TORONTO TRANSIT COMMISSION

EX16.1.114

July 11, 2016

Ulli Watkiss
City Clerk
Toronto City Hall
100 Queen Street West
Toronto, Ontario
M5H 2N2

Dear Ulli Watkiss:

At its meeting on Monday, July 11, 2016 the Toronto Transit Commission Board considered the attached report entitled "Developing Toronto's Transit Network Plan to 2031". The Board also received a presentation on this item from Deputy City Manager John Livey, Chief Planner Jennifer Keesmaat and Peter Notaro, Executive Director, Strategic & Corporate Policy.

The Board received the presentation and the staff report for information.

https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2016/July_11/Reports/8_City_of_Toronto_Report_Developing_Toronto%27s_Transit_Networ.pdf

The foregoing is submitted for your consideration in reference to Item EX16.1 on the July 12, 2016 agenda of City Council.

Sincerely,

Vincent Rodo
Chief Financial &
Administration Officer

1-11
Attachment

A copy of the report (June 21, 2016) from the City Manager, the Deputy City Manager Cluster B, and the Deputy City Manager and Chief Financial Officer on Developing Toronto's Transit Network Plan to 2031 has been previously distributed with Item EX16.1

ACTION REQUIRED

Date: July 11, 2016

Subject: City of Toronto Report – Developing Toronto's Transit Network Plan to 2031

Attached for the consideration of the TTC Board is a letter from Peter Wallace, City Manager, forwarding Executive Committee Item EX16.1 "Developing Toronto's Transit Network Plan to 2031," which was considered by the Executive Committee at its meeting on June 28, 2016.

Original signed by V. Rodo

Vincent Rodo
Chief Financial &
Administration Officer

Attachments

1. Letter from Peter Wallace, City Manager
2. EX16.1 Developing Toronto's Transit Network Plan to 2031(EX16.1 Attachments – refer to link provided in City Manager's letter)

Peter Wallace
City Manager

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June 29, 2016

Andy Byford
Chief Executive Officer
Toronto Transit Commission
1900 Yonge Street
Toronto, ON M4S 1Z2

RE: Developing Toronto's Transit Network Plan to 2031

Dear Mr. Byford,

As you know, the City and TTC have worked collaboratively to develop the report Developing Toronto's Transit Network Plan to 2031. Please find attached a final copy of the report and appendices for your records. The report is also available online at the following link: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2016.EX16.1

City staff can be available to provide a presentation to the July 11, 2016 TTC Board meeting. Thanks for your continued partnership in advancing transit expansion planning in Toronto.

Sincerely,

Original signed by Peter Wallace

Peter Wallace
City Manager

c.
John Livey, Deputy City Manager, Cluster B
Roberto Rossini, Deputy City Manager & Chief Financial Officer
Peter Notaro, Executive Director, Strategic & Corporate Policy

Att.
EX16.1 Developing Toronto's Transit Network Plan to 2031

TORONTO

STAFF REPORT
ACTION REQUIRED

Developing Toronto's Transit Network Plan to 2031

Date:	June 21, 2016
To:	Executive Committee
From:	City Manager, Deputy City Manager Cluster B, and the Deputy City Manager Cluster C & Chief Financial Officer
Wards:	All
Reference Number:	

SUMMARY

In March 2016, City Council considered the report EX13.3 Developing Toronto's Transit Network Plan: Phase 1, which provided a comprehensive update on transit expansion projects currently under assessment, including how each project contributes to the development of Toronto's future transit network. City Council directed staff to focus analysis on key options for each transit project. In particular, City Council:

- Approved SmartTrack/GO Regional Express Rail (RER) Integration options C and D for further study and removed from consideration the separate and parallel SmartTrack option, option A and option B.
- Removed heavy rail options on the western corridor for SmartTrack from consideration and requested a review of the Eglinton West LRT extension from Mount Dennis to Mississauga Airport Corporate Centre (MACC) and Pearson International Airport.
- Removed from consideration the Bellamy and Scarborough Express Rail (SmartSpur) corridors for the Scarborough Subway Extension (SSE); and
- Approved the Pape to Downtown via Queen/Richmond as the preferred corridor for the Relief Line project.

City Council also directed additional analysis be undertaken in partnership with the Toronto Transit Commission (TTC) and Metrolinx to advance these projects for consideration at the June 2016 Executive Committee meeting. This report provides recommendations on the preferred options resulting from further technical, planning and initial business case analysis for SmartTrack/GO RER including Eglinton West LRT, the Scarborough Transit Network, and Relief Line. In particular this report recommends City Council approve the following options which further define the scope of each project:

- SmartTrack/RER Integration scenario with up to six new stations on the Stouffville/Lakeshore East GO corridor (Finch, Lawrence, Gerrard, and Unilever) and the Kitchener GO Corridor (Liberty Village and St. Clair West);
- An Eglinton West LRT extension with 8 to 12 stops between Mount Dennis and Renforth Gateway, as the western corridor for SmartTrack;
- Remove from further consideration the 3-stop SSE, and focus further business case analysis on a Scarborough Transit network solution that considers Express SSE options to Scarborough Centre and an extension of the Eglinton East LRT.
- Approve the Pape-Eastern-Queen alignment for the first phase of Relief Line, and authorize City and TTC staff to prepare the Environmental Project Report (EPR) to move towards the Environmental Assessment (EA)/Transit Project Assessment Process (TPAP).

The recommendations in this report further define the key projects which will form Toronto's transit network by 2031, and identify the next steps to advance to the next phases of analysis and discussion with the Province of Ontario, Metrolinx and the TTC.

The next steps to advance SmartTrack include:

- Advancing further technical and planning work in order to undertake the EA/TPAP processes required for the recommended SmartTrack/RER Integration scenario, the new SmartTrack stations, and the Eglinton West LRT extension from Mount Dennis to Renforth Gateway;
- Commencing negotiations on cost-sharing, project governance, asset ownership, fare policy, and project delivery for SmartTrack and the Eglinton West LRT extensions;
- Identifying the funding implications related to the City's share of costs for SmartTrack; and
- Undertaking further work with the City of Mississauga and the Greater Toronto Airport Authority (GTAA) in partnership with Metrolinx to refine options for extending the LRT between Renforth Gateway and Pearson International Airport as a next phase of the project.

The next steps to advance a preferred solution for Scarborough Transit include:

- Retaining the services of a third-party expert in rail transit construction and cost-estimation to undertake a risk assessment and detailed review of the TTC’s 5% design cost estimates for the Express McCowan subway, and other possible express subway alignments;
- Preparing the Environmental Project Report for the SSE Express subway in order to issue the Notice of Commencement for the TPAP once ready to proceed;
- Advancing the design on the Eglinton East LRT to a minimum of 5% in order to support decision-making; and

- Evaluating the SSE Express subway option in conjunction with the Eglinton East LRT extension to UTSC and Malvern, in order to determine the preferred network solution for Scarborough through a business case analysis.

The City Manager will bring a subsequent report to City Council with respect to the status of negotiations with the Province of Ontario, Metrolinx, and the Government of Canada, including funding implications for the City's share of costs associated with SmartTrack and Scarborough Transit.

The Relief Line project, a priority for the City and TTC, will continue per Council direction to advance planning, design and the EA/TPAP process for the first phase of the project. The first phase of the Relief Line between Danforth and downtown is a critical component of the longer-term vision for the new subway line which is envisioned to extend north to Sheppard Avenue and west to connect to the Bloor subway line. The City and TTC will work with the Province and Metrolinx to advance the next phases of the Relief Line.

The priority projects advanced in this report will be integrated into further refinement of the City's long term transit network plan through the Official Plan review process, *Feeling Congested?,* and forwarded to Metrolinx for consideration in the Regional Transportation Plan Review. As directed by City Council in March 2016, a report from the Chief Planner & Executive Director, City Planning will be presented in Q1 2017 with an update on the second phase of Toronto's long term transit network plan.

The City Manager has forwarded this report to the President & CEO, Metrolinx, and the CEO, TTC for submission to the July 11, 2016 TTC Board meeting.

RECOMMENDATIONS

The City Manager, Deputy City Manager Cluster B and the Deputy City Manager Cluster C & Chief Financial Officer recommend,

SmartTrack

1. City Council approve the following components which comprise the SmartTrack project scope, and request the Province of Ontario and Metrolinx to partner with the City of Toronto and the Toronto Transit Commission, to complete the remaining technical and planning analysis and undertake any required Environmental Assessment/Transit Project Assessment Process:

    a. SmartTrack/Regional Express Rail (RER) Integration scenario with up to six new stations located at Finch, Lawrence, Gerrard and Unilever on the Stouffville/Lakeshore East GO corridors and Liberty Village and St. Clair West on the Kitchener GO corridor; and

    b. Eglinton West LRT extension with between 8 to 12 stops between Mount Dennis and Renforth Gateway, and potential grade separations located at Martin Grove Road, Kipling Avenue and the Eglinton Flats.

2. City Council request the City Planning Division and the Toronto Transit Commission, in partnership with Metrolinx, the City of Mississauga and the Greater Toronto Airport Authority (GTAA) to further develop options for extending the Eglinton West LRT between Renforth Gateway and Pearson International Airport.

Scarborough Transit Network

3. City Council request the City Manager and the CEO, Toronto Transit Commission to remove from consideration the 3-stop McCowan Scarborough Subway Extension (SSE) and continue to develop an SSE Express option, by conducting the following:

    a. Retaining the services of a third-party rail transit construction and cost – estimation expert to undertake a risk assessment and detailed review of the TTC's 5% design cost estimates for the McCowan corridor and other possible express subway alignment options; and

    b. Prepare the Environmental Project Report for the SSE express subway and issue the Notice of Commencement for the Transit Project Assessment Process (TPAP) once ready to proceed.

4. City Council request the City Manager and the CEO, Toronto Transit Commission, in partnership with Metrolinx, and in consultation with the University of Toronto Scarborough (UTSC), to undertake further technical and planning analysis with respect to an Eglinton East LRT extension to the UTSC, including:

a. Advancing the Eglinton East LRT to a minimum of 5% design;

b. Assessing the interface at Kennedy Station of the Eglinton East LRT, Metrolinx Eglinton Crosstown project, and the preferred SSE option as a result of the analysis requested in recommendation 3;

c. Assessing the potential realignment of Military Trail through UTSC; and

d. Identifying the requirements for the next phase of the Eglinton East LRT extension to Malvern.

5. City Council request the City Manager and the CEO, Toronto Transit Commission, in consultation with Metrolinx, to develop a business case analysis for the Scarborough Transit Network solution, and include the following components in the network scenarios:

    a. Express SSE, subject to the additional analysis outlined in recommendation 3; and

    b. Eglinton East LRT extension based on the additional analysis outlined in recommendation 4.

6. City Council request the Province of Ontario to confirm the timing for delivering the approved Sheppard East LRT extension, with committed funding under the Building Canada Fund and the Toronto-Metrolinx Light Rail Transit Master Agreement signed in 2012, in order to inform transit network planning and business case analysis for Scarborough's future transit network.

Relief Line

7. City Council approve the Pape-Eastern-Queen alignment for the Relief Line, and authorize the Chief Planner & Executive Director, City Planning and the CEO, Toronto Transit Commission to:

    a. Work in partnership with Metrolinx to confirm station locations for optimal connections between the Relief Line and SmartTrack/Regional Express Rail, including future extensions of the Relief Line; and

    b. Prepare the Environmental Project Report for the Relief Line and issue the Notice of Commencement for the Transit Project Assessment Process once ready to proceed.

8. City Council authorize the City Manager in consultation with the CEO, Toronto Transit Commission to develop a Terms of Reference with the Province of Ontario and Metrolinx to advance the next phases of planning and design for the Relief Line,

including extensions of the Relief Line north to Sheppard Avenue and west to the Bloor subway line.

9. City Council request the Toronto Transit Commission and the City Planning Division to assess potential impacts associated with tunnelling and station construction during the detailed design phase of the project, and identify mitigation measures for private property owners, and conduct further public consultation where impacts to residential areas are identified, such as near Pape Avenue and Queen Street.

Cost-Sharing and Funding Implications

10. City Council authorize the City Manager to undertake the following and report to City Council for its consideration:

    a. negotiate cost sharing and intergovernmental fundings arrangements with the Province of Ontario for shared costs associated with:
        i. implementing SmartTrack within the Regional Express Rail program;
        ii. extending an LRT along Eglinton West;
        iii. extending an LRT along Eglinton East;
        iv. operating and maintaining Metrolinx Toronto LRT projects;
        v. municipal utility and infrastructure within Metrolinx-owned rail corridors; and
        vi. any other outstanding transit related matter.

    b. review and report back on governance implications and arrangements to be put in place to effectively carry out the intergovernmental funding and cost share arrangements; and

    c. negotiate and enter into a funding agreement with the Government of Canada for the federal contribution towards the incremental costs associated with implementing the SmartTrack components within the Regional Express Rail program, per recommendation 1, and the Scarborough Transit Network per recommendation 3.

11. City Council request the City Manager and Deputy City Manager, Cluster C & Chief Financial Officer to report to City Council on the funding implications to the City associated with the proposed terms of cost-sharing arrangements provided for pursuant to recommendation 10.

12. City Council authorize the City Manager to include additional planning and design work for SmartTrack, Eglinton West LRT, Scarborough Subway Extension, Eglinton East LRT and Relief Line, as part of the priority list of projects to be submitted to the Government of Canada and the Province of Ontario under phase one of the Federal Public Transit Infrastructure Fund.

13. City Council approve the creation of an Eglinton East LRT capital sub-project within the Corporate Initiatives Capital Program's Transit Expansion Initiatives project, with

approval for a 2016 cash flow of $3 million and a 2017 cash flow of $4 million for a total of $7 million, for the purpose of advancing the Eglinton East LRT design work to 5%, fully funded from the Capital Financing Reserve Fund (XQ0011).

14. City Council request the City Manager in consultation with the CEO, TTC, Deputy City Manager, Cluster B and the Deputy City Manager, Cluster C & Chief Financial Officer to report through the budget process on the feasibility of establishing dedicated and properly resourced functions for the coordination, analysis and implementation of the City's multi-billion dollar transit expansion initatives.

Financial Impact

Planning and Design Work

Planning and design work for the Scarborough Subway Extension (SSE) and Relief Line is funded through the Council approved TTC Capital Program within their respective capital projects. This report proposes further design work also be undertaken for the Eglinton East LRT extension. It is recommended that Council approve the creation of an Eglinton East LRT capital sub-project within the Corporate Initiatives Capital Program's Transit Expansion Initiatives project, with a 2016 cash flow of $3 million, and a 2017 cash flow of $4 million, for the purpose of advancing the Eglinton East LRT design work to 5%, fully funded from the Capital Financing Reserve Fund (XQ0011).

This report also recommends the City Manager include eligible planning and design work for the SSE, Relief Line, SmartTrack and Eglinton East LRT as part of the priority list of projects to be submitted to the Government of Canada and Province of Ontario under the Federal Public Transit Infrastructure Fund (PTIF).

Capital Cost Estimates

It is important to emphasize that the following capital cost estimates are preliminary order of magnitude projections that are intended for planning purposes only. The estimates have not been thoroughly validated and will inevitably be subject to change as detailed design and project maturity occurs.

It is also important to note that some estimates were prepared by Metrolinx, and a greater level of scrutinity of the elements and basis of these estimates will be performed for the purposes of any future proposed cost sharing arrangements.

SmartTrack

This report recommends that City Council approve the completion of the remaining technical and planning analysis for the recommended scope of SmartTrack. The current high-level capital cost estimates for the recommended components of SmartTrack are provided below in Table 1. There is currently no funding approved for this project in the 10-Year Capital Plan.

Table 1. SmartTrack Capital Cost Estimates ($ billions)

	Estimate Class Level	Constant 2014$
SmartTrack/RER with up to 6 new stations	4/5	0.7 – 1.1
Eglinton West LRT with 8-12 stops and 3 potential grade separations.	4/5	1.5 – 2.1
	Total:	$2.2 – 3.2

Notes:

- Cost estimates prepared by Metrolinx, and have not been validated by the City. Cost estimates require reconciliation with the individual station costs outlined in each new station initial business case.
- Costs are described in 2014 figures, and do not include escalation, financing, lifecycle and operations/maintenance. See attachments 1 to 3.
- Province of Ontario has committed $13.5 billion (2014$) in capital costs for RER, including an estimated $3.7 billion (2014$) in capital costs to support key infrastructure for SmartTrack
- Eglinton West LRT directly benefits the City of Mississauga and the Greater Toronto Aiport Authority
- Cost estimates for the incremental components of SmartTrack have been developed at 0% design and are a Class 5 cost estimate. Base components associated with RER are at a higher level of design.

Scarborough Transit Network

As shown below in Table 2, the current capital cost estimates in year of expenditure (YOE/Escalated$) terms for the Scarborough Transit Network is approximately $4.74 - $4.83 billion. This includes the estimated $3.16 billion capital costs for the SSE McCowan Express subway (including SRT life extension and decommissioning costs), and the Eglinton East LRT extension to UTSC with an estimated capital cost of $1.58 - $1.67 billion. Table 2 also provides the updated capital cost estimate of $4.6 billion for the SSE 3-Stop McCowan subway option (including SRT life extension and decommissioning costs).

Table 2. Scarborough Transit Network- Capital Cost Estimates ($billions)

	Estimate Class Level	YOE/Escalated $billions		
		Construction Cost	SRT Life Extension and Decommissioning ($156M+$133M)	Total
SSE- 3 Stop McCowan (Option 1)	4	4.32	0.289	4.61
SSE- McCowan Express (Option 2A)	4	2.87	0.289	3.16
Eglinton East LRT to UTSC (Option 3)	5			1.58 – 1.67

SSE Notes:

- SSE Cost estimates prepared by the TTC. Estimates include cost to construct.
- Costs do not include financing, lifecycle and operations/maintenance. See attachments 4 to 5.
- Assumes line in service by late 2025, with construction taking approximately 6 years (2020-2025). Note this is a preliminary schedule based on City Council approving the preferred alignment in July 2016.
- Cost estimates have been developed at approximately 5% design and are a Class 4 cost estimate (per AACE guidelines). Class 3 estimates are required to establish the project budget baseline.

- Potential risks include the incorporation of a single tunnel design and the increased depth of the station(s), which could affect the expected accuracy of the estimates.
- Costs assume traditional procurement approach. A separate analysis on project delivery options is underway per City Council direction.

Eglinton East LRT to UTSC Notes:

- Eglinton East LRT cost estimate prepared by 3rd party consultant for the City. Estimates include cost to construct. Do not include cost to finance.
- Assumes line in service by late 2023, with construction taking approximately 4 years (2020-2023). Project timeline, funding source and procurement method still to be determined.
- Cost estimates have been developed at 0% design, and are a Class 5 estimate.
- Option 3 estimate includes storage tracks; does not include a maintenance facility.

Table 3 provides a summary of the plan adopted by City Council in 2013 for the funding of the original SSE 3-Stop McCowan option. The 2013 plan provided for a total of $3.56 billion in funding from Federal, Provincial and City contributions.

Table 3. 2013 Scarborough Subway Extension Funding Plan ($millions)

Overall Funding Sources	Amount YOE/Escalated $	% of Total
Federal Contribution	660	19%
Provincial Contribution	1,990*	56%
City Contribution	910	26%
Total Funding:	3,560	100%
Breakdown of City Contribution		
Estimated Development Charge Funding	165	18%
Estimated Tax Supported Funding	745	82%
Total City Funding:	910	100%

*The Province has committed $1.48B ($2010), less sunk costs associated with the cancellation of the Scarborough LRT project ($74.8M).

Based on the current capital cost estimates, an additional $1.18 - $1.27 billion in funding will be necessary to implement the full Scarborough Transit Network Plan. This estimate is subject to further design work, third party cost estimate assessments, and availability of federal and provincial funding.

This report recommends that the SSE McCowan Express option be further developed and reviewed by a third party to assess the potential for reduced capital costs. It also recommends that further technical and planning analysis be conducted on the proposed Eglinton East LRT extension to the Scarborough campus of the University of Toronto.

Relief Line

This report recommends that City Council approve the Pape-Eastern-Queen alignment for the Relief Line and the commencement of the Environmental Project Report and Transit Project Assessment Process for this project. Table 4 below provides the current capital cost estimate based on the recommended alignment.

Table 4. Relief Line Capital Cost Estimates ($billions)

	Estimate Class Level	YOE/Escalated $'s
Relief Line- Pape-Eastern-Queen (Option 3)	5	6.80

Notes:
- Cost estimate prepared by the TTC. Costs assume traditional procurement approach;
- Costs do not include financing, lifecycle and operations/maintenance. See attachment 6.
- Assumes line in service by 2031, with construction taking approximately 10 years (2021-2031)
- Cost estimates have been developed at less than 5% design and are a Class 5 cost estimate (per AACE guidelines).

Appendix 1 to this report outlines the accuracy ranges, and appropriate uses of cost and schedule estimates at various stages of project design per industry recognized guidelines developed by The Association for Advancement of Cost Engineering (AACE). AACE guidelines indicate that a Class 3 cost and schedule estimate (minimum 10% project design) should be used to authorize the project budget.

The full set of assumptions underlying the cost estimates can be found in the Financial Case section of the following appendices:

- Attachment 1- SmartTrack/RER Integration Initial Business Case
- Attachment 2- SmartTrack Stations
- Attachment 3- Eglinton West LRT Initial Business Case
- Attachment 4- Scarborough Subway Extension Initial Business Case
- Attachment 5- Eglinton East LRT Preliminary Options Analysis
- Attachment 6- Relief Line Initial Business Case

Committed Federal Funding

The Government of Canada has committed to funding Toronto transit expansion initiatives under various mandates and programs. A break down of these commitments are found in Table 5.

Table 5. Federal Funding Committments to Toronto Transit Expansion Projects ($millions)

Year	Funding ($M)	Project	Program
2009	333	Sheppard East LRT*	BCF-MIC[1]
2013	660	Scarborough Subway Extention	NBCF- PTIC[2]
2016	2,600	SmartTrack	PTIF – PH2[3]**

Notes:
* Sheppard East LRT to be delivered by Metrolinx
** Details for PTIF phase 2 anticipated within federal 2017 budget

Cost-Sharing, Funding & Financing

[1] Building Canada Fund Major Infrastructure Component (BCF-MIC)
[2] New Building Canada Fund (NBCF)- Provincial-Territorial Infrastructure Componenet (PTIC)
[3] Public Transit Infrastructure Fund (PTIF)- Phase 2

At the March 2016 meeting of City Council, the City Manager was directed to report to Executive Committee in June 2016 on information regarding cost sharing discussions for a range of transit initiatives, including reporting on any terms and conditions for City Council's consideration, prior to entering into any new or amended agreement with the Province of Ontario and Metrolinx[4]. Section 6 of this report provides an update on the status of cost sharing discussions with the Province of Ontario and Metrolinx.

This report recommends City Council authorize the City Manager to negotiate intergovernmental funding and cost share arrangements with the Province of Ontario on the various transit initiatives. The City Manager will report back on the negotiated terms for funding and cost-sharing for these projects with the Province and other relevant parties, for City Council's approval. The funding implications associated with the City's share of the costs will also be identified for City Council at that time.

The Deputy City Manager & Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

On March 31, 2016, City Council considered EX13.3 Developing Toronto's Transit Network Plan: Phase One. The report introduced a vision for Toronto's Transit Network by bringing together all transit projects currently under study. City Council adopted several recommendations that provided staff with direction to review and refine individual projects within the network plan in consultation with the public and key partners, including the Toronto Transit Commission, Province of Ontario and Metrolinx.

SmartTrack

In March 2016, City Council directed the City Manager and Metrolinx to remove the full and separate SmartTrack and SmartTrack/RER integration options A and B from further consideration. Direction was given to complete the analysis for options C and D. City Council also directed staff to remove heavy rail options on the western corridor from further consideration, and to review the approved environmental assessment for the Eglinton West LRT extension from Mount Dennis to the Mississauga Airport Corporate Centre (MACC) and Pearson International Airport.

Scarborough Transit Network

In March 2016, City Council directed the Chief Planner & Executive Director, City Planning in consultation with the TTC, to complete the review of corridor options and related work for the SSE, including integration of an Eglinton East LRT into the University of Toronto, Scarborough Campus (UTSC) as part of the Scarborough Transit Network plan. City Council also directed staff to remove the Bellamy corridor, and Scarborough Express Rail from further consideration as options for the SSE.

[4] EX13.3, Council Directive #3

Relief Line

In March 2016, City Council approved the Pape to Downtown via Queen/Richmond as the preferred corridor for the Relief Line project and requested the Chief Planner & Executive Director, City Planning in consultation with the TTC to continue planning and technical analysis to recommend a preferred alignment and stations in the June report.

Update on Discussions with Province

In March 2016, City Council directed the City Manager in consultation with the CEO, TTC to report to the June 2016 Executive Committee, on the capital and operating cost sharing discussions related to the following projects and initiatives, and report any terms and conditions for City Council consideration in order to protect the City's policy and fiscal interests, prior to entering into any new or amended agreement with the Province: Metrolinx Light Rail Transit Program; SmartTrack, including Eglinton West LRT; Eglinton East LRT Extension; SSE; Relief Line; RER/ GO transit capital including grade separations; fare policy; and governance.

ISSUE BACKGROUND

Transit Network Plan Development

In March 2016, City Council approved the report "*Developing Toronto's Transit Network Plan: Phase 1*" which brought together the various transit expansion projects currently under study, in order to consider each within the context of their contributions to the transit network as a whole.

The City and TTC have a key role in determining Toronto's transit network priorities. Transit is critical to meeting Toronto's transportation needs, with the TTC moving 541 million riders annually (2015). The TTC is the largest transit agency in Canada and responsible for serving 75% of public transit riders in the Greater Toronto and Hamilton Area[5]. In North America, the TTC has the third largest ridership, after Mexico City and New York City. Demand on the TTC network will continue to increase given the high growth the City will experience over the coming decades, particularly in the downtown core. Access to rapid transit is critical to achieving Toronto's social inclusion and economic development objectives. Approximately 37% of Toronto residents rely on transit infrastructure to make important connections to employment, school and community and social services[6]. The City in partnership with the TTC has a key interest in ensuring future investments in building the transit network to serve the needs of transit users and the communities that rely on the infrastructure to move around the City and region.

[5] TTC Board Report: 2016 Ridership Update (March 23, 2016)
[6] Statistics Canada, Census 2011

The City of Toronto, through the transportation component of the Official Plan review process ("Feeling Congested?") is developing Toronto's future transit network plan focused on the key city building goals of *serving people, strengthening places* and *supporting prosperity*. The City's Rapid Transit Evaluation Framework (RTEF) assesses how each transit project achieves the City's goals and contributes to the development of the overall network. The priority projects under evaluation in this report (SmartTrack, SSE, Relief Line, and extensions of the Eglinton LRT) will be integrated into longer term transit network planning underway by the City. An update on the 2031 and 2041 transit network priorities of the City will be brought forward to City Council in Q1 2017 as directed in March 2016 (2016.EX13.3).

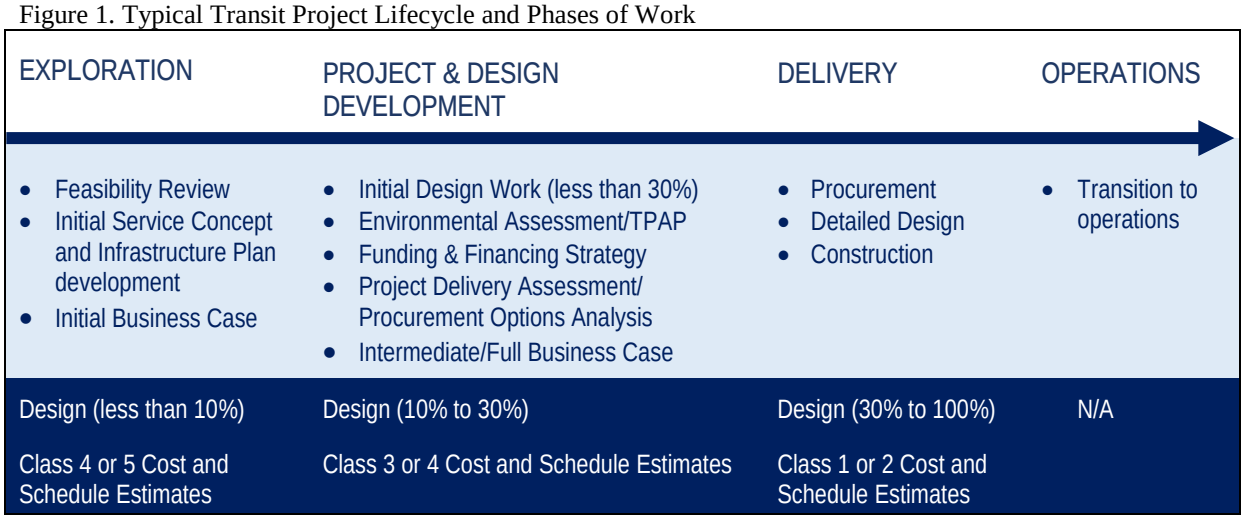
Metrolinx is responsible for developing a Regional Transportation Plan (the "RTP") in the interest of integrating transportation across the entire Greater Toronto and Hamilton Area (GTHA). Metrolinx is currently undertaking a review of the RTP with a twenty-five year outlook to 2041, and intends to report to the Metrolinx Board in 2017 on the updated RTP. The City's work to develop priority transit network improvements will be an important input into the RTP review.

Transit network development needs to consider both the local service and city building perspective and the regional perspective in order to ensure that investment in transit infrastructure best serves the needs of all types of transit trips and users. The City and TTC are working closely with the Province and Metrolinx to develop the future network plan for Toronto and the region in the interest of balancing these perspectives.

Project Development Process

The advancement of planning and technical analysis on multiple projects at the same time is critical given the long lead time to advance an individual project from initiation to completion. The typical transit project lifecycle involves the processes in Figure 1 below.

Figure 1. Typical Transit Project Lifecycle and Phases of Work



The City in partnership with the TTC and Metrolinx have been undertaking the initial planning, engineering and technical feasibility work on key projects. All five transit projects are in the exploration phase with initial business cases presented in this report. The SSE is the only project where there is an approved funding and financing strategy in place. Eglinton West LRT and Eglinton East LRT have previously approved Environmental Assessments, which will require amendments. Table 6 provides a summary of each project's status.

Table 6. Project Status Summary

Project	Lead/ Partnership	Current Status	EA/ TPAP Status	Funding Status
SSE	City, TTC	Initial Business Case Class 4 Estimate	Pre-TPAP. Project Assessment underway	$3.56B (YOE/Escalated$) committed
Relief Line	City, TTC	Initial Business Case Class 5 Estimate	Pre-TPAP. Project Assessment underway	Unfunded
SmartTrack	City, TTC, Metrolinx	Initial Business Case Class 4/5 Estimate	Pre-TPAP. Project Assessment underway	Unfunded
Eglinton West LRT	City, TTC, Metrolinx	Initial Business Case Class 4/5 Estimate	EA Approved (2010). Amendment required	Unfunded
Eglinton East LRT	City, TTC, Metrolinx	Preliminary Options Analysis- Class 5 Estimate	EA Approved (2009). Amendment required	Unfunded

Business Case Methodology

A business case assembles a suite of evidence on the potential strategic, economic, financial, deliverability and operational impacts of a proposed project to inform decision making throughout the project lifecycle. A business case captures both quantifiable and unquantifiable characteristics of a proposed project in a consistently structured document. The business case methodology was employed by Metrolinx in the development of the Regional Express Rail (RER) program and provided the evidence base for the Province's decision to invest $13.5 billion in improving the GO Transit network from a commuter service to an all-day more frequent service.

The Metrolinx Business Case Framework[7] consists of four chapters:

- *Strategic Case*— Assesses how each option achieves strategic policy and planning objectives
- *Financial Case*- Assesses the cost to build and operate each option.
- *Economic Case*- Assesses the value of the project in terms of costs and benefits.
- *Deliverability & Operations Case*- Assesses potential deliverability risks, and key considerations with respect to how the project could be constructed and operated.

[7] http://www.metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/GO_RER_Initial_Business_Case_EN.pdf (p.8)

Each case has a different level of development based on the stage of business case development. For example, an initial business case tends to focus more on the strategic, financial and economic chapters in order to screen potential options. The intermediate/ full business case contains further development of the analysis on the deliverability & operations case, as the preferred option has been identified by this stage. Efforts are focused on optimizing the preferred option in a full business case.

In an initial business case all four chapters are taken into consideration when screening options to ensure a comprehensive view of the project. For example, the economic case seeks to monetize the costs and benefits associated with an option in order to determine whether the option provides value for money. However, it is important to note that not all benefits associated with a project can be monetized and included within a Benefit-Cost Ratio (BCR) calculation. As a result it is also important to look at other benefits presented in the strategic case that cannot be monetized.

An option that performs well from the strategic and economic case perspective, may present significant deliverability and operations challenges that warrant an option being removed from consideration. Alternatively, the financial case may indicate that a preferred option is simply not affordable within available funding envelopes. In summary, the results of all four chapters of the initial business case are holistically assessed to determine a preferred option or conclude that further options analysis is required.

As directed by City Council in 2015, an initial business case has been developed for SmartTrack including Eglinton West LRT in order to support both City Council and the Province's decision-making process. The business case methodology has also been adopted by the City in order to assemble the suite of evidence developed for other key transit planning projects. An initial business case has been developed for the following projects:

Project	Authors	Attachment
SmartTrack/RER	Metrolinx, City, TTC	Attachment 1
SmartTrack Stations	Metrolinx with City and TTC input	Attachment 2
Eglinton West LRT	Metrolinx, City, TTC	Attachment 3
SSE	City and TTC	Attachment 4
Eglinton East LRT*	City and TTC	Attachment 5
Relief Line	City and TTC	Attachment 6

*Eglinton East LRT is at an earlier stage of analysis- Preliminary Options Analysis

The City has further enhanced the Metrolinx business case framework by integrating the City's *Feeling Congested?* evaluation framework within the Strategic Case in order to ensure the City's local service and city building objectives are a key consideration in the evaluation of options. Currently, the economic evaluation of options in the Metrolinx business case framework places emphasis on specific types of benefits—travel time savings, reduction in auto use—that do not fully capture and monetize the indirect

benefits associated with local transit and city building objectives. Additional benefits currently not captured include[8]:

- Benefits from increased economic activity and/or agglomeration of businesses;
- Benefits from property development and values owing to transit investment;
- Growth in employment in transit service area;
- Benefits to government from increased taxes generated by new development;
- Benefits from change in land use patterns (e.g. changes in the amount of land needed for roads and parking facilities; infill and efficient public service provision due to transit-oriented development).

The direct benefits (jobs and business activity) created by transit expenditures, and emphasis on the mobility benefits for non-discretionary transit users (i.e. users who do not own a car) is also currently not included in the economic case evaluation. The City has therefore placed greater focus on developing the strategic case section in order to capture benefits that have not been monetized.

The application of the business case methodology is new to Metrolinx as well as the City of Toronto and TTC. Metrolinx has previously undertaken a different form of Benefit-Case Analysis (BCAs). The development of the business case methodology and integration into the City's decision-making processes on major transit infrastructure will continue to evolve as the City and TTC jointly undertake effort to continuously improve processes and tools to evaluate, plan and develop projects. The City and TTC will continue to work in partnership with Metrolinx to improve the methodology and approach to evaluating projects.

A summary of the results of the initial business case analysis for SmartTrack/RER, Eglinton West LRT, SSE and Relief Line is provided. The assessment of Eglinton East LRT is preliminary and the results will be integrated into the future development of an initial business case for the project.

COMMENTS

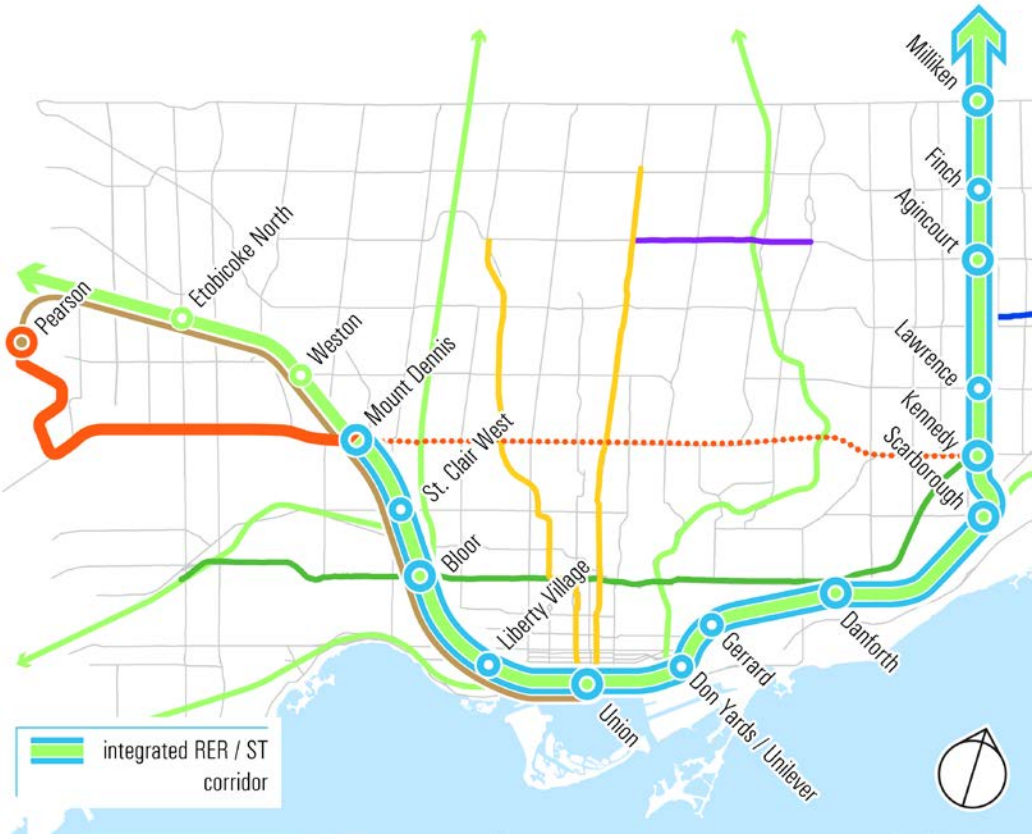
1. SmartTrack Initial Business Case

The City, Metrolinx and TTC have been working to develop options for SmartTrack in partnership since January 2015, when City Council approved a joint work program. Several reports have been brought forward to City Council and the Metrolinx Board in order to advance the planning and technical analysis of SmartTrack. This report recommends City Council approve the following scope elements of SmartTrack:

[8] December, 2015, Victoria Transport Policy Institute: Evaluating Public Transit Benefits and Costs – Best Practices Guidebook (T. Litman) http://www.vtpi.org/tranben.pdf

- SmartTrack/RER Integration scenario with up to six new SmartTrack stations, including Finch, Lawrence, Gerrard and Unilever on the Stouffville/Lakeshore East GO Corridor and Liberty Village and St. Clair West on the Kitchener GO Corridor; and
- Eglinton West LRT Extension with 8 to 12 new stations between Mount Dennis and Renforth Gateway, and potential grade separations located at Martin Grove Road, Kipling Avenue and the Eglinton Flats.

Figure 2. SmartTrack/RER Integration Scenario-Up to 6 New Stations



The following sections provide a summary of the recommended option for each component of the SmartTrack proposal using the business case methodology described earlier in this report.

1.1 SmartTrack/RER Integration

Background

Initial technical feasibility and planning analysis was presented to City Council in March 2016 on four options for integrating SmartTrack with the Metrolinx RER program on the

Kitchener, Stouffville and Lakeshore East GO corridors. The options ranged in number of stations, service frequency and required additional infrastructure.

- Option A – Increased frequencies, 5 new stations
- Option B – Express and local service, 8 new stations
- Option C – Committed RER frequencies, 7-8 new stations
- Option D – Committed RER frequencies, 4-5 new stations

Each option was assessed against the base case, which is the $13.5 billion provincially funded RER program. The significant infrastructure requirements and community impacts associated with a Separate and Parallel SmartTrack, Option A and Option B resulted in each of these options being screened out. In March 2016, City Council directed the City Manager and Metrolinx to finalize the analysis focusing on Options C and Option D[9] (2016.EX13.3).

Options C and D were advanced given the opportunities to improve accessibility and travel choice within Toronto. High-level analysis conducted by Metrolinx, indicates that both Options C and D can be implemented without the requirement to build additional track infrastructure. More detailed analysis has been undertaken since March 2016 by Metrolinx and City staff to understand the performance of each option. The results of the initial business case in Attachment 1 is summarized below.

Figure 3. SmartTrack/RER Integration Option C: 7 to 8 New Stations

New stations shown are conceptual; recommendations for any new stations will come through new stations analysis. Eglinton West LRT shown in red

[9] 2016.EX13.3, Council Directive #1

Figure 4. SmartTrack/RER Integration Option D: 4 to 5 New Stations

RER 10-Year Service Concept for Kitchener, Lakeshore East, and Stouffville corridors AM Peak Hour, Peak Direction. Eglinton West LRT shown in red.

Initial Business Case

This report recommends a SmartTrack/RER integration scenario with up to six new stations. The analysis supporting this recommendation is summarized below and included in detail in Attachment 1 to this report.

Strategic Case

The strategic case analysis suggests that there are different benefits associated with Options C and Option D. The City's Feeling Congested? evaluation framework identified that Option C performs better in terms of opening up new access points to the GO network in Toronto. In particular, Option C increases accessibility to the downtown job market from nearby areas lacking rapid transit acess to the downtown core. Conversely, adding additional stations to the base GO RER program imposes a loss of travel time savings on longer distance commuters in comparison to the RER program. As a result, Option D performs stronger from a travel time savings perspective. Both Option C and D provide similar ridership increases in comparison to the Base Case - GO RER. Option C provides an additional 2.4 million riders annually and Option D provides an additional 2.8 million riders annually (assuming a GO fare)[10]. The analysis in Attachment 1 is based on the assumption of the current GO fare structure, recognizing additional work is required through the GTHA Fare Integration study.

[10] Ridership numbers produced by Metrolinx.

The City has undertaken ridership analysis with the University of Toronto's GTHAModelv4.0 in order to illustrate the impact of a TTC fare on the performance of each option from a ridership perspective. The results are outlined in Table 7 below. Further evaluation of the recommended fare structure for SmartTrack is required and will be undertaken in partnership with Metrolinx. See section 5 for discussion on fare policy.

Table 7. Ridership and Travel Time Savings (TTC Fare)

Options	Ridership	Net New Riders	Transit Rider Travel Time Savings Compared to Base RER (million minutes)
GO RER	27.4 million on Kitchener-Stouffville		
Option C with TTC Fare	+26 million* on Kitchener-Stouffville	+8.5M	491.6**
Option D with TTC Fare	+25.1 million* on Kitchener-Stouffville	+9M	517.4**

Notes:
* The Option C ridership captures both TTC paying customers and those using the new stations. This calculation is done by comparing the ridership in the effected corridors before and after Option C. This incorporates any negative effect to long-distance riders.
**Compares back to 2031 Base RER Concept

Source: GTHAModel V4.0

Financial Case

In terms of the Financial Case, Options C and D are relatively similar in terms of financial performance and affordability. Option C is slightly more expensive to both build and operate, compared to Option D. It should be noted that capital cost estimates are preliminary and may not reflect the full costs of associated structure works required to deliver the stations or comprehensive fleet costs, depending on ongoing operational analysis.

Option C is approximately $1.1B to $1.7B (2014$) in incremental capital costs to the Base Case GO RER. Option D is approximately $0.7B to $1.0B (2014$) in incremental capital costs. The GO RER program includes $3.7B (2014$) in provincial infrastructure investment to upgrade the Kitchener, Stouffville and Lakeshore East GO Corridors to enable RER service frequencies. The provincial investment in RER, also supports the implementation of SmartTrack.

Table 8. SmartTrack/RER Integration Options Capital Cost Estimates ($billions)

	Option C 7-8 new stations	Option D 4- 5 new stations
Constant 2014$	1.1-1.7	0.7-1.0

Notes:

- Cost estimates prepared by Metrolinx, and have not been validated by the City. Cost estimates require reconciliation with the individual station costs outlined in each new station initial business case. See attachments 1-2.
- Costs are described in 2014 figures, and do not include escalation, financing, lifecycle and operations/maintenance.
- Province of Ontario has committed $13.5 billion (2014$) in capital costs for RER, including an estimated $3.7 billion (2014$) in capital costs to support key infrastructure for SmartTrack.
- Cost estimates for the incremental components of SmartTrack have been developed at 0% design and are a Class 5 cost estimate (per AACE guidelines). Base components associated with RER are at a higher level of design.

Economic Case

Economic analysis measures the costs and benefits of a project. For the GO RER Kitchener and Stouffville corridors, benefits such as the dollar value of travel time savings exceed the capital and operating costs by a ratio of 2:1. Economic analysis of the integrated options in the context of the overall analysis suggests that Option C would have a downward impact on the overall GO-RER benefit-cost-ratio (BCR) of approximately 30 percent while Option D would have a smaller downward impact, decreasing the GO RER BCR by approximately 18 percent. Both Option C and D have a positive BCR of 1.37 and 1.64 respectively, with benefits outweighing costs.

As noted earlier in this report, the economic case evaluation currently does not incorporate the full range of city building benefits associated with transit investments. The results of the economic case evaluation, therefore need to be considered in the context of the strategic case assessment which includes measures associated with achieving the City objectives of *serving people*, *strengthening places* and *supporting prosperity*.

Recommendation

Both Option C and Option D perform well in the business case analysis. From the City perspective, Option C with 7 to 8 new stations presents more strategic benefits in terms of providing accessibility and city building opportunities in alignment with the criteria under the Feeling Congested? evaluation framework.

Metrolinx is interested in serving medium to longer distance travellers and places emphasis on travel time savings for longer distance commuters. As a result, Metrolinx prefers Option D with 4 to 5 new stations, given additional stations added to the network increases the travel time for the longer distance commuters.

As a result of the initial business case analysis and requirement to balance local and regional objectives, the City and Metrolinx are recommending a SmartTrack/RER integration scenario with up to six new stations. This compromise mitigates some of the travel time impacts on longer distance commuters, while providing opportunities for accessibility, and achieving other city building objectives in Toronto.

The identification of the six new stations on the integrated SmartTrack/RER Kitchener and Stouffville/Lakeshore East GO corridors was established through the stations analysis process outlined in section 1.2 below. For further details on the SmartTrack/RER integration options see Attachment 1.

1.2 SmartTrack Stations

Background

The City and Metrolinx have been reviewing potential new stations associated with SmartTrack. This analysis has been included in previous reports to City Council and the Metrolinx Board:

- 2015.EX9.1 SmartTrack Status Update- Appendix 2 SmartTrack Stations Preliminary Assessment (October, 2015)
- 2015.EX9.1 SmartTrack Status Update- Appendix 2A SmartTrack Station Profiles (October 2015)
- February 10, 2016 Metrolinx Board Meeting: RER Stations Update Existing and New Station Analysis Update

The assessment of stations is an important element in determining the final SmartTrack concept. SmartTrack/RER Integration Options C and D identified the implications of adding additional stations to the GO/RER network. The stations analysis assessed the individual merits of each additional new station.

Initial Business Case Analysis

The SmartTrack proposal put forward in January 2015, identified approximately ten new stations on the Kitchener and Stouffville/Lakeshore East GO Corridors. Of the proposed stations, four have been removed from consideration— 14th Ave (in Markham), Ellesmere, Queen and Bathurst/Spadina.

Up to six new stations proposed for SmartTrack are recommended to proceed to the next phase of planning and technical work per the outcomes of the Metrolinx and City's assessment of new stations (Table 9). The SmartTrack stations were assessed within the context of new stations for the entire GO RER network (see section 2 and Attachment 2). The City provided additional inputs to Metrolinx to ensure the assessment of stations include broader city building and social equity goals within the evaluation framework for stations.

Table 9. SmartTrack Station Locations

GO Corridor	Recommended New Stations	Existing GO Stations
Stouffville/ Lakeshore East GO Corridor	1. Finch East 2. Lawrence East 3. Gerrard 4. Unilever/Don Yards	1. Unionville* 2. Milliken 3. Agincourt 4. Kennedy 5. Scarborough 6. Danforth
Union Station Rail Corridor		7. Union
Kitchener GO Corridor	5. Liberty Village 6. St. Clair West	8. Dundas West/Bloor 9. Mount Dennis**
Notes: *Outside jurisdiction ** Planned station		

Metrolinx will be recommending to their Board on June 28, 2016 the identified new SmartTrack stations to be included in the GO RER 10-year program subject to confirmation of funding by the City of Toronto by November 30, 2016. Following the Board's approval of the new SmartTrack stations on June 28, 2016, Metrolinx will work with the City on specific station locations. Metrolinx will be asking all municipalities to confirm funding for new stations across the entire GO RER network. Further consultation with municipalities on implementing transit supportive land-uses around stations and sustainable station access to enable first and last mile solutions is a key next step.

Public Consultation

A public meeting focused on SmartTrack/GO RER was held on June 1, 2016 at the Metro Toronto Convention Centre. (Information on the Relief Line was also presented at this meeting.) Approximately 50 people attended. Comments and questions discussed included:

- differences between SmartTrack and GO/RER;
- how the two systems interface with other proposed and planned services;
- fare integration; and
- station locations.

The same information about SmartTrack was also presented at other public meetings across the City that focused on other transit projects.

A SmartTrack/GO RER stakeholders meeting was held on June 8, 2016, at Metro Hall (12 stakeholders in attendance). There was overall support for the continued work on the SmartTrack/RER integration. Discussion with the Stakeholders included:

- the '*Feeling Congested?*' framework and how it is used to evaluate transit projects;
- issues around improving mobility and transit;
- differences between SmartTrack and GO/RER; and
- how the two systems interface with other proposed and planned services.

Next Steps

Additional technical and planning analysis around proposed new stations will be required in order to ensure consistency with Official Plan policies, for example:

- assessing how new stations are planned within the context of other studies underway (e.g. St. Clair West station needs to be considered in the St. Clair Avenue Study[11]);
- maximizing connections with existing and planned future transit; and
- planning and designing stations so that they are integrated appropriately within the existing and planned land use context, including opportunities for redevelopment at Unilever and Gerrard Square.

The City and TTC will work with Metrolinx as the Initial Business Cases for each new station are updated and refined, and advanced towards the commencement of EA/TPAP processes.

With respect to confirming funding for new stations, this report recommends City Council authorize the City Manager to enter into cost-sharing discussions with the Province, with respect to the incremental capital costs associated with SmartTrack (in addition to other transit related initiatives).

For further details on the recommended SmartTrack Stations see Attachment 2.

1.3 Eglinton West LRT Extension

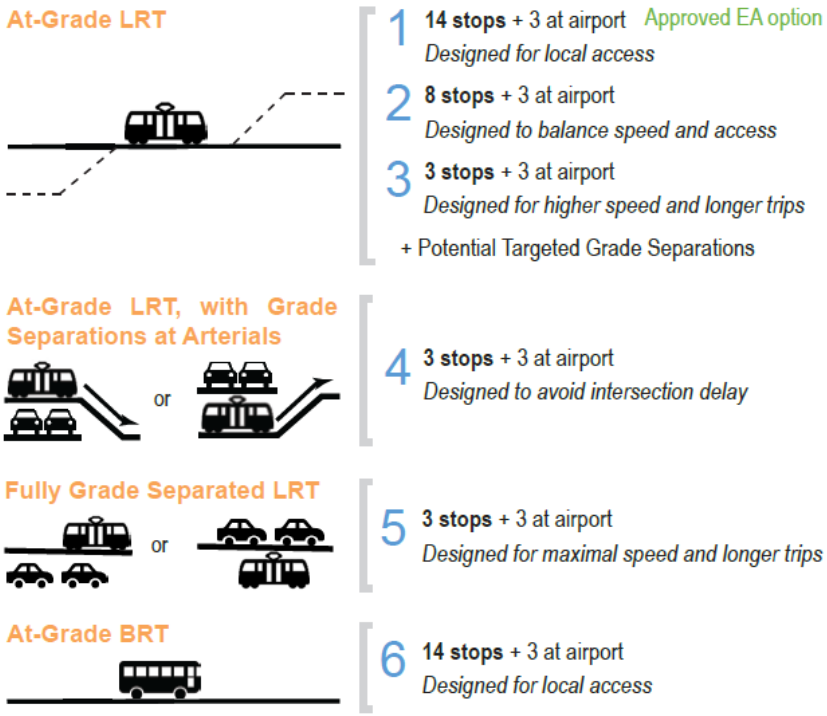
Background

At the March 2016 City Council meeting, direction was given to remove heavy rail options from consideration for the SmartTrack western corridor. City Council also directed staff to develop recommendations for the extension of the Eglinton West LRT from Mount Dennis to Mississauga Airport Corporate Centre (MACC) and to Pearson International Airport, including the number of stations and potential grade separations[12]. In addition, City Council also directed staff to work with Metrolinx to assess opportunities for expediting the project delivery schedule for the extension of the Eglinton LRT west and to report to Executive Committee in June 2016. An initial business case has been developed by the City, Metrolinx and TTC and is included as Attachment 3 to this report.
Six options were studied with different numbers of stops, different technology, as well as different degrees of grade separations. An EA for the full Eglinton Crosstown LRT from Kennedy Station to Pearson Airport was approved in 2010, which included 14-stops

[11] 2016.EX13.3, Directive #1b part i
[12] 2016.EX13.3 Directive #1a

along Eglinton Avenue West, between Mt. Dennis Station and the Renforth Gateway. The approved EA option is the base case for analysis.

Figure 5. Eglinton West LRT Options



Initial Business Case Analysis

The initial business case analysis for the Eglinton West LRT concludes that an LRT with between 8 to 12 stops is preferred. The City and TTC are working closely with Metrolinx on their comprehensive planning work related to the LRT. Different configurations of stops and targeted grade separations will be analysed using detailed traffic modelling to better understand the relationship between the LRT and other traffic. Potential grade separations have also been identified at Martin Grove Road, Kipling Avenue and the Eglinton Flats.

Strategic Case

While the Eglinton West LRT would provide an important regional link between the Crosstown LRT currently under construction and the Mississauga Transitway BRT, it would also provide Toronto residents with rapid transit access in the corridor. Due to this, the joint strategic case analysis for rapid transit on the Eglinton West corridor focused on balancing regional and local transit planning objectives of speed and access. The City evaluation did not consider Options 3, 4, and 5 in detail as they did not meet local access objectives and would require continuation of the existing local bus service. Option 6 was

not considered as City Council's March direction was to focus on an assessment of LRT options for serving this corridor. As such, Option 1 and 2 were the focus of the analysis.

Options 1 and 2 performed similarly based on many of the City's Feeling Congested? evaluation framework. From the perspective of providing improved access to rapid transit, Option 1 performed better given the additional stations. This option would minimize the need to run a parallel local bus service. Option 1 would also better meet the City's social equity objectives as the greater number of stations would serve 20% more equity seeking individuals. However, since the LRT would run through many stable neighbourhoods, adding a new station could bring unwanted development pressure and change. From this perspective, Option 2 performed better than Option 1.

Ultimately, the strategic case evaluation concludes that a hybrid between Options 1 and 2, with between 12 and 8 stops between Eglinton Avenue West between Mount Dennis and Renforth Gateway is preferred. Further study would determine the optimal number of stations that would minimize the impact on established neighbourhoods and communities, minimize the requirement to run a parallel local bus service at unattractive frequencies and additional operating costs, while also ensuring optimal local access to a rapid transit option.

Financial Case

Table 10. Eglinton West LRT Options ($billions)

<table>
<tr><th></th><th>Option 1
At-Grade
14 Eglinton +
3 Airport Stops</th><th>Option 2
At-Grade
8 Eglinton + 3
Airport Stops</th><th>Option 3
At-grade 3
Eglinton + 3
Airport stops</th><th>Option 4
At-Grade LRT
with Grade
Separations at
Arterials)</th><th>Option 5
(Fully Grde
Separated
LRT)</th><th>Option 6
(At-grade
BRT)</th></tr>
<tr><td rowspan="2">Total Capital Cost (2014$)</td><td>$1.4 - $1.8</td><td>$1.4 - $1.7</td><td rowspan="2">$1.3 - $1.7</td><td rowspan="2">$1.7-$2.1</td><td rowspan="2">$2.0-$3.0</td><td rowspan="2">$1.0-$1.3</td></tr>
<tr><td colspan="2">With Targeted Grade Separations: $1.5 - $2.1</td></tr>
<tr><td colspan="7">Notes:
• Cost estimates prepared by Metrolinx, and have not been validated by the City.
• Costs are described in 2014 figures, and do not include escalation, financing, lifecycle and operations/maintenance. See attachment 3.
• Construction period assumed 2020-2023 for Eglinton West LRT
• Eglinton West LRT directly benefits the City of Mississauga and the Greater Toronto Airport Authority
• Cost estimates prepared at 0% design and are a Class 5 cost estimate (per AACE guidelines).</td></tr>
</table>

From the financial case perspective, the key drivers in cost are the number of stations and grade separations. Keeping the LRT largely at grade is the more affordable option however it is recognized that grade separations are beneficial to mitigating traffic impacts and improved passenger transfers. While removing stops slightly lowers capital costs, it increases operating costs because of the need for a potential parallel bus service. Given the benefits of grade separations and stations, further analysis is required to determine the optimal number of stations required to maximize local access, reduce the requirement for

a parallel bus service, and refine analysis on potential grade separations at Martin Grove, Kipling, and Eglinton Flats.

Placeholder costs for the airport segment are currently included subject to further work with the Greater Toronto Airport Authority (GTAA) to refine the alignment on the Pearson Airport property.

Economic Case

From an economic case perspective, a fully grade-separated (elevated) option presented the highest benefit-cost ratio. This is primarily due to the fewer destinations for transit riders in this stretch of Eglinton Avenue than the areas immediately east and west, resulting in trips tend that to be longer distance through the area. This travel pattern means that benefit-cost ratios are highest for the options with the highest travel speeds – those with few stations and full grade separation. Although the fully grade separated (elevated) option has the highest benefit-cost ratio, it is not recommended because of the overall cost, significant community impacts, lower overall ridership and reduced local transit accessibility. Both the 14 stop and 8 stop options have positive benefit-cost ratios with the 8 stop option performing slightly better.

Deliverability Case

Deliverability for the at-grade options was addressed extensively during the 2010 Environmental Assessment process. Concerns about visual and operational impacts of grade separations at every major intersection were sufficient to screen these options out of from further analysis as they would result in a LRT structure that undulated up and down along the corridor and required significant station infrastructure.

Land sales in the corridor since 2010 by Build Toronto have protected just enough for road widening to accommodate the LRT as it was designed in the EA. The residential development which is now being completed on the recently sold lands faces onto Eglinton Avenue, changing the character of the street and introducing additional considerations about visual impacts of potential structures and grade separations. Right of way limitations near Mount Dennis increase the capital costs for the BRT option as additional infrastructure is needed to maintain road capacity and a transit right of way in this area. Because of this narrow right of way, the LRT would be tunneled through Mount Dennis from a portal west of Pearen Park as per existing plans.

Strategic Grade Separations

By targeting grade separations to specific locations, some key benefits may be obtained without the cost of grade separating the entire line. Three such locations were identified based on community feedback, traffic turning volumes and transit passenger transfers: Jane and the Humber River crossing through Scarlett; Martin Grove Avenue and the entrance to Highway 401; and Kipling Avenue. High level feasibility and costing was undertaken for these grade separations but further analysis is needed to understand how

these grade separations could be designed, the full benefits that they could have, and the impacts they might have on the community. All three grade separations raise the cost of the project to between $1.5 -$2.1 billion however because they reduce travel time, they do not appear to significantly impact the benefit/cost ratio. Further public engagement will be critical in advancing these proposed grade separation locations.

Public Consultation

A public meeting focused on SmartTrack/Eglinton West LRT was held on June 4, 2016 at York Humber High School (attended by approximately 26 people). There was general support for the project and the continued work on the corridor. Comments and questions included:

- how the proposed LRT would help the local community;
- what populations would be served by the transit line;
- how the proposed LRT would interface with plans for growth and development around Pearson Airport;
- how it would interface with other proposed and planned services; and
- fare integration.

Other concerns raised included increased congestion due to construction and due to the LRT alignment, limited left turns and increased traffic issues, and the implications of possible underground alignment options.

A SmartTrack/Eglinton West LRT stakeholders meeting was held on June 9, 2016, at St. Demetrius Church Hall (5 people in attendance). There was overall support for a western extension of the Crosstown LRT. Questions and comments included:

- transit modelling and mobility patterns;
- LRT construction methods;
- alignment options;
- traffic implications;
- social equity; and
- servicing of the airport area for employment.

Recommendations and Next Steps

The initial business case analysis for the Eglinton West LRT concludes that an LRT with between 8 to 12 stops is preferred. The City and TTC are working closely with Metrolinx on their comprehensive planning work related to the LRT. Different configurations of stops and targeted grade separations will be analysed using detailed traffic modelling to better understand the relationship between the LRT and other traffic. Potential grade separations have also been identified at Martin Grove Road, Kipling Avenue and the Eglinton Flats.

The original alignment for the project ended at the edge of Pearson Airport. Metrolinx and the City will work with the City of Mississauga and the Greater Toronto Airport Authority to develop an alignment to connect directly with the Airport.

Key next steps for advancing the planning and technical analysis include:

- Further reviewing traffic operations, stop locations, and grade separations and integrating design excellence and sustainability objectives.
- Continue working with the Greater Toronto Airports Authority on the alignment connecting to Toronto Pearson International Airport.
- Coordinate planning with the City of Mississauga on the interface with the BRT.
- Continuing to consult with the public in Toronto and Mississauga on the development of the Eglinton West LRT plans.

The Eglinton West LRT is an extension of the Metrolinx Crosstown project, and discussions with the Province of Ontario as the asset owner of the Crosstown are required with respect to issues of project delivery. As directed by Council in March 2016, the City will work with Metrolinx to determine opportunities and implications associated with expediting the project delivery schedule as a next step[13].

As directed by City Council in March 2016, a key next step is for City Planning to undertake a planning study for the Eglinton West Corridor from Mount Dennis to Etobicoke Creek[14]. The Chief Planner & Executive Director City Planning will report on a proposed approach to this planning study in Q1 2017.

2. Regional Express Rail

Background

In March 2016, an update was provide on the Metrolinx Regional Express Rail (RER) program to City Council. Metrolinx is undertaking an aggressive program, to assess infrastructure requirements to transform the current GO network from a commuter service to all-day frequent service network. Work is already underway to upgrade GO network infrastructure to allow for GO RER. This work includes:

- The Georgetown South (GTS) Project (completed in 2015) which included modifying/expanding 16 bridges and building grade separations to accommodate expanded GO service in the Kitchener Corridor and for Union Pearson Express.
- Stouffville Corridor Expansion Program (started in Q3 2015) to expand and improve a 17-kilometre segment of the Stouffville line in Scarborough and Markham.
- Modernizing Existing GO stations (currently underway) which includes Guildwood GO Station and Exhibition GO Station.
- Building planned stations (pre-RER announcement)—Caledonia GO Station on the Barrie GO line which will integrate with the Eglinton Crosstown LRT (Notice of Completion: Environmental Project Report- February 2016).

[13] 2016.EX13.3, Council Directive #6
[14] 2016.EX13.3, Council Directive #7

- Davenport Diamond Grade Separation – Metrolinx has completed the planning work and TPAP for this grade separation on the Barrie GO Corridor. Notice of Completion: Environmental Project Report - May 26, 2016 . A separate report from the Chief Planner & Executive Director, City Planning has been submitted to the June 28, 2016 Executive Committee providing an update on this process.

A report will be presented to the Metrolinx Board on June 28, 2016 providing an update on the GO RER program. The following sections highlight areas of ongoing work between the City and Metrolinx with respect to the planning, design and implementation of GO RER in Toronto.

Grade Separations

Metrolinx is consulting with the City regarding locations that may be suitable for the conversion of level crossings to grade separations (e.g., road over or under rail). City staff will consider various factors that may justify the conversion of level crossings (e.g., enhancing pedestrian, cyclist and vehicular safety, reducing wait times and congestion at level crossings, and eliminating noise from approaching trains). The City's perspectives will be combined with operational and other issues that Metrolinx may consider (e.g., the costs of property-taking, utility relocation, property access implications and engineering feasibility) to arrive at a joint ranking of preferred locations. The City will also consider proposals from Metrolinx to share the cost of constructing new grade separations, which is an established practice across the country.

New Stations

In February 2016, City Planning staff provided input to Metrolinx on potential new GO RER stations (2016.EX13.3, Appendix 4). In March 2016, City Council requested Metrolinx to consider including a station in the vicinity of the Woodbine Racetrack and to assess the feasibility of a GO station at Caledonia/St. Clair on the Barrie Corridor[15].

Metrolinx has been undertaking a process to evaluate stations across all GO corridors, including stations identified by City Council. The City has submitted inputs to Metrolinx to support the evaluation and to ensure key local city building objectives are included in the Metrolinx's new stations analysis.

The Metrolinx report to the June 28, 2016 Board meeting will contain recommendations on new GO RER stations (including SmartTrack stations; see section 1.2 above). Following decisions from the Metrolinx Board and Province of Ontario, a report to City Council will be prepared on proposed new RER stations, including any provincial terms and conditions attached to each station. Metrolinx is requesting municipalities to confirm funding for new stations by November 30, 2016 in order to be considered in the GO RER 10 year program. The following new stations are recommended in Toronto:

[15] 2016. EX13.3, Council Directive #19, 20

Table 11. Recommended New Stations in Toronto- GO RER and SmartTrack

GO Corridor	Recommended New Station Location
Barrie	1. Spadina (at Front St.) 2. Bloor-Davenport (Bloor St. near Lansdowne Ave.)
Kitchener (SmartTrack)	3. Liberty Village (at King St. West) 4. St. Clair West (near Weston Road)
Lakeshore East (SmartTrack)	5. Don Yard/Unilever (between Cherry St. and Eastern) 6. Gerrard
Stouffville (SmartTrack)	7. Finch (between Kennedy Road and Midland Ave) 8. Lawrence (between Kennedy Road and Midland Ave)

Several stations that were assessed in Toronto are not being recommended by Metrolinx for inclusion in the 10 year GO RER program. These stations include:

- Ellesmere (Stouffville Corridor)
- Park Lawn (Lakeshore West Corridor)
- St. Clair West (Barrie Corridor)
- Woodbine, at Highway 27 (Kitchener Corridor)

The City Manager, the Deputy City Manager Cluster B, and the Deputy City Manager Cluster C & Chief Financial Officer, will bring forward recommendations to City Council for consideration on non-SmartTrack stations, including identifying potential contributions to new stations from private interests.

3. Scarborough Transit

In January 2016, Executive Committee considered the report (2016.EX11.5) from the Chief Planner and Executive Director, City Planning and directed staff to review an optimized transit network for Scarborough, which includes an express subway to Scarborough Centre and an Eglinton East LRT extension to the UTSC. The optimized network proposal was developed as a potential alternative for assessment, as a result of changes in the planning context for Scarborough since the SSE was first approved in 2013 (2013.CC39.5). The next sections provide a summary of the initial business case analysis undertaken for the SSE and the preliminary options analysis for the Eglinton East LRT extension.

3.1 Scarborough Subway Extension Initial Business Case

Background

In March 2016, City Council requested the Chief Planner and Executive Director, to complete the review of SSE Corridor options and report on a recommended alignment in

June 2016[16]. City Council also directed specific corridor options be removed from consideration such as the Bellamy corridor and the Scarborough Express Rail concept (also known as SmartSpur). Direction was also given to consider whether all or portions of the SSE could be built at-grade.

The following set of options for the SSE have been assessed in the initial business case (Attachment 5) per the January 2016 Executive Committee direction to the Chief Planner & Executive Director, City Planning, and the March 2016 City Council direction to staff.

- SSE Option 1(Base Case)— 3-stop McCowan alignment to Sheppard Avenue
- SSE Option 2A— Express subway- McCowan alignment to Scarborough Centre
- SSE Option 2B— Express subway- Midland alignment to Scarborough Centre
- SSE Option 2C— Express subway- SRT corridor alignment to Scarborough Centre (with partial at-grade)

Initial Business Case Analysis

Based on the subway options assessed the SSE McCowan Express (Option 2A), from Kennedy Station to Scarborough Centre is the preferred option. The base case for the analysis is the Council approved SSE McCowan 3-Stop (Option 1) subway extension to Sheppard Avenue East. The Express options developed were assessed in comparison to the base case to determine which SSE express options should be considered within the context of a preferred Scarborough network solution that may also include an Eglinton East LRT extension.

Strategic Case

The Strategic Case evaluated the performance of the options based on the City's *Feeling Congested?* evaluation framework, with a focus on supporting growth and development at Scarborough Centre. Option 2A emerged as a strong option. The single station would best serve development on both sides of McCowan, would provide the fastest connection between Kennedy Station and Scarborough Centre (similar to Option 2B), and would not require the shut down of the SRT and replacement bus operations during construction. When future development opportunities are considered, Options 2B and 2C have more potential to support future growth in Scarborough Centre, as they would allow for the future extension of the subway into the McCowan Precinct on the east side of McCowan. Option 2B, like Option 2A, provides the fastest connection between Kennedy Station and Scarborough Centre, and also has the least impact on neighbourhoods. However, both Options 2B and 2C would require the shut down of the SRT during the full period of construction of the subway, which would potentially deter transit usage.

Option 1 (Base Case) performed the weakest as it would offer the slowest connection between Kennedy Station and Scarborough Centre, and has greater property impacts and mitigation requirements related to environmental impacts on the Highland Creek system.

[16] 2016. EX13.3, Council Directive #4

Deliverability & Operations Case

The Deliverability & Operations Case assessed the performance of each option with respect to technical and engineering considerations, and operations considerations. In the deliverability and operations case evaluation, it was determined that both Options 2B and 2C would require an SRT shutdown that would result in costs and significant service impacts.

Bus replacement for the SRT service during the construction period would require the purchase of 63 additional buses, infrastructure requirements such as a bus facility to accommodate the additional bus fleet, and bus terminal expansions at Scarborough Centre and Kennedy Station. The cost of shutting down the SRT during the construction period would amount to approximately $171 million. This cost applies to Options 2B and 2C. The SRT shutdown would also result in slower and less reliable transit service which would likely deter people from using public transit. As a result of these impacts, Options 2B and 2C were screened out from further consideration in this initial business case due to this key deliverability and operations challenge which add further risk and complexity to the project.

Financial Case

The Financial Case assessed the overall capital costs associated with each option. A high order-of-magnitude operating and maintenance cost estimate was also developed to give an indication of potential lifecycle costs associated with each option (see Financial Case, Attachment 4). Table 12 outlines the capital cost estimates associated with the two options still under consideration in the initial business case—Option 1 versus Option 2A.

Table 12 SSE Capital Cost Expenditure- Class 4 Estimate ($ millions)

	Option 1 3 Stop McCowan	**Option 2A Express McCowan**	**Difference: Option 1 – Option 2A**
Constant 2016$	$3,694	$2,545	$1,150
YOE/ Escalated $	$4,605	$3,159	$1,446

Notes:

- Cost estimates prepared by TTC. Costs do not include financing, lifecyle and operations/maintenance. See attachment 4.
- Assumes line in service by late 2025, with construction taking approximately 6 years (2020-2025). Note this is a preliminary schedule based on City Council approving the preferred alignment in July 2016. Any delay may result in future adjustments to the preliminary schedule, estimated opening of the subway, and added costs due to escalation.
- Cost estimates have been developed at approximately 5% design and are a Class 4 cost estimate (per AACE guidelines). Class 3 estimates are required to establish the project budget baseline.
- Potential risks include the incorporate of a single tunnel design and the increased depth of the station(s), which could affect the expected accuracy of the estimates.
- Costs assume traditional procurement approach. A separate analysis on project delivery options is underway per City Council direction.

In October 2013, when the SSE 3-stop McCowan option was approved, the option was at 0% design (Class 5 estimate), and estimated to cost $3.56 billion (YOE/Escalated $). The assumed project completion date was 2023. In both the July 2013 and October 2013 reports to City Council, staff identified the cost estimates as preliminary. The July report specifically stated the following—"*TTC preliminary cost estimates based on historical cost per km to be confirmed at 30% design. The accuracy of these estimates should be considered +/- 30%*".

Since 2013, further design work has been completed bringing the project to approximately 5% design. The 3-stop option is now estimated to cost $4.6 billion (YOE/ Escalated $), with a preliminary opening date of 2025. This is a 29% increase in cost from the original estimate. It should be noted this increase is within the +/- 35% range per industry guidelines; and within the original range identified by TTC in 2013. The cost differential can be attributed to a number of factors outlined below.

Approximately 19% of the cost estimate difference is associated with technical and engineering scope related requirements, such as stations to be built at greater depth than initially assumed. For example, due to the topography of the Lawrence station area, the station would be built at a depth approximately 30 metres below grade, which is roughly 14 metres deeper than initially anticipated. Additional technical issues were found for Scarborough Centre and Sheppard stations.

Approximately 10% of the cost estimate difference is associated with delays to the project schedule. The current work has been delayed by approximately one year from the original schedule, which estimated that design could begin in the summer of 2015. This was primarily due to key tasks that were added to the original project schedule such as the City's development of a new demand forecasting model, and evolving transit plans in Scarborough that resulted in project scope changes. An additional year has also been assumed given the added complexity of the stations, and additional time that may be required due to design-build contracting. The in-service date for the SSE, initially estimated for 2023 is now estimated to be in-service in 2025.

The budget for the 3-stop SSE was approved in 2013 with $3.56 billion (YOE/Escalated $) in funding from all three orders of government. As a result of escalation in cost the 3-stop McCowan option (Option 1) is no longer affordable within the current funding envelope. Option 2A is estimated to cost $3.15 billion (YOE/Escalated $). Given the approved budget, Option 2A is the preferred option.

Economic Case

Option 2A was the only option assessed through the economic case in comparison to the base case (Option 1), as other options were screened out earlier in the analysis. The economic analysis indicates that relative to Option 1, the Express subway option provides better value for money given the higher costs associated with the 3-stop subway option and relative benefits produced from the additional stations. The economic case analysis indicates that for every $2 saved in delivering Option 2A approximately $1 dollar in

benefits is given up. In conclusion, the Express McCowan subway relative to the 3-stop McCowan subway provides better value for money (see Attachment 4, Economic Case).

Since the SSE McCowan 3-Stop subway is the Council approved base case for assessment, the economic case valuation did not assess the benefits and costs of a subway relative to the current level of service provided by the SRT or a different technology.

Public Consultation

On May 31 2016, staff from both the City of Toronto and the TTC hosted a public meeting on four key transit initiatives currently being planned – with the Scarborough transit projects being the headline projects. The meeting was held at the Scarborough Civic Centre, and approximately 200 people attended.

Participants' questions and comments related primarily to the following themes:

- People asked about the timeline for the construction of the SSE. Several people expressed frustration over how long it is taking to get the subway construction under way.
- There was interest in the projected ridership for the subway and whether it was sufficient to support a subway.
- There was debate about the rationale behind the elimination of Lawrence and Sheppard subway stations. Participants were particularly interested in keeping a Lawrence station on the subway extension.
- Several people asked about corridor options and technology alternatives that have been considered, including upgrading the existing Scarborough RT, instead of building a subway.
- A number of participants had received letters from the TTC about potential property impacts related to subway construction. They expressed concern over these potential impacts, and asked about compensation to those affected. They also asked about whether all potential mitigation efforts have been considered to avoid displacing homeowners.

A meeting of the Stakeholder Advisory Group for the Scarborough Subway Extension project was held on June 6. Discussion focused on:

- the justification for not including a Lawrence station on the subway extension;
- clarification of the rationale for an express subway; and
- how best to address both the local and more regional transit needs of Scarborough residents.

Recommendation & Next Steps

In conclusion, the SSE IBC indicates that of the subway options considered, Option 2A, the express subway with a McCowan alignment and station at Scarborough Centre is preferred. Option 1 is recommended to be removed from further consideration in the development of the preferred Scarborough Transit Network solution.

Figure 6. Option 1: 3-Stop McCowan (Base Case)

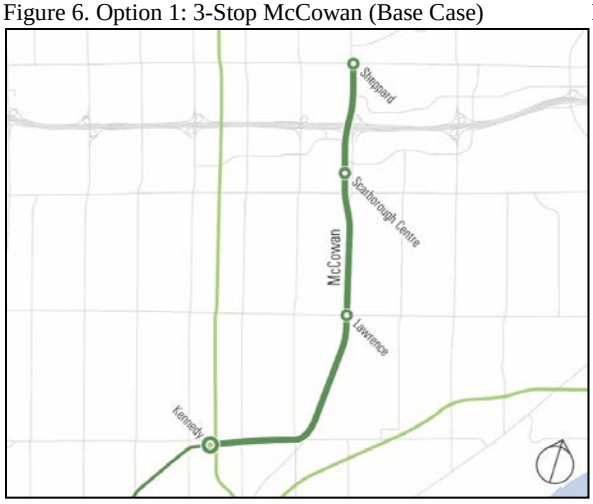
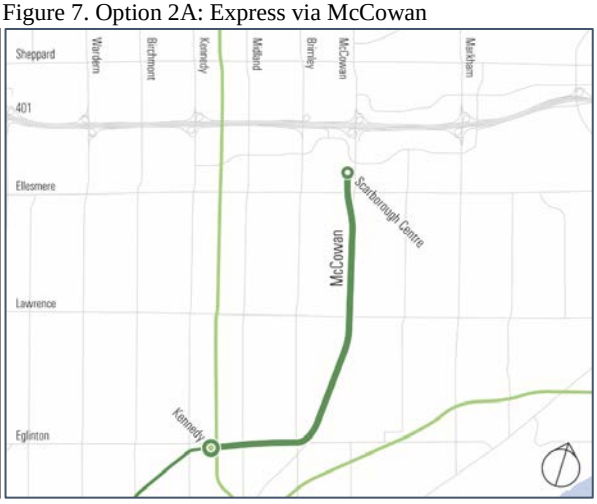


Figure 7. Option 2A: Express via McCowan



Given the progress in project scope definition from the 0% design level in 2013 to the current design level, additional analysis needs to be undertaken to review the cost estimates for the express McCowan subway option. This includes retaining the services of a rail construction and cost-estimation expert to undertake a risk assessment and detailed review of the TTC's approximate 5% design cost estimates for the McCowan express subway option, and any other express subway option considered to reduce costs. Efforts to expedite the cost estimate review will be undertaken, recognizing that a delay in advancing design on a preferred alignment will result in further delay to the project schedule which has an impact on cost. The current cost estimates assume initial operation of the express subway in late 2025, based on City Council approving a preferred alignment in this cycle of City Council.

There may be some further options that could be considered that may reduce capital costs for an express subway. For example, a revised option for the express subway on Brimley that would not involve the shutdown of the SRT, has recently been identified. This option could have the potential to reduce costs for the subway extension and could potentially be delivered quicker. It is a shorter distance and would support a shallower tunnel than the McCowan alignment. The revised Brimley alignment would cross the existing SRT corridor in a north-south orientation, not requiring the shut down of the SRT and bus replacement operations during construction.

However, due to its location within the Centre, it does not support the growth and development of Scarborough Centre as well as an alignment with a station closer to McCowan. The Brimley corridor option would be further away from the where the Official Plan directs development in Scarborough Centre, and it could impact a critical industrial zone west of Brimley. City Planning and the TTC will examine options such as the Brimley alignment to determine whether they would perform well.

3.2 Eglinton East LRT Preliminary Options Assessment

Background

In January 2016, the Executive Committee requested the Chief Planner and Executive Director, City Planning to report in June 2016 on the opportunity to extend the Eglinton East LRT to the UTSC in the context of an optimized transit network plan for Scarborough. In March 2016, City Council received an update on the proposal and requested the Chief Planner and Executive Director, City Planning to[17]:

- develop recommendations to integrate the proposed LRT into the UTSC master plan;
- identify areas in need of an Avenue Study to facilitate intensification along the proposed LRT corridor, including the vicinity of Kingston Road from Celeste Drive (Guildwood GO station) to the intersection of Kingston Road and Old Kingston Road;
- report on the cost of extending the Eglinton East LRT from UTSC to Malvern Town Centre; and
- if possible, assess opportunity to create an expedited project delivery schedule for the Eglinton East LRT by 2021.

Since March, staff have been undertaking further evaluation of the Eglinton East LRT extension in the context of the Scarborough Transit Network. Identifying the scope of the LRT through further technical and planning analysis is an important first step, prior to determining opportunities to expedite project delivery. In order to evaluate the options for the Eglinton East LRT, a preliminary options analysis was undertaken. Options include:

- Option 1 (Base Case)- Bus service along Eglinton from Kennedy Station to Sheppard
- Option 2- Approved EA extension to Sheppard from Kennedy Station along Eglinton Avenue East with modifications;
- Option 3- Shortened Eglinton East LRT to UTSC

Preliminary Options Analysis

A preliminary options analysis was undertaken drawing on the business case framework in order to ensure the analysis could carry forward into a future detailed business case. A high level assessment of the strategic, financial and deliverability and operations case was undertaken. Given only Class 5 cost estimates are available an economic case evaluation was deemed premature at this stage of project development. The following section provides a summary of the options analysis contained in Attachment 5.

[17] 2016.EX13.3, Council Directives 4c,13, 14, 5

Strategic Case

From the Strategic Case perspective, the Eglinton East LRT will provide enhanced transit service and transportation accessibility to the Eglinton East – Kingston Road corridor, and to UTSC. This enhanced accessibility will stimulate residential and employment growth throughout the corridor and act as a catalyst to renew these neighbourhoods.

On balance, both LRT options are equally preferred to the base case scenario of existing bus service. An LRT would reduce travel time, increase capacity, enhance service to Neighbourhood Improvement Areas, improve transit accessibility in Scarborough, and enhance the connection to the UTSC.

The strategic case concludes that Option 2, the LRT extension to Sheppard Avenue East, provides minimal additional benefit compared to an LRT terminating at UTSC (Option 3). This is partly because the timing of the Sheppard Avenue East LRT is uncertain. Without the Sheppard East LRT connection, it is likely that there would be minimal ridership demand at the Sheppard Avenue stop. However, it should be noted that terminating the LRT at UTSC does not preclude future extension of the LRT to Sheppard Avenue East and north to Malvern as envisioned under the original Transit City proposal. Planning, engineering and design work for the LRT will need to consider the future extension of the LRT in subsequent phases.

Financial Case

From the Financial Case perspective, the shortened LRT terminating at UTSC (Option 3) performs better as the cost is less due to the shortened length of the alignment.

Table 13. Eglinton East LRT Capital Cost Estimates ($millions)

	Option 1 Base Case	Option 2 Terminating at Sheppard	Option 3 Terminating at UTSC
Constant 2016$	-	$1,617 - $1,832	$1,331 - $1,412
YOE/Escalated $	-	$1,917 - $2,172	$1,578 - $1,674

Notes:

- Cost estimates developed by a third party consultant.
- Assumes line in service by late 2023, with construction taking approximately 4 years (2020-2023)
- Cost estimates have been developed at 0% design and are a Class 5 cost estimate (per AACE guidelines). Class 3 estimates are required to establish the project budget baseline.
- Cost estimates do not include financing, lifecycle, and operations/maintenance (see attachment 5).
- The estimate for Option 3 terminating at UTSC includes storage tracks, but does not include a maintenance facility; the low estimate for the option terminating at Sheppard includes some modification to the Crosstown MSF and storage tracks; the high estimate for the option terminating at Sheppard includes a stand-alone MSF, but not connecting tracks along Sheppard to Conlins.
- Project timeline, funding source and procurement method still to be determined.

Deliverability & Operations Case

Each option was assessed based on several engineering and technical considerations including the connection at Kennedy Station, the Military Trail re-alignment, traffic

impacts, and the maintenance and storage facility (MSF) requirements. In summary, this preliminary options analysis identified a number of issues that require further investigation in partnership with Metrolinx and the TTC. As a result, the cost estimates identified in Table 13 will require further review once key scope elements are clarified. In particular:

- The approved EA for the Scarborough-Malvern LRT did not contemplate a through connection at Kennedy Station. This critical hub is currently undergoing detailed design in order to accommodate the Eglinton Crosstown LRT. Kennedy station will also be impacted by the preferred SSE alignment.
- Maintenance and storage requirements need further review if the LRT terminates at UTSC. Cost estimates in table 13 for Option 3 do not include an MSF.
- Integration with the UTSC Master Plan (2011) which was envisioned two years following completion of the 2009 Scarborough Malvern LRT EA, will need to be undertaken. Specifically, the Master Plan proposes the realignment of Military Trail, which forms the LRT alignment through the campus.

Given the number of unknowns, both LRT options should be further assessed from a deliverability and operations perspective. This evaluation has identified a number of issues that should be carried forward to the next phase of work on the Eglinton East LRT extension. The timing for delivery of the project depends on the outcomes of this further work, and decisions regarding roles and responsibilities and project ownership.

Public Consultation

In the May/June 2016 consultations, the Eglinton East LRT to UTSC was presented for feedback. The 2009 approved Environmental Assessment option was also presented, showing a terminus stop at Sheppard Avenue East. Among those who supported the implementation of an LRT, modifying the EA-approved alignment to terminate at UTSC/ Toronto Pan Am Sports Centre was generally supported.

There were several people who expressed concern about traffic impacts, particularly on Kingston Road. Some residents were interested in seeing a traffic mitigation strategy to address anticipated impacts. A few residents expressed doubt about the transformation of Kingston Road from what is seen as a thoroughfare to a complete street Avenue, as designated in the Official Plan. There was also a suggestion to move the LRT to Ellesmere, between the new subway station at Scarborough Town Centre and UTSC.

Recommendation & Next Steps

The initial analysis of the Eglinton East LRT recommends Option 3 terminating at UTSC. However, there are a number of unknowns with respect to the project scope given the number of interfaces with other transit expansion projects at Kennedy station (e.g. Crosstown LRT and SSE).

This report recommends City Council request the City in partnership with the TTC, Metrolinx and in consultation with UTSC, undertake further technical and planning

analysis on the Eglinton East LRT. This includes advancing the Eglinton East LRT to a minimum of 5% design. Action needs to be taken to address the issues identified in the deliverability and operations case assessment.

City Planning has undertaken an initial review of existing planning studies that exist along the corridor of the Eglinton East LRT. An approach that integrates and updates existing studies and initiatives, and that fills in gaps along the corridor, could help to leverage benefits from the LRT investment. Additionally, City Planning will work with other City Divisions to explore opportunities for a more comprehensive strategy to encourage development and investment in this corridor. City Planning will bring forward recommendations on further complementary work that may be undertaken in conjunction with the development of the LRT.

3.3 Scarborough Transit Network Business Case Development

The analysis undertaken in Attachment 5 and 6 will be carried forward and integrated into a comprehensive business case analysis of the preferred network solution for Scarborough. This will include an assessment of the strategic, economic, financial and operational benefits and costs associated with different network configurations. The network scenarios will include the recommended express subway option between Kennedy and Scarborough Centre, and options for an LRT on Eglinton East.

Given the interdependencies between the SSE and the Eglinton East LRT alignment with respect to the Kennedy Station interchange, it is necessary to undertake more detailed assessment. Another critical component of the transit network is SmartTrack. This report recommends a SmartTrack/RER integration scenario with up to six new stations, including a new SmartTrack station at Lawrence Avenue East on the Stouffville Corridor. The range of potential network scenarios has been further refined through this phase of analysis on SmartTrack, SSE and Eglinton East LRT. To provide greater certainty to the context in which Scarborough transit is being planned, this report also recommends City Council request the Province of Ontario clarify timing for the delivery of the Sheppard East LRT.

A comprehensive business case and report on the preferred Scarborough Transit network solution will be presented to City Council by January 2017.

4. Relief Line Initial Business Case

Background

In March 2016, City Council approved Pape to Downtown via Queen/Richmond as the preferred corridor for the Relief Line project and requested the Chief Planner and

Executive Director, City Planning in consultation with the TTC to report the preferred alignment and stations to the June Executive Committee meeting[18].

Initiated in late 2013, the Relief Line Project Assessment process has been underway for the last two and a half years, in order to determine the preferred alignment and stations for the first phase of the Relief Line. The next phases of Relief Line assessment will consider northern and western extensions of the proposed line. The future extensions of the Relief Line were an important consideration in narrowing the longer list of potential corridor options for the first phase of the Relief Line project. The detailed technical and planning analysis conducted by the City and TTC has focused the alignment and station options within the Queen/Richmond Corridor.

The initial business case for the Relief Line assessed the following options:

- Option 1 (Base Case) – Continue with planned improvements to Line 1 and surface transit network on Queen Street and King Street
- Option 2- Relief Line Subway from Pape Station on Line 2 to Downtown via Queen
- Option 3- Relief Line Subway from Pape Station on Line 2 to Downtown via Eastern then Queen

Initial Business Case Summary

Strategic Case

The Strategic Case evaluated the performance of the options based on the City's *Feeling Congested?* evaluation framework with a focus on the ability of each option to meet the project objectives of providing relief on Line 1 (Yonge) and surface transit routes, and reducing crowding at Bloor-Yonge station, while meeting broader City-building objectives. Through this evaluation, it was determined that Option 3 would meet the project objectives while also serving a greater number of City-building objectives.

Both options assessed are capable of providing relief to Line 1 (Yonge). The first phase of the Relief Line is anticipated to provide a net reduction of 3,400 to 5,900 riders on Line 1 (Yonge) south of Bloor during the AM peak period. The subsequent extension of the Relief Line north to Sheppard Avenue East is projected to provide even greater relief, in the amount of 6,500 to 9,900 net reduction relative to the Base Case in 2041 (see Section 3 of Attachment 6). Although Option 2 performs better from the perspective of providing relief to Line 1, Option 3 is projected to bring more net new riders to Toronto's transit network. The ability of an option to attract new transit ridership is indicative of greater behavioural shifts in mobility choice, which supports Official Plan policy objectives of increasing public transit mode-share.

[18] 2016.EX13.3, Directive # 9

Table 14: Relief Line Ridership Summary

	Base Case	Option 2 (Pape to downtown via Queen)	Option 3 (Pape to downtown via Eastern then Queen)
2031 Ridership on Line 1 (Yonge South of Bloor)			
Total Volume (AM Peak)	40,100	34,200	36,700
Net Reduction (AM Peak)	n/a	5,900	3,400
Net New Riders	n/a	10,800	13,400
2031 Number of Transfers from Westbound Line 2 to Southbound Line 1 (Yonge)			
Total Volume (AM Peak)	10,300	4,600	7,300
Net Reduction (AM Peak)	n/a	5,700	3,000
2041 Ridership on Line 1 (Yonge South of Bloor) (with extension north to Sheppard Avenue)			
Total Volume (AM Peak)	42,600	32,700	36,100
Net Reduction (AM Peak)	n/a	9,900	6,500
Net New Riders	n/a	26,500	30,400
2041 Number of Transfers from Westbound Line 2 to Southbound Line 1 (Yonge) (with extension north to Sheppard Avenue)			
Total Volume (AM Peak)	10,400	5,100	8,400
Net Reduction (AM Peak)	n/a	5,300	2,000
Notes: *Forecasted boardings do not take into account the influence of SmartTrack **Capacity on Line 1 in 2031 and 2041 is 36,000.			

Option 3 also emerged as the preferred option as it provides greater potential for development and economic growth by opening up a significant amount of land for new jobs and affordable housing with station connections at the Unilever site and the West Don Lands. Another key consideration in the analysis was an option's ability to deliver on broader social equity goals. The analysis indicated that Option 3 would serve the greatest number of equity seeking households and provide improved transit connections for people to access the emerging employment hub planned for the Unilever site. Option 3 would also bridge existing barriers between neighbourhoods such as Corktown, serving a City-building objective of building healthy neighbourhoods.

The results of the strategic case evaluation suggest that while Option 2 performs better in providing relief to Line 1, Option 3 performs better from the perspective of broader city-building objectives and the City's *Feeling Congested?* evaluation framework, particularly with respect to social equity, shaping the city, supporting growth, and healthy neighbourhoods. Option 3 would also attract greater net new riders, and support and provide access to planned development at the Unilever site.

Financial Case

The Financial Case evaluated the options based on the estimated cost of the project over a 60-year lifecycle. Capital Cost estimates were developed based on less than 5% conceptual design. The preliminary financial case evaluation indicates the cost of Option 3 is greater than Option 2 by $500 million (YOE/Escalated$). The cost of Option 3 is higher than Option 2 due to the additional station and length of the alignment.

Table 15. Relief Line Capital Cost Expenditure ($ millions)

	Option 1 Base Case	Option 2 (Pape to downtown via Queen)	Option 3 (Pape to downtown via Eastern then Queen)
Constant 2016$	-	$4,082	$4,417
YOE/Escalated$	-	$6,284	$6,799

Notes:
- Cost estimates from TTC.
- Assumes line in service by 2031, with construction taking approximately 10 years (2021-2031)
- Cost estimates have been developed at less than 5% design and are a Class 5 cost estimate (per AACE guidelines). Class 3 estimates are required to establish the project budget baseline.
- Costs do not include, financing, lifecycle, and operations/maintenance (see attachment 6).
- Costs assume traditional procurement approach.

Economic Case

The Economic Case evaluated the performance of the options by monetizing the benefits of implementing rapid transit in the corridor. The economic case analysis indicates that both options of the Relief Line project would result in user benefits such as travel time savings, crowding relief, and benefits associated with a reduction in auto-use. Although Option 3 would provide approximately 10% more benefits than Option 2. However, thee cost of Option 3 is also proportionately higher than Option 2 (see attachment 6, section 5). The economic case analysis generated a Benefit-Cost Ratio (BCR) of 0.3 for both options. From the economic case perspective, both options perform equally.

It is important to note that the benefits captured through this economic case analysis is more closely associated to regional projects and do not accurately capture local benefits of large infrastructure investments. Further work to develop the economic case model to quantify benefits specific to local planning objectives will be undertaken in subsequent refinements of the initial business case for the Relief Line project.

Deliverability & Operations Case

The Deliverability & Operations Case assessed the performance of each option with respect to technical and engineering considerations, operations and service planning considerations, and project delivery and governance. There are a few challenges specific to Option 3, including additional property impacts due to an additional station and the longer alignment, vertical circulation requirements due to a deeper station at Queen and Pape, aging sewer infrastructure that would impact King/Sumach and Eastern/Broadview stations, and mitigation for flood protection south of Queen Street and east of the Don River. Both projects would require coordination with the Don & Central Waterfront Wet Weather Flow Tunnel Project. Although both options are technically feasible, Option 2 performs better from the Deliverability and Operations case perspective.

Improvements such as signal upgrades (i.e. automated train operations / automated train control) to the subway are expected to provide a measure of relief to overcrowding on Line 1. However, by 2031, major improvement such as the Relief Line and the

SmartTrack/GO RER will be required to achieve more significant relief. Beyond 2031, additional improvements including the extension of the Relief Line north to Sheppard Avenue will be required to relieve further growth in ridership in the Yonge corridor.

Public Consultation

The fifth round of consultations for the Relief Line Project Assessment were held May/June 2016. Presentations and discussions were focused on the emerging preferred alignment. The Relief Line Stakeholder Advisory Group (SAG) met on May 30, 2016 at Trinity Church (approximately 15 members were in attendance). There was overall support from the SAG for proceeding with the emerging preferred alignment. Comments from the SAG included: the need for improved PATH connections connecting to/from the Relief Line; pre-zoning lands to support appropriate levels of redevelopment around stations; and ensuring good connections with the proposed Waterfront transit improvements.

The Relief Line was the focus at the following public meetings:

- June 1 at the Metrolinx Toronto Convention Centre (attended by about 50 people)
- June 2 at Riverdale Collegiate (attended by approximately 225 people)
- June 15 at the Matty Eckler Community Centre (attended by approximately 400 people)

At the June 1 meeting, participant were interested in whether property acquisition would be required for stations and the need for a western extension. On June 2, the majority of people attending the meeting were residents from the neighbourhood near Pape Avenue and Queen Street. They raised concerns about the potential impacts of the emerging preferred alignment on the residential area. Most comments and questions were regarding issues about construction disruptions, noise and vibration and property impacts. Several participants expressed concern that they had not been previously contacted directly. Questions and concerns at the June 15 meeting were similar to the June 2 meeting, as most of the people in attendance represented the neighborhood at Pape between Gerrard and Queen. City Planning and TTC staff prepared a list of questions that were raised at the June 2 meeting and developed responses which were uploaded to the project website, as well as developed into a handout for the June 15 meeting.

Residents attending both the June 2 and June 15 asked why the alignment did not following Carlaw instead of Pape. The Relief Line Project Assessment has been an iterative study process of narrowing down options leading to the emerging Preferred Alignment, based on technical evaluation and public consultation.

If City Council approves the emerging preferred alignment, an Environmental Project Report will be prepared, which will start to identify the potential impacts and mitigation measures. Mitigation measures that may help to reduce the impact of the proposed station at Queen and Pape could be to use single-bore tunnel technology rather than the standard twin-bore method, mining the station, and shifting the location of station entrances and infrastructure. These and other mitigation measure can be explored through the design stage.

Since the Relief Line is to be constructed in fully built out urban conditions, any alignment would introduce potential impacts. Further design work needs to be undertaken to understand what the potential impacts to specific properties of the emerging preferred alignment actually are, and then mitigation measures can be developed to reduce those impacts.

Recommendations & Next Steps

This report recommends City Council approve the Pape-Eastern-Queen alignment for the first phase of the Relief Line, concluding two and a half years of technical analysis and public consultation to identify the preferred alignment and station locations.

Continuing to advance work on the Relief Line Phase 1 project is crucial to addressing capacity challenges on Line 1 (Yonge). Following approval of the preferred alignment by City Council, work to refine the route and station locations through further design will build on the City and TTC's work to-date, including:

- refinements to station locations and preparation of station concept plans;
- development of the conceptual design for the preferred alignment;
- determining potential impacts and mitigation measures;
- completing the Environmental Project Report (EPR); and
- launching the formal Transit Project Assessment Process (TPAP) and submitting the EPR for approval to the Ministry of Environment and Climate Change.

The City and TTC will work with Metrolinx to define future steps, such as initiation of planning and design for the northern and western extensions of the Relief Line, which are critical to obtain the full relief required on Line 1. The recent Provincial announcement to provide $150 million for planning and design of the Relief Line will support advancing this project.

A Memorandum of Agreement (MOA) detailing the roles and responsibilities of Metrolinx, the City and TTC for the next phases of the Relief Line project, will be developed.

5. Fare Policy

The SmartTrack/RER Integration IBC business case analysis is built on the assumption of a GO fare. The City's ridership analysis indicates that a TTC fare has a significant impact on improving the performance of SmartTrack/RER, in terms of generating new ridership (see Attachment 1). The results of the City analysis are illustrative of the importance of pricing transit to achieve the service and planning objectives envisioned when investing in the building of transit infrastructure.

Transit fare policy needs to be considered in the context of ongoing initiatives being undertaken by Metrolinx, the City and TTC. Metrolinx is working on the GTHA Fare Integration initiative, which will integrate the fare structures of all transit agencies in the GTHA to create a seamless transit network.

Fares on GO Transit provide the foundation for considering fare policy regionally. As GO Transit evolves from a system focused on suburban-to-downtown commuters to a more urban Regional Express Rail (RER) that connects Mobility Hubs in Toronto and

across the GTHA with frequent, all-day, two-way service, the fare structure should also evolve to support key City and Provincial planning and policy goals.

Attachment 7 provides a current state assessment of GO transit fare policy and implications to ridership in Toronto, including:

- GO Transit's distance-based fare structure makes short trips substantially more expensive (on a per-kilometre basis) due to the relatively high base and low distance components of the fare. This creates a barrier to using GO Transit in Toronto, where trips are relatively short.
- There is currently no co-fare option for transfers between GO Transit and TTC services (which is available for transfers with 905 transit agencies); this requires riders to pay two full fares when using both GO and TTC, reducing opportunities for riders to make integrated trips using both systems.
- GO Transit has stations within or in very close proximity to half of the City's Neighbourhood Improvement Areas, most of which are not served by existing rapid transit lines. Improving the affordability of GO Transit fares represents an opportunity to increase rapid transit access for low-income residents.

As a result, City and TTC staff propose Metrolinx consider the following policy considerations in the GTHA Fare Integration study:

- Reducing the base component and increasing the distance component of GO fares;
- Extending the co-fare option currently offered by 905 transit agencies to TTC services; and
- Continue working with the City and TTC to establish an appropriate fare for SmartTrack, consistent with the approach to pricing other transit services in Toronto.

The City Manager in consultation with the CEO, TTC will continue to report to the TTC Board and City Council as the Metrolinx GTHA Fare Integration study progresses, in order to ensure Toronto's interests with respect to SmartTrack and fare policy more broadly are identified and addressed.

6. Cost-Sharing Discussions with the Province of Ontario and Metrolinx

Historical Context

Since amalgamation, the City of Toronto and the Province of Ontario, and the Government of Canada to a limited extent, have cooperatively participated in major transit infrastructure projects: (i) the Sheppard East subway extension; (ii) the Toronto-York Spadina subway extension; (iii) the Scarborough Subway Extension; and (iv) the Metrolinx Toronto Light Rail Transit Projects.

The historical cost-sharing arrangements have been contributions by each order of government for the capital costs of the projects, with ownership and operating costs vesting with the local transit authority, as summarized below:

Table 16. Historical Context- Intergovernmental Transit Funding

Project	Capital Costs	Operating, Maintenance and Lifecycle Costs
Sheppard East Subway	$1B – 55% Province, and 45% City	City
Toronto York Spadina Subway Extension	$3.2B – Province 30%, City 28.5%, Federal 21.9%, and York Region 19%	City
Scarborough Subway Extension	$3.56B - Province 56%, City 26%, and Federal 18%	City
Metrolinx Toronto LRT Projects • Eglinton Crosstown LRT • Finch W. LRT • Sheppard E. LRT	$8.7B – Province (incl. $333M in federal funding for Sheppard E. LRT) 100%	TBD

RER and SmartTrack Integration

In 2014 the Province introduced GO RER which envisions all day two way service across the regional GO Transit network. In their 2015 Budget, the Province committed $13.5 billion of the $16 billion Greater Toronto & Hamilton Area (GTHA) transit infrastructure funding over the next ten years to GO RER.

As part of the review of SmartTrack, City staff have participated in preliminary discussions with provincial staff to work towards agreed-upon principles for sharing the costs of a broad range of transit initiatives. Staff are working with the Province towards reaching cost sharing and intergovernmental funding arrangements in respect of the following initiatives, subject to City Council approval:

- implementing SmartTrack within the Regional Express Rail program;
- extending an LRT along Eglinton West;
- extending an LRT along Eglinton East (project concept and design subject to further City Council consideration and approval);
- operating and maintaining Metrolinx Toronto LRT projects; and
- municipal utility and infrastructure within Metrolinx-owned rail corridors.

This report requests City Council authorize the City Manager to negotiate and report back on cost sharing and intergovernmental funding arrangements with the Province for these initiatives, including a review of any governance and funding implications, for City Council approval. The terms for sharing the capital, maintenance, operating, and capital maintenance components of RER/ST will form a major component of the proposed funding arrangement.

In discussing these terms, it is recognized that the City of Toronto and the Province of Ontario have each made and have each benefited from significant investments in transit infrastructure in Toronto and the Region. RER and SmartTrack will have both regional and local benefits.

The Province has historically taken responsibility for broad, regional transportation infrastructure, like the GO network, which carry major traffic flows across municipal boundaries. These form the public transit equivalent of Ontario's 400-series highways, which are funded entirely through the Ministry of Transportation. As such, ownership of these assets have generally vested with the Province.

As the SmartTrack initiative proposes a more local, urban service to be integrated within the core GO RER service, there is a supportable rationale for the City to make contributions towards the incremental costs associated with the SmartTrack proposal. The Government of Canada commitment of funding for SmartTrack will supplement the City's overall contribution to the Province of Ontario for integrating the incremental costs associated with the City's request.

Any potential contribution towards incremental costs related to SmartTrack should have regard to the importance of ensuring that the service concept and fare strategy implemented by Metrolinx will support the City's ridership objectives for SmartTrack and service integration with the TTC.

Metrolinx Toronto LRT Projects

In addition to discussing cost-sharing for the components of SmartTrack located on the GO RER corridors, the Province has requested the City share in the costs associated with operating and maintaining the Metrolinx Toronto LRT projects.

The Province has committed to funding 100% of the capital costs associated with the Eglinton-Crosstown, Finch West, and Sheppard East LRT projects, as well as to the life-cycle maintenance costs.

The Province has recently established a broad policy through the 2016 Budget of seeking ongoing municipal support for the operating and maintenance costs of Metrolinx projects that have replaced or supplemented local transit services.

It is anticipated that a common approach will be negotiated for addressing the sharing of ongoing revenues and costs for these existing Metrolinx Toronto LRT projects, and the 2012 Master Agreement contemplates the need to enter into operating agreements with Metrolinx in this regard.

Further due diligence is required before a specific City position can be reached on revenue and cost-sharing for these projects. Staff are guided by the following key considerations:

- The TTC would operate the Metrolinx Toronto LRTs
- The limited ability of the TTC to bear additional operating budget impacts
- The potential savings that can be realized from any reductions in the existing TTC bus services currently operating on these routes
- The benefits of continuing to apply a consistent TTC fare policy to all services in Toronto
- The benefits of City and TTC input with respect to project specifications, service standards and project quality control

Sharing of Costs for Proposed Extensions of the Eglinton-Crosstown LRT

In addition to the operating agreements discussed above, agreements for capital and operating cost-sharing will be required for the potential westward and eastward extensions of the Eglinton-Crosstown LRT discussed in this report.

Both eastward and westward extensions once formed part of the Metrolinx "Big Move" regional transit plan, but have been deferred because of Provincial budget considerations. These projects closely follow the example of the other LRT projects being built in Ottawa, Kitchener, Hamilton, Mississauga, & Brampton. The capital costs of these projects have all been funded entirely by the Province.

With the proposed extensions in place, the Eglinton-Crosstown LRT will extend from the Scarborough campus of the University of Toronto all the way to the Airport Corporate Centre in Mississauga. This LRT will also be servicing Pearson International Airport, which is a major regional and national transportation hub.

As such, there appears to be an important role for the Province in providing funding contributions for these projects based on the regional benefits generated by the extended LRT. However, because this project does not form part of the Province's current Moving Ontario Forward infrastructure plan, in order to advance this project, there may be a need to negotiate potential City contributions towards these costs. Consideration should also be given to funding from Mississauga, given that a portion of the Eglinton West LRT extension extends into and serves Mississauga. Discussions will focus on the creation of a governance structure which provides for sufficient City and TTC decision making with respect to project procurement, financial risk allocation, ownership, fare policy and operating impacts.

Federal Funding

The Government of Canada has committed considerable funding towards Toronto transit expansion initiatives in recent years, including:

- $333 million for Sheppard East LRT, delivered by Metrolinx;
- $660 million for the Scarborough Subway Extension; and
- $2.6 billion for SmartTrack.

These commitments are in addition to the recently announced $840 million allocated to Toronto for state-of-good-repair projects to be delivered under Phase 1 of the Public Transit Infrastructure Fund. Details of the City's priorities under this federal program will be considered by City Council later this year.

This report authorizes the City Manager to negotiate and enter into funding agreements with the Government of Canada for federal contributions towards the incremental costs associated with implementing the SmartTrack components within the Regional Express Rail program, and implementing the Scarborough Transit Network. The report also requests the Province to provide an update on the schedule for implementing the Sheppard East LRT.

Road crossings and municipal utility work within GO rail corridors

A considerable amount of work will have to be carried out at locations where the GO RER corridors cross City roads in order to facilitate much more frequent train crossings.

When this work involves the relocation of existing City utility infrastructure, the City contribution to this cost should consider the remaining value in use of the existing infrastructure. This principle has been established through earlier negotiations with Metrolinx regarding the GO Georgetown Corridor.

Staff propose that the cost-sharing approach for new grade separations should take into consideration the high cost for the significant number of grade separations required in Toronto to implement RER. While some GO corridors run through each of the other GTHA municipalities, all of the GO corridors pass through Toronto as they all converge at Union Station. Therefore, Toronto would bear a disproportionate share of these costs if all GTHA municipalities contribute towards the cost of individual grade separations within their municipality based on the same formula.

Further assessment is required to reach a specific City position on cost-sharing for grade separations resulting from RER. Staff will examine the potential for basing municipal contributions towards the costs of grade separations on an equitable division between Metrolinx and all of the benefiting municipalities of the total cost for all of the grade separations required for RER.

7. Next Steps

Recommendations and key next steps were outlined for each project in the report in order to advance through the project development process. This report established the scope of key projects that form Toronto's priority transit network and sets the stage for discussions with the Province and Metrolinx on key issues such as cost-sharing, project governance and project delivery and fare policy.

Cost-Sharing, Funding & Finance

As outlined in the Financial Impact section of this report, there are several key next steps:

- Enter into cost-sharing discussions with the Province of Ontario, Federal Government and other key partners as appropriate, for SmartTrack, Eglinton West LRT, and Scarborough Transit.
- Identify the funding implications related to the costs associated with key projects, based on the outcomes of cost-sharing discussions with other orders of government.

This report recommends City Council authorize the City Manager to negotiate intergovernmental funding and cost share arrangements with the Province of Ontario. It is also recommended City Council request the City Manager to report to City Council on the following:

- Negotiated terms and conditions for cost-sharing for City Council approval;
- Governance implications and arrangements to be put in place to effectively carry out the intergovernmental funding and cost-sharing arrangement; and
- An update on the funding implications for the City's share of costs.

Long Term Transit Network Plan Update

As outlined in the March 2016 report to City Council, a key next step is integrating the priority projects within the long term transit network plan that is being evaluated through the second phase of the transportation component of the City's Official Plan review process. This second phase will resume in late 2016, and will cover policies and schedules related to transit and cycling. The ongoing studies of rapid transit projects will be sufficiently advanced for findings to be incorporated into the Official Plan.

The long term transit network planning process will identify the longer list of transit projects the City will need to consider, in consultation with the TTC and Metrolinx, for advancing planning, technical and business case analysis over the next several years. This includes evaluating projects such as the Downsview Station-Sheppard-Yonge Line connection; and the extension of the Finch West LRT from Humber College to Pearson Airport, identified by City Council in March 2016[19]. The analysis will also ensure priority transit projects connect with City's urban growth centres, in order to address the intensification and development that is underway[20]. Other key considerations include assessing the transportation needs of major employment zones, includes those surrounding Pearson Airport[21]. A report on progress in phase 2 of the long term transit network planning process will be brought forward in Q1 2017 as directed by City Council.

[19] 2016. EX13.3, Directive 16 and 20
[20] 2016. EX13.3, Directive 17
[21] 2016.EX13.3 Directive 15

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SIGNATURES

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ATTACHMENTS

Attachment 1 - SmartTrack/RER Integration Initial Business Case
Attachment 2 - SmartTrack Stations
Attachment 3 - Eglinton West LRT Initial Business Case
Attachment 4 - Scarborough Subway Extension Initial Business Case
Attachment 5 - Eglinton East LRT Preliminary Options Analysis
Attachment 6 - Relief Line Initial Business Case
Attachment 7 - Fare Policy-Current State Assessment

Appendix 1: Cost and Schedule Estimate Classification

Classification of Cost Estimates

Cost estimate classification systems are used throughout the estimating industry to categorize cost estimates based on the maturity level of project definition. As project development proceeds; estimate accuracy ranges narrow. This is due to the fact that as project design becomes further developed, more is known about the project and there is a corresponding reduction in risk and uncertainty in the cost estimate.

The Association for Advancement of Cost Engineering (AACE) provides the most generally accepted industry guidelines for cost estimate classification systems. Table 2 depicts AACE's Cost Estimate Classification system which provides general principles for using cost estimates to evaluate, approve and/or fund projects.[22] Table 2 illustrates typical ranges of accuracy. The +/- represents typical variation of actual costs from the cost estimate after application of contingency for given scope. A Class 5 cost estimate is based on the lowest degree of project definition, and a Class 1 cost estimate is based on a the highest maturity of project definition (full project definition). In addition to the degree of project definition, estimate accuracy is also driven by other systemic risks such as familiarity with the technology in the project; complexity; quality of reference cost estimating data; unique nature of the project, etc.

Table 17. AACE International Recommended Practice- Cost Estimate Classification Matrix (AACE 18R-97), 2016)

Estimate Class	Maturity of Project Definition *Expressed as % of complete definition*	End Usage *Typical purpose of estimate*	Methodology *Typical estimating method*	AACE Classification Expected Accuracy Range *Typical variation in low and high ranges*	MOTI BC Classification Expected Accuracy Range *Typical variation in low and high ranges [a]*
Class 5	0% to 2%	Concept Screening.	Parametric models; judgement or analogy	L: -20% to - 50% H: +30% to +100%	+/- 35%
Class 4	1% to 15%	Study or feasibility.	Parametric; Elemental factored	L: -15% to -30% H: +20% to +50%	
Class 3	10% to 40%	Budget authorization or control.	Semi-detailed unit costs	L: -10% to -20% H: +10% to +30%	+/- 20%
Class 2	30% to 75%	Control or bid/tender.	Detailed costing	L: -5% to -15% H: +5% to +20%	
Class 1	65% to 100%	Check estimate or bid/tender.	Detailed costing	L: -3% to -10% H: +3% to +15%	+/- 10%

Notes [a] Confidence interval 90% (i.e. expected accuracy 90 times out of 100)

[22] The Association for the Advancement of Cost Engineering (AACE), (2016) http://www.aacei.org/toc/toc_18R-97.pdf

The estimate level is important in terms of when it is appropriate to establish the project budget. The Ministry of Transportation and Infrastructure (MOTI), Government of British Columbia (MOTI BC Guidelines) has an established guideline that indicates at minimum 10 to 40% design should be complete (Class 3, AACE Estimate) in order for the estimate to become the basis for developing the project budget. This also is consistent with AACE Cost Classification Standards (AACE RP No.17R-97).

Further refinement of the cost estimates for the recommended scope of each project is required once further design has been completed, including undertaking project risk assessment processes.

Schedule Estimate Classification

The estimated project schedule also has an impact on estimated project cost. Assumptions based on historical project information were made with respect to the schedule for constructing each project in order to calculate the present value cost for each project.

AACE has published guidelines on recommended practice for the development of project schedules for the purpose of improving the understanding among stakeholders involved with preparing, evaluating and using project schedules for decision-making purposes. Table 3 outlines the AACE Schedule Classification Matrix, which uses the degree of project definition as the primary characteristic to define "Schedule Class". A Class 5 schedule is based on the lowest degree of project definition, and a Class 1 schedule is based on a the highest maturity of project definition (full definition).

Table 18. AACE International Recommended Practice- Schedule Classification Matrix[23]

Schedule Class	Maturity of Project Definition *Expressed as % of complete definition [1]*	End Usage *Typical purpose of estimate*	Methodology *Scheduling Methods Used*
Class 5	0% to 2%	Concept Screening.	Top down planning using high level milestones and key project events.
Class 4	1% to 15%	Study or feasibility.	Top down planning using high level milestones and key project events.
Class 3	10% to 40%	Budget authorization or control.	"Package" top down planning using key events. Semi-detailed.
Class 2	30% to 70%	Control or bid/tender.	Bottom up planning. Detailed
Class 1	70% to 100%	Check estimate or bid/tender.	Bottom up planning. Detailed.

Note [1] AACE RP NO. 18R-97 provides the range in percentages for each class.

[23] AACE International Recommended Practice No. 27R-03, (2010), "Schedule Classification System". http://www.aacei.org/toc/toc_27R-03.pdf

Appendix 2: City Council Directives - March 31, 2016

EX13.3 Developing Toronto's Transit Network Plan: Phase 1
Requirements Traceability Matrix

Directive	Section/Appendix
1. City Council request the City Manager and Metrolinx to finalize the technical and planning analysis phase for SmartTrack and prepare background studies required for Transit Project Assessment Processes (TPAPs), by completing the following: a. review the approved environmental assessment for the Eglinton West LRT extension from Mount Dennis to the Mississauga Airport Corporate Centre and Pearson Airport to optimize design, and remove the heavy rail options on the western corridor from further consideration; b. complete the analysis for SmartTrack/GO Regional Express Rail integration options C and D, and remove from consideration the Separate and Parallel SmartTrack option, option A and option B, as defined in table 3 in the report (March 3, 2016) from the City Manager, the Deputy City Manager, Cluster B, and the Chief Planner and Executive Director, City Planning; and i. that the St. Clair West Station being recommended in the integrated GO Regional Express Rail/SmartTrack Options C and D be further considered within the context of the ongoing employment growth in the immediate area, and the purpose of the St. Clair Avenue West and St. Clair Avenue Study; and c. report to the June 28, 2016 Executive Committee meeting ,subject to Part 22 below, and the June 28, 2016 Metrolinx Board meeting with the recommended SmartTrack concept	Section 1 and Attachment 1-3
2. City Council direct the City Manager to request Metrolinx to assess the requirement for grade separation at Progress Avenue as part of the infrastructure required by the Province to implement Regional Express Rail in the City of Toronto and include the results of the review as part of the Regional Express Rail costs and associated municipal impacts to be included in the June 28, 2016 report to Executive Committee, subject to Part 22 below.	Section 2
3. City Council direct the City Manager in consultation with the Chief Executive Officer, Toronto Transit Commission to report to the Executive Committee on June 28, 2016, subject to Part 22 below, on information regarding the capital and operating cost sharing discussions related to the following projects and initiatives, and report any terms and conditions for City Council consideration in order to protect the City's policy and fiscal interests, prior to entering into any new or amended agreement with the Province and Metrolinx: a. Metrolinx Light Rail Transit Program	Financial Impact Section and Next Steps section

Directive	Section/Appendix
b. SmartTrack c. Eglinton West LRT and Eglinton East LRT Extensions d. Scarborough Subway Extension e. Relief Line f. Regional Express Rail/ GO Transit Capital including grade separations g. Fare Policy h. Governance	
4. City Council request the Chief Planner and Executive Director, City Planning, to complete the review of corridor options and related work for the Scarborough Subway Extension, and in doing so: a. remove the Bellamy corridor from further consideration; b. remove the Scarborough Express Rail from further consideration; c. develop recommendations to integrate the proposed optimized Eglinton East LRT into the University of Toronto Scarborough Campus secondary plan; and identify areas in need of an Avenue Study to facilitate intensification along the proposed LRT corridor in consultation with the Toronto Transit Commission, Metrolinx and the University of Toronto. d. report to the June 28, 2016 Executive Committee on Part c above, subject to Part 22 below, along with a recommended preferred corridor and alignment that includes an update, in consultation with Metrolinx, of Item CC39.5 Scarborough Rapid Transit Options: Reporting on Council Terms and Conditions presented to the October 8, 9, 10 and 11, 2013 meeting of City Council, to determine whether all or portions of the Scarborough Subway Extension could be built at-grade along with the number and location of stations.	4abd -Section 3.1 4c- Section 3.2
5. City Council request the Chief Planner and Executive Director, City Planning to work with Metrolinx to create an expedited project delivery schedule for the Eglinton Crosstown East LRT by 2021, if at all possible, and report to the June 28, 2016 meeting of Executive Committee, subject to Part 22 below.	Section 3.2
6. City Council request the Chief Planner and Executive Director, City Planning to work with Metrolinx to create an expedited project delivery schedule for the Eglinton Crosstown West LRT by 2021, if at all possible, and report to the June 28, 2016 meeting of Executive Committee, subject to Part 22 below.	Section 1.3-Next Steps
7. City Council direct to the Chief Planner and Executive Director, City Planning to commence a comprehensive planning framework review for the Eglinton Avenue West corridor from Mount Dennis to the Etobicoke Creek to articulate the future of this linear tract and catchment area, along with an integrated approach to the community's long term vision, such review will: a. build upon and extend the work of Eglinton Connects and the Mount Dennis Nodal Study, and better inform land use, transportation and transit planning with an aim to define specific future growth potential; b. include, but not be limited to, Official Plan designations, zoning bylaws,	Section 1.3-Next Steps

Directive	Section/Appendix
avenue overlays where they exist, a market feasibility study, nodal opportunities, roads, infrastructure and public realm associated with transit and transportation infrastructure investments, and an enhanced public communication and consultation process; and c. incorporate Eglinton Avenue West itself, and significant points of potential such as plazas, apartment lands infill sites, and under-utilized sites within 750 metres of transit along the avenue.	
8. City Council request the Toronto Transit Commission Board to request: a. the Toronto Transit Commission to add to its service plan the north-south bus route designed for Ward 43 in 2010, considered at its Board meeting on March 24, 2014 for further study, to facilitate ridership to support for the Eglinton Crosstown East LRT. *Status update: TTC staff are conducting a study in the Kingston Road-Lawrence-Morningside area commencing in late 2016. The study will identify short-term improvements and potential long-term enhancements when rapid transit projects like Line 2 extension and Line 5 Eglinton are implemented.* b. Toronto Transit Commission staff to report on a possible enhanced bus service from the Eglinton Crosstown East LRT to the Toronto Zoo as a destination. *Status update: TTC staff are working with the Toronto Zoo and Parks Canada to develop a near-term and long-term transit service plan to improve transit connectivity to the zoo and the Rouge National Urban Park. This will include a consideration of proposed rapid transit projects, including GO RER, Crosstown East LRT, Sheppard East LRT, and Line 2 Extension.*	See status update in left column.
9. City Council approve Pape to Downtown via Queen/Richmond as the preferred corridor for the Relief Line project and request the Chief Planner and Executive Director, City Planning in consultation with the Toronto Transit Commission to report the preferred alignment and stations to the June 28, 2016 Executive Committee, subject to Part 22 below.	Section 4, Attachment 7
10. City Council direct the Deputy City Manager, Cluster B and the Chief Planner and Executive Director, City Planning to report to the June 28, 2016 Executive Committee, subject to Part 22 below, with an update on the Waterfront Transit Reset Study.	Separate report on June 28, 2016 Executive Committee Agenda (2016.EX16.17)
11. City Council direct the City Manager and the Deputy City Manager and Chief Financial Officer to include the transit network plan priorities for the next 15 years in the inventory of projects for funding consideration in the development of the City's fiscal plan.	Forwarded.
12. City Council direct the City Manager, the Deputy City Manager, Cluster B, and the Chief Planner and Executive Director, City Planning to undertake	Completed in May and June 2016.

Directive	Section/Appendix
additional consultation and stakeholder engagement with respect to the transit network plan and rapid transit expansion projects outlined in the report (March 3, 2016) from the City Manager, the Deputy City Manager, Cluster B, and the Chief Planner and Executive Director, City Planning, in advance of the June 28, 2016 report to Executive Committee, subject to Part 22 below.	
13. City Council request the Chief Planner and Executive Director, City Planning to include in her report to the June 28, 2016 Executive Committee, meeting subject to Part 22 below, whether an Avenue Study in the vicinity of Kingston Road from Celeste Drive (Guildwood GO Station) to the intersection of Kingston Road and Old Kingston Road is beneficial given the impacts to the area.	Section 3.2
14. City Council direct the Chief Planner and Executive Director, City Planning to report to the June 28, 2016 Executive Committee, subject to Part 22 below, on the cost of extending the Eglinton Crosstown LRT from the University of Toronto, Scarborough Campus, to Malvern Town Centre.	Section 3.2
15. City Council request that the Chief Planner and Executive Director, City Planning to review and consider the transportation needs of the employment zone surrounding Toronto Pearson International Airport in the development of the transit network plan and transit expansions on projects outlined in the report (March 3, 2016) from the City Manager, the Deputy City Manager, Cluster B, and the Chief Planner and Executive Director, City Planning.	Section 5
16. City Council direct the Deputy City Manager, Cluster B, the Chief Planner and Executive Director, City Planning, and the Chief Executive Officer, Toronto Transit Commission to include in their Fall 2016 re-evaluation of all candidate projects using "Feeling Congested?" criteria, a cost range and funding options for an environmental assessment for the Downsview Station - Sheppard -Yonge Line connection as outlined in Communication EX13.3.8.	Section 5
17. City Council direct the City Manager to report to the Executive Committee by the end of 2016 on potential projects to be included in phase two of the City's Transit Network Plan, such plan to include priority transit projects which connect urban growth centres across the City, in order to address the intensification that had already occurred and to ensure that the City's transit planning keeps pace with the development of the City's Urban growth centres.	Section 5
18. City Council direct the City Manager and the Chief Planner and Executive Director, City Planning to forward the report and appendices (March 3, 2016) from the City Manager, the Deputy City Manager, Cluster B and the Chief Planner and Executive Director, City Planning to Metrolinx for consideration in the review of the Regional Transportation Plan ("The Big Move"), and Regional Express Rail planning.	Section 5
19. City Council request the City Manager and Metrolinx to consider:	Section 2

Directive	Section/Appendix
a. that service levels north of Mount Dennis on the Kitchener GO Corridor, should be similar to the service levels proposed under SmartTrack/Regional Express Rail integration options C and D, in order to provide improved service to northern Etobicoke; and b. including an additional station in the vicinity of the Woodbine Racetrack in the GO Regional Express Rail Program.	
20. City Council direct the Chief Planner and Executive Director, City Planning Division, in collaboration with the Chief Executive Officer, Toronto Transit Commission, to study an extension of the Finch West LRT from Humber College to Pearson International Airport, including a review of the opportunity to create an interchange from Kitchener GO corridor in the vicinity of the Woodbine Racetrack, and to report back to the Executive Committee in the first quarter of 2017.	Section 5
21. City Council direct the Chief Planner and Executive Director, City Planning to further consult with GO Transit Regional Express Railway on the feasibility of implementing the Caledonia/St. Clair GO Transit Station on the Barrie GO Transit Line, in view of the ongoing employment growth and economic revitalization in the area due to the St. Clair Avenue Study, the Exclusive Right of Way, and the five-year Official Plan Review of the north-west quadrant of St. Clair Avenue West and Caledonia Road, and request the Chief Planner and Executive Director, City Planning to report back to the June 28, 2016 Executive Committee meeting subject, to Part 22 below.	Section 2
22. City Council request the Chair of the Executive Committee to call a special meeting of the Executive Committee to consider the Toronto Transit Network reports and related matters, on a date prior to June 28, 2016 as determined by the Chair.	Decision required by Chair.
23. City Council request the Chief Planner and Executive Director, City Planning to release all reports identified for the June 28, 2016 Executive Committee on or before June 14, 2016, subject to Part 22 above.	Released on June 21, 2016 with official agenda.
24. City Council request the Chief Planner and Executive Director, City Planning to hold one public information meeting between June 14, 2016 and June 27, 2016 regarding all reports identified for the June 28, 2016 Executive Committee, subject to Part 22 above.	June 21, 2016 public meeting.