OPTION B: SUBWAY EXTENSION

1. ECONOMIC & FISCAL MANAGEMENT

1.1. Delivery Model Considerations: Subway Versus LRT in Median

The economic recovery remains fragile. Fiscal prudence requires governments to maintain a focus on **job creation, economic growth and long term sustainability of its programs**. The Provincial plan to spend $8.4 billion in Toronto on street level transit without first examining the benefits of leveraging willing private sector capital, innovation and expertise is doubtful fiscal management at the best of times. Given Ontario's precarious economic and fiscal situation - lagging economic growth and the largest deficit relative to GDP of any province (Drummond Report) – it is reckless fiscal management to simply ignore alternative delivery models, such as P3 procurement. This is especially true when considering:

- **Ontario Pension Plans Investing Offshore** - Ontario Pension Plans and private equity managers are clamouring for local investment opportunities and being forced to invest and create economic growth and jobs abroad;
- **Need to Borrow, Raise Taxes or Cut Services To Deliver on $8.4 billion** – the Province will have to borrow, raise taxes or cut services elsewhere to fund the $8.4 billion plan using traditional public sector procurement approaches. Spending caps and credit rating impacts will affect timelines;
- **Higher Capital Cost Structure** - TTC's capital cost estimates are significantly higher than other Canadian and global cities;
- **Local Businesses Will Be Hurt**- LRT construction will hurt local businesses, costing many their jobs and livelihood and potentially subjecting the Province and City to costly litigation processes;
- **Regional and Family Transportation Savings Will Lost** - the LRT plan relative to subway will negatively impact traffic flow, congestion and air pollutants in the corridor relative to the subway plan with higher overall transportation operating costs for regions and families (road costs, vehicle costs, collisions); and
- **Limited Economic Development Potential of LRTs** - economic development associated with the LRT plan will be extremely limited due to the poorer quality of the transit service relative to subway - travel time, station length, exposure to the elements, connection to major employment centres, decrease in transit choice, and transit connectivity with GO and Scarborough Bus Terminal

SUBWAY PLAN

The Sheppard Subway plan out performs the LRT Plan in terms of economic and fiscal management. The Subway Plan incorporates proven project management, capital financing and technological advancements that will attract international attention and investors to Toronto. It will result in robust capital and risk pricing, detailed consideration of life-cycle costs, consistent on-time delivery schedules, contractual discipline and potential for partners to subsidize construction costs.

BC used $250 million to leverage 87% of the costs of the Vancouver line, including $450 million from the Federal Government. Ontario's $8.4 billion is leveraging less than 4% from Federal Government ($333m) with no other identified partners.

Alberta is funding transit expansion by returning the education portion of the property tax to Calgary.

1.2. Operating Costs (Responsibility of the City) Considerations: Subway/Underground Versus LRT in Median

The Subway Plan outperforms the above ground LRT plan in terms of operating costs. It is reckless fiscal management to ignore the long term operating costs of technology alternatives in transit decisions; especially when operating costs in this debate are the responsibility of the City. Council needs to see a full accounting of operating costs. According to American Public Transportation Association data (APTA) LRT has higher operating costs per passenger-mile than other forms of transit

The decision to move the Eglinton Crosstown route to LRT above ground east of Laird running in a median will cost the City/TTC upwards of an additional $15-$20 million annually in operating costs.

To fund these additional costs (associated with removing fully automated underground operations from the LRT plan) Toronto will have to increase fares, increase taxes or cut services elsewhere in the City.

1.4. Long Term Cost-Effectiveness/Life-Cycle Costs Considerations: Subway Plan Versus LRT in Median

The Subway Plan outperforms the LRT plan in terms of cost-effectiveness over the long run. Life cycle cost benefits argued to capture federal dollars for the Spadina subway extension concluded that that the overall benefits of this investment would exceed the cost of the subway ($2.1 billion) by $522 million (at a 10% discount rate).

> **"*Subway extension necessitates large up-front capital costs in the early years (2007-2015) while the economic benefits of the project accruing in the form of congestion management, affordable mobility and economic development manifest over a longer period of time."*** Source: Building Canada Fund Application for Toronto-York Spadina Subway Extension (version 7.5)

RIDERSHIP	SUBWAY	LRT
Life-Cycle Costs/Benefits	✓ **Subway** $555 million positive benefits (Spadina proxy)	**LRT** According to American Public Transportation Association data (APTA) LRT has higher operating costs per passenger-mile than other forms of transit

Holding storage, vehicles and property acquisition costs constant, the higher capital costs of the subway would be recovered from operating savings in less than 21 years, after which there would be significant cost savings to the project (based on most recent capital and operating costs available for subway from Yonge Street to Scarborough Centre).

Contributing to the Subway's superior cost-effectiveness performance versus LRT are the following factors:

Transit-Specific Savings

• **Transit Vehicle Costs**	$2.8 million per unit for subway; $5.3 million for LRT	✓ **Subway Better**
• **Design Life**	40-45 years design life (before replacement) for subway vehicles; 25-30 years LRT	✓ **Subway Better**
• **Travel Time**	10 minute saving for subway; 4 minutes for LRT	✓ **Subway Better**
• **Ridership**	>27 million annual riders for subway; 17 million for LRT	✓ **Subway Better**
• **Reliability**	Unimpeded flow for subway; intersections/traffic/collision to navigate LRT	✓ **Subway Better**
• **Transit Collisions with Traffic**	Nil for Subway; significant LRT	✓ **Subway Better**

Wider Transportation Savings

• **Auto Savings**	Greater highway/road savings for subways - more people out of cars; Lower highway/road savings for LRT	✓ **Subway Better**
• **Traffic Flow**	Improve traffic flow and reduce bottlenecks for subway; Interfere with traffic flow and increase bottlenecks especially during construction LRT	✓ **Subway Better**
• **Peak-Period Congestion**	Reduce Peak Period Congestion subway; increase peak period congestion LRT (Traffic is capacity currently)	✓ **Subway Better**
• **Auto Operating Savings**	Greater auto vehicle savings (people out of cars) for subway; Minimal (local transit) for LRT	✓ **Subway Better**
• **Auto Collision Savings**	150 fewer collisions per year for subway; no data available for LRT	✓ **Subway Better**
• **Family Income Savings**	More people out of cars/fewer need for car/second car subway; Minimal (local transit/serve captive transit) for LRT	✓ **Subway Better**

Environment and Health Savings

• **Air Pollutants GHGs**	Less air pollutants/GHGs for subways; much higher for LRT	✓ **Subway Better**
• **Health and Health System Costs**	Fewer adverse health risks (associated with air quality) for subway; higher for LRT	✓ **Subway Better**

Density and Intensification

• **Attracting Investment**	Greater with subway; less with LRT	✓ **Subway Better**
• **Urban Amenity Optimization**	According to (APTA the more development in the transit corridor the more cost-effective the technology will be (i.e. less development investment = less cost-effective	✓ **Subway Better**

CALGARY LRT COLLISIONS

(serving a small population of 1 million)

Five multi-million dollar vehicles were retired by the City between 2002 and 2009 due to collisions with moving and stationary vehicles.

2002 LRT destroyed due to collision with a truck (retired)
2007 LRT damaged when it collided with a flatbed truck (retired)
2007 LRT damaged when collided with a vehicle (retired, later repaired)
2008 LRT damaged when it hit a crane in median (retired, later repaired)
2009 LRT damaged when it hit a backhoe used in construction (retired)

EDMONTON LRT CONTROVERSY

(serving population of half a million)

The LRT plan in Edmonton has been under attack by residents for a lack of vision guiding expansion. Chief among the criticisms has been a lack of co-ordination between transit development, planning goals of the City (intensification around transit nodes/transit-oriented development), integration with regional transportation nodes, and fears that the Council may change its mind with respect to plans to put LRT underground and put the line above ground through communities

"For Champion, the president of the Central McDougall community league, the route is unacceptable. Not only would it divide his community and destroy more than a hundred units of affordable housing, it would also, he says, destroy green space and discourage new infill development ...

"The city is now following the path of greatest destruction," says Lorne Billingsley-Smith, a property owner whose office and warehouse building would need to be demolished under the current planned route".

Source: The Edmonton Journal

1.5. Environmental Costs: Subway Plan Versus LRT in Median

Toronto's Climate Change, Clean Air & Sustainable Energy Action Plan adopted by City Council calls for an 80% reduction in air emissions, from all sectors in Toronto, by 2050 .

> "[This] will require many innovative and large scale changes to be accepted as by the major contributors – people who drive, people who use electricity and people who use natural gas to heat water and buildings, and people who create waste – in other words all of us as individuals. Industry contributes less than 4% of the criteria air contaminants released in Toronto and only 8% of the Greenhouse Gasses (GHG) attributable to Toronto (the difference between 4% and 8% is due to the consumption of electricity produced beyond the city limits)."

The Subway Plan outperforms the LRT Plan in every environmental category (1992 Sheppard Subway Environmental Assessment). LRT will provide limited benefit in terms of air emissions reductions compared with subway for the corridor, and may increase GHGs associated with automobile congestion. Both LRT and subway will reduce GHGs associated with fewer buses in the corridor.

ENIRONMENTAL FACTORS	SUBWAY	LRT
Climate Change Action Plan Climate Change, Clean Air & Sustainable Energy Action Plan calls for an 80% reduction in air emissions, as from all sectors in Toronto, by 2050	✓Subway Better Positive impact on improving greenhouse gas reductions, assisting Toronto to emissions reduction target by 2050	LRT Limited – Negative Limited impact on greenhouse gas emissions. May actually increase, through increased congestion on Sheppard Avenue
Air Pollutants and Greenhouse Gas Reductions (GHG Reductions per kilometer/vehicles off road)	✓Subway Better 4,323/3,514	LRT Lower Reductions 2,538/1,923
Noise Levels (0.5 dBA leq over ambient)	✓Subway Better 0	LRT More Noise 402
Visual Impacts	✓ Subway Better None	LRT More Visual Moderate

Traffic Is Already At Capacity for 9 Intersections in Sheppard Corridor

Source: 2008 EA

1.6. Construction and Community Impact: Subway Plan Versus LRT in Median

The Subway Plan outperforms the LRT plan in terms of limiting impact for traffic and to business owners during construction. LRT construction above ground from Consumers Road (tunnelled from Don Mills Under 404) will significantly impact local businesses in the corridor, costing many their jobs and livelihood.

In addition to a reduction in auto vehicle lanes, LRT in medians will block intersections creating further challenging driving conditions along the corridor and adding to travel time for local residents and commercial auto users entering Sheppard Avenue.

Traffic Is Already At Capacity for 9 Intersections in Sheppard Corridor
2008 LRT Environmental Assessment

The 2008 LRT Environmental Assessment undertook an examination of present traffic flow in the Sheppard corridor, examining signalized intersections. Signalized intersections are the "pinch-points" for traffic flow and, therefore, their operation defines the level of traffic congestion (typically called the "level of service") on that segment of the roadway.

The analysis concluded that the most significantly congested section of Sheppard Avenue in the study area is between **Don Mills Road and Brian Drive**, where the volume of traffic in at least one of the peak hours (a.m. or p.m.) is **equal to the capacity of the intersections to accommodate** it. Other intersections where the current volume of traffic is roughly **equal to the capacity of the intersection** are:

- Pharmacy (P.M),
- Warden (P.M.),
- Birchmount (A.M. and P.M.),
- Kennedy (P.M.),
- Agincourt GO Station (P.M.),
- Midland (A.M.), Markham (A.M. and P.M.),
- Neilson (A.M.),
- Morningside (A.M. and P.M.)

Community Impact Data: 1992 Environmental Assessment

The Subway Plan outperforms the LRT plan in terms of limiting community impact. Many community impact factors were not considered by the 2008 Environmental Assessment for the LRT. To get a comparison (proxy of relative differences), the 1992 Environmental Assessment was used.

COMMUNITY IMPACT	SUBWAY	LRT	SUBWAY VS LRT
Residential Units Displaced During Construction	3	502	✓ **Subway Better**
Jobs Displaced During Construction	0	300	✓ **Subway Better**
Community Facilities/Services Displaced	0	2	✓ **Subway Better**
Impact on Pedestrian Movement	None	High	✓ **Subway Better**
Full Partial Residential Property Required for ROW Acquisition	3/0	308/102	✓ **Subway Better**
Full Partial Commercial Property Required for ROW Acquisition	1 /4	23/66	✓ **Subway Better**
Heritage Resources Impacted	1	9	✓ **Subway Better**
Archaeological Resources Impacted	0	6	✓ **Subway Better**
Driveways with access restricted	0	250	✓ **Subway Better**
Signalized intersections affected	0	32	✓ **Subway Better**
Intersections with access restricted	0	21	✓ **Subway Better**

Cultural Heritage Features Located within Sheppard East Study Area:
Knox United Church and Cemetery

1.7. Economic Development Considerations: Subway Plan Versus LRT in Median

The Subway Plan outperforms the LRT plan in terms of economic output, job creation and business sales. The Subway Plan will provide **a total economic impact** of $3.8 billion compared to $1.6 billion for LRT, generate more than 22,800 person-years of direct and indirect employment compared with 9,500 for LRT, and increase business sales by $7.2 billion compared to $3.0 billion for LRT

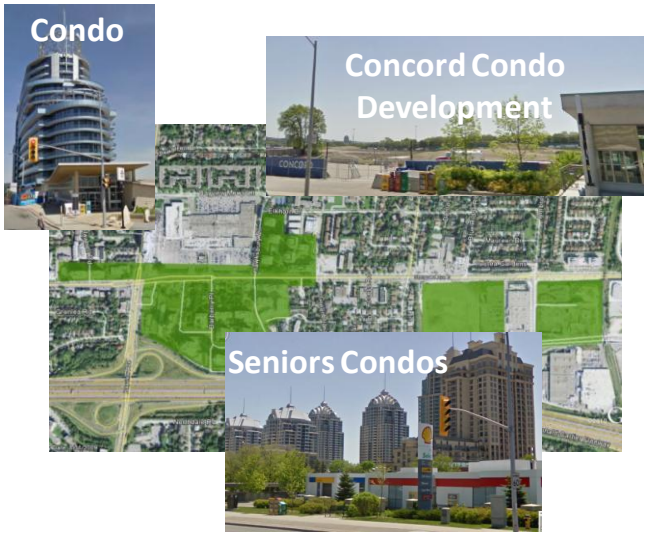
Economic Indicators	Subway	LRT
Economic Output (billions)	$3.8 billion	$1.6 billion
Employment (person-years)	22,8000	9,500
Business Sales (billions)	$7.2 billion	$3.0 billion

Multipiliers: Ottawa Light Rail Plan, American Public Transit Association

1.8. Development Uplift: Subway Plan Versus LRT in Median

The Subway Plan outperforms the LRT Plan in terms of economic uplift (residential/commercial development along the corridor). Subway stations are seen as a premium by developers, whereas LRT stops are not. On the ground in Toronto today developers are building neighborhoods with 18 times (approx) the density on new subways compared to new LRT.

Sheppard Avenue Subway: Bayview & Leslie



Gunns Loop: End of St Clair LRT

Development investment near the Sheppard Subway is worth more than twice the cost of the project itself. More than $2 billion in new construction investment has been generated by the construction of the subway (which cost approximately $1 billion, from Yonge to Don Mills). Research in Support of Yonge North Subway Extension Benefits Case Analysis completed by Metrolinx further confirmed this concluding: subway projects across North America have resulted in greater value uplift, for residential, commercial and industrial development compared with LRT. There is generally more retail development with LRT.

1.9. Optimizing Urban Amenities Through Intensification: Subway Plan Versus LRT in Median

The Subway Plan outperforms the LRT Plan in terms of urban amenity optimization. Promoting higher densities at key locations ensures transit infrastructure and other urban amenities are viable and optimized. According to American Public Transportation Association data (APTA) the more development in the transit corridor the more cost-effective the technology will be (i.e. less development investment = less cost-effective)

AMENITIES	SUBWAY	LRT
Urban Amenity Optimization	✓ **Subway Better** Intensification at subway stations higher in Toronto and across North America	**LRT Limited** Limit intensification at stops along Avenue.

1.10. City and Provincial Planning Goals: Subway Plan Versus LRT in Median

The Subway Plan outperforms the LRT Plan in terms of alignment with City and Provincial planning goals with respect to City-building, i.e. encouraging intensification in the major centres and abutting or adjacent to rapid transit stations. **The Official Plan** states "*growth will be directed to the Centres, Avenues, Employment Districts and the Downtown*"**.** The **Provincial Growth Plan** requires municipalities to develop and implement policies to phase in and achieve intensification, including intensification corridors and **major transit station areas** as a key focus for development.

Toronto Official Plan

In the Official Plan, the Centres are Scarborough, North York, Etobicoke, Yonge and Eglinton:

"*Four key location on the rapid transit system, shown as Centres on Map 2, play an important role in how we manage growth. The Scarborough, North York, Etobicoke and Yonge Eglinton Centres are places with excellent transit accessibility where jobs, housing and services will be concentrated in dynamic mixed use setting with different levels of activity and intensity … substantial past investment in transit and other infrastructure in these Centres has made it possible to accommodate economic growth*" (pages 2-12 – 2-14)

LRT Plan ignores Centre objectives of the Official Plan

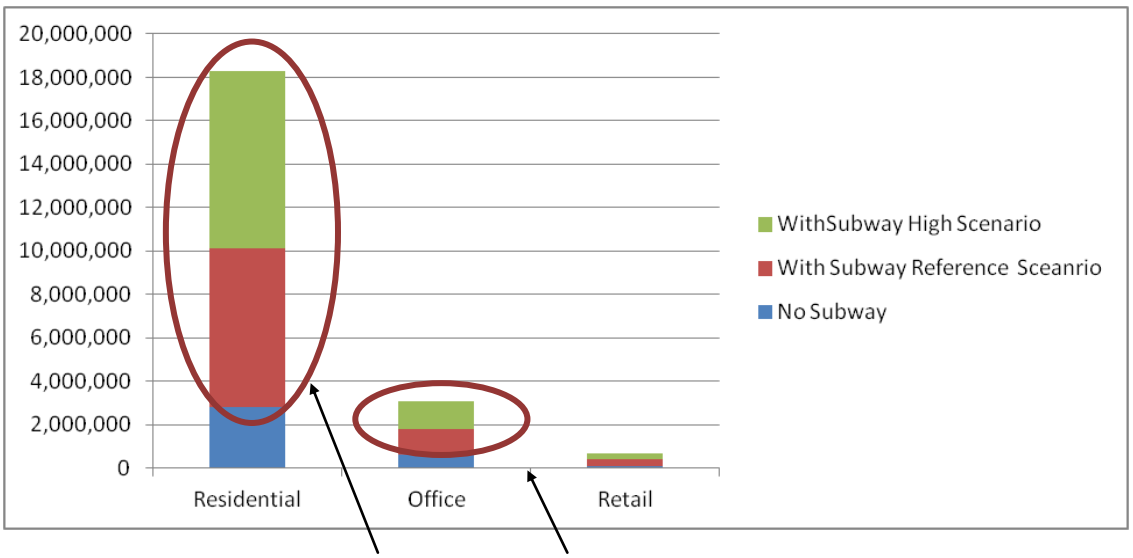
CITY BUILDING	SUBWAY	LRT
Toronto Official Plan	✓ **Subway Better** Provide enormous opportunity to support intensification at Stations, Centres , Employment Areas and modest intensification along Sheppard Avenue .	**LRT Limited** Does not meet requirements of Official Plan. Limited focus on "Avenues". By-passes Centres - where people and jobs are concentrated
Provincial Growth Plan	✓ **Subway Better** Provide enormous opportunity to support intensification at the Major Centres and at stations	**LRT Limited** Limit intensification at stops along Avenue. No direct connection to major employment and retail centre

1.11. Capturing GTA Growth: Subway Versus LRT in Median

The Subway Plan outperforms the LRT Plan in terms of being able to capture the estimate 6 million people that will move to the GTA over the next 50 years. **Toronto is losing out to York Region and Markham's** planning focus on higher densities abutting or adjacent to rapid transit stations.

The Subway Plan offers the greatest potential in the City to reverse this trend. N. Barry Lyon Consulting developed forecasts of residential, commercial, retail and industrial **value uplift** between 2012 and 2062 for Sheppard-Eglinton corridor near stations. The main findings from this analysis include 8,761,207 – 9,736,668 sq meters new growth, in 800 metre zones around stations (capturing roughly 50,000 to 60,000 units of high-rise growth that would have otherwise occurred elsewhere in the GTA) and $159.5 billion - $171.3 billion CVA (current value assessment) within the zone around stations, with inflation (1.5%).

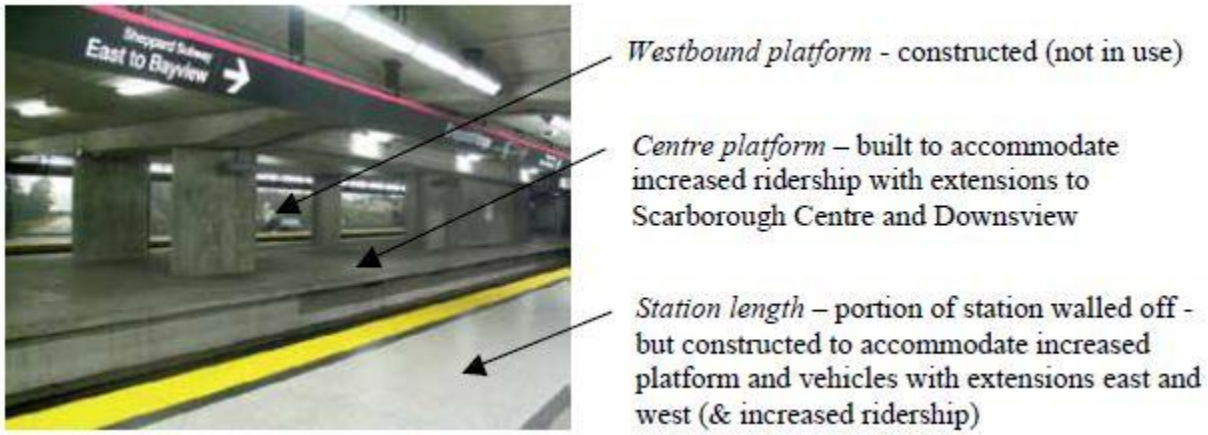
Development Potential (sq m) Around Stations With Subway by 2062



Growth With Subway Projected

1.12. Recouping Sunk Costs: Subway Versus LRT in Median

Hundreds of millions of dollars (in 2011 dollars) was invested by all three levels of government (City/Metro Toronto, TTC, Province and Federal) between 1980 and 2007 on the Sheppard Subway extensions (east and west) compared to $35 million for the LRT plan. This includes a lengthy tail track of 835 meters west of Yonge Street, connecting Wye tracks on the south west side of Yonge Street to tail track to "accommodate future westbound extension", stations and platform design, placement and construction (five stations) to support both east and west extensions, and higher commuter traffic and longer trains as predicted by ridership forecasts associated with extension of the line to Scarborough Centre, rapid transit studies, development of functional specifications/preliminary designs, technology investigations, comparative studies, environmental assessment and approvals, financial analyses and plans, implementation of development charges and negotiations of funding agreements, Official plan studies and amendments; and other staff/officials time devoted to the project. The majority of these sunk costs can be recouped with the completion of the design and construction work for the Sheppard Subway extension.



2. TRANSIT AND NETWORK CONNECTIVITY CONSIDERATIONS

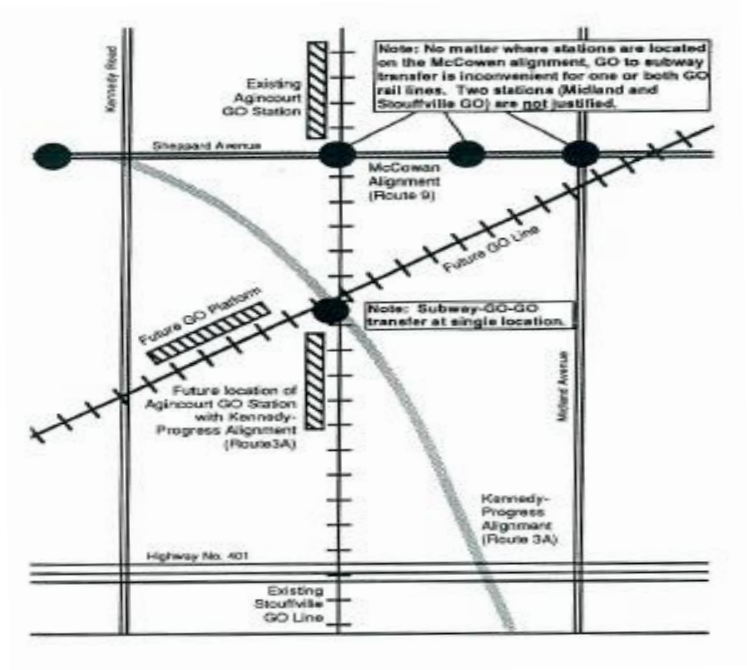
2.4. Connectivity: Subway Versus LRT in Median

The Subway Plan outperforms the LRT Plan in terms of direct access and connectivity with existing bus terminals at Scarbrough and North York and integration with GO transit. The Subway Plan also outperforms the LRT Plan in terms of required transfers for Scarborough residents to reach other parts of the City. Research shows that transit use decreases with every transfer.

CONNECTIVITY	SUBWAY	LRT
Connectivity to rapid transit, local service transit and inter-regional transit	The subway system will feature high-capacity integration with GO transit and local bus service,	LRT alignment/station placing is inconvenient (long walks to GO) and does not connect with Scarborough Bus Terminal
Transfers to Downtown	2	4

Network Interface of Kennedy-Progress Route with GO (Exhibit 8.5.3, 1992 EA)

No direct connection possible. Transit users will have to walk between stations. The strategic interface of GO and a subway station was a major factor in the selection of the Kennedy-Progress route as the recommended 1992 alignment for the subway, together with the long term development potential of the CN/CP catchment area (area bounded by Highway 401, Kennedy Road, Sheppard Avenue and Midland Avenue).

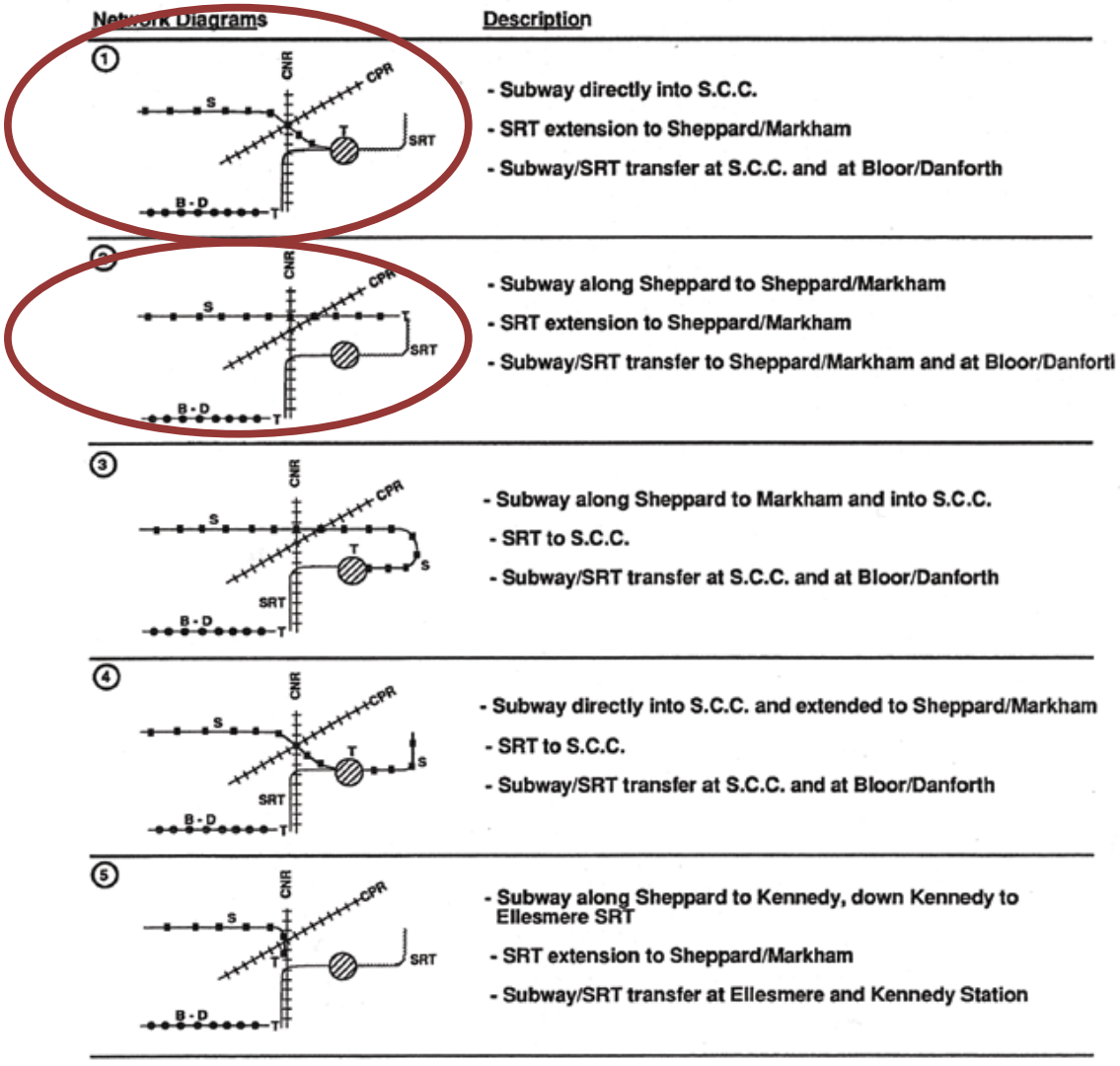


2.5. Connectivity and Direct Access to Scarborough: Subway Versus LRT in Median 1992 Sheppard Subway Environmental Assessment

Option 1 Sheppard Subway Plan had near unanimous support (97%)

Option 2 (similar to proposed LRT plan) *was screened out* based on:

- Travel time and number of transfers required to access Scarborough Centre ... an additional 10 minutes travel time from Scarborough centre to North York
- Directness of route
- Convenience and access to other transit, including GO
- By-passes largest development and employment potential
- Cost (including costs of extending SRT north)
- Did not meet the planning goals of the Official Plan (connecting the major centres)



2.6. System Expansion Considerations (Council Directed Study: February 8th 2012)

Council authorized the Toronto Transit Commission to direct staff to enter into discussions with Metrolinx to study the future feasibility "**extension of the TTC Bloor-Danforth Subway line from Kennedy Subway Station north-eastward to the Scarborough Town Centre"**, replacing the existing the SRT.

The Subway Plan outperforms the LRT plan in terms of connectivity with an extended Bloor-Danforth Subway line; offering the additional benefits not available with an LRT approach including: 1. closed loop with the existing Sheppard Subway (one-seat ride); 2. **continuous no-transfer rapid transit connection between the Major Centres in Etobicoke, Downtown Toronto, Scarborough and North York**; 3. interlining option; 4. common technology across Toronto's subway system; 5. relief capacity (via Bloor-Danforth) between the Sheppard corridor and Downtown; 6. risk mitigation in the event of service disruption on Yonge via an alternate subway route from North York / Sheppard to Downtown; 7. increased value-capture potential resulting in additional private sector subsidy; and 8. expected increased utilization of the Sheppard Subway corridor further supporting the need for subway capacity along Sheppard East)

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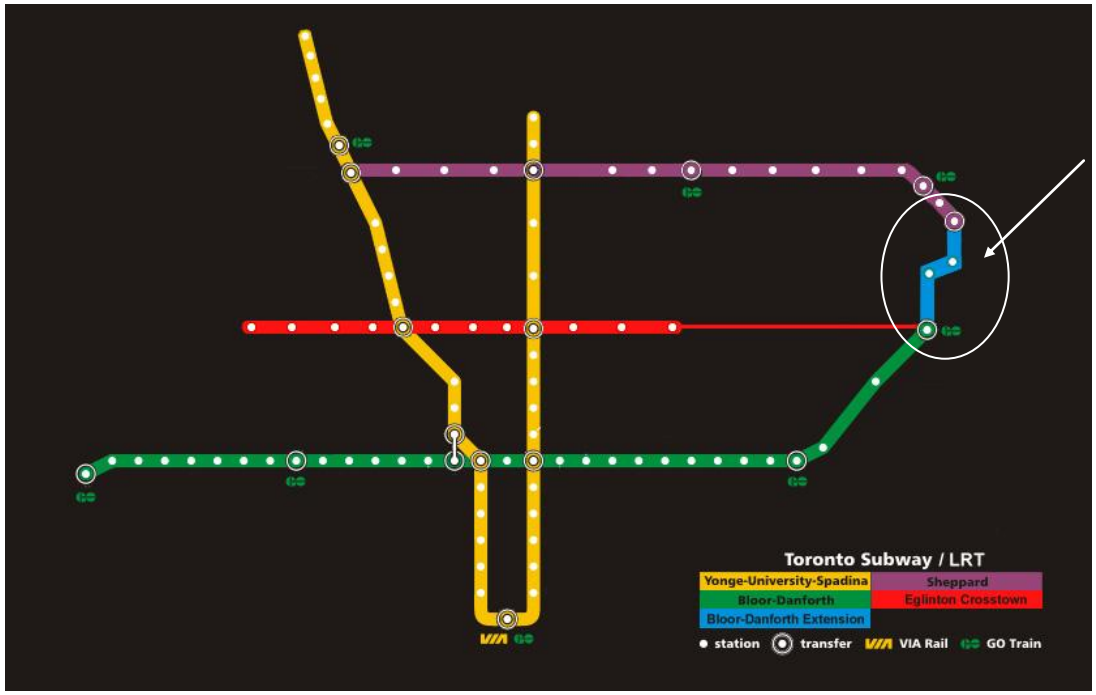


Council Directed Study: February 8th 2012

Engineers involved in the 1992 Sheppard Avenue Environment Assessment recommend that the McCowan alignment (over Kennedy-Progress) is better suited to support subway connections at Scarbrough Centre and support "one seat ride" around the loop from Yonge/Sheppard to Scarborough Centre to Kennedy to Yonge/Bloor.

2.7. Service Level Considerations: Subway Versus LRT in Median

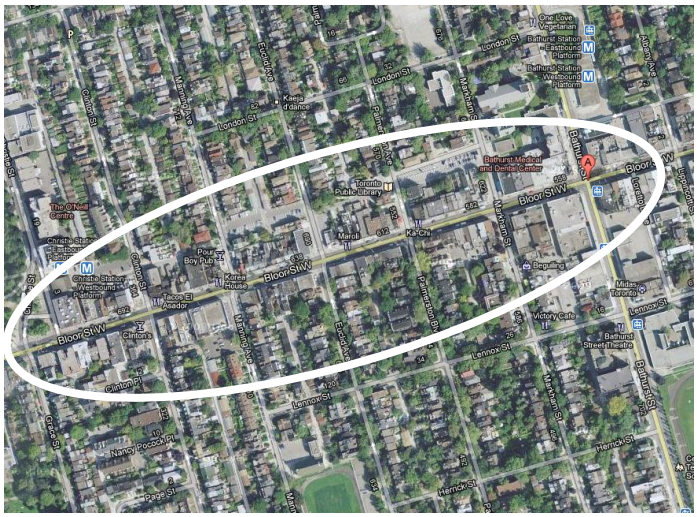
The Subway Plan outperforms the LRT plan in terms of speed, fewer transfers, station length to accommodate transit users waiting to board, protected from elements, and employment within 500m of each station.

SERVICE LEVEL	SUBWAY	LRT
Speed	38 km per hour	23-24 km per hour
Station Accessibility	Existing employment within 500m of station greater	Existing residential population within 500m of planned stop (data not provided by TTC)
Station Length	Longer stations – more capacity due to increased length	Shorter stations – less capacity due to shorter stop platform

TTC claimed that LRT outperforms Subway in terms of residential population served. However, the nature of neighbourhood development that currently exists east of Dons Mills is such that many residences have no direct access to the Avenue, which in turn will impact the actual numbers of residents that will move out of their cars to walk to a poorer quality transit service that is LRT in a median with stoppages at intersections. It is not the same street plan as downtown and along Yonge Street where Streets are in a grid-like pattern and run perpendicular to the main arterial/transit routes. **Residential pattern of the area best suits a subway.**

Sheppard Avenue Residential Patterns
Limited Direct Access to LRT Stops

Better Served by High Quality Subway/Rapid Transit



Downtown Residential Pattern

2.8. Equity and Accessibility: Subway versus LRT in Median

The Subway Plan outperforms the LRT Plan in terms of being a progressive transportation plan,

- ✓ Increasing transit options for the local residents and businesses,
- ✓ Offering a higher quality of service (speed, fewer transfers, access to downtown) and comparable service to elsewhere in the City;
- ✓ Reducing exposure to the elements by transit users;
- ✓ Minimizing traffic impacts and supporting intensification and growth policies for the City.
- ✓ Reducing environmental and community impacts for residents and business owners along the corridor.

The LRT Plan that restricts transit options is regressive public policy.

2.9. Ridership: Subway versus LRT in Median

Ridership numbers for the corridor depend upon all of the above factors. Better quality transit (subway), direct connections to other modes of transit, and improvements to the core system of subways will increase intensification and development with the corridor which will increase ridership.

Metrolinx state the minimum travel demand per hour required to support a subway investment is 10,000 people[1]. Options 1 (East and West extensions), 2 (east extension via Kennedy-Progress) and 3 (east extension via McCowan) of the Chong Report **all exceed this 10,000 people per hour mark by 2031**, based on current densities and growth patterns in the corridor.

2031 AM Peak Hour Passenger Loads from Scarborough Centre (SC) Approaching Each Station

(Before higher density projections by N Barry Lyon Consulting)

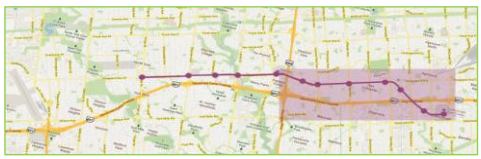
Stop Name	Option1 SC-Downsview	Option2 SC-Don Mills (Kennedy-Progress)	Option3 SC-Don Mills (McCowan)
Scarborough Centre	-	-	-
Consumers	11,000	9,200	10,300
Don Mills	11,000	9,300	10,300
Sheppard Yonge	13,700	11,000	12,000
Downsview	6,500		

Source: Metrolinx Consultants (SDG): Headway 5 minutes. Speed: 40km/hr

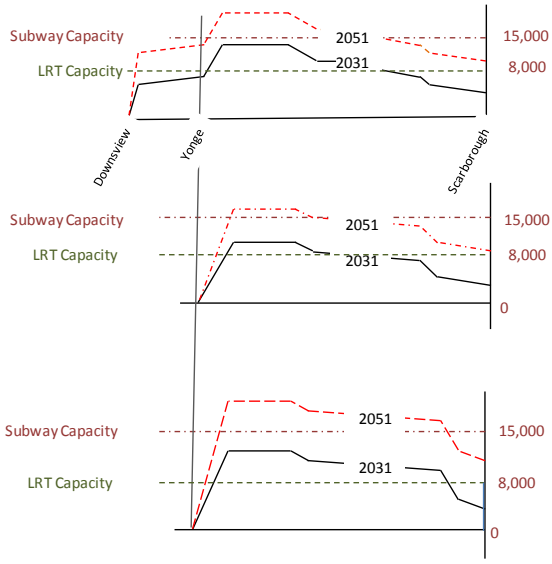
Source: Metrolinx Consultants (Steer Davis Gleave) 2012: Preliminary Ridership Analysis for the Sheppard Subway, 2011 - 2031. 2051 estimates are hypothetical and need to be verified.

Sheppard Subway Extension E & W with 1992 EA Alignment

Sheppard Subway Extension E with 1992 EA Alignment



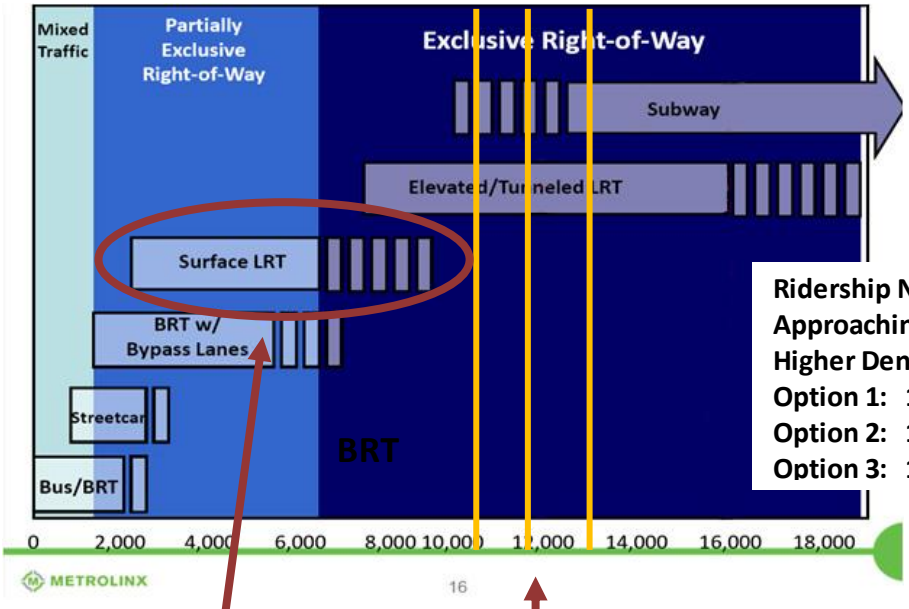
Sheppard Subway Extension E with Alternative EA Alignment



[1] http://www.toronto.ca/involved/projects/eglinton_crosstown_lrt/pdf/2009-11-20_display_panels_part1.pd

These estimates are before N Barry Lyon Consulting projections of higher densities with subway development. **Estimates for options 1-3 <u>are beyond the capacity of LRT</u> in Median as planned for Sheppard, which Metrolinx estimate at 8,000 people per peak hour.**

2031 AM Peak Hour Passenger Loads Approaching Sheppard Yonge



Ridership Numbers People Per Hour Approaching Sheppard Yonge Before Higher Density Projections
Option 1: 13,400
Option 2: 10,800
Option 3: 11,900

Sheppard Subway Plan
Before calculating for N Barry Lyons higher density projections

Sheppard LRT Plan capacity limitations
Will run in a partial right of way mixing with traffic at intersections

RIDERSHIP	SUBWAY	LRT
Capacity	✓ Subway Better Ridership forecasts exceeds LRT capacity by 2031 for the North-York Scarborough Corridor	LRT Limited TTC ridership forecasts skewed lower as alignment by-passes Scarborough Centre
Future Capacity	✓ Subway Better Ability to accommodate growth with increased platform capacity and shorter headway times	LRT Limited Intersections restrict faster headway and ability to accommodate growth
Transit Generator	✓ Subway Better Ridership to/from a major Centre like Scarborough Centre is a unique generator of increased transit ridership	LRT Limited Limited generator of new riders

3. SHEPPARD SUBWAY PLAN SUMMARY: PARTNERING WITH THE PRIVATE SECTOR

3.1. Sheppard Subway Operating Plan

The Sheppard Subway Operating Plan is as follows:

OPERATING FEATURES	DETAILS
Technology	Compatible with current Sheppard line
Run Times	25 minutes
Service Headway	5 minutes with 4 car trains New platforms planned for 6-car trains as capacity increases (as is the case with existing line)
Fleet Storage	Expanded Wilson Yard

3.2. Sheppard Design Features Plan

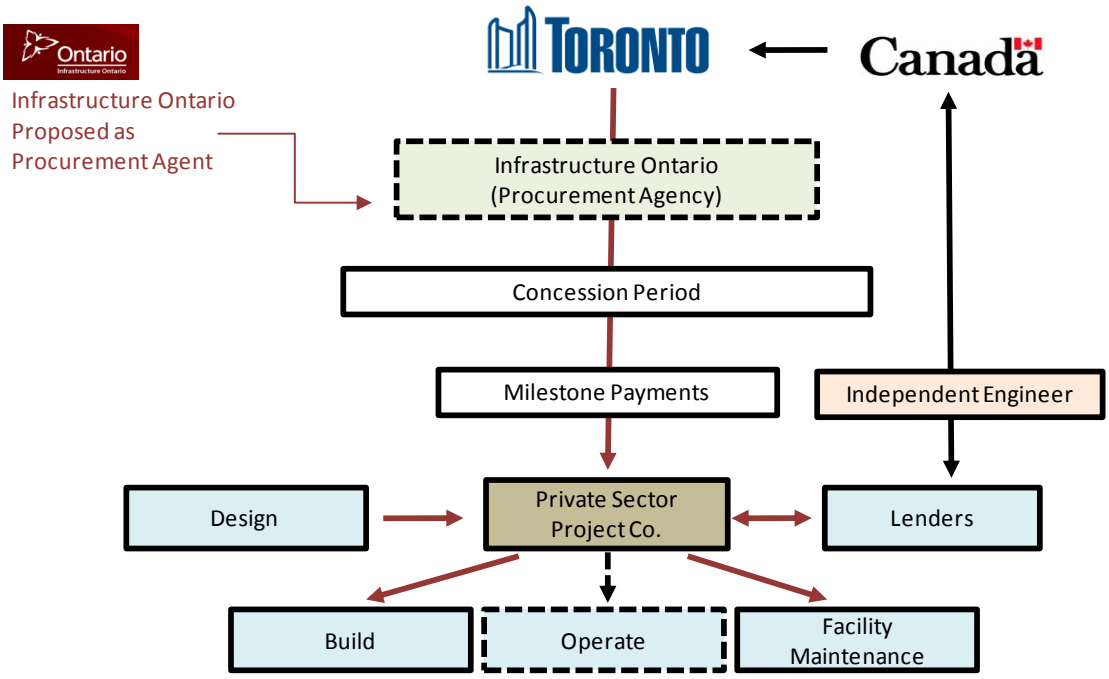
The Sheppard Subway Design Features Plan is as follows:

DESIGN FEATURES	DETAILS
Automatic Train Control	Switch machines and cabling VOBC units to the sub-way vehicles Automatic train control and signalling system allowing for operation by drivers
Stations – Length 165 meters	Below grade stations of cut and cover construction with a platform length of 155 metres. The station structures will be 10 metres longer than the platforms. The finish and service standards will be comparable with the existing TTC below grade stations. It is anticipated the station will include a single level mezzanine with two entries. The stations are shown on the EA alignment drawings to be between 20 and 30 metres below grade, averaging approximately 25 metres deep.
Platforms	Underground platform length – 155 metres
Power Supply and Distribution	Power supply and distribution sub-stations to the numbers shown above Power rail with high voltage power feed Blue light stations and general cabling
Guideway	Cut and cover tunnels for the end stations and tail tracks 5400mm Internal diameter bored tunnel, based upon the use of four tunnel boring machines for options 1, 2, and 3. Progress rates for all options is assumed to average 10 metres per day per machine Emergency exit buildings are included, and each shaft is assumed to be 6 x 24 metres on plan and contains a staircase from the cross-passage to street level. 4-5 shafts on East Extension, 9 on East and West.
Trackwork	Direct fixation trackwork. Cross-over and storage tracks
Revenue Collection	**Four ticket vending machines per station** **Two validators to each new station**

Site Restoration	General landscaping along the guideway route
Environmental	Environmental Approval 1994 by the Province in place (1992 Alignment)
Utility Relocations	Permanent removal, protection and relocation of utilities along the route, the rate used for the allowance is an assessment of anticipated relocations based on the guideway type and the surrounding development, based on the existing budget
Permanent Roadworks	Repaving and grading adjacent to the in new stations, and replacing roads disturbed by cut and cover guideway construction
Community Relations Projects	New community relations projects associated with the transit project, such as plazas or seating areas
Maintenance Facility	There are no details of the maintenance facility, and at this stage an allowance of $2.66 million per vehicle has been used as the basis of the estimate cost. This figure will be subject to adjustment as the detail of the facility becomes clearer.
Provisions for Persons with Disabilities	Sheppard Subway Extension stations will be designed to be fully accessible to all levels

3.3. Sheppard Design Procurement and Contract Plan

Toronto will remain responsible for the delivery of the Sheppard Subway. Fixed assets will remain the ownership of the public sector. Procurement will include design, construction, maintenance and financing. Operating will be negotiated. The City will contract procurement design, delivery and negotiation with private sector bidders to Infrastructure Ontario. **The Sheppard Subway Procurement and Contract Plan is as follows:**



3.4. Sheppard Design Funding and Cash Flow Plan

The Sheppard Subway Funding and Cash Flow Plan (EA Alignment, East extension) is as follows:

Sources	Total	2012	2013	2014	2015	2016	2017	2018
Federal Contributions	$333	$182.5	$150.1					
Provincial Contributions	$650		$264.0	$386.0				
Bonds Proceeds	$448					$448		
Property Rights	$221			$221				
Municipal Revenues	$217	$1.4	$28.1	$31.2	$34.4	$37.6	$41.0	$44.3
Private Sector Financing	$914			$11.5	$500.4		192.0	$210.0

3.5. Sheppard Design Closing the Capital Gap Plan

The Sheppard Subway Closing the Capital Gap Plan is as follows:

Sources	KPMG Totals	Additional	New Total
Federal Contributions	$333	**$85**[1]	$418
Provincial Contributions	$650		$650
Bonds Proceeds	$448		$245
Property Rights	$221	**$25**[2]	$246
Municipal Revenues	$217		-
Private Sector Station Development		**$300**[2]	$300
Private Sector Financing	$914		$914

1. $85 million from PPP Canada (transferred from LRT storage, or additional funding).
2. Additional property rights near Scarborough Centre
3. Station construction subsidized by the private sector (at 50% of cost - $77.5 million Spadina Proxy)
4. Conservative estimate. May increase if more dependable revenue tools chosen and/or federal government backed guarantee

3.6. Sheppard Design Risk Allocation Plan

The Sheppard Subway Risk Allocation Plan is as follows:

- ✓ Design
- ✓ Construction Cost and Delay
- ✓ Inflation During Construction Period
- ✓ Systems and Civil Works Integration
- ✓ Maintenance
- ✓ Inflation During Operating Period
- ✓ Financing

Procurement and negotiation phase will determine risk allocation profile for the following elements:

- Environmental/Regulatory Approvals
- Land/Right of Way Acquisition
- Contaminated Soils
- Changed soil conditions (tunnelling)
- Utilities Relocation
- Ridership and Revenue
- Operations
- Change in Law

Public sector will maintain responsibility for:

- Operating Performance Specification/Function

3.7. Sheppard Private Sector Payment Plan

The Sheppard Subway Private Sector Payment Plan is as follows:

Construction Period

- Scheduled based – monthly
- Progress against Project Agreement as determined by Independent Engineer
- Deductions for failing to meet performance standards
- Continuous performance failures – termination of concession agreement
- Cash flows will be paid subject to partial milestone and milestones (e.g. stations)

Operating Period

- TBD

Facility Maintenance Period

- Scheduled based – monthly
- Progress against Project Agreement as determined by Independent Engineer
- Deductions for failing to meet performance standards
- Continuous failures – termination of concession agreement
- Cash flows will be paid subject to meeting performance standards

4. Staging Options: Subway to Victoria Park, Bus Rapid Transit to Scarborough Centre and Scarborough East

The Sheppard Subway Plan includes consideration of staged implementation of subway construction, with the first phase proposed by the Expert Panel extending the line from Don Mills to Victoria Park with Bus Rapid Transit (BRT) serving Scarborough centre and Scarborough East. (LRT Plan includes a tunnel to Consumers)

Ridership Advantages

- Provides access to high density Consumers Road Business district and high volume bus routes on Victoria Park, which penetrate York Region.
- Additional ridership from the east to and from Richmond Hill will generate additional ridership
- Higher farebox recovery to fund operating costs for existing line

Travel Time Advantages

- Significant travel time savings for Finch/Steeles/Consumers bus riders travelling to Yonge Subway

Landuse Objectives

- Excellent support for North York Centre.

Bus Operations

- Victoria Park bus terminal is sized to accommodate bus flows of a terminal station. No additional property required if Victoria Park is a terminal station.

Terminal Station

- Technical drawings for Victoria Park Station show that Victoria Park is an on-line station and with appropriate tail tracks east of the station Victoria Park can function as a terminal station from a subway operations perspective.