

## **Comments on *Save Our Subways Proposal Move Toronto***

**By Steve Munro**

**February 6, 2010**

These comments are organized roughly in the sequence of the *Move Toronto* paper. Although variations and alternatives have appeared in other locations, notably threads on the UrbanToronto website, I have not attempted to address these as they are (a) a moving target and (b) not necessarily the formal position of the *Save Our Subways* group.

I believe that *Move Toronto* contains many flaws arising from an underlying desire to justify a subway network just as critics of Transit City argue against its focus on LRT. Among my major concerns are:

- Subway lines are consistently underpriced.
- LRT is dismissed as an inferior quality of service with statements more akin to streetcar lines than a true LRT implementation.
- Having used every penny to build the subway network, *Move Toronto* proposes a network of BRT lines for the leftover routes. However, this “network” is in fact little more than the addition of traffic signal priority and queue jump lanes (“BRT Light”) on almost all of the BRT “network”.
- Parts of the BRT network suggest that the authors lack familiarity with the affected neighbourhoods and travel patterns.
- There is no financial analysis of the life-cycle cost of building and operating routes with subway technology even though demand is unlikely to reach subway levels within the lifetime of some of the infrastructure.

### ***Why Not Transit City?***

This section starts off the discussion with a number of points:

- Transit City is all LRT, and this one-size-fits-all approach is not appropriate technologically or financially.
- Transit City is focussed on the suburbs and does not address travel to downtown where it is really needed.
- Transit City does not connect major transit hubs and growth centres.
- Transit City imposes transfers that will be a considerable inconvenience for future riders.

I will address some of these points elsewhere, but a few general comments. Transit City was conceived in the context of projected demand levels for suburban routes that are very much lower than those normally associated with subways, but higher than can be handled by buses (even BRT in the physical context of existing streets). Money will always be found for high profile projects like the subways to York Region, but not for “in town” lines with the exception of Eglinton that is seen as a regional facility because of its length.

Transit City never intended to address travel to the core area as that function has been left primarily to GO Transit, but to provide higher capacity and somewhat higher speed service to the growing suburban 416 areas. It is totally inappropriate to criticize a plan for omitting something for which it was never intended. Indeed, a better target would be Metrolinx whose Big Move has gaping holes in the ability to serve local travel within municipalities. The focus on Transit City and the absence of corresponding comments about The Big Move gives the impression of selective criticism.

Major hubs and growth centres, unfortunately, are located where it has been convenient to access the road network, or in some cases, simply because a developer assembled land, and a pliant Council approved their plans decades ago. Connecting every node will be difficult in any network, and the challenge is to make the best of the situation. Transit systems have artificial nodes serving only as major interchange points, but with little or no development immediately nearby now, or in some cases, for the foreseeable future. Compare Wilson Station to Eglinton Station. Debates continue on whether a “Mobility Hub” should be a parking lot or a residential/commercial development around a major transit station.

There is a TTC myth that stations stimulate development making rapid transit construction viable. Look at the many stations on both YUS and BD that have little or no development around them and never will. The bulk of the high demand on these lines comes from surface feeder routes, not from walk-in trade. By contrast, the goal for at least some parts of the TC network is to encourage medium density development along a route, and to build infrastructure at a level that does not depend on a very large catchment area served by bus feeder routes.

Transfers are a fact of life in a transit system and, properly used, a great strength by comparison with attempts to give one seat rides to every traveller. The debate here is about locations where those transfers should be imposed on the network, and whether removing them is a substantial benefit to riders and to the network's attractiveness.

Transfers at Kennedy and Don Mills are singled out for special mention as “inconvenient”. This is a direct result of the poor design of both terminals which require long walks through multiple levels to make the connections. Both of these will be addressed in the new station designs. At Kennedy, the LRT connections will likely be at the mezzanine level, one above the subway and immediately adjacent to it. At Don Mills, the LRT will serve an extended platform at the same level as the subway. Yes, there will still be transfers, but the existing designs should not be used to disparage the future network.

## ***Why Move Toronto?***

As an alternative, Move Toronto proposes:

- An Eglinton subway first from Don Mills to the Airport, with a later extension east to Kingston Road
- The Downtown Relief Line (DRL) first east to Don Mills and Eglinton from downtown, later to the northwest via the rail corridor to Weston/Eglinton
- Extension of the Bloor-Danforth line to Scarborough Town Centre (STC) and Sherway, with a later extension to Mississauga's Square One
- Extension of the Sheppard line east to STC and west to Downsview
- Extension of the Yonge-University-Spadina line to Vaughan and to Richmond Hill
- Use of Bus Rapid Transit (BRT) as a lower-cost alternative to LRT in other corridors

Of the proposed subway extensions, only the line to Vaughan is funded at present, and all other lines would require either new or reallocated funding.

### ***The Downtown Relief Line***

As I said above, I agree that the DRL east should be built north to Eglinton. The basic premise is that the south end of the Don Mills LRT will have to be completely grade separated anyhow, and it might as well be part of a DRL. This configuration would make Don Mills and Eglinton station (regardless of technologies) a major transit node. That has a big advantage in the network generally because it splits this function off from the cramped stations on the Danforth Subway (Pape is the proposed interchange point, but others are possible).

The DRL east also benefits the Bloor-Yonge interchange by removing transfer traffic and lowering demand on the Yonge line below Bloor. The proposed expansion of Bloor-Yonge, one of the most outlandish schemes the TTC has ever come up with, would also be saved, and this (both the hard budget dollars and the softer "cost" of disrupting a major junction for years) value can also be used to offset the DRL's construction.

Two related but unfunded projects are obviously part of the equation: the Yonge subway extension to Richmond Hill and Metrolinx' proposed "regional express" rail service to the same location. There is some debate about the physical constructability of the Metrolinx proposal, and it is not part of their short-term plans. Whether it will survive the current budget crisis and funding needs elsewhere (electrification) remains to be seen.

The DRL west is proposed to run in the rail corridor. This runs headlong into both the problems of usage (urban transit vs mainline rail, vehicle crash strength, etc.) and the infamous Air-Rail link (aka Blue 22) which would use the same space where the DRL might go. For all my supposed influence, I and many others have been unsuccessful in even getting a public discussion started about the folly of Blue 22, the resources expended on it, and the stupidity of putting a premium fare service in a corridor that should be handling regular transit customers.

The private partner, SNC Lavalin, has the government so tied in knots, and the push to get anything built to the airport before the Pan Am Games is so strong, that nobody will touch this issue. Oddly

enough, neither SOS nor any of the mayoral candidates has attacked this waste of public resources (the corridor's physical capacity) nor the highjacking of an important link to serve a very limited market.

I am less convinced of the need for a DRL west *per se* because:

- DRL west provides less of a "relief" function than the east leg because it intercepts the BD line further from the core and because it partly duplicates the Spadina-University line's function which has no equivalent east of Yonge.
- If GO Transit's and the TTC's fare structures are properly integrated, and if a good electrified GO service operates in the Weston corridor, it will provide the equivalent function with a better reach than a subway line ending at Eglinton.
- I believe that the DRL east should not connect into the existing network at Union Station which will have great difficulty just handling the proposed commuter rail upgrades in the Metrolinx plans.
- A western route out of downtown from anywhere other than Union Station is more difficult than an eastern one.

Moreover, I am not convinced of the need for a through service between the two DRLs given other paths through the transit network for longer distance travellers. For example, if someone wants to go across midtown, they could use the BD subway or the Eglinton line (a subway or largely underground LRT). Further north, whatever east-west lines might exist (including future GO services) would provide this function.

Keeping the two parts of a DRL separate might offend those who want to see direct connections everywhere on a map, but I do not believe that providing for such a connection should constrain alignment choices.

## *The Eglinton Line*

SOS proposes a subway on Eglinton from the Airport to Don Mills with BRT east to Kingston Road. Subsequently, I have received comments suggesting that LRT would be an acceptable alternative to SOS if the western part of the line were physically separated from Eglinton Avenue using the Richview Expressway lands between Jane Street and 427.

SOS states:

“While we agree that Eglinton deserves rapid transit, we do not agree with having 60% of the line at-grade, susceptible to traffic delays, poor light timing, car accidents, and inclement weather.” (Page 8)

This statement is political cant, not the reasoned transportation planning argument SOS purports to advance. Surface transit is not susceptible to traffic delays because it is in its own right-of-way. Certainly there have been issues with St. Clair, and earlier with Spadina, where cars have driven into the right-of-way, but these are problems of bad design, and of unreasonable concessions to auto traffic, not an inherent flaw in LRT. BRT systems would be subject to exactly the same level of incursion, if not worse because of the temptation to share lanes where physical space was tight.

Poor light (traffic signal) timing is, again, a design issue. Toronto's signalling system has built-in limitations, not the least of which is the stubbornness of the engineers responsible for it, and the way that transit is always forced to take a back seat to car traffic. St. Clair has design issues with its signal timing (some of which are common to other existing and proposed routes), but we see a brand new line implemented with built-in delays of transit vehicles. Again this is not inherent to LRT, but to the way that signalling is designed in Toronto. As an LRT advocate, my fight is with the traffic engineers (the TTC planning folks have big fights of their own, but that's another story). For SOS to simply pick on this as a shortcoming of LRT avoids the real issue.

Subways are not immune from delays, but their effects can be far more pervasive. Recently, I was delayed for about 15 minutes waiting for a westbound train at Broadview while service on the entire BD line was stopped. Why? There was a Passenger Assistance Alarm on a train at Main Street. Mechanical problems and PAAs are common on the subway, and the TTC commonly responds by holding all service until they can decide whether an alternate operating strategy such as short turning or splitting the line is required. (Platform doors, which are advocated as an anti-suicide measure, only address a small portion of the total delays in the subway.)

Inclement weather on a right-of-way should not, generally speaking, be a problem for LRT unless the city does something truly dumb like ploughing snow off of the adjacent roadway onto the tracks (as they did on St. Clair on one occasion). Subways (at least those in open cuts) are also plagued by heavy snow and ice storms, but both rail modes can deal with the usual Toronto weather. The real issue is for passengers waiting at stops. The tradeoff here is between relatively closely spaced surface stops which can be accessed simply by crossing a few lanes of traffic, and underground stations with their issues of vertical access and security.

If SOS wants to argue these points, then they should do so on the merits, and don't use arguments more appropriate for transit operating in mixed traffic against LRT in its own right-of-way.

The costs projected by SOS for sections of the Eglinton subway are:

Segment	Length (km)	Cost (\$bn)	Cost/km (\$m)
Jane to Don Mills	13	4.05	322
Jane to Airport	10	2.91	291
Don Mills to Kingston Road	10.5	3.21	306
Total	33.5	10.17	304

These numbers do not entirely make sense, especially the relatively low premium for a bored tunnel section (Jane to Don Mills) with many deep stations as compared to the section from Jane to the Airport that would likely be cut-and-cover for much of its length. It is unclear whether SOS has included provision for a new maintenance yard in their estimate.

The TTC LRT proposal, adapted to an equal footing, is:

Segment	Length (km)	Cost (\$bn)	Cost/km (\$m)
Airport to Kennedy (including maintenance facility, rolling stock and inflation to completion)	33	4.6	139
Scarborough-Malvern (without inflation)	13	.630	50
Pro-rated for Kennedy to Kingston Road (including allowance for inflation)	5	.300	60
Total Airport to Kingston Road	38	4.9	129

The total length for the Eglinton subway line according to SOS is only .5km longer than the TTC's LRT proposal, although the line runs all the way east to Kingston Road. Using Google to get distances for various route segments:

Segment	Length (km)
Stated length of Eglinton LRT (per TTC)	33
Commerce Blvd. to Jane	8.2
Jane to Don Mills	13.5
Don Mills to Kennedy	6.0
Subtotal	27.7
Length of Airport Link (33.0 – 27.7)	5.3
Kennedy to Kingston Road	4.7
Airport to Kingston Road (33.0 + 4.7)	37.7

It is possible that the SOS design is underpriced by about 4km worth of subway structure, or around \$1.2bn.

For whatever benefits SOS expects from an all-subway Eglinton line, the cost premium is at least \$5bn by their own estimate. The line segments in question that would be converted from surface LRT to subway will not have peak demands anywhere near the level needed to justify subway construction. That is why the Eglinton line is proposed as LRT in the first place.

## *The Sheppard Extensions*

SOS states:

“The Sheppard subway from Yonge to Don Mills opened in 2000. It was part of the Network 2011 Plan, originally planned to go from Downsview to Scarborough Town Centre (STC). However, due to budget cuts, it was reduced to its current length.” (Page 9)

This is not strictly true. The cost of building the Sheppard subway escalated, and the Harris government had given Toronto a fixed payment as their final subsidy contribution. Any overruns had to be covered by the City. The line ends at Don Mills because they could not afford the cost of going to Victoria Park, let alone any further east. This is a good example of the low-balling of subway construction costs common in TTC projects.

SOS estimates that the 7km subway from Don Mills to Scarborough Town Centre would cost \$2.2sbn, or \$317m/km.

The proposed extension from Sheppard/Yonge to Downsview is priced at \$1.23bn for roughly 4 km, the same unit cost of construction.

However, the TTC recently priced the connection via Sheppard West as part of their subway rail yard needs study<sup>1</sup>, and it came in at \$2.3bn. This figure included creation of some storage capacity for trains, but the full difference between the TTC estimate and the SOS figure of over \$1bn cannot be completely explained from that source. Another possibility is that the TTC figures include inflation to a likely construction date later this decade. In any event, there is a wide gap between the TTC cost estimate and the figures used by SOS which raises questions about the latter’s validity.

SOS quotes the Rapid Transit Expansion Study of 2001 (RTES) as projecting a peak demand of 8,100 passengers per hour east of Don Mills Station on a Sheppard Subway. What this does not mention is the fact that the demand model used in RTES did not include **any** GO Transit improvements relative to the then existing network. Notable by its absence was any new service on the CPR corridor through Agincourt or substantial improvement in the Stouffville line. The effect was to force the model to assign trips to the Sheppard Subway (and thence to the Yonge Subway and downtown) as it had no other route to place them on.

Planning related to the Sheppard Subway has emphasized east-west trips in support of growth in suburban workplaces while downplaying north-south links (GO) because these do not serve the planning goals. However, the demand model has a large volume of traffic destined to the core. In the absence of other routes, it places this on the Sheppard and Yonge subways both inflating apparent demand for Sheppard and overloading the Yonge line.

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<sup>1</sup> See Yonge-University-Spadina Line – Rail Yard Needs Strategy, TTC Agenda, December 16, 2009.

## *The Bloor-Danforth Extensions*

SOS proposes a 6km extension of the BD subway northeast from Kennedy Station to Scarborough Town Centre where it would link with the Sheppard Subway. The projected cost is \$1.8bn, or \$300-million/mile.

Any route leaving Kennedy must take into account existing buildings in the area, and the east-west alignment of Kennedy Station more or less dictates that the BD line leave in that general direction. A wide turn east to north to follow the existing SRT right-of-way is blocked by a large apartment building. The next opportunities to the east are Midland and Brimley. At STC, entering on a north-south alignment is almost impossible given existing developments through which a station must fit.

If both the BD and Sheppard lines come to STC, then a structure must be designed to accommodate both routes including an interchange station.

SOS proposes a 3.25km extension to Sherway Gardens at an estimated cost of \$990m, at grade in the rail corridor. The TTC has already examined this proposal in 2007 when they opted for an underground alignment because of difficulties threading a surface rapid transit line along the corridor. Their estimated cost was \$1bn for a 3.7km extension, but this was in 2007\$.

SOS also proposes an 8km, \$2.4bn extension to Square One. In 2007, the TTC costed a 1.5km extension to Dixie Road at \$500m.

In both cases, the TTC's 2007 estimate is comparable to the SOS figures, suggesting that the SOS numbers are low. Moreover, the TTC estimate does not include additional rolling stock.

SOS speaks of this extension being funded by Mississauga as if this somehow takes the cost of the line off the books. However, all recent projects have been largely, and in some cases totally funded by Queen's Park, and there is only one pot of money. We cannot wish away the cost just because the line is outside the 416.

Indeed, on the Vaughan Extension, York Region is only paying for 1/3 (the municipal share) of the portion of the line north of Steeles. Ottawa and Queen's Park are paying the rest, and the TTC will eat the net new operating costs of over \$10m per year.

## ***The Yonge-University-Spadina Extensions***

The Spadina extension to Vaughan is 8.6km and has a budget of \$2.6bn or \$302m/km. This does not include provision for a storage yard (the expansion of Wilson Yard is in another budget line), and only a modest amount of additional rolling stock.

The Richmond Hill extension is projected to cost \$2.4bn (2008) not including new yard, nor enough cars to get down to the frequent headway often cited by the TTC for its future operations. The 6.8km line would cost \$353m/km (2008\$). This money has to come from somewhere, and the project will compete with other proposals for funding. Moreover, it has already triggered debates about the DRL, the capacity of Bloor-Yonge Station and the Richmond Hill GO service. Funding for any of these is over and above the cost of the Richmond Hill subway.

The Vaughan extension is funded, but the Richmond Hill extension is not.

## ***BRT and "BRT Light"***

*Move Toronto* distinguishes between two forms of BRT. The first, styled "BRT" in this discussion, requires a dedicated lane and signal priority. The second, styled "BRT Light" uses "cue jump<sup>2</sup> [sic] lanes, curbside cut-outs and signal priority" and its intent is to provide a faster path through intersections for routes that otherwise move in mixed traffic.

SOS does not state clearly whether a "BRT Light" would be anything more than a local bus service with expanded facilities at intersections. Moreover, given the many sources of potential delay on bus routes, it is unclear what proportion of running time would actually be saved by the intersection changes even assuming they were physically possible. BRT Light may get buses along a route somewhat faster, but it will not address the inherent capacity limitations of a surface bus route in mixed traffic.

SOS argues that the combination of a larger subway network plus BRT is preferable to Transit City's LRT network as the latter places riders on LRT for a longer trip to reach the rapid transit system.

"In *Move Toronto*, the subway network has been designed to carry passengers over the long distances, not LRT. Subway can deliver this service more efficiently, quickly, and comfortably compared to LRT." (Page 12)

This statement ignores the capital and operating cost differentials between the two modes which, one might hope, would be part of the term "efficiency". There is an implicit assumption that a substantial proportion of riders actually want to make a long trip that happens to lie along a continuous rapid transit line, rather than transferring at least once at an intermediate point.

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<sup>2</sup> The term should, of course, be "queue jump" as it is the lineups, or queues, of autos waiting to turn which the buses "jump" past.

SOS does not discuss the relative importance of local, surface traffic, and the station spacing which can support it. This is related to problems of demand and travel patterns that I will address below.

### *Future LRT Upgrades from BRT*

*Move Toronto* states:

“While the secondary network is currently being built as a BRT, that does not exclude the possibility of this network, or selected lines on the network, being upgraded to LRT once there is sufficient demand and funds are available.

“BRT was chosen because it is the optimal combination of speed, reliability, capacity, and cost, when it is used as a secondary network.” (Page 14)

This statement is dishonest because much of the “BRT” network proposed here is “BRT Light” which does not leave streets with a right-of-way just waiting for the installation of track and power supply.

Just as subway advocates want every LRT line built to subway standards, whether the route will ever justify such infrastructure, LRT advocates might ask that every “BRT” route be built at least to a standard that will allow for future LRT conversion.

Very little of the “BRT” network proposed in *Move Toronto* is actually “BRT” as the term is widely used and understood. A casual reader may erroneously look forward to a network of dedicated bus lanes when, in fact, all they will actually get is a bunch of queue jump lanes.

### *Highway 27/427 BRT*

SOS claims that the exit ramps of the highways can be used as loading areas for passengers, but gives no design showing how this might be done. Moreover, there is no information about where the highway-based stations would be or how passengers would reach the BRT stations either as pedestrians, or as transfer traffic from intersecting routes.

More baffling is the fact that there is already an express bus, route 191, operating on Highways 427 and 27 from Kipling Station (a much more logical transit hub than Long Branch Loop) to Steeles by way of Humber College (which is bypassed by the proposed BRT).

### *Jane / Etobicoke South BRT Light*

SOS argues for this route with the statement:

“Under the Transit City Plan, Jane was slated to receive an LRT from Jane station up to Steeles West station. However, given that the Move Toronto plan proposes a BRT along Highway 27 as well, an LRT along Jane is no longer cost-effective.” (Page 13)

It is unclear how the installation of a BRT on Highway 27, effectively duplicating route 191 already on that road, makes the Jane LRT “no longer cost-effective”. Ridership in the Jane Street corridor

has nothing to do with any transit service on Highway 27 as these routes serve completely different catchment areas and are, for their entire length, separated by the Humber River valley.

One might debate the need for an LRT over the entire length of Jane (see the section on demand and travel patterns below), but once we have established the ridership in the corridor supports LRT, end of discussion. The real reason the Jane LRT is “no longer cost-effective” is that it does not fit into the SOS plans to convert the Eglinton route to subway and the Finch West route to BRT. In effect, *Move Toronto* replaces an LRT line with selective upgrades to the existing Jane bus. Some of these will face exactly the same issues of right-of-way width and property impacts as the LRT proposal, but with considerably less increase in the route’s capacity.

At the south end of the Jane BRT, the route takes a very odd route through South Kingsway, a low density, residential area, and then morphs into the Long Branch route. This arrangement, leaving aside the effect a frequent bus service might have on the Kingsway residents, presumes that folks on Lake Shore Blvd. W. all want to get to the Bloor Subway. They can do this today with a variety of routes serving that area, and can do so more quickly than riding all the way to Jane Station.

Meanwhile there is the question of the Long Branch “507” streetcar which is the subject of considerable debate in the community. The service quality there has been degraded for many years by interlining the route with 501 Queen. The community wants a separate 507 car operated from Long Branch Loop to Dundas West Station. This has a number of operational benefits that I won’t go into here.

Also important is the fact that **half** of the demand on Lake Shore for east-west travel is local to the community. A BRT to Jane Station does not address this and, in any event, as an express service cannot provide the granularity of access available with a local route (or the proposed Waterfront West LRT which, by this point, is simply an upgraded streetcar line).

Finally, by eliminating the WWLRT, the SOS plan omits any discussion of improved service to Exhibition Place and the Western Waterfront. The WWLRT is not ideal, especially in its failure to serve the development potential of Lake Shore Blvd within Exhibition Place, but this should not condemn it to disappearing from the plans. The DRL West, should it be built, will be even further north than the WWLRT and in no way can be thought of as serving areas around Ontario Place or Sunnyside.

### *Finch BRT Light*

SOS proposes a BRT Light for the length of Finch Avenue from Highway 27 to Neilson. I will not repeat my comments above, but must emphasize that simply adding queue jump lanes and some traffic priority signalling is far below the improvement proposed with the Finch West LRT.

Possibly this is another corridor where “cost effectiveness” as seen by SOS is an issue. They do not explain how a BRT Light will substantially increase route capacity in the existing corridor. However, I must assume that they feel the demand here will be soaked up by the extended Sheppard Subway. If this argument were advanced, I would counter that the Finch corridor has a lot of local demand. Especially on Finch West, one is struck by the constant on-and-off of passengers along the

route. These trips would not be served by nor attracted to a subway two kilometres away on Sheppard with widely-spaced stops.

#### *Don Mills BRT Light*

We are in agreement that the DRL would handle the south end of the Don Mills route below Eglinton, and the only question is the mode from there north. SOS claims that demand in this segment will be low enough for BRT Light to handle. However, SOS offers no demand projections to support this claim.

Again, I must stress that BRT Light does not add capacity to Don Mills, only, possibly, speeds up the service.

#### *Kingston Road BRT*

This project is already under study by the TTC, although with an eastern terminus of Eglinton Avenue, shorter scope than in the *Move Toronto* plan. It began as a full EA and is now converting to the quicker TPA process.

*Move Toronto* confuses the purpose of local service with the regional scope of a line into Durham. People who wish to make long trips into Toronto will do so using GO Transit, not with a route ending at Main Station. This is shown quite clearly in the origin destination information in the EA study materials.

An important goal of improved service on Kingston Road is to assist in the redevelopment of that street and the older neighbourhoods of southern Scarborough. It was originally proposed as LRT (separately and before Transit City), but the projected demand does not justify that mode.

#### *Ellesmere BRT Light*

This is little more than a selective upgrade of the outer part of the York Mills bus, rerouted to Scarborough Town Centre.

#### *Neilson BRT Light*

This replaces the Malvern service proposed in Transit City by the SMLRT, and more recently with the possible extension of the SRT.

## ***Additional Issues***

A number of issues deserve discussion beyond the degree they are present, if at all, in the *Move Toronto* proposal.

### ***Demand Forecasts and Travel Patterns***

A major problem with studies for the past decades lies in their demand forecasts. One can fairly easily find a projection to support whatever network one wants to build, and unfortunately, many extant projections were done with specific target projects in mind. The older the estimate and the more specific it is to one proposal, the less reliable it will be. Moreover, the land use and population projections of studies done 20 or more years ago are no longer valid.

There are two sets of competing demand forecasts that are fairly current and address networks under active consideration.

One set is the TTC projections for Transit City ridership. The other is the set generated for Metrolinx' Big Move plan. Each has its benefits and limitations, some of which arise from the nature of the network being modelled.

The TTC estimates are for a network of local lines with improved service and capacity, and varying improvements in speed depending on the nature of each route segment. The land use is based on the Official Plan. The demand will include a substantial component of local riding complemented, but not dominated by, longer trips.

The Metrolinx estimates are given only for their 25-year plan, and assume that all of the routes in the Big Move have actually been implemented. Current funding shows quite clearly that this will not happen, but Metrolinx has not given us any "Plan B" showing a scaled down network and its behaviour. Moreover, Metrolinx focus is overwhelmingly regional, not local.

Metrolinx original projections for some lines, notably Eglinton, assumed a much higher operating speed (and hence fewer stations) in light of its proposed regional role. Once this was corrected, the Metrolinx and TTC projections came into better accord with each other. The underlying question here is the function of each part of the network.

There are serious concerns about the projected demands, especially on GO Transit, because of physical limitations of various rail corridors and the over commitment of Union Station's capacity by a substantial margin.

Metrolinx shows acceptable peak demands on the existing subway network, but this occurs only because of the large diversion of traffic to the Richmond Hill Regional Express GO service and the DRL East. Indeed, Metrolinx projects lower demand 25 years out on the affected parts of the subway network than we actually see today because their model shifts so much traffic to other routes.

In all of the debates about appropriate technologies, there is an underlying philosophical issue that has not been addressed. Where is everybody going? This may seem like a trite question, but it is very important.

Both SOS and Metrolinx argue for routes with relative fast travel times and few stops on the ground that the network's goal is to handle long-haul traffic that would be delayed beyond a rider's patience with anything other than subways or true BRT line-haul operations. However, the origin-destination pattern on the TTC is quite diverse, and it does not all consist of trips over long distances.

What is needed is a much more fine-grained projection that reviews the behaviour of existing and planned routes. This would address issues such as:

- the effect of moving from one service pattern to another
- whether the stop spacing is appropriate
- how far riders will travel
- whether an “average” trip is really representative or a misleading blend of groups of long-distance and short-haul rides
- what proportion of riders is affected by new or existing transfer connections

This type of background is needed to support implementation of any new technology and route structure, but rarely do we see it in any transit studies.

### ***Subway Yards***

Expansion of the subway system on the scale proposed by SOS will require new yards to hold the trains. Property requirements for such yards are different from those for LRT for several reasons.

- Subway trains, especially the newest equipment on order, are kept in 4-car or 6-car trainsets, and yard trackage must be laid out in multiples of the standard trainlength. This also affects design of the carhouses.
- Curves for subways are not as tight as for LRT, and this can increase the space needed for access and runaround tracks.
- Sufficient room is needed between the mainline and the yard for the ramp structure to get trains up to surface level unless one is lucky enough to have prevailing grades that avoid this (such as at Greenwood where the carhouse is on land at a lower elevation than the surrounding roads) or if the subway itself is on the surface (as at Wilson and Davisville).

Land which may have been appropriate for use as an LRT yard and carhouse may not work for a subway operation.

The cost of yards and maintenance facilities must be included in any subway or LRT plans. These yards were not included in the original Transit City cost estimates, but have been factored in for projects that now have funding. The TTC has already identified the need for a new yard to support the Richmond Hill extension, and SOS proposals for additional subway lines will also trigger higher yard capacity needs.

Conversely, when the TTC talks about very frequent service on the YUS (105 seconds), they have not yet budgeted for the additional cars needed to run trains at this spacing. Those cars will require yard space. This is another cost associated with putting all of the demand on the YUS along with the cost of expanding capacity at Bloor-Yonge. These are both offsets available against spending on the DRL.

### ***Operating Costs***

At no point does SOS consider the marginal addition to operating costs of their subway network proposal relative to LRT. This is not just a question of onboard crews, but the small army of staff needed to maintain station and tunnel infrastructure. The savings in operating costs available with LRT have an equivalent present value and must also be included in comparing total costs for the two networks.