EX23.1

ATTACHMENT 1:

Update to the Initial Business Case- Scarborough Subway Extension (SSE)

BACKGROUND

At its July 12, 2016 meeting, City Council (EX16.1) received Initial Business Case (IBC) reports for transit infrastructure projects identified as part of the City's rapid transit plan. An IBC for the Scarborough Subway Extension (SSE) provided evidence in support of an express subway extension from Kennedy Station to Scarborough Centre along the preferred McCowan alignment relative to the base case option (3-stop McCowan SSE). City Council directed staff to remove from consideration the 3-stop McCowan SSE, and to further develop the express option.

Through an exercise aimed at identifying opportunities to reduce the capital cost of the SSE in a way that would allow the project to still achieve its objectives, additional alignment options were identified in Q3 2016. Of these options, one emerged as a potential option to be brought forward for evaluation within the update to the IBC. This option included an express alignment between Kennedy Station and Scarborough Centre via Eglinton Avenue East and Brimley Road, with a station located on an undeveloped site on the western edge of Scarborough Centre. The station location for this option would be approximately 600m west of the proposed station location for the McCowan option.

Since the original IBC was developed in Q2 2016, the base network has been refined. The base network refers to all of the working assumptions about the transit network that are incorporated into the ridership model. Changes can include minor modifications such as transit travel speeds, and modifications to bus routes. The most significant change in the base network since the previous IBC is the refinement of the SmartTrack concept and GO RER. Several previously assumed stations, including Ellesmere SmartTrack Station, have been removed. GO RER Stations at Spadina and Lansdowne on the Barrie corridor have been added.

This update to the IBC is required to understand the impact of shifting the alignment from an express option via McCowan to an express option via Brimley. This document should be read as an addendum to the IBC that was considered by City Council on July 12, 2016.

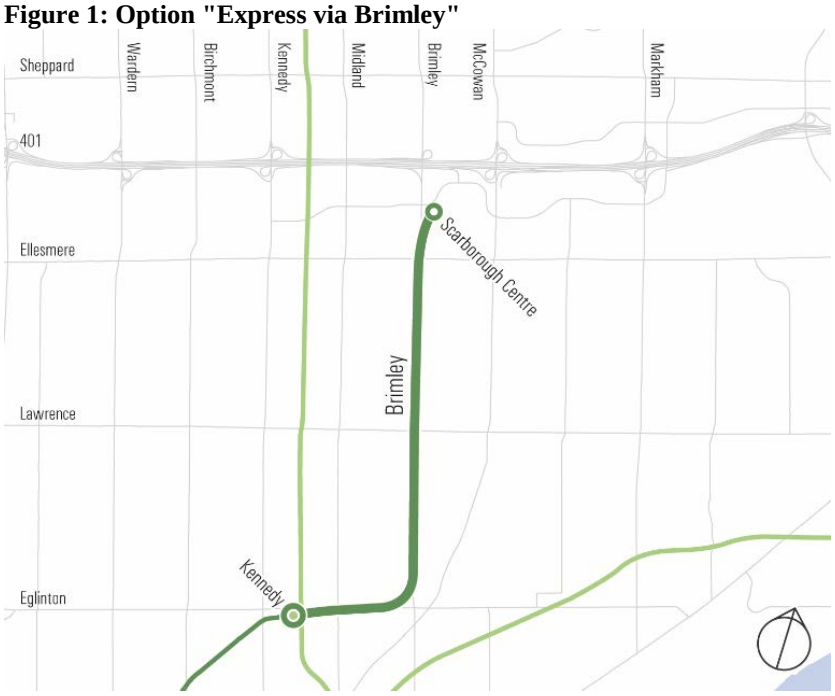
OPTIONS DEVELOPMENT

At its July 12, 2016 meeting, City Council directed staff to further develop an express option for the SSE to Scarborough Centre. An express SSE via McCowan was considered the most likely option to move forward as it would best achieve the project objectives, while keeping the SRT (Scarborough Rapid Transit Line 3) operational throughout the duration of the subway construction. Council directed staff to advance an express option and to explore other options

that may have lower capital costs, including the option of a partially at-grade alignment along the existing SRT corridor.

Through this process of developing options to reduce the capital cost of the SSE, an option emerged that considered an express extension via Brimley Road. Prior to the emergence of the express option, the Brimley corridor option had been removed from consideration as part of the '3-stop' scenario in June, 2015, as it did not perform as well as other '3-stop' alignments that were being considered at the time (Midland, McCowan and Bellamy)[1]. The Brimley option (Figure 1) re-emerged for consideration as a potential express alignment as it could reduce the capital costs while maintaining the operation of the SRT during subway construction.

Figure 1: Option "Express via Brimley"



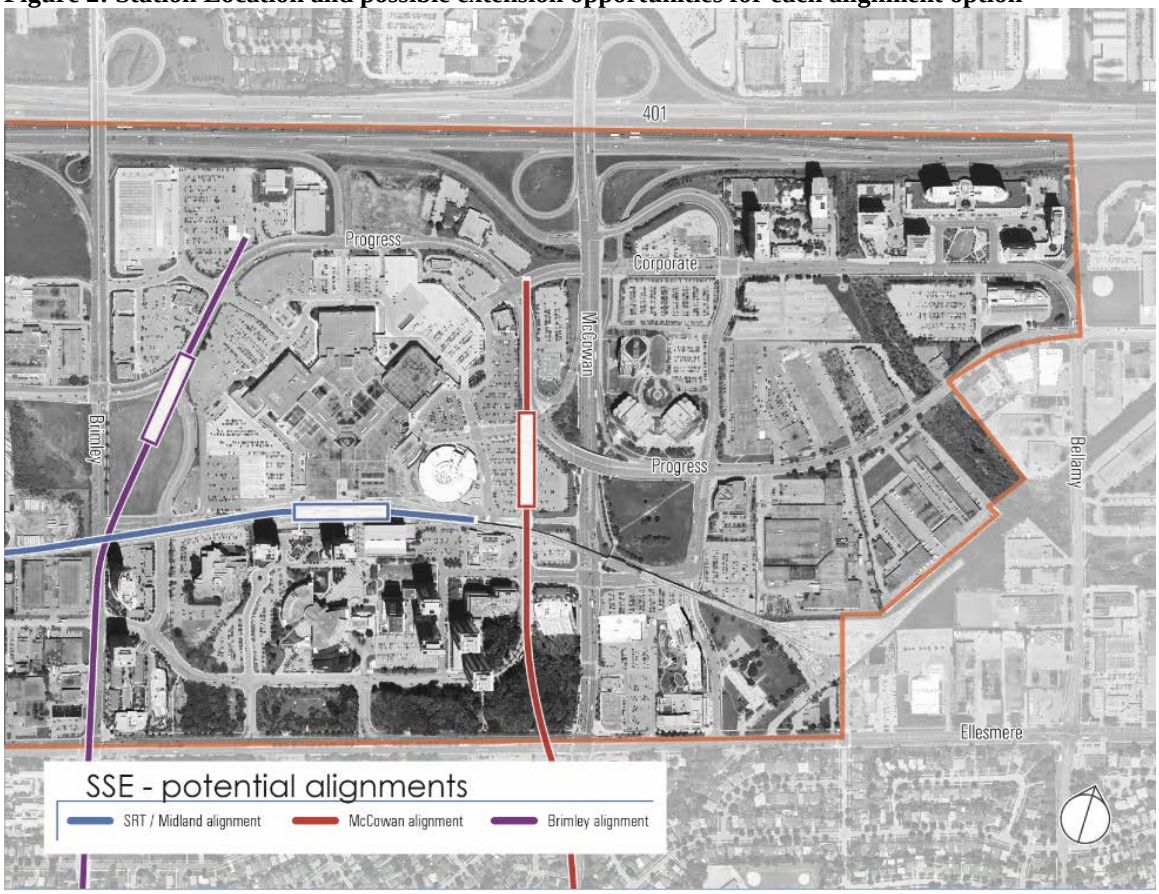
The express Brimley option is approximately a 6.0 km express connection via Brimley, with a station on the western edge of Scarborough Centre. Similar to other alignment options, this option assumes a continuation of Line 2 (Bloor-Danforth) subway service.

The difference in station location for the McCowan option and the Brimley option is shown in

[1] Public meetings between June 13 and 25, 2015 identified a short list of three corridors based on the project's evaluation criteria. At the time of the evaluation, the subway extension was contemplating three stations, and a station at Lawrence/Midland was preferred over a station at Lawrence and Brimley, and for this reason, Midland emerged as a preferred option over Brimley.

Figure 2. The Brimley option would see a terminus station located over half of a kilometre to the west, away from the geographic centre of Scarborough Centre.

Figure 2: Station Location and possible extension opportunities for each alignment option



Update to Options Development

A list of the alignment options in the July 12, 2016 IBC, and the subsequent development of potentially lower cost options are provided in Table 1.

Table 1: Express SSE options and initial screening results

Alignment Option	Screening Assessment
McCowan – 3 Stop McCowan to Sheppard Underground, north/south alignment, 3 stops ("Base Case") to Sheppard Ave	**Removed from consideration:** Other lower-cost options performed better in achieving objectives
McCowan – Underground, north/south alignment; SRT open during construction (previously preferred)	**Carried forward for further analysis:** Evaluation is included in this updated IBC
Express Midland to SC Underground, east/west alignment	**Removed from consideration:** Requires closure of SRT

Alignment Option	Screening Assessment
Express SRT Corridor to SC Express subway to Scarborough Centre via SRT corridor (1.4km portion at-grade)	**Removed from consideration:** Requires closure of SRT
Additional options that emerged in Summer 2016	
Midland – Elevated, east/west alignment	**Removed from consideration:** Requires closure of SRT
Midland – Elevated, east/west alignment, station farther west	**Removed from consideration:** Requires closure of SRT
Midland – Underground, east/west alignment,	**Removed from consideration:** Removed from consideration: Requires closure of SRT
Midland – Underground, east/west alignment, station farther west	**Removed from consideration:** This option is approximately the same cost as the preferred McCowan alignment but has an inferior station location
SRT Corridor – Express subway to Scarborough Centre via SRT corridor (2.2km portion at-grade), with elevated east-west alignment into Scarborough Centre (re-examined per Council direction on July 12, 2016)	**Removed from consideration:** Requires closure of SRT
Brimley – Underground, north/south alignment;	**Carried forward for further analysis:** Evaluation is included in this updated IBC

As the 3-stop subway extension via McCowan option was removed from consideration at the July 12, 2016 City Council meeting, this update to the IBC focuses on the differences between an express subway via McCowan, and an express subway via Brimley (see Table 1). This IBC considers the alignment and subway station platform location only. Bus terminal sizes and locations are not considered in this analysis of alignments. Summary descriptions of two options are provided in Table 2.

Table 2: Summary descriptions of the McCowan option and the Brimley option

	McCowan Option (Express McCowan to STC)	Brimley option (Express Brimley to STC-west side)
Corridor & Alignment	McCowan	Brimley
Length of Alignment	Approximately 6.2 km	Approximately 6.0 km
Station Locations	Scarborough Centre (station oriented North-South)	Scarborough Centre west side (station oriented south-west to north-east)
Service Concept	Continuation of all Line 2 services	Continuation of all Line 2 services

	McCowan Option (Express McCowan to STC)	Brimley option (Express Brimley to STC-west side)
Infrastructure Requirements	• 6.0 km tunneling • 0.2 km cut & cover • 1 new subway station with expanded off-street bus terminal • On line vehicle storage	• 5.8 km tunneling • 0.2 km cut & cover • 1 new subway station with expanded off-street bus terminal • On line vehicle storage
Network Assumptions	Bus network largely unchanged in north Scarborough, continuing to focus on Scarborough Centre Station; re-route some buses terminating at Lawrence to Kennedy; some other bus re-routings to ensure good connections to the subway.	Bus network largely unchanged in north Scarborough, continuing to focus on Scarborough Centre Station; re-route some buses terminating at Lawrence to Kennedy; some other bus re-routings to ensure good connections to the subway.

EVALUATION

Consistent with previous IBCs, the options were evaluated with respect to the Strategic Case, Financial Case, Economic Case and Deliverability Case.

Some analyses were not available for the updated Business Case. This includes the Accessibility analysis[2] that was included in the previous IBC. Additional analyses have been undertaken to provide a greater understanding of the differences between the McCowan option and the Brimley option. These additional analyses included the potential for transit-oriented development within walking distance of the proposed station at Scarborough Centre and developable hectares.

STRATEGIC CASE

As with previous IBCs, the strategic case makes use of the "Feeling Congested?" principles and criteria to organize the evidence and ensure all important facets of city building are considered.

Table 3: Summary of the Rapid Transit Evaluation Framework (RTEF)

Serving People	
Choice	Develop an integrated network that connects different modes to provide for more travel options.
Experience	Capacity to ease crowding / congestion; reduce travel times; make travel more reliable, safe and enjoyable

[2] The accessibility analysis was undertaken by a consultant, whose contract has since been completed.

Social Equity	Allow everyone good access to work, school and other activities
Strengthening Places	
Shaping the City	Develop an integrated network that connects different modes to provide for more travel options
Healthy Neighbourhoods	Changes in the transportation network should strengthen and enhance existing neighbourhoods; promote safe walking and cycling within and between neighbourhoods
Public Health and Environment	Support and enhance natural areas; encourage people to reduce how far they drive; mitigate negative impacts
Supporting Prosperity	
Supports Growth	Investment in public transportation should support economic development: allow workers to get to jobs more easily; allow goods to get to markets more efficiently.
Affordability	Improvements to the transportation system should be affordable to build, maintain and operate.

Supporting Prosperity

Supporting Prosperity - Supporting Growth

Transit investments can play a very significant role in employment development in the city. Rapid transit may be constructed to serve areas of high employment density, or be built in areas planned for higher employment density in order to increase transportation accessibility and thus incentivize businesses to locate high-density employment like offices in appropriate areas.

The differences between the McCowan option and the Brimley option with respect to supporting growth are discussed below.

The McCowan option performed well in terms of supporting growth and providing access to a higher density of jobs. The McCowan option is projected to serve the highest density of jobs (18,500 jobs/km^2).

Scarborough Centre has significant development potential with the entire Centre designated mixed-use by the Official Plan. The station for the Brimley option is located approximately 600m farther away from both the geographic centre of Scarborough Centre and the Gateway at McCowan Road and Bushby Drive/Town Centre Court than the station for the McCowan option. If walking to or from the geographic centre to a station associated with the Brimley option, there would be an additional 8 to 9 minute walk. The station for the McCowan option would also be closer to the McCowan Precinct[3] where significant development is expected in the future, and would bring slightly more of the Centre within walking distance of a subway station. The McCowan option offers

[3] Scarborough Centre is designated for growth. The Centre is divided into four precincts, each with its own policy direction. McCowan Road is more centrally located within Scarborough Centre, with a policy framework and a development pipeline that supports greater intensification than the Brimley Precinct.

improved proximity to people's workplaces, and supports economic development significantly more than the Brimley option.

The McCowan option could yield approximately 130,000 square metres of transit-oriented employment development. The Brimley option is expected to facilitate approximately 115, 000 square metres of transit oriented employment development.

Table 4: Supporting Growth Measures

Measure	**McCowan Option (Express via McCowan)**	**Brimley Option (Express via Brimley)**
Service to Employment Growth Areas	Single station planned for Commercial Precinct of Scarborough Centre – a mixed-use growth area. Station will encourage residential intensification and urbanization of the Centre.	Single station planned for the western edge of Commercial Precinct of Scarborough Centre – a mixed-use growth area. Station will encourage some residential intensification and urbanization of the Centre, primarily in the western portion.
Proximity to geographic centre of Scarborough Centre	151 m	675m
Area of land within walking distance of stations designated for Employment growth	0.6 km^2 (mixed use) 0.06 km^2 (Employment, Institutional and Regeneration Lands)	0.5 km^2 (mixed use) 0.02 km^2 (Employment, Institutional and Regeneration Lands)
Proportion of land within walking distance of stations designated for employment growth	70.8% (mixed use) 7.2% (Employment, Institutional and Regeneration Lands)	70.2% (mixed use) 2.8% (Employment, Institutional and Regeneration Lands)
Existing Jobs within walking distance of the stations	10,900 jobs	7,100 jobs
Projected Job Growth within walking distance of stations	2,400 jobs	1,700 jobs
Projected Future Jobs within walking distance of stations	13,300 jobs	8,800 jobs
Existing Employment Density within walking distance of the stations	15,400 jobs/km^2	10,900 jobs/km^2
Projected Increase in Employment Density within walking distance of the stations	3,100 jobs /km^2	2,200 jobs/km^2

Measure	McCowan Option (Express via McCowan)	Brimley Option (Express via Brimley)
Projected Future Employment Density within walking distance of the stations	18,500 jobs/km^2	13,100 jobs/km^2
Potential for Transit-Oriented employment Development within 500m of Scarborough Centre Station	130,000m^2	115,000 m^2

Similar to *Shaping the City*, the same 800m radius and service area were used to compare the potential commercial space around the two station sites. As seen in the table below, the McCowan option could attract significantly more office development in Scarborough Centre. The McCowan option's proximity to the McCowan corridor and Bushby/Town Centre Court gateway will encourage more development than the Brimley option, creating a higher return on investment in the transit infrastructure.

Table 5: Potential area (m^2) of Commercial Space

Alignment	Potential area (m^2) of Commercial Space	
	800m Service Area	800m Buffer
McCowan option	159,800	222,700
Brimley option	148,500	166,100
Difference	**11,300**	**56,600**

Not evaluated in this study is the impact either option could have on existing local businesses. A major landowner around the McCowan option sees opportunity to integrate the station with future development at Scarborough Town Centre, and sees the Brimley option as potentially negatively impacting connectivity to Scarborough Town Centre. The Brimley option could have an adverse impact on another important local industrial landowner in this area to the west of Brimley. This land owner, whose business operation occupies over 10 ha of land between Brimley, Progress Ave, and the SRT corridor, has made significant investments in their facilities and has been a vocal opponent to subway alignments that would bring development pressure to the west side of Scarborough Centre. Current planning policies support development of mixed-use on the western edge of Scarborough Centre, including a strip immediately west of Brimley Road.

Strengthening Places

Strengthening Places - Shaping the City

Shaping the City considers the transportation network as a tool to shape the residential development of the City. It evaluates the opportunities created by the

station to encourage transit-oriented development within the vicinity of the station site.

The population of Scarborough Centre more than doubled between 2001 and 2011, expanding at a rate faster than that of either Etobicoke Centre, or Yonge-Eglinton Centre. Analysis undertaken as part of City Planning's Growing Up Study shows that Scarborough Centre houses the highest percentage of families with children of all the Centres (35%), and the highest percentage of families with children owning their own homes (73% compared with North York at 60%, Etobicoke at 26% and Yonge-Eglinton at 24%). Together these factors reveal Scarborough Centre to be more family-oriented and more stable than other Centres.

Both options are equal in the amount of land designated for population growth within walking distance of a station (0.6km^2).

Compared with the Brimley option, the McCowan option has slightly greater potential for transit-oriented residential development within 800m of Scarborough Centre Station, a greater projected future population density within walking distance of the stations, greater existing and future increase in population density around stations, and higher projected population growth around the stations.

The McCowan option serves a slightly larger existing population within walking distance of the station. The McCowan option also serves a larger projected population growth within walking distance.

Some figures have been refined from the previous Initial Business Case. For example, the centroid for the McCowan option station was shifted slightly west toward Borough Drive, to provide a more accurate representation of where the station would be located for this option. (Previously, the station centroid for analysis had been located within the McCowan right-of-way.)

A summary of findings is provided in Table 6.

Table 6: Shaping the City Measures

Measure	**McCowan option (Express via McCowan)**	**Brimley option (Express via Brimley)**
Service to Residential Growth Areas (see further detail in "Service to Employment Growth Areas")	Single station planned for Commercial Precinct of Scarborough Centre – a mixed-use growth area. Station will encourage residential intensification and urbanization of the Centre.	Single station planned for Commercial Precinct of Scarborough Centre – a mixed-use growth area. Station will encourage residential intensification and urbanization of the Centre.
Area of land within walking distance of stations designated for population growth	0.6 km^2 (mixed use)	0.6 km^2 (mixed use)

Measure	McCowan option (Express via McCowan)	Brimley option (Express via Brimley)
Proportion of land within walking distance of stations designated for population growth	70.8% (mixed use)	70.2% (mixed use)
Existing Population within walking distance of the stations (500m)	3100 people	2900 people
Projected Population Growth within walking distance of stations	1200people	900 people
Projected Future Population within walking distance of the stations (500m)	4300 people	3800 people
Existing Population Density within walking distance of the stations	4000 people/km^2	3700 people/km^2
Projected Increase in Population Density within walking distance of the stations	1600 people/km^2	1100 people/km^2
Projected Future Population Density within walking distance of the stations	5600 people/km^2	4800 people/km^2
Potential for Transit-oriented Residential Development within 800m of Scarborough Centre Station[4]	12 500 units	11 500 units

Additional analysis was undertaken to understand the differences between the McCowan option and the Brimley option. This analysis examined the localized development potential around each station location[5] in terms of both developable hectares and potential residents.

[4] A high-level analysis of potential transit-oriented development around the stations was undertaken and focussed on potential growth beyond the population projected by the population and employment models. It can be understood as the potential directly related to the construction of a subway station. Since it is not possible to determine a future proportion of residential and employment uses in a mixed use area, an assumption of 90 percent of all future development has been anticipated for residential uses. Applying the typical lot coverage for recent developments in Scarborough Centre to available land around the station associated with the McCowan option, suggests that it is possible to develop approximately 12 500 residential units within 800 metres of the station. These units include already-approved developments, sites in the pipeline, and underutilized sites but excludes the land inside the ring road around Scarborough Town Centre. This compares to the opportunity to develop approximately 11 500 residential units within 800m of the initial station associated with the Brimley option.

[5] To compare the development potential associated with the two options, an 800m radius from the centroid of each station that extends to the Centre's boundary was used. All soft sites without development approvals or active development proposals were identified in each 800m radius. An assumption of 4.7 times coverage

The McCowan option is expected to encourage greater development of residential units.

Table 7: Residential Development Potential for the McCowan option and the Brimley option

Alignment	800m Buffer	
	Developable Hectares	Potential Residents
McCowan option	41.1	40,800
Brimley option	29.1	28,700
Difference	**12**	**12,100**

This methodology provides a conservative estimate of the residential development potential. The McCowan option is expected to have greater intensification potential, as development of Scarborough Centre has been planned with an orientation around the McCowan corridor and specifically the Bushby/Town Centre Court gateway. The Scarborough Centre Secondary Plan further confirms the planning direction of the McCowan Precinct as having considerable development potential, with residential and employment uses being the focus for this area. These findings are supported by a similar analysis that considered 800m walking distance from the station (limited by the street and pedestrian path connections). There is greater potential to encourage intensification and residential development with the McCowan option.

When accounting for the approved residential pipeline developments within the vicinity of the two options, the McCowan option has approximately 500 more approved residential units than the Brimley option, with 3,036 and 2,559 approved residential units, respectively.

With respect to *Shaping the City*, the McCowan option is preferred over the Brimley option.

Serving People - Choice

The Choice criterion evaluates how the subway station location and design promotes access to destinations through seamless pedestrian connections and integration with the surrounding neighbourhood.

The McCowan option best achieves the objective of promoting quality connections to the surrounding area as it is located within the centre of Scarborough Centre and is located close to existing destinations and planned development east of McCowan Road. Through the development of the Scarborough Centre Transportation Master Plan, improved east-west connections will be identified to promote improved station access.

was applied to these parcels to create a conservative estimate of future residents that could be encouraged by implementation of the station.

The Brimley option would see a station along the western fringe of Scarborough Centre, further from existing destinations and resulting in few opportunities to create quality connections to areas east of McCowan Road. This would effectively reduce the attractiveness of using transit, as a greater number of people in the future would incur a longer walk to reach the station if it were located on the western edge of Scarborough Centre.

Today, there are approximately 3100 residents within a 500 metre radius of the proposed McCowan station location, approximately 7% more than around a proposed Brimley station (approximately 2900 residents). The McCowan option provides greater transportation choice as it serves more residents within walking distance, and will serve both the existing and future population of McCowan Precinct.

Serving People - Experience

A traveller's experience of transit, and the quality of that experience, has a direct impact on whether they will choose to take transit in the future. The better the experience, the greater the chance that transit becomes the preferred mode of travel in the future. Experience can further be understood in terms of change in travel time between origins and destinations, how many destinations a rider can access using the transit network and the ability to mitigate crowding on transit.

The expected travel time between Scarborough Centre Station and Kennedy Station is expected to be 6.7-to-7.5 minutes for both the McCowan option and the Brimley option. Both options would involve a similar distance of travel, with the Brimley option approximately 200m shorter than the McCowan option.

The McCowan option would incent approximately 1,000 more net new riders to the transit system compared with the Brimley option. The McCowan option is expected to result in 500 more boardings in the morning peak hour than the Brimley option, and 3,800 additional riders throughout the day.

Net new riders were calculated in Spring 2016 using Option 1 (3-stop McCowan) as the base case and assuming SmartTrack 'Option C' and assumed a station at Ellesmere. In this update to the Business Case, the SRT is used as a reference case for the purposes of comparing the McCowan option and the Brimley option. Additionally, the network model was updated to reflect more recent assumptions, e.g. removing several Smart Track stations including Ellesmere. As a result, the base network has improved, resulting in fewer net new riders than previously estimated in the analysis reported for the July 12, 2016 Initial Business Case.

With respect to 'Experience', the McCowan option is preferred.

Table 8: Experience Measures

Measure	McCowan Option (Express via McCowan)	Brimley Option (Express via Brimley)
Connections between Scarborough Centre and other UGCs/Mobility Hubs[6]	Approximately 6.5 – 7.5 minutes connection between Scarborough Centre and Kennedy Mobility Hub	Approximately 6.5 – 7.5 minutes connection between Scarborough Centre and Kennedy Mobility Hub
Transit Ridership Change[7]	2,300	1,300

Strengthening Places - Public Health and Environment

Transit has a very positive impact on public health by encouraging a more active lifestyle and reducing air quality impacts through reduction in automobile usage and emissions. However, large infrastructure projects like rapid transit may also have detrimental impacts to natural features, which must be avoided or mitigated.

The Highland Creek system is a significant natural feature of the SSE study area. Both options are underground when crossing the Highland Creek system, they may require mitigation to minimize the impact to the Highland Creek system.

Both options are anticipated to have the same impact on reducing automobile usage.

Table 9: Public Health & Environment Measures

Measure	McCowan option (Express via McCowan)	Brimley option (Express via Brimley)
Significant Environmental Challenges	Mitigation required	Mitigation required
Auto Mode Share (%)[8]	55	55

[6] Reported travel times between Scarborough Centre Station and Kennedy Station represent high-level estimates and should not be considered actual travel time that would be experienced by customers on the subway. Estimates continue to be refined as design of the subway progresses. Reported travel time estimates vary slightly from travel time inputs used by the GTHAv4.0 model to generate ridership projections.

[7] Net new riders were calculated in Spring 2016 using Option 1 (3-stop McCowan) as the base case and assuming SmartTrack 'Option C' and assumed a station at Ellesmere. In this update to the Business Case, the SRT is used as a reference case for the purposes of comparing the McCowan option and the Brimley option. Additionally, the network model was updated to reflect more recent assumptions, e.g. without a Smart Track station at Ellesmere. As a result, the base network has improved, resulting in fewer net new riders than previously estimated in the analysis reported for the July 12, 2016 Initial Business Case.

[8] In the July 12, 2016 IBC reported to Council, auto mode share was erroneously reported as *change in auto mode share: 0.55%.* The report should have read: Auto mode share (%): 55. In other words, there is no change in auto mode share between the July 12, 2016 IBC and the update to the IBC, nor are there any differences in auto mode share between the McCowan and Brimley options.

There are no measurable differences between the options with respect to Public Health & Environment.

Serving People - Social Equity

The impact of a transit investment can be expressed in terms of a change in access to jobs for residents of Neighbourhood Improvement Areas (NIA) and number of NIA residents served by rapid transit.

The McCowan option serves a slightly greater number of social equity seeking individuals than the Brimley option.

Table 10: Social Equity Measures

Measure	McCowan Option (Express via McCowan)	Brimley Option (Express via Brimley)
Change in disadvantaged residents served	1700 people	1500 people

Strengthening Places – Healthy Neighbourhoods

Just as transit investments can be a powerful force in shaping the city, they can also have long-term detrimental impacts on existing, stable neighbourhoods. The majority of the SSE study area outside of Scarborough Centre is recognized as stable neighbourhoods, to which adding a subway station could bring unwanted development pressure and change.

Impact to private property is a significant consideration. Table 11 below identifies subsurface property impacts to private properties for each option. In most cases, the partial impact involves narrow strips of property at those locations where a portion of the path of the tunnel-boring machine, together with the three-metre buffer that is maintained on either side, cannot be maintained entirely within the road right-of-way. The Initial Business Case presented to Council on July 12, 2016 examined all property impacts of the tunnel and ancillary structures, such as emergency exit buildings and power substations. This update examines only subsurface property impacts. Since ancillary structures have not been designed for Brimley, to provide an 'apples-to-apples' comparison of the options, surface property impacts have been removed from McCowan.

With respect to subsurface property impacts associated with constructing the new subway tunnel, the Brimley option is preferred as it would impact fewer properties. More detailed planning and design is required to understand the property impacts that would be associated with ancillary structures.

Table 11: Neighbourhood Impact Measures

Measure	McCowan option (Express via McCowan)	Brimley option (Express via Brimley)
Private Property Impacts	Total: 31	Total: 23
Number of Single Family homes impacted:	Partial (subsurface): 19 Complete: 0	Partial (subsurface): 11 Complete: 0
Number of residential multi-unit properties impacted:	Partial (subsurface): 4 Complete: 0	Partial (subsurface): 2 Complete: 0
Number of Commercial properties impacted:	Partial (subsurface): 8 Complete: 0	Partial (subsurface): 10 Complete: 0
Area of land within walking distance of stations designated as Neighbourhoods	0.0 km^2	0.0 km^2
Proportion of land within walking distance of stations designated as Neighbourhoods	0.8%	0.0%

The analysis as it currently stands favours the Brimley option. It is noted that this is an incomplete analysis and additional property impacts are anticipated based on details regarding ancillary structures for both options.

Summary of Strategic Case

	McCowan	Brimley
Serving People		
Choice	*Preferred*	
Experience	*Preferred*	
Social Equity	*Insignificant difference*	*Insignificant difference*
Strengthening Places		
Shaping the City	*Preferred*	
Healthy Neighbourhoods		*Preferred*
Public Health and Environment	*Insignificant difference*	*Insignificant difference*
Supporting Prosperity		
Supports Growth	*Preferred*	
Summary		
	Preferred	

The McCowan option is the preferred alignment for the strategic case.

FINANCIAL CASE: UPDATE

The financial case refers to the capital and operating costs and revenues over the service lifetime of the project, typically 60 years.

Table 12: Capital costs, reported in $Year of Expenditure ($YOE)

	McCowan option (Express via McCowan)	Brimley option (Express via Brimley)
Estimated capital cost ($YOE)	$3.159 B	$2.945 B
Summary		*Preferred*
Notes: • SSE cost estimates prepared by the TTC. Estimates include cost to construct. • Costs do not include costs for project delivery, management reserve or risk allowances. These costs are reflected in the staff report to the Executive Committee. • Costs do not include lifecycle and operations/maintenance. • Costs have been escalated based on the preliminary schedule. The schedule reflects in service by Q2 2026, with construction taking approximately 6 years (2020-2026). Schedule based on March 2017 approval to proceed. • Cost estimates have been developed at approximately 5% design and are a Class 4 cost estimate (per AACE guidelines).		

The capital cost estimate for the McCowan and Brimley options fall within an AACE Class 4 category based on level of design completed, which is typically associated -30% to +50% range of accuracy.

The operating, capital and recapitalization cost estimates for both the McCowan option and the Brimley option are provided in Table 13. These costs are provided in 'present value' dollars (i.e. 2015$). Capital cost estimates in Table 12 were provided in year-of-expenditure (YOE$) costs. The difference in cost between the two options is $0.140 B in present value (2015$) dollars, and $0.214 B in year-of-expenditure dollars. In the financial case evaluation, the Brimley option is preferred as it costs less than the McCowan option. Operational costs are estimated to be approximately the same for both options.

Table 13: Costs (Present Value)

	McCowan option ($, thousand)	**Brimley option ($, thousand)**
Operating Cost	$301,000	$301,000
Capital Costs ($2015)[9]	$2,129,300	$1,996,400
Recapitalization Costs	$742,900	$735,700
Total PV of Costs (PVC)	$3,172,800	$3,032,800

[9] Difference in capital cost reported in Table 12 and
Table **13** reflect difference in the $year. Table 12 is reported in dollars in the year of expenditure ($YOE), while
Table **13** is reported in $2015 Present Value.

ECONOMIC CASE: UPDATE

The economic case quantifies and monetizes the costs and benefits of a proposed project and is developed using the guidance set out in the Draft Metrolinx Business Case Methodology[10]. The economic case is a method for monetizing both the positive and negative impacts of a project for the purposes of evaluating the overall impact of a project, and for the purposes of comparing one option with another.

This economic case evaluation has assessed the benefits and costs of the Brimley option relative to the McCowan option, using a specific set of economic measures. The following measures were considered in comparing the two options:

- User benefits: Travel time savings, travel cost savings, crowding relief.
- Producer benefits: incremental fare savings
- External benefits: Benefits associated with reduction in Vehicle Kilometres Travelled (Vkt)—GHG emissions reduction; road decongestion; accident prevention etc.

It is important to note that not all impacts of a project can be quantified or monetized, and are therefore excluded from the economic case. An example would be the extent to which an option achieves its strategic objectives (see Strategic Case).

The economic case can also include wider economic benefits associated with a project. For example, benefits to commercial businesses as a result of gaining access to a wider labour market. Another example would be the benefits to retail and commercial businesses accrued as a result of being located in closer proximity to other similar type of ventures. These are referred to as economies of agglomeration. These benefits are anticipated for the SSE, but were not analyzed as part of this economic case evaluation[11].

Findings

The Brimley option provides fewer benefits relative to the McCowan option (Table 14) by approximately $9.1 million over a 60-year lifecycle. Relative to the McCowan option, the Brimley option provides less crowding relief and travel

[10] The Metrolinx Business Case Methodology Guidance is currently in draft form. The methodology is based on guidance from the United Kingdom's 'Web-TAG' (Web-Transport Appraisal Guidance) which is applied to any major transportation infrastructure projects for which funding is sought from the UK Government.

[11] Wider Economic Benefits (WEBs) are evaluated in the UK as part of the Web-TAG approach; however, a methodology for evaluating Canadian-based WEBs has not yet been developed.

time-savings but more road decongestion benefits, accident prevention and Greenhouse Gas (GhG) emission benefits. Table 14 provides a summary. The Brimley option is estimated to incur lower costs relative to the McCowan option by approximately $140 million over a 60-year lifecycle (Table15).

Table 14: Economic Benefits (numbers are rounded to nearest '00,000)

	Brimley option, relative to the McCowan Option ($, thousand, rounded to nearest '00,000)
User Benefits	
Travel Time Savings	-$135,500
Fare Savings	-$1,900
Crowding Relief	$64,900
Producer Benefits	
Incremental Fare Revenue	-10,900
External Benefits	
GhG Emissions	$100
CAC Emissions	$0
Accident Prevention	$1,000
Road Decongestion	$58,500
Auto Costs	$14,700
Total Present Value of Benefits (PVB)	**-$9,100**

Table 15: Economic Case Summary

	Brimley option, relative to the McCowan Option ($, thousand, rounded to nearest '00)
Operating Cost	$0
Capital Cost (in $2015)	-$132,900
Recapitalization Cost (in $2015)	-$7,200
Total Present Value of Lifecycle Cost (PVC)	**-$140,100**
Present Value of Benefits (PVB)	-$9,100
Net Present Value (NPV) (PVB-PVC)	**$131,000**

The Net Present Value (NPV) of an option is the difference between benefits and costs (PVB- PVC), and offers insight into the present value of the various options under study[12].

The difference in the NPV between the Brimley option and the McCowan option is approximately $131 million over a 60 year lifecycle. As such, the Brimley option offers a slightly better economic case than the McCowan option taking into consideration the economic measures utilized in this evaluation.

Appendix 1 includes the assumptions used in this economic case evaluation.

[12] Caution should be applied when comparing the BCRs and NPVs of different projects presented in different business cases due to potentially different base assumptions for business cases.

DELIVERABILITY AND OPERATIONS CASE: UPDATE

Operation and Service Planning Considerations

Both options will keep the SRT operational during the construction period. An SRT shutdown would result in additional cost[13] and negative service impacts for passengers.

There may be some impacts to bus operations if the bus terminal is located at Brimley, as approximately half of the bus routes would require travelling a slightly longer distance west to reach the bus terminal. The impacts are not considered significant enough to inform decision-making.

The difference in the impacts to bus operations between the McCowan option and the Brimley option is negligible.

Engineering / Technical Considerations

The construction of a station at Scarborough Centre will impact the mall and road infrastructure. The Brimley option would have fewer impacts, as the bus terminal and station would be built on a vacant property west of the mall. This option would likely involve the tunnel work site being located on the vacant property where the station is constructed, thus minimizing adverse impacts on local businesses and residents. The McCowan option would require the station and bus terminal to be built in a dense area, with greater potential for engineering constraints and costs – which is reflected in the cost estimates.

CONCLUSION

The IBC for the SSE identified a subway connection with a station in the vicinity of Borough Drive and Triton Road (referred to here as McCowan) as being best suited to improve Scarborough Centre's connectivity, and critical to its success as a vibrant urban node and regional gateway. The subway connection is also meant to encourage new development in Scarborough Centre to enable the creation of new walkable complete communities and encourage businesses and institutions to locate there.

Table 16: Summary of Findings

	McCowan option	Brimley option
Strategic Case	*Strongly Preferred*	
Financial Case		*Slightly Preferred*
Economic Case		*Slightly Preferred*
Deliverability & Operations Case	*Insignificant difference*	*Insignificant difference*
SUMMARY	***Preferred***	

[13] Additional costs incurred as a result of shuttering the SRT are included in the cost estimates.

While the Brimley option represents a reduction in costs, the McCowan option is preferred because it is better positioned to meet the objectives of investing in the SSE, to *support the growth and development of Scarborough Centre into a vibrant urban node.* In particular, the McCowan option is preferred because:

1. It is estimated that there will be more boardings (500 more boardings in the AM peak, 1000 more daily net new riders);
2. It better serves existing destinations, population and employment on both sides of McCowan Road and is close to the McCowan Precinct, where development pressure is greatest and future growth is planned;
3. It is consistent with current and future land uses; and more amenable to existing land owners within Scarborough Centre;
4. It supports plans to orient development around the McCowan Road corridor and specifically the Bushby/Town Centre Court gateway, including the expansion of the Scarborough Town Centre to this central area.

In contrast, the area around the Brimley station (the western edge of the Centre) does not have the same number of existing destinations. The area around the Brimley station location does not have the same level of planned growth as the area around McCowan Station. As a result, a station located on the western edge of Scarborough Centre associated with the Brimley option would not meet a key planning objective of the SSE— supporting the development of Scarborough Centre as a vibrant urban node.

A station located in the geographic centre of Scarborough Centre proximal to existing and future development will better support Scarborough Centre as a vibrant urban node.

APPENDIX 1- ECONOMIC CASE ASSUMPTIONS

Table: Economic Case Parameters and Value Assumptions

Parameter	Value	Source / Comments
Discount Year	2015	Business Case Development Handbook (BCDH), Metrolinx
Discount Rate	3.50%	BCDH Tier 2 v0.2, pg44, section 10.3.4
Appraisal period (yrs)	60	BCDH Tier 2 v0.2, pg23, section 6.2.2
Auto operating cost savings ($/veh-km)	$0.63	Metrolinx recommended value
Auto operating cost savings annual growth (%)	0.7%	BCDH Tier 2 v0.2, pg47, section 10.5.1
Accident value ($/veh-km)	$0.07	BCDH Tier 2 v0.2, pg47, section 10.5.1
Accident value annual growth (%)	0.0%	BCDH Tier 2 v0.2, pg47, section 10.5.1
Greenhouse Gas ($/veh-km)	$0.010	BCDH Tier 2 v0.2, pg48, section 10.5.2
Greenhouse Gas annual growth (%)	0.0%	Assumed (Value not specified in BCDH)
Air Quality ($/veh-km)	$0.002	BCDH Tier 2 v0.3, pg42, table 10.1.5 (not specified in v0.2)
Air quality value annual growth (%)	0.0%	Assumed (Value not specified in BCDH)
Annualization factor	300	BCDH Tier 2 v0.2, pg44, section 10.3.3
Value of Time - Non-working (Commuting) $ per hour	$16.13	BCDH Tier 2 v0.2, pg46, section 10.4.2
Value of Time growth (pa)	1.600%	BCDH Tier 2 Draft 0.2, pg46, section 10.4.2
Costs Real or Nominal	Nominal	
Inflation	2.0%	BCDH Tier 2 v0.2, pg22, section 6.2.1

Appraisal Year	Buildup
1	35%
2	70%
3	100%
4	100%
5	100%
6	100%
7	100%
8	100%
9	100%
10	100%