

Document 1 - Details of the Potential Proposed Corridors in Ottawa

Source: STO website (www.sto.ca)

1. Introduction

Potential corridors in downtown Ottawa were assessed based on a number of considerations, including:

- System requirements
 - Straightest possible route for a tram.
 - Efficient connection with the O-Train stations.
 - Attractive system for riders (reliable, stops close to places of interest).
 - One way in each direction.
- Importance and prestige of the Confederation Boulevard
- City of Ottawa development plans
 - Queen Street redesigned as a complete street to accommodate more pedestrians.
 - Sparks Street rejuvenation plans.
 - Albert and Slater repurposed to include active transportation.
 - Various cycling projects, including on Bay and Wellington streets.

The studies conducted, including the above considerations, identified two main options for integrating the tram component:

- surface integration on Wellington Street; and,
- tunnel integration under Sparks Street.

Each of these options are described further below.

2. Surface Integration on Wellington Street Option

Description of the Integration Option

- Arrival by the Portage Bridge without overhead catenary wires.

- At-grade integration on Wellington Street without overhead catenary wires.
- Route continuing along Wellington Street until Elgin Street, in dedicated transit lanes.

Wellington Street has been identified as the preferred corridor for an at-grade integration of the tram. Two scenarios for this corridor were developed:

1. where traffic is maintained along the entire length of Wellington Street; and,
2. where vehicular traffic is eliminated between Bank Street and Elgin Street.

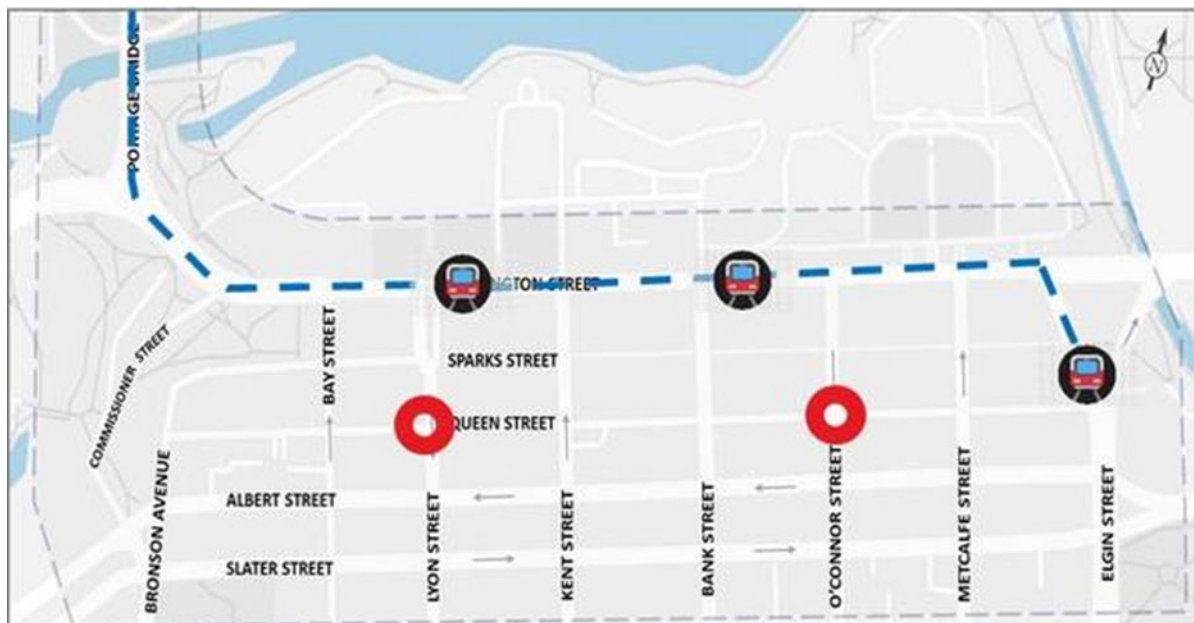
Although for each of these options, three tram stations would best meet the needs and objectives of the overall project, the many compromises necessary to fit each of them along this corridor is one aspect of this study that is still under review.

The design of a tram on Wellington Street would have to be in line with the needs, functions and esthetics of Confederation Boulevard, including its function as a ceremonial route and its symbolic role as a place of national interest. This could involve specific features, such as minimal infrastructure or running the tram on batteries instead of overhead catenary wires.

2A. Route and Proposed Tram Station Locations

- Distributing transit riders over 3 stations would allow for:
 - many customers to walk directly to their downtown destination without having to transfer to the O-Train, thereby reducing travel times; and,
 - more comfortable waiting, boarding and disembarking conditions (i.e. less crowding at each station).
- The following proposed locations would meet the needs of the project, but these would be refined during the next phases of the overall project where more detailed analysis of various aspects such as the built environment or the functional and security constraints of the areas would be undertaken.
 - Lyon / Wellington station;
 - Bank / Wellington station; and,
 - Elgin / Queen terminus station.

- Due to the very large anticipated volume of pedestrians coming from the first tram station that would be required to cross Wellington Street (either transfer to the O-Train at Lyon Station or to walk directly to a downtown destination), a pedestrian tunnel could be added to facilitate this movement. It would include a direct connection between these two stations. As with the different components of the project, this tunnel would be designed in compliance with the various applicable standards and regulations, including the most stringent safety requirements.
- Transfer time between the tram on Wellington and the O-Train Lyon and Parliament stations is estimated to be approximately 5 minutes (3 minutes walking and 2 minutes waiting at signalized intersections).



Proposed station locations for surface tramway option

2B. Impacts of the Integration Option

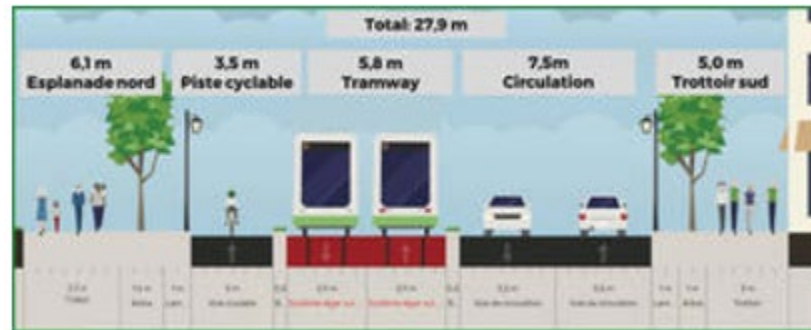
- Full redesign and reconstruction of the Wellington Street corridor to integrate the tram and the bike lane planned by the City of Ottawa and the NCC, while conserving a wide space for pedestrians in accordance with the standards for Confederation Boulevard.
- The stations would be designed to fit in with the layouts of Wellington Street and Elgin Street.

- Some STO buses would continue to cross over to Ottawa (in mixed traffic), using one of three loops, depending on the bus routes.

2C. Two Possible Traffic Scenarios

Two possible scenarios are under review for the Wellington corridor

Option 1: The scenario with traffic maintained along the entire length of Wellington Street.



Sample cross-section of Option 1

The following provides a brief description of the main elements of this potential scenario to integrate a tram along Wellington Street:

- The tram would operate on the north side of the street;
- Vehicular traffic would be maintained along the entire length Wellington Street, but reduced to one lane in each direction east of Lyon Street;
- Two eastbound right turn lanes from Wellington Street to Lyon Street would be maintained;
- Westbound left turns from Wellington Street to Lyon Street would be permitted, but the left turn lane would be eliminated;
- All other left turn lanes would be eliminated, and at some intersections, the left turns would not be permitted;
- Vehicular accesses to the Parliament complex (there are currently 8 access points) will be affected and all may not be maintained;
- There will be traffic impact on other downtown streets;

- Pedestrian sidewalks would be maintained on both sides of the street, including partial widenings where possible;
- A pedestrian passage under Wellington at Lyon is considered due to the expected high volume of pedestrian crossings at this location;
- A planned two-way cycling facility would be included;
- Some mature trees may have to be removed; and,
- An additional property would be required west of Bank Street.

Options to accommodate the planned cycling facility

Due to a limited available width on Wellington Street, particularly at the proposed Parliament tram station, four options for the integration of the cycling facility were considered:

As described below, none of these options are ideal. This corridor has several uses competing for space which would require compromises to be made.

These plans are presented for information only, the various aspects related to integration (impacts on the existing surroundings, intersections affected by the corridor, functional and security constraints, etc.) will be refined during upcoming steps.

Legend: the tram line is in red, the tram stations in yellow, and the cycle path in blue.

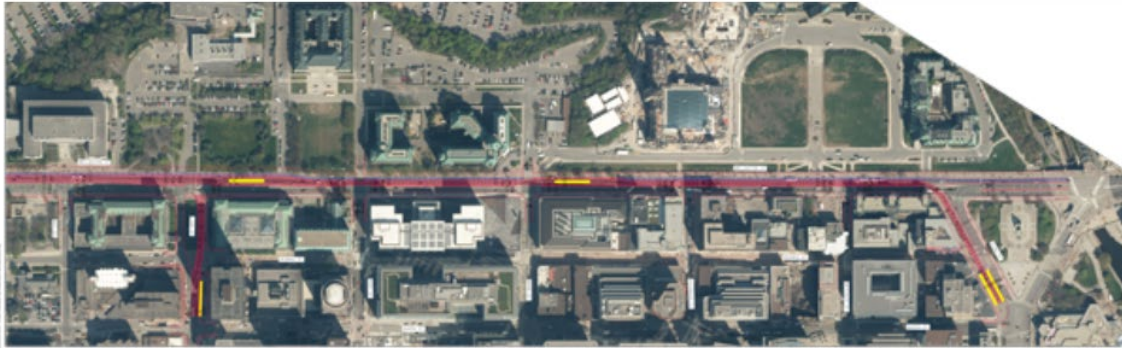
Option A: Discontinued east of Bank Street

The two-way cycling facility would be provided on the north side of the street between the Portage Bridge and Bank Street but wouldn't be available for the portion of Wellington Street east of Bank Street.



Option B: Shared with pedestrians at Parliament station

The two-way cycling facility would be provided on the north side of the street, but for a short section in the vicinity of the proposed Parliament tram station (approximately 50 m long), pedestrians and cyclists would have to share the same space.



Option C: Re-routed in front of Parliament

There would be a continuous two-way facility along Wellington Street, but in the vicinity of Parliament it would be re-routed from Wellington's roadway edge and proceed along the Parliament internal roadway network.

Note: the plan of option C is displayed east of Bank Street only because it is identical to option A west of Bank Street.



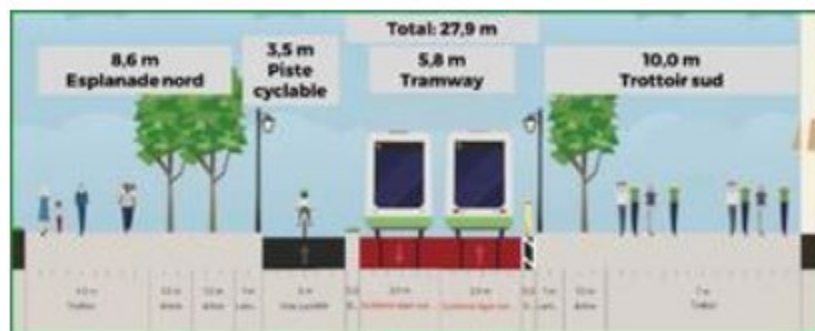
Option D: Continuous, but with reduced widths at the Parliament tram station

There would be a continuous two-way cycling facility along Wellington Street, but in the vicinity of the Parliament tram station, the widths of both the cycling facility (2.5 m) and the adjacent sidewalk (3) would be reduced on approximately 50 meters.

Note: the plan of option D is displayed east of Bank Street only because it is identical to option B west of Bank Street.



Option 2: The scenario without traffic between Bank Street and Elgin Street. In this scenario, traffic is disrupted between Bank Street and Elgin Street to leave more space for active modes.



Sample cross-section of Option 2

The following provides a brief description of the main elements of this scenario to integrate a tram along Wellington Street:

- The tram would operate on the north side of the street;
- Vehicular traffic would be maintained along Wellington Street west of Bank Street, but reduced to one lane in each direction;
- Vehicular traffic would be eliminated between Bank Street and Elgin Street;
- Two eastbound right turn lanes from Wellington Street to Lyon Street would be maintained;
- All left turn lanes west of Bank Street would be eliminated, and at some intersections, the left turns would not be permitted;

- Vehicular accesses to the Parliament complex (there are currently 8 access points) will be affected and all may not be maintained;
- There will be traffic impact on other downtown streets;
- Widened pedestrian sidewalks would be provided on both sides of the street;
- A pedestrian passage under Wellington at Lyon is considered due to the expected high volume of pedestrian crossings at this location;
- A planned two-way cycling facility would be continuous along Wellington Street;
- Existing mature trees should be able to be preserved; and,
- An additional property would be necessary west of Bank Street.

Note: this plan is presented for information only, the various aspects related to integration (impacts on the existing surroundings, intersections affected by the corridor, functional and security constraints, etc.) will be refined during upcoming steps.

The following plan shows the tram integration for this scenario:



Legend: the tram line is in red, the stations in yellow, and the cycle path in blue.

2D. Constraints related to access to Parliament Hill

There are currently 8 access points to and from Parliament Hill on the north side of Wellington Street. In order to integrate the tram on Wellington Street while remaining as much as possible within the available right-of-way, these accesses will have to be further studied in depth in order to confirm the layouts that will ensure efficient traffic circulation to and within Parliament Hill. It should be noted that integrating a tram on Wellington Street will likely significantly impact many of these accesses in order for the tram to run efficiently and safely. This impact to the Parliamentary accesses may be

deemed too significant for the functions of Parliament Hill which could affect the feasibility of this option.



Existing accesses to Parliament Hill

3. Tunnel Integration Under Sparks Street Option

Description of the Integration Option

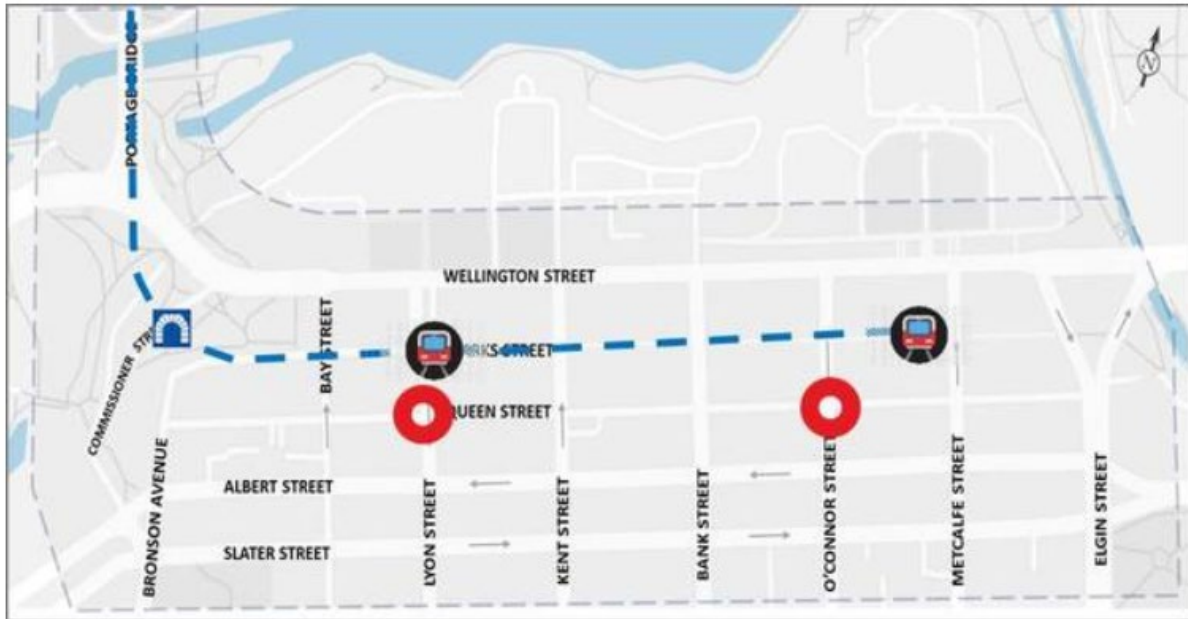
- Arrival by the Portage Bridge.
- Crossing the open space west of Commissioner Street.
- Integration into the tunnel in the vicinity of Commissioner Street.
- The route runs parallel to that of the O-Train, but under Sparks Street instead of under Queen Street.

Sparks Street has been identified as the preferred corridor for a tunnel integration of the tram.

3A. Route and Proposed Tram Station Locations

- The stations would be positioned to facilitate transfers with the O-Train:
 - Lyon/Sparks station; and
 - O'Connor/Sparks terminal station.
- These proposed locations would meet the needs of the project, but these would be refined during the next phases of the overall project where more detailed analysis of various aspects such as the built environment or the nature of the soils and its geotechnical characteristics would be undertaken.
- The tunnel can be brought close to Elgin Street, but it would be difficult to have a station in the vicinity of O'Connor Street and another in the vicinity of Elgin Street because they would be too close to each other for efficient transit operation.

- Pedestrians could choose the quickest route out of the tunnel to their destination, including direct underground connections to the O-Train stations which would provide weather protected transfers. Exits would be strategically located to optimize access to users' final destinations.



Proposed station locations for tunnel tramway option

3B. Impacts of the Integration Option

- Redesign and reconstruction of the area next to the open space west of Commissioner Street.
- Some STO buses would continue to cross over to Ottawa on surface, in mixed traffic.
- Very low impact on the urban layout, no impact on Wellington Street.

Preliminary assessments have concluded that a tunnel under Sparks street would be technically feasible. The intent of these preliminary assessments was not to finalize an exact alignment (both horizontal and vertical) but rather to consider the implications of this option in terms of feasibility, potential constraints and impacts on transit customers.

3C. Preliminary Assessments

Sparks Street was chosen because:

- proximity to the downtown core;

- can accommodate the alignment of a tram to/from Portage Bridge; and,
- proximity to the O-Train stations to facilitate underground transfers between the two systems.

Key findings of these preliminary assessments include:

- several constraints exist under Sparks Street, but none that would prevent the construction of a tunnel. Some of these issues include:
 - the right-of-way width of Sparks Street will limit the width of the tunnel and stations;
 - existing underground infrastructure and utilities will have to be avoided or relocated;
 - access to stations will have to be added at surface level, possibly incorporated into existing buildings; and,
 - special attention will be paid to heritage and security issues for certain buildings.
- the elevation difference between the Portage Bridge and downtown Ottawa should facilitate tunneling through the existing bedrock;
- major underground infrastructure at Kent Street would have to be relocated to accommodate the construction of the tunnel. This will require more detailed analysis;
- a 3-station option would not be viable, based on the space limitations for the design of the underground stations and their proximity to each other in the downtown core; and,
- the approach to the tunnel portal will have impact on the open space west of Commissioner Street, which this project will have to mitigate.

The following is the concept plan for a tram tunnel under Sparks Street:



Legend: the tunnel for the tram coming from Gatineau and its stations are in purple, the O-Train tunnel is in black with stations in red.

Note: this plan is presented for information only, the various aspects related to integration will be refined during upcoming steps.