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A detailed line drawing of a Scarborough Light Rail Transit train, shown from a front-three-quarter perspective. The train is white with dark accents and has a pantograph on top. It is positioned diagonally across the page, serving as a background for the title.

**Scarborough
Light
Rail Transit
Kennedy Station
to Town Centre**

SCARBOROUGH LRT REDUX
SRT ISSUES AND OPTIONS

PROGRESS REPORT NO.1
OCTOBER 1980

MARCH 9, 2010

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Glossary of Technical Terms

<i>ppdph</i>	Passengers Per Direction Per Hour, a unit of measurement for transit capacity
<i>headway</i>	The time between trains at stops/stations
<i>signal cycle</i>	A full traffic signal cycle that includes north-south left, north-south through, yellow, red, east-west left, east-west through, yellow, red
<i>consist</i>	A train
<i>LRT</i>	Light Rail Transit (also called streetcars), a rail-based transit mode for demands too high for buses but lower than appropriate for subways [Heavy Rail Transit]
<i>ICTS</i>	Intermediate Capacity Transit System, the current technology of the SRT
<i>exclusive right-of-way</i>	An alignment for transit reserved exclusively for transit vehicles, free from any interference, with all crossings grade-separated. Has the highest capacity.
<i>Semi-exclusive right-of-way</i>	An alignment for transit reserved for transit vehicles, but shares crossings with other modes of transportation. Has high capacity if served by rail.

Background

Changes Since the SRT Extension Project Began

The public consultations for the SRT extension began in 2008, following decisions made in 2006 about upgrading the existing technology. Over the course of 2009 through on-going discussions, the 2006 decision on future technology for the line was revisited and revised, influenced substantially by the early-2007 "Transit City Light Rail Plan" debut and the finalized late-2008 Metrolinx Regional Transportation Plan "The Big Move." The technology for both the existing SRT line as well as the extension is now planned to be LRT.



March 16/21, 2007



November 8, 2008

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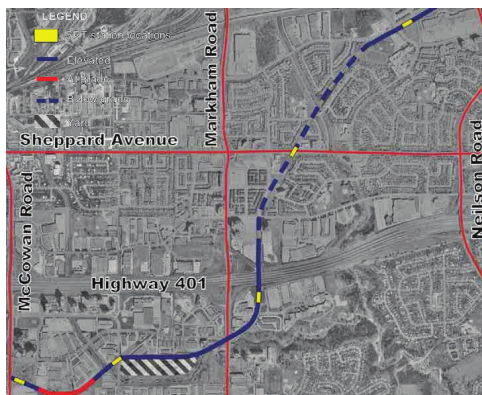
Funding

The Ontario Government has provided funding for the SRT extension's first phase: From Scarborough Centre to Sheppard Ave E. Funding has also been provided for the Eglinton-Crosstown LRT, and the Sheppard East LRT, both of which will connect to the SRT, including track connections. All 3 projects are part of Metrolinx's "Big 5 Priorities."

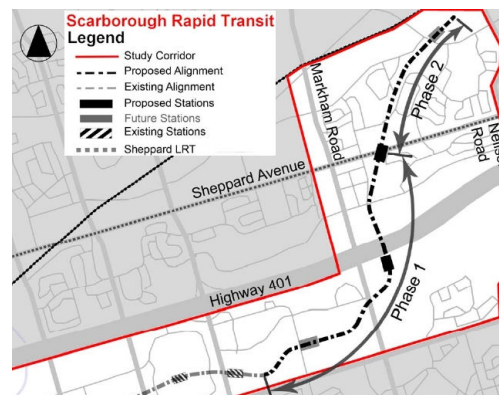


Lack of Revisiting Proposal Following Revised Technology Decision

The TTC has not revisited the work done to date that never considered converting the existing line from Kennedy to McCowan from the existing technology (ICTS) to LRT like the rest of Transit City. This is evident by the fact that the defining characteristics of the alignment are identical to the proposed alignment for an ICTS-compatible implementation in 2009. This is a significant oversight when the public feedback collected from the past public consultations is analyzed objectively.



TTC 2009 Proposal



TTC 2010 Proposal

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Past Public Feedback

Out of the 4 options presented (Appendix 1), only one had a continuous line from Kennedy to Malvern, and that was an all-ICTS-compatible proposal, requiring an exclusive right-of-way from Kennedy to Malvern. The other 3 options looked at a mix of ICTS and LRT for the Kennedy to Malvern run, none of which provided a continuous trip. The public comments collected that supported the all-ICTS-compatible alignment were as follows:

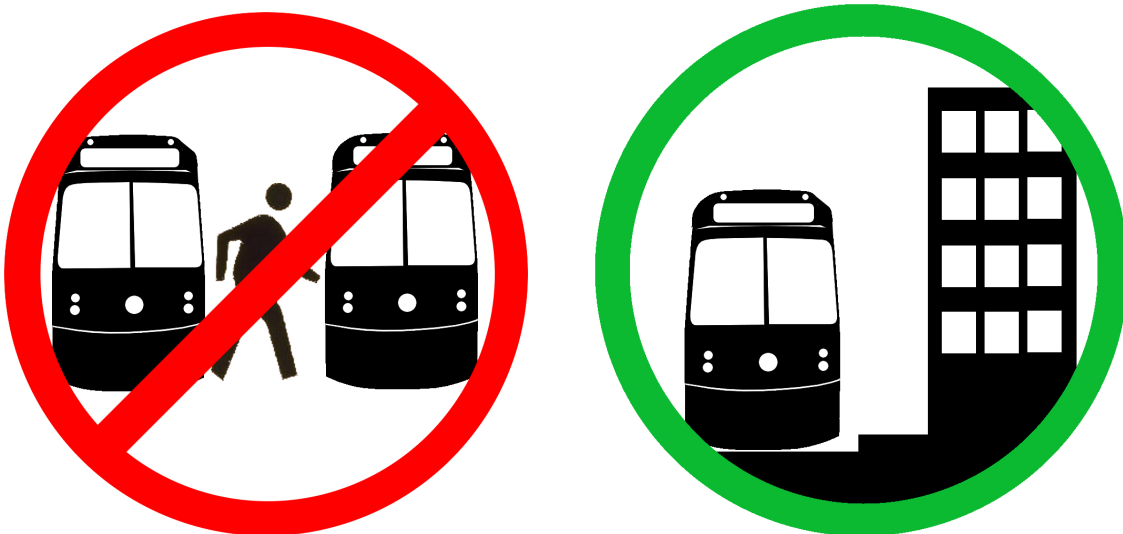
- *Potential for expansion North or East later*
- *No Transfers: more transfers = less people who use it*
- *Most of the ridership comes from [the Malvern] area already*
- *It would be the fastest*
- *Markham & Sheppard will be heavily developed and therefore will require a technology that will carry people from Markham*
- *Other options involve too many transfers*

This can be summarized in two main points and one sub point:

Main 1: the alignment should accommodate future extensions and intensification in the Markham/Sheppard and Malvern areas, where ridership patterns are established and growing.

Main 2: transfers should be avoided as much as possible.

Sub: it's faster as an exclusive right-of-way



Interpreting Past Feedback

The speed argument is identified as a sub point because speed should not be the determining factor on whether or not an exclusive right-of-way should be constructed; All transit projects would be exclusive right-of-ways if that were the common practice. The decision on whether or not an exclusive right-of-way should be implemented should be based on demand projections and the capacity that needs to be provided to meet that demand. Naturally, an exclusive right-of-way has the highest capacity of any option, but it also comes with, by far, the highest capital, operating, and maintenance costs. Exclusive right-of-ways typically have “subway style” stations with a closed fare-paid area, vertical transportation equipment such as escalators and elevators, and the staff associated with manning and maintaining such complexes. Such stations may also include expensive bus terminals. The ridership must be very high to have such infrastructure justified as a sound investment. The 2031 projection between Scarborough Centre and Kennedy meets this benchmark, at a demand projection of 10,000ppdph, but the new extension does not, at a peak-point demand of 4,500ppdph. For this reason, the average operating speed should be regarded as a sub point, and should not be considered as important as the main points, as any rail-based service would increase the average operating speed over the bus service it replaces.

The main points of intensification and extensions, and avoiding transfers, are met just as well by LRT as ICTS. There is little if any difference regarding those main points between ICTS and LRT when the existing line from Kennedy to McCowan is to be converted to LRT. In fact, LRT could be better for intensification by allowing more stops along the route through more “urban” alignments conducive to transit-oriented development, as City Planning is suggested to prefer. Options for interlining on the Sheppard East and Eglinton-Crosstown LRTs can further reduce transfers as well.

Other Objectives Identified Previously by TTC Staff

A key objective identified was “Achieve reasonable cost,” as was “Connect SRT to approved Sheppard LRT.” “Connect” is subject to a more integrated interpretation now that both lines are to be the same technology, but this has only been considered from a non-revenue movement perspective by the TTC, which creates inflexibility with the network’s infrastructure.

A Second Look at Alignment "S1"

Alignment "S1," which went along Progress Ave, had been written off because of the associated costs of an elevated structure all along Progress Ave between McCowan Rd and Markham Rd. Staff identified significant property impacts associated with alignment "S1" as well. If the elevated nature of the line is taken out by adopting an in-street LRT option, "S1" becomes a very cost-effective option, and should not require the substantial property acquisition that ICTS required. Reconstructing McCowan Station would be substantially cheaper by having McCowan (or Grangeway) as an at-grade stop, which is an option with LRT, instead of an elevated station, as demand projections drop sharply (by up to 5,500ppdph) east from Scarborough Centre Station.

Progress is a 27m right-of-way. If the centre traffic lanes are reserved for LRT and Progress is reduced to one lane in each direction for road traffic, minimal widening would be needed (for bike lanes, as Progress Ave is identified as a proposed bike lane route in the Toronto Bike Plan). If widening for maintaining 2 lanes for road traffic in each direction is determined to be necessary, the new width would be 36m, but given the network layout should be unnecessary between Markham Rd and Grangeway Ave. A width of 36m could be achieved by partial property acquisitions only impacting landscaped elements and parking, but some spots may be difficult, such as the Toyota Canada Main Campus property with respect to truck movement requirements.

It is important to draw this attention to alignment "S1" because it was identified as having the best coverage and the best pedestrian access to existing developments in the McCowan and Bellamy areas. It also best supports the objectives of Toronto City Planning and the Scarborough Centre Secondary Plan for transit-oriented development in these areas. If LRT makes this alignment cost-effective, the TTC should pursue alignment "S1" to support these objectives, as the objectives of City Planning and the TTC are mutually supportive of one another.

Metrolinx Support for At-Grade SRT Extension in Benefits Case Analysis

In a Benefits Case Analysis report that Metrolinx published on January 28, 2009, very strong supporting figures for an at-grade extension of the SRT, including a conversion of the existing line to LRT, known as "Option 4," was presented. "Option 4" uses alignment "S1." Metrolinx gave "Option 4" the lowest capital costs, operating costs, and incremental costs of any of the 4 options evaluated, while also having the highest net benefit value. Metrolinx highlights improved passenger connections and network accessibility as a qualitative user benefit that "Option 4" excelled in due to providing the largest walk-in catchment area, specifically citing increased pedestrian activity along the corridor being encouraged by more stations improving accessibility, which is attractive to residential and commercial developments along the corridor. "Option 4" had

the benefit of having the lowest visual and noise impacts, and promotes community-based development. "Option 4" also had the highest automobile cost savings and accident reductions, as well as the highest 2031 reduction in CO₂. "Option 4" had the highest Benefit-Cost Ratio, at an exceptionally high score of 2.4 (it is rare to hit 2.0 or higher).

TTC Staff Support Poorest-Scoring Alignment "S3"

What is curious now is that the TTC is proposing alignment "S3," which had the poorest ranking of all the options west of Centennial College. If it scored so poorly, why is it now being selected? "S3" scored the worst for pedestrian access to developments, worst for coverage, worst for supporting the secondary plan, worst for spurring transit-oriented development, and worst for environmental (but not community) impacts. As a line that would be elevated east from Bellamy Rd, it would also be more expensive to construct than an at-grade version of alignment "S1."

Comments

The Bellamy Station and relocated McCowan Station of alignment S1 provide the shortest walking distance to existing higher density development in the area. Walking distances are slightly longer with alignments S2 and S2 modified and the longest for alignment S3.

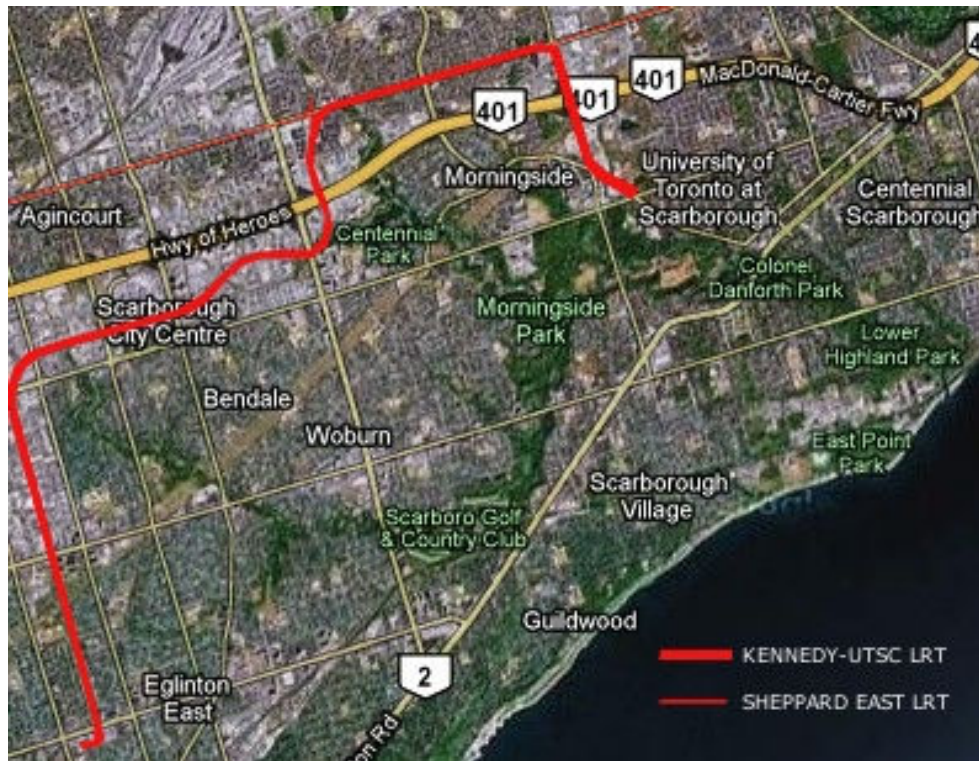
The proposed Bellamy Station and relocated McCowan Station of alignment S1 provides the best overall coverage within the Scarborough City Centre Secondary Plan area, and thereby provide the greatest support for City planning objectives and transit oriented development opportunities. S2 and S2 modified alignments can provide most of these benefits. S3, which pushes Bellamy Station further south, provides the least support of the alternative being considered.

S2 modified is the most preferred as it has the lowest impacts to the businesses along Progress Avenue and modest adverse effects to the natural environment. Although S3 has the potential to greatly impact Highland Creek, these impacts can be mitigated whereas the impacts to businesses along Progress (associated with S1) cannot be readily mitigated and therefore S1 is least preferred.

Alignment Comparison Comments from TTC 2009 Presentation Boards

TTC Proposal for Connecting to Sheppard East LRT

The TTC proposal for the Sheppard East LRT connection with the SRT is very lacking in versatility. The TTC proposes underground west-to-north and south-to-east curves that would serve no purpose at all outside of carhouse movements, and at great cost with an additional portal to/from Sheppard Ave E. If north-to-east and west-to-south curves were proposed instead, a direct one-seat route from Kennedy Station to University of Toronto Scarborough Campus would be feasible, and that could be particularly beneficial for the Pan-Am Games. This would be possible at substantially less cost than the TTC's proposal by having the connection at grade.

*Phasing and Bus Connections*

The bus terminal and passenger pick-up and drop-off is extremely wasteful when compared against available alternatives. If the SRT interlines with the Sheppard East LRT in the interim, then the SRT can make all the bus connections on its way to Sheppard/Meadowvale that it would have otherwise made with a terminal at Sheppard/Progress. This would be accomplished with fewer changes to the bus network as well, which would be beneficial for riders who are used to the current route structures. It would also avoid the huge costs associated with an interim bus terminal that will presumably be demolished when phase 2 of the SRT extension is complete. All-in, the TTC proposal for the Sheppard Ave terminal and interchange is \$200-million, one of the most expensive stations ever proposed.

Since neither McCowan nor Scarborough Centre have a passenger pick-up and drop-off facility, it should be completely unnecessary for the extension's interim terminus. With the LRT running at grade, there's no room for a passenger pick-up and drop-off anyway, and this cannot reasonably be used as justification for not proceeding with an at-grade option.

To accommodate the Sheppard East LRT's operating needs, part of the SRT line on the north side of Sheppard can be built and include east-to-north and south-to-west tracks for short-turning Sheppard East LRT runs to make room for the SRT's interim interlining. The different consist lengths between the Sheppard East LRT and the SRT (2 vs. 3) proposed by the TTC are addressed in the next section.

Capacities Requirements

2031 Demand Projections

The projected capacity requirement between Scarborough Centre and Kennedy stations is 10,000ppdph, but is less than half that, at 4,500ppdph, for the extension to Sheppard, and even less north of Sheppard. The demand warrants neither ATO nor an exclusive right-of-way on the extension.

Ridership

	Per Hour in Peak Direction (pphd)	Daily Total	Year
Existing Capacity	3,800		
Existing Demand - South to Kennedy	5,000	45,000	2009
Future Demand - South to Kennedy	10,000	90,000	2031
Future Demand - South to McCowan Station	4,500	40,000	2031

Chart from TTC Presentation (2009/2010)

Incremental Perspective

It is critical to approach the challenges of designing transit capacity appropriately based on the projected future demand on an incremental basis. The demands in 2021 will differ from those in 2031, and infrastructure for 2031 capacity need not be available in full as early as 2015, or even in 2021.

Compared Against Eglinton-Crosstown LRT

For comparison purposes, the Eglinton-Crosstown LRT is projected to carry a peak point, peak period demand of 5,400ppdph. The TTC can achieve a capacity of 5,200ppdph with 2-car consists even on the surface sections of the line, at a 3-minute headway. 5,400ppdph is the peak point projection of the Eglinton-Crosstown line, which would be in the underground part of the line near one of the YUS subway connections. It should be noted, if each car is assumed to carry 130 passengers, that demands above 5,200ppdph would require additional 2-car consists running in the underground central section for tighter headways to boost capacity, or would require moving to 3-car consists. Underground headways can be tighter than those on the surface due to the absence of traffic signals shared with road traffic. One strategy that can be effective is to run two branches that overlap in the middle exclusive right-of-way section of the route.

SRT Capacity Requirement Details from Scarborough Centre to Sheppard Ave E

The 2031 demand on the SRT extension is less than that of the Eglinton-Crosstown LRT. At 4,500ppdph, the SRT extension would only require a 3-minute 20-second headway with 2-car consists. 3-minute headways are tough to meet for in-street operation, and the TTC has had to implement special traffic management strategies at busier intersections on Eglinton as a result, although those strategies might not actually be necessary until after 2031 if the peak point demand on the line – in the underground section – is 5,400ppdph. 3-minute 20-second headways would not require such measures, as a 100-second signal cycle would comfortably accommodate that headway on a street like Progress, where certain turning prohibitions, if necessary, are very logical and reasonable due to the road network geometry in the area, and would affect an insignificant fraction of car drivers. Therefore, the 4,500ppdph projection is compatible with in-street operation using 2-car consists, and the capacity could be further increased to 7,000ppdph – if necessary, however unlikely – by adding a 3rd car to consists, and possibly more by tightening headways (but would likely require turning restrictions or other arrangements at Grangeway/Progress, Bellamy/Progress, and Markham/Progress). The TTC should be prepared to increase consist length to 3 cars beyond 2031, but this should not be necessary before 2031, and only provisions for easy construction of platform extensions at a future date should be necessary. This can save some capital costs for the first phase on both the existing line and the extension, and would not need to be addressed in full until well beyond 2013 when the development of the Metrolinx Investment Strategy is expected to be completed, presumably including new revenue-generating tools for funding capital and operating costs. This is why the incremental perspective is essential when approaching capacity challenges.

Automatic Train Operation

Capacity Impacts of ATO

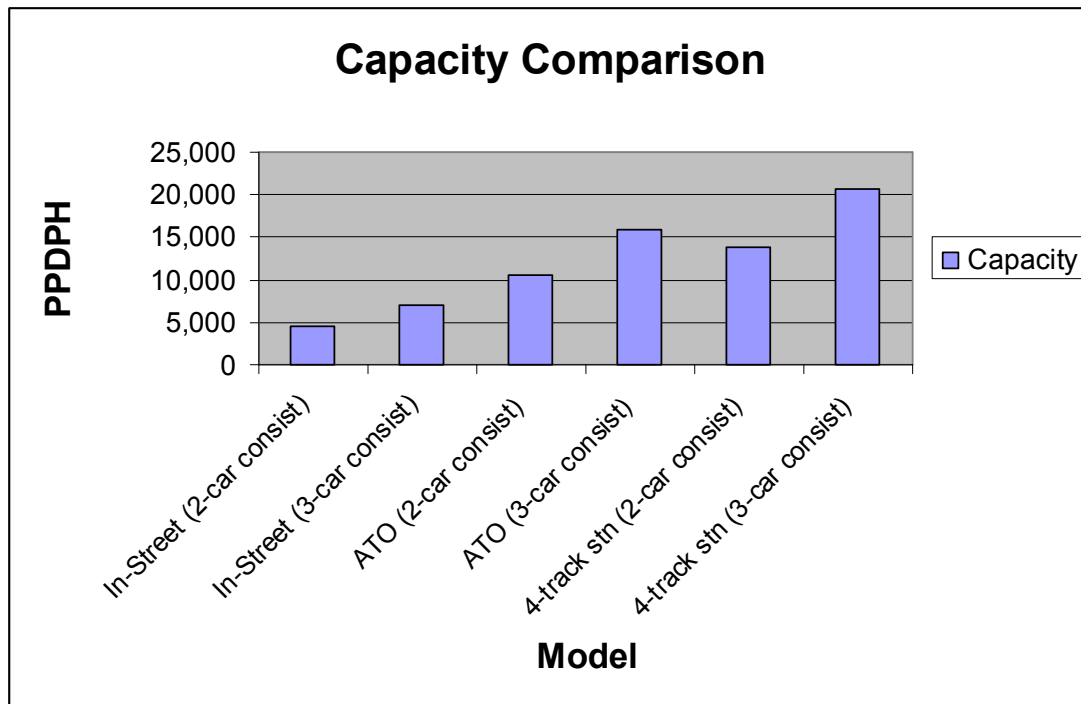
The TTC seeks ATO to be implemented on the SRT (both the existing line and the extension) to prepare for a projected 2031 peak demand of 10,000ppdph entering Kennedy Station. Staff say that they will not be able to meet the 2031 demand projections for the line without ATO as the headways will not be able to reliably keep up. This is true in the context of a strictly 2-track line continuously from end to end, and in that context ATO makes sense. However, this is not the only approach, and is not necessarily the best approach either.

Where the Demand Peaks and How to Accommodate it

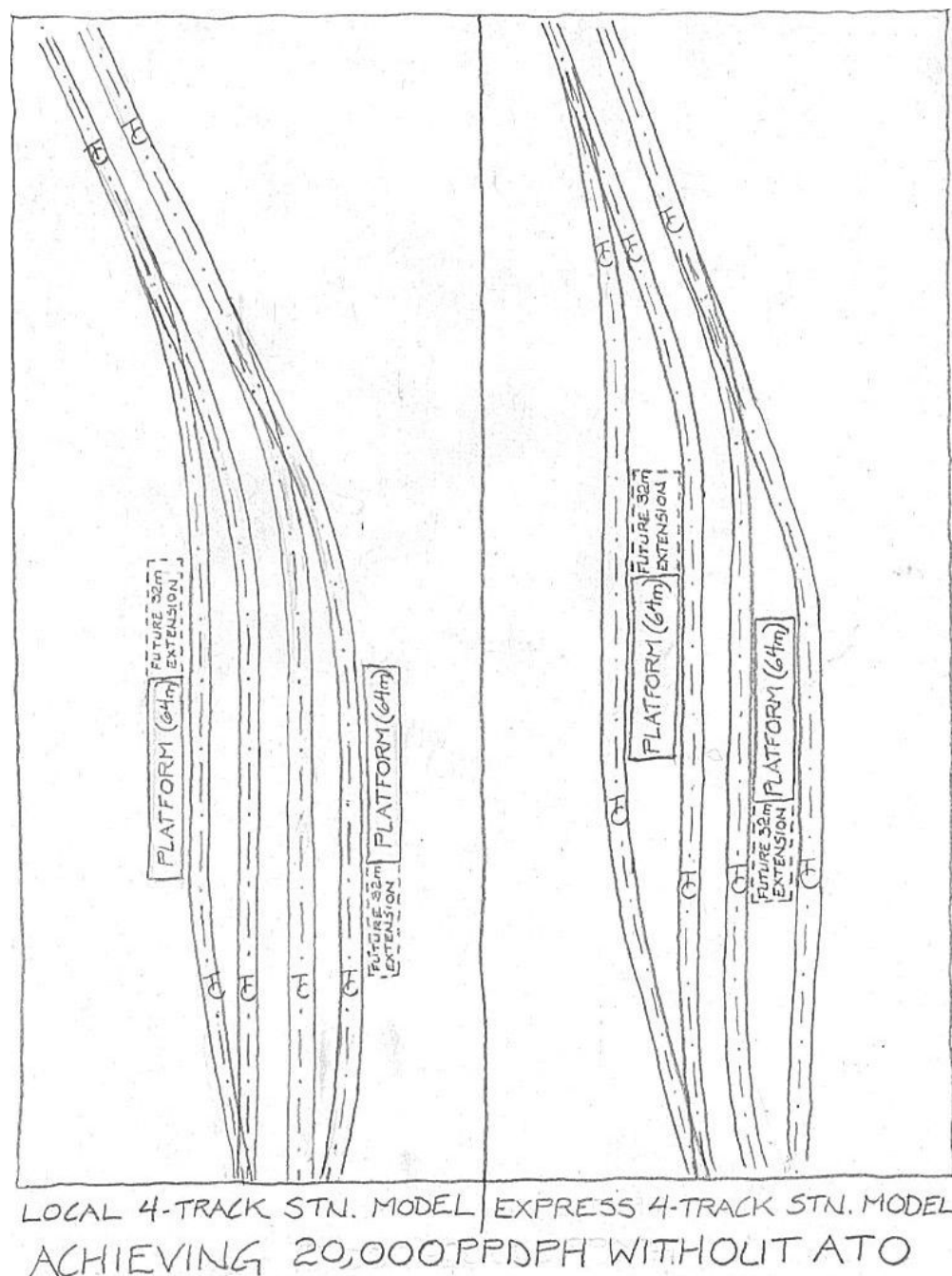
Worth noting is that the demand projections from Scarborough Centre to Kennedy are overwhelmingly only between those two stations, with little being added from the stations in-between. This means that there is a good argument for running two levels of service: One as express, one as local. If the stations are designed with 4 tracks instead of 2, but still only have 2 mainline tracks between stations, then the capacity of the line rises substantially because the impacts of dwell times are almost eliminated through allowing the next train to arrive (or overtake) while the train ahead of it is still in and/or departing the same station. There is an added benefit of passenger alarms activated on trains or mechanical problems with trains not impacting other trains on the line between (but excluding) Kennedy and Scarborough Centre. Compared to the cost of adding a tunnel through Malvern, this should certainly be a cheaper solution.

Ellesmere, Midland, and – when built – Brimley stations would likely not require platforms at the “express” tracks. Lawrence East may or may not, so island platforms need to be considered. Scarborough Centre would definitely require island platforms. Kennedy, as a loop and wye, will be able to handle the capacity, although the wye would ideally allow the north-side Eglinton-Crosstown track at Kennedy to become available for looping SRT runs in emergencies, which the TTC is including as a provision to protect for adding such a wye later.

These measures would increase the capacity of the Scarborough Centre to Kennedy segment of the line without requiring ATO, and to a higher capacity than ATO is capable of delivering with 2-track stations. With ATO and 2-track stations, the capacity is 16,000ppdph at a 1-minute 45-second headway with 3-car consists (10,600ppdph with 2-car consists). With 4-track stations, the capacity could exceed 20,000ppdph with 3-car consists (13,800ppdph with 2-car consists) without ATO, assuming a headway on each track at 2-minute 15-second headways at stations (effective net headway of 1-minute 8-second combined). This is not to suggest that a capacity of 20,000ppdph needs to be provided, it certainly won't be needed, but the network/system flexibility of this approach is superior by a significant margin, with ample room for any reasonable margin of error, and at reasonable cost.



It is important to consider the costs of the additional tracks at stations against the costs of the tunneled and elevated sections of the SRT extension, as well as that of the terminus facilities that interlining would make obsolete. The much-increased capacity of the existing line by 2-car consists facilitates easier interlining on the Sheppard East LRT without the need to extend Sheppard East platforms east of Progress Ave. The prospect of immediate interlining with the Eglinton-Crosstown upon its completion in 2018 becomes viable. The costs of extending the SRT station platforms would be possible to defer to a future date until demand warrants such extensions, and the “express” tracks could be deferred to a future date as well, so long as the space for them is reserved in the reconstruction of the existing line.



The fleet size required for the 4-track model and the ATO model should be relatively equal. If at all different, the 4-track model may require slightly fewer vehicles than the ATO model due to the function of many Scarborough Centre to Kennedy trips being handled by an express service that could require fewer vehicles to achieve the same headway that an all-local ATO service would as the speed of a round trip on the express service is faster and can save a consist or two, resulting in operations and maintenance savings.

Avoiding Parklands

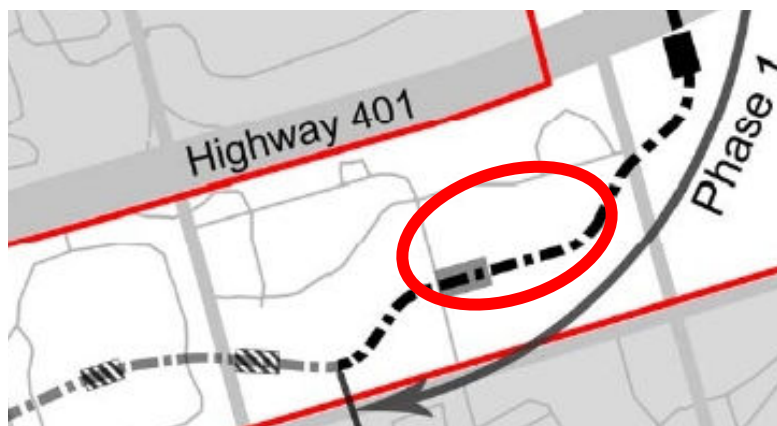
The staff argument of “avoiding parklands as much as possible” is not to be achieved at any cost, evident by the York University Busway running through parklands, and by the staff proposal for consuming the parklands in the southeast quadrant of the McLevin Ave and Tapscott Rd intersection with an elevated station, commuter parking, and a bus terminal; if parklands are that important, why not leave the line underground in Malvern? The TTC should at least be consistent.

The “park” above the proposed tunnel is in fact a preserved railway corridor: Preserved for the SRT rail line. This land has been reserved for the SRT for a long time, and there is no reasonable justification to tunnel beneath it given the other options available at substantially less cost while still meeting the needs of the communities as well as the needs of the SRT extension itself.

It is worth considering that residents are generally accepting of the presence of transit infrastructure if access to it for their use is convenient, which additional stops could address for low cost in an at-grade option for the old Canadian Northern Corridor.

Bellamy Yard

The TTC wishes to continue to protect the site of a Bellamy Yard for possible future fleet growth beyond 2031. This is prudent; however, it does not make sense for a potential future yard site to dictate the alignment of the SRT extension, as appears to be taking place.



TTC Proposed SRT Alignment By Future Bellamy Yard Site (Circled in Red)

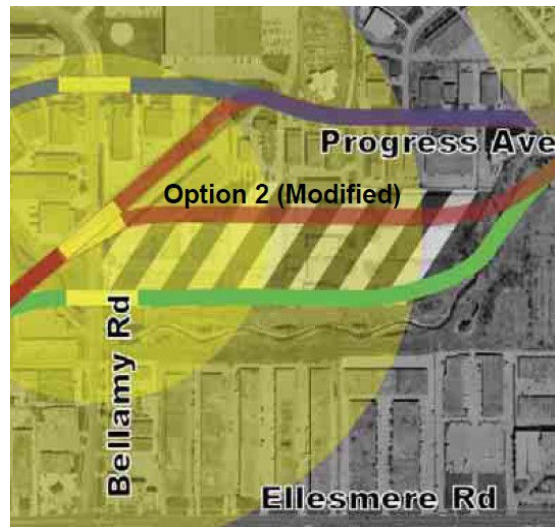
The TTC can continue to hold on to the property of the current eastern tail of the SRT east of McCowan Station even if it is not being used for anything. Assuming alignment “S1” were to go forward, as City Planning and the Scarborough Centre Secondary Plan would prefer, the lands of the existing east tail of the SRT could then be used as one of two access points to a future Bellamy Yard, with another coming down Bellamy from Progress, or – alternatively – coming in off the southwest quadrant of the Markham Rd and Progress Ave intersection. There is no need for the alignment to run immediately alongside a yard that isn’t going to be used for a couple of decades (if at all), particularly when such an alignment results in the worst evaluation scores, as appears to be the case with the SRT extension.

Bellamy Station

Bellamy Station has been removed from the immediate construction of the line and is instead being included as a provision only, despite the public feedback showing strong support for a Bellamy Station in the past public consultations; Bellamy Station was only added after the June 2008 public consultations, and now the TTC is renegeing on its commitment to public input. The reason for TTC deferring the construction of Bellamy Station is due to their moving Bellamy Station to an even more unattractive location in alignment “S3” than it previously had been with alignment “S2.” If alignment “S1” were to move forward instead, a Bellamy stop would certainly have to be included as that location is attractive.



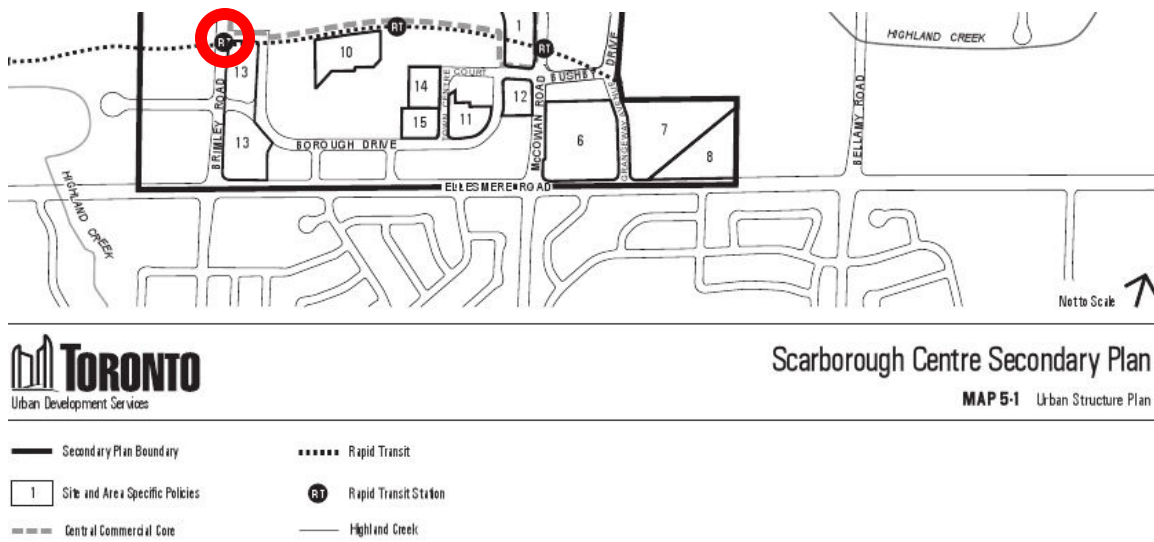
Overview of Past ICTS Alignments



Detailed Alignments at Bellamy Rd

Brimley Station – Still Uncommitted

The TTC still is not committing to the construction of a Brimley Station between Midland and Scarborough Centre stations, despite the position of City Planning and Transportation Services at the City of Toronto and the position of Scarborough Community Council, both of which have made their position clear since 2006. Logically, the best time to construct such a station is while the line is down for construction anyway. The TTC is requesting building permits being presented to them prior to making any commitment to construction of a station at Brimley Rd, a break from past recent practice, such as that of the TYSSE. Brimley Station is included on the City of Toronto Urban Development Services Scarborough Centre Secondary Plan Map 5-1: Urban Structure Plan, shown below. The Secondary Plan's Brimley Station is circled in red.



Ellesmere Station Surface Connection

Ellesmere Station has a poor connection with the 95 York Mills bus route, arguably the worst such connection in the TTC's rapid transit system. As the poorest performing rapid transit station in the system, the station must have the connection to the 95 York Mills bus improved substantially. The alternative would be to remove the station entirely, but that would require a change of TTC policy, or at least an exception granted by the Commissioners. The performance of Ellesmere Station must be improved, and an attractive feeder is one means, arguably the best means, of achieving that.

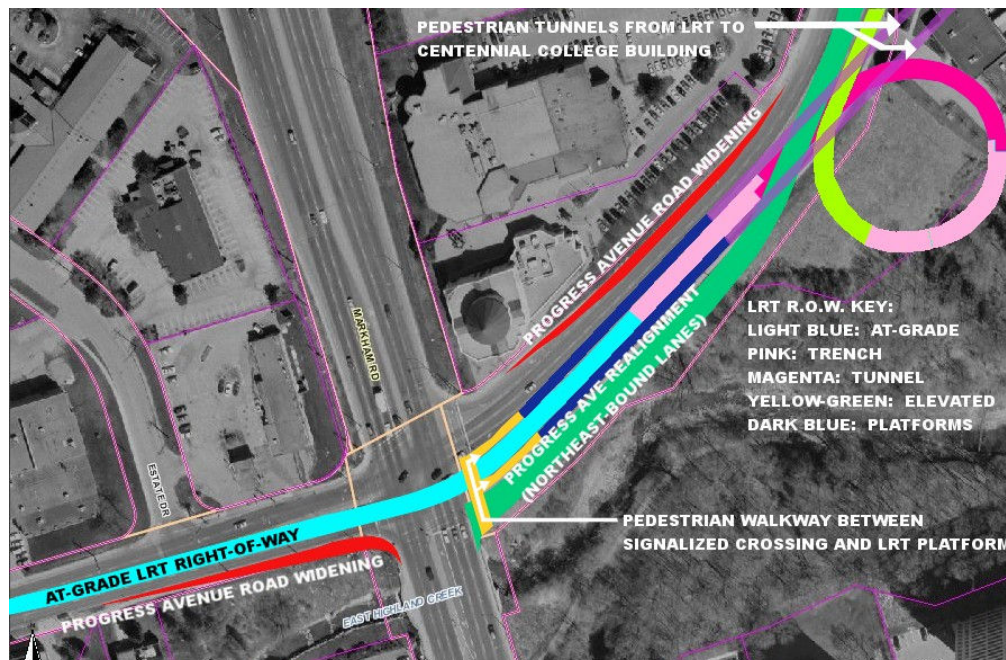
Markham Rd/Centennial College Progress Campus

Serving Markham Rd and Centennial College Simultaneously

There continues to be no stop at Markham Rd, and the TTC-proposed station at Centennial College is located too far from Markham Rd to be considered servicing both locations at the same time.

Progress Ave between Markham Rd and the Highway 401 on-ramp is extremely challenging, as most of the road is very steep, at a 6.5% grade, well exceeding the LRT maximum grade of 5.0%. The rise from Markham Rd to the Highway 401 on-ramp is estimated at around 24m over a 375m climb consistently at 6.5%, which likely exceeds the real conditions for which detailed data is not available for this document. At a grade of 5.0% over the same length, the difference in height would be around 5.5m. For the LRT to rise to the same height, it would need an additional 110m or so. Challenging as the site may be, unconventional approaches can turn it into an opportunity.

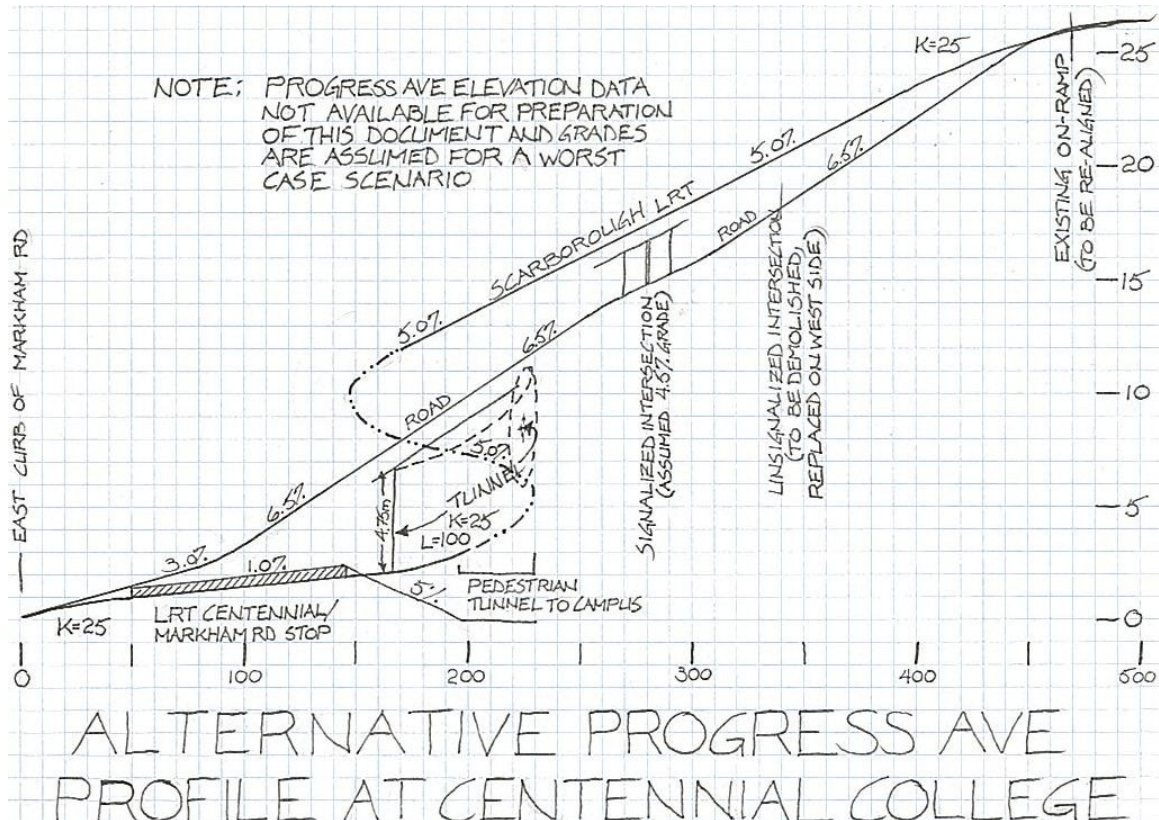
If the location for a stop was at the segment of straight road on Progress Ave immediately east of Markham Rd, which is about 100m long, then both the Centennial College campus and Markham Rd would be served by a single LRT stop. Assuming a near-flat grade for the stop, part of it would be at-grade while part would have the road rise around it. The northeast-bound lanes of Progress Ave would have to be realigned at this location to accommodate the platform area(s), but no buildings exist on the south side, and this part of the Progress Ave Corridor is unusually wide.



Colour-Coded Diagram of Alternative Through the Markham/Progress Area

Such a stop would, at first, appear to make an unfavourable situation worse, but is actually part of

the solution. Past the east end of the stop, the northeast-bound lanes of Progress Ave can pass overtop the LRT, and the LRT alignment can swing south of Progress Ave and do a 340-or-so degree curve with a radius of around 30m and a length of around 190m, at a grade of 5.0%. At the point where the LRT runs almost full-circle, along the east side of the road, the LRT should be about 4m higher, with 300m to the 401 to go. The difference over 300m between a rise at 6.5% and 5.0% is 4.5m, and Progress Ave becomes gentler momentarily at the traffic signal to the campus, which would see the LRT meet Progress Ave at the same elevation at the top by Highway 401.



The platform height relative to the road surface at the east end of the stop creates opportunities for grade-separated and sheltered access for pedestrians to the campus building(s) from the LRT, shown in purple in the image on the previous page, but needs to be designed carefully to maximize safety and security (good sightlines, good lighting, good acoustics, etc.).

An advantage with this option is the alignment switches to the east side of Progress Ave, which is beneficial north of Highway 401. However, south of Highway 401, it causes some complications for road access to the Centennial College campus. Because the LRT will be elevated, but would not be high enough for all types of vehicles to pass beneath it at the signalized intersection, at a height clearance estimated at about 2m, reconfigured road access to the campus would be required, a potential option for which is shown below. The non-signalized road access to the campus would

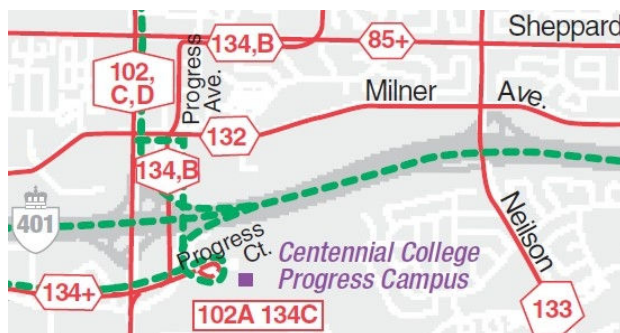
have to be closed, as no vehicles would fit beneath the LRT at that point. Access to the 401 would require reconfiguration as well, as the existing ramp would be cut off by the LRT.



Conceptual Road Reconfiguration for Centennial College and 401 Access

SRT Connections with 102 Markham Rd Bus Service

It should be highlighted that the connection that exists for the 102 Markham Rd bus branch “A” at Progress Ct on the Centennial College campus does not constitute a valid reason for not connecting with branches “C” and “D” of the same bus route at Markham Rd proper. This would be poor service connectivity and a disjointed network that is not attractive to inducing ridership on both the 102 Markham Rd bus route and the SRT extension alike. Given the fire that the TTC is under lately for poor customer service, such details for capital expansion projects are more important than ever. Having all branches of the 102 Markham Rd bus enter the campus is not a progressive solution either, as it would result in indirect travel along the route and reduce the attractiveness of the 102 for passengers not transferring to the SRT.



Current Centennial Service (102A, 134C terminus)



TTC Proposed Centennial SRT Stop

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Milner Ave

With the portal and associated grades removed from the alignment, a stop at the intersection of Milner Ave and Progress Ave can be added to the alignment to connect with the 132 Milner bus service and serve the businesses in the Milner Ave and Markham Rd area. The TTC had already planned to run the alignment on the east side of Progress Ave in this area, and the measures taken to accommodate that are assumed to be unchanged for the alternative proposed in this document, but with the LRT running at-grade and adding a stop at Milner, an example of which is shown below.



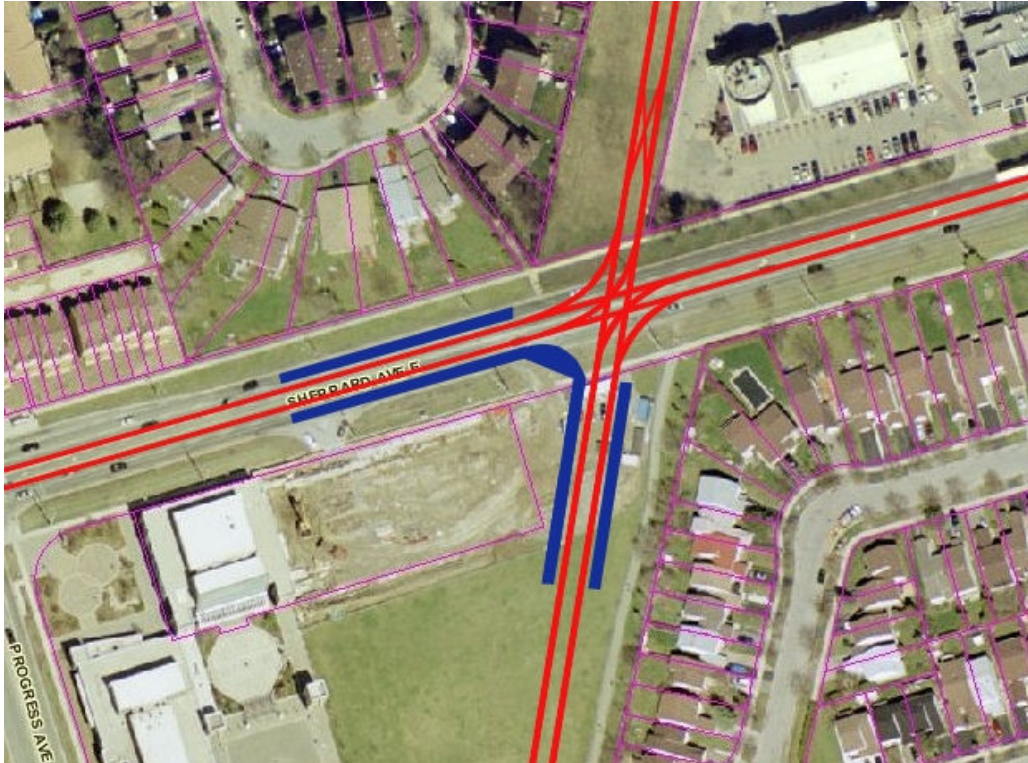
Conceptual At-Grade Milner Ave LRT Stop on Progress Ave

Sheppard Ave E

The SRT meets the Sheppard East LRT at Sheppard Ave E, just east of Progress Ave, on the east side of the Chinese Cultural Centre. While it is of course important to recognize that this is a complicated site, the TTC should consider revisiting their proposal.

The demand projection at this part of the line is far too low to warrant an exclusive right-of-way, and the provision for ATO is not a valid justification given the comparatively low-cost option of limited additional single-track-kilometres at stations along the existing line versus an extensively elevated and underground alignment.

The junction proposed by the TTC between the SRT and the Sheppard East LRT is poor value. The TTC is proposing west-to-north/south-to-east single-track curve between the two lines. Of all 4 quadrants, the northeast quadrant is likely the most useless. The junction should be composed of north-to-east and west-to-south curves, which would make for gentler curves since the two lines do not intersect at right angles. East-to-north and south-to-west tracks can also be provided to short-turn Sheppard East LRVs as necessary to accommodate the SRT's interlining in the interim.

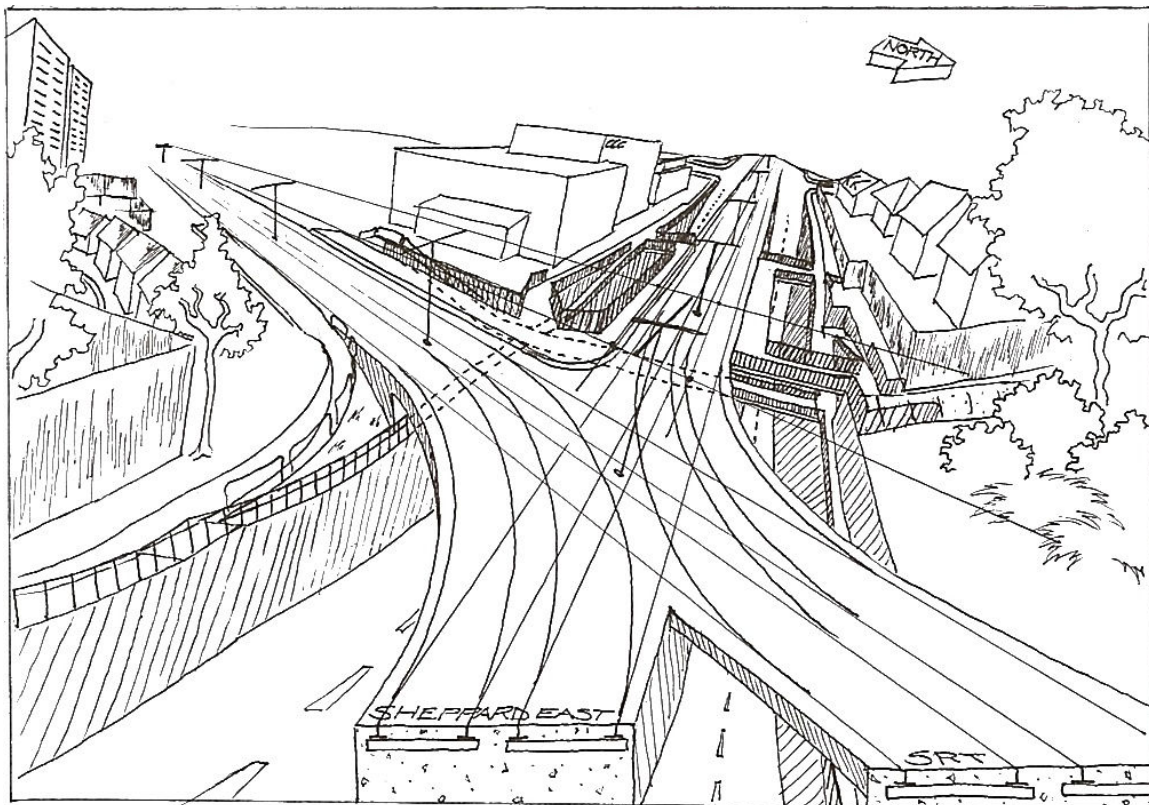


Conceptual Alternative Track and Platform Layout with North-to-East and West-to-South Curves

(See 3-D Sketch and Profile for Road/Rail/Pedestrian Relationships)

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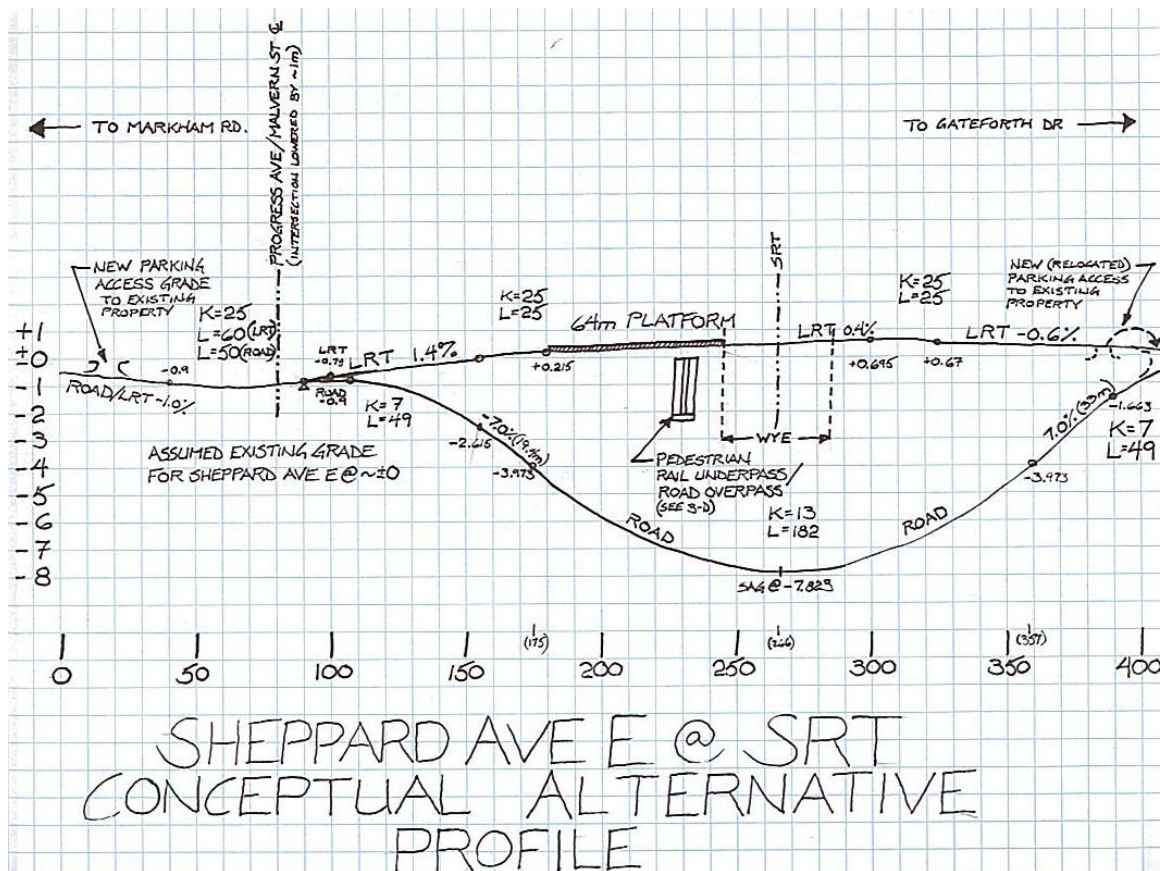
This junction should not be underground, and should not be composed of single-track curves. It makes no sense to invest the money for a portal along Sheppard to connect to the SRT purely for carhouse movements. This is a very inefficient and wasteful use of scarce capital taxpayer dollars. However, this doesn't necessarily mean that Sheppard's road traffic should not be grade-separated. It is worth noting that there are only two properties connecting to Sheppard between Progress Ave/Malvern St and Gateforth Dr. Both of these have already been proposed for expropriation by the TTC's current proposal, it should be noted. One is a parking lot for the Chinese Cultural Centre, which would have to be expropriated to run the SRT extension at grade. The other is a strip mall, which can remain if the SRT extension runs at grade and eliminates the need for an expensive interim 7-route bus terminal. Although it would not require expropriation, it would require having its access off Sheppard Ave E shifted slightly east if road traffic is grade-separated from the LRT traffic. There is an access to the strip mall's parking area off of Gateforth Dr. that would remain unaffected throughout the construction period.



3-D SKETCH OF SRT/SHEPPARD EAST LRT
ALTERNATIVE JUNCTION
N.T.S.



Key Plan for Profile (Below)





Approximate Scope of Sheppard Ave E Road/Rail Grade-Separation Shown in Orange

As illustrated in the images above and on the preceding page, if a slope begins along Sheppard Ave E a little west of Progress Ave/Malvern St, and includes re-grading small parts of Malvern St and Progress Ave while avoiding property impacts, Sheppard Ave E's road surface will be deep enough to have both the SRT pass overtop it, and have 60m platforms for the Sheppard East LRT above the road traffic west of the junction with the SRT. This would be a substantially less-expensive way to connect the two services, as mechanical vertical transportation is eliminated, the need for a closed fare-paid area is eliminated, and even the need for a bus terminal is eliminated, because the interim arrangement can have the SRT interline with the Sheppard East LRT to Meadowvale to connect with the various bus routes through the Malvern area. This avoids very expensive temporary facilities.

Crossings north of Sheppard Ave E

There are at least two crossings north of Sheppard that the SRT must traverse. These are Mammoth Hall Trail, and Greenspire Rd. It is possible to grade-separate these crossings, but it may not be necessary with the low demand projections and low traffic of these areas. A crossing arm could suffice.

Mammoth Hall Trail is difficult to grade-separate due to 2 factors: First is that the LRT cannot descend except for a small amount due to the presence of Highland Creek; Second is property impacts across the street from Malvern Jr. Public School and at the intersection with Gateforth Dr.

Greenspire Rd. is comparatively simple to grade-separate. With at-grade operation, the option of additional stops at such crossings becomes both physically and financially feasible, and would boost the ridership on the line.

Revisiting the Terminus

The terminus proposed at Tapscott Rd and McLevin Ave was not the best place for the line to run, but was the only place the space-inefficient ICTS facilities could have fit, including a bus terminal. Good planning, as well as the position of Scarborough Community Council expressed in 2006, would rather the line go to the intersection of Neilson Rd and Tapscott/Sewells Rd.

There is no need for a bus terminal at the end of the line, as there is no need for a fare-controlled area. This can allow the SRT extension to run down Tapscott Rd to Neilson Rd, in the very heart of the Malvern community.

The only real challenge for running down Tapscott Rd is re-entering the road network from the old Canadian Northern Corridor, which may best be achieved by lowering only the eastbound McLevin Ave lanes and allowing the LRT to pass over those to enter the middle of McLevin Ave, and then turn onto Tapscott Rd.

Obsolescence of the Tunnel

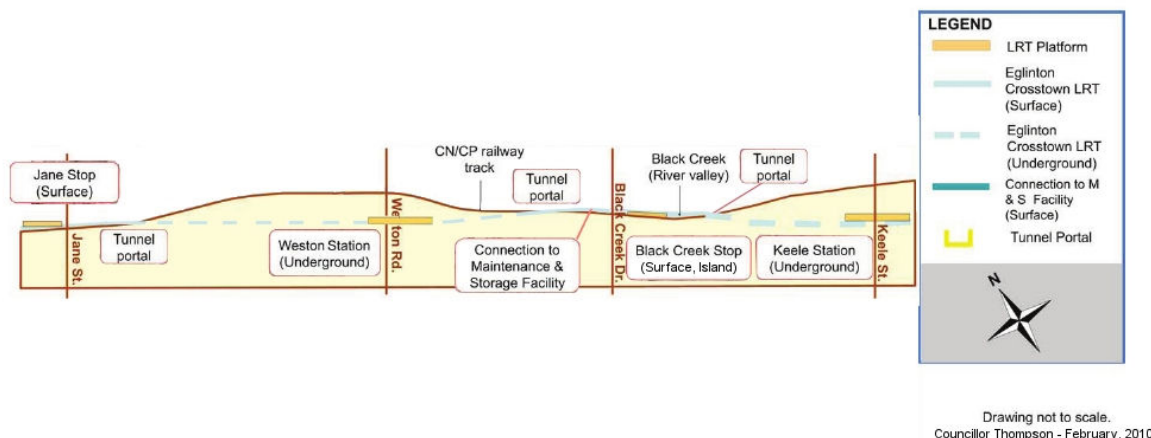
The tunnel could only reasonable be argued as necessary for the ICTS technology. With the LRT conversion, issues of noise and vibration are overwhelmingly reduced compared to ICTS, thereby removing justification for a tunnel. There are more options available with LRT, but some of these options have yet to be evaluated. LRT can save an enormous amount of capital dollars by running at-grade at Sheppard, an option that has never been evaluated.

No at-grade option has been evaluated, with ATO used as the justification by the TTC. As this document has proven, ATO is unnecessary to meet the SRT's long-term demand projections, and that the alternative without ATO can in fact exceed that of the line with ATO. The tunnel through Malvern, and all its associated capital costs, is obsolete, and it would be irresponsible to spend the capital dollars on such a tunnel. Any privacy concerns can be addressed with a slight recess if necessary, depending on sightlines to private properties. The option to grade-separate the LRT at Sheppard Ave E from road traffic is still an available option if necessary, as previously illustrated.

Cost savings and applications

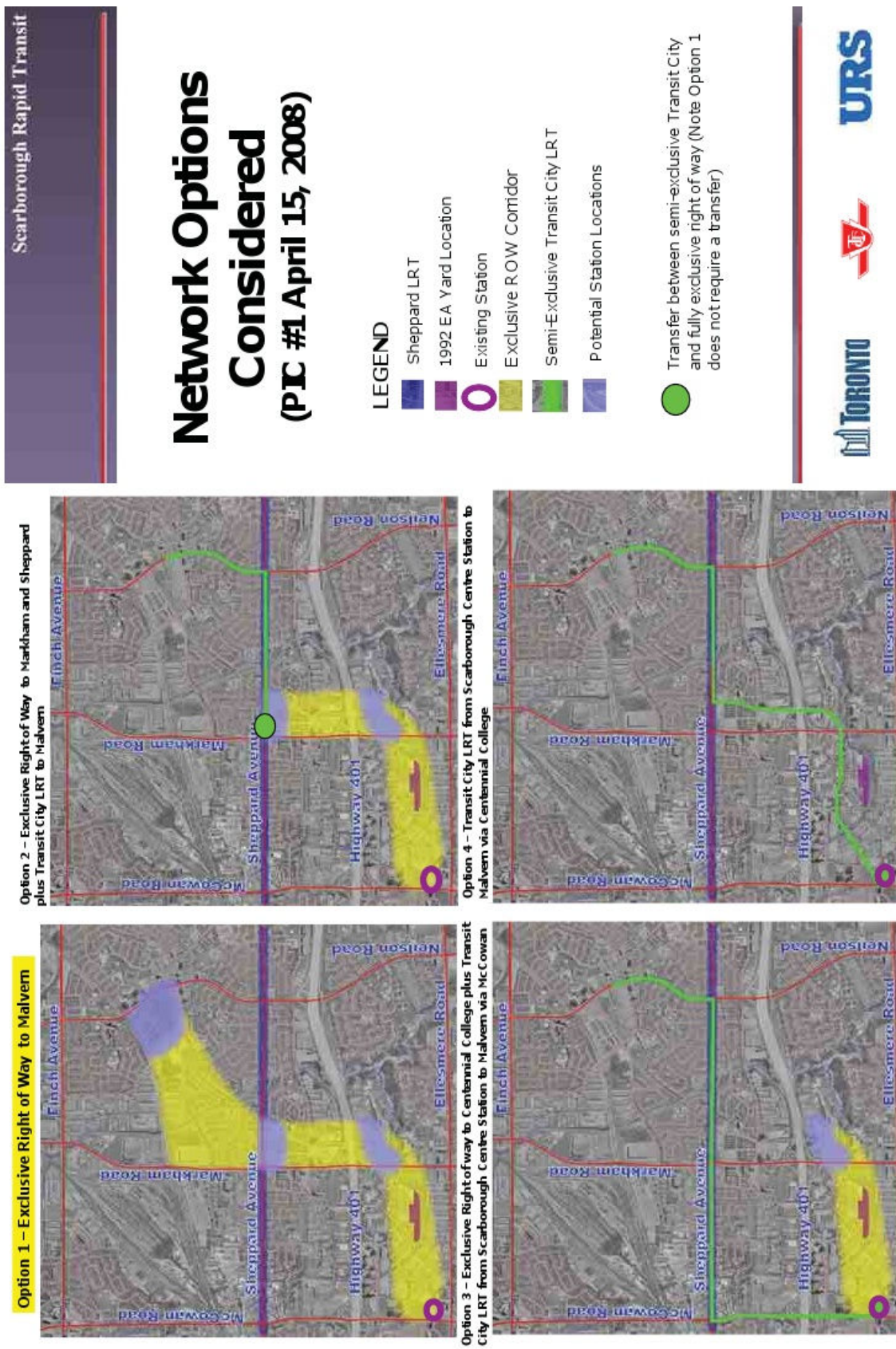
There is an opportunity to save hundreds of millions of dollars while at the same time providing better service more aligned with city planning and the Scarborough Centre Secondary Plan. The savings achieved by avoiding the tunnel could be put towards the Mount Dennis area of the Eglinton-Crosstown LRT, where there actually is a valid justification for going underground. The savings could also be put towards the construction of a station at Brimley Rd.

Conceptual Alternative Alignment – Keele Street to Jane Street



APPENDIX 1

ALIGNMENTS EVALUATED BY TTC IN PAST PUBLIC CONSULTATION



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Scarborough Town Centre Light Rail Transit Feasibility Study



The Metropolitan Toronto Planning Department and the Toronto Transit Commission

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