



City of Richmond

Report to Committee

To: General Purposes Committee **Date:** May 29, 2020
From: Marie Fenwick **File:** 11-7000-01/2019-Vol 01
 Director, Arts, Culture & Heritage Services
Re: **Steveston Tram Feasibility Study**

Staff Recommendation

That Option 1: Maintain Current Tram Program as detailed in the report titled “Steveston Tram Feasibility Study”, dated May 29, 2020, from the Director, Arts, Culture & Heritage Services be endorsed.

CM Fenwick

Marie Fenwick
 Director, Arts, Culture & Heritage Services
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REPORT CONCURRENCE		
ROUTED TO:	CONCURRENCE	CONCURRENCE OF GENERAL MANAGE
Arts, Culture & Heritage	<input checked="" type="checkbox"/>	<i>Sevener</i>
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Engineering	<input checked="" type="checkbox"/>	
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SENIOR STAFF REPORT REVIEW	INITIALS:	APPROVED BY CAO
	<i>MF</i>	<i>[Signature]</i>

Staff Report

Origin

At the City Council meeting on September 11, 2017, Council endorsed the staff report titled *Feasibility of Running the Steveston Interurban Tram* to undertake a feasibility study. The following staff recommendation was adopted on consent:

That \$50,000 be allocated from Council Contingency to undertake a feasibility study that includes a business case analysis (including cost vs. benefits) and transportation and engineering analysis of the operation of the Tram running between the existing Tram building at No.1 Road and Moncton Street and the Gulf of Georgia Cannery, as well as further work including determining the capital and operating costs required for the Tram itself.

This report supports Council's Strategic Plan 2018-2022 Strategy #3 One Community Together:

Vibrant and diverse arts and cultural activities and opportunities for community engagement and connection.

3.2 Enhance arts and cultural programs and activities.

3.4 Celebrate Richmond's unique and diverse history and heritage.

This report supports Council's Strategic Plan 2018-2022 Strategy #6 Strategic and Well-Planned Growth:

Leadership in effective and sustainable growth that supports Richmond's physical and social needs.

6.4 Recognize Richmond's history and heritage through preservation, protection and interpretation.

Analysis

Heritage Context and the Steveston Area Conservation Strategy

Tram Car 1220, the City's largest artefact, represents an important part of Richmond's history as it symbolizes the transportation connection between Steveston and Vancouver that supported the development of Richmond. Its presentation to the public plays an important role in sharing the history of Richmond.

During its operation, the Tram ran from Eburne Junction at the north end of Lulu Island to Steveston. Its last passenger stop at the southern end was located at No. 1 Rd. and Moncton Street where the Steveston Tram Building is located today. The line continued down what is now Bayview Street to the Gulf of Georgia Cannery to pick up freight. The line did not go down Moncton Street. A section of the original track remains in Steveston Park running north from the Steveston Tram Building. This track is listed on the City of Richmond's heritage register.

Figure 1: Richmond Tram Stops, 1956



The Steveston Area Conservation Strategy, created in 2009, was put in place to conserve the heritage character of Steveston Village. Bylaws, guidelines and incentives help conserve the original heritage character of the exterior of identified heritage buildings and streetscapes. The Steveston Village Conservation Strategy identifies the core themes for preserving the heritage character. This includes elements typical to a small frontier town such as, “street and lane patterns and building design which all show characteristics in common with most burgeoning small settlements in the West”. Additionally it states that “Steveston is valued for the extent of its historic character and intrinsic heritage values, seen less in individual buildings than

in the cumulative effect its physical and intangible elements have had on its heritage significance since 1880”.

Moncton Street played a central role in the history of Steveston and continues to be a hub for the village today. As described in the Steveston Village Conservation Strategy, “Moncton Street in particular is a testament to the importance of the commercial core of small-town British Columbia; it continues to evolve as the economic and social heart of the village and the primary local source for goods and services, much as it was historically”.

Current Tram Program

In order to preserve the Tram, and make it accessible to the public, the Steveston Tram Building was constructed and opened to visitors in 2013. It immediately became a popular destination for community members and tourists, with over 55,000 visits annually, including over 18,000 visits from Richmond residents. Visitors report a high level of satisfaction with their experience of Tram Car 1220, with 94% of people ranking their visit Very Good or Excellent.

A full restoration of Tram Car 1220 was completed in 2019. A restoration team made up of volunteers, conservators, curators, specialized contractors and City trades worked diligently to preserve original materials and return the car to its appearance from 1912 to 1958. Volunteers contributed over 800 hours of their time to help restore the Tram. Visitors also watched and participated in the restoration process.

The completion of restoration has created the opportunity for additional programs in the Steveston Tram Building, which offer visitors the opportunity to experience the Tram in-person and learn about its history and importance to Richmond.

There are many programs and events offered throughout the year including;

- **Living History:** Historical Interpreters and Heritage Ambassadors (volunteers) offer an immersive experience for visitors as they tell the story of Richmond’s transportation history in historic costume. Stories include, going to the races, the mechanics of the Tram, moving agricultural goods through the Interurban system and a typical workday of a Motorman.
- **Winter Tram:** Visitors listen to festive music; sit with Santa on the Tram Car while stories all about winter celebrations, trains and trams are told.
- **Tourism Passport Challenge:** The Tram Building participates in the Tourism Passport Challenge, which welcomed 13,356 tourism professionals in 2019. This program has a significant impact on promoting the site.
- **School Programs:** Students from kindergarten through grade six participate in two programs, *All Aboard Tram Car 1220* and *Rails Across Richmond*, aimed at teaching them about how the Tram brought community together.

- Canada Day: The Tram is winched out on Canada Day and visitors are encouraged to board the car and explore hands on activities and entertainment in the Tram Building. 3,400 visitors experienced the Tram as part of the 2019 Steveston Salmon Festival.
- Citywide Events: The Tram is part of Culture Days, Doors Open and Family Day. Visitors board the Tram Car and explore the car's history through an interactive discovery centre. Over 1,600 visitors attended these special events in 2019.

While public access and programming at the Tram has been temporarily suspended as a result of COVID-19, it will resume as outlined in the Council-approved restoration of services plan. Access to the Tram Car itself will likely be later in the restoration of services continuum as the cleaning that would be required to disinfect high-touch surfaces would be damaging to the Tram car, the City's largest artefact.

Tram Feasibility Study

A consulting team from Davies Transportation Consulting Inc., WavePoint Consulting Ltd., Hooper Engineering and Morch Engineering Inc. was retained to conduct a feasibility study.

The findings of the feasibility study are detailed in this report and address the following:

1. Tram Car Operations Best Practices Review;
2. Tram Car Assessment;
3. Tram Routing Options;
4. Business Case;
5. Safety Issues;
6. Regulatory and Operational Considerations; and
7. Steveston Streetscape Study Impacts.

Tram Car Operations Best Practices Review

The consulting team analyzed active heritage tram operations in nine other cities to identify characteristics of successful examples.

Their findings include:

- Many services operate from a historical urban location and are marketed primarily toward heritage tourism, family or cultural experiences rather than as practical passenger transportation.
- Services that run in urban areas are usually built on original track and operate as part of a larger transit system. This is the case in New Orleans and Dallas where heritage streetcars are part of the transit system and used to showcase the community's heritage for both residents and tourists. Several connect to major urban experiences that are a destination such as convention centres or sports stadiums.

- Other services operate in rural or industrial landscapes where there is limited interaction with pedestrians and other vehicles. These include the Fraser Valley Heritage Railway in Surrey and Riverfront Trolley in Astoria, Oregon.
- The majority of services operate on a seasonal basis, typically from May to September.
- The length of the tram line services varies from between 1.9km to 7.4km.
- In almost all cases, heritage streetcars operate over existing right-of-way, including active or abandoned freight railway tracks (Astoria) and/or active public transit routes (New Orleans).
- Heritage cars are prone to breakdown and parts and service can be difficult to procure. Some operate more than one vehicle to improve reliability.
- All services depend on some level of government funding or grants to finance operations and/or equipment and infrastructure maintenance and repair.
- Most services have a volunteer component.
- Fares tend to be low, approximately \$5 CDN on average, for round trips that while relatively short, are longer than the route options considered in this report. The Fraser Valley Heritage Railway Society costs range from \$10 to \$20 per person for a 55 minute ride.
- Some museums and heritage destinations use train, street and tram cars as part of a static interpretive experience, such as Engine 374 at Yaletown Roundhouse and Street Car 153 planned in the new North Vancouver Museum, scheduled to open in 2020. Other cars are primarily static, but do have the ability to move by winch, such as the 1223 at Burnaby Village Museum.
- Tram services cease operation for a variety of reasons. For example, The Vancouver Downtown Historic Railway operated from 1998 to 2011 between Granville Island and Olympic Village Station. It ran on weekends and holidays from May to mid October. The cars and line was owned and maintained by the City of Vancouver and operated by volunteers from the Transit Museum Society. Operations closed because it offered a limited tourism experience, the operational costs were considered high, and there were significant safety concerns.

Tram Car Assessment

Richmond's Tram Car 1220 has been restored on an aesthetic and structural level for static exhibition purposes. To operate the Tram, beyond the current ability to move it outside the building, extensive work would be required including hazardous material removal, structural and safety work, mechanical and electrical assessments, and further rebuilding and restoration of additional Tram components.

To rebuild and restore these components of the Tram would require specialists in restoration and knowledge and skill in rehabilitating the mechanical and electrical systems. The work would entail removing the framework that supports the car body and contains the wheel sets "trucks". To complete an assessment and rebuild, the trucks would then need to be disassembled and reassemble at an offsite location. The rebuild would include the replacement or repair of existing components.

The electrical systems of the car would need to be upgraded to connect to the braking system and traction motors. Any existing high voltage wiring would be removed from the undercarriage. The

brake system would also need to be inspected and potentially replaced. This would include but not be limited to the compressor, the emergency hand brake control and brake piping.

Structural components would need to be considered as well. The structure of the car would require careful assessment to ensure that all interior components are secure when in motion.

In order to complete the work to make the Tram operational, newly restored components will need to be removed and rebuilt.

The current Tram does not meet the standard universal design for accessibility. Altering the Tram to accommodate passengers with mobility challenges would result in additional costs and loss of heritage integrity. It is possible to purchase a replica streetcar of a similar but not identical design, complete with modern systems that would meet accessibility standards.

There are three options for powering the Tram. An overhead catenary, a towed generator or an onboard power cell or battery system. Each option has operational considerations that impact resources, maintenance and streetscape design. Further assessment and investigation would be required.

Once operational, regular maintenance would be required to maintain safety standards and ensure that the Tram is preserved. If any part of the Tram breaks, parts are rare and not easily attainable and skilled tradespeople to complete the work may be challenging to find. This could result in a disruption of service.

The estimated cost to make the Tram operational is \$2 to \$4 million dollars. Further analysis would be required to make recommendations on the options noted above and the estimates could be refined accordingly

An additional option for consideration is the purchase of a replica tram car. Opting for a replica car would provide opportunities to install onboard power, meet accessibility needs and provide modern conveniences such as air conditioning. The estimated cost of this option is \$2.5 million to \$3.5 million. These costs do not include a structure to house the replica for storage, maintenance and repair.

Tram Routing Options

The consulting team reviewed three routing options for Council's consideration. Each option was assessed to determine the costs, transportation and engineering considerations related to routing and road impacts and safety.

Figure 2: Tram Routing Options

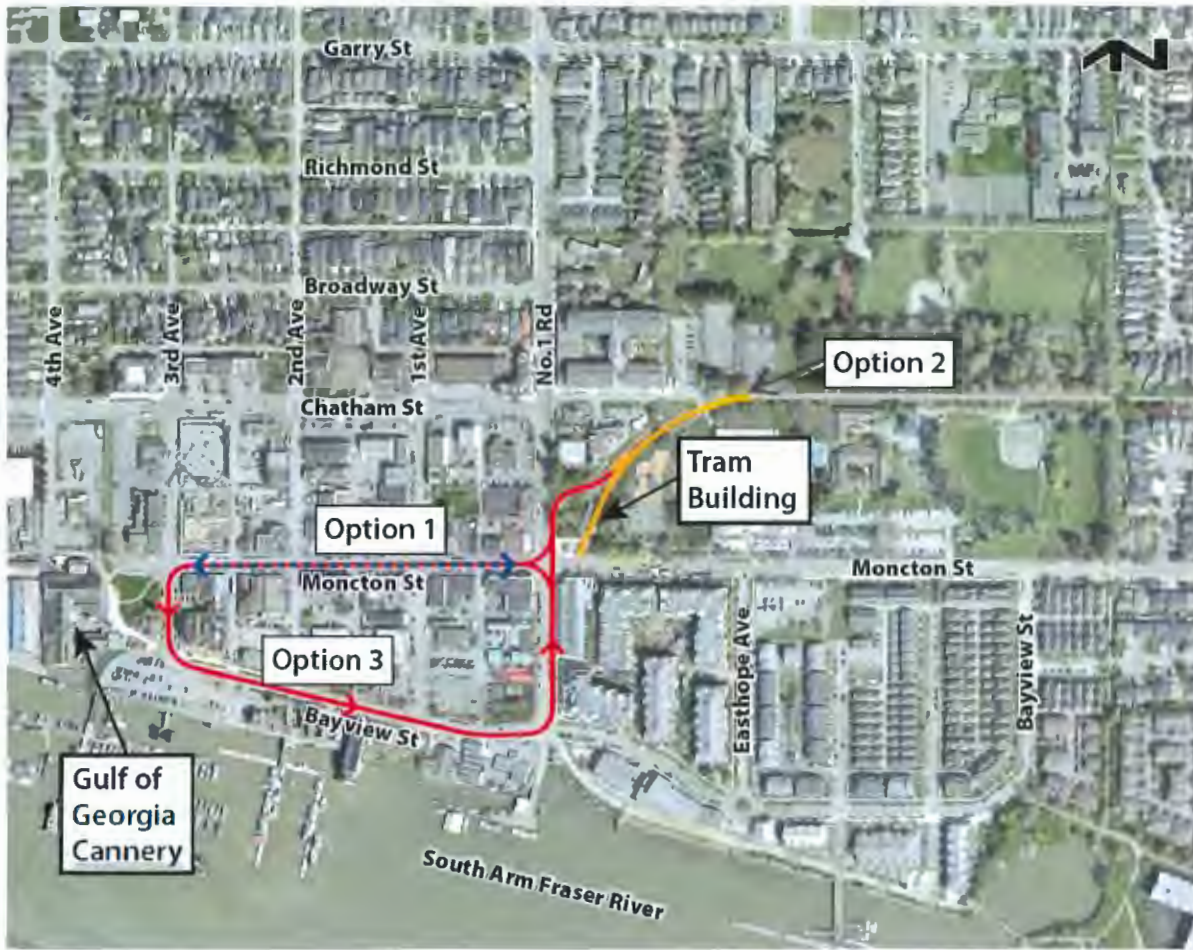


Table 1: Tram Routing Options and Estimated Order of Magnitude Capital Costs

Route Option	Tram Car Restoration Cost	Track Infrastructure Capital Cost	Total Cost
Option 1: Moncton Street	\$2M to \$4M	\$1.6M to \$6M	\$3.6M to \$10M
Option 2: Off Street: in Park	\$2M to \$4M	\$1.1M	\$3.1M to \$5.1M
Option 3: On Street: track – Moncton St., Third Ave., Bayview St., No. 1 Road	\$2M to \$4M	\$4M to \$8M	\$6M to \$12M

Exiting the Building

The consulting team confirmed that the Tram will have to exit from the north side of the Tram Building due to the physical constraints of the existing structure and the physical space available in the road right-of-way to negotiate a right turn onto Moncton Street. Therefore, all routing options include the provision for the start and end of the trip via the north side of the building.

Considerations for all options include:

- Relocation and construction of new pathway in park;
- Potential conflict with other park uses. Due to the adjacency to the playground, a fence or safety barrier would need to be installed.
- If powered by catenary wires (overhead wires) would likely conflict with trees in the park and on Moncton Street;
- Negative impact to the heritage value of the Steveston Conservation Area; and
- Potential disruption to the experience of the Nikkei Memorial.

Option 1: Moncton Street

The option of the Tram running back and forth on Moncton Street between the Tram Building and the Gulf of Georgia Cannery was reviewed to address the specific route identified in the referral.

Option 1A: Single Track

This option envisions a single track set on Moncton Street to allow the Tram car to operate in both directions back and forth from the Tram Building to the Gulf of Georgia Cannery.

The primary advantage of this option is:

- Reduced safety risks compared to the other options, as the roadway would be completely closed to vehicle traffic and parking during Tram operation.

The challenges of this option include:

- Street closed to vehicle traffic;
- Coordination and scheduling impacts with adjacent business deliveries and environmental services;
- Approximately 25 parking stalls are lost during Tram operation; and
- Depending on the location of the track, boarding would have to be accommodated on the sidewalk or in the street.

Option 1B: Double Track

A double track option on Moncton Street envisions track inlaid in each traffic lane in both directions with switches at either end to allow for Tram car turnaround.

The primary advantage of this option is:

- As the Tram would run in the same direction as traffic, traffic flow could be maintained.

The challenges of this option include:

- Significant permanent alterations to road infrastructure and operations;
- Adjacent curbside parking would be unavailable during Tram operation;
- Turn movements from the north-south streets and lanes would need to be restricted; and
- There would need to be a switch west of No. 1 Road and another at Third Avenue. The switch would allow the Tram to reposition itself into the proper lane. This would require traffic personnel at each end to manage the switch, disrupt movements of other road users, and create delay in Tram service reducing the possible number of trips per day.

Option 2: Track extension north of Tram Building

This option utilizes the existing Tram right-of-way north of the Tram Building. A short 500 metre section of track could be installed for a limited two-way operation of the Tram within the park. Rehabilitation and extension of the existing 130 metre of track along the original interurban line would create a completely off-street route thereby eliminating conflict with other road users. Although this option would not provide travel to other destinations for passengers, it would serve to provide a demonstration of an operational Tram.

The advantages of this option include:

- The grade and asphalt are able to support Tram load;
- The track can be above ground with wooden ties similar to the existing section of track;
- Reflective of the original Tram route; and
- No impact on other street users.

The challenges with this option include:

- The line will not have any destination which would limit its appeal to visitors; and
- Impact on park users.

Option 3: Moncton and Bayview Streets

This option would have a 1.1 kilometre inlaid street track with the Tram running in a counter clock-wise direction along Moncton Street, Third Avenue, Bayview Street and No. 1 Road. The Tram would run in the travel lane. This route will serve the Tram building, the Cannery and the waterfront.

The advantages of this option include:

- The route serves the Gulf of Georgia Cannery and waterfront areas;
- The existing road base is sufficient to support tracks and Tram load; and
- Tram would run in the travel lane.

The challenges with this option include:

- High cost of construction related to installation of track and additional reconstruction work due to Tram routing from the Tram Building through the No. 1 Road and Moncton street intersection;
- Extensive manual or automated traffic control required at major intersections and pedestrian crossings, including No. 1 Road and Moncton Street;
- Loss of parking on the outside lane;
- Delays to other road users during Tram operation; and
- Impact to dike alignment and potential future raising of the road. This work would result in greater elevation differences, disruption of service and could complicate raising initiative.

Safety Issues

The study identifies several safety considerations associated with operating the Tram. Safety considerations that impact all three route options include;

- Due to the proximity of the tracks to the playground, a fence or barrier would be required to protect the park users and pedestrians; and
- The movement of the Tram Car could result in cyclists and pedestrian conflicts.

Safety concerns related to any on street routing options include;

- Cyclists could fall on slippery rails during wet weather. Cyclist's tires could also become trapped in the rail. Mitigation measures that would require further consideration include dedicated bike lanes to separate cyclists from the travel lane or prohibiting cyclists on the roads and intersections used for the Tram route.
- Operational and safety challenges for motorists, cyclists and buses. Potential mitigation measures for safe Tram integration to the street system may include traffic signal modifications, the dismounting of cyclists, removal of street parking, introduction of traffic control personnel, re-arrangement of traffic flow and turning movement conditions.

Regulatory and Operational Considerations

Technical Safety BC would require that the City of Richmond secure an operating certificate based on the regulations to run a rail service. The following additional resources would be required:

- Full time staff or contractor expertise;
- Safety management plan;
- Communication plan;
- Electrical safety plan;
- Medical clearance, training and qualification of crew and maintenance personnel; and
- Insurance.

Business Case

A high-level business case based on the estimated costs and anticipated revenue for Tram routing options 1, 2 and 3 was developed. The results indicate that the capital and ongoing operating costs for all options significantly exceed the anticipated revenue of running a seasonal Tram.

A revenue estimate based on seasonal operation is detailed in Table 3 below.

Table 2: Tram Routing Options and Estimated Annual Revenue and Operational Costs

Route Option	Estimated Annual Revenue	Estimated Annual Operational Costs*	Annual Subsidy
Option 1: Moncton Street	\$57,600	\$500,000 to \$1M**	\$442,400 to \$942,400
Option 2: Off Street: in Park	\$28,000	\$500,000	\$472,000
Option 3: On Street: track – Moncton St., Third Ave., Bayview St., No. 1 Road	\$86,000	\$500,000 to \$1M**	\$414,00 to \$914,000

**Annual operational costs include Tram maintenance, track and infrastructure maintenance, insurance and some personnel. The operational costs do not include all provisions for additional staff costs related to maintenance, operations and traffic control.*

*** Operating Budget Impacts due to removal and replacement of rails and power for completing road and utility infrastructure works have not been included.*

A survey of other tram services indicates fares average \$5.00 fare for tourism-oriented use. As the assessed routes are relatively short, the average fare for Option 2 was estimated at \$1.00 and \$3.00 for Options 1 and 3.

The business case analysis includes the use of volunteers to assist with program delivery including greeting visitors, narrating tours and assisting with events. While this helps to achieve cost savings, many of the positions related to tram operation require specialized skills and would therefore require trained staff to ensure safety and reliability of service. If staff were required for these potential volunteer positions, the annual subsidy required would be greater.

Steveston Streetscape Impacts

At the November 21, 2017, Planning Committee a report from the Director, Transportation and the Manager, Policy Planning, titled “Update: Proposed Steveston Area Plan Village Conservation Changes and Long Term Streetscape Visions for Bayview, Moncton and Chatham Streets” was presented. The following referral was made regarding the streetscape options:

That the recommended long-term Bayview, Moncton and Chatham Street Streetscape visions be referred back to staff for further investigation and future reporting on issues related to details of the streetscape elements, the Steveston interurban Tram and an upgraded Steveston bus exchange.

The findings conclude that none of the options presented in the staff report preclude a future operating Tram. The Tram can be accommodated in a single travel lane on both Bayview and Moncton Street under the existing and proposed future conditions. Locations of any stops along these streets will require re-allocating the placement or the elimination of some street elements, such as enhanced boulevards, bike lanes, street furniture and on street parking.

The recommended long-term streetscape for Bayview Street comprises shifting both the north and south curbs to create a wider pedestrian realm on the south side of the street combined with removal of the on street parking on the south side for provision of a two-way protected cycling facility on the south side, or a bi-directional cycling lane.

The Tram can operate in the south travel lane on Bayview Street in the eastbound direction. The preferred streetscape option for Bayview Street would not preclude the operation of the Tram. If the Tram was to operate ahead of the streetscape upgrades, there would be costs incurred for the removal and relocation of the rails to facilitate the recommended ultimate streetscape vision for Bayview Street in the future.

The recommended streetscape option for Moncton Street with slopes asphalt curb extensions to replace the existing concrete curb extensions at the intersections, will also be compatible with the route proposed along the westbound travel lane. At the intersection of No. 1 Road and Third Avenue where the Tram will turn, there will be impact to the road geometry and the curb extensions at some of the corners of the intersection.

Staff analysis has confirmed that operating the Tram car will be compatible with the proposed changes to the streetscape upgrades for Bayview and Moncton Streets and the streetscape options do not preclude operating the Tram car in Steveston Village in the future.

Steveston Tram Options

Based on the information provided by the consultants, the following options are presented for Council's consideration.

Option 1 – Maintain the Current Tram Program (Recommended)

With over 55,000 visitors annually and a high degree of visitor satisfaction, the current program offer at the Tram contributes to the rich offer of interpretive opportunities in Steveston. Making the Tram operational comes with considerable risks and challenges including risks to Tram Car 1220, the City's largest artefact, potential conflicts with other road users, including pedestrians and cyclists, and negative impacts to other valued community assets including the Steveston Nikkei Memorial. The proposed routing options are too short to offer a significant tourist experience and would require an operating subsidy.

Option 2 – Public Consultation

All options outlined in this report are technically feasible. Should Council wish to proceed beyond this feasibility review to advance the design to a functional plan, staff recommend engaging in a stakeholder and public consultation process that will include the Richmond Heritage Commission. This would provide an opportunity to assess the community's response to both the potential to make the Tram operational and to the routing options.

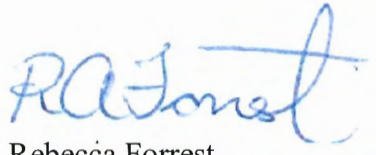
Staff would report back with these findings and recommendations. Should Council wish to advance planning after this initial public consultation process, additional funding would be required to complete a functional plan. This functional plan would provide more detailed information on regulatory and operational considerations, impacts for all road users, and provide cost estimates to a level required for a capital submission.

Financial Impact

None.

Conclusion

Staff recommend that the current program plan to interpret and preserve Tram Car 1220 is maintained. While the feasibility study shows that all options are technically feasible, there are considerable risks and safety implications when operating the Tram car in Steveston for cyclists, pedestrians, vehicles and the Tram itself.



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