

Union Station – Queens Quay Transit Link Study

Welcome



Union Station in 1899. Image: City of Toronto Archives



Union Station today. Image: Camil Rosiak



Activity along Queens Quay. Image: Waterfront Toronto



For more information or to comment, visit toronto.ca/waterfronttransit or email waterfronttransit@toronto.ca



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Project Background

1990

Union Station Streetcar Loop opens establishing higher-order underground transit connection between Union Station, central, and western waterfront

2010

East Bayfront Transit EA approves new surface LRT for Queens Quay East connecting to proposed expanded Union Station streetcar loop

Key changes since East Bayfront Transit EA approval

- Planning and Implementation of Major GO Transit Expansion, Relief Line Subway, and Union Station Revitalization
- Ongoing Waterfront Revitalization and significant waterfront land use growth outpacing previous projections
- Further design investigation of subsurface conditions
- Major adjacent local developments along Bay Street



Existing Union Station streetcar loop. Image: Bryan Bonnici



East Bayfront LRT preferred design concept

2016 – 2018

Waterfront Transit Reset – Council approved the Waterfront Transit Network Plan

- For Lower Bay Street, Council directed a focused comparative study of repurposed tunnel with funicular (APM) transit technology and Streetcar Loop Expansion options; each would connect to Queens Quay LRT
- Repurposing of Bay tunnel to walking + moving sidewalk eliminated from consideration



2018 – present

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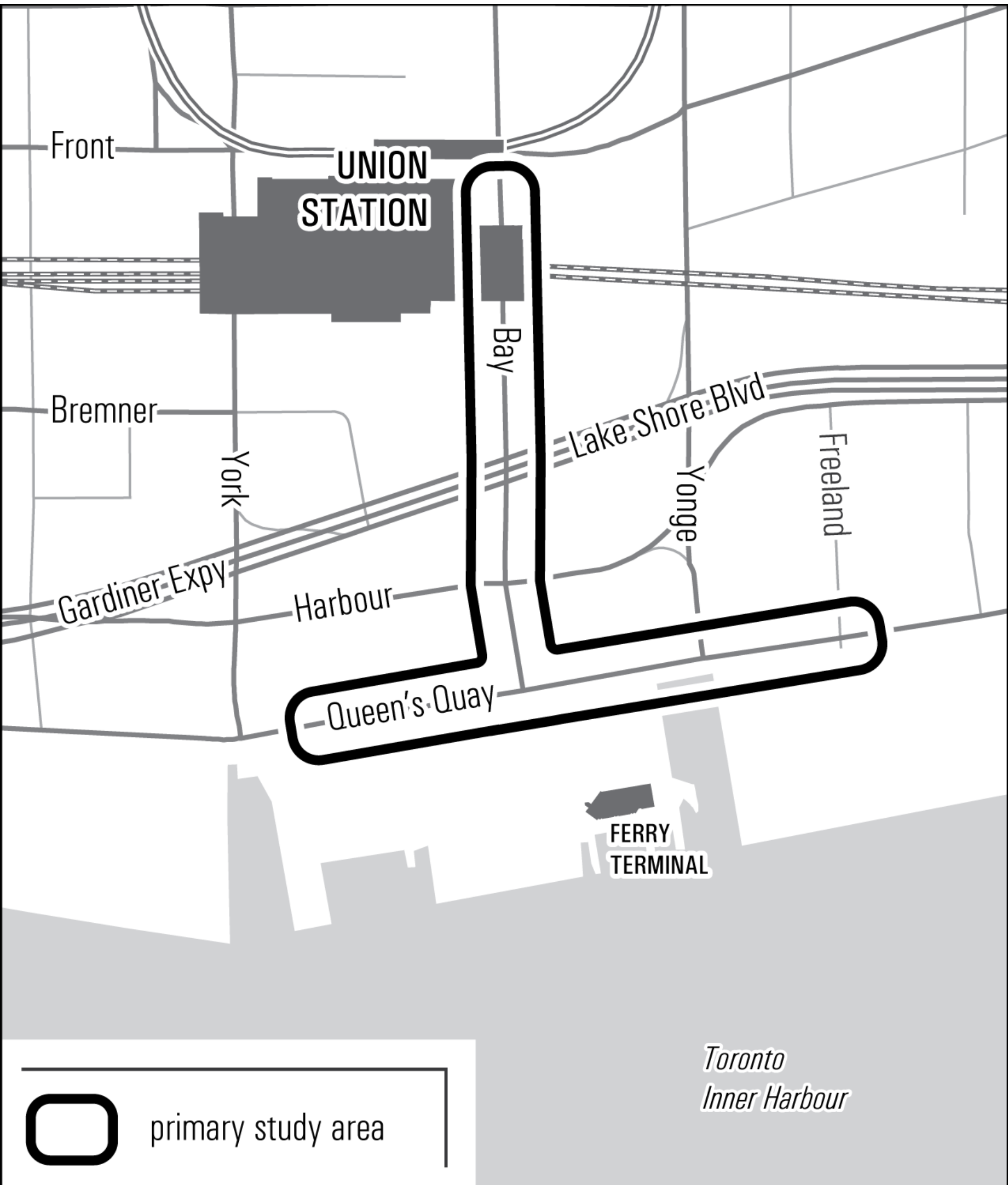


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Study Overview

Study purpose

- Confirm an appropriate and implementable solution for the connection of Queens Quay LRT to Union Station
- The primary study area includes the Bay Street corridor between Front Street and Queens Quay and the Queens Quay corridor between York Street and Freeland Street



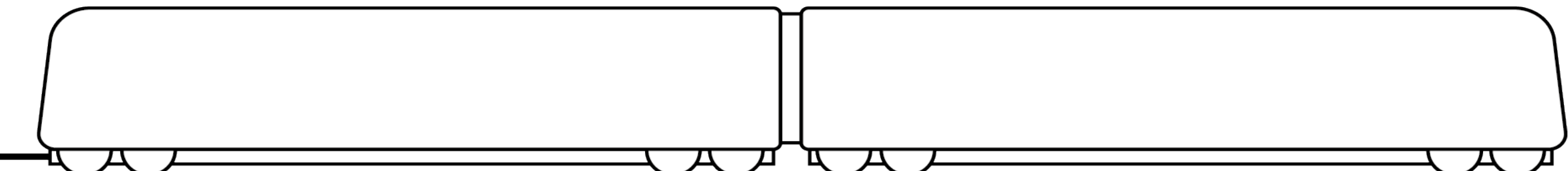
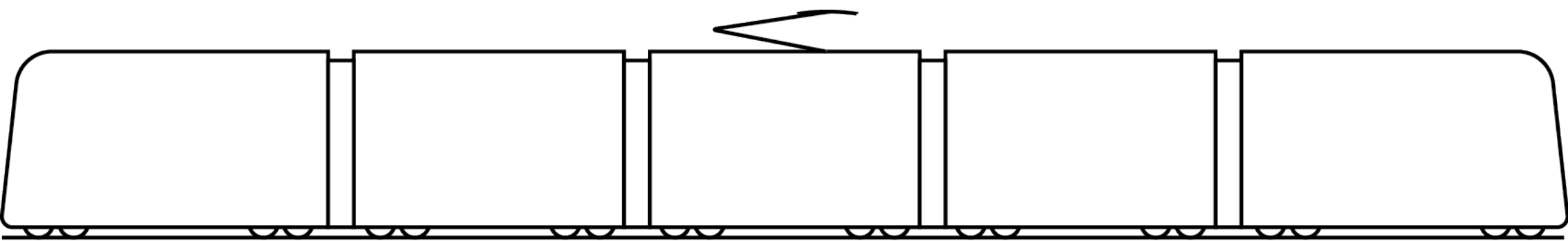
Technologies



Streetcar to Union (modified from EA)



E/W Streetcar on Queens Quay with N/S Automated People Mover (APM) to Union



TTC Flexity Streetcar	
Length	30m
Capacity (standard load)	130
Propulsion	Traction power

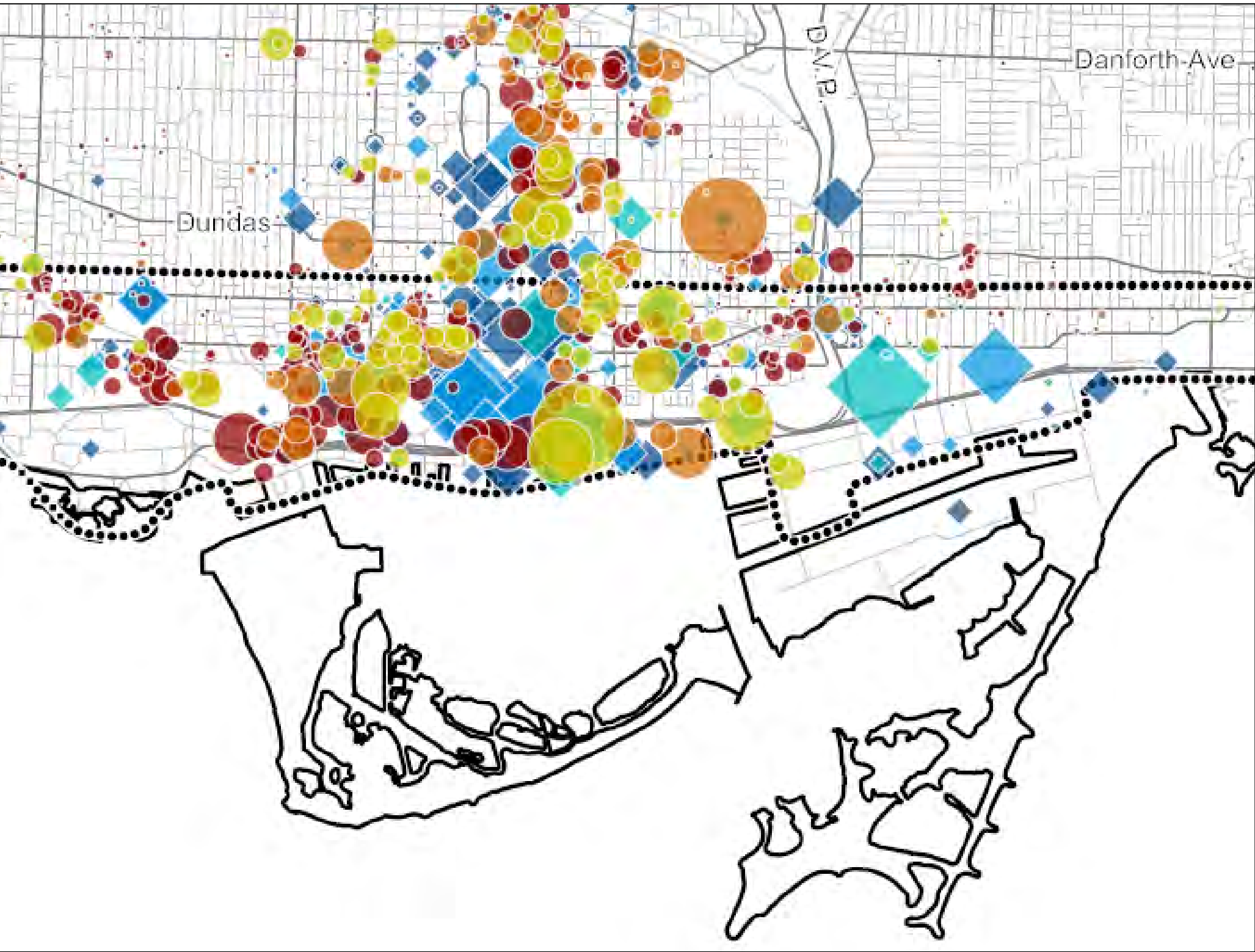
Automated People Mover	
Length	36m (variable)
Capacity (standard load)	200
Propulsion	Cable-pulled



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Growth & Travel Demand

Waterfront growth & need factors



Very significant growth is occurring and planned on the waterfront in the coming years

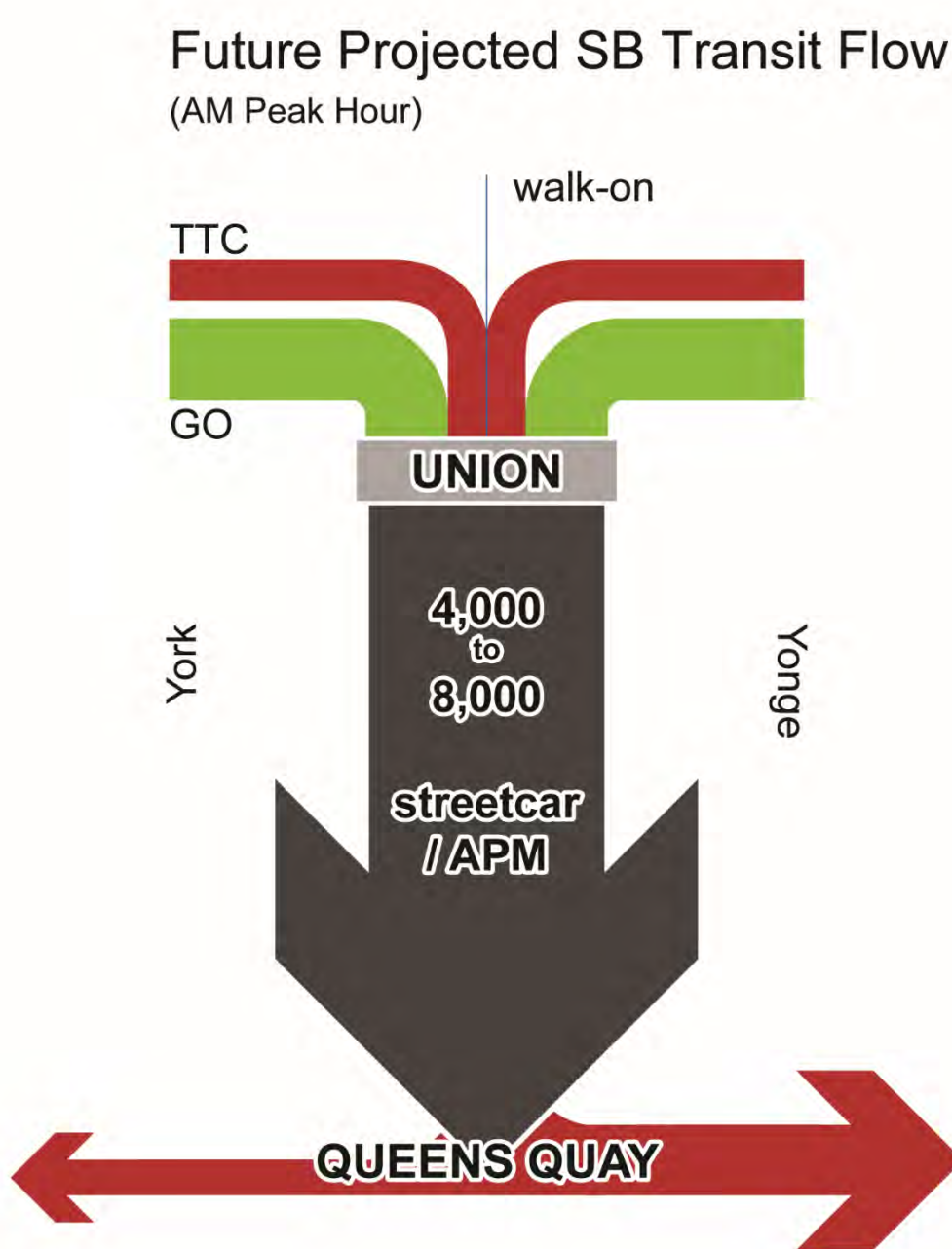
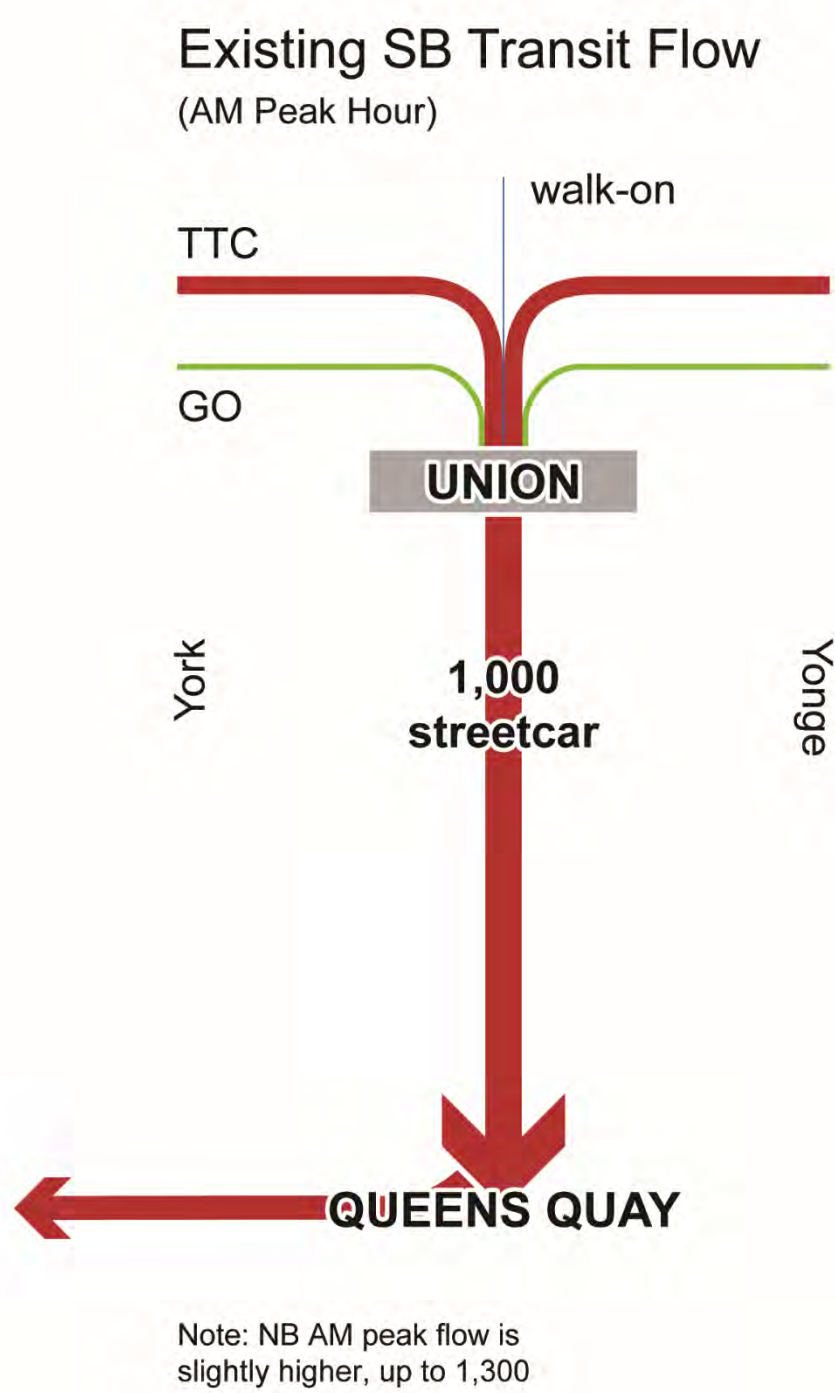


Peak hour transit ridership

- Peak transit demand in the Bay corridor is forecasted to be 4,000 – 8,000* passengers by 2041
- Approximately 40% of AM peak hour trips are destined to QQ/Bay and the remaining 60% of trips are destined to the wider waterfront

* Range subject to design refinement and fare structure assumptions

* Assumes Relief Line South in network



All day ridership considerations

- The Bay Street and Queens Quay corridors draw thousands of additional daily tourists, recreation, and special event riders
- Billy Bishop Airport draws approximately 2.8 million passengers per year
- These riders are not well-captured through transit demand forecasting

Venue/destination	Estimated annual visits/attendance
Harbourfront Centre	17,000,000
Exhibition Place	7,000,000
Scotiabank Arena	3,000,000
Jack Layton Ferry Terminal/Toronto Islands	1,500,000

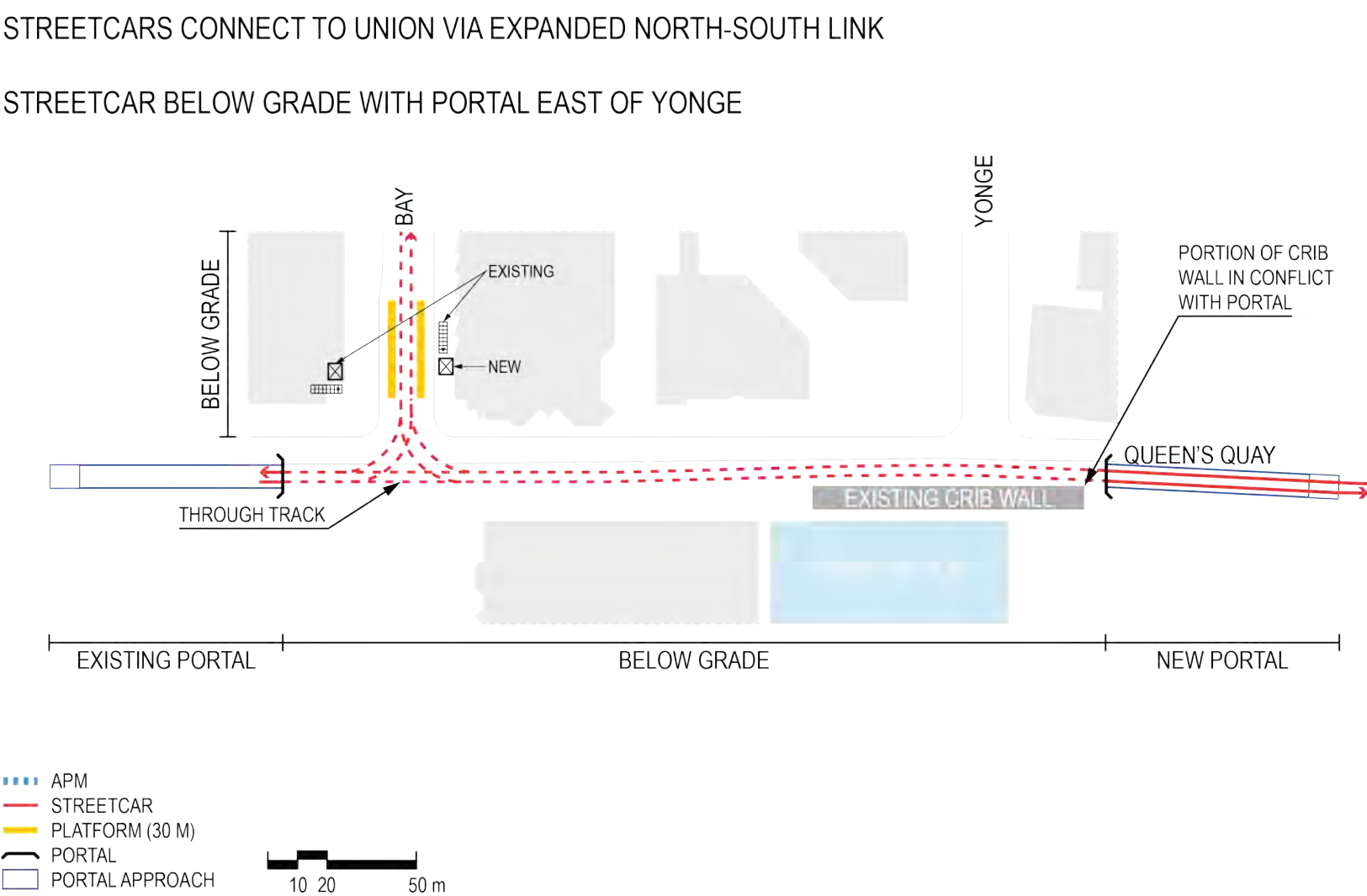


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Screening

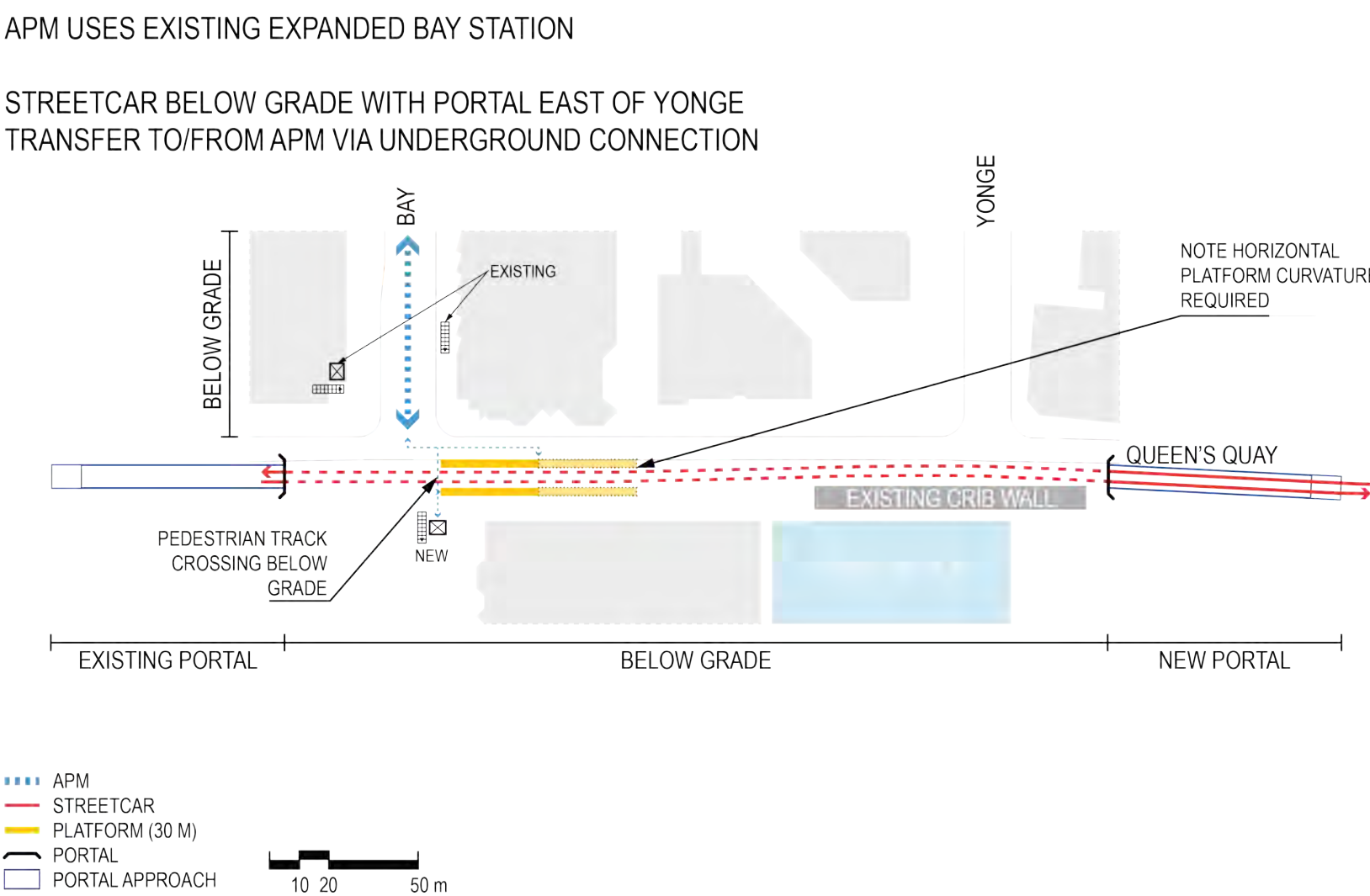
Initial options considered

Streetcar with expanded Union loop and QQ Station (modified EA)



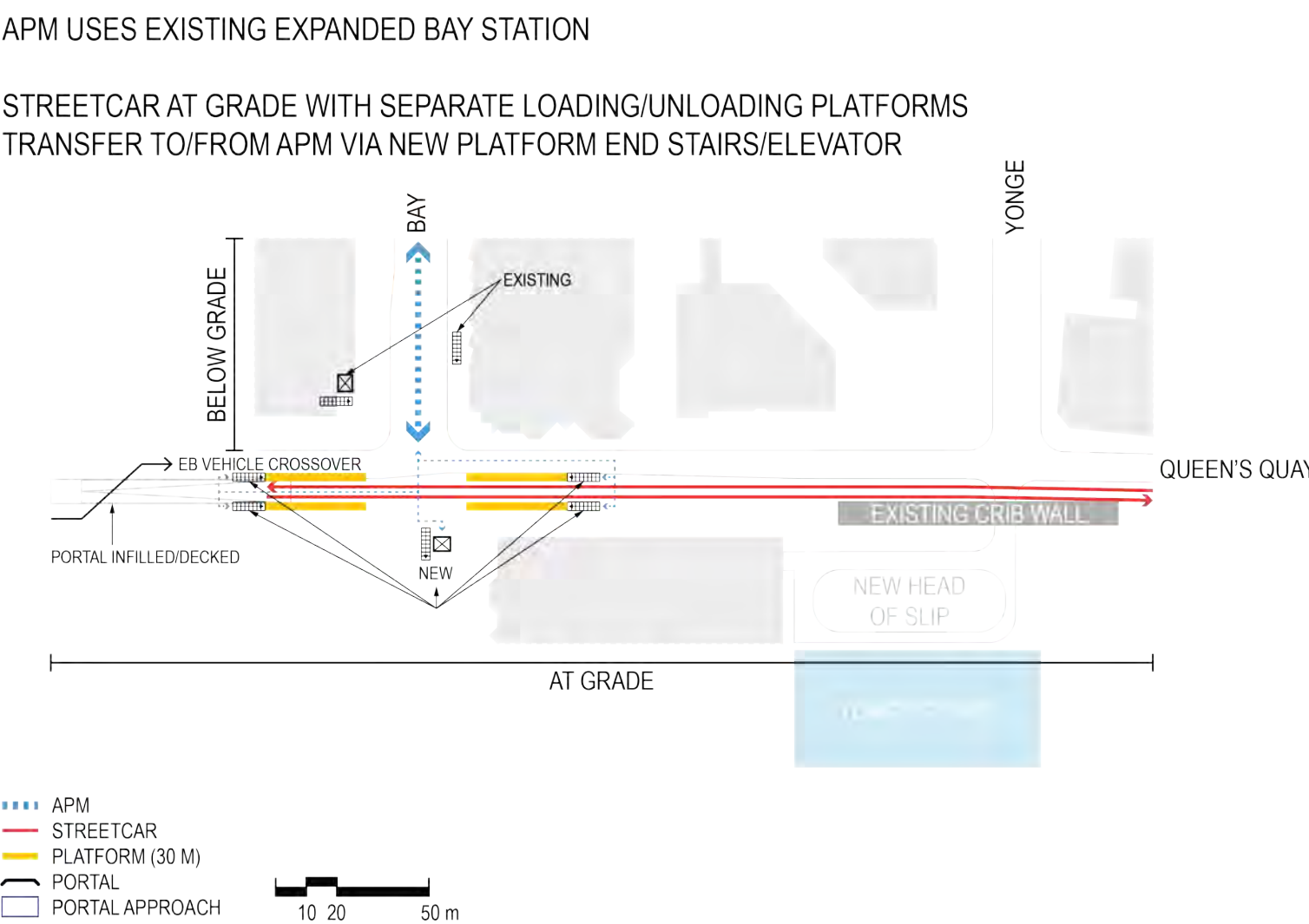
Carried forward

APM with streetcar below grade at QQ/Bay



Carried forward

APM with streetcar at grade along QQ



Not carried forward

APM with streetcar at grade along Queens Quay presented challenges

- Major transfer volumes increase potential for conflicts between pedestrians, cyclists, transit, and traffic at grade
- Insufficient space within the roadway to fit streetcar platforms while maintaining access to Harbour Square
- Non weather protected connection for large passenger transfer volume is undesirable
- A number of optimization exercises were conducted but it was ultimately decided that a below-grade APM/streetcar interchange is safest and most convenient



Pedestrian activity at street level at Queens Quay and Bay Street. Image: 2018 Google

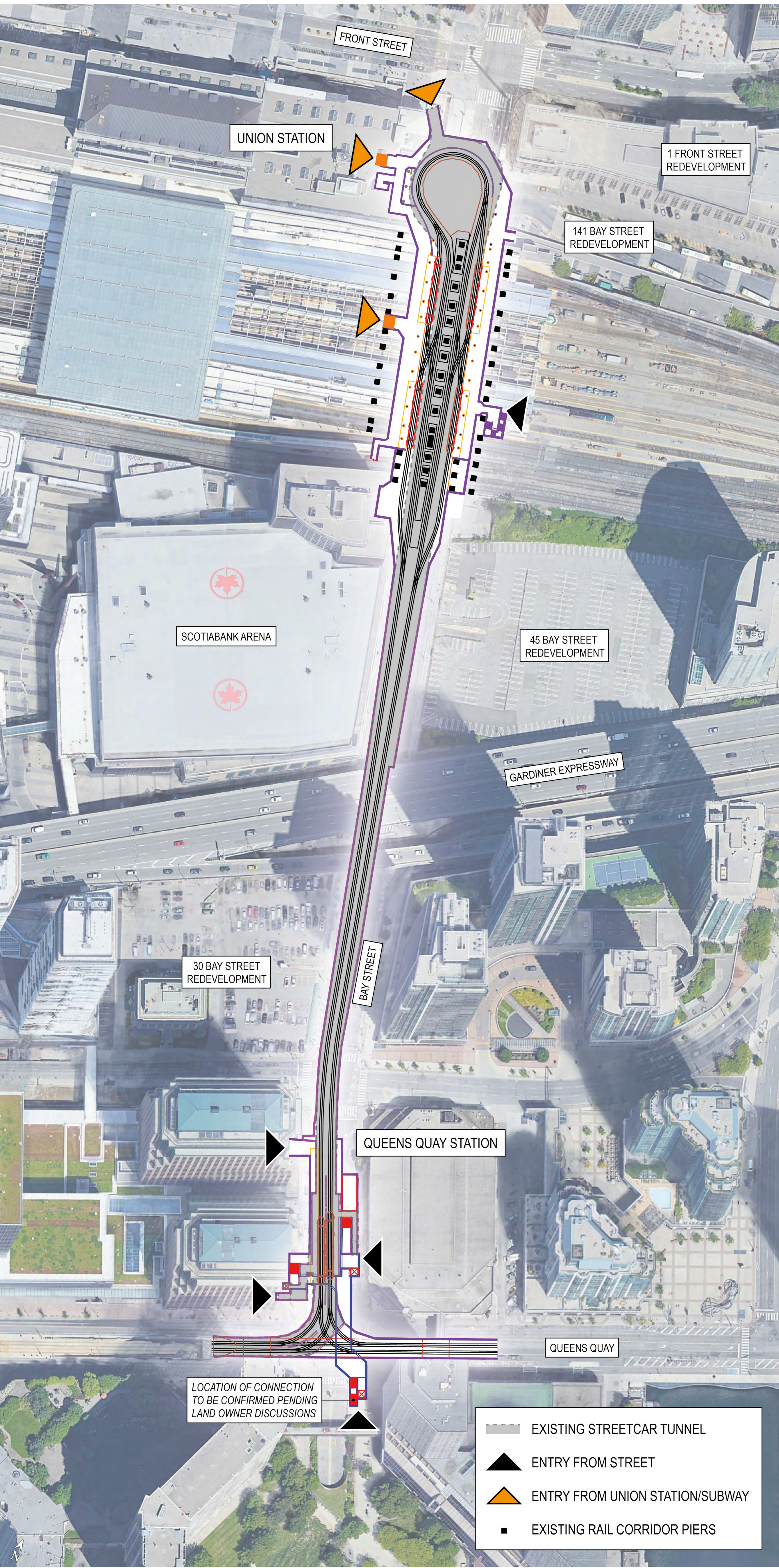


Pedestrian activity along Queens Quay. Image: DTAH



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Streetcar Option (Modified EA)



Station render showing the vision for Union Station, looking south

Artist's depiction subject to change and future design refinement

The Modified EA Option keeps the existing streetcar service from the west waterfront to an expanded Union Station streetcar loop, while adding a new underground streetcar connection between Union Station and the eastern waterfront.



Station render showing the vision for Queens Quay Station, looking south

Artist's depiction subject to change and future design refinement

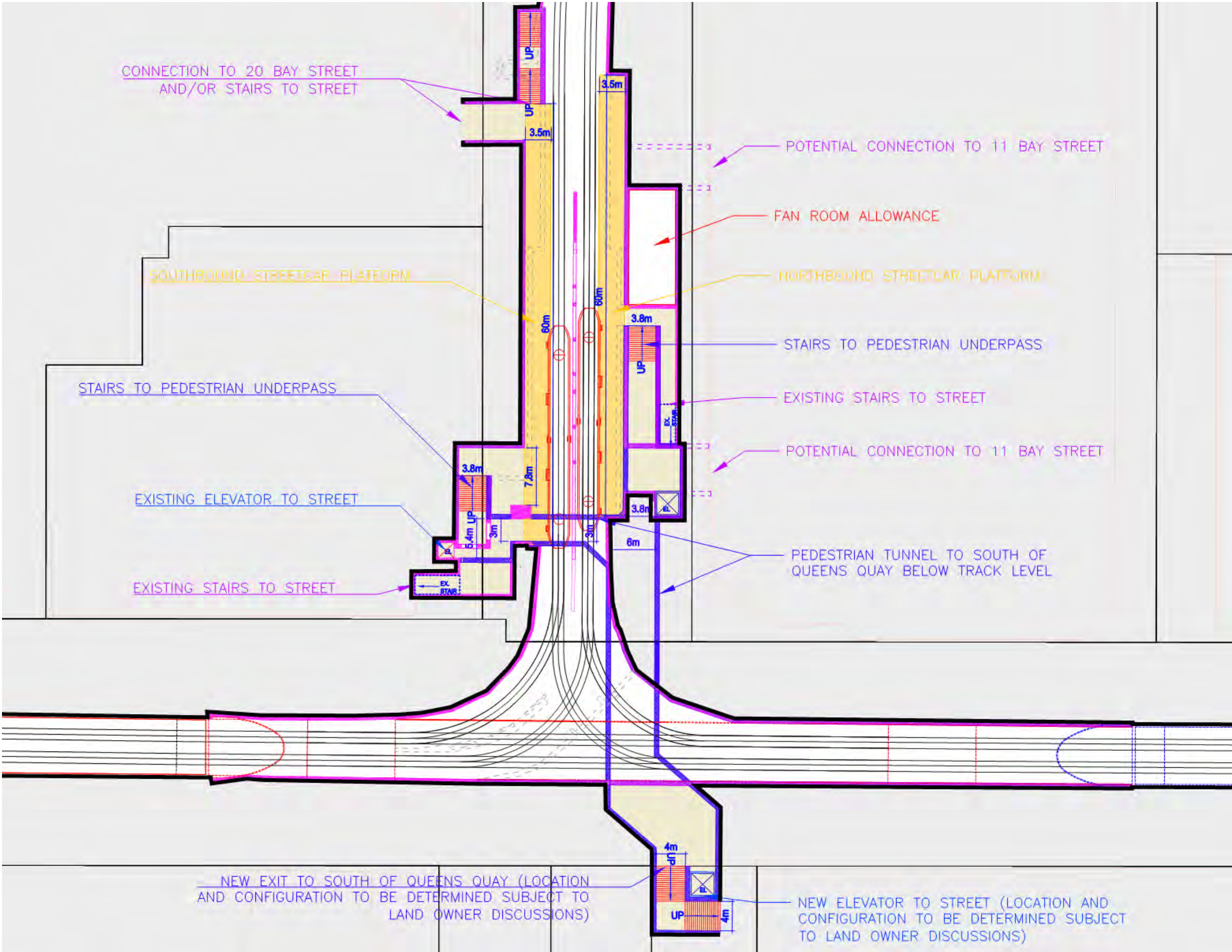
Drawings are preliminary and are not necessarily representative of final design.



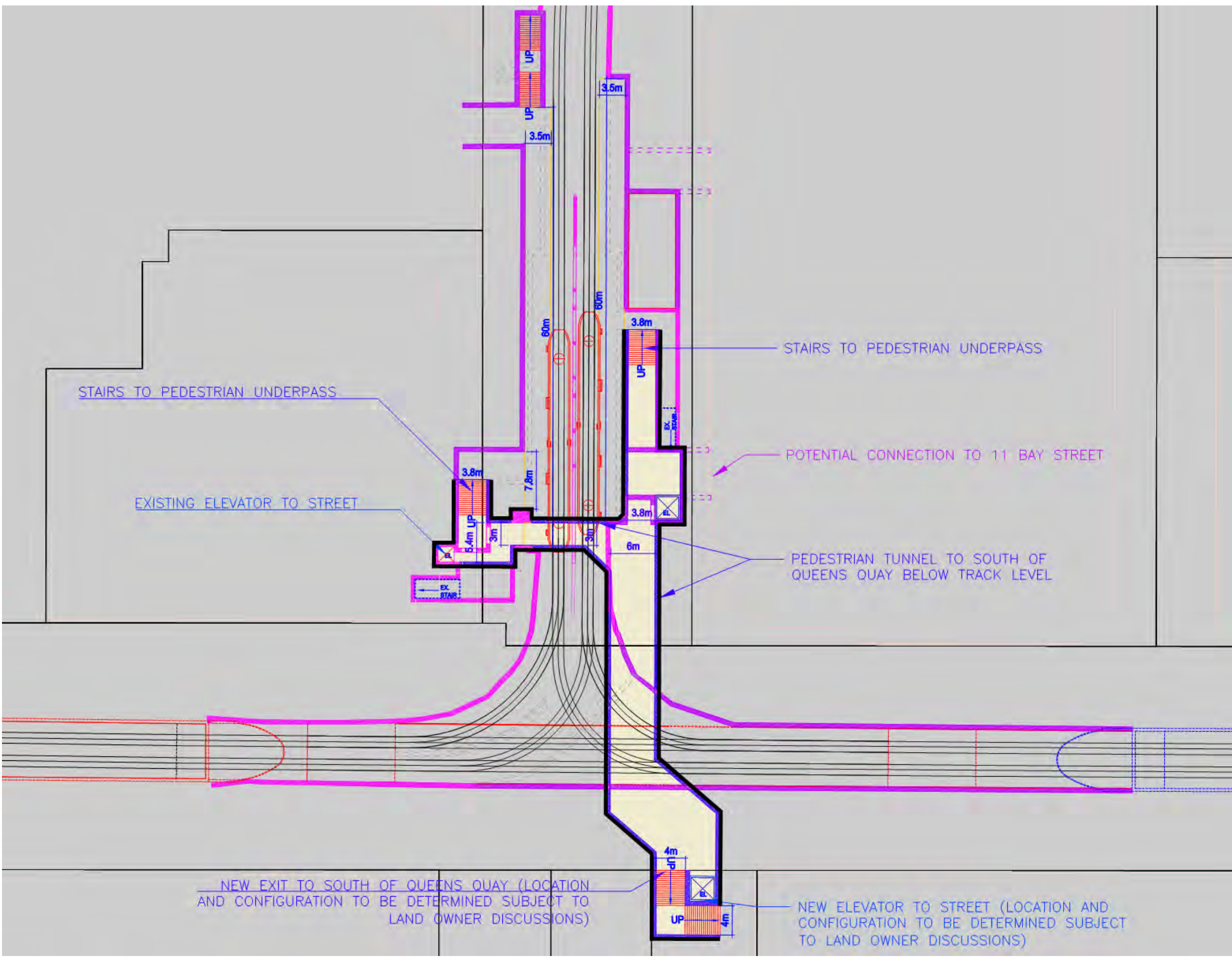
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Streetcar Option (Modified EA)

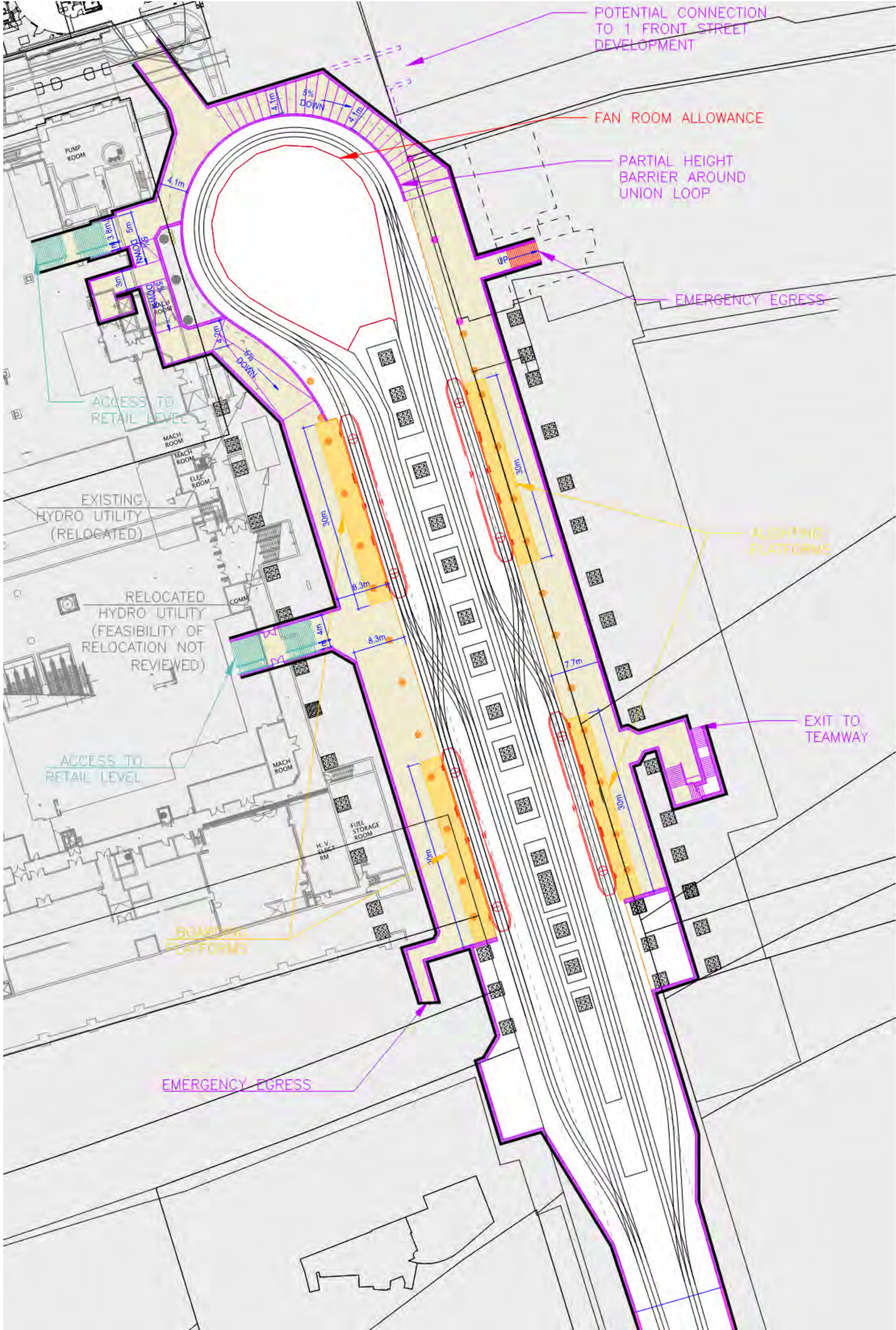
Queens Quay Station, track level



Queens Quay Station, below track level



Union Station, track level

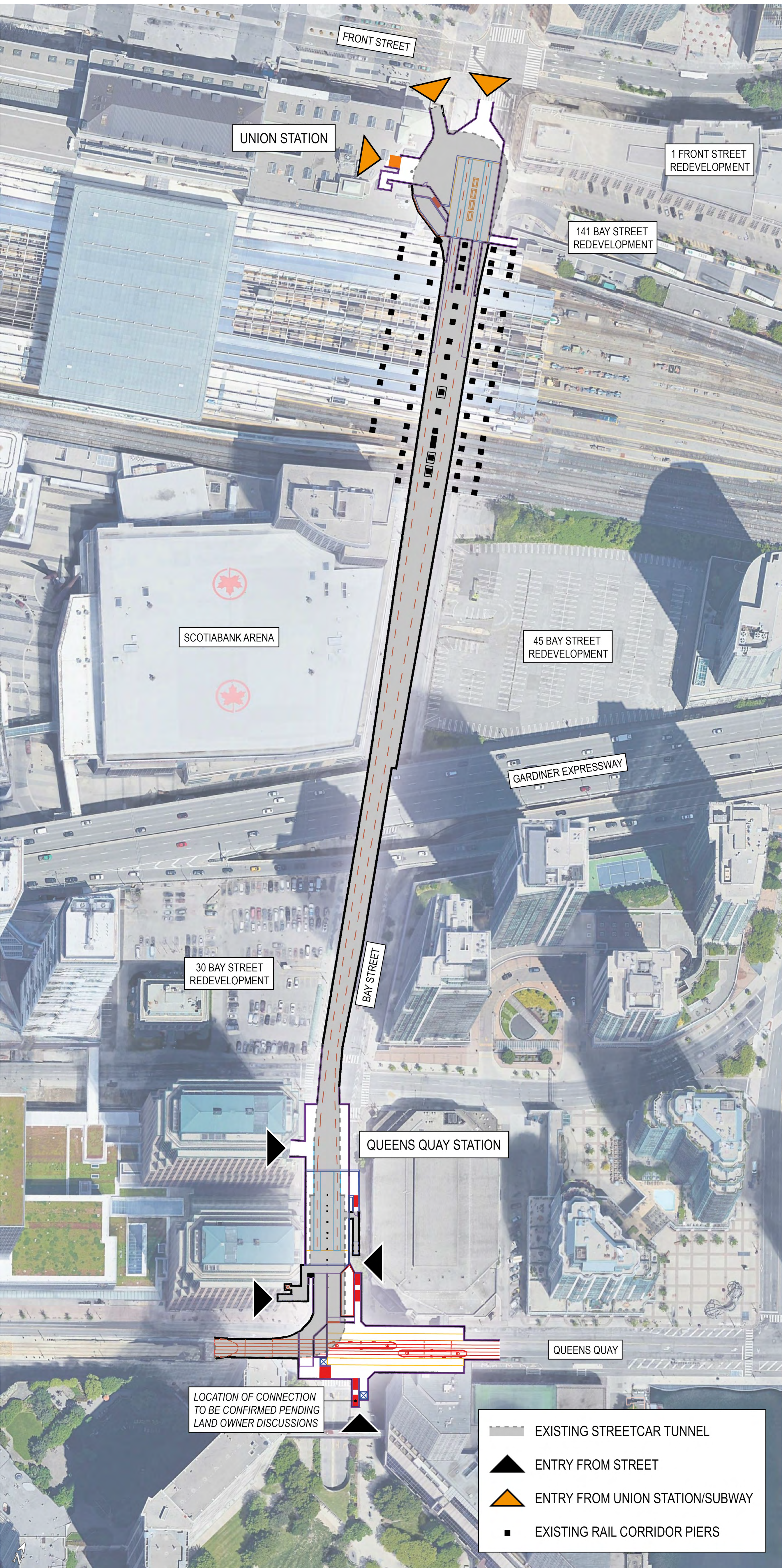


- STATION ENVELOPE
- WALLS (DEMOLISHED)
- WALLS (EXISTING, RETAINED)
- WALLS, G-1 LEVEL (NEW)
- WALLS, G-2 LEVEL (NEW)
- PLATFORMS
- STATION AREA



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APM Option



Station render showing the vision for Union Station, looking south

Artist's depiction subject to change and future design refinement

The APM Option repurposes the existing streetcar tunnel between Queens Quay and Union Station with an underground driverless Automated People Mover (APM). Streetcar services between the east waterfront and west waterfront connect riders to the southern terminus of the APM at a new underground Queens Quay Interchange Station.



Station render showing the vision for Queens Quay Station, looking south

Artist's depiction subject to change and future design refinement

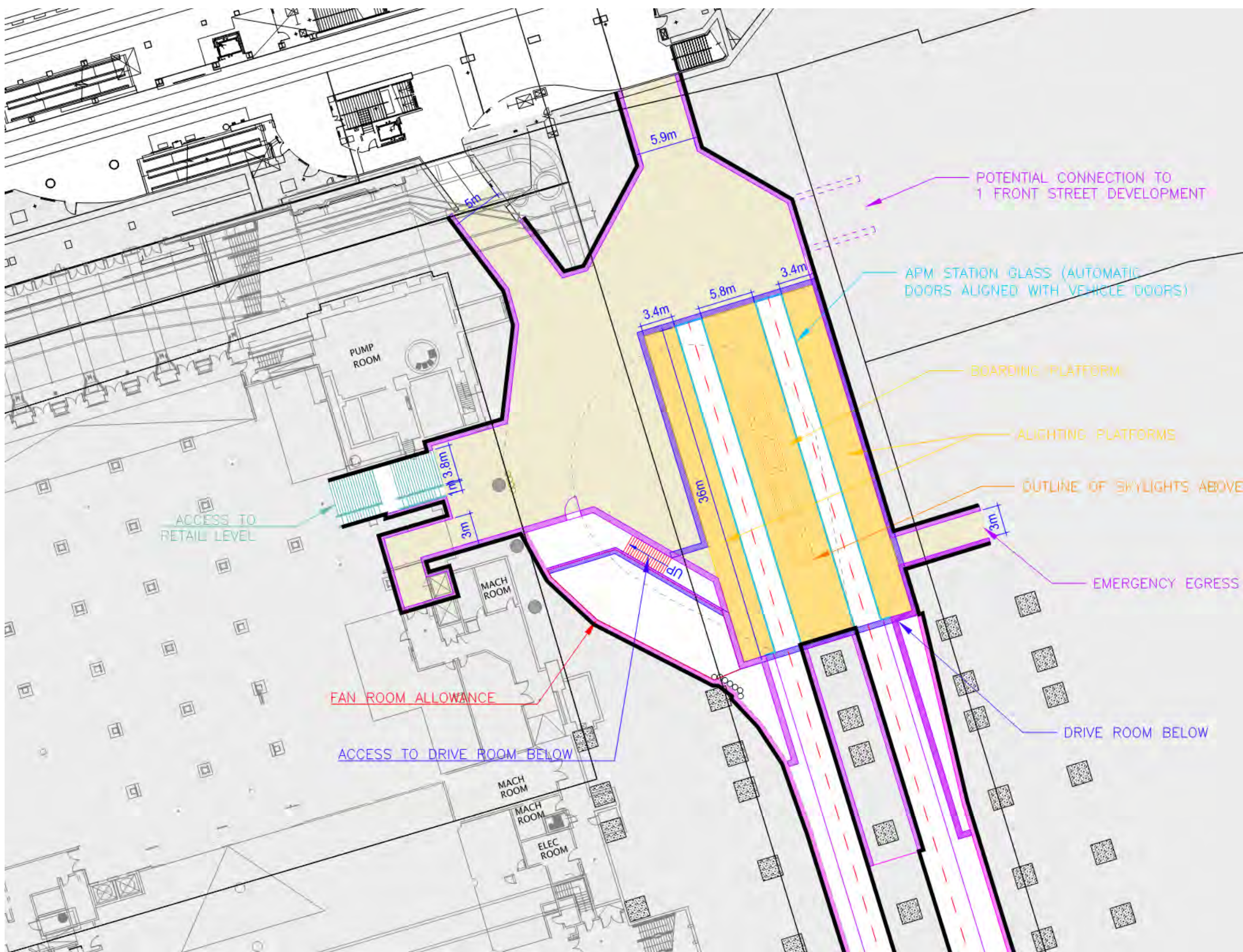
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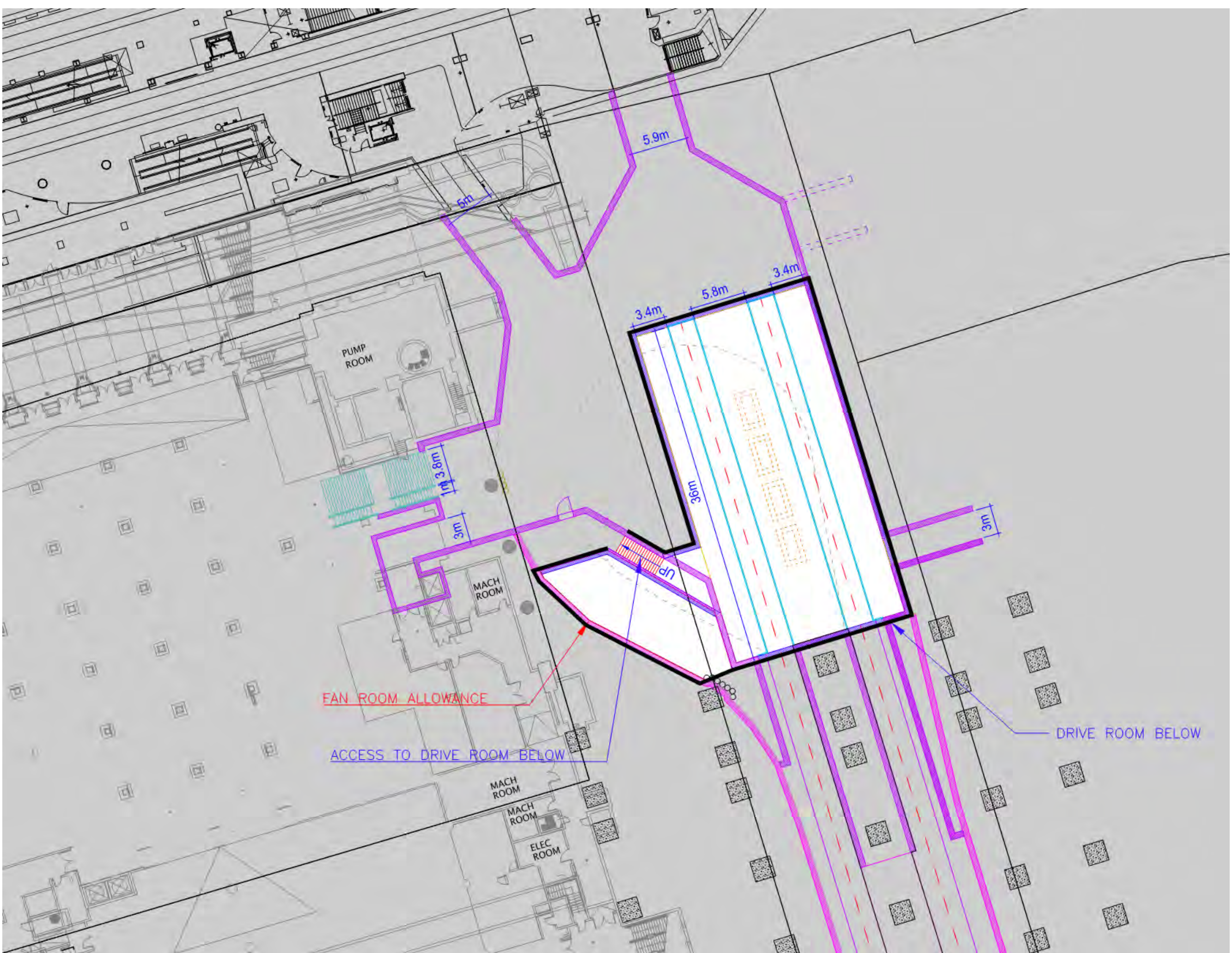
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APM Option

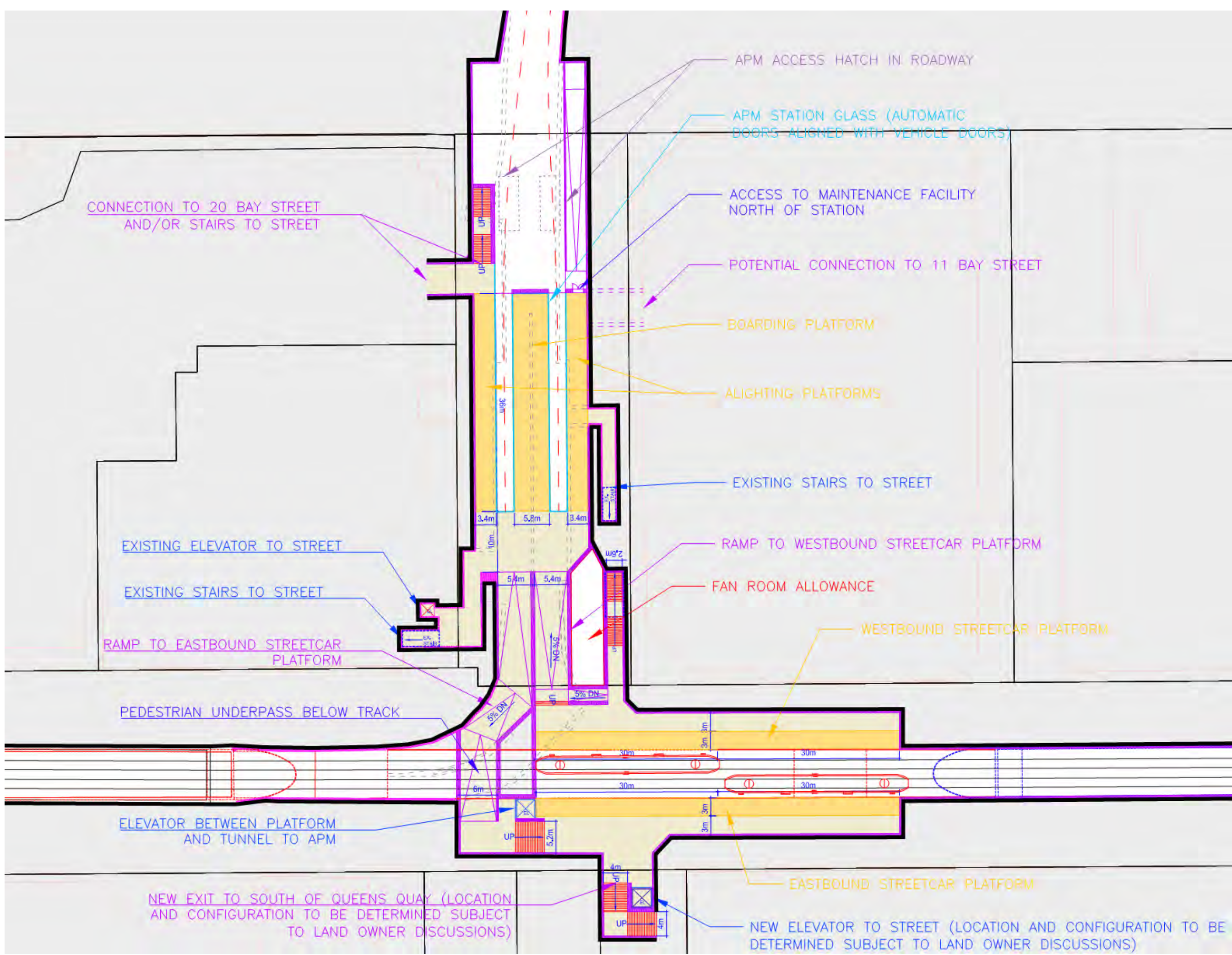
Union Station, track level



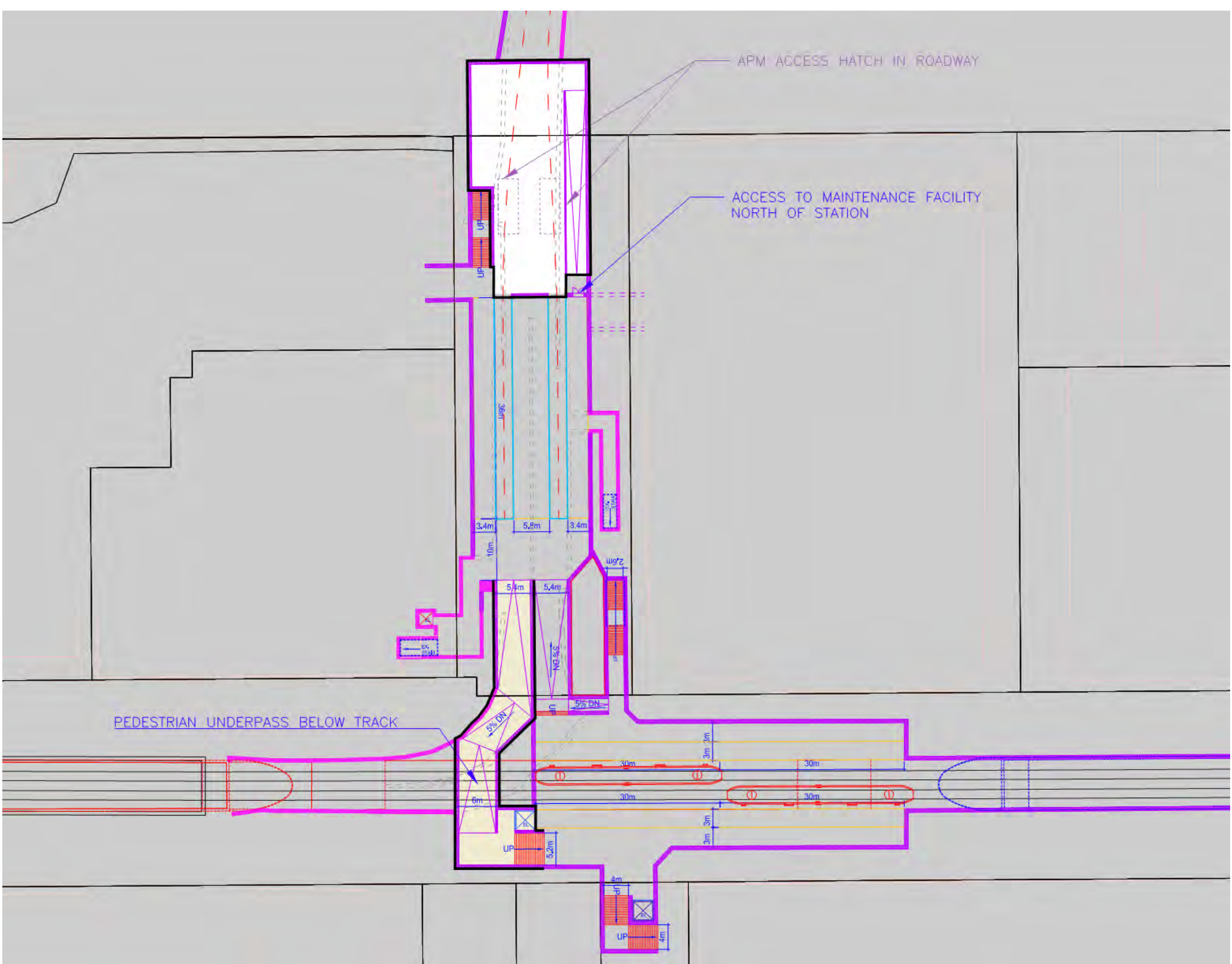
Union Station, below track level



Queens Quay Station, track level



Queens Quay Station, below track level



- STATION ENVELOPE
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Evaluation

A focused evaluation of the two options is based on the following key criteria:

User experience

Criterion	Streetcar	APM
Travel time assessment	Medium/longer trips (QQ) faster	Short trips (Bay) faster
Service reliability	Union Loop subject to potential on-street delays	Higher headway reliability for Bay Street trips
Comfort/convenience/accessibility	Single ride to/from Union	Additional transfer to/from Union
Conclusion	Preliminary preferred	-

Transportation

Criterion	Streetcar	APM
Local (QQ & Bay) transit riders	Higher along QQ east and west	Higher for Bay Street
Network (GTA) transit riders	Small increase in TTC ridership	Small increase in GO ridership
Streetcar network	Expanded terminal at Union	No terminal at Union
Overall	Preliminary preferred	-

Construction impacts

Criterion	Streetcar	APM
Risk profile	Rail viaduct risks	No rail viaduct risks
Pedestrian teamways	Teamways closed and pedestrians rerouted due to construction	Teamways not closed for construction
Property impacts	141 Bay basement impacts and teamways	No significant impacts
Bay Street lane impacts	South of rail viaduct impacts	No significant impacts
Duration estimation	4-5 years	3-4 years
Overall	-	Preliminary preferred

Class 4 capital cost estimates

Criterion	Streetcar	APM
Capital costs (to interim loop near Parliament Street)	\$650 - \$700 million*	\$650 - \$700 million*
Overall	No preliminary preferred	

*subject to refinement

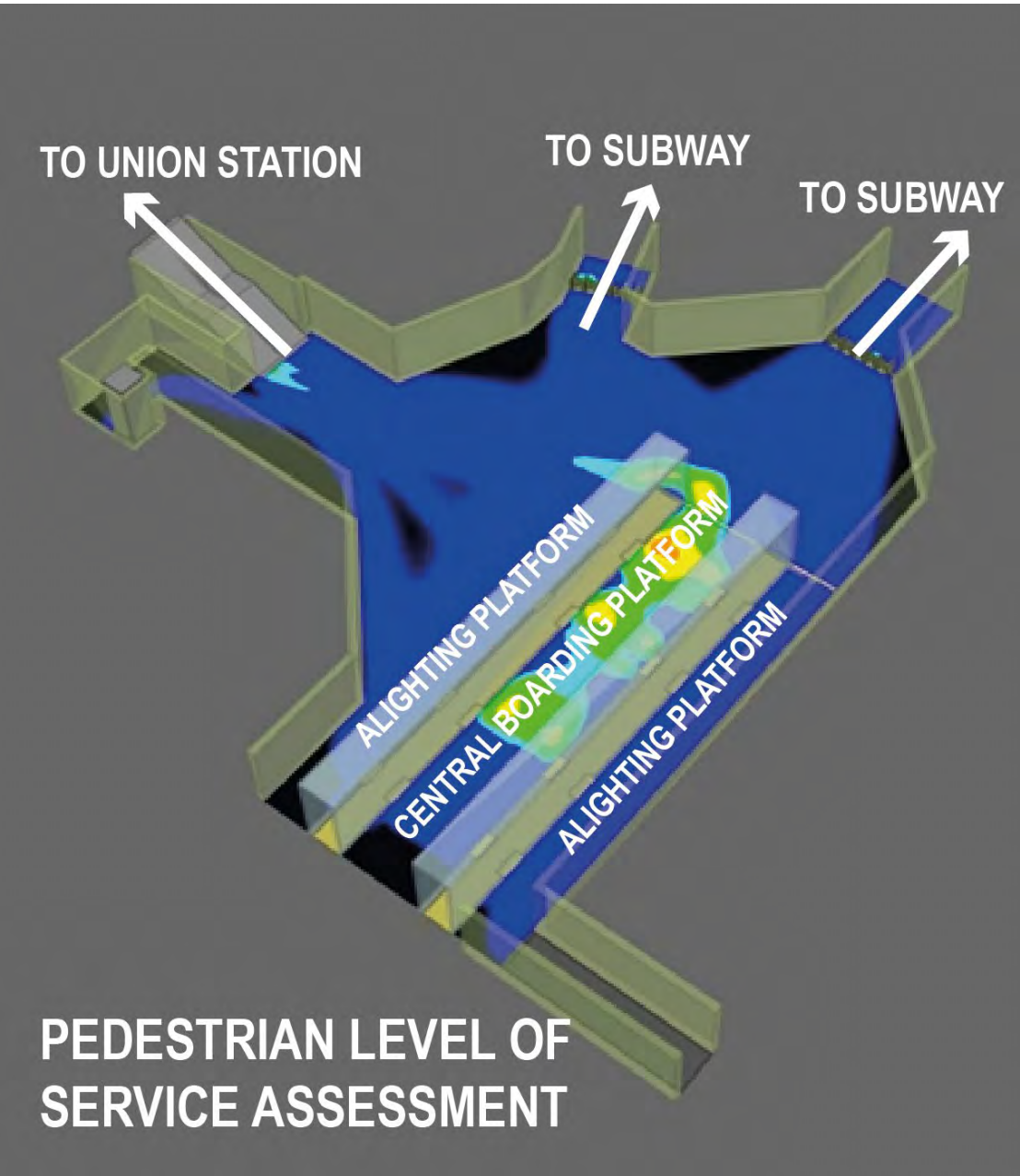
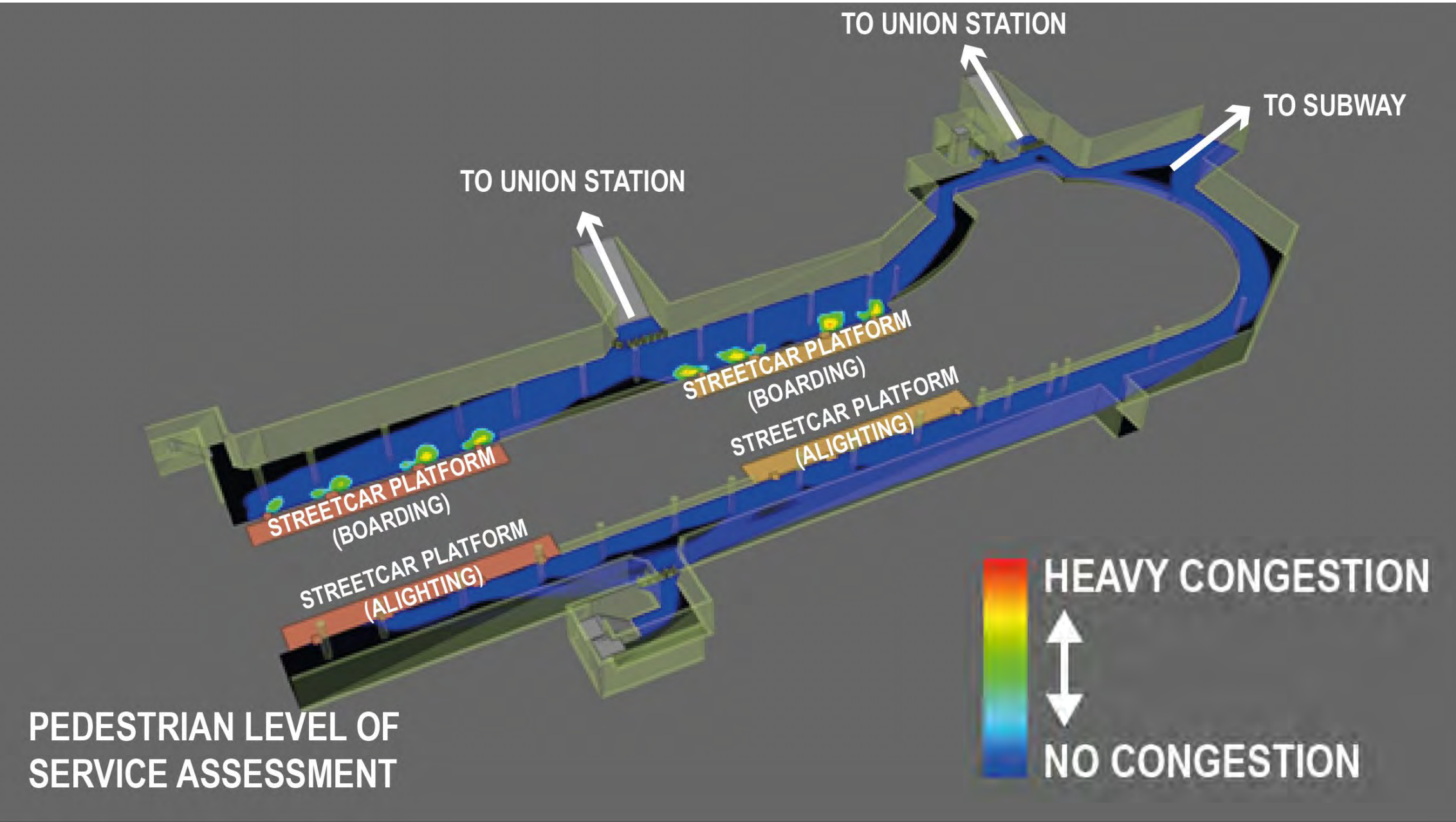
Operating costs forthcoming



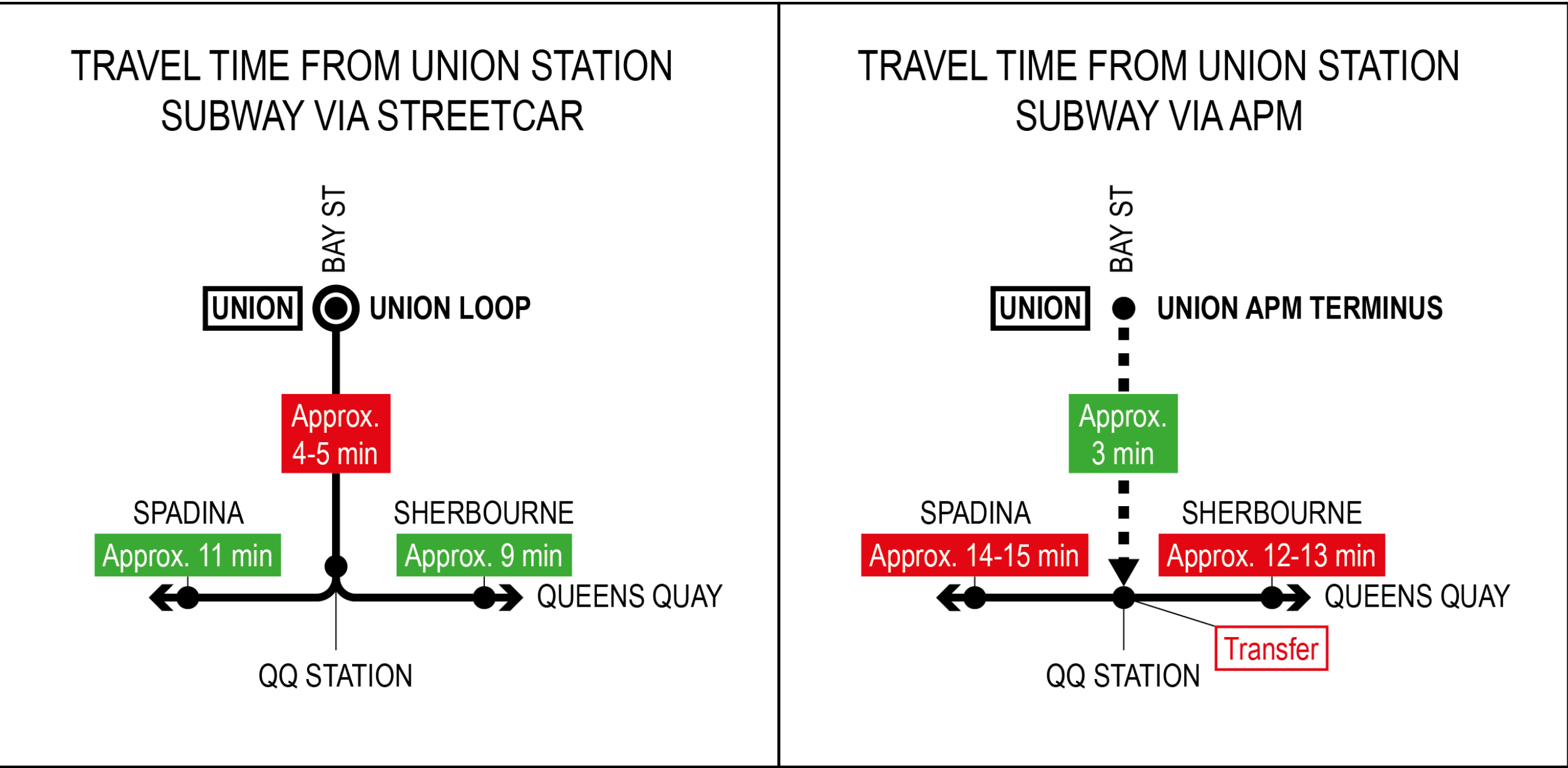
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Elements of Assessment

User experience



- Pedestrian level of service assessment shows station areas are suitably sized for anticipated ridership transfer volumes



- Travel time assessment shows APM is slightly faster for one-stop Bay Street trips while streetcar is faster for medium/longer distance trips along the waterfront due to no transfer required at Queens Quay

Transportation



Map showing existing (solid) and future (dashed) higher order transit on the waterfront

- A streetcar terminal at Union Station offers the greatest amount of flexibility for future waterfront transit network implementation and service planning



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Preliminary Preferred Option

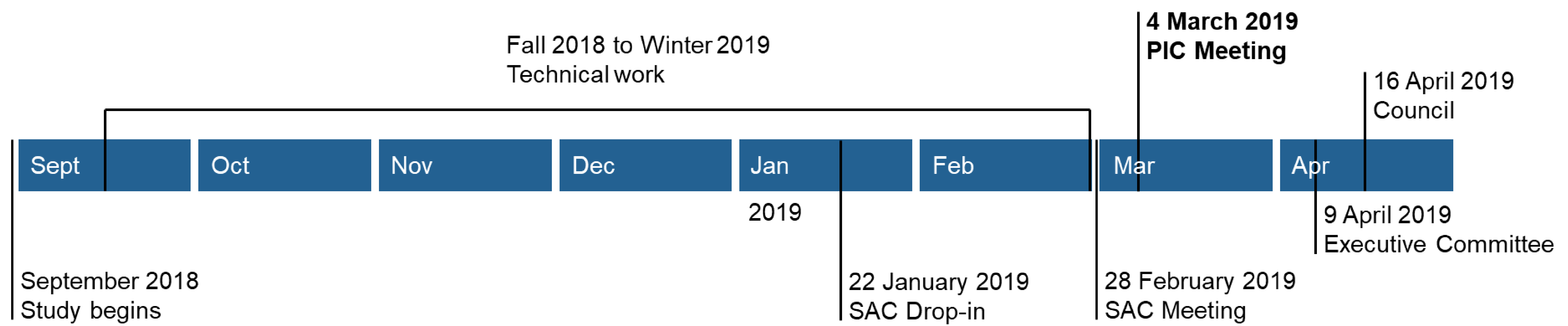
Overall evaluation summary

Criterion	Streetcar	APM
User experience	Preliminary preferred	-
Transportation	Preliminary preferred	-
Construction impact	-	Preliminary preferred
Capital costs	No preliminary preferred	
Overall	Preliminary preferred	-

- Both options are viable
- Both options offer significant improvements to moving people
- Construction of both options is feasible
- Streetcars is preferred for the overall TTC network

Next steps

- Finalize technical analysis and evaluation, considering public feedback
- Report to City Council April 2019



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Construction Management

Transit service

- **Streetcar service along Bay suspended for duration of construction for both options**
- **Replacement bus service required**
- **Phasing to mitigate impacts to transit to be evaluated in next phases**

Construction coordination

- **Pedestrian access in the corridor will be maintained and may require significant temporary improvements to accommodate anticipated flows**
- **Bike access and one lane of traffic in each direction will be maintained**
- **Significant concurrent projects to be coordinated**
 - Numerous Metrolinx projects
 - Future developments under construction and planned/proposed
 - E.g. CIBC Square: 141 and 81/45 Bay Street
 - Gardiner ramp changes (e.g. removal of Bay Street on-ramp)



Image: Toronto Star



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East Bayfront LRT

Delivery

- The Union Station – Queens Quay Transit Link will be integrated with the delivery of the East Bayfront LRT to Parliament Street

Portal location

- EA-approved portal is located east of Yonge Street
- An alternate portal location west of Yonge Street may be considered
- Locating the portal west of Yonge Street would involve partial lake filling, reconfiguration of access to the Westin Harbour Castle property and the Jack Layton Ferry Terminal, and create new public space



Street-level render of EA-approved portal location east of Yonge Street

Artist's depiction subject to change and future design refinement



Street-level render of alternate portal location west of Yonge Street

Artist's depiction subject to change and future design refinement

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