MEETING DATE: September 25, 2013

SUBJECT: SCARBOROUGH SUBWAY OPTIONS

ACTION ITEM

RECOMMENDATION

It is recommended that the Board:

1. Support the Scarborough subway alignment along the McCowan corridor, through Scarborough City Centre and north to Sheppard Avenue East (indicated in Figure 2), previously approved by City Council at the meeting of July 17, 2013;

2. Forward this report to the City Manager for inclusion in the City Manager's report to City Council at the October 8, 2013 meeting; and

3. Forward this report to Metrolinx, Provincial Minister of Transportation and Federal Minister of Infrastructure, Communities and Intergovernmental Affairs.

FUNDING

In 2009 the Province announced funding of $1.8 billion for the cost of the design and construction for the conversion of the Scarborough RT to LRT and extension to Sheppard Avenue. The Master Agreement between the City, TTC and Metrolinx confirms Metrolinx’s responsibility for project delivery.

The Province has publically committed $1.48 of the $1.8 billion to funding the Bloor-Danforth subway extension, less the sunk costs associated with the Scarborough LRT, design and project management (currently estimated at $85 million) and any costs associated with the re-negotiation of the Bombardier LRV contract.

Neither the Provincial (RT corridor alignment) nor TTC (McCowan corridor alignment) subway option to Sheppard Avenue estimated at $2.9 billion and $2.5 billion ($2010) respectively, are achievable within the current Provincial funding envelope. Even when the options are truncated at Scarborough City Centre both Provincial and TTC options estimated at $1.7 - $1.9 billion and $1.9 billion ($2010) respectively require additional funding.

Additional funding from the Federal Government, Province or the City will be required to proceed with any of the subway options. The City has requested funding commitment from the Federal Government and anticipates a response before the end of September.
BACKGROUND

In May 2013, City Council indicated support for the extension of the Bloor-Danforth subway line from Kennedy Station to Scarborough Centre and Sheppard Avenue, with an alignment along the McCowan corridor, as an alternate to the Scarborough LRT. As a result, Metrolinx requested clarification on the City’s commitment to the Master Agreement and the Scarborough LRT project, in a letter received June 28, 2013. The letter outlines sunk costs and other implications associated with a change in direction by the City.

City Council on July 17, 2013, confirmed its support for the Scarborough Subway contingent on a number of funding conditions.

If these conditions are not met, the Scarborough LRT project would proceed.

The City Manager will be submitting a report to the October Council meeting outlining the status of Council’s funding conditions.

DISCUSSION

Provincial Plan - Overview

On September 4, 2013, Provincial Transportation Minister Glen Murray announced a new subway plan for Scarborough. The proposed RT corridor alignment is approximately 10.3 kilometers, with four stations at Lawrence, Scarborough City Centre, Centennial College, and Sheppard East following the previous planned Scarborough LRT alignment. The alignment is predominantly at
grade or elevated with small tunneled section at either end. To permit the line to follow the existing SRT corridor a new Kennedy Station must be built to the north and west of its current location. The anticipated duration of this project is 10 years, with construction commencing in year 5. The Province’s estimated cost is $2.3 billion ($2010).

Only the first 6.4 kilometers to Scarborough City Center, with a station at Lawrence would be built in the first phase. The Province has committed to fully funding this phase at an estimated cost of $1.4 billion ($2010).

Chair Stintz in her September 6, 2013 letter requested clarification on a number of questions arising from the plan and press conference. Metrolinx Chair Robert Pritchard in his September 10, 2013 letter of response indicated that:

1) The extension would be owned and operated by the TTC;
2) TTC/City would be responsible for project scope & schedule including cost overruns, operating costs and maintenance costs (this would appear to preclude any transfer of operating maintenance funding from Metrolinx as mentioned at the July 17, 2013 City Council meeting);
3) Metrolinx would assume the net incremental operating costs incurred to the TTC as a result of the construction to offset the SRT closure and the closure from Kennedy to Warden Stations (Bus Bridge);
4) An amendment to the Master Agreement is required for the extension of the Bloor – Danforth Subway; and
5) The proposed alignment would be subject to review as part of the environmental assessment process.

Metrolinx provided to TTC the Feasibility Study prepared in support of the Province’s Scarborough Subway Plan. TTC has reviewed the Feasibility Study and although there are many issues that require more information from Metrolinx, the following provides TTC’s initial comments on the available information.

Planning

In order to properly assess this proposal the following information is required and was not provided in the Feasibility Study:

1) Ridership projections for both Provincial options;
2) Average operating speed and trip time for both subway options;
3) Location of the bus terminal;
4) Walking distance from the TTC bus terminal and GO station to the subway platform; and
5) Any other advantage of this proposal over the TTC proposal.

TTC has requested information from Metrolinx and waits to receive it for further evaluation.

City Planning is reviewing the Feasibility Study and will provide input to the City Manager for his report to the October City Council Meeting.

The introduction of a subway alignment within the existing GO corridor may prevent or limit any future expansion.

Customer Impact

The Province’s subway alignment is along the current SRT line, requiring two major closures. First a 3-year closure of the SRT line that would be accommodated by a bus bridge from McCowan to Kennedy Station. Then after constructing the new Kennedy Station it must be connected to the existing Bloor-Danforth line requiring the closure from Warden to Kennedy Stations for an unspecified period of time. This would be accommodated by extending the bus bridge from Kennedy to Warden Station. Currently, Warden Station is not configured to support bus terminal operations of this magnitude and temporary infrastructure would be required.

The new Kennedy Station’s location, to the north and west, would increase the passenger transfer time from both the GO station and the bus terminal to the subway. Detailed designs are not available to quantify this increase.
The design of six curves on the full alignment is well below optimal and approaching the ultimate allowable design standard. The impact of these tight curves requires that the speed in these areas must be reduced from the standard 80 kilometers per hour down to 50 or 55 kilometers per hour. This results in an increase of the overall trip time and possibly impacts to the remaining Bloor-Danforth line. To fully assess these impacts a computer modelling study is required.

Community Impact

In comparison with the current SRT or LRT’s elevated structure, the elevated subway structures are much more intrusive. This may result in community impact and resistance during the environmental assessment process and presents an urban design issue. The combination of elevated structures and tight curves will allow noise, such as wheel squeal, to carry further.

Operational Impacts

As with the current SRT alignment, the proposed Provincial alignment is at surface and elevated, presenting the same operating challenges as currently experienced during fall and winter resulting in delays.

1) During freezing rain and snow there is a build-up of ice on the rails, the third rail and switches. The build-up on the third rail can prevent power from reaching the trains. The significant grades approaching 3.0% are challenging with icy rails and loss of power.

2) The ice build-up can interfere with the operation of the switches, preventing route selection or loss of signal detection.

3) In the fall, the leaves accumulate on the tracks, causing wheel flats, noise, vibration and increase maintenance costs.

4) The extremely tight curves on the alignment will also result in increased wheel and track wear causing premature replacement.

Schedule

TTC and Provincial proposals indicate a start date of 2014 and a completion date of 2023. Therefore, schedule is not a factor between the two options.

Cost

The Province’s feasibility study did not provide a detailed cost breakdown for TTC review nor did time available allow for such a review. The Province’s estimate for Kennedy to Sheppard is $2.3 billion ($2010) specifically excluding the following items:

1) Vehicles;
2) Storage facility;
3) Traction power substations;
4) Cost of interim replacement bus service routing & associated infrastructure; and
5) HST.
In addition it does not include:
1) Signal system upgrades required for Automated Train Control;
2) Bus bridge during construction; and
3) SRT life extension until 2019, the start of construction.

TTC estimates that the full cost of these exclusions and additions to be $670 million while Metrolinx estimates the costs to be $585 million ($2010). Therefore the total actual cost for the Provincial proposal (RT corridor alignment) is between $2.9 to $3.0 billion ($2010). The TTC estimate for the McCowan corridor alignment is $2.5 billion ($2010). However, it should be noted that the cost estimates should be treated as an order of magnitude estimate for comparison purposes only.

Using a similar comparison for the Provincial alignment to Scarborough City Centre, TTC estimates the full cost to be $1.9 billion while Metrolinx estimates $1.7 billion ($2010). The cost for the TTC alignment (McCowan corridor) is $1.9 billion ($2010). Based on the lack of detailed engineering analysis the $100 million difference is not material to the decision making process.

A summary of the exclusions and additions are provided in the following table.

### Provincial Subway Plan (RT Corridor Alignment)

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<td>(McCowan Corridor)</td>
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<tr>
<td>Variance</td>
<td>$410 to 495</td>
<td>-$215 to -50</td>
</tr>
</tbody>
</table>

Table 1: Metrolinx Adjusted Estimates ($2010M)
JUSTIFICATION

The TTC Board should be apprised of operational and customer impacts identified by TTC staff on proposed alignment changes to the Scarborough subway.

81-1
September 20, 2013
03074-188-288

Attachments: 1. TTC Chair Stintz's letter dated September 6, 2013
Dear Mr. Prichard,

RE: Minister Murray's September 4, 2013, Scarborough Subway Announcement

On September 4, 2013, the Minister of Transportation, Glen Murray, announced that the Province of Ontario will be funding an extension of the Bloor-Danforth subway line to Scarborough Town Centre. The Minister's proposal uses the current Scarborough Rapid Transit alignment, envisions the relocation of Kennedy Station, ends at Scarborough Town Centre, adds a total of two additional stops, and has a proposed budget of $1.4 billion.

Minister Murray’s plan will be studied by the TTC to ensure that it is technically feasible and to assess any impact on the operation of the extended Bloor-Danforth Line. Commissioners should be as informed as possible before we authorize Staff to carry out the study.

I would appreciate clarity from Metrolinx on the following points:

- That the alignment and proposal by the Minister has been approved by the Metrolinx Board of Directors;
- That the input provided by City Council on July 17, 2013, (Item CC37.17, „Scarborough Rapid Transit Options”), including funding and alignment, in response to the letter sent by the Metrolinx CEO, Bruce McCuaig, to the Toronto City Manager, Joe Pennachetti, dated June 28, 2013, is no longer being considered by Metrolinx, and that no Federal funding is being pursued as a result;
- A breakdown of the costs and timelines for this proposal, and confirmation that any cost overruns associated with this plan will be the sole responsibility of the Province and/or Metrolinx;
- Confirmation that the shutdown time of the Scarborough RT, during which the TTC would need to provide approximately 15 million customer shuttle bus riders per annum, will not exceed three years and that the cost of this shuttle bus service will be borne by the Province, as was the case under the original Scarborough LRT proposal;
- Confirmation that the Province will provide or fund alternative transit for TTC customers unable to transition between Warden and Kennedy while the new connection is cut in;
• The impacts (if any) of the Minister's proposal on the Eglinton Crosstown LRT, since the proposal includes the relocation of Kennedy Station;

• Confirmation of the role of the TTC in the design, building and operating of the Minister's proposed subway extension;

• Approvals, if any, which Metrolinx will seek from the City to implement the Minister's proposal.

Of overriding importance is the current status of the Master Agreement, signed by Metrolinx, the Toronto Transit Commission and the City of Toronto on November 29, 2012. Metrolinx CEO Bruce McCuaig stated in his letter dated June 28, 2013, to the Toronto City Manager, Joe Pennachetti, that Metrolinx "continue[s] to rely on the Master Agreement as the legal contract with the City and the TTC to deliver the four [LRT] projects." I request confirmation that this is still the case, noting Mr. McCuaig's subsequent advice to Mr. Pennachetti in his letter dated August 2, 2013:

"The Scarborough LRT remains an approved part of the Master Agreement among Metrolinx, City Council and the TTC."

As there is a meeting of the Metrolinx Board of Directors on September 10, 2013, I ask that you provide the answers to the above by Thursday September 19, 2013, so my fellow Commissioners may discuss them at our meeting September 25, 2013.

Sincerely,

Karen Stintz
Chair, Toronto Transit Commission

Toronto City Hall
100 Queen Street West
Toronto, ON, M5H 2N2
Fax: 416-392-9228
councillor_stintz@toronto.ca

cc: Bruce McCuaig, President and CEO, Metrolinx
Joe Pennachetti, City Manager, City of Toronto
Andy Byford, CEO, Toronto Transit Commission
TTC Commissioners
September 10, 2013

Karen Stintz
Chair
Toronto Transit Commission
Toronto City Hall
100 Queen Street West
Toronto, Ontario
MSH 2N2

Dear Chair Stintz,

RE: Response to your letter dated September 6, 2013

Thank you for your letter of September 6, 2013 with respect to the announcement made by the Ontario Minister of Transportation, the Honourable Glen Murray, on September 4, 2013 related to the proposed extension of the Bloor-Danforth subway to Scarborough Town Centre using the SAT alignment. Today, the Metrolinx Board of Directors met and discussed the project and I can provide you with the following information in response to your questions.

Metrolinx has consistently supported using the SAT corridor to bring rapid transit to Scarborough Town Centre and linking it to Kennedy Station. The Big Move, the Transit City plan, the 2009 funding announcement and the master agreement between Metrolinx and the City/TTC all reflect this commitment to using the SAT corridor. Similarly, the Minister’s announcement of September 4, 2013 continues this commitment. The alignment has previously been approved under the Environmental Assessment Act for the LAT project.

Following City Council's July 17, 2013 decision expressing the City’s preference for a subway for Scarborough instead of the LRT contemplated by the master agreement, Minister Murray asked Metrolinx to study whether the proposed subway could follow the existing SRT alignment. We undertook a preliminary feasibility study. It suggests the route using the SRT alignment announced by Minister Murray has a number of advantages: it has greater opportunities for economic growth and employment along its length, relative to the route earlier proposed by the City and TTC; it takes advantage of an existing transportation corridor instead of incurring the cost of building a new one; our preliminary analysis suggests that it could potentially be delivered at a lower capital cost as it requires much less tunnelling; and assuming rapid transit is subsequently extended to Sheppard Avenue East, it serves more priority neighbourhoods and double the population within walking distance. In addition, preliminary work suggests that the subway from Kennedy to Scarborough Town Centre could be delivered close to the existing provincial funding commitment of $1.48 billion. All of these factors suggest using the existing SRT alignment, which is also the approved alignment for the LRT in the master agreement, is
worthy of the most serious consideration. It offers the possibility of a better solution at lower cost serving more people and generating greater economic growth than any other alignment.

Metrolinx staff met with City and TTC officials on August 29, 2013, when the alignment using the route previously approved for the LRT was discussed and our feasibility study was shared. At that time, TTC officials agreed to review the technical feasibility of the route. I understand that the TTC continues to review this alignment and we are grateful for this work. We will continue to work closely with Mr. Byford and his team to assess the various technical issues and financial estimates.

We acknowledge the need for careful due diligence to confirm our preliminary analysis. We look forward to working closely with your colleagues at the TTC and City to complete this confirmatory work in the next few weeks. Once that work is completed, we will expect Metrolinx management to bring a full report and recommendation to the Metrolinx Board of Directors for consideration. Ultimately, the alignment for the proposed extension will need to receive approval in accordance with the Environmental Assessment Act.

Metrolinx and the Province support securing strong federal support for the rapid transit for the Greater Toronto and Hamilton Area. We encourage the City’s efforts to achieve this goal as well and we are willing to assist the City in any way we can.

As you know, Metrolinx has been clear in communicating its position to City and TTC officials on the proposed subway extension both before and after City Council’s July 17th decision, regardless of the alignment that is ultimately approved and constructed. The position consistently communicated to City and TTC representatives includes:

- Provincial funding of $1.48 billion ($2010) is available for the project.
- All sunk costs for the approved Scarborough LRT, currently estimated at $85 million, must be reimbursed by the City.
- Any costs associated with the re-negotiation of the contract with Bombardier for the supply of LRVs will need to be reimbursed by the City.
- Provincial contributions towards the project will begin no earlier than 2018/19.
- The extension of the TTC’s subway would be a City/TIC project, and the City would be responsible for project scope and schedule, including any cost overruns, operating costs and maintenance costs.
- The Province and Metrolinx will work with the City and TTC to align the scope of the project and the routing with provincial growth and transportation objectives, reflecting the need to maximize economic growth and employment along the corridor.
- The Province is interested in building in a role for Infrastructure Ontario to support the City’s and TTC’s efforts to deliver the project to its schedule and budget.

Preliminary estimates of costs and the potential schedule for the SRT alignment were included in the report we provided to City and TTC officials on August 29th. This represents preliminary work and it was agreed, at that time, that the TTC would undertake an initial review of the report, recognizing that the alignment required significant technical review and analysis.

In terms of the impact of the SRT alignment on the existing Scarborough RT service, it is acknowledged that a shutdown would be required, of up to three years. This is essentially the same as the period of shutdown time built into the LRT project, which City Council and the TTC
approved and was included in the master agreement. In terms of the costs associated with the
bus bridge, this would need to be addressed in the context of any amendments to the master
agreement. The master agreement currently provides for the four existing approval projects,
Metrolinx will reimburse the net incremental operating costs incurred by the TTC which are
attributable to disruption to normal service as a result of and during construction.

As indicated above, Metrolinx’s position is that the extension of an existing TTC asset, in this
case the Bloor-Danforth subway, must be owned and operated by the TTC. Metrolinx will
provide input, advice and support to the TTC, and Infrastructure Ontario is ready to support the
project to help ensure it is delivered to schedule and to budget.

Metrolinx continues to rely on the master agreement, as it may be amended from time-to-time,
as the legal contract with the City and the TTC. As was agreed with the City and TTC officials
when we met, to implement the proposed extension of the Bloor-Danforth subway, an
amendment to the master agreement would be required.

Metrolinx is also interested in working with the City of Toronto and the Region of Durham to
extend the Pulse bus rapid transit system into Toronto, linking in to the Scarborough Town
Centre and serving important regional destinations, such as Centennial College and the
University of Toronto at Scarborough. This is a priority project in the Next Wave of transit
priorities set out in The Big Move and would strengthen the role of Scarborough Town Centre as
an important regional hub.

Metrolinx’s objective continues to be the delivery of improved transit services to the entire
Greater Toronto and Hamilton Area, including the City of Toronto. There continues to be great
progress, with projects including the revitalization of Union Station, the Eglinton Crosstown, 30-
minute service on the GO Lakeshore rail lines, the construction of the Union Pearson Express,
the opening of the initial York Viva Rapidways service along Highway 7, the construction of the
Mississauga Transitway, and the deployment of PRESTO, with over 750,000 customers
currently in place, advancing well. These are just some of the several hundred projects
currently underway, many of which are made possible by strong partnerships with the affected
municipalities and their transit systems. Our interest is in moving forward with the Scarborough
rapid transit project as quickly as possible based on a strong partnership with the TTC and the
City of Toronto.

As always, I would be pleased to discuss these matters with you at your convenience.

Warm Regards,

J. Robert S. Prichard
Chair
Metrolinx

c. Bruce McCuaig, President and Chief Executive Officer, Metrolinx
   Joe Pennachetti, City Manager, City of Toronto
   Andy Byford, Chief Executive Officer, Toronto Transit Commission
SCARBOROUGH SUBWAY OPTIONS

Sameh Ghaly, Chief Capital Officer
Presentation to Toronto Transit Commission
September 25, 2013
MINISTER MURRAY’S ANNOUNCEMENT

September 4, 2013 – Provincial Scarborough Subway Plan

Full Alignment
- 10.2km
- 4 Stations
- $2.28B ($2010)

Truncated at SCC
- 6.4km
- 2 Stations
- $1.33B ($2010)
TTC Requested from Metrolinx:

- Ridership projections for both Provincial options
- Average operating speed and trip time for both subway options
- Location of the bus terminal
- Walking distance from the TTC bus terminal and GO station to the subway platform
- Any other advantage of this proposal over the TTC proposal

City Planning is reviewing the Study and will provide input to the City Manager’s report to the October Council meeting
CUSTOMER IMPACT

Stations:

- Stations proposed appear to be well-sited
- Centennial College Station location beneficial
- Opportunity for larger mobility hub at Kennedy, providing existing Kennedy Station is eliminated

Slower operation:

- Design min. curves & max. grades = 50-55 kph vs 80 kph operating standard
- Six speed restricted zones
- Increases overall trip and passenger time
CUSTOMER IMPACT

Extended service shut-downs:
- SRT shut down for minimum 3 years
- Warden to Kennedy subway closure for undetermined time
  - Additional bus requirement to extend to Warden Station which may require a temporary bus terminal

Less convenient transfer:
- TTC-GO connection at Kennedy is longer
- Bus-Subway connection at Kennedy is longer

Expansion in Rail Corridor:
- May preclude GO Transit’s expansion plan
COMMUNITY IMPACT

Noisy:
- Wheel squeal at tight curves on elevated guideway

Size of Structure:
- Size of elevated guideway is larger than SRT and have greater presence in community
Exposed winter fall conditions are a concern:

- Snow drifting and ice accumulation risk
- 3.0% gradient in open-cut
- Wheel flats
- Potential for service delays
Provincial and TTC option both:
• Commence in 2014
• Completed in 2023

Schedule not a factor

Construction start in 2019 will require 4 years of additional operation of the SRT and associated life extension costs to maintain service($48 million $2010)
### Provincial Scarborough Subway Plan

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<tr>
<th></th>
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<td>-$215 (11%) to -50 (3%)</td>
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REEXAMINE TTC SUBWAY OPTION

• End line at SCC
• 5.9km
• 2 stations
• Cost $1.75B
• Comparable costs
  • Demolition $75M
  • SRT life ext $96M
• Total Cost $1.92B
## OPTION SUMMARY

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TTC REVIEW LIMITATIONS

Concept is too preliminary for development of reliable schedule and detailed cost estimate

Estimates accepted as provided, without detailed review
### SCC OPTION COMPARISON

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CONCLUSIONS

• Provincial alignment appears to be technically feasible, but does not optimize the advantages of subway technology
• Cost of Provincial and TTC/City alignments to SCC are comparable given the preliminary nature of the estimates
• TTC alignment to SCC has customer, community and operational benefits
• Detailed alignment should be selected as part of the environmental assessment process
• No clear advantage of Provincial proposal, many disadvantages