts north edge of Trillium Park. Minimal loss of park land on north edge where park design anticipated potential street right-of-way.

MALKIN

CONSTRUCTABILITY

- Overpass structure length is moderate (approx. 400m) and spans a rail yard of about 11 tracks.
- Soil conditions are worse than Prior/Venables St, similar to William St, and better than National Ave. Moderate thickness of poor quality fill and marine deposit, and moderate depth to competent soils (approx. 5-7 m). Relatively deep foundations and remediation required (similar to William St). Soil is potentially susceptible to liquefaction.
- North-south streets would need to be regraded. Raymur Ave would be raised by about 3m to intersect with Malkin Ave, while Glen Dr and Vernon Dr would be lowered by about 1-2 m to maintain access under the overpass.
- Construction schedule would be longer than Prior/Venables and William, but shorter than National but may depend on potential mitigations for Produce Row businesses to maintain business operations.
- A traffic management plan for construction would be developed to ensure that local access is maintained and traffic is appropriately rerouted to other arterial streets.

PROJECT COST CONSIDERATIONS

Potential project cost ranges are provided separately.

- Construction cost of the roadway and overpass is similar across the variations.
- Costs for land acquisition and property mitigations will be highly dependent on the type and scale of mitigations required, and the amount of property acquisition required for mitigations.
- Moderate long-term maintenance costs as compared to other structure lengths.





Explore opportunities to rebuild Cottonwood Community Gardens and establish a long-term space in a new location

Although many parts of the garden may be difficult to relocate, there is an opportunity to find a more permanent space, rebuild the gardens over time, and consider longer-term needs such as facilities for programming and education. Further consultation and study by the City and Park Board would be needed to identify how the impacts can be appropriately mitigated.

Explore mitigations for the Produce Row cluster

Through further consultation with businesses, potential opportunities could be identified to offset the space requirement and truck manoeuvering directly on Malkin Ave. Some concepts worth exploring include shared or consolidated loading areas, shared distribution and wholesaling facilities, temporary facilities during construction or building layout changes and upgrades.

Explore opportunities to avoid net loss of park space

Through further consultation and study, the City and Park Board could explore opportunities to offset loss of park land on the south edge Strathcona Park by securing new park land. Other opportunities to plant trees, replace vegetation, modify facilities can also be explored

Assess feasible options to modify and rebuild the Animal Services Facilities

Impacts to the building, site access, and dog runs would need to be mitigated. Further study is needed to identify the building modifications and/or land acquisition needed to replace lost functions and reduce the effects of an arterial on the animals.

MITIGATION STRATEGIES AND OPPORTUNITIES

In later stages of the project, the City will seek opportunities and strategies to mitigate the impacts and challenges. Potential considerations specific to this option include:

Explore opportunities to improve walking and cycling, and integrate facilities with Strathcona Park

Rather than placing a sidewalk and bike lane adjacent to the vehicle lanes on Malkin, they could be routed through a southern edge of the park to reduce the impact to Cottonwood Community Gardens and provide a more enjoyable experience. Further consultation and study by the Park Board would be needed to explore these opportunities and their feasibility in relation to other space requirements. Further work could also explore integration with the ramp and structure and provision of public space features.

Explore opportunities to enhance the walking and cycling experience on Prior/Venables St upon downgrading Prior/Venables St from an arterial to a local-serving collector street

Improvements such as widened sidewalks, landscaping, and all-day parking could be implemented on Prior/Venables St. However, it would continue to be an important throughroute for local access and emergency services due to the closures and diverters in Strathcona. Improvements would need to balance the need to maintain local connectivity while reducing shortcutting. Union St would likely continue to be a preferred bike route due to the gentler slope and the connections west of Main St and east of Clark Dr. Venables St would continue to be an important collector street between Clark Dr and Commercial Dr.



NATIONAL



Notes:



ARTERIAL DESCRIPTION

The National Avenue option connects the arterial street from Main St to the west and Clark Dr to the east with a S-Curve around Trillium Park and National Works Yard. The arterial would end at Clark Dr, with no through route to or from Grandview-Woodland. The overpass would start east of Chess St, pass through and over the Fire Training Facility and Heavy Urban Search and Rescue Facility, the rail yard, Vernon Dr, and align with Grant St. People could still travel under the overpass at Glen Dr and Vernon Dr

This option would move the arterial from Prior/ Venables St and protect existing uses along Malkin Ave east of Thornton St by focusing impacts on City-owned land and facilities along National Ave. It also maintains the same roadway alignment as the Malkin and William options along the north side of the new St. Paul's Hospital site. Other variations through the hospital site were explored but not pursued further because a diagonal with a gentle road curve impacts the viability of the hospital site design, and a grid network does not provide the adequate capacity and travel time reliability for the arterial.

There are two variations of the National route that have been suggested by members of the community, including:

Civic Facilities Overpass: A variation of the National route could address the challenges of an S-Curve around Trillium Park and the National Works Yard by a more gentle road curve. However, the gentle curve would still significantly impact the northern part of Trillium Park and the National Works Yard. The intent of this option is to run through City-owned lands and civic facilities, in order to reduce the property impacts to residents and businesses. The variation would have the same overpass structure connecting National Ave and Grant St.

National-Charles Overpass: A variation of the National route could address the challenges of intersection proximity to E 1st Ave at Clark Dr and the long structure length by connecting National Ave to Charles St east of the rail tracks, rather than Grant St. The overpass connecting National Ave to Charles St would be shorter than connecting National Ave to Grant St, but longer than connecting Malkin Ave to Charles St. Further design work is needed to review the roadway geometry and structure.

KEY BENEFITS, CHALLENGES AND OPPORTUNITIES

- Poor spacing between the other arterials on E Hastings St and E 1st Ave. Concerns about the operations at the Clark Dr intersection and impact to north-south travel on Clark Dr.
- Route is indirect and would have higher travel times and be less reliable.
- Concerns with the safety and performance of the road S-Curve around Trillium Park (similar to the current condition at McGill/Nanaimo.
- Transit service would likely be rerouted to National Ave. Majority of residents and businesses from Grandview-Woodland and Strathcona are not within a 5 min walk to National Ave but are within a 5 min walk to services on Hastings St.
- Significant impact to the Fire Training and HUSAR facilities which would require relocation.
- Moderate impacts to National Works Yard, which are a trade-off with impacts to Trillium Park and would need to be mitigated.
- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Avoids direct land impacts to Strathcona Park, Cottonwood Community Gardens, Produce Row businesses, and Animal Services Facility.
- Least impact on urban forest canopy and ecosystem, since large, mature trees are not impacted.
- Significantly higher cost and longer construction schedule than other options, due to longer structure and poor soil conditions.
- Impacts to businesses on Grant St (or Charles St) would need to be mitigated.



TRANSPORTATION CONSIDERATIONS

NATIONAL

NETWORK CONNECTIVITY

- Poor spacing between the other arterials on E Hastings St and E 1st Ave, leading to capacity and reliability concerns at the intersection with Clark Dr.
- Concerns with safety around the two 90° turns on Thornton St (similar to the current condition at McGill/Nanaimo), leading to a higher likelihood of collisions. Potential for trucks to track across both lanes, impacting the safety and reliability.
- Total travel times across the network are highest compared to other options. Travel times on the Clark-Knight corridor (a truck route and Major Road Network route) would be impacted due to the close proximity of National Ave and Terminal Ave intersections on Clark Dr. Reliability will be highly dependent on intersection design and operations at Clark Dr.
- The route between downtown and east Vancouver would be less direct, but would be more direct for south Vancouver. To reduce neighbourhood shortcutting in Grandview-Woodland, all

LOCAL VEHICLE ACCESS

- There are no buildings, land uses, or street connections to the south for a significant portion of the alignment (VIA Rail).
- Local access would be circuitous due to many T-intersections and discontinuous streets. It would generally provide poor local service. Distance to access the arterial would be longer and require more travel on local streets.
- Properties east of the rail tracks could access the areas north and south of Grant St via Clark Dr and would be connected by Vernon Dr.



vehicles travelling east-west across Clark Dr would need to turn right or left to continue on other arterials.

- Indirect routing and transportation performance more significantly impacts travel time and reliability of emergency services accessing Fire Hall #1 and new St. Paul's Hospital.
- Business areas west of the rail tracks could be accessed via Chess St or a right-in-right out intersection at Malkin Ave and Thornton St, connecting to Raymur Ave and Hawks Ave.
- Residential areas west of the rail tracks would be accessed either via Gore Ave to Prior St and potential new streets in the St. Paul's Hospital area, or via Chess St or a right-in-right out intersection at Malkin Ave and Thornton St which would travel through business and trucking operations on Malkin Ave.
- Although Prior/Venables St would no longer be an arterial, the street would be critical for local access for residents, businesses, and emergency services between Gore Ave and Raymur Ave.









WALKING AND CYCLING

- New walking and cycling facilities would be provided on National Ave but the width, separation, and protection may be compromised due to the narrow rightof-way.
- Cycling route would be indirect for east-west travel but would continue on Grant St (or Charles St) east of Clark Dr, which has a steep grade to connect with the cycling network at McLean Dr. The Adanac Bikeway on Union St would continue to be a preferred route for eastwest travel.
- Fewer opportunities to walk or bike across the arterial, especially near Trillium Park due to the road geometry.
- Concerns with safety for pedestrian and bikes crossing at the right-in-rightout intersections at the 90° turns on Thornton St.
- Overpass would be at an incline that meets universal accessible guidelines and would need further consideration to mitigate the long incline distance.
- Connecting streets would need to be upgraded to provide accessible sidewalks and cycling connections (e.g. Raymur Ave, Hawks Ave and Malkin Ave). Need for a more direct and accessible active transportation connection on Malkin Ave.

TRANSIT

- A majority of residents and businesses in Grandview-Woodland and Strathcona would not be within a 5 min walk to the arterial, but would still be within a 5 min walk to other routes on Hastings St.
- Bus service would likely be rerouted from Prior/Venables St onto National Ave. New Bus stops would be provided.
- All future transit routing and service would be determined by TransLink.

NATIONAL

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





ADJACENT RESIDENTS

- Opportunity to downgrade Prior/Venables St to a more local-serving collector street.
- Arterial is located further from residents on Prior St, but is closer to residents on Atlantic Ave that would be buffered by a berm and vegetation.
- No property impact to residents.

INDUSTRIAL BUSINESSES

 Local businesses on Grant St (or Charles St) between the rail tracks and Clark Dr are impacted and appropriate mitigation measures would be determined on a case by case basis.

PARKS

- No impacts to Strathcona Park.
- Impacts to the north and east edges of Trillium Park depending on the scale of impacts to National Works Yard. Park design anticipated impacts to potential street right-of-way on north edge of Trillium Park. Trillium Park would be adjacent to the arterial on two sides and significantly user impact experience.
- Least impact on urban forest and canopy cover as compared to other options.

CIVIC FACILITIES

- Significant impact to Fire Training and Heavy Urban Search and Rescue facilities, which would require relocation to another central industrial area of the City. Facility cannot be reconfigured due to the space requirements and burn tower.
- Some impacts to National Works Yard along Thornton St, including storage sheds and parking lot, depending on the scale of impacts to Trillium Park. Some impacts along the south edge of the National Works Yard, and potentially to the fueling facility, but no impact to the administration building.
- Potential impact to Vancouver School Board Workshop.
 Scale of impact depends on impact to properties on the north side of Grant St.
 If impacted, appropriate mitigation measures would be determined taking into account its heritage value.
- No impacts to Animal Services Facility.
- No impacts to Fire Hall #1.

COMMUNITY GARDENS

- No impacts to Cottonwood Community Gardens.
- No impacts to Strathcona Community Gardens.
- The environmental learning art and community learning garden area in Trillium Park would be adjacent to the arterial.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Compatible with new street network for St. Paul's Hospital in the Council approved Policy Statement (2017).

PRODUCE ROW

- For businesses between Thornton St and Glen Dr, truck operations could continue on the existing stretch of Malkin Ave.
- Building modifications required on the south property line for some businesses near Raymur Ave. Appropriate mitigation measures would be determined on a case by case basis.

NATIONAL

CONSTRUCTABILITY

- Overpass structure length is longest (approx. 620m) compared to all other structures. It spans a rail yard of about 14 tracks and a curved track connecting with Pacific Central Station.
- Soil conditions are comparatively worse than all other routes with high thickness of poor quality fill and marine deposit. High depth to competent soils (approx. 9-12 m) and highest cost for foundations (about twice the remediation effort required compared to William). Soil is potentially susceptible to liquefaction.
- Longest construction schedule and potential for delays due to the time to relocate the Fire Training and HUSAR facilities which would need to be fully operational before constructing the overpass. Schedule would include acquiring and assembling land, design and community consultation on the new location and facilities, constructing the new facilities and decommissioning the existing facilities, and then constructing the roadway and overpass.
- A traffic management plan for construction would be developed to ensure that local access is maintained and traffic is appropriately rerouted to other arterial streets.

PROJECT COST CONSIDERATIONS

Potential project cost ranges are provided separately.

- Significantly higher cost than other options, primarily due to a longer structure length, higher soil remediation effort, cost escalation from a longer construction schedule, and relocation of Fire Training and HUSAR facilities.
- Highest long-term maintenance cost due to longest structure length.





Design refinements to reduce safety and reliability concerns

Some opportunities to improve the road geometry can be explored, but there are few improvements that would substantially improve the safety of the S-curve without major land impacts to Trillium Park and National Works Yard. Some improvements for vehicle capacity may come at a trade-off with walking and cycling conditions. For example, there is no crosswalk on the north leg of the Clark Dr and E 6th Ave intersection. This is inconvenient for people walking and cycling, but allows for more vehicles to turn left from E 6th Ave.

Relocate the Fire Training and the Heavy Urban Search and Rescue facilities

Due to the space requirements, the facilities cannot be reconfigured within a smaller footprint in the impacted location. The central location is vital to Vancouver Fire and Rescue Services operations, and a replacement training facility would need to be relocated within the False Creek Flats or another central industrial area of the City. The existing facilities would need to remain in operation until a new facility is built. Further study and a consultation process would be needed for the new location and facilities.

Assess feasible ways to modify the National Works Yard

A master plan would be needed to determine the extent of reorganizing the functional layout of the works yard.

MITIGATION STRATEGIES AND OPPORTUNITIES

In later stages of the project, the City will seek opportunities and strategies to mitigate the impacts and challenges. Potential considerations specific to this option include:

Explore opportunities to provide a more direct east-west route for walking and cycling

Due to the indirect route on National, there is a greater need for a more direct and accessible active transportation connection. Further consultation and study by the City and Park Board would be needed to explore these opportunities.

Explore opportunities to enhance the walking and cycling experience on Prior/Venables St upon downgrading Prior from an arterial to a local-serving collector street

Improvements such as widened sidewalks, landscaping, and all-day parking could be implemented on Prior/Venables St. However, it would continue to be an important throughroute for local access and emergency services due to the closures and diverters in Strathcona. Improvements would need to balance the need to maintain local connectivity while reducing shortcutting. Union Street would continue to be a preferred bike route due to the gentler slope and the connections west of Main St and east of Clark Dr. Venables St would continue to be an important collector street between Clark Dr and Commercial Dr.



Notes:



CIVIC FACILITIES OVERPASS VARIATION

ARTERIAL DESCRIPTION

The following information focuses on the differences of the Civic Facilities Overpass as compared to the base National route, which includes an S-Curve around Trillium Park and National Works Yard, and an overpass connecting from National Ave at Chess St to Grant St east of the rail yard.



KEY BENEFITS, CHALLENGES AND OPPORTUNITIES

- Although the safety and reliability concerns of the road geometry is reduced and is more preferable from a transportation perspective, the significant impact to the National Works Yard, Fire Training and HUSAR facilities, and Trillium Park is highly costly to mitigate.
- Other key aspects of the route are similar to the base National route.

TRANSPORTATION CONSIDERATIONS

NATIONAL

CIVIC FACILITIES OVERPASS VARIATION

The transportation considerations are the same as the base National route, except for the following:

NETWORK CONNECTIVITY

 Concerns with safety of the two 90° turns on Thornton St is reduced, and travel reliability would be higher than the base National route, but still comparatively worse than Malkin due to the intersection spacing and proximity with E 1st Ave at Clark Dr.



LOCAL VEHICLE ACCESS

- As land uses would be better balanced on both sides of the street, the travel distance to access the arterial would be slightly shorter.
- Most areas would be accessed by the same routes, and would be similarly circuitous due to many T-intersections and discontinuous streets.





CIVIC FACILITIES OVERPASS VARIATION





WALKING AND CYCLING

- Safety concern of pedestrian and bike crossing is reduced, and more crossing opportunities can be provided.
- Poor travel experience and urban design due to blank walls along the back of Produce Row buildings between Thornton St and Raymur Ave.

TRANSIT

• Similar to National route

.....

NATIONAL

CIVIC FACILITIES OVERPASS VARIATION

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





CIVIC FACILITIES OVERPASS VARIATION

ADJACENT RESIDENTS

Same as National route

INDUSTRIAL BUSINESSES

Same as National route

PARKS

- Significant impacts to the northern portion of Trillium Park, including loss of land in the environmental learning art and community learning garden area.
- Scale of impacts would depend on the road geometry limitations and the scale of impacts to the Produce Row business at Thornton St and Malkin Ave.

CIVIC FACILITIES

- Significant impacts to National Works Yard that would require entire reconfiguration of the site and likely relocation of some operations. It is highly challenging to reconfigure yards by using the existing National Ave right-of-way due to the location of the administration building, gas station, overall space requirements and truck manoeuvering.
- Similar significant impact to Fire Training and Heavy Urban Search and Rescue facilities, which would require relocation to another central industrial area of the City. Facility cannot be reconfigured due to the space requirements and burn tower.

COMMUNITY GARDENS

 Significant impacts to the northern portion of Trillium Park, including loss of land in the environmental learning art and community learning garden area.

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

Same as National route

PRODUCE ROW

 Potential impacts near Thornton St, depending on the road geometry limitations and the scale of impacts to Trillium Park.

CONSTRUCTABILITY

The cost and constructability considerations are the same as base National route, except:

- New street right-of-way would need to be designated through a significant portion along the corridor through Trillium Park and National Works Yard.
- Longer construction schedule than base National option, due to the time to relocate the Fire Training and HUSAR facilities, and reconfigure and/or relocate the National Works Yard which would both need to be fully operational before constructing the overpass. Schedule would include acquiring and assembling land, design and community consultation on the new locations and facilities, constructing the new facilities and decommissioning the existing facilities, and then constructing the roadway and overpass.

PROJECT COST CONSIDERATIONS

• Project cost would be significantly higher than the base National route due to the additional reconfiguration and relocation of National Works Yard.



Notes:



NATIONAL-CHARLES OVERPASS VARIATION

ARTERIAL DESCRIPTION

The following information focuses on the differences of the National-Charles Overpass as compared to the base National route, which includes an S-Curve around Trillium Park and National Works Yard, and an overpass connecting from National Ave at Chess St to Grant St east of the rail yard.



KEY BENEFITS, CHALLENGES AND OPPORTUNITIES

- Although the capacity and reliability concerns related to the intersection with Clark Dr is reduced, the variation is less preferable from a transportation perspective due the indirect routing of the S-curve combined with the curved overpass. As there would still be a significant impact to the Fire Training and HUSAR facilities, it would be highly costly to mitigate.
- Other key aspects of the route are similar to the base National route.

TRANSPORTATION CONSIDERATIONS

NATIONAL

NATIONAL-CHARLES OVERPASS VARIATION

NETWORK CONNECTIVITY

- Network spacing between the other arterials on E Hastings St and E 1st Ave at Clark Dr is improved and similar to Malkin.
- Route is highly indirect and would function poorly as an arterial street. Total travel times across the network would be highest and likely less reliable.
- High likelihood of shortcutting through the neighbourhood and on Prior/Venables St, especially if an intersection is provided at Raymur Ave.
- In addition to safety concerns around the two 90° turns on Thornton St, there may be additional concerns along the overpass if the road curvature can feasibly be tighter than the National-Grant overpass curvature.



LOCAL VEHICLE ACCESS

- Due to an indirect arterial route, access to/from the arterial would be a trade-off between convenient local access and shortcutting.
- Most areas would be accessed by the same routes, and would be similarly circuitous due to many T-intersections and discontinuous streets.





NATIONAL-CHARLES OVERPASS VARIATION





WALKING AND CYCLING

• The indirect route more significantly impedes people walking and cycling more than vehicles. Although grades are more favourable on Charles St east of Clark Dr, the route may be poorly utilized. There would be a greater need for an accessible active transportation route on Malkin Ave.

TRANSIT

• Simlar to National route

NATIONAL

NATIONAL-CHARLES OVERPASS VARIATION

ADJACENT LAND IMPACTS AND CONSIDERATIONS

Changes to the transportation network impact everyone in the broader community. As well, the arterial route would impact the properties and land uses that are located directly on the arterial. This section provides a brief description of the considerations and potential impacts and considerations to the land uses adjacent to the arterial.





NATIONAL-CHARLES OVERPASS VARIATION

ADJACENT RESIDENTS

Same as National route

INDUSTRIAL BUSINESSES

 Local businesses on Charles St, rather than Grant St, between Raymur Ave and Clark Dr would be impacted and appropriate mitigation measures would be determined on a case by case basis.

CIVIC FACILITIES

Similar significant impact to Fire Training and Heavy Urban Search and Rescue facilities, which would require relocation to another central industrial area of the City. Facility cannot be reconfigured due to the space requirements and burn tower.

COMMUNITY GARDENS

Same as National route

NEW ST. PAUL'S HOSPITAL AND HEALTH CENTRE

• Same as National route

PARKS

• Same as National route

PRODUCE ROW

 Building modifications required on the south property line for some businesses near Raymur Ave. Scale of impact dependent on overpass structure footprint. Appropriate mitigation measures would be determined on a case by case basis.

CONSTRUCTABILITY

The cost and constructability considerations are the same as base National route, except:

- The overall structure footprint would be shorter than the base National route and longer than Malkin. However, the structure span of would be longer than National if it spans the rail yards (about 14 tracks) at a diagonal rather than the shortest path (the longest bridge span typically defines the type and cost of a structure). For an overpass between National Ave to Grant St, the overall footprint is longer due to the curved track but piers and foundations could straddle the rail yards via the shortest possible route.
- Similar soil conditions and remediation efforts as the base National Route in the western extent of the overpass. Soil conditions would be similar to the Malkin option in the segment east of the rail tracks.

PROJECT COST CONSIDERATIONS

 Project cost would be likely be similar to the base National route due to the shorter overpass approach but longer structure span.



POTENTIAL COST RANGES

In the planning phase, preliminary estimates provide the approximate order of magnitude of the cost. The cost ranges have been derived from unit rates of other similar projects, the probable conditions of the site based on limited information, and professional experience.

The major components of the project cost are:

- Construction costs include the design and construction of the arterial roadway, the overpass structure, and the Adanac Bikeway structure.
- Land Acquisition and Property Impact Mitigation costs include purchasing land for the roadway and overpass, and to mitigate the direct property impacts on private properties, businesses and city facilities.
- **Park Mitigation** include mitigating impacts to Trillium Park and Strathcona Park.

Please Note:

Cost estimates are only indicative of the current market conditions and are subject to change. The planning-level cost ranges provide an order of magnitude of cost and the relative cost difference between the arterial route options.

	PRIOR		WILLIAM	MALKIN	NATIONAL
	Overpass	Underpass		All Variations	Base Route with Grant overpass*
Construction Cost	\$45-70 M	\$60-85 M	\$130-180 M	\$130-180 M	\$150-200 M
Land Acquisition and Property Mitigation Cost	\$20-30 M	\$20-30 M	\$40-65 M	\$40-85 M	\$195-285 M
Total Project Cost (park mitigation costs provided separately)	\$65-100 M	\$80-115 M	\$170-245 M	\$170-265 M	\$345-485 M

The potential cost ranges for the arterial routes are provided in the table below.

Note: Cost estimates are only indicative of the current market conditions and available information, and are subject to change. The planning-level cost ranges provide an order of magnitude of cost that indicates the relative cost difference between the arterial route options.

*Cost ranges for variations of the National route are not available. The Civic Facilities Overpass variation would be an order of magnitude higher due to significant impact to the National Works Yard. The National-Charles Overpass variation would be a similar cost range as the National base route. Both variations require relocation of the Fire Training and Heavy Urban Search and Rescue facilities.

KEY COST CATEGORIES

Roadway

The roadway includes the pavement surface, sidewalks and cycling facilities, traffic signals, bus stops, street lights, above- and underground utilities, street furniture, and landscaping in the public realm.

For arterial routes on William St, Malkin Ave, and National Ave, a new arterial street of about 1.7-2.0 km would need to be constructed. On Prior/Venables St, the existing arterial would be upgraded.

Overpass Structure

The arterial overpass structure includes the approach ramps and retaining walls, bridge deck, bridge structure, piers, and foundations. The structure cost varies significantly between options because of the following key features:

Length – The length of the longest span and the entire length of the structure is primarily defined by the number of rail tracks it needs to span and the height clearance.

- Prior/Venables overpass spans the rail line with 2 tracks. The underpass can be thought of as a railway overpass that would span the roadway.
- William spans the railyard with 4 tracks.
- Malkin spans the railyard with 11 tracks.
- National spans the railyard with 14 tracks, along with a curved track connecting with Pacific Central Station.

Piers and Foundation – The soil conditions define the amount of remediation and the size and depth of foundations required.

- Prior soil is stable at a shallow depth.
- William stable soils are approx. 5-6m below the surface.
- Malkin stable soils are approx. 5-7m below the surface.
- National stable soils are approx. 9-12m below the surface.

Underpass Considerations – A road underpass requires building a railway overpass, but has additional costs for excavation and mechanical systems to address groundwater and rainwater.

Adanac Bikeway Structure

The project includes a pedestrian and bike structure for the Adanac Bikeway, which may be an underpass or overpass, and either on Union St or Prior St.

For the Prior/Venables route, the Adanac Bikeway could be routed onto the arterial street, to cross the rail tracks at the same location. The cost ranges represent one structure for all transportation modes on Prior/Venables, but a separate structure could also be constructed on Union St. For the William, Malkin, and National routes, a separated walking and cycling structure would be provided.

Land Acquisition

The street right-of way would need to be expanded in some areas to accommodate the width of the arterial and overpass. The cost for each route differs based on the width of the existing street right-of-way and was estimated using current market value. The land acquisition cost shown only includes private properties and does not include City-owned land. If land is needed to relocate a property, the cost for new land is included in the property impact mitigation category.

Property Impact Mitigation

The arterial roadway and structure would have direct property impacts to private properties, businesses, and civic facilities. The City takes care and effort to support businesses continuity and mitigate property impacts. When mitigation measures cannot be address in place and buildings need to be entirely relocated, the cost includes land acquisition for a new location.

The major costs to mitigate the impacts to businesses and city facilities would include:

- Prior/Venables mitigating impacts to businesses.
- William mitigating impacts to Produce Row and other businesses.
- Malkin mitigating impacts to Produce Row and other businesses.
- National relocating and reconstructing the Fire Training and Heavy Urban Search and Rescue facilities, and the National Work Yards.

The breakdown of key cost factors is as follows:

	PRIOR		WILLIAM	MALKIN	NATIONAL
	Overpass	Underpass		(includes all variations)	Base Route with Grant overpass
Roadway	\$5-15 M	\$5-15 M	\$20-25 M	\$20-25 M	\$20-25 M
Overpass Structure	\$40-55 M	\$55-70 M	\$85-120 M	\$85-120 M	\$105-140 M
Adanac Bikeway Structure	(included in overpass cost)	(included in underpass cost)	\$25-35 M	\$25-35 M	\$25-35 M
Land Acquisition	\$10-15 M	\$10-15 M	\$35-45 M	\$25-60 M	\$35-45 M
Property Impact Mitigation	\$10-15 M	\$10-15 M	\$15-20 M	\$15-25 M	\$160-240 M
Total Project Cost (park mitigation costs provided separately)	\$65-100 M	\$80-115 M	\$170-245 M	\$170-265 M	\$345-485 M

Note: Cost estimates are only indicative of the current market conditions and available information, and are subject to change. The planning-level cost ranges provide an order of magnitude of cost that indicates the relative cost difference between the arterial route options.

*Cost ranges for variations of the National route are not available. The Civic Facilities Overpass variation would be an order of magnitude higher due to significant impact to the National Works Yard. The National-Charles Overpass variation would be a similar cost range as the National base route. Both variations require relocation of the Fire Training and Heavy Urban Search and Rescue facilities.

PARK MITIGATION COSTS

Costs to mitigate potential impacts to Strathcona Park and Trillium Park include replacement costs for amenities impacted, replacement and compensation fee for trees, planning and design costs, construction costs for affected park space outside of alignment boundaries.

	PRIOR		WILLIAM	MALKIN	NATIONAL
	Overpass	Underpass		All Variations	Base Route with Grant overpass
Parkland Acquisition	\$8-13M	\$10-16M	\$40-66M	\$5-47M	\$4-8M
Park Mitigation	\$1-2M	\$1-2M	\$11-18M	\$1-16M	\$0.5-1M
Total Park Cost	\$9-15M	\$11-19M	\$50-82M	\$6-63M	\$4.5-9M

*Costs are preliminary, order of magnitude only.

FALSE CREEK FLATS

STREETSCAPE RENDERINGS + PUBLIC REALM OBSERVATIONS

12 September 2019



Appendix B



STREETSCAPE + PUBLIC REALM CONSIDERATIONS

In order to ensure streets are well used, friendly and vibrant, considerations to enhance the concept of people-oriented places for the major streets are being contemplated in the False Creek Flats area. These considerations are reflective of the same considerations established for the streetscapes of North East False Creek to the west of this study area.

In order to identify strengths, challenges, and opportunities for improvement, several considerations for streets and intersections will need to be further reviewed during design development of a final option.

These criteria fall into four categories Protection, Comfort, Legibility, and Enjoyment.

The considerations are aspirational in intent. We recognize that not all considerations can be met at all locations. These measures provide a best practices approach to work towards in the future.

PROTECTION

The protection measures the safety and perception of safety for pedestrians and cyclists.



Traffic

- Are people walking and cycling physically protected from cars?
- Are people visible to cars?
- Does the street design take into consideration all ages and abilities for both pedestrians and cyclists?
- Have traffic speeds and volumes been mitigated through the street design?

Crime

- Is the area well and evenly lit at night?
- Do a variety of functions keep the street active at least 18 hours a day?
- Are buildings and public spaces arranged for passive surveillance by residents?

Sensory

- Have traffic noise levels been mitigated through street design improvements ?
- Can one shelter from rain/snow?
- Does the microclimate minimize wind?

COMFORT

The comfort measures the physical experience of place and one's ability to be at ease while within it.

Movement

- Is there ample room to avoid crowding (especially around bus/ trolley stops)?
- Are sidewalks/bikeways continuous?
- Are paths free of obstruction and well-maintained?
- Are paths accessible and at a comfortable grade?

Staying

- Are there comfortable places to stay, especially near building entrances and corners?
- Are there objects to lean against and stand near?

Sitting

- Are there opportunities to sit at least every 200m?
- Is there both public and private seating?
- Are there pleasant views and opportunities to people watch?



Legibility measures the ease which people in the space can decipher where they are, where they want to go, and how easily they can get there.



Orientation

- Are there great views of surrounding landmarks?
- Is street name signage clear?
- Does distinctive architecture contribute to orientation?

Destinations

- Is hierarchy of streets clearly differentiated?
- Are sightlines to immediate destinations clear?

Wayfinding

- Is movement through the intersection as direct as possible?
- Is the view free from signage clutter?
- Is wayfinding signage legible and at correct scale?
- Are bus stops visible for travel in both directions?



ENJOYMENT

Enjoyment measures the psychological experience of place and the delight it provides to people within it.



Human Scale

- Is the proportion of the street (street width to street wall height) roughly 1:1 to 2:1?
 - Are edges inhabitable and inviting?

Climate

- Are there opportunities to enjoy the sun/shade?
- Is the microclimate optimized for the intended program?

Aesthetics

- Is design detail applied where most human activity occurs?
- Do trees, plants, art or water features enhance the experience of place?
- Does level of texture/detail match the speed of people's movement?



I Key Plan for Diagrams and Sketches



STREETSCAPE RENDERINGS | FLATS ARTERIAL | SEPTEMBER 2019 | PAGE 3



I Public Realm Observations - Prior Street West

PRIOR STREET WEST OBSERVATIONS

STREETSCAPE RENDERINGS | FLATS ARTERIAL | SEPTEMBER 2019 | PAGE 4

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PRIOR ST

CONGIDER PARK, UTILITY and TRUCK TURNING NEEDS WHEN RE DESIGNING HANKS

der removing parking porate green infrastructure on crossings of curb bulges to community gurden to street edge and public into park space to create nesive purt environment

CONGIDER OPTIONS or additional part uses

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I Public Realm Observations - Prior Street East

PRIOR STREET EAST OBSERVATIONS





I Sketch Looking West at the removed viaducts and the proposed streetscape character

PRIOR STREET IMPROVEMENTS

Improvements in the section from Gore Avenue to Jackson Street along Prior Street focus on the transition from the Viaducts removal to a new street designed to enable safe access for all users.

- waiting for the light to change.
- wider sidewalk
- neighbourhood
- buffer planting at street edge
- Avenue to Campbell Avenue
- 7. the north edge of the street.
- St. Paul's Hospital Precinct.

Introduce a signalized intersection at Dunlevy for pedestrian and cyclist crossings (off sketch)



PRIOR STREET at GORE AVENUE

1. Provide sufficient crosswalk areas on all four sides of new intersections for people to comfortably congregate while

2. Upgrade existing poor sidewalks with the introduction of a new,

3. Introduce a new bike path between Gore and Dunlevy to connect to the new St. Paul's Hospital Precinct and the Strathcona

4. Separate the walkway and bikeway from traffic with a curb and

5. Discuss the introduction of new bus stops with Translink

6. Introduce new street trees to match existing Hornbeam trees to provide a legible and consistent street tree treatment from Gore

Introduce a new bike path and planting to buffer the sidewalk on

8. Expand walking and cycling pathways to improve connections between the Strathcona neighbourhood, Trillium Park and the new




3 **PRIOR STREET at HAWKS AVENUE**



I Sketch Looking Southeast toward Strathcona Park at Hawks Avenue







PRIOR STREET at HAWKS AVENUE

STREETSCAPE RENDERINGS | FLATS ARTERIAL | SEPTEMBER 2019 | PAGE 8

AREA IMPROVEMENTS

Improvements in this area focus on the public realm and walkability across Prior Street and connections between the neighbourhood and Strathcona Park and Community Garden.

- lawn area below them
- enjoyment
- to change.
- 6. Re-paint crosswalk and introduce an interesting crosswalk garden themed pattern or public art
- 7. Introduce sidewalks on Hawks south of Prior and incorporate green infrastructure
- 8. Integrate the public realm and street with the north edge of Strathcona Park. Shift the sidewalk south so that it is buffered from the road by the existing street trees.

1. North of Prior open up planting to the grouping of trees and the

2. Introduce benches in selective locations for comfort and

3. Move the sidewalk north away from the curb and plant a buffer between the road and walk to improve safety for pedestrians.

4. Expand the crosswalk areas on all four sides of the intersection for people to comfortably congregate while waiting for the light

5. Consider improving underutilized park spaces (just off sketch)

Improve linkages and visibility to bus shelters (off sketch)





PRIOR STREET near RAYMUR AVE.

5



I Aerial Sketch Looking East along Prior Street near Raymur Street

AREA IMPROVEMENTS

Improvements focus on the area around the underpass and adjacent opportunities to integrate the public realm, urban design, park space connections.

North side

- condition)

South side

- street interest



PRIOR STREET near RAYMUR AVE.

1. Provide a planted buffer and railing between the upper pedestrian area and lower traffic area (4 lanes as per current

2. Develop an upper level and lower level walkway configuration connected with stairs where feasible

3. Continue the tree lined street edge along Prior

4. Incorporate signage, banners and public art into the overall scheme including highlighting the transition from Strathcona with its residential garden feel to East Van with a more industrial and arts-based feel in this location

5. Consider a small under-croft retail space at the pedestrian/ bicycle ramp east of Raymur Avenue to provide interest and a fixed and continuous presence to this area

6. Provide a grade separated sidewalk above the lanes of traffic with a planted buffer where feasible

7. Bring retail down to walkway level east of Raymur to provide

8. Introduce stairs and a public art piece to create an entrance to Strathcona Park at Raymur that is visually accessible

9. Incorporate signage and banners into the scheme including highlighting the transition from Strathcona to East Vancouver

I Eye Level Sketch looking east at Underpass



PRIOR STREET near RAYMUR AVE.

AREA IMPROVEMENTS

Improvements focus on the area beneath the underpass and adjacent opportunities to create a dynamic walking & cycling space

South side

- 1. Provide a railing between the vehicle lanes and the sidewalk to protect pedestrians
- scheme
- level
- 4. Consider stairs between rail line and new development to connect up to Glen Avenue and the Parker Street studios
- 5. Use the rail bridge as a gateway transition from Strathcona to East Vancouver

North side

- 6. Provide a planted buffer and railing between the pedestrian area and traffic (4 lanes as per current condition)
- 7. Separate pedestrians from cyclists in clearly marked zones
- 8. Continue the tree lined street edge along Prior

- 2. Incorporate lighting, banners and public art into the overall
- **3.** Incorporate retail with transparent frontages at the pedestrian



IMPROVEMENTS

Consider a small under-croft retail space at the pedestrian/bicycle ramp east of Raymur Avenue to provide interest and a fixed and continuous presence to this area. The under-croft area is generally a ground level area which is relatively open to the sides, but covered by a structure above. In this case the rail line.



I Retail Space beneath rail line adjacent to the bike path









PRIOR STREET near RAYMUR AVE.



I National - Charles Corridor Public Realm Observations

8 **NATIONAL / CHARLES CORRIDOR**





NATIONAL AVENUE 9

STREETSCAPE RENDERINGS | FLATS ARTERIAL | SEPTEMBER 2019 | PAGE 14

AREA IMPROVEMENTS

Improvements in this area focus on the street experience from a pedestrian and cycling perspective.

- 2. Maximize pockets of planting
- distances between destinations
- area and intersections



1. Provide a protected walkway and bikeway from the road

3. Consider mitigation measures, if feasible, for the long stretches of walk and cycle path that have few eyes on the pathways

4. Establish a measured wayfinding system to provide the

5. Provide interesting vertical elements, like lighting and banners, to enliven the space. Lighting levels should be adequate for the

6. Explore the use of public art or light art on the south side of the street adjacent to the railway fencing





AREA IMPROVEMENTS

Improvements focus on mitigating the scale and length (.5km long) of the structure, and the connectivity between the St. Paul's Hospital Precinct and the East side. It should be noted that for the National / Charles overpass option additional work will need to be done at Union Street to get cyclists and pedestrians over or under the rail line.

- bikeway on the structure

- Glen Drive



NATIONAL AVENUE OVERPASS 10

1. As a specialized bridge structure is needed to span the 14 rail lines and the rail yard, consider a dynamic form that provides a signature piece of infrastructure to the city (shown in precedent images below). Incorporate a protected walkway/

2. Provide road access to properties on Glen and Vernon Drive

3. Incorporate lighting on the underside of the structure, where needed, such as, for pedestrian on Glen Drive or Vernon Drive

4. Ensure clear wayfinding for people walking/cycling, since the viaduct structure will be longer than .5 of a kilometre

5. Provide adequate sidewalks space, and reduce crossing distance where possible without limiting traffic movements at the intersection of Clark Drive.

6. Provide a grade separated walkway and bikeway for pedestrians and cyclists (Adanac Bike Route) to either get over or under the existing rail lines on Union Street between Raymur Avenue and

7. Consider ways to enhance Prior Street and reduce shortcutting without restricting access to businesses and residents.

8. Provide access at Chess Street and on local roads through the Flats for Strathcona residents





















11 **PRECEDENT IMAGES**

		-	

Detailed Analysis and Comparison of the National-Charles Overpass and Prior/Venables Underpass options

In April 2019, Council received the final report of the Flats Arterial Community Panel. Staff analysed the prioritization of values, evaluation and ranking of routes and identified further work before seeking a Council decision. The review of the Community Panel's report and steps for further work was shared in a June 2019 memo to Council, and was also shared with panellists, stakeholders, and the public.

Guided by the Community Panel's work, staff subsequently examined how to address the most significant drawbacks of both the National-Charles Overpass and the Prior/Venables Underpass. This included refining the conceptual design for the National-Charles Overpass, working with independent consultants to validate property values and cost estimates; exploring external funding opportunities with key partners, and assessing opportunities to lessen traffic impacts and enhance the public realm of either of the options.

A summary of the comparison between the National-Charles Overpass and Prior/Venables Underpass route options, along with a more detailed assessment, is provided in the following sections.

A. Summary of the National-Charles Overpass and Prior/Venables Underpass Comparison

1) Summary analysis of the National-Charles Overpass

As the Community Panel identified, the National-Charles Overpass has two significant advantages: unlike some of the other alternate routes it avoids some of the highest impacts to parks, community gardens and local businesses, and it moves arterial traffic away from Strathcona residents therefore allowing Prior Street to be downgraded to a local-serving street. This latter advantage is particularly important to many Strathcona residents as it promises to improve livability by reducing noise and air pollution, and allows for easier access to Strathcona Park.

Despite these advantages, the National-Charles Overpass also has some significant disadvantages that despite further technical analysis, cannot be overlooked.

First, the scale of the overpass and overall grade-separation project is significantly larger than the Prior/Venables Underpass. An overpass requires a height clearance of 7m to clear the railyards, and therefore a higher and longer structure is needed. At this location, the overpass must span about 80m to cross a 14-track railyard. As this exceeds the threshold span for a conventional girder structure, a more costly specialized structure, such as a steel arch or a cable-stayed bridge, would be required. Multiple bridge spans, similar to a viaduct, would be needed to cross Glen Drive and Vernon Drive, and the entire length of the structure would be approximately 600m including the approaches. In addition, a new cycling route on National-Charles would not replace the Adanac-Union Bikeway, and a grade-separated pedestrian/bike-only structure would be needed at Union Street to maintain a convenient cycling connection.

Second, the new arterial alignment would have more impacts to existing businesses and facilities than the Prior/Venables Underpass. Local streets would need to be widened and a new street right-of-way is needed for the new arterial, about 2km long. For example, some Produce

Row businesses and industrial businesses along Charles St would need to be relocated, the Fire Training and HUSAR Facility would need to be relocated, and the National Works Yards would need to be reconfigured. Several properties along Union and Venables Streets would also be impacted in order to grade-separate the Adanac Bikeway. These property impacts would need to be addressed before the start of construction and increases the cost and schedule.

Third, the scale of project and property costs, and the challenge of securing external funding would result in a significant cost to the City. Overall, preliminary capital cost estimates indicate that the National-Charles Overpass would cost \$409-417 million¹. The single project greatly exceeds the four-year 2019-2022 transportation capital plan of \$160 million towards new city-wide infrastructure to improve transportation safety, and expand walking, cycling and support transit capacity. Although external funding could be secured for a portion of the project, several project partners have expressed that their contribution value would be based on the most cost-effective grade-separation solution. Thus, a majority of the project cost would likely be borne by the City.

In order for the City to fund a large proportion of a high-cost project, construction would need to be phased over several capital plans and investments would need to be diverted from other citybuilding priorities. In addition, the long-term maintenance costs of the roadway viaduct would be borne by the City, as it would be a City-owned asset in comparison to the rail bridge in the underpass option, which would be owned and maintained by CN.

Fourth, the National-Charles Overpass would be a less connected, less enjoyable and less effective as an arterial street. National-Charles is not well integrated into the local street network - it is farther away from many of the destinations it serves, and many residents and businesses would rely on a single intersection at Chess Street for access. This also negatively impacts on transit service to the area - by rerouting transit to National-Charles, many Strathcona residents would need to walk more than 900m (more than double the distance recommended by TransLink's Transit Service Guidelines). Without a mature tree canopy like there is on Prior/Venables, many sections of National-Charles would feel isolated and similar to a highway environment. The grade increase of 9m at the overpass would be less accessible and less enjoyable for those walking, cycling, and rolling. As well, the route curves and backtracks. This results in a less direct and less reliable connection, longer transit travel times, and slower emergency response times, including for Fire Hall No. 1 located on Prior Street. Furthermore, TransLink approval would be required to remove the existing truck route on Prior/Venables Street, in order to facilitate its downgrading. The City would need to be able to demonstrate equivalent or improved capacity for the efficient movement of people and goods accessing areas within the Flats and the downtown, and the change would need to be supported by commercial vehicle stakeholders.

Finally, the National-Charles Overpass creates certain challenges for local access. In particular, residents near the Main Street & National Avenue intersection, the Clark Drive & Charles Street intersection, and along East 1st Avenue are likely to see an increase in traffic-related impacts. Moving the arterial further away from Strathcona residents would reduce traffic-related noise and air impacts, but would also reduce transit and local access.

¹ Class D Capital Cost Estimate prepared in 2019 dollars and rounded to the closest million. Estimate has not included construction cost escalation if the project is not constructed for several years. Property costs reflect current market value and are subject to change. Cost range indicates the varying cost for an underpass or an overpass for the Adanac Bikeway grade-separation.

The closure of Prior/Venables Street at the rail tracks (which would be required to fully gradeseparate the corridor and to convert it to local-serving function), in combination with other closures at Cordova Street, Raymur Avenue, Union Street, and Parker/Glen Streets, would reduce connectivity between the east and west sides of the neighbourhood. Although the community would be connected by walking and cycling links at Keefer Street and Union Street, people would need to drive an additional 1-1.5km to cross the rail tracks at either Hastings Street or the National-Charles Overpass. There is therefore likely to be more truck traffic on local streets to reach their destinations.







Figure 2 - Illustration of the National-Charles route around Trillium Park and National Yards

Note: Drawings are illustrative only, and subject to discussion between City and Park Board staff. Any proposed changes to park boundaries require Council and Park Board approval.



Figure 3 - Illustration of the National-Charles Overpass from National Avenue to Clark Drive

2) Summary analysis of Prior-Venables Underpass

Similar to the National-Charles Overpass, the Prior-Venables Underpass avoids some of the most significant impacts to parks, community gardens, and businesses.

In contrast to the National-Charles Overpass, however, the scale of the Prior-Venables Underpass project is smaller and would have fewer property impacts. The underpass would include a 15m wide rail bridge that supports two rail tracks at the existing grade. To pass underneath, the roadway would be lowered along the existing arterial alignment and property acquisition would be needed to widen the right-of-way for retaining walls and the bikeway.

As the height clearance of an underpass is less compared to an overpass, the length of the approaches and associated property impacts would be lower than the National-Charles Overpass. Although underpasses were considered along the other arterial alignments, Prior/Venables is the only feasible location for an underpass due to the ground conditions and width of the rail crossing. The proximity to the Union-Adanac Bikeway also allows the active transportation crossing to be combined with the arterial as a single structure. Overall, the smaller scale of the project means there are less property impacts for this route.

Importantly, the Prior/Venables Underpass is significantly more cost-effective and easier to implement. Overall, the preliminary capital cost estimate of the Prior/Venables Underpass is approximately \$125 million². Potential funding partners have expressed their preference for this route. As such, not only is the likelihood of securing funding higher than for the National-Charles Overpass, but the funding would also likely cover a greater proportion of the project costs.

The design and delivery of the Prior/Venables Underpass rail bridge would be led by the railway company, who would also own and maintain the structure, thereby significantly reducing the long-term costs for the City. As well, the underpass could be completed on a shorter schedule because it would require fewer property acquisitions, and avoid needing to purchase a replacement site to relocate the Fire Training and HUSAR facility.

More significantly, the Prior/Venables Underpass enables an arterial street that would better serve the collective needs of local residents, businesses, the city and the region. The route would provide better east-west connectivity, access for local residents and businesses, more direct emergency access across the rail tracks and to the St. Paul's hospital, support more reliable transit service and better coverage, and more conveniently connect neighbourhoods separated by the rail tracks. The Prior/Venables Underpass would be more accessible and comfortable than the National-Charles Overpass as there would be less of a grade change – walking and cycling paths on the underpass would be about 4-5m below the rail tracks, in comparison to about 9-10m above the railyard for the overpass.

The underpass would also be easier for cyclists of all ages and abilities, as first going downhill would create momentum for the ascent on the other side. The sidewalk and bikeway on the underpass would be better separated and protected from vehicles, as the paths would be 2m above the traffic lanes. Finally, although the mature tree canopy and residential homes alongside the corridor limit the opportunities for widening sidewalks and adding planted buffers, it is the vitality of these neighbourhood features and the adjacency to Strathcona Park that create a more enjoyable walking experience overall.

² Class D Capital Cost Estimate prepared in 2019 dollars and rounded to the closest million. Estimate has not included construction cost escalation if the project is not constructed for several years. Property costs reflect current market value and are subject to change.

Nevertheless, it is clear that the Prior/Venables Underpass route has a significant disadvantage – it does not allow for Prior Street to be downgraded to a local-serving street and therefore associated safety concerns, noise and air pollution on nearby residents would remain. These impacts would continue to be a challenging reality for many residents. However, vehicle volumes on Prior Street have declined from about 29,000 to 25,000 vehicles per day since 2013, and through the ongoing progress of improving traffic safety and shifting more trips to sustainable modes, including walking, cycling, transit, and electric vehicles, staff anticipate that noise, air pollution, and other traffic-related impacts will continue to decline.



Figure 4 - Prior/Venables Underpass and related components to grade-separate the BI Line



Figure 5 - Illustration of the Prior/Venables Underpass and Adanac Bikeway looking southeast

Note: Drawings are illustrative only, and subject to discussion between City and Park Board staff. Any proposed changes to park boundaries require Council and Park Board approval.

Figure 6 - Illustration of the underpass on Prior/Venables Street, looking east near Raymur Street



Note: Drawings are illustrative only, and subject to discussion between City and Park Board staff. Any proposed changes to park boundaries require Council and Park Board approval.

3) Summary Multi-Criteria Evaluation of the National-Charles Overpass and Prior/Venables Underpass

The comprehensive multi-criteria evaluation of both routes leads staff to recommend the Prior-Venables Underpass as the most cost-effective grade-separation solution that minimizes impacts to existing land uses in the area, and provides better connectivity and access for all transportation modes to serve the collective needs of local residents, businesses, the city and the region.

A summary of the multi-criteria evaluation comparing the National-Charles Overpass and the Prior/Venables Underpass options is shown in **Table 1**, and a more detailed comparison between the two options is provided in **Appendix B**.

There was not a clear preference between the impacts to parks and community gardens of the National-Charles Overpass and Prior/Venables Underpass options, as the two routes would impact Strathcona Park and Trillium Park differently, but both have relatively minor impacts on only one park.

For the National-Charles Overpass option, Strathcona Park would be physically unaffected, and walking or cycling to the park from north of Prior Street would be more comfortable and enjoyable. However, the traffic-related impacts of noise and air quality would be shifted from Strathcona Park to Trillium Park. The effect could be more significant to park users and the Environmental Art and Community Learning Gardens, because the arterial would wrap around two edges of the park and there are no mature trees on that could buffer the park from vehicles, unlike along Prior Street.

For the Prior/Venables Underpass option, the Trillium Park would be largely unaffected from today and the area currently being preserved for the replacement arterial could be utilized. However, the arterial and its traffic-related impacts would remain adjacent to Strathcona Park, similar to today. The lowered roadway could serve as a buffer that reduces some of the noise, but in order to enhance sidewalks and public realm, the edges and boundary of Strathcona Park would be impacted, which is currently un-programmed space.

Table 1 – Summary of multi-criteria comparison between the National-Charles Overpass and Prior/Venables Underpass options

	National-Charles Overpass	Prior/Venables Underpass		
Effectiveness as an arterial street				
Grade-separated from the rail line	Equally preferred	Equally preferred		
Good connectivity within the broader transportation network	Less preferred	More preferred		
Provides reliable and accessible transit service to the most customers	Less preferred	More preferred		
Provides a direct route for emergency response to local communities, and access to St. Paul's Hospital	Less preferred	More preferred		
Supports access to local streets, parks, business areas, and civic facilities	Less preferred	More preferred		
High-quality street design				
Arterial street design that provides all-ages and abilities cycling facilities and network	More preferred	Less preferred		
Street design, including the overpass or underpass structure, that is convenient and delightful for people walking, cycling, and rolling	Less preferred	More preferred		
Street design reduces likelihood of traffic-related safety incidents	Less preferred	More preferred		
Community livability				
Traffic and associated impacts of living adjacent to an arterial for Strathcona residents near Prior Street and Grandview Woodland residents near Venables Street	More preferred	Less preferred		
Traffic and associated impacts of living adjacent to an arterial for Citygate residents near National and Main, and Grandview-Woodland residents near Clark Drive and near East 1 st Avenue	Less preferred	More preferred		
Impacts on existing land uses				
Minimizes impacts and disturbance to parks and community gardens	Equally preferred	Equally preferred		
Minimizes impacts and disturbance to local businesses	Less preferred	More preferred		
Minimizes impacts and disturbance to civic facilities	Less preferred	More preferred		
Cost-effective and deliverable				
Lower project complexity	Less preferred	More preferred		
Shorter project schedule	Less preferred	More preferred		
Lower project cost	Less preferred	More preferred		
Lower long-term maintenance cost	Less preferred	More preferred		

B. Multi-Criteria Evaluation of the National-Charles Overpass and Prior/Venables Underpass Options

Staff have equally assessed the National-Charles Overpass and the Prior/Venables Underpass options using a multi-criteria evaluation, which has incorporated the feedback heard from community members, stakeholders, and the public throughout the engagement process.The evaluation generally considered:

- the project scope and scale to grade-separate the rail line;
- the route's effectiveness as an arterial street for emergency vehicle response, goods movement, transit, local access, walking and cycling, and public realm;
- the scale of impacts on existing land uses, including existing businesses, residential properties, city facilities, community gardens, and parks;
- the complexity of the project and the ease of implementation and construction;
- the likelihood and impact of project delivery risks;
- the cost-effectiveness, considering the capital costs, property acquisition costs, and ongoing maintenance costs, and
- the level of support from impacted stakeholders and the public.

1) Project Scope

The National-Charles Overpass (road over rail) would be a new arterial alignment and would require a structure to cross a railyard where there are 14 tracks. The structure would require approximately 2km of new roadway to be constructed, as well as a viaduct with multiple bridge spans to cross the railyard, Glen Drive, and Vernon Drive. In addition, the diagonal crossing of the railyards exceeds the threshold span for a conventional girder structure, and would require a specialized structure such as a steel arch or a cable stayed bridge. City of Vancouver would need to own and maintain the new viaduct. Given the distance from Union St, the new cycling route on National-Charles would not replace the Adanac Bikeway and a separated pedestrian/bike-only structure would be needed at Union St. To fully grade-separate the BI Line between the waterfront and the False Creek Flats, the rail crossings at Cordova Street, Raymur Avenue, Union Street, Prior/Venables Street and Parker/Glen Streets would then be closed to vehicles. (See **Figure 1**)

In comparison, the Prior/Venables Underpass (road under rail) would cross the rail line along the existing alignment between Campbell Ave and George St. In this section of the rail corridor, there will be two rail tracks and the crossing would be achieved by constructing a rail bridge at the existing grade, and then lowering the roadway under the rail bridge. The proximity to Union Street allows the cycling crossing for the Adanac Bikeway to be integrated into the underpass as a single structure, thereby reducing the scale of the project and the associated property impacts and costs. The scale of the Prior/Venables Underpass would be similar to other rail grade-separation projects across the region and the rail structure itself would be owned and operated by CN, unlike the road viaduct which would be owned the City. To fully grade-separate the BI Line between the waterfront and the False Creek Flats, the current at-grade rail crossings at Cordova Street, Raymur Avenue, Union Street, and Parker/Glen Streets would then be closed to vehicles. (See **Figure 4**)

The scale of the infrastructure needed to grade-separate the arterial route and the Adanac Bikeway is significantly less for the Prior/Venables Underpass than the National Charles Overpass. The difference in project scale is also due to the type of grade-separation; an overpass needs to clear above the rail tracks by approximately 7m, whereas the overhead clearance for an underpass is 5m for vehicles, and 3m for people walking and cycling. Therefore, an underpass reduces the needed height (or depth) of the structure, and

consequently also the length of the approaches which cannot exceed a certain grade for vehicles and for accessibility along the sidewalk. Underpasses were considered for other routes, but Prior/Venables is the only location where an underpass is feasible, due to the width of the railyards and ground conditions at other locations.

2) Transportation and Public Realm

Both of the arterial alignments would achieve some of the key benefits of grade-separation, as follows:

- Improve travel time reliability and reduce traffic disruptions from the rail line, which would significantly benefit transit passengers, goods movement, and emergency response;
- Improve safety of all road users, including people walking, cycling, and driving across the rail tracks;
- Reduce the vehicles shortcutting through the Strathcona neighbourhood to cross the tracks at the overpass on Hastings Street; and
- Reduce the environmental impact by supporting more goods moved by rail, rather than by trucks on City streets.

Overall, the Prior/Venables route would allow for a more connected and effective arterial street, which is more likely to meet the access and multimodal needs of the community and the city for the following reasons:

- Emergency response Prior/Venables Street is more direct and emergency response times would be faster, including for Fire Hall No. 1 response east of the rail tracks, for all ambulance trips to the new St. Paul's Hospital from the east, and for all other emergency vehicles travelling east-west through the area.
- Transit Prior/Venables Street provides better transit service coverage to more residents and destinations between Hastings Street and Terminal Avenue, and the majority of Strathcona residents would continue to be within a 400m to the 22 Knight/Downtown bus, which meets the distance recommended by TransLink's Transit Service Guidelines. Rerouting transit to National-Charles would reduce transit coverage for many Strathcona residents, who may need to walk more than 900m, which is greater than the walk distance recommended by TransLink's Transit Service Guidelines for this route.
- **Goods movement and vehicles** Prior/Venables Street is a more direct and efficient Truck Route and reduces the total greenhouse gases emitted from commercial and heavy vehicles. The alignment has fewer curves and turns, which also improves safety and reduces noise and emissions from stop and go movements. The network of truck routes is more distributed and trucks could travel less on local streets to reach their destination. TransLink approval would be required for any modifications to the truck route network and the City would need to be able to demonstrate that the arterial on National-Charles would have equivalent or improved capacity as the truck route on Prior/Venables Street for the efficient movement of people and goods accessing areas within the False Creek Flats and the downtown.
- **Street network** Prior/Venables maintains the existing street grid and an evenly spaced network of arterial streets. This provides better access between neighbourhoods and disperses traffic more evenly, which reduces the pressure on each intersection. A better

connected network also provides more redundancy and resiliency to respond both to everyday stresses and major shocks to the transportation network.

- Local access Prior/Venables Street intersects with more local streets and provides better access to destinations both in Strathcona and the False Creek Flats. In contrast, most destinations in Strathcona and the Flats would rely on a single intersection at Chess Street to access the National-Charles overpass. The distance between streets is also longer along the National-Charles route due to large sites such as the National Works Yard and Trillium Park. An arterial along National-Charles would also not provide direct access to Strathcona residents. The route is not adjacent to the community and Prior/Venables St would be closed at the rail crossing. This would mean that vehicles would have to travel an additional 1 to 1.5 km to cross the rail tracks at either Hastings or the National-Charles Overpass. In comparison, Prior/Venables St would provide better connectivity for residents living to the east and west of the rail tracks.
- Walking and cycling Both arterial routes would similarly provide a new gradeseparated walking and cycling route for the Adanac Bikeway. The National-Charles Overpass option would provide a second rail crossing for walking and cycling closer to Terminal Ave. Although not included in the current project scope, a pedestrian/bike-only overpass to connect Malkin Ave with Charles St could also be provided with the Prior/Venables Underpass option.

When comparing the experience along the arterial, the underpass on Prior/Venables St would be more accessible and comfortable than an overpass on National-Charles, as there is less of a grade change (the underpass is about 4-5m below the rail tracks, and the overpass is about 9-10 m above the railyard) and it would be easier to use the momentum of going downhill to ascend after crossing under the tracks. The sidewalk and bikeway along the underpass would be 2m above vehicle lanes, providing a better separation and protection from vehicles. Higher intersection density contributes to walkability and Prior/Venables Street has more intersections spaced an average of 150m apart, rather than an average of 250m apart on the National-Charles route.

- Public realm and enjoyment Both routes have opportunities to improve the public realm and experience. The mature tree canopy and the activity along the Prior/Venables corridor, such as Strathcona Park and storefronts (new developments could provide entrances at the sidewalk level), would lead to a more enjoyable walking experience. Along National-Charles, fences along the rail yards and engineering works yards would line both sides of the corridor east of Trillium Park, and many of the existing trees on Thornton and National Ave would need to be removed in order to provide sidewalks and cycling facilities.
- Traffic-related safety Both arterial routes would be designed to meet geometric standards. The road profile of the underpass would better address speeding concerns along the arterial, as vehicle speeds gained from ramping down would be absorbed by travelling back uphill. In contrast, higher speeds would likely be observed on the overpass, as vehicles would gain momentum descending the overpass, which is similar to the conditions observed today where the Georgia Viaducts off-ramp meets Prior Street. In addition, it would be more challenging to provide safe crossings for vulnerable road users (people walking and cycling) for the National-Charles option, due to the longer blocks, the curvilinear alignment and the turns.

- Crime prevention through environmental design (CPTED) The Prior/Venables underpass is preferred from a CPTED perspective because isolated spaces would not be created by the structure. The sidewalk and bikeway underneath the structure would be visible from passing vehicles and busy with people walking and cycling (currently 4,000 cyclists on a typical summer day). Lighting, public art, landscaping, and other design features could further improve the sense of safety and security on the sidewalk and bikeway on the underpass. Several isolated areas would be created underneath the National-Charles Overpass on Glen Dr, alongside the railyard, and on Vernon Dr, which are industrial streets with less foot traffic and eyes on the street.
- **GHG emissions**, **air quality and noise** The total greenhouse gas emissions would be lower for the Prior/Venables route, given that it is 300m shorter than the National-Charles route. The mature tree canopy on Prior/Venables Street would be more effective at removing traffic-related air pollution, whereas there is insufficient space for a treed boulevard along the majority of the National-Charles Overpass option without significant land acquisition costs, and nearly all of the existing trees on Thornton Avenue and National Avenue would need to be removed. The landscaping and underpass trench would dampen the roadway noise, whereas roadway noise would be projected farther from the overpass.



Figure 7 – Comparison of arterial spacing, cycling network, and transit catchment areas

3) Adjacent Land Use and Property Impacts

Both the Prior/Venables Underpass and the National-Charles Overpass require the acquisition of property and have impacts on adjacent land uses.

A new street right-of-way is needed for the National-Charles Overpass, which would require relocating several Produce Row businesses and industrial businesses along Charles St, relocating the Fire Training and HUSAR Facility, and a reconfiguring the National Works Yards. In addition, several properties along Union St and Venables St would be impacted in order to grade-separate the Adanac Bikeway. There would also be some impact to Trillium Park, but no impact to Strathcona Park or the community gardens.

As the existing arterial, Prior/Venables Underpass has less direct property impacts. Building an underpass would require relocating a few businesses on Venables, but the combined bikeway and arterial underpass means there is significantly fewer direct property impacts. This route would not impact Produce Row, the community gardens, the city facilities, but there would be some impact to the northeast corner of Strathcona Park.

Although both route options are compatible with the St. Paul's Hospital and Health Campus proposed rezoning, the Prior/Venables route enables better use and design of the St. Paul's Hospital site.

Furthermore, the arterial route also impacts property access from street network. As was mentioned above, the Prior/Venables Underpass route provides relatively direct access to local streets and only minor rerouting would be required near the underpass. In contrast, the change in arterial route to National-Charles would significantly change circulation patterns on local streets and reduce vehicles access in some areas. This would impact not only residents, but also businesses that rely on convenient access for customers and deliveries. Emergency response times would increase from Fire Hall No. 1 to properties east of the rail tracks, and relocation to a new site with direct access to an arterial street may need to be considered during renewal.

In comparison, the overall property impacts of the National-Charles Overpass are much greater, both in terms of the total number of properties, and the area of land that needs to be purchased or expropriated. (See **Table 2** for a comparison of the properties impacted and needing to be acquired, and **Figure 8** and **Figure 9** for a summary of the land use impacts for each route).

	National-Charles Overpass	Prior/Venables Underpass
Number of Properties Impacted	18 properties total: 13 privately-owned 5 city-owned	9 properties total: 8 privately-owned 1 city-owned
Area of land to be purchased or expropriated	Approx. 286,000 sq.ft. total	Approx. 58,000 sq.ft. total

Table 2 - Summary comparison of property acquisition



Figure 8 – Impacts of National-Charles Overpass to Adjacent Properties and Land Uses

Figure 9 – Impacts of National-Charles Overpass to Adjacent Properties and Land Uses



4) Project Delivery and Risks

The Prior/Venables Underpass would be easier to implement, with fewer project delivery risks and within a shorter timeframe, than the National-Charles Overpass.

The design and delivery of the Prior/Venables Underpass rail bridge would be led by the railway company, rather than the City, and the project complexity and scale would be similar to other grade-separation projects currently underway across Metro Vancouver. In contrast, the design and delivery of the National-Charles Overpass (including a specialized structure, multiple bridge spans and about 2 km of new arterial roadway) and a separate structure for the Adanac Bikeway would likely be led by the City and would be significantly more challenging to construct.

Ground conditions are significantly more favourable along Prior Street. Based on a desktop geotechnical review, there are stable soils at a shallow depth on Prior Street, in comparison with approximately 9-12m of marine deposit and poor quality fill along the National-Charles alignment, which significantly increases the cost of the substructure and increases the ground preparation required for post-disaster standards. Surface and groundwater management and utility relocations may be more complex for the Prior/Venables Underpass, but a drainage system could be designed to prevent flooding. Based on the Archaeological Overview Assessment, both options would require archaeological monitoring, implementation of a Chance Find Management Plan, and ongoing consultation with all involved First Nations to ensure all First Nation heritage concerns are met. Overall, the risk of project delays and cost increases due to site conditions is higher for the National-Charles Overpass option.

The Prior/Venables Underpass could be completed in a shorter schedule, than the National-Charles Overpass. The larger scale of the overpass project would inherently take longer than the underpass. The schedule would also need to account for the time to acquire a replacement site for the Fire Training and HUSAR Facility. This could require assembling land and the replacement facility would need to be operational before the existing site could be demolished for the overpass.

Furthermore, the Prior/Venables Underpass would not require TransLink approval to proceed. As part of the South Coast British Columbia Transportation Authority (SCBCTA) Act, Section 21, municipalities must seek TransLink approval on road alterations that reduce the capacity of the Major Road Network (MRN) and prohibit truck movements. If the National-Charles Overpass were selected by Council, the City would need TransLink approval to remove the truck route on Prior and Venables Streets to downgrade it from an arterial to a local-serving street. TransLink approval would consider input from goods movement stakeholders and analysis that would need to show the National-Charles route is a suitable mitigation measures and equivalent to the status quo of the existing truck route on Prior/Venables Street. The National-Charles Overpass would also require TransLink approval for a new signalized intersection, which may reduce the capacity of the MRN on Clark Drive.

5) Capital Cost Comparison

As the project is in the early corridor planning phase, a Class D cost estimate was developed using industry standards for cost estimating. Class D cost estimates provide an order of magnitude and relative comparison between options.

Cost estimates are only indicative of the current market conditions and are subject to change. The main limitations of the Class D cost estimates include that they are based on high-level concepts (10% design level) and the scope or concept may change as the design progress; there is limited site data and is based on probable site conditions of topography, underground utilities, soil conditions, archaeology, groundwater, etc.; the unit rates for construction material, labour, and property would fluctuate and escalate before construction is underway; and the uncertainties related to property acquisition and building mitigations.

Category	Key Elements	National-Charles Overpass (in \$ millions)	Prior/Venables Underpass (in \$ millions)
Property Acquisition	Property acquisition, access changes and building modifications, business mitigations and other fees or compensation. Park and City property impacts excluded unless Civic property is so negatively impacted that a replacement property or building is necessary.	249	45
Streets	Roadway construction including base, surface, traffic signals, traffic management, utility relocations, railings, landscaping, and public realm	15	8
Structural	Excavation of the underpass, bridge deck structure, piers, abutments, pedestrian/cyclist approaches, retaining walls, underpass drainage system including pumping room and mechanical systems	Arterial: 65 Adanac Bikeway: 22-30*	38
Construction Soft Costs	Project management, preliminary and detailed design, engineering costs	27	16
Construction Contingency	30% of hard and soft costs for unknown elements in the conceptual design phase	32	18
Transportation, Parks, and Public Realm Enhancements	Broader transportation, public realm, public space, and parks improvements in the neighbourhood, to be determined in future project stages	TBD	TBD
Total Capital Cost (Class D Estimate)		\$409-417 M + neighbourhood improvements TBD	\$125 M + neighbourhood improvements TBD

Figure 10 – Capital Cost	Comparison of National-Ch	narles Overpass and Prior/\	enables Underpass
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Note: Figures rounded to the closest million. All cost estimates were prepared in \$2019. Construction costs do not have a cost allowance for escalation if the project is not constructed for several years. Property costs reflect current market value. Costs do not include cost-sharing arrangement for the arterial segment within the New St. Paul's Hospital site that would be resolved through the rezoning process. Aside from an underpass with an all-ages-abilities cycling route, wide sidewalks, and landscaping at the

underpass and along Prior/Venables Street, costs do not include other transportation, public realm, public space, and park improvements in the neighbourhood.

Lifecycle capital maintenance costs of the National-Charles Overpass and Prior/Venables Underpass differ significantly. Although the maintenance costs have not been estimated at the current design stage, the scale is primarily dependent on the type and size of the structure. Maintenance costs would be apportioned based on CTA guidelines ³ as follows:

- For the National-Charles Overpass option, the maintenance costs would be apportioned as follows:
 - 1. the road authority pays all maintenance costs of the substructure, superstructure and retaining walls of an overhead bridge; and
 - 2. the railway company pays all other maintenance costs of an overhead bridge, including the cost of maintaining the railway approaches, track structure, railway drainage and communication facilities.
- For the Prior/Venables Underpass option, the maintenance costs would be apportioned as follows:
 - 1. the railway company pays all maintenance costs of the substructure and the superstructure of an underpass; and
 - 2. the road authority pays all other maintenance costs of an underpass, including the cost of maintaining the road approaches, retaining walls, road surface, sidewalks, drainage and lighting.

For the City, maintenance costs would be significantly lower for the Prior/Venables Underpass than the National-Charles Overpass.

6) Key Project Risks

The risk profile of the National-Charles Overpass and the Prior/Venables Underpass options vary considerably, primarily due to the difference in project scale and complexity. The risk allocation between the two projects would also differ due to the project procurement and delivery methods. There would likely be less risk allocated to the City for the Prior/Venables Underpass, as the railway company would be the lead agency in delivering the project, whereas a significant portion of risk would likely be allocated to the City for the National-Charles Overpass, as the City would likely be the lead agency in delivering the project.

The National-Charles Overpass has numerous risks have a high likelihood of occurring and would have a high impact to the project cost and/or schedule, including risks that would prohibit or delay the project from proceeding into the next phase of securing funding and detailed design. A comparison of key project risks between the two options is described in **Table 3**.

³ Apportionment of Costs of Grade Separations: A Resource Tool, Canadian Transportation Authority, 2011 <u>https://otc-cta.gc.ca/sites/default/files/apportionment-of-costs-of-grade-separations_0.pdf</u>

Table 3 - Comparison of National-Charles Overpass and Prior/Venables Underpass Project Risks

Description of	Potential	National/Charles Overpass		Prior/Venables Underpass		Considerations	
Description of Risk							
INISK	inipacts	Likelihood	Impact	Likelihood	Impact		
External funding partners do not support the Council approved route (e.g. benefit-cost ratio is not positive, or the project is not cost-effective)	Unable to secure funding from external partners, or the total funding contribution would be based on the lowest cost option	High	High	Low	Moderate	Several potential funding partners have expressed preference for Prior/Venables. Funding contributions are typically proportional to the benefit for each party. For this project, the incremental cost of the National- Charles option would not increase the benefits to port/rail operations.	
Long timeframe to secure funding	Project cost escalation	High	High	Low	Moderate	External funding partners have indicated support for grade- separation, as a priority project within the Greater Vancouver Gateway 2030 plan. Given the scale of funding request for National-Charles, all funding partners would need more time to reprioritize budgets, including the City's cost-sharing portion and for property-related expenses. The larger the project scale, the more it is impacted by cost escalation.	
Site analysis and investigations identify increased construction complexity or challenging conditions	Project cost increases, and may escalate due to longer construction schedule	High	High	Moderate	Moderate	Desktop review shows that soil stability and contamination is a greater concern for National- Charles and could increase substructure costs. Utility and groundwater risks may increase cost of Prior/Venables, but no major concerns identified in desktop review.	
Construction over/under an active rail yard	Project cost increase and schedule delay	High	High	Low	Moderate	Due to project delivery model, the risk is allocated to the City for National-Charles, and risk is allocated to the railway company for Prior/Venables.	
Land value fluctuates	Project cost increase	High	High	High	Moderate	Higher allocation of property- related risks to the City than other funding partners. Although land values are dependent on many factors, there is a clear trend of decreasing supply and increasing demand for light industrial land.	
Delay in reaching agreement in land acquisition / business mitigation / expropriation	Project cost increase and schedule delay	Moderate	High	Moderate	Moderate	Higher allocation of property- related risks to the City than other funding partners. Although each property is unique and all land deals have risk, there are more properties and more complex negotiations for National-Charles.	
Purchasing a replacement site for Fire Training and HUSAR Facility	Project cost increase and schedule delay	High	High	N/A (Does not impact Fire Training facility)		Higher allocation of property- related risks to the City than other funding partners. Land assembly would likely be required. City would be unable to expropriate the land.	
TransLink Board does not approve Truck Route Change Request	Truck route on Prior/Venables St cannot be removed from the Truck Route Network.	High	High	N/A (Truck Route Change process would not be initiated)		TransLink Board considers stakeholder support, such as BCTA and Port of Vancouver, who have indicated preference for Prior/Venables. Truck Route Change Process would be initiated following Council route decision. TransLink Board Approval should be sought before significant design work is conducted.	

Public and Stakeholder Engagement Metrics

A summary of the public and stakeholder engagement throughout the Flats Arterial Grade-Separation planning process is as follows:

False Creek Flats Rail Corridor Strategy (2008)

Developed in partnership with:

- Transport Canada
 - Port of Vancouver
 - Greater Vancouver Gateway Council and railway companies
 - TransLink
 - Vancouver Area Cycling Coalition
 - Better Environmentally Sound Transportation

False Creek Flats Area Plan (2015-2017)

Over 4,300 participants were engaged over the duration of the planning process:

- Over 700 provided feedback through an online survey
- Over 150 businesses responded to the business survey
- Over 400 stakeholders participated in the launch event
- Over 650 members of the public attended the onsite office
- Over 150 individuals attended six themed workshops including one workshop focused on connectivity, transit and transportation

Specifically on the Prior/Venables Workshops and Open House (March 2016)

- Approximately 20 impacted stakeholders from the seven directly impacted stakeholder groups attended a workshop to discuss the issues and potential solutions of the Prior/Venables replacement route, and over 250 visitors attended a public open house.
- Over 150 provided feedback through an online and in-person survey to gauge the level of support or non-support for the Prior/Venables replacement arterial options

Two Advisory Groups provided significant input to the process:

- Advisory Committee Meetings Approximately 40 members were on the False Creek Flats Plan Advisory Committee. The committee assembled was a cross-section of area stakeholders, who gathered to provide feedback and constructive commentary at 5 key milestones throughout the planning process.
- Goods Movement Committee Meetings Roughly a half dozen meetings were held with this group, coordinated with the support of the Greater Vancouver Gateway Council, to disseminate information and discuss the impact and potential improvements on the movement of goods and people as a result of this plan and the arterial routes. Representatives included: all major railway in the study area, Port of Vancouver, TransLink, BC Trucking Association, and the Greater Vancouver Board of Trade.

Flats Arterial Community Panel (2018-2019)

- The Flats Arterial Community Panel consisted of 42 panelists, who were selected from approximately 200 volunteer applications
- Over 50 community groups, stakeholders, and staff presented information and perspectives for the panelists to take into consideration
- Over 200 people attended two public workshops
- Over 80 online submissions were received

Targeted Stakeholder Outreach (2019)

Staff conducted targeted engagement with potential funding and project partners to determine the level of support for the National-Charles Overpass and the Prior/Venables Underpass Options, including:

- 6 project partner meetings
- 3 resident group meetings

Council Advisory Committees

Various City Council advisory committees were engaged and passed motions throughout the project, including:

- Transportation Advisory Committee (in 2019)
- Active Transportation Policy Council (up to 2018)
- Vancouver Food Policy Council

STAKEHOLDER LETTERS

Attached are letters from the following project partners, stakeholders, businesses, and community groups, received during the final phase of stakeholder outreach in during the summer 2019.

Project Partners / Agencies

- Port of Vancouver
- TransLink
- CN Rail
- Greater Vancouver Gateway Council
- BC Trucking Association
- Providence Healthcare

Businesses

- FreshPoint (Produce Row)
- Charles St businesses (Ancient Secrets Inc., ATN Visuals Inc., Black Suns Art Studio, BMS Plumbing & Mechanical, Cascadia Tableware, La Fabrica Marine, Penfolds Roofing, Signs By Ken, TreeTop Marketing, Vancouver E-Fasteners, Vancouver International Marathon Society)

Resident Groups

- Grandview Woodland Advisory Council
- The National Strata Council (1128 Quebec Street)
- The Viceroy Strata Council (1088 Quebec Street)



Vancouver Fraser Port Authority 100 The Pointe, 999 Canada Place Vancouver, B.C. Canada V6C 3T4 portvancouver.com

Via email: lon.laclaire@vancouver.ca

September 3, 2019

2

Lon LaClaire Director of Transportation City of Vancouver

Re: False Creek Flats Arterial Route Decision

Dear Mr. LaClaire:

I am writing on behalf of the Vancouver Fraser Port Authority to express support for an underpass of the Burrard Inlet rail line at Prior/Venables as the preferred grade-separated arterial route through the False Creek Flats area of Vancouver.

The Vancouver Fraser Port Authority is a federal agency governed by the Canada Marine Act and is responsible for the stewardship of the federal port lands in and around Vancouver, British Columbia. We are financially self-sufficient and accountable to the federal minister of transport. We have a mission to enable Canada's trade objectives, ensuring safety, environmental protection and consideration for local communities. We are working with government and industry to take the necessary steps to accommodate Canada's growth in trade. We work closely with local partners, railways and agencies to ensure delivery of high quality projects, either through delivery by our own team or by contributing to other projects that help meet our objectives.

The Port of Vancouver is made up of multiple businesses and is Canada's largest port, and the third largest in North America, by tonnes of cargo. The Port of Vancouver facilitates trade between Canada and more than 170 world economies. Located in a naturally beautiful setting on Canada's west coast, the port authority and port terminals and tenants are responsible for the efficient and reliable movement of goods and passengers, integrating environmental, social and economic sustainability initiatives into all areas of port operations.

In 2014, the port authority helped establish the Gateway Transportation Collaboration Forum, a collaborative effort to ensure the Greater Vancouver gateway is ready to manage growing trade. It includes Transport Canada, the BC Ministry of Transportation and Infrastructure, Vancouver Fraser Port Authority, TransLink and the Greater Vancouver Gateway Council. As part of the Gateway Transportation Collaboration Forum, we helped create the Greater Vancouver Gateway 2030 strategy to identify smart infrastructure investments to address the community impacts of anticipated trade and population growth.

Grade separation and track twinning along the Burrard Inlet Line were both identified as a priority during this process. CN has received funding for track twinning and are moving ahead with plans to enhance rail capacity along the line, making grade separation along the line even more important.

.... /2

Lon LaClaire False Creek Flats Arterial Route Decision September 3, 2019 Page 2 of 2

By supporting projects such as grade-separation at Prior/Venables, the port authority is adhering to our mandate to facilitate Canada's trade objectives, ensuring goods are moved safely while protecting the environment and considering local communities. We have supported similar grade separation projects in other communities. This includes past contributions to the Powell Street overpass (completed in 2015) and currently leading the implementation of similar projects in Burnaby, Richmond, Surrey, Pitt Meadows, Coquitlam, and Port Coquitlam.

Based on work done to date by the City of Vancouver, the Prior/Venables option is preferred by the port authority over the National option as it is better situated for effective goods movement by truck, and appears to deliver the most benefit at the least cost of options considered.

While we support the grade-separation at Prior/Venables, we believe that in order for any grade-separation of the Burrard Inlet Line to be successful:

- The City should also close remaining grade crossings along the Burrard Inlet Line to the Grandview Cut to eliminate at-grade crossings through Strathcona.
- The City, port authority and rail companies should work together to protect necessary land in the area for suitable functional rail yards to support freight movement.
- The City should protect and enhance the Clark/Knight corridor for reliable and efficient north-south movement of container trucks.

In addition to supporting growing trade, grade separation projects help to achieve sustainability and livability goals, including opportunities for improved public safety, better emergency response, more reliable commute times, reduced congestion and GHG emissions, as well as presenting opportunities for improved walking and cycling connections.

Sincerely,

VANCOUVER FRASER PORT AUTHORITY

Peter Xotta Vice President, Planning & Operations

Cc Paul Mochrie, City of Vancouver Greg Yeomans, VFPA

3



TransLink 400 - 287 Nelson's Court New Westminster, BC V3L 0E7 Canada Tel 778.375.7500 translink.ca

South Coast British Columbia Transportation Authority

September 16, 2019

Lon LaClaire Director, Transportation City of Vancouver 507 W Broadway Vancouver, BC V5Z 0B4

(Sent via email to lon.laclaire@vancouver.ca)

Dear Mr. LaClaire,

RE: Flats Arterial Community Panel Recommended Routes: National-Charles Overpass and the Prior/Venables Underpass

Thank you for the opportunity to review and provide input on the Flats Arterial Community Panel's recommendation for a grade-separated route to replace Prior/Venables as the arterial through False Creek Flats. Our comments are based on the understanding that the Panel's recommended preferred option for this arterial replacement is the National-Charles Overpass, and that the Prior-Venables Underpass is the Panel's second preferred route.

Over the years, TransLink has been actively engaged in the Flats Arterial planning process given our mandate to manage the regional transportation system, including transit, regional goods movement, and the Major Road Network (MRN), and further given our management of and participation in the Greater Vancouver Urban Freight Council.

Per this legislation, TransLink approval is required for any actions that would:

- Reduce the capacity of all or any part of the MRN to move people; or
- Prohibit the movement of trucks on any road or segment (except for provincial highways), regardless of whether that road or segment is part of the MRN or not. Such actions include (but aren't limited to) the removal of a roadway or segment from the designated truck route network.

TransLink has provided ongoing input to the City and the Flats Arterial Community Panel – communicating the importance of continued transit access for Strathcona residents, improving the reliability of local transit, and retaining existing goods movement capacity.
Lon LaClaire September 16, 2019 Page 2 of 4

Both the Community Panel's first and second preferred route options (National-Charles Overpass and Prior-Venables Underpass, respectively) have implications for the transportation network, which are detailed below.

Transit

Re-routing the 22 Knight/Downtown bus from Prior Street to the National-Charles Overpass route would reduce transit coverage in Strathcona along Prior Street and Venables Street, increasing the distance some customers will need to walk to access this bus route. Currently, approximately 800 daily boardings and alightings occur along the section of Clark Drive between First Avenue and Venables Street and between Clark Drive and Gore Avenue on Prior/Venables. These customers boarding and alighting along this section of the route would need to walk an additional 400 metres to Charles Street and National Avenue, which still falls within the 250-400 metres average stop spacing guideline, as provided in the Transit Service Guidelines (TSGs) for this type of standard bus service. Customers accessing route 22 from Hastings Street would need to walk 900 metres to National Avenue, a distance not within the TSGs recommended stop spacing guideline.

The service reliability of route 22 would be improved by grade separation; however due to the indirect alignment of the National-Charles Overpass, reliability improvements may be marginal as more vehicle turning movements increase travel time.

The Prior-Venables Underpass is more direct route and would better support transit service through the Flats. Destinations north of Prior Street and Venables Street would still be located within 400 metres of stops located along Prior Street and Clark Drive, with no reduced transit coverage to Strathcona residents. In addition, most of the current bus stops along the route could be maintained. The Underpass grade separation would significantly improve the service reliability of route 22; even waiting for one train crossing can have a significant cumulative ripple effect on the entire bus schedule.

Major Road Network (MRN)

The National-Charles Overpass route option will require a new signalized intersection on Clark Drive and the National-Charles intersection. The proposed road access onto Clark Drive, which is part of the MRN will need to be approved by TransLink as defined in section 21(1) of the South Coast British Columbia Transportation Authority Act (the "SCBCTA"), municipalities are required to obtain TransLink's approval for any road alterations that would reduce the capacity of any part of the Major Road Network (the "MRN") to move people. The Prior-Venables Underpass Option does not trigger the MRN approval process as per Section 21(1) SCBCTA.

Goods Movement and Roads

The National-Charles Overpass route, if implemented, would be accompanied by the downgrading of Prior Street and Venables Street (between Main Street and Clark Drive) as major arterial routes, which would include their removal from the designated truck route network.

The South Coast British Columbia Transportation Authority (SCBCTA) Act, Part 2 Section 21 requires Municipalities to seek TransLink approval for any action that would prohibit the movement of trucks on any road in the transportation service region.

21 (2) Despite the Community Charter, the Vancouver Charter or any other enactment but subject to subsection (3) of this section, a municipality must not, without the approval of the authority, take, authorize or permit any action that would prohibit the movement of trucks on all or any part of a highway in the transportation service region.

Consistent with the City of Vancouver *Street and Traffic By-law No. 2849*, removing the truck route designation on Prior Street and Venables Street would prohibit trucks from using the downgraded roads for through-travel, and therefore would be subject to review under Section 21 (2) of the SCBCTA Act. TransLink's *Standard Operating Procedure (SOP) INM-005* guides the review and analysis of municipal requests for changes to truck routes. Municipalities are advised to follow this procedure and provide supporting information to assist TransLink in the review process. The starting point in the process is a Council resolution endorsing the proposed changes. TransLink reviews requested changes as submitted by a municipality. If the analysis of the proposed changes shows that they would compromise the continuity and completeness of the truck route network, it is incumbent on the municipality to identify appropriate mitigation measures, which could include the designation of new (alternate) truck routes. However, additions to the truck route network are outside TransLink's authority under the SCBCTA Act and at the discretion of individual municipalities.

In the context of selecting a new Flats Arterial route, the Prior-Venables Underpass option and continued designation of Prior-Venables as a truck route would be consistent with the status quo, and likely constitute an improvement on the status quo due to the grade separation. As such, if this option were to be selected, it would not be subject to TransLink's truck route review process. This observation is premised on the assumption that the underpass would be constructed consistent with the guidelines in the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*, including minimum vertical clearances, thus ensuring that heavy commercial vehicles which comply with legislated dimension limits and over-dimensional vehicles could continue to use this route.

The National-Charles Overpass route is currently not part of the designated truck route network. While the addition of National-Charles to the truck route network would be at the discretion of the City of Vancouver and would not require TransLink's approval, the accompanying downgrading of Prior-Venables would trigger the truck route review process. The supporting analysis would have to show that the National-Charles Overpass route is a suitable mitigation measure, meaning that it would have to be at least equivalent to the status quo and other route options that the City considered as potential mitigation measures. The circuitous alignment of the National-Charles Overpass route, as well as addition of a new structure that would have to be evaluated under the City's overweight vehicle permit application process would be among the factors that the City would need to address in the analysis.

7

Walking and Cycling

Both the National-Charles Overpass route and the Prior-Venables Underpass routes are within the Regional Growth Strategy-designated Metro Core, with Clark Drive being the eastern boundary. Additionally, Union-Adanac is identified as being part of the Major Bikeway Network, and route 22 is part of the Frequent Transit Network. This means that regional cost-share funding for walking and cycling improvements could potentially be utilized to cover up to 75% of the eligible cost of walking and cycling related components. Road, cycling and pedestrian infrastructure improvements for both route options could be eligible for TransLink municipal cost-share programs (MRNB, BICCS, WITT), subject to the improvements meeting funding program eligibility requirements. The City can either earmark allocated funding to the project or apply for competitive funding. The City may also consider applying for TRRIP funding program, which is managed by CMBC.

We hope these comments are helpful feedback and thank you again for the opportunity to participate in the City's Flats Arterial planning process, to advance regional and local transportation goals in a mutually beneficially manner. If you have any questions or wish to discuss further, please contact me at 778.375.7859 or <u>matt.craig@translink.ca</u>.

Sincerely,

Matt Craig, Senior Manager, Transportation and Land Use Planning

cc: Greg Kolesniak, Project Manager, Infrastructure Program Management



Joslyn Young Manager, Public Affairs British Columbia

11717 138th Street, Floor 2 Surrey, British Columbia V3R 6T5 **Joslyn Young** Gestionnaire, affaires publiques en Colombie-Britannique

11717 138 ^{ème} rue, 2 ^{ème} étage Surrey, Colombie-Britannique V3R 6T5

September 9, 2019

Lon LaClaire Director of Transportation City of Vancouver Via e-mail: <u>lon.laclaire@vancouver.ca</u>

Dear Mr. LaClaire,

I am writing on behalf of CN regarding the proposed grade separation of the Burrard Inlet rail line in the False Creek Flats.

The Burrard Inlet rail line is used by CN to access Port of Vancouver import/export terminals on the south shore of the Burrard Inlet. The elimination of level crossings and track twinning along the Burrard Inlet Line were both identified as a priority in the Greater Vancouver Gateway 2030 strategy. CN has received federal funding for a portion of the cost of the track twinning and is moving ahead with plans to enhance rail capacity along the line. This will support our obligation to meet the growing demands of the Canadian economy.

Federally-regulated railways in Canada are obliged by law to provide a reasonable level of service to shippers (common carrier obligation). For instance, railways are required to:

- provide adequate facilities for the receiving, loading, carriage, unloading and delivering of shipments, and;
- to carry and deliver shipments without delay, and with due care and diligence.

Of the two grade separation options the City is considering, the Prior/Venables underpass appears to be the most cost effective means by which to achieve the gateway strategic objective of eliminating level crossings in the corridor. Considering the many demands on municipal resources, this option would address mobility issues in the region while minimizing budget impacts on other important municipal priorities.

As the City is considering this important decision, the overall strategic vision must include the closure of the all remaining at grade crossings along the Burrard Inlet Line from Powell Street to the Grandview Cut.

In addition, the City, port authority and rail companies should continue to work together to protect industrial and port support lands in the area and ensure that the <u>Proximity Guidelines</u> are followed for all new developments near rail corridors to promote liveability and optimum safety for residents.

The City may wish to look into the Rail Safety Improvement Program (RSIP) administered by Transport Canada, which provides grant and contribution funding to improve rail safety and reduce injuries and fatalities related to rail transportation. Detailed information can be found at: <u>https://www.tc.gc.ca/en/services/rail/apply-rsip-itr-funding/rsip-itr-applicants-guide.html#recipients</u>

CN is a true backbone of the economy, transporting more than C\$250 billion worth of goods annually for a wide range of business sectors, ranging from resource products to manufactured products to consumer goods, across a rail network of approximately 20,000 route-miles spanning Canada and mid-America. CN – Canadian National Railway Company, along with its operating railway subsidiaries – serves the cities and ports of Vancouver, Prince Rupert, B.C., Montreal, Halifax, New Orleans, and Mobile, Ala., and the metropolitan areas of Toronto, Edmonton, Winnipeg, Calgary, Chicago, Memphis, Detroit, Duluth, Minn./Superior, Wis., and Jackson, Miss., with connections to all points in North America. For more information about CN, visit the Company's website at <u>www.cn.ca</u>.

Sincerely,

Joslyn Young

GREATER VANCOUVER GATEWAY COUNCIL

200 – 349 Railway Street Vancouver, British Columbia V6A 1A4

August 1, 2019

Lon LaClaire Director of Transportation City of Vancouver Via email: <u>Lon.laclaire@vancouver.ca</u>

Re.: False Creek Flats Arterial Route

Dear Mr. LaClaire:

I am writing on behalf of the Greater Vancouver Gateway Council (GVGC) to express support for the Prior/Venables Underpass as the City of Vancouver's choice for the grade-separated arterial route in the False Creek Flats.

The GVGC was formed in 1994 to pursue a vision for Greater Vancouver as the gateway of choice for North America, able to capitalize on opportunities from expanding world trade and tourism. The GVGC comprises senior executives from industry, government and academia. As such, issues that affect the Greater Vancouver transportation network are of interest due to their impact on different modes of goods transportation, and their overall economic impact for the entire region and the country.

The GVGC recognizes that one of the primary challenges facing the region is how to reduce emissions related to transportation, while also planning for growth as well as increased population and demand for transportation. We recommend that the City of Vancouver select Prior/Venables Underpass as the arterial as it provides better access to transit and it provides better arterial spacing, which distributes vehicle traffic more efficiently. Its geometric design also allows more free-flowing traffic by reducing stop and go movements, thereby reducing greenhouse gas emissions and noise pollution. The National-Charles Overpass option's S curve design will contribute to increased congestion, emissions, noise, and the risk of more vehicle collisions.

The GVGC is also concerned that the National-Charles route will have a significant impact on civic services, including the fire training facility and the heavy urban search and rescue site, and therefore has the potential to impact City of Vancouver operations. It may be difficult for the City of Vancouver to continue providing high quality and affordable civic services given the difficulty there will be in finding a suitable replacement site for these services, particularly with a growing population. Additionally, Prior/Venables is the least costly of the two alternatives recommended by the False Creek Flats Community Panel. Current estimates indicate the National-Charles option would be two to four times more expensive than the Prior/Venables option with construction costs approaching \$500 million in addition to land acquisition costs. If the City must spend significantly more on the National/Charles overpass option, there will be fewer funds available for other, much needed transportation and safety upgrades.

Economically, the choice of arterial has the potential for significant impacts to nearby businesses and to the local food wholesale distribution hub located on Malkin Avenue known as "produce row." Produce row is critical to BC's food distribution supply chain network, supplying approximately \$700 million worth of food to independent grocery stores and restaurants across Metro Vancouver. The preservation of produce row was a key concern for the False Creek Flats Community Panel due to its importance to local food security. The Prior/Venables Underpass as the arterial route will avoid directly impacting all of the produce row businesses. The National-Charles Overpass, on the other hand, will impact at least 3 of the produce row businesses, and another 12 local businesses.

The GVGC has been involved in City of Vancouver's planning and community initiatives related to an arterial through False Creek Flats due to the importance of the area in the regional transportation network for both rail and truck operations. We have developed an appreciation for the perspectives of the various stakeholders who live and work in the False Creek Flats community and for the concerns they have about the Prior/Venables Underpass option. However, it is important for the arterial route selection process to take into account the impact of this decision on stakeholders from all of Greater Vancouver.

While the GVGC understands the complexity of this decision, we strongly recommend the Prior/Venables Underpass arterial option as it will address the safety concerns associated with increased transportation activities in the False Creek Flats, it is the least costly option, and has fewer negative impacts to the transportation network, emissions and traffic flow, the local economy, and civic services. We further recommend that in addition to the preferred option, the City proceed with closures of other grade crossings in the False Creek Flats and surrounding area in order for the grade separation to achieve the intended benefits for goods movement.

Sincerely,

M Hen

Michael Henderson Managing Director Greater Vancouver Gateway Council



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bctrucking.com

July 26, 2019

Lon LaClaire Director of Transportation City of Vancouver Via email: <u>lon.laclaire@vancouver.ca</u>

Re.: False Creek Flats Arterial Route Decision

Dear Mr. LaClaire:

I am writing on behalf of the BC Trucking Association (BCTA) to express support for the Prior/Venables Underpass option as the grade-separated arterial route in the False Creek Flats area of Vancouver; the second preferred choice recommended by the False Creek Flats Community Panel.

BCTA is a member-based, non-profit, non-partisan organization dedicated to advocating for and representing the commercial road transportation industry in BC. BCTA members include trucking companies hauling every type of freight, as well as charter and scheduled motor coach companies. BCTA represents over 1,200 trucking and motor coach fleets that operate over 13,000 commercial vehicles and employ over 26,000 British Columbians. Whether based in this region or not, many of our members' vehicles are operated in the Lower Mainland, supporting the quality of life British Columbians expect through delivery of vital supplies to retail outlets, including all types of groceries and produce.

From a transportation and safety perspective, the Prior/Venables Underpass provides more reliable access to the new St. Paul's Hospital, and it is a vastly more resilient route compared to either National Overpass options. Prior/Venables is preferable in the event of a large scale disaster, as well as in terms of transportation safety, minimizing commercial vehicle noise, and reducing road transportation GHG emissions. All of these are priorities of the City of Vancouver and the residents of the area, as demonstrated through the City of Vancouver's 2016/17 False Creek Flats consultation and planning process. Specifically, the Prior/Venables Underpass does not present the same safety concerns that are associated with the S curve of the National-Charles Overpass route alignment. Prior/Venables has fewer curves which will minimize stop and go movements, and reduce greenhouse gas emissions and noise from commercial vehicles. Additionally, selecting Prior/Venables provides better arterial spacing with its more equal distance from the nearest arterial north (Hastings Street) and south (Terminal Avenue), further reducing congestion and GHG emissions by facilitating more efficient traffic flow.

From an economic and community perspective, the choice of arterial has the potential to significantly impact food security and businesses in the False Creek Flats through its impact on a group of 14 companies (several are BCTA members) known as "produce row." Produce row is a food wholesale distribution hub centred along Malkin Avenue that is critical to BC's food distribution supply chain network, and for food distribution in Vancouver in particular. Combined, these 14 companies transport approximately \$700 million worth of food throughout BC to independent grocery stores (e.g., IGA, Whole Foods, East Vancouver Food Co-Op), Kin's Markets, Granville Island, and to restaurants across Metro Vancouver. These companies supply grocery stores in the False Creek Flats, which supports food security to families in the community and the entire City. Moreover, these businesses provide critical social and economic support to the community, including donations of fresh produce to the local food bank and homeless shelters in the surrounding areas. As BCTA has previously noted during the 2016/17 False Creek Flats consultation and planning process, the produce row businesses have operated in the area since 1959 and today provide over 1,000 well-paying, family-supporting jobs, with a total annual payroll of over \$49 million.

Since 2015, BCTA has been involved in City of Vancouver's planning and community initiatives on behalf of our members who are based in the area, such as the False Creek Flats Advisory Committee and more recently with the Flats Arterial Community Panel process. Through our involvement we have an understanding of the different stakeholders who reside and work in the community and use its public spaces and transportation network, and their concerns with respect to the selection of an arterial route. However, the arterial route selection also impacts stakeholders outside the community in other areas of Vancouver.

The preservation of produce row was a key concern for the False Creek Flats Community Panel due to its importance to local food security, and selecting the Prior/Venables Underpass as the arterial route will avoid direct negative impacts to all of the produce row businesses. The Panel's first choice, the National-Charles Overpass, will impact at least 3 of the produce row businesses, and another 12 local businesses.

While BCTA understands the complexity of this decision and the community's concerns with the Prior/Venables Underpass, it is the safer option that delivers the most overall benefits, with fewer disadvantages, to the False Creek Flats community, produce row, the City of Vancouver, and future St. Paul's Hospital patients.

We strongly urge the City of Vancouver to select the Prior/Venables Underpass in order to proceed with grade separation, and address safety concerns due to the increased rail activity in False Creek Flats.

Sincerely7

Dave Earle President and CEO



How you want to be treated.

September 18, 2019

<u>Via E-mail</u> Sadhu.Johnston@vancouver.ca Gil.Kelley@vancouver.ca Jerry.Dobrovolny@vancouver.ca

Sadhu Johnston, City Manager Gil Kelley, General Manager GM Jerry Dobrovolny, General Manager City of Vancouver

Providence Health Care (PHC) has been working closely with the City of Vancouver since April 2015 through extensive negotiations and public consultations, leading to the approval of a policy statement in June 2017 and then to a formal rezoning application submitted in August 2018. We have very much appreciated the City's guidance and support as we have worked through these stages.

The New St. Paul's Hospital will serve as a major regional destination and employment centre and as such, will require a functional road network that provides reliable and efficient access. Emergency response times in particular are significantly affected by the flow of the surrounding road network. Although, gradeseparating the rail crossing on either of the arterial route options will improve traffic flow and reliability through the region, there are certain aspects of each that should be noted.

New Arterial Overpass Option:

- Requires the maximum area to be dedicated to roads and therefore has the greatest impact on the delivery of healthcare services.
- Ambulance and public access to the emergency department will be from a busy arterial, which is not ideal from a safety and accessibility perspective.
- Uncertainty regarding when the arterial will be completed poses a risk associated with constructing a major arterial roadway after the opening of the hospital (e.g. maintaining emergency access, having temporary sidewalk/road/building grade alignment, heavy machinery noise, vibration & disruption).

Prior / Venables Option:

- With the arterial located outside our site boundary, it provides the opportunity to optimize the campus design from the perspective of clinical efficiency, light penetration, geotechnical benefits and community services for patients, families and the public.



c/o St. Paul's Hospital 344 Burrard Building 1081 Burrard Street Vancouver, BC Canada V6Z 1Y6

Tel 604 806 9090 officeoftheceo@providencehealth.bc.ca www.providencehealthcare.org



- Allows for the design of a quiet access road to the emergency department for the ambulance and public emergency traffic.
- Allows for connection into a reliable city grid network and a resilient road system by providing lots of local road options and redundancy during a post-disaster event.
- The indicative masterplan design had to locate the hospital's energy centre in a space allocated for future acute care expansion. This is not appropriate use of this land and it is not ideal in terms of a utility servicing strategy. The location enabled by this option, in the north, on solid ground, closer to incoming utilities would allow for a more robust and reliable post-disaster energy centre at a lower cost and with fewer points of failure to the hospital.

PHC can accommodate either arterial alignment option proposed above, however a lengthy deferral of a decision on alignment will impact site design and efficiencies.

As discussed in our meeting of 8 May 2019, timing of our rezoning is critical so as not to impede our procurement process. I appreciate what you and your staff have done to secure us time on the 22 October 2019 Council agenda and look forward to a successful outcome.

Sincerely,

Fiona Dalton President and Chief Executive Officer Providence Health Care



August 7, 2019

Lon LaClaire Director of Transportation City of Vancouver Via email: <u>lon.laclaire@vancouver.ca</u>

Dear Mr. LaClaire:

Freshpoint Vancouver would like to express support for the Prior/Venables Underpass as the City of Vancouver's choice for the grade-separated arterial route in the False Creek Flats.

Freshpoint Vancouver is part of Produce Row and has been in business for over 80 years with 42 of those years on Malkin Avenue. We have annual sales of \$170 million and employ 240 employees in this location.

Our customers include Kin's Farm Market, T&T Supermarkets, Granville Island, BC Ferries, Princess Cruises, Holland America Cruise Lines, Royal Caribbean Cruise Lines, Disney Cruise lines and 100's of downtown hotels and independent green grocers across the lower mainland.

Freshpoint Vancouver is threatened by one of main options under consideration for a new grade-separated arterial route. The National-Charles Overpass, one of the preferred options recommended by the False Creek Flats Community Panel (the Panel), will fragment Produce Row, as it will cut through FreshPoint Vancouver, and it is expected to impact the properties of two of the other businesses. This will likely result in the loss of Produce Row altogether as many of the businesses will have to move to other municipalities. The Prior/Venables Underpass option, on the other hand, does not negatively impact Produce Row by directly impacting the space or through any disruptions to operations that would be caused during construction.

While we understand the complexity of this decision, we recommend the Prior/Venables Underpass as it has fewer negative impacts to Produce Row, the transportation network, greenhouse gas emissions reduction and traffic flow, the local economy, and civic services.

Kindest regards, Bryan Uyesugi President, Freshpoint Vancouver <u>bryan.uyesugi@freshpoint.com</u> 17

Lon LaClaire Director of Transportation City of Vancouver Via email: lon.laclaire@vancouver.ca

Hello Mr. LaClaire:

On behalf of Charles Street businesses, I am writing to express our collective support for the Prior/Venables Underpass route for the grade-separated arterial through False Creek Flats.

We represent a unique collection of private businesses, organizations, and non-profits that:

- provide over 200 full-time skilled jobs.

- generate over \$100 million dollars in annual revenue.

- include the Vancouver International Marathon Society raising millions of dollars for charity; a manufacturing business that prioritizes hiring refugees and helping them establish peaceful lives in Canada; a non-profit that takes in disadvantaged East Van youth to teach them trades and industrial art to spark an interest in a career in the arts or trades, as well as an art space for the East End Cultural; several significant suppliers to the local construction, manufacturing, restaurant, and retail industries; as well as small manufacturers

- are tax-based properties

The majority of our businesses are small family-owned and would have to shut their doors if the National-Charles route goes through. Light industrial land is nearly impossible to find within city limits, and the units available are small and unaffordable, with little to no warehouse space that is critical to the majority of our businesses. Put another way, the National-Charles route would eliminate many of our businesses, the valuable products and services we provide to the city, hundreds of skilled, well-paying jobs and the valuable tax revenue base generated by our commerce.

There are several reasons we oppose the National-Charles route in addition to our property and business interests. Firstly, this route is the most expensive choice at an estimated \$450 million, while Prior-Venables is around \$80 million. The City does not have the finances and will need money from federal and provincial governments, as well as private industry. It is our opinion that none of these contributors will provide hundreds of millions when a cheaper, pre-established, well-spaced route is available. In terms of any of the levels of government, such an expenditure would be a waste of infrastructure money that could be put to better use than a single road. The city would have to raise taxes again, when they are already under pressure to contribute their portion for waste management and transportation infrastructure upgrades required in upcoming budgets. This is an irresponsible waste of taxpayers' money. The National-Charles route also: - has dangerous S-curves and will increase pollution and traffic accidents

- requires relocation of the National Works Yard, Vancouver Fire & Safety Training Centre and the Heavy Urban Search and Rescue facility

- takes out Fresh Point Produce, the largest of the distributors on Produce Row, affecting the most amount of jobs and food availability

- is located close to a current arterial, Terminal Ave, and will not effectively divert traffic off it

- it is not the ideal route for emergency access to the new \$2.5 billion St. Paul's Hospital, which

prefers Prior-Venables

Finally, we've had concerns around the Community Panel since learning of it in 2018. One of our business owners joined the panel along with other local business owners and was shocked at the lack of transparent disclosure. The process was often rushed with little time to process and inquire about the information presented to panel members .For three years I have fought hard to have our voices heard and was capped at 5 min to present all of Charles Street businesses case. I find it hard to believe that Panel members were able to make reasonable judgements or recommendations.

In the interest of business viability, good jobs within the city and maintenance of light industrial land, the financial reality and fiscal priorities, safety and pollution, we write with our support for Prior-Venables route as the only viable and responsible route for the entire city infrastructure , the taxpayers of Vancouver, and the multi billion-dollar hospital.

Sincerely,

Kelly Ready, Charles Street representative

In alliance with the following Charles Street businesses:

Ancient Secrets Inc.	Sherina Jamal, Owner, office@beautythroughbalance.ca
ATN Visuals Inc .	Terry Guscott, Owner, terry@atnvisuals.com
Black Suns Art Studio	Kelly Ready, Owner, kready@blacksunsart.com
BMS Plumbing & Mechanical	Tamara Merchan, Owner, tamara@bmsgroup.ca
Cascadia Tableware	Derek Hoogstra, Owner, derek@cascadiatableware.com
La Fabrica Marine	William Castro, Owner, info@lafabricamarine.com
Penfolds Roofing	Ken Mayhew, Owner, k.mayhew@penfoldsroofing.com
Signs By Ken	Ken Wong, Owner, signsbyken@telus.net
TreeTop Marketing	Richard Clune, Owner, richard@treetopmarketing.ca
Vancouver E-Fasteners	Jerry Hoang, Director of Operations, jerry@vefsupply.com
Vancouver International Marathon Society info@runvan.org	

Other Charles Street businesses that would be impacted by National-Charles include:

Black & McDonald Black Top & Checker Cabs Eddie's Hangup Display July 1, 2019

The Viceroy Strata Council 1088 Quebec Street Vancouver, BC V6A 4H2

Mr. Dale Bracewell Manager, Transportation Planning City of Vancouver 453 West 12th Avenue Vancouver, BC V5Y 1V4

Dear Mr. Bracewell,

As the residents, owners and taxpayers of the Citygate neighbourhood we have read with interest the Final Report for the Flats Arterial Community Plan. We all understand the enormous task in trying to please a variety of constituencies while coming up with sensible and cost effective solutions to moving vehicles of all types through the busy transportation corridors.

I am sure your staff will be reviewing all options. While many feel the National-Charles proposed route with its cost four times greater than the logical Prior Street route is an egregious use of tax dollars when so many other priorities should be addressed we want to voice our significant specific concerns with the potential impact to National Avenue and Milross Avenue between Quebec Street and Main Street.

In the event that the proposed National route is approved we can anticipate that National with a left turn lane from Quebec will become a "rat run" very quickly as cars look for a way to avoid the traffic congestion that is likely to result from the large s-curve design that cuts around the new hospital and Trillium park. The city will inadvertently create a new faster route on what is currently already a congested street which serves the four residential tower parking garages where four driveways serve well over 500 residential units. The same to a lesser degree will occur on Milross Avenue where a forced right at Main Street will do little to deter an alternative "rat run" to get to the left turn bay from Main Street to National on the north side of Thornton Park. We are officially requesting that the city review what traffic mitigation measures would be required to keep both of these routes free from further traffic congestion if the National Charles route moves ahead. At minimum this would likely require limiting access on both ends of National between Quebec and Main. Similar limitations may be required for Milross.

We appreciate the Strathcona residents concerns for their street being less congested. However, shifting the problem to another area while significantly increasing the cost to all residents is not a practical solution. We understand that there will be a staff recommendation coming in the fall of 2019 and we want our concerns addressed prior to any staff recommendations to council being completed.

19

Understand as taxpayers we stand for the most cost effective solution to the road realignment that delivers the least disruption from the current traffic patterns. It is our opinion that the National-Charles recommendation is flawed at the core of both of these requirements.

We respectfully request your staff to contact us to discuss our concerns. You may contact me directly at 604-889-2704 so we can facilitate the dialog.

Strata Council Members The Viceroy

CC: Vancouver Mayor and City Council - all members Patsy McMillan - False Creek Residents Association Rodney LeGrow – Wynford Property Management

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September 17, 2019

The Viceroy Strata Council 1088 Quebec Street Vancouver, BC V6A 4H2

Councillor Adriane Carr Councillor Pete Fry Councillor Sarah Kirby-Yung Councillor Lisa Dominato City of Vancouver 453 West 12th Avenue Vancouver, BC V5Y 1V4

Dear Councillors,

Thank you for taking the time to meet with our group of strata representatives for the False Creek Residents Association and the Citygate neighbourhood on Monday evening September 16, 2019. We appreciate you taking the time to listen to our concerns and trust you will focus on finding actionable solutions to the issues we all share for the interconnected neighbourhoods that were represented.

The two primary areas of focus for our meeting were the ongoing discussions surrounding the form and delivery of Creekside Park and the concern for traffic planning as it relates to the false creek arterial plan. Per our previous correspondence you are aware that our council had significant concerns over the false creek arterial plan.

We were pleased to hear from you that the National-Charles proposed route with its high cost to taxpayers and numerous other obstacles is likely to be removed from consideration when the staff report is presented later this month for review at your council meeting on October 2nd.

Further comments from Councillor Fry and Councillor Carr had us reviewing the Strathcona Residents Association website again for proposed new alternatives. The new Strathcona "Plan B" appears to move ahead with downgrading Prior Street to a two-lane residential street and scuttle the entire east-west connection from the end of the viaducts or the new Pacific Avenue through to Clark Drive. Councillor Carr reiterated her support in our meeting for downgrading Prior per three previous council votes. While we fully appreciate the concerns of the Strathcona residents for their street being less congested the proposed "Plan B" being put forward by the Strathcona Residents Association does not take into consideration the consequences for Quebec Street and Main Street.

- If this plan is implemented in advance of the Viaduct removal the east west traffic congestion on Prior will either increase due to the single lane or vehicles will exit for Main Street to head north through Chinatown to Hastings or Powell or south to reach Terminal or Great Northern Way. All these routes are already highly congested through out the day and particularly at peak hours.
- 2) If this plan is implemented after the viaduct removal the flows will be similar except the potential for using Quebec street will be amplified as vehicles who are forced to Main by the current viaduct structure will have the option of turning left or right at Quebec Street. This does nothing to mitigate our previously stated concerns anticipating that National with a left turn lane from Quebec will become a "rat run" as cars look for a way to avoid the traffic congestion at Main street and the new Pacific Boulevard.
- 3) The compounded traffic congestion on Quebec and Main Streets and the potential impact to National Avenue and Milross Avenue between Quebec Street and Main Street is likely an unintended result of this Plan "B" and is unacceptable to our community.

Managing the major east/west and north/south traffic flows certainly is a complex challenge for the city and council owes a responsibility to all residents to consider how their actions to improve one area may create challenges for other neighbours. Removing east-west roadway capacity will not reduce the current volume it will only force it to squeeze into already congested corridors. For this reason, we can not support the Strathcona Residents proposed Plan "B" and urge all councillors to vote against this proposal if it is put to them.

The Citygate neighbourhood fully understands the challenge of a five-lane roadway on your doorstep. We fully support the Strathcona residents demand for a well-designed road that is speed appropriate that incorporates wide pedestrian walkways, properly separated bike lanes and safe crossing zones through overpasses and pedestrian controlled intersections. We believe properly incorporated design can satisfy the Strathcona residents concerns while continuing to provide a vital east-west vehicle corridor. We will insist on similar considerations for Quebec Street as the resulting flow from the eventual new Pacific Boulevard become more known.

We maintain our opinion that the Prior Street route as proposed is still the most appropriate from a cost and needs perspective. We do not believe reducing capacity will reduce need and will only effectively serve to shift the problem to another area. With staff recommendations coming on this matter soon the time to implement an actionable solution has come. The proposed Plan "B" does nothing to improve the roadway considerations surrounding the removal of the viaducts and the redevelopment of the roadway network. Despite the challenges we urge you to vote in favour of the Prior Street roadway and work to deliver a safe and effective design for the residents of Strathcona.

We respectfully request your response to discuss our concerns and an opportunity to meet with our council. You may contact me directly at 604-889-2704.

Strata Council Members The Viceroy

CC: Vancouver Mayor and remaining council members Carol Kong -City of Vancouver <u>carol.kong@vancouver.ca</u> Patsy McMillan - False Creek Residents Association Rodney LeGrow – Wynford Property Management August 6, 2019

The National 1128 Quebec Street Vancouver, BC V6A 4E1

Mr. Dale Bracewell Manager, Transportation Planning City of Vancouver 453 West 12th Avenue Vancouver, BC V5Y 1V4

Dear Mr. Bracewell,

We are writing to you today as a result of reading the final report for the Flats Arterial Community Plan. While we understand the difficulties associated with coming up with the right plan that will provide effective solutions for moving vehicles through this area, it must also take cost considerations into mind.

Some feel that the National-Charles corridor is the right way to go. We counter that this would be a total waste of tax payer dollars as the costs would be astronomically greater than the proposed Prior Street route which would be between 3-4 times less expensive.

In addition, the traffic currently running through National Street during rush hours is often bumper to bumper on National between Main and Quebec making extremely difficult and dangerous for the 800+ residents that live in the 4 condo towers to access their parkades. If the National/Charles corridor was to proceed then even more cars would enter onto National looking for ways to avoid congestion trying to gain a few minutes of time. Overall congestion would go up on Quebec, National, Main and Milros. It would also be more difficult for emergency vehicles to get to the new St Paul's Hospital.

If the National Charles route was to move ahead, we would at the very minimum would need assurance that resident only access and speed bumps on both ends of National between Quebec and Main would be implemented as part of the overall plan.

We also know that the Strathcona Community has been very vocal in wanting their streets being less congested. However, shifting the problem to another area while significantly increasing the cost to all residents is not a prudent solution.

We respectfully request your staff to approve the Prior Street route as this is the most logical and cost-effective solution for all taxpayers of Vancouver.

The National Strata Council LMS1108

Ralph Wettstein Devon Kuiper Monique Lamoureux John Murray Grant Fletcher Sue Godlonton Lata Casiano

CC: Vancouver Mayor and City Council Jerry.debrovolny@vancouver.ca Lon.leclair@vancouver.ca Paul.mochrie@vancouver.ca Kevin.mcnaney@vancouver.ca Patsy McMillan Ken Ho All members

False Creek Residents Association Wynford Property Management September 19, 2019

The National Strata Council 1128 Quebec Street Vancouver, BC V6A 4E1

Councillor Adriane Carr Councillor Pete Fry Councillor Sarah Kirby-Yung Councillor Lisa Dominato City of Vancouver 453 West 12th Avenue Vancouver, BC V5Y 1V4

Dear Councillors,

The strata council of the National would like to thank you all for your taking the time last Monday, September 16th, 2019 to attend our meeting to discuss some of our concerns regarding both: I.) the shape, size and delivery of the Creekside Park Extension and 2.) the choice of traffic flow through our neighbourhood with the proposed removal of the viaducts.

Once again, with regards to the park, we would like to see the eventual extension to mirror the ODP of 1990 with the 9.06 acres proposed to be situated between False Creek to the south and Pacific Blvd. to the north and Carrall St. Greenway to the west and Quebec to the east with no development on Lot# 9 east of the present day Carrall Street. As well, since there seems to be some discrepancies in the actual size of any proposed park and what constitutes park space, we'd like to see the numbers sorted out, and perhaps an actual survey would be warranted.

And secondly, we have concerns over of the effects on Citygate with whichever choice the City decides on for any proposed traffic flow plans with the removal of the viaducts. Besides National Avenue which already has more traffic than the road was originally designed for, and depending on which plan the City goes with again, there are concerns over increased traffic directed along Quebec and Main Street. In the meantime, we'd like to see some traffic calming measures taken along National Avenue such as greater signage and monitoring of trucks and buses using National as a shortcut, the installation of speed bumps and a traffic light erected on the west side of Quebec at the T-junction of National and Quebec.

Thanks again for your efforts to involve us as we hope to be included in making any final decisions that will impact us all in the community.

Strata Council Members The National

CC: Vancouver Mayor and remaining council members Carol Kong -City of Vancouver <u>carol.kong@vancouver.ca</u> Patsy McMillan - False Creek Residents Association Ken Ho – Wynford Property Management



VIA EMAIL

June 17th, 2019

Attention: Mayor Stewart and Council,

The Grandview Woodland Area Council would like to convey our support for the recommendation of the Flats Arterial Community Panel to use National-Charles as the route for the new arterial road.

Furthermore, we support the restoration of Prior-Venables to a low-volume, neighbourhood serving street to allow Strathcona to reconnect with their green space.

We request that Grandview Woodland be consulted prior to and during the design process to ensure that the impacts of the new arterial route are understood and mitigated.

Regards,

Craig Ollenberger Director, Grandview Woodland Area Council

cc Lon LaClaire Jerry Dobrovolny Gil Kelley

Vancouver Fire Rescue Services Considerations

The quality of emergency response and the Vancouver Fire Rescue Services facilities, including Fire Hall No. 1, the Fire Training and Heavy Urban Search and Rescue (HUSAR) facilities, are important considerations for grade-separating the rail crossing, and the alternate arterial options that were explored.

The following is a summary of the important considerations related to Vancouver Fire Rescue Services.

A. 900 Heatley Ave: Headquarters, Fire Hall No. 1 and Fleet Maintenance

The alternate arterial options bring corresponding impacts to the Vancouver Fire Rescue Service Headquarters, Firehall #1 and Fleet Maintenance Facility all located at 900 Heatley Avenue, adjacent to Prior Street. These impacts are listed below:

- If Prior Street remains as an arterial and becomes grade-separated, the new Firehall #1 could be rebuilt on its existing site. This arterial alignment is the most direct, and therefore supports the most efficient response times.
- If there is not a reliable emergency access on Prior Street at the rail crossing (e.g. closed to vehicles or consistently blocked by trains), the Firehall #1 location emergency response time performance would be severely impacted and would not be functional as the site for the redevelopment of new Firehall #1. An alternative site would need to be purchased.
- If there is not a reliable emergency access on Prior Street at the rail crossing (e.g. closed to vehicles or consistently blocked by trains), and an alternate grade-separation arterial is constructed on Malkin Avenue (where the VFRS Fleet Maintenance Facility is currently located), then the 900 Heatley Avenue site could be reconfigured: Firehall #1 could be relocated to the current area where the VFRS Fleet Maintenance Facility is located on the site. A new site would then be required for the fleet maintenance facility.
- Should there be any proposals to reduce Prior Street to 2 traffic lanes during the peak hours (one lane in each direction), such as a temporary or permanent condition, the impact to VFRS response time performance will need to be monitored, and it may result in requiring to relocate Firehall #1 to a new site. The purchase price of the site would need to be considered as part of the mitigation cost should the current location be unable to meet the needs of effective emergency response.

B. Training Facilities

The Vancouver Fire and Rescue Training Centre and Heavy Urban Search and Rescue (HUSAR) are co-located on the same 4 acre site at 1330 Chess Street in the False Creek Flats. The training site is strategically located in a central location within the city, close to the urban core, within industrially zoned land, and close to the maintenance facility and Fire Hall 1.

A central location of the VFRS Training Centre is essential as it allows the VFRS to operate a Secondary Response Model to accommodate required training. This means that on-shift staff undergoing training can quickly be placed back into service for emergency response. If the training centre was to be move outside of the city centre this model would not be possible and additional staff would need to be hired to accomplish training which would be an ongoing operational cost to the City.

The nature of the training activities, including the operation of the burn tower, large training props (buses, tractor trailer units, and rail cars), noise pollution, etc. requires that the facility be

located on industrial land away from residential users and potential conflicts. The requirement for the facility to be centrally located on industrial land limits the potential options for relocation if the current facility is displaced. A new location for the Training Centre would likely need to be found within the False Creek Flats industrial land.

A key policy in the 2017 False Creek Flats Plan is the protection and enhancement of city lands within the Flats that provide essential services such as emergency management and emergency response. This is to allow for emergency response services access to emergencies within a reasonable travel time and to ensure the provision of appropriate space for functional operations to meet current and future civic needs.

1) Vancouver Fire and Rescue Training Centre

The VFRS Training Centre provides training for new and existing staff including new recruit candidates, firefighters, and Fire Officers. The site is also used multiple times annually for partnership training programs between VFRS and VPD (Rescue Task Force & PSU). The training center also provides CPR and first aid training to the public, training for Vancouver Volunteer Corps, and training for the Neighbourhood Emergency Assistance Teams (NEAT).

The Fire Training site (Figure 1) has been designated for specialty training programs and includes the following facilities:

- Training Classrooms
- Computer Lab (used as a backup Department Operations Centre)
- Administration Space
- Training Division Staff Office Space
- Training Material Prep Room
- Training Media/Curriculum Development Lab
- Boardroom/Meeting Room(s)
- Washrooms, Locker Rooms, Change Rooms and Shower Facilities
- Fitness Facility
- Kitchen Facility & Lunch Rooms
- Site Workshop (for prop construction, equipment/prop maintenance)
- Fuel Storage Compound (propane supply for training props)
- Trainee Facilities including:
 - Washrooms, Locker Rooms, Change Rooms and Shower Facilities
 - o Gear/Equipment Storage and Drying Facilities
- Training Props:
 - Driving Track (Emergency Vehicle Operator and other driving training programs)
 - Burn Tower
 - Vehicle & Machinery Extrication props
 - Structural Collapse pad
 - Hazardous Material Response Training Props (rail car, chemical transportation units/devices, etc.)
 - Drafting Pit (water supply)

2) Heavy Urban Search and Rescue

Canada Task Force 1 (CAN-TF1) Heavy Urban Search And Rescue Team is a special operations task force with up to 120 members including medical, fire suppression, emergency response, search and rescue, and engineering backgrounds. It is one of six heavy urban search

and rescue teams in Canada able to deploy anywhere in the world. The Task Force is trained as an all hazards emergency response team that can be deployed to earth quakes, fires, landslides, catastrophic weather events, structural collapses, mass casualty events, etc.

The CAN-TF1HUSAR facility is the base of operations for training and during deployment. Their warehouse shares the 1330 Chess St. site with the Vancouver Fire and Rescue Training centre. An adjacent site at 1440 Glen Drive houses props dedicated to HUSAR training. CAN-TF1 HUSAR site includes the following facilities:

- Equipment storage warehouse
- Offices, administration and communication facilities
- Washrooms, Locker Rooms, Change Rooms and Shower Facilities
- Training Classroom
- Training Props and Facilities:
 - Structural Collapse Training Area
 - Backhoe and Gradall Training Area
 - Confined Space Rescue / Extrication Training Prop
 - o Trench Rescue Training Prop
 - o Technical Rescue (Rope rescue) Training Area
 - Site Workshop (for prop construction, equipment/prop maintenance)

Figure 1 - Vancouver Fire and Rescue Training Centre





