

# TORONTO TRANSIT COMMISSION REPORT NO.

**MEETING DATE:** May 28, 2009

**SUBJECT:** EAST BAYFRONT TRANSIT ENVIRONMENTAL  
ASSESSMENT: STREETCAR SERVICE ON QUEENS QUAY  
EAST BETWEEN YONGE STREET AND PARLIAMENT  
STREET

## **ACTION ITEM**

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### **RECOMMENDATIONS**

It is recommended that the Commission:

1. Request that Toronto City Council:
  - a) authorize the Chief General Manager of the TTC and the General Manager of Transportation Services to issue a Notice of Completion for the East Bayfront Transit Environmental Assessment, following the completion of the Environmental Study Report (ESR) substantially in the form outlined in this report, and place the report in the public record for a minimum 30-day period in accordance with the requirements under the Municipal Class Environmental Assessment Act;
  - b) authorize the installation of traffic control signals at only the following intersections on Queens Quay East: Freeland Street, the westerly-most access to 95 Queens Quay East, Richardson Street, Sherbourne Street, and Proposed Street "D" (as shown in Exhibit 11), coincident with the reconstruction of Queens Quay East;
  - c) require that any future proposals for the installation of additional signals on this section of Queens Quay East be supported by an independent technical audit, completed to the satisfaction of the General Manager, Transportation Services and the Chief General Manager of the TTC, to ensure that such signals can be installed in a way that does not negatively affect streetcar operations. This includes the signals suggested for Small Street, Bonnycastle Street and proposed "Street A" as shown in Exhibit 11; and
  - d) direct that the truck-movement control gate required for the eastern, egress-only, access from Redpath Sugar, be owned and operated by the TTC to ensure that priority for streetcar operations is maintained to optimal design;
2. Note that:
  - the project provides for streetcars operating in a new tunnel section east of the existing streetcar tunnel at Queens Quay West and Bay Street, through a portal on the south side of Queens Quay East between Yonge Street and Freeland Street, and on a surface transit right-of-way on the south side of Queens Quay East between Freeland Street and Parliament Street;
  - the recommended design includes a 38-metre overall right-of-way on Queens Quay East incorporating a dedicated streetcar right-of-way south of two through auto lanes (one in

**EAST BAYFRONT TRANSIT ENVIRONMENTAL ASSESSMENT: STREETCAR SERVICE ON QUEENS QUAY EAST BETWEEN YONGE STREET AND PARLIAMENT STREET** Page 2

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- each direction), a continuous Martin Goodman Trail, and generous sidewalks and median space separating the uses in the corridor;
- the *East Bayfront Transit EA* project is being undertaken and funded by Waterfront Toronto as part of a larger project to reconstruct Queens Quay between Bathurst Street and Parliament Street;
  - approval for the transit elements of the overall project are in two parts:
    - i) the *East Bayfront Transit EA* addresses the section east of Yonge Street, which is the subject of this report, and
    - ii) a separate City staff report, entitled *Queens Quay Revitalisation EA Study*, addresses the section west of Yonge Street;
  - the development of the preferred design has been a joint initiative between Waterfront Toronto, the City of Toronto, and the TTC and has included an extensive public input process and a significant emphasis on excellence in urban design;
  - the recommended design addresses City of Toronto Council's concerns related to assessing alternate cross-section design options for Queens Quay East and minimising the curb-to-curb distance on the roadway to improve pedestrian access;
  - this report has been prepared jointly by TTC staff and City of Toronto staff who concur with the recommendations;
  - TTC and Waterfront Toronto staff are developing a Delivery Agreement for the TTC to undertake the design and construction of the transit elements of the project to ensure that the resulting transit facilities are acceptable to the TTC;
  - conditional on appropriate funding approvals by Waterfront Toronto, road, transit and associated urban realm improvements are planned for design in 2010/2011 and construction in 2012/2014. Opening day for the transit operation is expected to be in 2014;
  - initially, streetcar service on the line would operate on Queens Quay East between Union Station and a temporary streetcar loop east of Parliament Street. The design of the new line permits future operation further east when development occurs in the Lower Don and Port Lands areas; and
  - the light rail vehicles required for the operation of this service have been included in the TTC's order of new low-floor streetcars to replace the existing aging fleet;
3. Forward this report to the Executive Committee of the City of Toronto, to be considered in conjunction with the Queens Quay Revitalization EA staff report on June 2, 2009); and,
  4. Forward this report to Waterfront Toronto and Councillor McConnell for information.

## **FUNDING**

No TTC funds are available for this project. Waterfront Toronto is expected to provide the funding required for construction of the East Bayfront Streetcar line, including a share of the expansion of the Union Station streetcar Loop required for streetcar service to the East Bayfront area. The project is included in the TTC's 2009-2013 Capital Program as a "below-the-line"

project which can proceed only upon confirmation of funding commitments from Waterfront Toronto.

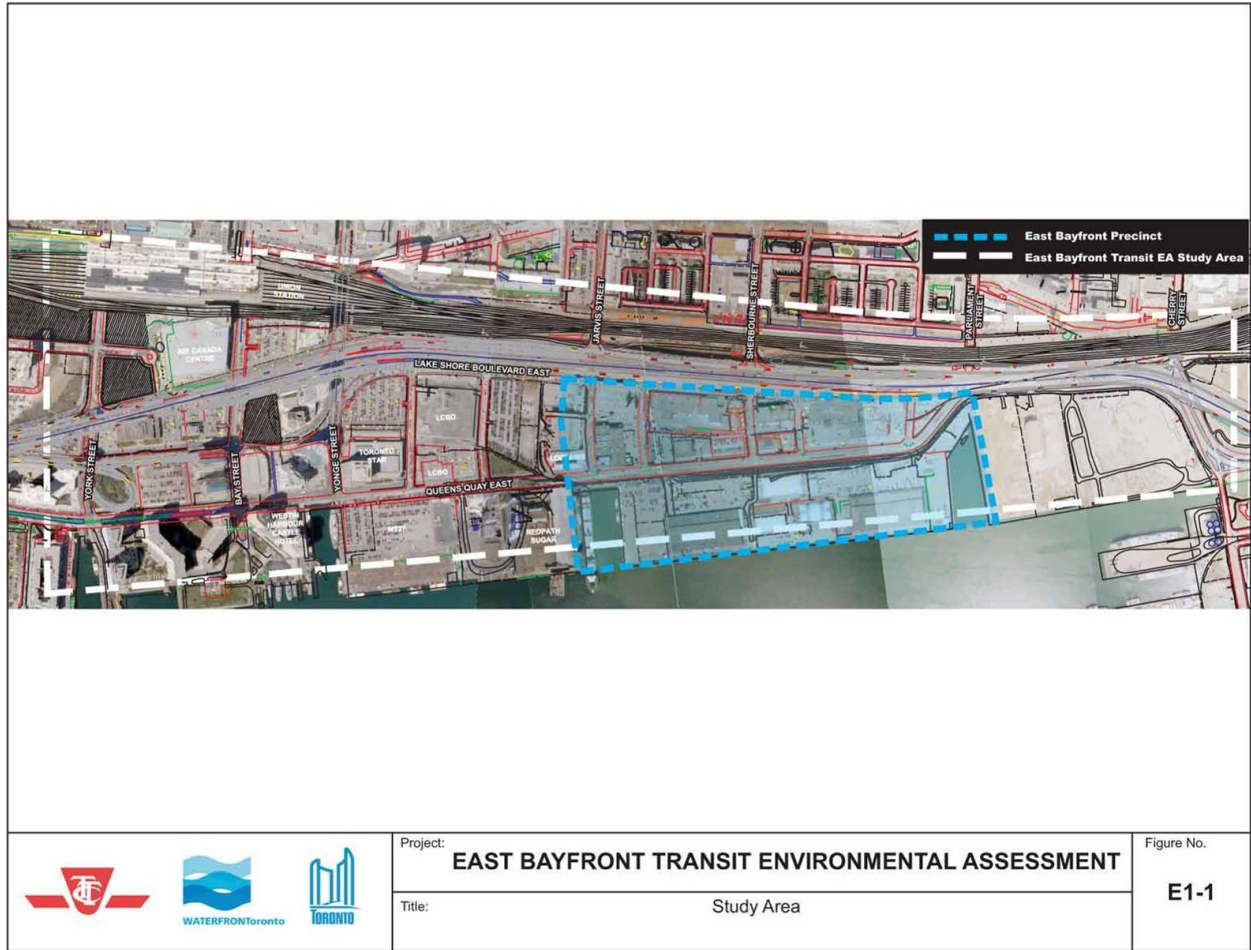
## **BACKGROUND**

Waterfront Toronto (formerly the Toronto Waterfront Revitalization Corporation, TWRC), was formed with the mandate and responsibility for developing Toronto's waterfront, including the East Bayfront area. The Corporation is jointly owned by the City of Toronto, the Province of Ontario and the Government of Canada. Waterfront Toronto is the proponent for all revitalization activities in the East Bayfront area and the *East Bayfront Transit Environmental Assessment Study* has been carried out under their auspices. They have funded the study, and plan to implement the recommendations of the study as part of their mandate, including all design and construction costs related to transit facilities required to serve the East Bayfront area.

The East Bayfront development area is located generally east of Lower Jarvis Street and west of Parliament Street, between Lake Shore Boulevard and the inner harbour shorelines, as shown in Exhibit 1. The area is planned to undergo a transformation from derelict brownfields into a mix of new higher-density residential and commercial uses. The East Bayfront precinct is a 25-hectare site that ultimately will have 6,600 housing units, and 186,000 square metres of non-residential development. George Brown College plans to locate a campus accommodating 4,200 full-time students in the area. When fully occupied, these developments are expected to generate an additional 4 million riders per year for the TTC.

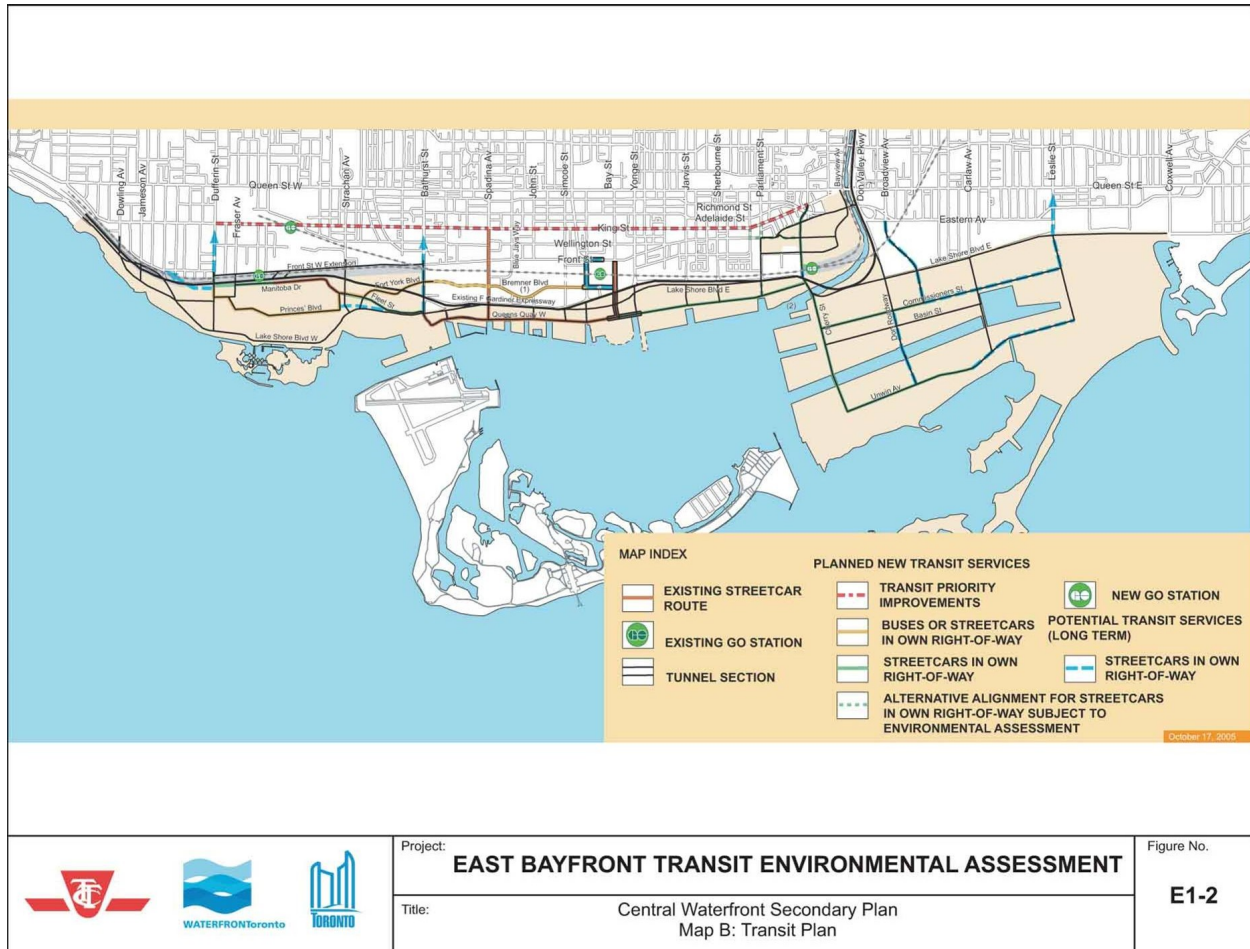
Toronto City Council adopted the *Central Waterfront Secondary Plan* in 2003, in part, to establish guiding principles for the redevelopment of brownfield sites such as the East Bayfront area. One of the principles established was the need to strongly encourage non-auto-based travel in the newly-developing areas and, as shown in Exhibit 2, the *Plan* envisioned a network of streetcars operating in their own rights-of-way throughout the Eastern Waterfront.

## **Exhibit 1: East Bayfront Transit Environmental Assessment – Study Area**



Council reinforced this principle by approving a “transit first” policy for waterfront development, whereby surface rapid transit services are to be constructed at the earliest stage of the redevelopment process so that excellent transit services are in place by the time the first developments are occupied, thereby encouraging transit oriented travel patterns from the outset.

**Exhibit 2: Central Waterfront Secondary Plan – Transit Plan**



In December, 2005, City Council endorsed the *East Bayfront Precinct Plan* and *Environmental Assessment Master Plan* which included the provision of exclusive transit rights-of-way on the roadways identified in the *Secondary Plan*. Concerns were raised at that time that the resulting roadway, premised on two auto travel lanes in each direction, was too wide on Queens Quay East. Council approved the *Environmental Assessment Master Plan* subject to, among others, the following conditions:

- “the recommended preferred design and alternate cross-section design options for Queens Quay between Jarvis Street and Small Street be identified as ‘preliminary, subject to further evaluation’ in the context of the upcoming Transit EA Study”;
- “the TTC and the TWRC be directed, in the Transit EA, to revisit whether smaller rights-of-way are technically feasible and desirable; and
- “the TTC and the TWRC consult with community stakeholders on this matter;”

In June, 2005, the Commission authorised TTC staff to undertake environmental assessment studies for transit projects in the Eastern Waterfront including a study of transit needs in the East Bayfront area on behalf of Waterfront Toronto. The study has been done in close co-operation with City of Toronto and Waterfront Toronto staff, with a project team made up of representatives

of the TTC, City of Toronto and Waterfront Toronto guiding the study. A consortium of consultants led by McCormick Rankin Corporation is undertaking transit environmental assessment studies in the Eastern Waterfront, under the direction of the project team.

The *Environmental Assessment Study* for transit services in the East Bayfront was initiated as an Individual Environmental Assessment. In September, 2007, the Ministry of the Environment approved an amendment to the Municipal Class Environmental Assessment to permit transit projects to be undertaken under the Municipal Class EA Process, and TTC staff elected to formally convert the study to fall under the new Municipal Class EA Process for transit projects.

This report provides an overview of the *Environmental Assessment Study*, and describes the key decisions that led to the recommended alternative, which is the operation of streetcars in their own right-of-way on the south side of Queens Quay to serve the East Bayfront area with a tunnel section west of Freeland Street connecting to the existing streetcar tunnel on Bay Street, and an expansion of the streetcar loop at Union Station to accommodate the new service.

## **DISCUSSION**

The redevelopment of the City's brownfield waterfront sites and, in particular, the East Bayfront precinct, represents a significant opportunity to attract people and jobs to the City as envisioned in the City's *Official Plan*. The *Official Plan* calls for an intensification of land uses in the city to make best-use of existing infrastructure and to achieve the large environmental and sustainability benefits of a compact urban form. Transit plays a critical role in achieving this objective if it, along with pedestrian and cycling modes of travel, can provide a reasonable alternative to auto travel.

Ridership forecasts, and studies of existing higher-density mixed-use communities in the City, indicate that, if an effective transit system is in place, at peak times, non-auto mode splits of 50% to 60% are achievable. In the East Bayfront area, 40% of all trips are expected to use transit services. This is based on a number of factors including location, proposed land uses, and the plan for an integrated transit network in the Eastern Waterfront, as shown in Exhibit 3.

### **Exhibit 3: Future Transit Network in the Eastern Waterfront**



The purpose of the *East Bayfront Transit Environmental Assessment Study* has been to determine the transit facilities required to serve the long-term needs of the study area, while achieving the TTC’s objectives of high-quality, reliable transit services and the City’s and Waterfront Toronto’s objectives of design and environmental excellence. The remainder of this report outlines the process, results and conclusion of this study.

### Current Conditions

The East Bayfront Precinct area is currently an underused brown-field site, which has been considered a prime candidate for revitalization for decades. Within the precinct area, lands along the south side of Queens Quay East from Lower Jarvis Street to Parliament Street are in public ownership. The land north of Queens Quay East is evenly split in ownership between Waterfront Toronto and private interests.

Based on the approved *East Bayfront Precinct Plan* and the *Environmental Assessment Master Plan*, Waterfront Toronto is proceeding with approvals, design and construction of a number of elements of the *Plan* including:

- widening the right-of-way of Queens Quay East to improve public realm and transportation functions;

- construction of the streetcar right-of-way and implementation of streetcar service along Queens Quay East; and
- building of new sewer, watermain, and stormwater infrastructure.

Land uses along Queens Quay, from Bay Street easterly, vary widely from high-density residential and commercial uses west of Freeland Street, to low-density commercial and industrial uses east of Freeland Street. The Redpath Sugar plant is located just west of the Jarvis Street Slip, which is outside the area addressed in the *East Bayfront Precinct Plan*. A rail spur formerly serving the plant has been terminated.

There are minimal historic or heritage features remaining on the site and there is negligible vegetation, with limited diversity aquatic habitat in the vicinity of the East Bayfront, and no other features of natural environmental significance.

Currently, there are three north-south transit routes serving the area and no east-west services through the area. The TTC's 75 SHERBOURNE, 97B YONGE and the 6 BAY routes provide north-south services to the Queens Quay East/Lower Jarvis area. The 509 HARBOURFRONT and 510 SPADINA streetcar routes, providing frequent services to and from Union Station, are on the periphery of the study area. Both streetcar routes operate along a dedicated right-of-way in the centre of Queens Quay West.

In addition, the 509 HARBOURFRONT and 510 SPADINA services are not currently accessible for many people with limited mobility, or passengers who use mobility aids. The Accessibility for Ontarians with Disabilities Act (AODA) requires the TTC to ensure that its services are accessible to people with mobility limitations. The TTC is in the process of purchasing replacement streetcars that will have low floors, which will help to address this problem, but passenger platforms are also an important element in making transit services fully accessible. The provision of passenger platforms is a requirement for any newly constructed streetcar/light rail line through the East Bayfront area.

### Purpose of the Project

Current transit services in the area are beyond a convenient walk for most of the large numbers of travelers expected to and from the new developments planned for the new East Bayfront community. The *East Bayfront Precinct Plan* established a goal of providing frequent and reliable transit service within a 5-minute walk of most residents of the East Bayfront area and current services do not meet this objective.

In addition, the developments in the East Bayfront are not occurring in isolation. A fundamental principle of the broader planning for the waterfront area is the need to tie future development into the fabric of city by encouraging linkages between existing communities and future communities. From a transit perspective, this is achieved by providing an integrated network of transit services that link both north-south and east-west into and through the community. Transit services in the East Bayfront need to be integrated with redevelopment plans for the West Don Lands, Lower Don Lands, and Port Lands areas to achieve the overall benefits of the broader integrated planning approach being taken in the waterfront area.

### Community Involvement Process

Waterfront Toronto has established a high standard for public and community involvement in its



work, and has been successful in engaging both the local community, and a wide range of interested community groups and individuals in the planning process for the waterfront. This approach has been incorporated into the planning process for the *East Bayfront Transit EA*. A thirteen-member Community Liaison Committee was established for the study, which met seven times during the course of the EA study to provide input and advice on the conclusions being reached and on mechanisms to achieve effective consultation. In addition to three formal public workshop/information centres conducted during the study, a drop-in style information centre was also part of the public input process. The feedback provided through the public input process resulted in a refined design concept that addresses the concerns and issues brought forward by the community. Consultation for the *East Bayfront Transit EA* was carried out in conjunction with the *Queens Quay Revitalization Class EA*, which has a study area that overlaps with the *Transit EA*. Numerous meetings with major landowners and property developers in the *Transit EA* study area were carried out by Waterfront Toronto for the benefit of both EA studies. Results from these discussions helped guide the development and selection of the preferred design alternative for the entire Queens Quay corridor.

#### Approach to Assessment of Alternatives

The assessment was undertaken in three stages. The first related to assessing overall needs, and the identification of a preferred corridor. The second stage looked at alternatives related to the preferred vehicle technology to provide the best quality of transit service in the chosen corridor. The third and final stage, looked at alternatives related to the preferred way of designing the transportation facilities and public realm to best accommodate the preferred vehicle type. In accordance with the Class EA process, input from the public and key stakeholders was sought at each key decision point.

A significant first step in the needs assessment was the undertaking of travel demand forecasts to better-understand travel needs in the community and, in particular, the need for transit capacity through the study area. A key assumption in the analysis was that an enhanced network of high-quality transit services will be provided in and around the Eastern Waterfront area that will be successful in attracting a high-mode split to transit. Based on an approach used by the City of Toronto for its transportation planning work and preparation of its Official Plan, the travel demand analysis concluded that, assuming a mature state of redevelopment in the Eastern Waterfront area, up to 4,250 people will be traveling on transit through the East Bayfront area in the peak direction during a typical weekday morning peak hour. The conclusion was a key input in the selection of the preferred corridor and transit technology.

The next step in the needs assessment was the decision on the number of through auto traffic lanes on Queens Quay East: 2 lanes versus 4 lanes. It should be noted that, from the outset of this study, there has been a preference to adopt as narrow a right-of-way as possible to minimize overall scale of the street while providing the necessary cross-sectional elements. The traffic operations analyses, undertaken as part of the *East Bayfront Class EA Master Plan*, demonstrated that provision of only 1 through lane in each direction on Queens Quay East (2 lanes in total) adequately supports future development along the corridor, provided that dedicated turn lanes are available at key intersections. There would be limited roadway capacity for through-traffic, but this condition was deemed an acceptable trade-off given the benefits to the local community itself. The lack of discretionary auto capacity has the potential to discourage transient auto traffic and maintain Queens Quay East as a local roadway for local developments.

This conclusion results in benefits for the East Bayfront from a community and urban design perspective, and provides an opportunity to narrow the traveled portion of Queens Quay East. This conclusion has been an important input into the second stage of the assessment process related to the preferred design for Queens Quay East.

#### Preferred Corridor – “Queens Quay Only”

Providing a convenient link to Union Station, while serving the long term residential, employment, and waterfront access needs in the East Bayfront area, is a key requirement of the study. The Project team assessed two corridor options to serve East Bayfront area:

1. **‘Queens Quay Only’**: One transit facility along the Queens Quay East-Bay Street corridor. Trips to/from the East Bayfront and Port Land areas would be served by transit on Queens Quay East.
2. **‘Queens Quay Local plus Lake Shore Express’**: One transit facility along the Queens Quay East-Bay Street corridor to serve local demands and a second transit facility along Lake Shore Boulevard to provide an express bypass route for those riders passing through the study area.

The Queens Quay East corridor bisects the future development in the precinct and provides the most direct service to and from existing and future development. It also allows for a connection to the existing streetcar tunnel under Bay Street. The Lake Shore corridor is on the northern edge of the study area and, while providing a possible bypass route for transit users passing through the study area, it would provide only limited direct service to existing and future development in the East Bayfront area.

The options were evaluated based on a comprehensive set of evaluation criteria to determine the preferred alternative. The ‘Queens Quay Only’ option of providing service to Union Station is preferred because it will fully serve developments in the East Bayfront and Port Land areas, provide higher-service frequency on Queens Quay East, and result in lower capital cost. The ‘Queens Quay Local plus Lake Shore Express’ option would require two parallel facilities in close proximity which would, in turn, reduce service frequency on Queens Quay East while incurring higher capital cost. The need for ‘Lake Shore Express’ to negotiate through-traffic around Union Station, as determined in the review of this option, would also result in transit operational delays and create adverse impacts on Front Street from transportation, public realm, and urban design perspectives.

The assessment confirmed the need for transit services on Queens Quay in the East Bayfront, to connect with planned services on Cherry Street in the West Don Lands area, and to the Port Land area to the south. These connections are elements of the *Lower Don Lands Class EA Master Plan*, which is being undertaken by Waterfront Toronto. The preferred design for these connections will be addressed in that study.

#### Preferred Technology: Streetcar in Dedicated Right-of-Way

The Project Team began with considering a wide range of possible transit technologies. It was

determined that the anticipated travel demand in the corridor does not warrant the expense of fully-grade separated facilities (such as a subway) and these options were screened from further consideration. A number of bus propulsion technologies were identified including those that would eliminate local emissions, such as electric or fuel-cell technology buses. The assessment was done based on the best future technology. Therefore, for this comparison, it was assumed that buses, in the future, will have zero local emissions (assuming fuel cell or electric propulsion). Suggestions were also made by the Community Liaison Committee concerning the possible elimination of the current streetcar connection between Queens Quay and Union Station and replacement by a 'moving walkway' or a 'people mover'.

The Project Team assessed five technology options to serve East Bayfront area:

1. bus in mixed-traffic ('Do Nothing' alternative)
2. streetcar in mixed-traffic
3. bus in dedicated right-of-way
4. streetcar in dedicated right-of-way
5. streetcar or bus on Queens Quay plus 'moving walkway' under Bay Street

Mixed-traffic operations were screened out as they do not provide a high enough quality of transit service (reliability and speed) to compete effectively with the automobile, attract a high mode-split to transit, and address projected significant future travel demand in the Eastern Waterfront area.

The Project Team then examined connection issues between Queens Quay and Union Station. The concept involves replacing transit in the existing Bay Street Tunnel with a pedestrian 'moving walkway'. Transit vehicles would only operate east-west on Queens Quay while passengers heading north to Union Station would have to transfer at Bay Street and use the underground 'moving walkway' to get to Union Station. Although the concept would improve streetscape by eliminating the existing tunnel portal on Queens Quay, the need to transfer would create an inconvenience to transit users, resulting in reduced quality of service and reduced ridership. Therefore, the 'moving walkway' concept was screened out by the Project Team.

Bus services in a dedicated right-of-way would require significant reconstruction of the existing Bay Street Tunnel to accommodate buses as well as existing streetcar services to/from the west. As a bus carries fewer passengers than a modern streetcar, a bus service would require many more vehicles than a streetcar service to meet the demand. The large number of buses needed to operate the Queens Quay East service, combined with existing streetcar services from the west, would result in significant bunching and delays at Union Station, affecting the reliability and attractiveness of the services. Streetcars, with higher passenger capacity, would be capable of meeting the ridership demand and still operating at manageable headways. Also, buses cannot be integrated well with the existing streetcar services on Queens Quay, or future streetcar service on Cherry Street, whereas, streetcars will fit seamlessly within the existing network that is prevalent in the downtown area. For these reasons, streetcars in a dedicated right-of-way are preferred over buses.

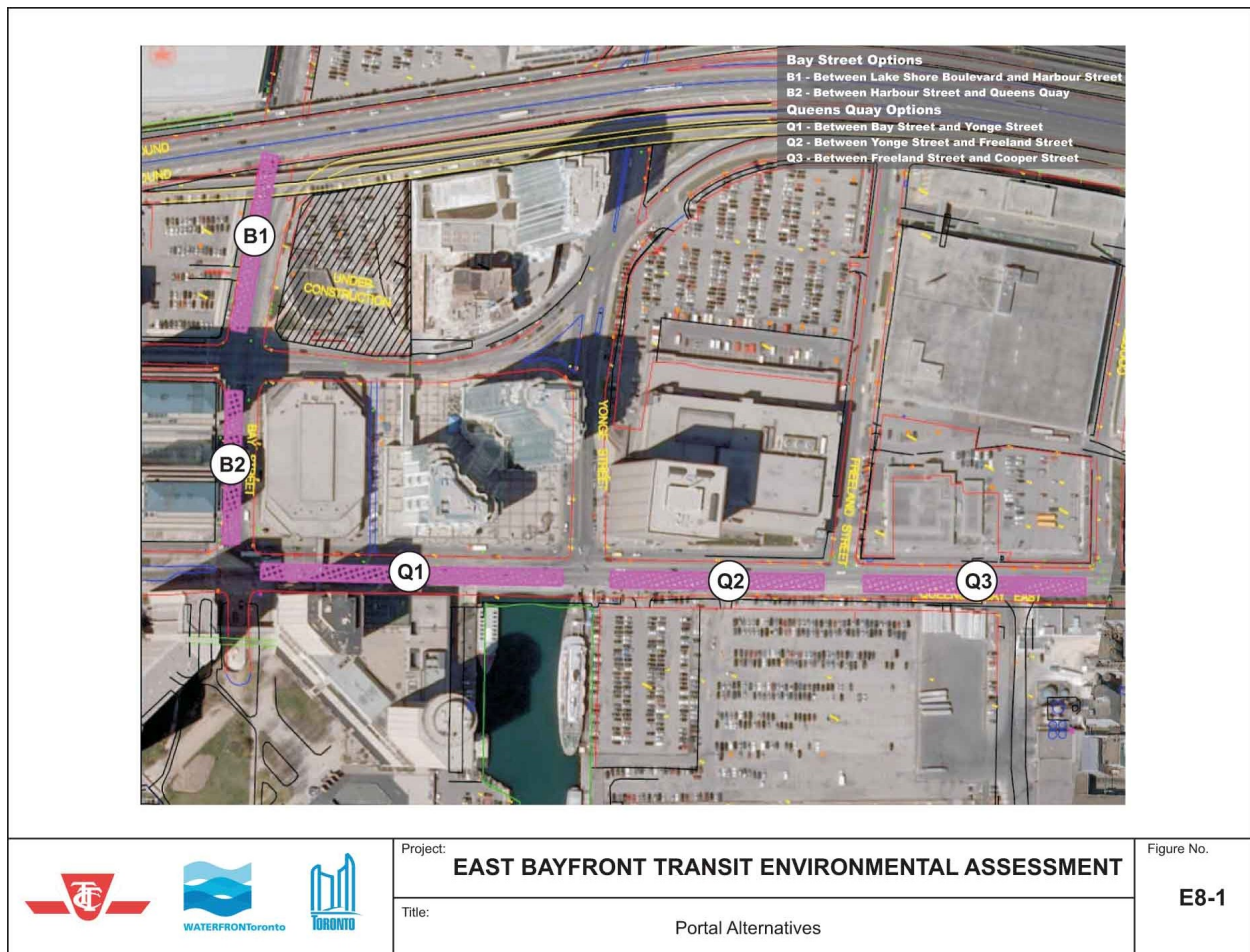
### Preferred Portal Location

The Project Team examined a wide range of possibilities of where to locate the transition from the existing streetcar tunnel under Bay Street to a surface right-of-way. A long list of options was considered: Yonge Street, Bay Street, York Street, Harbour Street, and Queens Quay. A high-level assessment was carried out to screen out options that were less feasible. Yonge Street, York Street and Harbour Street were screened out from further considerations as all of these options would create an undesirable impact on transit and traffic operations, impose a circuitous and indirect transit access to Union Station from Queens Quay, and result in higher impacts on existing commercial and residential features in the area.

As shown in Exhibit 4, five short-list alternatives were considered:

- Option B1 – Bay Street between Lake Shore Boulevard and Harbour Street
- Option B2 – Bay Street between Harbour Street and Queens Quay
- Option Q1 – Queens Quay between Bay Street and Yonge Street
- Option Q2 – Queens Quay between Yonge Street and Freeland Street
- Option Q3 – Queens Quay between Freeland Street and Cooper Street

### **Exhibit 4: Portal Alternatives**



The Bay Street options (B1 and B2), would require all streetcars to and from Union Station to enter through the Bay Street/Queens Quay intersection at-grade, mixed with surface traffic and pedestrian movements. There would be one tunnel portal on Bay Street serving all streetcars from Queens Quay West and Queens Quay East. The existing portal on Queens Quay west of Bay Street would be eliminated. Extensive modification to the existing Bay Street Tunnel would also be required.

The Queens Quay options (Q1, Q2, and Q3), require an extension of the existing Bay Street Tunnel easterly from the Bay Street/Queens Quay intersection to a new portal on Queens Quay East. All streetcars to and from Union Station would operate through the Bay/Queens Quay intersection underground, grade-separated from surface traffic and pedestrian movements. There would be two tunnel portals on Queens Quay: the existing portal west of Bay Street and a new portal east of Bay Street.

Option B2, was screened out subsequently as there is inadequate space on Bay Street south of Harbour Street to accommodate the required track geometry at the Bay Street/Queens Quay

intersection. The remaining alternatives were evaluated with respect to a wide range of objectives. Impacts on transit service, traffic operations, public realm, and existing commercial and residential features were considered major factors in the selection process. Through a detailed assessment and evaluation process, the option of having the portal on Queens Quay between Yonge Street and Freeland Street (Option Q2), was recommended as the preferred location as it would result in better quality of transit service and minimal impact on pedestrian and traffic operations. The portal would fit within available right-of-way, allow for public realm improvements on Queens Quay, and create the lowest impact on commercial and residential features.

#### Preferred Design: Streetcars on the South Side of Queens Quay

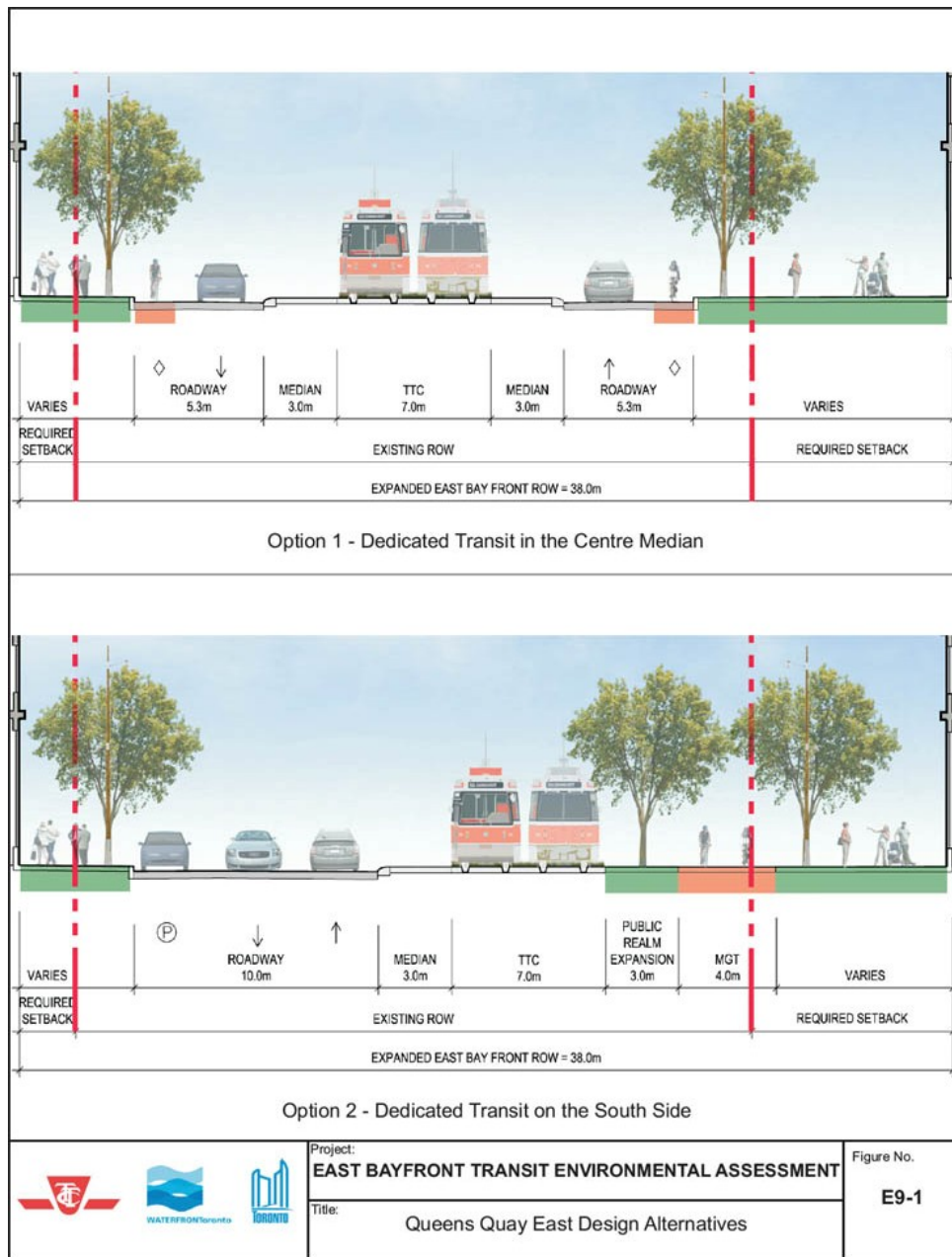
The project team evaluated two alternative designs for the operation of streetcars on Queens Quay East, which are illustrated in Exhibit 5 and discussed below:

##### *Alternative 1 – Dedicated Transit in the Centre Median*

This option is best from a transit and traffic operations perspective. It is a typical arrangement in Toronto and autos, pedestrians and transit operators are familiar with the arrangement. This option would also provide the best ability to provide transit signal priority at intersections. With transit in the centre of the road, there are opportunities to reduce the number of intersections crossing the transit right-of-way and maintain the desirable distance between traffic signals for an effective operation of transit signal priority. However, transit in the centre median requires that transit stops be fixed from the outset – typically placed opposite a left-turn lane – and has limited flexibility to change operating arrangements over time. In addition, from a passenger perspective, the provision of waiting areas in the middle of the roadway is less desirable than integrating the transit stop into the pedestrian area, as is possible with the other options.

To be consistent with the same concept examined by the *Queens Quay Revitalization Environmental Assessment*, the centre transit option includes on-street bike lanes. Although adequate space exists within the widest parts of Queens Quay east of Jarvis Street to accommodate the Martin Goodman Trail, this cross section cannot be carried throughout the entire *East Bayfront Transit EA* study area due to the narrower right-of-way west of Jarvis Street.

#### **Exhibit 5: Queens Quay Design Alternatives**



The provision of transit in the median adds to the real and perceived width of the street and creates a sense of isolation for transit passengers because the separation from the sidewalks and adjacent land uses by through traffic. This aspect of the design results in the perception of a wide transportation corridor with limited opportunities for innovative urban design treatments

*Alternative 2 – Dedicated Transit on the South Side*

This option is more challenging from a transit and traffic operations perspective but provides

opportunities for urban design treatments that can reduce the scale of the roadway and improve the public realm. A key factor is that the distance for pedestrians crossing general traffic is reduced. The passenger loading and unloading areas are also less impacted by the sense of isolation associated with the middle of the road option. Eastbound passengers, in particular, benefit from having the waiting area integrated with the pedestrian area and having a greater buffer from traffic. The design also incorporates a single median to separate general traffic from the transit right-of-way. This provides the opportunity for a median width that is generous enough to support the healthy growth of trees and to separate the street into corridors that create a comfortable public realm.

With transit on the south side of the road it is difficult to reduce the number of intersections or driveways crossing the transit right-of-way. However, there are strategies that can help reduce the number of signals that streetcars would need to cross, maintain an acceptable distance between transit signals, and allow for effective implementation of transit signal priority.

The alternatives were evaluated with respect to transit, traffic, pedestrian and urban design objectives. Option 2 – dedicated transit on the south side of Queens Quay East – was recommended as the preferred design as it will:

- reduce north-south crossing distance for pedestrians, allowing more time in the signal cycle to be dedicated to east-west transit movements,
- accommodate an extension of the Martin Goodman Trail which would provide a safer and more-efficient facility for cyclists than an in-traffic facility,
- accommodate an expanded public realm by visually associating the transit right-of-way with the adjacent Martin Goodman Trail and the pedestrian boulevard,
- provide the best balance between the needs of pedestrians, cyclists, transit users, and motorists,
- support the transit-oriented development, and non-auto travel goals of the waterfront and the City more broadly, and
- create a consistent transportation facility, for all modes, across the Queens Quay corridor from Spadina Avenue to Parliament Street and beyond.

The preferred design is described in more detail in the following sections.

#### Description of the Recommended Design

One of the key considerations in selecting transit on the south side was the potential to visually associate the transit right-of-way with the adjacent south side boulevard and Martin Goodman Trail. A fundamental element of the urban design approach in the study has been to consider the street as an urban place, not simply a corridor for movement. This embodies the principles of:

- designing for spatial comfort and human scale;
- making a place not a thoroughfare; and
- orienting to the pedestrian

The preferred design provides an opportunity to visually expand the non-auto portion of the street.



Generally, the Queens Quay East right-of-way will be composed of:

- north sidewalk of variable width;
- a pavement width generally 10 metres;
- a 3-metre median between the roadway and the transit right-of-way;
- a dedicated transit right-of-way 7 metres;
- a tree-line buffer 3 metres;
- the Martin Goodman Trail 4 metres; and
- south sidewalk of variable width
- **TOTAL RIGHT OF WAY 38 metres**

In general terms, the proposed curb line on the north side of the road will remain similar to where it is today, except at Jarvis Street and Sherbourne Street where provision of a westbound right-turn lane would require the current curb line to be shifted north. Roadway modifications are expected to take place along the south side of the road.

The standard 38-metre right-of-way cannot be maintained west of Lower Jarvis Street in front of the Redpath Sugar property, where the existing building face on the south side of Queens Quay requires that the right-of-way be narrower. Design elements will be adjusted where necessary to account for these types of right-of-way constraints.

The recommended design concept is illustrated in Exhibit 6 and typical cross-sections are illustrated in Exhibit 7.

#### *Transit Right-of-Way*

The transit right-of-way will generally be 7 metres wide, with overhead traction power suspended from guy wires attached to poles on either side of the right-of-way (i.e. one pole in the landscaped median and one pole in the boulevard). Toronto Fire prefers this configuration as the clear 7 metres provides an additional drivable surface - Fire and EMS vehicles can use either the roadway or the transit right-of-way in the event of an emergency. The poles can be stand alone or be used in combination with streetlights.

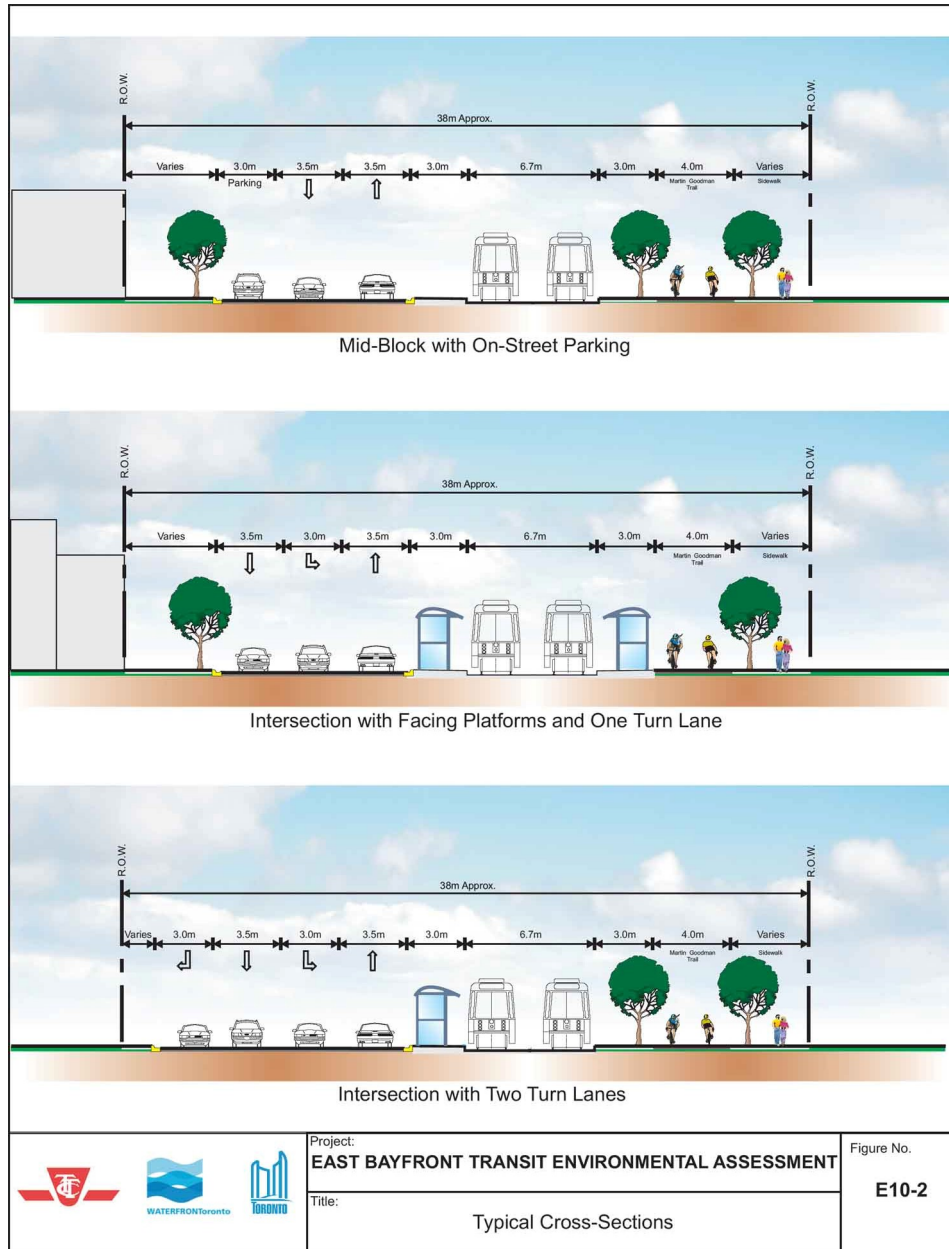
#### **Exhibit 6: South Side Option**



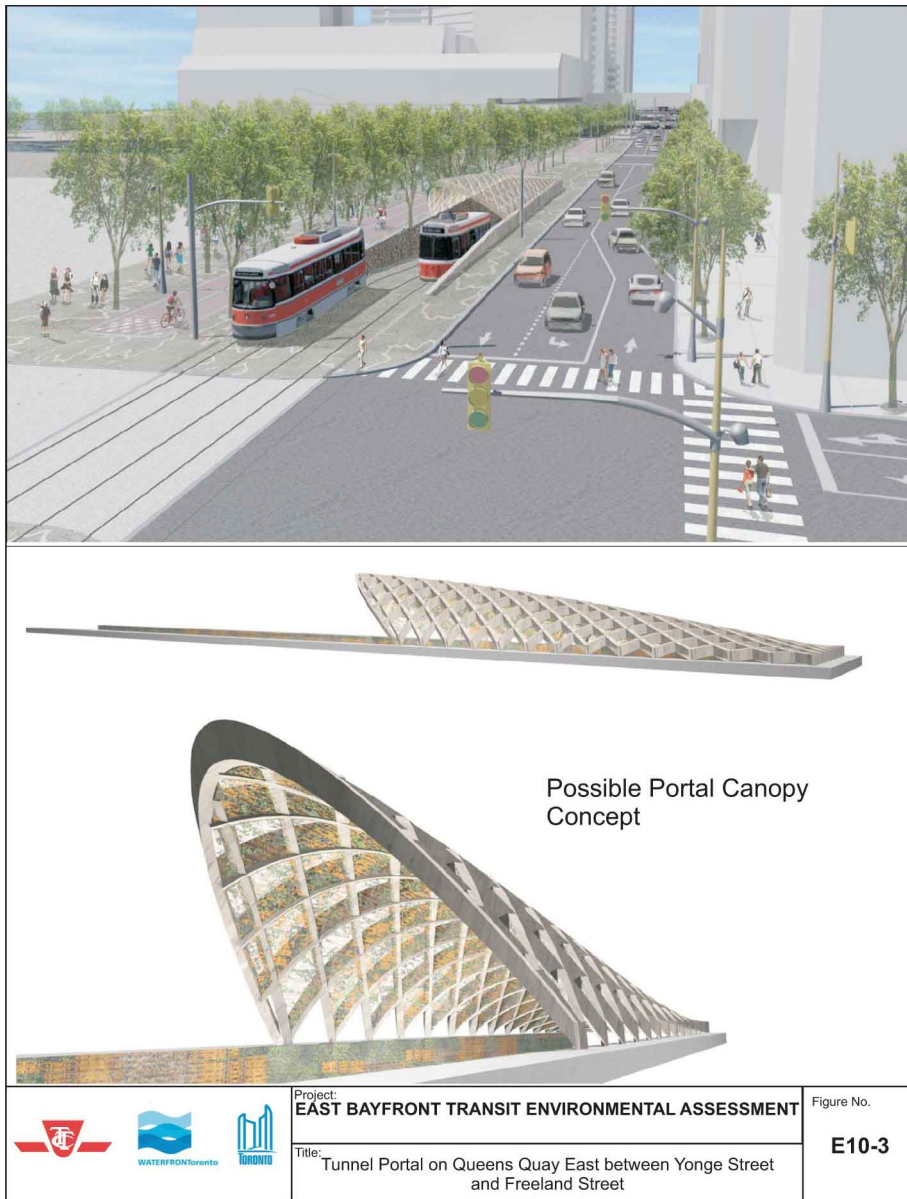
*Tunnel Portal*

The proposed Queens Quay East service will transition from a fully-underground route at Yonge Street, to a surface route by Freeland Street. The portal for the line will be located between Yonge Street and Freeland Street. Past the portal, the route will ascend to surface along a ramp at a grade of 7.5%, which is similar to the ramp connecting to the existing portal west of Bay Street. This is steeper than desirable but the presence of a major storm sewer culvert running north-south under Yonge Street forces this steep grade. Even so, the sewer will need to be realigned westerly at Queens Quay in order for the streetcar route to reach the surface prior to Freeland Street. The tunnel portal and ramp will be approximately 9 metres in width and they will be constructed using the open-cut method. Exhibit 8 shows a conceptual view of the tunnel portal.

**Exhibit 7: Typical Cross-Sections**



**Exhibit 8: Portal on Queens Quay East Between Yonge Street and Freeland Street**



*Streetcar Tunnel*

The proposed streetcar route will begin underground at Union Station Loop and travel south through the existing streetcar tunnel under Bay Street. At the intersection of Bay Street and Queens Quay, the route will turn east through a reconfigured wye (a triangular streetcar junction) and enter a new running structure under Queens Quay. The new tunnel will continue easterly within the Queens Quay right-of-way until it reaches a new portal located east of Yonge Street. The tunnel will be approximately 10 metres in width, 6 metres in height, and it will be constructed using the cut-and-cover method. Details related to the design of the tunnel will be determined during the Detail Design Phase.

### *Union Station Loop Expansion*

The existing underground streetcar loop at Union Station is the eastern terminus for the 509 HARBOURFRONT and 510 SPADINA streetcar lines. The loop is located directly south of Union Subway Station on the same level as the subway platforms. The loop provides a direct connection via a tunnel walkway to the fare-paid area of the subway station's east mezzanine. The streetcar loop features one platform for unloading and another for loading passengers.

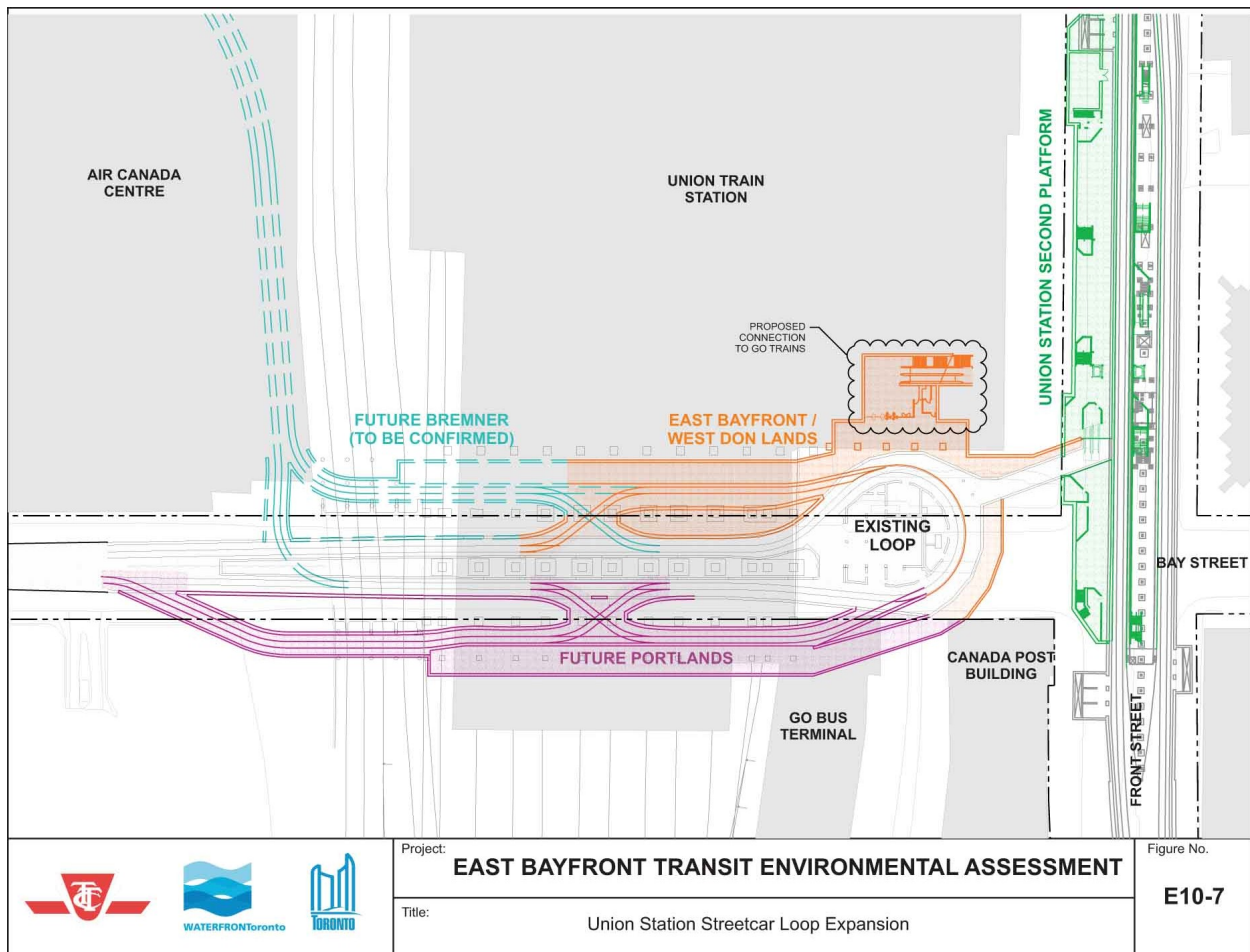
As the loop currently operates at, or over, its maximum capacity at busy times, an expansion of its loading areas will be required in order to accommodate future transit demands destined to/originating from the Eastern Waterfront as developments occur in the East Bayfront, West Don Lands, and Port Lands areas. Additional transit demands are also anticipated in areas west of Union Station and south of the rail corridor where developments continue to occur on the remaining former railway lands. Future Waterfront West Light Rail Transit, part of the *Transit City Light Rail Plan* initiatives, is also expected to carry additional passengers into the streetcar loop, possibly via a connection from Bremner Boulevard. All of these current/future plans contribute to the projected increase in passenger activities at the streetcar loop.

The current streetcar loop must be expanded to accommodate the proposed streetcar service on Queens Quay East as well as future services on Cherry Street in the West Don Lands and the Port Lands areas. The feasibility of routing future Waterfront West LRT to Union Station via Bremner Boulevard is currently under investigation by the *Waterfront West LRT Union Station to Exhibition Place Class EA*. Although the need to provide a connection to Bremner Boulevard is still to be confirmed, the proposed loop expansion concept does not preclude a future connection and loading area for Waterfront West LRT via Bremner Boulevard. The proposed loop expansion concept is illustrated in Exhibit 9.

### *Electrical Substation*

An electrical substation will be required in the vicinity of Queens Quay East and Sherbourne Street to provide traction power for the streetcar line. A substation for streetcars is typically an at-grade structure that is approximately 4 metres high with a 4-metre by 12-metre footprint, however, alternative potential configurations are being investigated. The exact location and positioning of the substation will be confirmed during the Detailed Design Phase.

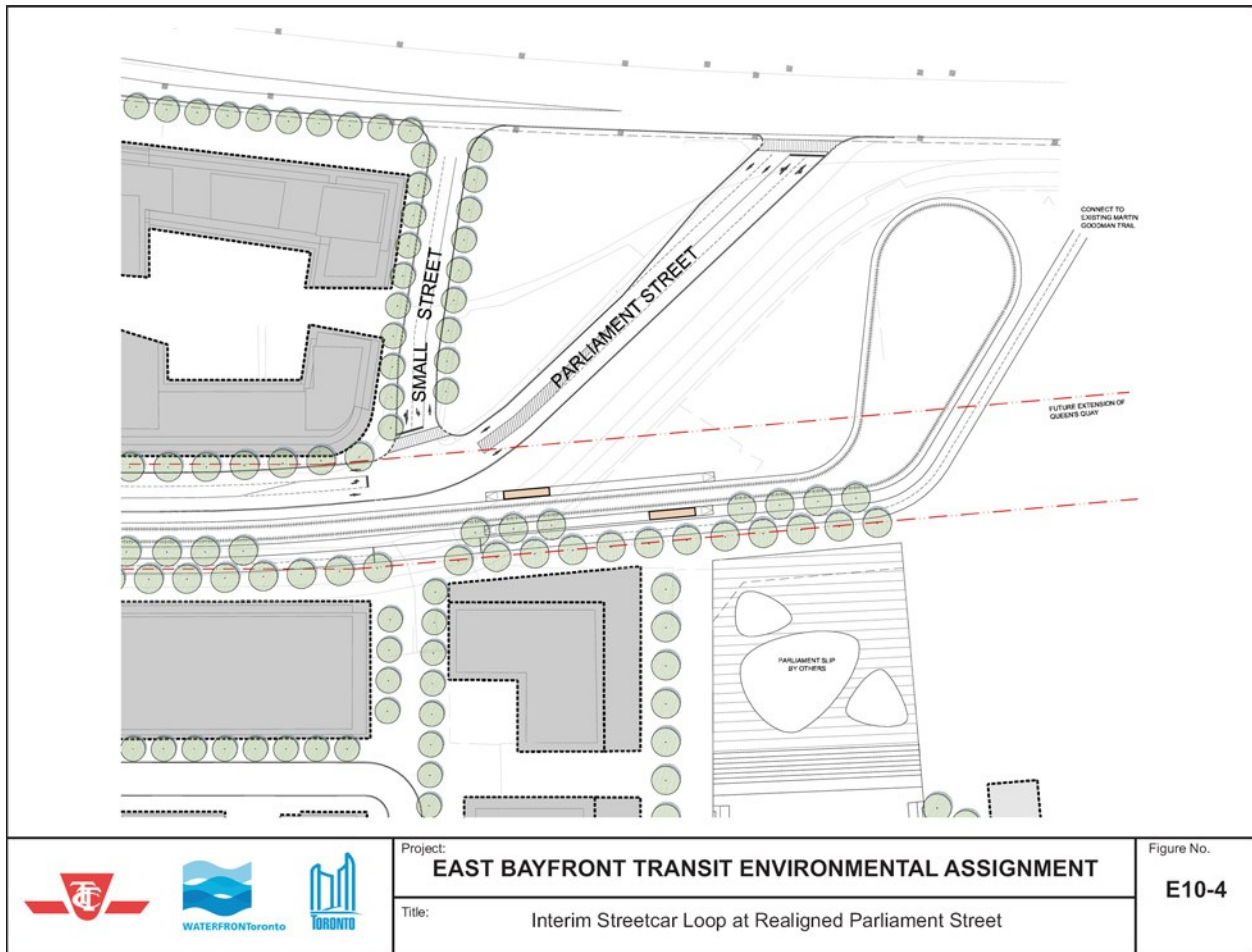
## **Exhibit 9: Union Station Streetcar Loop Expansion**



*Interim Loop at Parliament Street*

In the short term, the Queens Quay East roadway is expected to terminate east of Parliament Street so an interim streetcar loop will be required to turn streetcars around until the road is extended to Cherry Street. The preferred location for the interim loop is the east side of the proposed realigned Parliament Street immediately north of Queens Quay East, as shown in Exhibit 10. This location overlaps with two other EA studies notably the *East Bayfront Class EA Master Plan – Addendum – Stormwater Collection and Management System*, and the *Lower Don Lands Class EA Master Plan* which are seeking approval for the filling-in of the north end of the Parliament Street Slip and the exact configuration of Queens Quay east of Parliament Street, and Parliament Street south of Lake Shore Boulevard. In the longer term, the extension of Queens Quay East to Cherry Street would eliminate the need for the loop, as the Queens Quay East service will be connected with future streetcar service on Cherry Street.

**Exhibit 10: Interim Streetcar Loop at Realigned Parliament Street**



*Extension to Cherry Street*

Although Queens Quay East service is proposed to terminate at an interim loop at the realigned Parliament Street, it is expected that the streetcar service will be extended easterly to Cherry Street in conjunction with the future roadway extension of Queens Quay East and the re-development of the Lower Don Lands area. Streetcar service on Queens Quay East will connect with future streetcar service on Cherry Street through the West Don Lands area and into the Port Lands, as called for in the *Central Waterfront Secondary Plan*.

Waterfront Toronto is undertaking a *Municipal Class EA Master Plan* for the Lower Don Lands area and EA approval for the connection to Cherry Street will be part of that study.

*Roadway*

The recommended design provides for one traffic lane per direction. At some intersections one auxiliary turn lane is provided. A right-turn lane as well as a left-turn lane is provided at Redpath

Sugar Main Driveway, Jarvis Street, Sherbourne Street and Street 'D'. The right-turn lane at Freeland Street and Street 'D' requires the lane to cut into the centre median, while the right-turn lane at Jarvis Street and Sherbourne Street requires that the north curb line to be shifted north.

On-street parking is provided at mid-block locations, wherever possible, along the north side of the street. The pavement width is generally 10 metres from the north curb line to the centre median. At intersections where both a left-turn and a right-turn lane are provided, the width is increased to 13 metres. The final roadway width will be confirmed during the Detail Design Phase.

### *Intersections*

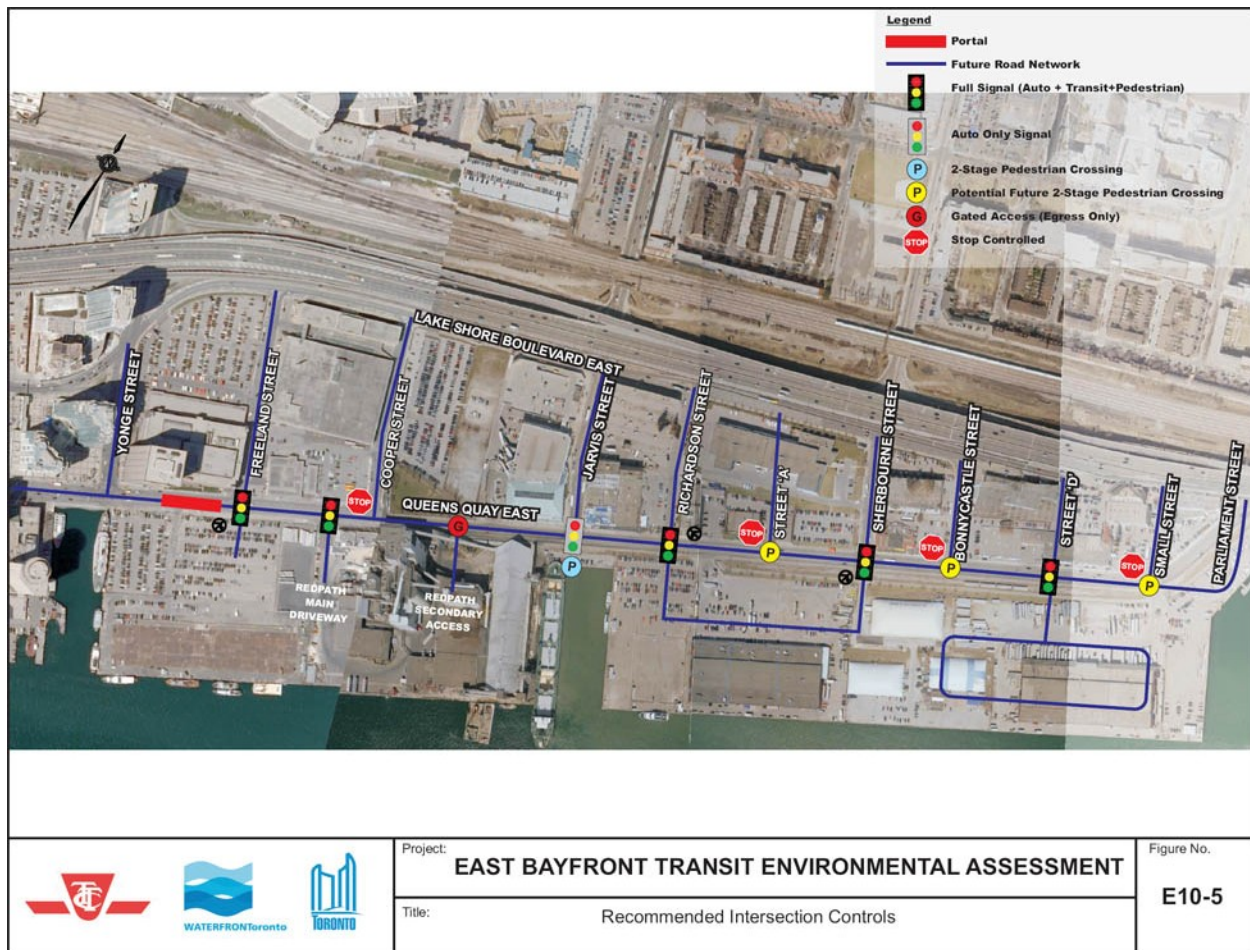
With the preferred south side transit alignment, it is necessary to introduce traffic signal controls at all road crossings of the streetcar tracks to avoid conflicts between turning vehicles and streetcars. The Queens Quay East intersections with Freeland Street, the westerly-most access to 95 Queens Quay East (Redpath), Lower Jarvis Street (a-T-intersection), Richardson Street, Lower Sherbourne Street and Street 'D' (as shown on Exhibit 11) will all operate under traffic signal control.

To optimize transit operations at these signalized intersections and, notably, to increase the available green time for transit vehicles operating along Queens Quay East, the signal phasing strategies at these intersections have been developed to enable east-west transit movements to occur at the same time as the east-west main traffic phases.

For safety reasons, and to avoid conflicts between turning vehicles and streetcars on the TTC transit right-of-way, this phasing strategy requires that turning movements across the streetcar tracks at the various intersections (i.e. eastbound right-turn and westbound left-turn movements) to operate only during protected turn phases and from an exclusive turn lane. No permissive movements or right turns on red will be permitted on turning movements across the streetcar tracks (i.e. westbound and northbound right-turn movements) due to safety and operational considerations. The proposed signalization plan and turn prohibitions are illustrated in Exhibit 11.

### **Exhibit 11: Recommended Intersection Controls**





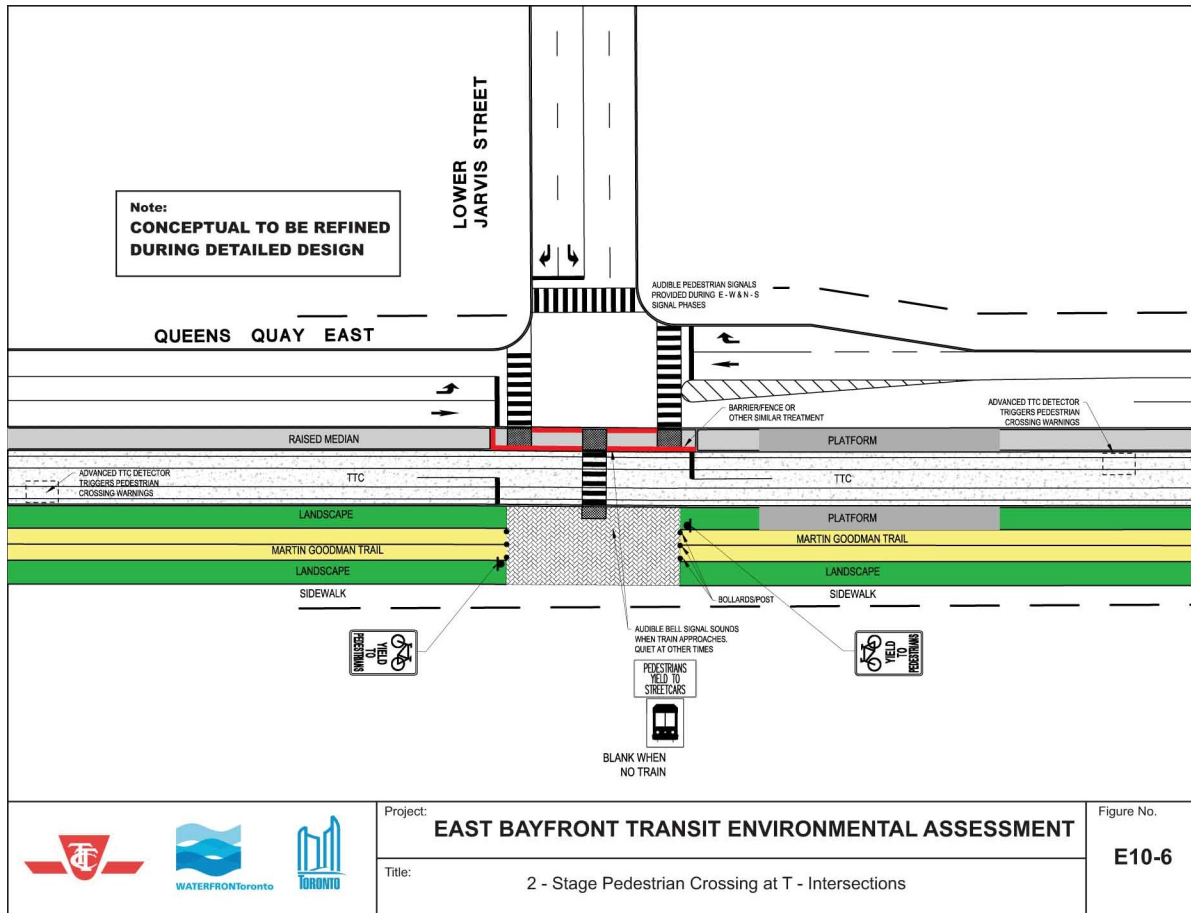
*Pedestrian Crossing at T-Intersections*

The preferred design features a T-intersection at Lower Jarvis Street, where no roadway extends south of Queens Quay East. Recognizing that there will be no vehicular movements crossing the streetcar tracks at this T-intersection, a two-stage pedestrian crossing arrangement has been adopted to minimize the need for transit vehicles to stop and encounter delays. The arrangement separates the activation of the pedestrian facilities over the roadway from the streetcar portions of Queens Quay East. The arrangement, illustrated in Exhibit 12, includes full traffic signal control of the roadway portion of Queens Quay East, with pedestrian crossings on the east and west sides of the intersection, and a separate single pedestrian crossing of the streetcar tracks. The pedestrian crossing operates independent of the main road traffic signal but provides a protected crossing facility for pedestrians.

It may be possible to apply this concept to other locations on Queens Quay East notably at Small Street, Bonnycastle Street and Street “A”, however, the resulting multiple closely-spaced traffic signals may require that they be coordinated, for safety reasons, in a way that is very detrimental to streetcar operations. It is essential for effective transit operations that these signals only be installed if it can be done so in such a way as to not affect the transit priority

signal system on the street. For this reason, these signals will not be installed until an independent technical audit confirms that such signals can be safely installed without affecting transit signal priority on Queens Quay East.

**Exhibit 12: Two-Stage Pedestrian Crossings at “T” Intersections**



*Pedestrian Zone and Boulevard Space*

The transit-on-the-south-side option offers the potential to visually expand the public realm through the use of consistent colour/texture treatments for both the pedestrian area and the transit right-of-way. Generous boulevard space, and a continuous median, provides considerable space for street trees and additional planting to reduce the “scale” of the street. Bollards, curbs and trees will be used to delineate the transit right-of-way from the sidewalk. A three metre wide landscaped median will separate the streetcar tracks from the roadway. The median will serve as the platform for transit stops and, will feature a surface treatment in keeping with the unique design for the street to be developed in the detailed design phase.

*Martin Goodman Trail*

The proposed design will provide for continuation of the Martin Goodman Trail throughout the corridor from Spadina Avenue to Parliament Street. The trail is a multi-use facility that runs for 22

kilometres along Lake Ontario and forms part of the 900-kilometre Waterfront Trail. The trail will be generally 4-metre wide and framed by two rows of trees, wherever possible, along the south side of the transit right-of-way. One row of trees will separate the TTC right-of-way from the trail; the other will define the edge between the trail and the pedestrian boulevard. Each tree will be provided sufficient soil to meet the City's desired target. The Martin Goodman Trail, a multi-use trail, will be primarily for non-pedestrian movements and activities.

#### Property Requirements and Access Issues

The recommended design would result in a widening of Queens Quay East from the current 27- to 30-metre right-of-way to approximately 38 metres. While this is less than the width originally prescribed in the *Central Waterfront Secondary Plan*, some easements will be required on the south side of Queens Quay East to accommodate the sidewalk and the Martin Goodman Trail.

#### *Property Requirements*

East of Jarvis Street, where much of the lands required for the proposed design is under public ownership, acquisition of private properties is expected to be minimal. The realignment of Queens Quay at Parliament Street, and the interim streetcar loop east of Parliament Street, are the only facilities associated with the proposed design that may be sited on private properties.

West of Jarvis Street, where the available right-of-way is constrained by an existing building face along the Redpath Sugar property, some easement may be required from Redpath to accommodate the sidewalk and the Martin Goodman Trail. Along the south side of Queens Quay East, between Redpath Sugar and the Yonge Street Slip, the zoning bylaw requires an 11-metre setback along much of the northern edge of the development site at 25 Queens Quay East. However, as a result of this Environmental Assessment study, the 11-metre setback can be reduced to 9 metres.

#### *Access To Redpath Sugar*

Redpath Sugar currently maintains a main driveway off Queens Quay East at the west side of their property, and a secondary driveway mid-site and a minor access point to the east. Although the proposed design will improve Redpath's main driveway by providing a traffic signal control at the intersection, the secondary driveway will require an egress-only gate to control truck movements across the transit right-of-way, while the minor access point will become a flagged entrance. Truck activity at the secondary driveway is typically five or six trucks per hour in the morning peak period, and the minor access point is used infrequently to bring special equipment on to the west side of the Jarvis Street Slip.

The installation of additional signals at the Redpath site will significantly affect the speed and reliability of streetcar service through the area, however, a central egress location, in addition to the proposed signalized intersection at the west entrance, can be accommodated if it is controlled by a gate to ensure that streetcars are not affected by truck movements. From opening day until the full build-out of the East Bayfront area, streetcar service at peak times is expected to be provided approximately every six minutes, and less frequently at off-peak times. With six minute service, typically there will be 45 minutes of time available for trucks to exit this site every hour, which is more than adequate to accommodate existing and forecast truck movements at the plant.

As development occurs in the Lower Don Lands and the Port Lands, more frequent service will be required on the Queens Quay East streetcar route which will reduce the time available for trucks to exit the site. There are no plans to operate streetcars more frequently than every 6 minutes at off-peak times, however, so even with full build-out of the Eastern Waterfront area the proposed gate approach will provide for truck egress from the central driveway at off-peak times.

To operate a transit service effectively on Queens Quay the TTC needs to control and manage the streetcar right-of-way. For this reason, it is recommended that the proposed gate arrangement be owned and operated by the TTC. Waterfront Toronto, TTC and the City of Toronto will continue discussions with Redpath Sugar on the logistics of the gate operation as this project moves through detailed design.

#### Next Steps in the Approval Process

Following the approval of this report by City Council, the *East Bayfront Transit Environmental Study Report*, once completed substantially in the form outlined in this report, will be filed on the public record for a minimum 30-day period in accordance with the Municipal Class Environmental Assessment process. After EA approval is received, design and construction of the recommended design can proceed.

Waterfront Toronto is initiating the Detail Design Phase of the project in conjunction with the overall design for Queens Quay East and has indicated that this work will incorporate a public consultation and input process. TTC and Waterfront Toronto staff are developing a Delivery Agreement for TTC staff involvement in the design and construction project, to ensure that the resulting transit facilities are acceptable to the TTC.

### **JUSTIFICATION**

Providing improved transit service into the East Bayfront development area on a “transit first” basis, where a high-quality of transit service is provided in conjunction with the first development to take place, will provide a strong encouragement for the community to become highly transit-oriented. The recommended option of providing streetcars in a dedicated right-of-way on the south side of Queens Quay provides excellent coverage and access to high-quality transit services for the East Bayfront and surrounding areas. It also provides an opportunity to create a unique pedestrian and public realm for Queens Quay, consistent with the City of Toronto and Waterfront Toronto’s objectives for urban design excellence in Toronto’s waterfront.

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