

Attachment 4 – Assessment of Ontario Line

As directed by City Council in April 2019, City and TTC staff have assessed the Province’s proposed Ontario Line. The details of this assessment are provided in this attachment.

1. Project Summary

1.1. Project Description

The Ontario Line was included as part of the 2019 Ontario Budget¹ as a transit project that will cover similar study areas as the Relief Line South and North, as well as a western extension. The proposed project is a 15.5-kilometre higher-order transit line with 15 stations, connecting from Exhibition GO station to Line 5 at Don Mills Road and Eglinton Avenue East, near the Science Centre station, as shown in **Figure 1**.



Figure 1. Ontario Line Proposal (source: Metrolinx IBC)

Since April 2019, technical working groups comprising staff from the City, TTC, Metrolinx, Infrastructure Ontario and the Ministry of Transportation met regularly to understand alignment and station location options being considered for the Ontario

¹ <http://budget.ontario.ca/2019/contents.html>

Line. Discussions also considered fleet requirements, infrastructure design criteria, and travel demand modelling.

Metrolinx prepared an Initial Business Case (IBC) that was publicly posted on July 25, 2019.² The IBC compared the Ontario Line and Relief Line South projects against a Business As Usual scenario. The general findings by Metrolinx were that "both Relief Line South and Ontario Line offer significant improvements compared to a Business As Usual scenario, generating \$3.4 billion and \$7.4 billion worth of economic benefits, respectively. Because it generates twice the economic benefits for a proportionally smaller cost increase, the Ontario Line provides better value for money than the Relief Line South, with a Benefit-to-Cost Ratio between 0.90 and 0.96 when delivered under a Public-Private Partnership (P3) delivery model."³

Further, the IBC recommends advancing design of the Ontario Line option over the Relief Line South. Next steps will include refining design and engineering to maximize benefits and address risks, developing a Preliminary Design Business Case, seeking environmental approvals through a Transit Project Assessment Process and proceeding towards delivery. Though the Ontario Line would expand mobility and opportunities for people in the GTHA, as well as provide relief to the existing transit network, it is also recommended that overall expansion of the transit system, beyond current plans for 2041, be pursued at pace in order to anticipate and support future growth of the region."⁴

As the planning and design work for the Ontario Line is still at a very early stage, details concerning the precise alignment and station locations are not yet available (e.g., the IBC provides only a representation alignment and station locations). As a result, the assessment of the project that follows is at a high level.

For the purposes of this report, the project is described in three main sections:

- *Western Section:* From an interchange at the Exhibition GO station to downtown, connecting with Line 1 at Osgoode station. This section has not previously been studied by the City/TTC;
- *Central Section:* From Osgoode station on Line 1 to Pape station on Line 2, which coincides with the Relief Line South project study area; and
- *Northern Section:* From Pape station on Line 2 to an interchange with the Eglinton Crosstown LRT at Don Mills station, which coincides with the Relief Line North project study area.

The Ontario Line builds on and extends the work undertaken in partnership by the City, TTC and Metrolinx on the Relief Line South and North. Portions of the alignment follow the Council-approved Relief Line South alignment and share similar station locations.

There are major differences in some areas, such as elevating the alignment over the Lower Don River and running above grade within the Lakeshore East GO rail corridor in the central section. Similarly, in the northern section, the Ontario Line follows one of the

² <https://metrolinx.files.wordpress.com/2019/07/click-here-to-view-the-ontario-line-initial-business-case.pdf>

³ Ontario Line Initial Business Case, page 10.

⁴ Ontario Line Initial Business Case, Page 12

alignment options that was studied in the Relief Line North assessment, but with an elevated guideway.

1.2 Project Costs and Schedule

The Ontario Budget included a preliminary cost estimate of \$10.9 billion, while the IBC estimated the capital cost to be \$10.2 billion (2019\$), assuming the representative 15.5-kilometre alignment with 15 stations at a conceptual planning stage. This is a Class 5 cost estimate undertaken by an international project management consultant. Accuracy ranges for a class 5 estimate can be anywhere on the low end from -50% and on the high end of +100%.

The Province has stated a project timeline with a 2027 in-service date for the Ontario Line, two years sooner than the accelerated Relief Line South schedule. It is anticipated that a more accurate estimate of schedule for the Ontario Line will be determined as the project advances. The Province has committed to ensuring the Ontario Line is in service prior to the Yonge Subway Extension.

Given the current stage of the project and the variety of design challenges that remain to be overcome in a project of this scale, further design and development must occur before City and TTC are able to assess the validity of the stated timetable or the estimated cost at this time.

1.3 Project Delivery

Metrolinx has indicated that it intends to undertake a Transit Project Assessment Process (TPAP) for the Ontario Line; however, the timing for Notice of Commencement is not yet available. By way of a letter to the Ministry of Environment, Conservation and Parks, Metrolinx provided notice that it will be proceeding as the sole proponent for the Ontario Line TPAP.

Based on discussions with the Province and as noted in the IBC, procurement contemplates a P3, design-build-finance-maintain (DBFM) delivery model for delivery of the project.

2. City/TTC Assessment

The City and TTC assessment of the representative Ontario Line project as included in the IBC was guided by the Rapid Transit Evaluation Framework (RTEF). Background information on the RTEF is provided in Attachment 2.

Information to support the assessment of the plans for the Ontario Line was obtained through a series of technical working group meetings with Provincial staff from the Ministry of Transportation, Infrastructure Ontario, and Metrolinx, and from the Initial Business Case (IBC) prepared by Metrolinx and released in July 2019.

It is important to note that this assessment is based on the current early conceptual design. The project may change significantly through further design and a P3 delivery

process, which could result in changes to the City and TTC assessment of the project in the future.

Highlights

- A design capacity of at least 34,000 riders per hour for the Ontario Line will meet demand in the project corridor for approximately 50 years.
- The Ontario Line will help relieve demand on Line 1. The modelling suggests that the Ontario Line is projected to reduce demand on Line 1 north of Bloor by between 700–2,000 riders per hour and between 3,200-5,400 riders south of Bloor in 2041.
 - This would reduce the demand north of Bloor to 31,000-38,500 passengers per hour and south of Bloor on Line 1 to approximately 33,500-36,000 passengers per hour; the upper end of these estimated range matches or exceeds the projected capacity of the line.
- The Ontario Line is expected to bring higher-order transit closer to equity-seeking communities. The northern section will directly serve the Thorncliffe Park and Flemingdon Park Neighbourhood Improvement Areas. Other portions of the line will be close to the Regent Park and Parkdale NIAs, as well as the Alexandra Park and Moss Park communities.
- The Ontario Line has the potential to support the development of employment and prosperity in the City, serving a large number of existing and future jobs. Proposed stations in the central section provide direct access to the Financial District in the Downtown, while employment in the King-Spadina Secondary Plan area is well-served by two proposed stations in the western section. Other stations such as East Harbour will serve emerging employment precincts.
- The Ontario Line is consistent with the policy goals in both provincial and City planning frameworks. The proposed stations are generally located in areas where the Official Plan directs population and employment growth, with land use designations in the station area that support the development of this growth. There are transit-oriented development opportunities at many of the proposed station locations. Comprehensive station-area planning studies would help to determine the appropriate nature and scale of potential development, including consideration of station access, public realm integration and fit with the area's planned urban context.
- As planning, design and delivery of the Ontario Line proceeds, potential temporary and permanent impacts to residents and businesses will need to be mitigated and well-managed. The portions of the line that are above-grade or on an elevated guideway have the potential for permanent noise and vibration, property, traffic, and visual impacts. For example, the section between Cherry Street and Gerrard Street East has the potential for significant impacts on the existing community and will require great care during the design process and during construction. Operational impacts may also result. Design and

construction of the elevated crossing of the Lower Don will need to be well coordinated with numerous major infrastructure improvement projects, including but not limited to planned flood protection mitigation measures and the Gardiner Rehabilitation Project.

- The Ontario Line has the potential to provide improved public transit access to several public parks and attractions such as Exhibition Place, Fort York, Nathan Phillips Square, and the Don Valley parks system. The project passes through several heritage conservation districts and many station areas include listed and designated heritage properties. The Don River crossing presents sensitive environmental interfaces, including potential impacts to the flood channel. Potential impacts to natural and cultural heritage features will need to be appropriately mitigated.

Consultation with City divisions and agencies responsible for stewardship, management and planning of these resources and infrastructure is important in protecting public health and the environment.

2.1 Rapid Transit Evaluation Framework Principle #1 – Serving People

Transit Users Choice

The Ontario Line is expected to contribute to the development of a comprehensive higher-order transit network in Toronto, in a manner similar to what City Council has previously endorsed as a priority in the City's transit network plan. It provides transit riders additional routes and alternatives for making transit journeys to the Downtown core and across the city. The Ontario Line provides several interchange opportunities with other higher-order transit lines, most critically a second network connection from Line 2 to Line 1, similar to the Relief Line South concept, and generally provides good connectivity with existing and planned TTC streetcar and bus routes in its service area. Further information on each section are discussed below.

- *Western Section*

Exhibition Station, the western terminus station, will contribute to good network development by providing interchange opportunities with Lakeshore West GO rail services, and existing and future TTC bus and streetcar services at Exhibition Loop and in Liberty Village. Good pedestrian access to Liberty Village would provide excellent rapid transit connections to that area. Frequent service on the Ontario Line, combined with a track arrangement allowing cross-platform transfers between Ontario Line trains and GO trains, will provide a very attractive alternative for many passengers on GO Trains destined to the northern part of the financial district that would otherwise continue to travel through Union Station.

Stations along the western section of the representative alignment provide good connections to surface transit routes. Importantly, King-Bathurst station provides a transfer opportunity to the heart of the Financial District with the 504 King streetcar, while Queen-Spadina station will connect with the 501 Queen and 510 Spadina streetcars.

The western section will interface with some important existing and future transit infrastructure in the vicinity of Exhibition station. The Exhibition Loop is an important facility for serving TTC streetcar and bus customers, and provides necessary space for terminating and storing streetcars and buses to support service on several busy routes. The first phase of a future expanded Waterfront streetcar network, connecting Exhibition Loop to Dufferin Gate Loop, is currently at 30% design and is planned to be constructed parallel to the Lakeshore West GO rail corridor. Any conflicts between the proposed track arrangements to permit cross-platform transfers between Ontario Line and GO trains must be identified and resolved.

- *Central Section*

The Ontario Line provides optimal interchange opportunities with other higher-order transit services in the central section. Direct connections are provided at Osgoode, Queen, and Pape stations to existing Line 1 and Line 2 trains. An elevated crossing of the Don River along the existing GO rail bridge creates an opportunity to provide a cross-platform exchange for passengers transferring between Lakeshore East or Stouffville GO rail services to the Ontario Line at East Harbour, saving passengers several minutes of journey time and making the transfer more attractive.

The Corktown station will be located west of Parliament Street near King Street, instead of near King Street/Sumach Street/Eastern Avenue as proposed by the Relief Line South. This station will provide a new connection to buses on Parliament Street, but will be more distant from the developing area in the West Don Lands, as compared to the Sumach station.

The central section connects well with local TTC bus and streetcar services. The Leslieville station will be located at Queen Street and the Lakeshore East GO rail corridor, just east of Broadview Avenue, instead of the Queen Street/Carlaw Avenue location proposed by the Relief Line South. The Leslieville station will provide connections to streetcars on Queen Street but will not connect to buses on Carlaw Avenue.

The location of Gerrard station on the Ontario Line may preclude the construction of the planned SmartTrack station at Gerrard-Carlaw. More work is required to understand the interdependency of these two stations and consider design options.

In the central section, station access from the surrounding neighbourhoods to each of the Ontario Line stations by various modes of transportation is excellent. The proposed stations at Queen-Yonge, Moss Park, Corktown, Leslieville, Gerrard and Pape are located in mature urban neighbourhoods with well-developed pedestrian infrastructure, providing multiple walking access routes approaching stations from all directions. East Harbour station is located in a future employment precinct where Official Plan policies and development plans are prioritizing a good pedestrian environment. Wide sidewalks and high-quality public realm improvements will be provided, particularly along the signature Broadview Avenue extension.

- *Northern Section*

A well-designed interchange station at the Don Mills/Eglinton station for the Ontario Line, with direct connection to the Science Centre station on Line 5 and the bus terminal on the northeast corner, will provide an important transfer for transit riders.

The Ontario Line will replace some of the TTC bus service currently operating on Pape Avenue, Millwood Road, Overlea Boulevard, and Don Mills Road (south of Eglinton Avenue East). TTC bus services in the Thorncliffe Park and Flemingdon Park neighbourhoods will be revised to provide efficient, direct connections for passengers to the closest higher-order transit stations on the Ontario Line. The station at Cosburn will connect with the busy east-west 87 Cosburn bus service.

Pedestrian and cyclist station access to proposed Ontario Line stations in the northern section is not as well developed and the pedestrian network in some areas, such as Thorncliffe Park and Flemingdon Park, is fragmented. Station design provides an opportunity to improve the pedestrian environment along key walking routes near the station, as well as enhancements to cycling connections. Station locations that can leverage transit-oriented development opportunities can also improve pedestrian and cycling connections to the station.

Experience

Ontario Line Design Capacity and Line 1 Demand

A key component of the City and TTCs assessment of the Ontario Line is determining how it could affect the overall performance of the transit network. Key considerations include how it may:

1. Reduce future demand on Line 1 (i.e. provide relief); and
2. Meet future demand in the new corridor.

Given the significant investment being made, a very long term view is prudent. Travel demand modelling is a tool that is used to help understand these issues. Travel demand models use inputs such as projected population and employment distributions, demographics and existing travel behaviour to estimate demand on Toronto's transportation network at a point in the future, known as the planning horizon.

Travel demand modelling has been undertaken by both the City and Metrolinx – key results are summarized in Table 1.

Table 1: Ontario Line Travel Demand Projections⁵

Planned Ontario Line Capacity	34,000 riders per hour ⁶
Projected Ontario Line Demand (2041): <ul style="list-style-type: none"> • Greatest Hourly Demand (Morning peak hour, westbound between East Harbour and Moss Park Stations; peak hour, peak point, peak direction) • Total Daily Boardings 	19,000 - 20,000 riders per hour 391,000 - 410,000 riders per day
Projected timeline when Ontario Line will reach capacity	Approximately 50 years after opening ⁷
Line 1 capacity	36,000 riders per hour ⁸
Projected Line 1 Demand in 2041 (With Ontario Line): <ul style="list-style-type: none"> • Morning peak hour, southbound <ul style="list-style-type: none"> ○ South of Bloor ○ North of Bloor 	33,500 - 36,000 riders per hour 31,000 - 38,500 riders per hour

The findings are preliminary and will be the subject of further refinement. The work is based on the best information available about the Provincial projects, and relies on population and employment projections that do not yet reflect recent changes to Official Plan policies prescribed by the Province for the Downtown and Yonge-Eglinton Centre.

⁵ All demand estimates reported are for the 2041 planning horizon. All four provincial priority projects are assumed to have been built and are included in the model. In all cases, the range of values represents the different estimates resulting from the travel demand models run by the City and Metrolinx; in all cases the lower estimates are output by the Metrolinx model, while the higher estimates are the output by the City model.

⁶ 34,000 passengers per hour is the product of 850 passengers per train, times 40 trains per hour (i.e. one train every 90 seconds).

⁷ Using industry-standard assumed growth rates of 1.5% per year beyond the planning horizon suggests that the Ontario Line's capacity is sufficient to meet demand well into the 2070s, or approximately 50 years after opening. This estimate does not account for changes in development and growth patterns that will likely occur in response to the Ontario Line's construction.

⁸ 36,000 passengers per hour is the approximate product of 1100 passengers per train, times 33 trains per hour (i.e. one train every 110 seconds)

Key conclusions from the City's travel demand modelling are as follows:

1. The Ontario Line will provide relief to Line 1 in the short term.
2. Even with the Ontario Line, Line 1 demand will exceed capacity by 2041
 - The City's travel demand model estimates the demand on Line 1, north of Bloor, will exceed 36,000 passengers/hour in 2041.
 - Based on these results, it is expected that Line 1 demand will exceed capacity both north and south of Bloor shortly after 2041.
3. The Ontario Line's anticipated design capacity of 34,000 riders per hour will meet demand in the Ontario Line corridor for approximately 50 years.
 - The selection of a transit vehicle for the Ontario Line that has sufficient capacity is crucial to the long term success of the project. Demand for the Ontario Line may exceed capacity earlier if development patterns shift as a result of its construction.
 - A train with a capacity of 1100 passengers used by the TTC on Lines 1 and 2 would offer more flexibility to meet increased demand and ensure that the project is fit for purpose further into the future compared to the capacity of 850 passengers being planned for Ontario Line.

These conclusions mean that:

1. Additional expansion of the rapid transit network will be required by 2041 to meet future demand in the Yonge corridor; and
2. It is critical that the proposed performance of the Ontario Line be maintained or enhanced as design work progresses.

Additional travel demand modelling should be undertaken to analyze future extensions of the Ontario Line and other potential projects that could respond to the projected demand on Line 1. Extensions of the Ontario Line north to Sheppard Avenue and west to Line 2 and improvements to the Richmond Hill GO line among other projects should be considered. Impacts of possible changes in development patterns should also be further analyzed.

Operations

The Ontario Line will use a transit technology that is not the same as existing TTC subway technology and trains will not be compatible with existing TTC subway trains, tracks, or other facilities. TTC and City staff continue to advocate for interoperability of trains to allow for shared use of facilities, provide economies of scale in purchasing trains; and increase flexibility in operations.

It is understood that the Ontario Line is planned to operate with very frequent service of up to one train every 90 seconds in each direction. Delivering such a frequent service can be challenging, and will require highly optimised trains, signals, terminals, and operating practises. It is assumed that service at all times of the week will be operated in accordance with standards similar to those used by the TTC, which call for a train every five minutes or better at all times. The hours of operation should match those of

the TTC, which have service start at approximately 05:45 Monday-Saturday or 08:00 on Sunday, and end at approximately 02:00 every day.

Changes to the TTC bus and streetcar network will be needed to connect to the new line. This could mean reduced bus or streetcar service where it currently overlaps the Ontario Line corridor, or increased service connecting to the corridor to meet the increased demand. Appropriate bus and streetcar facilities such as on-street stops or off-street terminals, will be required for passenger connections at all stations.

- *Western Section*

The western section is critical to providing significant relief to Union Station, by providing GO Transit riders an alternative route to the Downtown and Financial District with a transfer opportunity at Exhibition station. This was not one of the project objectives for the Relief Line South or North. AM peak hour station usage at Union Station is forecast to drop by approximately 20,000 passengers with the Ontario Line in service. This relief could allow Union Station to operate more efficiently by reducing train dwell times and platform clearance times, which could in turn increase Union Station's capacity to bring additional GO Transit services to the station. The western section does not significantly impact demand on, or provide material relief to Line 1.

The western terminus at Exhibition station is proposed to be at-grade, to provide a cross-platform transfer opportunity with Lakeshore West GO trains. Frequent 90-second headways during peak periods will mitigate the impact of passengers being exposed to the elements in an exterior station. Nevertheless, passenger comfort could be improved by providing climate-controlled waiting areas on the platforms.

- *Central Section*

The central section approximates the route of the approved Relief Line South, and therefore functions to provide relief to Line 1 and reduce passenger congestion at Bloor-Yonge station. It is essential that the interchange between Line 2 and the Ontario Line at Pape station is designed in a manner that encourages riders bound for Downtown to transfer at this location. This requires minimizing the vertical separation distance between the two lines and providing multiple, direct, legible routes for passengers making the transfer, in order to minimize the transfer journey time. The ease of transferring is particularly important from the westbound platform to southbound platform, corresponding with the predominant passenger flows in the AM peak period.

Although several stations in the central section may be partially exposed to the elements, frequent service will minimize passenger waiting time in stations, and passenger comfort amenities can be provided in the design.

- *Northern Section*

The northern section will provide some additional relief to the existing subway network by providing Line 5 passengers with an alternative journey to Line 1 to

access the Downtown. Given the elevated guideway, consideration should be given to providing climate-controlled areas in Flemingdon Park and Thorncliffe Park stations to reduce passenger exposure to elements and to provide a more comfortable passenger experience; although this may be addressed through the use of platform edge doors as currently proposed.

Social Equity

The Ontario Line as proposed is expected to bring higher-order transit service closer to equity-seeking communities residing in Neighbourhood Improvement Areas (NIAs). It will also provide benefits to densely populated areas of the City that are not currently served well by higher-order transit.

- *Western Section*

The Ontario Line will improve higher-order transit access to residents of Alexandra Park, a community that would be well served by the Queen-Spadina Station. The western section is also relatively close to the South Parkdale NIA. Within the western section, the Ontario Line will bring an additional 64,000 people within an 800-metre walk of higher-order transit that were not previously within walking distance of a rapid transit station.

Social equity could be further improved by considering changes to the representative alignment in the western section that could provide stations at Queen-Bathurst and King-Strachan, which would provide an additional station in proximity to Alexandra Park and improve streetcar connectivity with the Parkdale NIA to the west along King Street.

- *Central Section*

Moss Park station is proposed to be adjacent to an apartment complex within the Moss Park community. Corktown Station as currently proposed will provide improved access to Regent Park via a short connection with the 65 Parliament bus. Within the central section, the Ontario Line will bring 71,500 additional people within an 800-metre walk of higher-order transit that were not previously within walking distance of a rapid transit station.

Social equity could be further improved by the Ontario Line project by examining a potential station location between Berkeley Street and the Don River that would be better situated to serve the Regent Park NIA, and the social services/community facilities emerging in the West Don Lands neighbourhood. The improved geographic coverage provided by such a station could also bring additional population within an 800-metre walking distance of rapid transit.

- *Northern Section*

The Ontario Line is expected to provide excellent service to neighbourhoods in need with stations located in Thorncliffe Park and Flemingdon Park NIAs. Within the northern section, the Ontario Line will bring an additional 41,000 people within an

800-metre walk of higher-order transit that were not previously within walking distance of a rapid transit station (not including the Science Centre station, which will already have access to Line 5).

Social equity could be further improved in the northern section by considering the benefits of adding a second station in Thorncliffe Park. This could better serve the greatest population concentration and provide improved coverage of a neighbourhood with a relatively large geographic area and disconnected street network.

2.2 Rapid Transit Evaluation Framework Principle #2 – Strengthening Places

Shaping the City

The Ontario Line is consistent with the planning and growth management frameworks at both the provincial and municipal levels, providing a high degree of coordination between transportation and land use planning. The proposed Ontario Line stations are generally located within or adjacent to areas where the Official Plan urban structure plan directs population and employment growth. Transit-oriented development opportunities are present at many station locations. Comprehensive station-area planning studies could be undertaken by City Planning to determine the appropriate nature and scale of development at proposed Ontario Line stations, including consideration of public realm integration and fit with the area's urban context.

- *Western Section*

The western section aligns well with City planning policies and is supportive of development trends and transit-oriented development opportunities. The Official Plan urban structure plan identifies all stations in the western section to be within the Downtown & Central Waterfront area, where growth is encouraged. Western section station areas are highly compatible with the Official Plan land use plan, with about 59% of land within 800 metres of stations designated Mixed Use Areas, Regeneration Areas, and General/Core Employment Areas.

The western section passes through neighbourhoods with a significant existing population, as 78,000 people already live within an 800-metre walking distance of the proposed stations. This is projected to increase to over 132,000 by 2041, which translates into a highly transit-supportive density. The most significant growth is anticipated to occur around the Queen-Spadina station.

Although the area served by the Ontario Line is already highly urbanized, there are some station areas with potential for further development and infill, subject to further study of the planned context.

The Ontario Line could be improved if the alignment better served the southern part of the King-Spadina Secondary Plan area, one of the densest and fastest growing areas of the city. Consideration of an alignment that passes through stations at King-Spadina or Front-Spadina would further improve the coordination of land use with transportation planning.

- *Central Section*

In the central section, Queen-Yonge, Moss Park and Corktown stations are located entirely within the Downtown & Central Waterfront. East Harbour station is located within an Employment Area, and Leslieville and Gerrard stations are located along Avenues. In terms of the Official Plan land use plan, about half of the lands within 800 metres of stations in the central section is designated Mixed Use Areas, Regeneration Areas, and General/Core Employment Areas.

The central section serves a sizable existing population, as well as areas where significant population growth has been projected by the City. About 75,000 people currently live within an 800-metre walking distance of the proposed central section Ontario Line stations, a figure that is projected to increase to over 113,000 by 2041 (figures represent data from Moss Park to Gerrard stations inclusive). Most of this growth is anticipated to occur around the Moss Park and Corktown stations, where development applications representing approximately 35,000 residential units have been approved or are currently under review (as of July 2019).

The Ontario Line supports some significant opportunities for transit-oriented development in proximity to proposed stations. East Harbour station will provide access to approximately one million square metres of office and retail floor space being developed in the Unilever Precinct as a new employment cluster immediately east of Downtown on brownfield land that is underutilized. Gerrard station is adjacent to a potential major redevelopment opportunity at the Riverdale Plaza site, which is being considered as part of the Gerrard-Carlway planning study. Corktown station is adjacent to vacant and underutilized land that is the subject of both private and public/civic development interest.

Refinements to the Ontario Line plan have the opportunity to further improve the coordination of land use and transportation planning. Improvements to the spacing of some stations would provide better geographic coverage of higher-order transit access for neighbourhoods served by the Ontario Line and increase the existing and future population within the walking catchment area of stations. In particular, the proposed spacing of approximately 500 metres between Moss Park and Corktown stations, and between East Harbour and Leslieville stations, is considered to be close together for higher-order transit. As a result, some of the walking catchment areas are duplicated for these stations, while leaving a 1.7-kilometre gap between Corktown and East Harbour stations where a station could be better located to serve the rapidly-growing West Don Lands neighbourhood.

- *Northern Section*

An alignment with four stations from Cosburn to Science Centre stations captures the largest potential of existing and projected populations. Cosburn station provides access to apartment buildings along Cosburn Avenue. Stations near Flemingdon Park and Thorncliffe Park apartment communities provide access to the highest catchment of existing and projected populations. Within 800 metres of stations, the population is projected to grow by approximately 60,000 people by 2041.

Overlea Boulevard is a hub with retail shops, grocery stores, restaurants and East York Town Centre. It is important to reduce the presence of elevated guideway physical barriers along Overlea Boulevard to maintain access for businesses and residents. Planned residential developments near Science Centre and Flemingdon Park stations provide an opportunity for integrated transit-oriented development.

The Ontario Line can be potentially integrated into East York Town Centre and Flemingdon Park Shopping Centre, if the malls were to be redeveloped as part of the project. Major integrated development potential at all four corners of Eglinton and Don Mills with Science Centre Parking Lot, Line 5 station and bus terminal, CreateTO lands and Celestica Lands. Integrated development at these sites can improve transit connectivity, economic and residential growth as well as public realm improvements.

Healthy Neighbourhoods

In order to better understand the permanent and temporary impacts on neighbourhoods, further details about the project design and proposed construction methods will be required. Cut-and-cover construction methods, for example, would have greater negative impacts on traffic management than tunnel boring or station mining methods. A 2027 targeted opening day for the Ontario Line is anticipated to require a compressed construction timeline, increasing the intensity but reducing the duration of construction impacts to residents and businesses adjacent to stations. Community consultation with residents and businesses will be important to maintaining healthy neighbourhoods and generate creative solutions with broad-based support to mitigate impacts.

- *Western Section*

Permanent impacts to residents will be minimized by the largely underground alignment, with stations assumed to be underneath the public right-of-way. Property impacts around Queen-Spadina and King-Bathurst stations will likely occur for entrances. The need for emergency exit buildings and traction power substations may also result in property impacts. Care needs to be taken to mitigate sensitive land uses, including the Four Seasons Centre for the Performing Arts, from long-term operational impacts like noise and vibration.

Temporary impacts from construction are anticipated to be typical of a large urban infrastructure project. Impacts are likely to be focused around stations and construction shafts, and include increased construction-related traffic, noise and vibration.

- *Central Section*

This section of the proposed Ontario Line, from west of the Don River to the area near Carlaw Avenue/Pape Avenue and Gerrard Street East/Riverdale Avenue has the potential for significant impacts on the existing community and will require great care during the design process and during construction. The proposal to construct a significant portion of the central section above grade along the Lakeshore East GO

rail corridor will have temporary construction impacts that are anticipated to be shorter in duration (but potentially greater in intensity) than the complex construction associated with building underground tunnels and stations.

If widening of the Lakeshore East GO rail corridor is required to accommodate the project, property acquisition of homes, businesses and community facilities may be required. Operational impacts (e.g., slower train speeds) may result from the elevated nature of the GO Corridor, and from the grades and curves that may be necessary to fit along the alignment. The operation of trains along GO rail line embankment may generate additional noise and vibration that could impact sensitive receptors like residential homes, schools, and parks. Mitigation measures such as covered stations, vegetation strategies, and noise walls could be employed in the project design as appropriate to reduce impacts. Further design work is required to fully understand the permanent and temporary impacts to residents and businesses.

- *Northern Section*

The intent to construct an elevated guideway for the Ontario Line in Thorncliffe Park and Flemingdon Park will have permanent impacts on residents and businesses. Overlea Boulevard is a busy mixed-use arterial which connects Thorncliffe Park and Flemingdon Park, with several high-rise apartment towers, businesses and shopping centres front onto the boulevard. Designed poorly, the impacts of elevated guideways can be severe.

The Ontario Line design must mitigate the visual, noise and vibration impacts that can be created by an elevated guideway. The guideway design should preserve sightlines and visibility from street frontage to businesses and commercial signage. Public realm strategies should be implemented to mitigate the negative aspects of elevated guideways and enhance the character of Overlea Boulevard and Don Mills Road. Further design work is required to fully understand the impacts.

Public Health and Environment

The Ontario Line will provide improved public access to several parks, public spaces, recreation opportunities, and heritage sites which will be beneficial to residents and visitors of the city. The project can support public health and the environment by minimizing and mitigating impacts to natural areas, parks and public spaces, city infrastructure and cultural heritage features along its alignment. Data collection and prescribed studies must be undertaken to determine any impacts the Ontario Line may have on these natural and cultural features, and to identify any appropriate mitigation measures. Consultation with the appropriate City divisions and agencies responsible for the management of these features is essential.

- *Western Section*

The western section will improve public access to some high-profile cultural heritage resources at Fort York and Exhibition Place that are of great importance in the context of the City's history and evolution, representing a major benefit to residents and visitors of Toronto. Because of this, the project must also take care to avoid and

mitigate impacts on Fort York, an important National Heritage Site which is also protected under the Ontario Heritage Act. The western section also passes through the Queen Street West Heritage Conservation District, which includes several properties that are protected under the Ontario Heritage Act. A Heritage Impact Assessment must be prepared for any facilities that create an impact on this HCD.

Further modifications to the representative alignment could improve public health and environment considerations in the western section, particularly some heritage impacts that were emerging during the preliminary design and engineering work being undertaken for the Relief Line South. If the alignment were to follow Simcoe Street to include an interchange station at St Andrew station, impacts to key cultural heritage resources around Osgoode station (e.g. Osgoode Hall, Campbell House, and 250 University Avenue) could be minimized by avoiding the need to construct a second platform on the Line 1 Osgoode station.

- *Central Section*

The central section will interface with a number of natural areas, particularly where it crosses the Lower Don River on the Lakeshore East GO rail corridor bridge, which may need to be widened, or on a bridge structure parallel to the existing bridge. This may involve placement of piers or support columns into the Don River, which may affect the flood channel and flood profile of the river. Consultation with the Toronto Region Conservation Authority (TRCA) will be needed to ensure impacts to the flood channel are mitigated and the flood profile is compatible with existing and under-construction flood protection landforms along the Don River and in the Port Lands.

As previously mentioned, the design and construction of the elevated crossing of the Lower Don and above-grade station at East Harbour will need to be well coordinated with a significant number of major infrastructure improvement projects.

If the Lakeshore East GO rail corridor requires widening to accommodate the project, there may be impacts on adjacent parks and recreation centres. Leslieville station is proposed to be located adjacent to the Jimmie Simpson Recreation Centre, McCleary Playground, and Bruce Mackey Park (on Degrossi Street). Gerrard station will be adjacent to the Gerrard-Carlaw Parkette, an important neighbourhood amenity. Further design and analysis is required to understand the degree of impact to these facilities, which will be determined by the exact location of station platforms, vertical circulation, entrance buildings, and other infrastructure. Consultation with the Parks Forestry & Recreation division will be essential to ensure the functionality of these parks and recreation centres is maintained to the extent possible.

Important heritage sites in the central section include the First Parliament and the St. Lawrence Foundry sites (at the proposed Corktown station), which are the subject of intense public planning interest and have been identified as archaeologically sensitive areas. Several heritage conservation districts (HCDs) in various stages of the approval process are present within the central section including the St. Lawrence HCD (under appeal) at Moss Park and Corktown stations, the Distillery District HCD (under study) near the Cherry Street portal, the Queen Street East

HCD (under study) at Leslieville station, and Riverdale HCD (designated) at Gerrard station. Appropriate studies including cultural heritage evaluation reports and heritage impact assessments need to be undertaken to appropriately conserve heritage resources.

- *Northern Section*

The Ontario Line infrastructure for the crossing over the Don River and West Don River Ravine could have an environmental impacts. For example, support columns for the bridge crossing may impact the natural environment. The project requires further field research to confirm impacts. Due to the potential placement of the elevated guideway in the middle of the street, construction and traffic management plans must mitigate the degree of infrastructure impacts on the public realm and road reconstruction. It will be important to maintain road access for residents and businesses and reduce impacts to major city infrastructure.

2.3 Rapid Transit Evaluation Framework – Principle #3 – Supporting Prosperity

Cost and Schedule

- *Western Section*

In the western section, further analysis may provide additional ways to reduce costs and maintain an ambitious schedule. For example, alternative alignments running within the rail corridor could be less costly, and achieve some of the other planning objectives for the line. Alignments that do not follow public rights-of-way could be shorter and less costly, but introduce some construction risk to the project. The technical feasibility of these modifications would need to be assessed.

Project risks in the western section include uncertainties about geological conditions along the representative alignment; borehole testing has not been undertaken for this section.

- *Central Section*

Between Cherry Street and Gerrard Street East the project will be above-grade within the Lakeshore East GO rail corridor, rather than in a tunnel, in order to reduce costs. These cost savings will be partially offset by the portals that will be needed to transition between an underground and above-grade alignment and additional property costs if widening of the rail corridor is required. Maintenance and operating costs may be higher for above-grade sections, as the infrastructure will have greater exposure to the elements.

Project risks that may result in increased costs in this section include uncertainties about the technical design required to achieve an elevated crossing of the Don River, coordination with multiple other construction projects occurring during the same timeframe in the Lower Don area, and uncertainties about the mitigation measures required in the above-grade corridor running through Leslieville.

- *Northern Section*

An elevated guideway along Overlea Boulevard and Don Mills Road is anticipated to reduce costs in comparison to tunneling. The northern section is anticipated to be relatively simple to design and construct with fewer potential technical challenges identified. Major works include portals and bridges crossing sensitive ravine lands in the Don River valley.

Supports Growth

The Ontario Line is well-positioned to support the development of employment and prosperity in the City, serving a large number of existing and future jobs.

- *Western Section*

The western section serves the highest concentration of existing jobs within the Ontario Line alignment. Almost 300,000 jobs are situated within an 800-metre walking distance of the proposed western section Ontario Line stations, a figure that is projected to increase to over 360,000 by 2041. The project will serve several areas of major growth, including continued growth in the expanding Financial District around Osgoode station, as well as the area around Queen-Spadina station.

The Ontario Line could enhance support of employment growth by considering an alignment following Simcoe and Front Streets, with an interchange station at St. Andrew. Providing a station closer to the Financial District and along the southern edge of the dense employment in the King-Spadina area, this alignment would have an even greater employment concentration of 320,000 existing jobs within 800 metres of stations, projected to grow to over 405,000 by 2041.

- *Central Section*

The central section serves a considerable number of existing jobs, as well as areas where significant employment growth has been planned for and projected by the City. About 60,000 jobs are currently situated within an 800-metre walking distance of the proposed central section Ontario Line stations, a figure that is projected to increase to about 125,000 by 2041 (figures represent data from Moss Park to Gerrard stations inclusive). The majority of this growth is anticipated to occur around the East Harbour station, where eight development applications representing more than one million square metres of non-residential floor space have been approved or are under review as of July 2019.

Supporting growth can be further enhanced by examining station spacing along certain portions of the alignment and considering station locations closer to employment growth in the South of Eastern area and the eastern portion of the Port Lands. As previously discussed, Moss Park and Corktown stations are relatively close together, as are East Harbour and Leslieville stations. While both Corktown and Leslieville stations are projected to have high employment densities within their 800-metre walking catchment areas, much of this catchment area is duplicated by the area served by Moss Park and East Harbour stations. At the same time, the

currently-proposed alignment bypasses some nearby employment areas like the South of Eastern and Port Lands precincts east of Carlaw Avenue, which are projected to grow significantly in the medium to long term. While the Leslieville station must continue to provide a good transfer connection to the 501 Queen streetcar, consideration of a station closer to these employment lands, with high-quality surface transit connections, would be beneficial to supporting future growth.

- *Northern Section*

Although the northern section has a lower concentration of jobs than other sections of the Ontario Line, the stations capture existing and projected employment growth in the area served by the line. Employment growth is concentrated in the western part of Thorncliffe Park near existing business parks. Within 800 metres of stations, over 22,000 jobs are projected in the area by 2041. The Ontario Line alignment could capture more employment growth by serving both the west and east side of Thorncliffe Park. This could be achieved through an improved station access strategy or by adding another station on the west side of Thorncliffe Park, optimizing the spacing between the two stations to provide the best coverage of this community.

The Ontario Line will best support planned growth in the Don Mills/Eglinton area if the station is located on the north side of Eglinton Avenue East, on the west side of Don Mills. A new mixed-use transit-oriented community is planned in the area, based on the Don Mills Crossing Secondary Plan (which includes the Celestica site), with approximately 70,000 square metres of new commercial office/retail and 5,000 residential units. This station location would also support future northern extension towards Sheppard Avenue.

The proposed maintenance and storage facility (MSF) for the Ontario Line is proposed to be located in Leaside near Wicksteed Avenue and Beth Neilson Drive. It is to be situated on existing employment lands that contain a number of viable business enterprises that collectively employ over 700 people.

Initial Business Case

Consolidated City and TTC high-level comments regarding the IBC were provided to Metrolinx on September 10, 2019. Metrolinx has subsequently confirmed its intention to work with the City to assess these concerns as part of the development of the Preliminary Design Business Case. The following is a summary of the key issues raised:

- Since the IBC evaluated the Ontario Line against the Relief Line South, a project with a much narrower scope, it did not make an "apples-to-apples" comparison. Using projects of a more similar scope would have provided more meaningful conclusions on benefits and costs.
- The IBC contained some inaccurate assumptions about design, vehicle technology, operations and delivery that were being considered for the Relief Line South. For example, fully automated operation was being planned and delivery options, including P3, were to be evaluated.

- Based on travel demand modelling conducted by the City and TTC, Line 1 will be at or near capacity by 2041, even with the Ontario Line.
- There are better city-building opportunities with the location of the Sumach, Carlaw and Gerrard stations as proposed for the Relief Line South in comparison to the Corktown, Leslieville and Gerrard stations as proposed for the Ontario Line.
- Additional information and further design work is needed to understand the potential impacts and opportunities of the Ontario Line, including integration of land use and transportation planning as set out in the Provincial Growth Plan.
- The IBC does not quantify environmental and community impacts beyond transportation-related impacts, which means that they have not been factored into the analysis in the same way.
- There are many instances where conclusions are reached and/or statements made where no backup documents are provided.