1 Executive Summary

The Union Station – Queens Quay Transit Link Study (the Study) considered two technologies for enhancing the connection between Union Station and Queens Quay: an expanded streetcar loop at Union Station; or, an Automated People Mover (APM) using the existing tunnel replacing the existing streetcar.

This Initial Business Case (IBC) accompanies the Study and provides a strategic, economic, financial and operations appraisal of the two technology options. While the Study focusses on the Link itself, this IBC considers the benefits and costs associated with the full Waterfront Transit Network (WTN) which the Link serves.

Context

The expansion of the Union Station – Queens Quay Transit Link (USQQL) was originally contemplated as part of the approved East Bayfront Transit EA. At the time, streetcar loop expansion was configured to accommodate four independent streetcar stops which was sufficient to accommodate the East Bayfront plus the wider waterfront and the Bremner extension.

The USQQL was studied further as part of the Waterfront Transit Reset study, led by the City of Toronto, which refined plans for a Waterfront West and Waterfront East LRT; both identified as 'in-development' projects in the Regional Transportation Plan (RTP) by Metrolinx. In January 2018, Council directed staff to review more cost-effective options for the USQQL, including an funicular (or APM).

As identified during the Waterfront Transit Reset, the USQQL is a critical piece of the overall WTN which will enable the full development of LRT service to the East Bayfront and beyond. These network enhancements will help to support the rapid pace of development along the waterfront.

Figure 1: Waterfront Transit Network Plan, City of Toronto

The evaluation of the Union Station – Queens Quay Transit Link Study identified that an expanded streetcar loop, as originally contemplated in the EA, is the preferred solution for the USQQL.

Investment Options

Two options were proposed to serve the USQQL: an expansion of the existing streetcar loop with new connections to the east, or a repurposing of the existing streetcar tunnel with an Automated People Mover (APM). Over the course of design refinement and evaluation, the expanded streetcar loop emerged as the preferred option.

Union Station Streetcar Option **Union Station APM Option**

Strategic Case

Both the streetcar and APM options offer a viable solution to accommodate future demand; however, the expanded streetcar loop supports the broader development of the waterfront LRT and provides the greatest overall benefit for the waterfront LRT network. From a network resiliency and connectivity perspective, the expanded streetcar terminal at Union Station offers the greatest operational flexibility. It also improves upon existing service while providing a new, single-seat-ride service to the East Bayfront and into the Port Lands.

Travel demand within the Bay Street corridor from Union Station to Queens Quay Station is expected to grow significantly by 2041. The increase in demand is mainly a result of significant population and employment growth in the central waterfront, East Bayfront and beyond into the Port Lands. In addition to typical weekday commuter demand, there is significant additional demand outside of typical commuter peaks associated with the Jack Layton Ferry Terminal, Harbourfront Centre, Billy Bishop Airport, and other waterfront activities and event venues. With all of this activity considered, there is a clear need to improve this vital link to the WTN.

Based on the evaluation of specific criteria identified for the Study, the expanded streetcar loop scored better than APM related to user experience, due to one less transfer compared to APM, and transportation, due to increased routing flexibility for the waterfront streetcar network. Both options broadly meet the Metrolinx Regional Transportation Plan (RTP) goals; however, the East and West waterfront LRT services have the greatest flexibility with the expanded streetcar loop at Union.

Economic Case

The economic analysis indicates additional benefits for APM when compared to the streetcar option but likely underrepresents the quality of transfer with the streetcar option, resulting in an underestimation of streetcar ridership. This is due to limitations to modelling parameters at Union Station.

Table 1 presents a summary of the economic analysis and resulting benefits, costs and Benefit Cost Ratios (BCRs). Even though the resulting BCRs of 0.41 and 0.55 are relatively close, the gap would be even smaller if the streetcar benefits were accurately captured.

Table 1: Economic analysis summary and BCR

Item	Streetcar	APM
Total Present Value of Benefits (PVB)	$990,000,000	$1,340,000,000
Total Present Value of Costs (PVC)	$2,420,000,000	$2,440,000,000
Total Net Present Value (NPV)	-$1,520,000,000	-$1,100,000,000
Expanded Benefits Cost Ratio (BCR)	**0.41**	**0.55**

Financial Case

The financial case prepared for this IBC includes capital costs, operating and maintenance (O&M) costs and incremental revenue all in present value (PV). Costs are for the full waterfront streetcar network from Park Lawn to Leslie, including the Union Station – Queens Quay Transit Link and operational improvement from Park Lawn to Long Branch.

The economic case is also based on the Metrolinx method which requires different assumptions resulting in costs slightly different than the economic case. The difference is primarily due to the discount rates. The economic case uses a 'social discount rate' of 3.5% compared to financial case which uses a 'financial discount rate' of 5.5%. The resulting costs are indicated in Table 2.

Table 2: Financial components (to nearest $10 million)

Item	Streetcar	APM
Total Costs (PV)	**$2,150,000,000**	**$2,160,000,000**
Capital Costs (PV)	$1,760,000,000	$1,760,000,000
60-year O&M Costs (PV)	$390,000,000	$400,000,000
60-year Total Incremental Revenue (PV)	**$80,000,000**	**$120,000,000**
Total Costs (PV) – Revenue (PV)	**$2,070,000,000**	**$2,040,000,000**

Deliverability and operations

Both projects are feasible and would require a coordinated project delivery team between the City, TTC and Waterfront Toronto. The TTC indicated a reluctance to operate the APM; however, governance was not finalized as part of the Study.

Design-bid-build (DBB) is likely the simplest procurement method. An alternative financing and procurement (AFP) model could be considered; however, given the interconnectedness of the network, this would be a complex arrangement that would require further detailed analysis.

There are additional risks associated with building the expanded streetcar loop below the active GO rail viaduct. These risks are understood and accepted given experience with existing work underway at Union Station which is an example of similar construction efforts in highly constrained and complex environments. APM has a lower construction risk profile with a shorter construction period.

Conclusions

- **Context.** The Waterfront Transit Network is in the approved plans from the City and Metrolinx; The Link is a vital enabling component of those plans.
- **Strategic Case**. Both technologies can support increased demand due to development and special uses such as Harbourfront centre, Exhibition Place, Billy Bishop Airport, etc. The expanded streetcar loop is preferred because it supports the wider transit network and with improved service flexibility.
- **Economic Case**. Both technology options produce similar BCRs which are similar to other surface transit projects. The streetcar loop option is artificially low due to limitations to modelling parameters at Union Station.
- **Financial Case**. The financial case shows that the two technology options are essentially the same cost. The APM has somewhat higher operating costs due to reduced streetcar routing flexibility plus the APM operating costs.
- **Deliverability and operations case**. Both projects are feasible and would require a coordinated project delivery team between the City, TTC and Waterfront Toronto. Design-bid-build is likely the most straight-forward procurement method. Construction risks are higher for the streetcar loop but the risks are understood from recent works at Union Station.

Next Steps

Next, following endorsement by Council and securing funding, additional investigation and design refinement will be required. Alongside these project stages, the business case should be updated in sequence including: Preliminary Design Business Case; Full Business Case; and Post In-Service Business Case. The function and purpose of each of these subsequent stages of business case development is defined on the Metrolinx business case guidance website.