

TORONTO TRANSIT COMMISSION REPORT NO.

MEETING DATE: JUNE 18, 2008

SUBJECT: WATERFRONT WEST LRT CONNECTION TO UNION STATION:
FORT YORK-BREMNER BOULEVARD

ACTION ITEM: X

RECOMMENDATIONS

It is recommended that the Commission:

1. approve the concept of constructing a light rail transit right-of-way alignment in the Bremner Boulevard-Fort York corridor, between Union Station and Exhibition Place, as described in this report, to serve both as the necessary connection for the future construction of the Waterfront West Light Rail Line, and as an important service to meet the needs of the rapidly- and densely-developing Railway Lands and Fort York Neighbourhood, noting that:
 - the Waterfront West Light Rail Line will introduce a new, dedicated transit right-of-way linking the developing areas of Mississauga, southern Etobicoke, The Queensway, Parkdale, and Exhibition Place with Toronto's central business district and, in so doing, will remove 3 million car trips and 10 tonnes of greenhouse gases per year;
 - the Railway Lands and Fort York Neighbourhood, located between the Waterfront West LRT and Union Station, are being developed extremely quickly, so the need for high-capacity transit in this area has become more urgent;
 - the number of riders who will travel via the Waterfront West LRT in the Railway Lands-Fort York Neighbourhood area is approximately 44,800 per day, or about 13.7 million per year, which is roughly equal to the ridership on the 501 QUEEN streetcar route;
 - analytical and modelling work which has been done as part of the environmental assessment (EA) for the Bremner-Fort York Light Rail Line has concluded that the existing Fleet Street-Bathurst Street-Queens Quay right-of-way will not be able to accommodate the total volume of light rail vehicles which will be travelling between Union Station, and Exhibition Place and points west;
 - another east-west connecting link between Union Station and Exhibition Place will be essential if the Waterfront West LRT is to provide attractive, reliable, and fast service;

- the most logical and feasible alternate link would be the Bremner-Fort York LRT Corridor which is already under study;
 - for this corridor, west of Bathurst Street, operational analyses and modelling have demonstrated that the “under the Gardiner Expressway” alignment, as described in this report, would be best for both transit and traffic operations;
 - there is opposition to this alignment because, although it is literally underneath the Gardiner expressway amid concrete support columns, the land is part of the Fort York National Historic site;
 - all of these findings will be formalized in the Environmental Assessment Study Report for the Bremner-Fort York Light Rail Line which is currently in preparation;
 - for the reasons described in this report, there is a need to expedite the approvals, funding, and construction of the Bremner-Fort York LRT line;
2. request City of Toronto Council to endorse this report; and
 3. request Metrolinx to provide funding for this vital component of the Transit City Light Rail network, because it will provide a sustainable-transportation alternative for residents and workers in what will soon be one of the most densely-developed areas in the entire GTHA, and will lay the foundation for the Waterfront West Light Rail Line.

FUNDING

On June 15, 2007, the Province of Ontario announced funding of \$17.5 billion for the implementation of the *MoveOntario 2020* rapid transit program in the Greater Toronto and Hamilton area (GTHA) over the next 12 years. *MoveOntario 2020* includes funding for the TTC-City of Toronto *Transit City Light Rail Plan*, which includes the proposed Waterfront West LRT line.

Funds in the amount of \$7.1 million for *Transit City* environmental assessments were included in the 2008-2012 TTC Capital Program budget, (pages 1531-1534) as approved by City Council on December 11, 2007. The March 25, 2008 provincial budget announced funding to cover this \$7.1 million cost, as part of Metrolinx’s Quick Wins initiatives and these funds have been paid to the City. Funding for the Waterfront West LRT EA was included under this project; however no funds are available at this time to proceed with the construction of the line.

All *Transit City* initiatives are currently included in the TTC’s 2009-2013 Capital Program as “below-the-line” items, all awaiting funding from Metrolinx. Metrolinx will soon be presenting their Regional Transportation Plan and funding approval for selected GTHA rapid transit initiatives. Based on Metrolinx’s funding decisions, TTC staff will be seeking Commission approval for specific project expenditures for lines and facilities for 2009 and beyond.

BACKGROUND

At its meeting of March 21, 2007, the Commission endorsed the *Toronto Transit City Light Rail Plan* as the basis and priority for rapid transit expansion in the City of Toronto. This plan included the Waterfront West LRT line as one of seven lines forming a network of fast, reliable, environmentally-sustainable light rail transit throughout the City. The Waterfront West Light Rail line will introduce a new dedicated transit right-of-way linking rapidly-developing areas in southern Etobicoke, The Queensway, Parkdale, and Exhibition Place with Union Station (see Exhibit 1, attached).

At the same time, the area between the Waterfront West service area and Union Station – the Railway Lands and Fort York neighbourhoods, shown in Exhibit 1 – are undergoing a transformation from former railway and industrial uses, into vibrant, dense, mixed land uses. When redevelopment is complete, these neighbourhoods will include 16,000 residential units, high-density office and commercial buildings, hotels, and major event destinations, including the Rogers Centre, the CN Tower, and the Metro Toronto Convention Centre. The planning for redevelopment of these lands in the heart of downtown Toronto purposely did not include any major new road infrastructure. Only some smaller local roadways were included to provide immediate access to these new developments. It was envisaged that most travel outside of the immediate area would be accommodated by high-quality transit service operating in dedicated rights-of-way, as identified in the Central Waterfront Secondary Plan. Redevelopment of these lands is proceeding quickly, and applications for development of many of the remaining parcels have been submitted.

The Waterfront West LRT project – which will provide service between Union Station and Exhibition Place and points west – is currently undergoing a phased Environmental Assessment (EA), with the EA for the section between Exhibition Place and Roncesvalles Avenue being the most advanced.

TTC and City staff also began, in May, 2007, an Environmental Assessment (EA) study for a 3.5-kilometre dedicated transit right-of-way in the Bremner Boulevard-Fort York Boulevard corridor between Union Station and Exhibition Place, where it would connect to the proposed Waterfront West LRT. The project was initiated to enable the TTC and City to be able to meet existing and projected travel demand in the rapidly-developing Railway Lands and Fort York areas. However, the pace of development in the Railway Lands and Fort York Neighbourhood is proceeding so quickly that the need for high-capacity transit in the area has become more urgent.

Equally important, the analytical and modelling work which has been done as part of the Bremner-Fort York LRT EA has concluded that the existing Fleet Street-Bathurst Street-Queens Quay right-of-way will not be capable of accommodating the total volume of light rail vehicles which will travel between Union Station and Exhibition Place and points west. Another east-west connecting link between Union Station and Exhibition Place will be essential if the Waterfront West LRT service is to provide attractive, reliable, and fast service. The most logical and feasible alternative link would be the Bremner-Fort York LRT Corridor which is already under study. These facts, together, result in a need to expedite the

approvals, funding, and construction of the Bremner-Fort York LRT line. This report provides an explanation of why priority should be now be given to this project.

DISCUSSION

Waterfront West – Bremner Light Rail: Ridership and City-Building Benefits

The Transit City light rail network is a key part of improving transit, reducing auto dependency, and creating a more environmentally-sustainable transportation system throughout Toronto and the GTHA. Many of the Transit City LRT lines, including the Waterfront West line, have the potential to provide inter-regional service through extensions to Mississauga, York Region, and Durham Region. For these reasons, the Transit City network has been strongly endorsed as an important regional transit project by the TTC, the City of Toronto, Metrolinx, and the Province of Ontario. The Waterfront West-Queen's Quay/Bremner/Fort York light rail corridor is a vital part of the Transit City light rail plan, because it would provide reliable, fast, and delay-free service for people travelling between Toronto's central business district (Union Station) and points west of Exhibition Place, while also providing excellent local transit service to the new developments east of Exhibition Place.

The transit ridership originating from or destined to developments in the Railway Lands and the Fort York neighbourhood is projected to be approximately 28,000 riders each weekday. On the remainder of the Waterfront West LRT line, west of Exhibition Place, there will be an additional 22,000 daily riders, the majority of which will pass through the Fort York – Bremner-Queen's Quay corridor on their way to and from the central business district. Therefore, the combined number of weekday riders over this common section of the route, which links the Waterfront West LRT with Union Station, will be in the order of 44,800 riders each weekday, or approximately 13.7 million riders annually. This short section of LRT, then, will carry passenger volumes roughly equivalent to today's 501 QUEEN streetcar route.

By providing a high-quality, reliable, and fast transit service, the Waterfront West LRT line will attract new customers to transit, resulting in 3 million automobile trips being taken off the road each year. Attracting these trips out of cars and onto light rail transit will reduce greenhouse gas emissions by approximately 10,000 tonnes annually.

Operational Challenges of Current Alignment of Waterfront West LRT

The Waterfront West LRT line was originally designed to follow an alignment, east of Exhibition Place, which would be the same as the routing of the existing 509 HARBOURFRONT streetcar line – that is, east on Fleet Street, south on Bathurst Street crossing Lake Shore Boulevard, east on Queen's Quay, and north via the Bay Street tunnel, to Union Station. However, as mentioned above, detailed modelling work done as part of the analysis of options for the Bremner-Fort York EA, has determined that the complex signal and operations through the Fleet-Bathurst-Lake Shore intersection cannot accommodate the combined volume of light rail vehicles -- from both the existing 509

HARBOURFRONT route and the proposed Waterfront West light rail line – which would pass through this intersection. A further complication is that the busy 511 BATHURST streetcar route also operates through this same Fleet-Bathurst-Lake Shore intersection. These three services, combined, would result in a total of approximately 70 light rail vehicles per hour trying to travel through this intersection per hour, in both directions. The intersection and its complex multi-phase signalling are not designed to move this volume of transit vehicles, and the result would be that, on a consistent basis, anywhere from one to three light rail vehicles would not make it through the intersection during a signal cycle, and these vehicles would bunch up into queues in both directions, resulting in chronically unreliable and slow service.

On top of all this, a study is underway to determine the feasibility and desirability of operating a percentage of streetcars from the 501 QUEEN and 504 KING streetcar routes, east of Dufferin Street, through Exhibition Place, via the planned right-of-way, to Union Station, in order to provide people destined to the central business district with a faster and more-reliable service than the current operations in mixed traffic. As more and more light rail vehicles were to try to operate through this intersection, there would be an exponential increase in the chances that a light rail vehicle on one of the routes would miss its opportunity to get through because a light rail vehicle in front of it would be waiting for its own phase to move. This would significantly increase delays for customers on all of these light rail services. The increase in delay and the increase in the variability of the delays would also make service reliability on these routes worse, making transit less attractive to customers. This is not the intended outcome of the significant transit infrastructure and transit service improvements being planned.

Operation of the Waterfront West LRT via the existing Fleet Street-Bathurst Street-Queen's Quay routing would also significantly affect all other traffic movements using the intersection. Streetcars crossing Lake Shore Boulevard West move on their own special transit phase, and the time for this phase is taken from the east/west or north/south traffic. Lake Shore Boulevard is a major traffic corridor that is considered to provide significant traffic capacity relief for the Gardiner Expressway. The intersection operates with very long cycle lengths - up to 144 seconds in the AM peak period – which permit a maximum of 50 transit phase opportunities per hour. As more and more streetcars were to be routed through this intersection, east/west and north/south traffic would be given less and less green time, and delays and queuing to all other traffic would increase significantly.

In summary, the concept of operating a high-frequency, high-capacity light rail line, such as the planned Waterfront West line, through the Fleet-Bathurst-Queen's Quay intersection, and then along Queen's Quay to the Bay Street tunnel, is not operationally feasible. Another alignment will have to be provided if this service is to operate in a reliable and attractive way.

Recommended Alternative Alignment for Waterfront West LRT: Bremner Boulevard-Fort York Boulevard-Gardiner Expressway Corridor

Based on analyses conducted to date, it has been concluded that a dedicated right-of-way in the Bremner Boulevard-Fort York Boulevard-Gardiner Expressway corridor, between Union Station and Exhibition Place, would best serve the Railway Lands, the Fort York neighbourhood, and travellers from west Toronto/Etobicoke and Mississauga. A dedicated LRT right-of-way in this corridor would also provide the aforementioned sought-after operational and routing flexibility for other busy streetcar services into the central business district and downtown area.

Study undertaken for the Bremner-Fort York environmental assessment has identified the following alignment to be feasible and operationally superior (see Exhibit 2):

- terminal operation in an expanded Union Station LRT/streetcar loop, which has already undergone preliminary engineering and design
- south through the existing Bay Street tunnel
- west via a new tunnel to be built under the Air Canada Centre Galleria, under the southeast corner of the office building under construction at 25 York Street (at Bremner Boulevard) and under a short section of Bremner Boulevard. This tunnel has been previously protected during the design and construction of these buildings
- right-of-way would emerge to grade via a portal on Bremner Boulevard near Simcoe Street
- between Simcoe Street and Bathurst Street, the dedicated streetcar right-of-way would be in the centre of Bremner Boulevard and Fort York Boulevard. During the construction of Fort York Boulevard, between Spadina Avenue and Bathurst Street, a centre median was included for the specific purpose of accommodating a light rail right-of-way and passenger platforms
- the reconstruction of the Bathurst Street bridge over the railway tracks, expected to begin later in 2008, has been designed to allow for light rail/streetcar movements across Bathurst Street, and between Bathurst Street and Fort York Boulevard

Alignment Options Between Bathurst Street and Exhibition Place

Between Bathurst Street and Exhibition Place, two alignments options are still under consideration:

- In Option A, shown in Exhibit 3, the dedicated right-of-way would continue west in the centre of Fort York Boulevard from Bathurst Street and connect to the existing LRT/streetcar right-of-way on Fleet Street, where the alignment would proceed west along the existing Fleet Street right-of-way to Exhibition Place and the onward

connections with the Waterfront West light rail line. This “centre of Fleet Street and Fort York Boulevard” alignment is illustrated in the *Central Waterfront Secondary Plan*.

- In Option B, shown in Exhibit 4, the dedicated right-of-way would continue west in the centre of Fort York Boulevard, and then shift north to an alignment under the Gardiner Expressway where Fort York Boulevard crosses under the expressway. In this “under the Gardiner” alignment, the right-of-way would then continue west under the Gardiner Expressway and make use of an abandoned railway cut and underpass at Strachan Avenue to connect to Exhibition Place and the Waterfront West light rail line. Exhibit 5 is a photograph showing the area proposed for this alignment under the Gardiner Expressway, looking west towards the Strachan Avenue bridge, and Exhibit 6 is a rendering illustrating a potential light rail right-of-way and passenger stop at Strachan Avenue.

Comparison of Transit and Traffic Operations of the Two Alignment Options west of Bathurst Street

Operational analyses and modelling have clearly demonstrated that the “under the Gardiner” alignment would be the best for both transit and traffic operations and, for this reason, TTC staff recommend that the Commission endorse this option as the preferred option. Some of the most-important operational benefits of this option are described below.

There is opposition, however, to the “under the Gardiner” option from a culture and heritage perspective. The area in question is part of the Fort York National Historic site. The area is located, quite literally, under the Gardiner Expressway and, as such, the property is cluttered with concrete support columns for the expressway and has the appearance of derelict industrial real estate. This may be seen in Exhibit 5. The *Fort York and Garrison Common – Parks and Open Space Design and Implementation Plan*, which is being used to guide the redevelopment of the Fort York National Historic site and surrounding area, states:

“The railway cut could also provide pedestrian (and possibly public transit) access under Strachan Avenue into the Exhibition Grounds.”

That same document states that the property in question could also be used for parking. For these reasons and, given the already-established presence of the expressway super-structure on the property, TTC staff do not believe that the implementation of light rail transit in this corridor underneath the Gardiner Expressway would violate any perceptible historic features.

The provision of rail transit in close proximity to Fort York would be consistent with the history of the site over many decades. Less than 60 years after the fort was established, the first railways were built close to the north side of the fort, in the 1850s. A second railway ran along the south side of the fort from the 1860s until the 1980s – this is the abandoned corridor proposed for the “under the Gardiner” alignment. Streetcars operated along the north side of the fort, immediately adjacent to the ramparts, from 1916 to 1931, and along the east side of the site from 1931 until today.

The “under the Gardiner” alignment option would allow the provision of transit service that is significantly more reliable and faster than the “Fort York Boulevard-Fleet Street” alignment option for a number of reasons:

- With the “under the Gardiner” option, the light rail vehicles would not have to travel through the Fleet Street/Strachan Avenue/Canada Boulevard intersection. The geometric configuration of this intersection requires LRV/streetcars to move only on their own special short transit phase. Streetcars operating through this intersection today experience delays. With the Fort York Boulevard-Fleet Street alignment (Option B), these delays would be exacerbated by the large volume of streetcars which would travel through this intersection in the future because as many as six routes would be routed this way: the 509 HARBOURFRONT and 511 BATHURST existing routes, new Waterfront West and Bremner routes, and possibly additional routes that would bring streetcars from Queen Street and King Street along the alignment to Union Station, to provide a faster trip to downtown. In the AM peak hour, as many as 70 LRV/streetcars per hour would use this intersection.
- With the “under the Gardiner” option, the majority of light rail vehicles would not have to travel through the Fleet Street/Fort York Boulevard intersection. At this intersection, some or all of the new routes would make an east-to-north left-turn and south-to-west right-turn. These routes would incur lengthy delays because they would be able to turn only during a very short transit phase each cycle. Given the long cycle lengths and the large number of LRV/streetcars, the other routes sharing the same right-of-way would often be delayed behind an LRV/ streetcar waiting to turn left.
- The shorter travel time that would be realised by the “under the Gardiner” alignment would improve service for transit customers.
- Stop locations on the “under the Gardiner” alignment would provide convenient access for customers to all local destinations.
- The Fort York Boulevard-Fleet Street alignment (Option A) would connect to the existing LRT/streetcar right-of-way on Fleet Street at the Fleet Street/Fort York Boulevard intersection, and would require one traffic lane in each direction on the north leg of Fort York Boulevard to be converted to a dedicated LRT right-of-way. With the approved closure of the westbound egress lane on Fleet Street at Bathurst Street, most of the traffic destined from southbound Bathurst Street to westbound Lake Shore Boulevard would have to use Fort York Boulevard. If one of the southbound lanes on Fort York Boulevard at the Fleet Street intersection were to be converted to an LRT right-of-way, there would not be sufficient capacity to accommodate the diverted traffic.

Benefits to the Waterfront West LRT from the Bremner/Fort York Dedicated Streetcar Right-of-way

In addition to serving its immediate catchment area, the Bremner Boulevard/Fort York Boulevard streetcar right-of-way would be more direct and provide a faster and more-reliable service between Union Station and Exhibition Place for the Waterfront West LRT, compared to using the existing Queens Quay right-of-way. The following table summarizes the comparison of the three routing options which are illustrated in Exhibit 2.

**Waterfront West LRT
Comparison of Routing Options**

	Queens Quay Routing	Bremner/Fort York Routing	
		Fort York-Fleet Alignment "A"	Under the Gardiner Alignment "B"
Average Travel Time Savings, compared to Queens Quay option	NA	10%	20%
Round Trip Distance	8.0 km	7.2 km	7.0 km
Number of Traffic Signals	16	13	11
Problematic Intersections	3	2	None

This more direct routing would be up to 12% shorter in distance, travel through up to 31% fewer signalised intersections, and have to travel through few or no complex signalised intersections where LRV's would experience lengthy delays due to complex signal operations and having to turn.

Costs of Constructing the Bremner-Fort York LRT Alignment

The cost of constructing the 3.5-kilometre LRT alignment between Union Station and Exhibition Place, as described in this report, including the necessary expansion of the Union Station LRT/streetcar loop, the new east-west tunnel connecting the Bay Street tunnel to Bremner Boulevard, the portal at Bremner/Simcoe, and all other related civil works, is approximately \$180 million.

JUSTIFICATION

The concept of constructing the Bremner-Fort York Light Rail Line, as described in this report, should be approved by the Commission and City Council, and included for funding by Metrolinx because it would provide a much-needed sustainable-transportation alternative for residents and workers in what is one of the most quickly- and densely-developing areas in the entire GTHA, and because it will establish the essential east-west connecting link between Union Station and Exhibition Place which would allow the Waterfront West LRT to provide attractive, reliable, and fast service.

June, 10, 2008

11-31-78

Attachments: Exhibits 1 - 6

Exhibit 1

Waterfront West LRT

corridor concept



Exhibit 2
Waterfront West LRT Routing Options
Union Station to Exhibition Place



Exhibit 3

Union Station to Exhibition Place - Transit EA

Option A: Bremner Blvd - Fort York Blvd - Fleet St



Exhibit 4

Union Station to Exhibition Place - Transit EA

Option B: Bremner Blvd - Fort York Blvd - under Gardiner Expwy

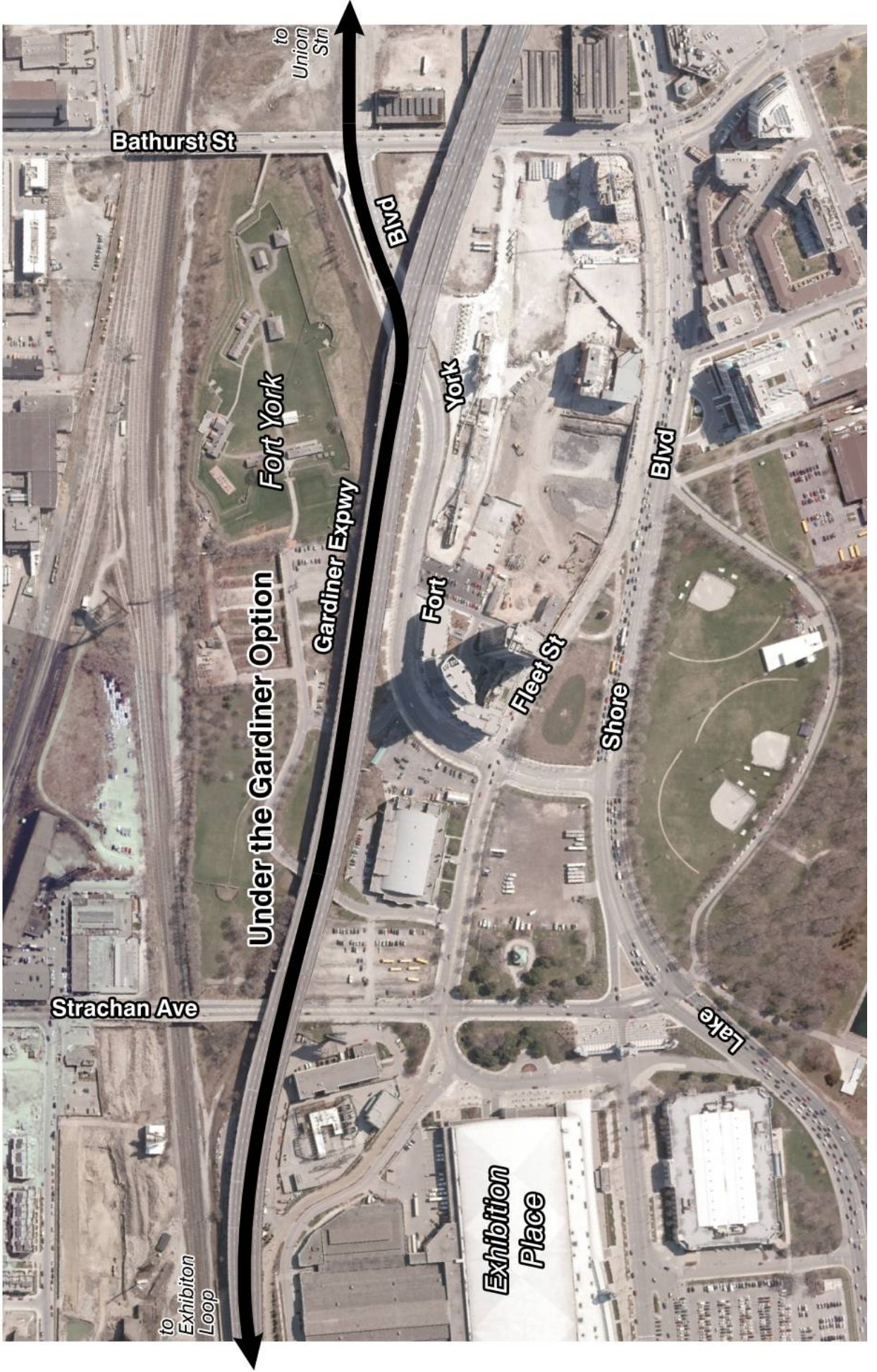


Exhibit 5

Option A: Under the Gardiner, Looking West to Strachan Ave



Exhibit 6

Option A: Under the Gardiner, with Potential Streetcar Right-of-Way

