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Form Revised: February 2005

**TORONTO TRANSIT COMMISSION
REPORT NO.**

MEETING DATE: MARCH 21, 2007

SUBJECT: Toronto Transit City – Light Rail Plan

RECOMMENDATIONS

It is recommended that the Commission:

1. Endorse the *Toronto Transit City – Light Rail Plan* as the basis and priority for rapid transit expansion in the City of Toronto, noting that the *Plan* would provide:
 - much-faster travel between the major areas of Toronto, offering people a truly travel-time competitive and less-stressful alternative to private cars
 - highly-reliable and frequent service in road space reserved for transit customers, eliminating the delays caused by operation in mixed traffic
 - fully-accessible design, so that people with all levels of mobility can use the service with confidence and ease
 - direct rapid transit links to areas that are currently far removed from rapid transit, including the north, west, and eastern areas of Toronto
 - connections with all existing rapid transit routes and proposed extensions, to provide additional travel opportunities and the greatest possible integration of the new lines into the TTC rapid transit network
 - connections or connection opportunities to the Greater Toronto regional transit network, including Mississauga, York Region, and Durham Region
 - connection opportunities to all GO Transit rail lines; and
2. Forward this report to the City of Toronto, the Greater Toronto Transportation Authority, the Canadian Urban Transit Association, the Federation of Canadian Municipalities, the Province of Ontario, and the Government of Canada.

FUNDING

There is no funding currently provided in the TTC's or City of Toronto's capital budgets for the implementation of the Toronto Transit City – Light Rail Plan as described in this report. Implementation of this Plan is dependent on funding support from the Province of Ontario and the Government of Canada.

BACKGROUND

For years, all three levels of government – federal, provincial, and municipal – have recognized the growing problem of traffic congestion in major urban areas and the resulting economic, social and environmental costs. This has resulted in increasing interest in, and support for, expansion of public transit.

In the 1990s, the Government of Canada established its Task Force on Urban Issues which stated that, “Congestion is not so much a symptom of not enough roads, but of not investing enough in other forms of transportation”. The Province of Ontario established its Smart Growth Council and Greater Toronto Area Gridlock Subcommittee, both intended to focus efforts on more-compact and efficient land uses, and on greater use of transit in urban areas. The Smart Growth Council advocated, “Increasing transit use by making transit a viable alternative to taking the car....to relieve gridlock in the long-term”.

In 2002, the City of Toronto approved its new Official Plan which states, in part, “The focus [of this plan] is on altering behaviour so as to reduce our dependence on the private automobile [through] high-quality transit services, including priority measures for buses and streetcars”.

Toronto's Official Plan was the foundation for the Toronto Transit Commission's Ridership Growth Strategy (2003) [RGS] and Building a Transit City program (2004) [BTC], which contained a wide range of transit initiatives intended to make transit in Toronto a more attractive and viable travel option, and which highlighted the need to establish a network of bus and streetcar rapid transit lines serving the city in an efficient, attractive way.

In 2004–2006, work began on implementing components of the RGS and BTC programs, specifically, cost-effective and environmentally-sustainable bus and streetcar rapid transit in the St Clair Avenue, Yonge Street/Finch Station, and York University corridors.

In 2006, environmental issues – notably greenhouse gases, global warming, and climate change – soared dramatically to the top of national concerns among Canadians. Gas prices repeatedly passed the plateau of \$1.00 per litre throughout much of Canada. The widely-accepted and hard-hitting report of the Intergovernmental Panel on Climate Change entitled, “Climate Change 2007” grabbed international attention.

Throughout all of this and the many studies and initiatives intended to address the growing crisis of global warming and climate change, attention has been focussed on the need for increased use of public transit, instead of private vehicles, as one of the most practical, achievable, and effective means of reducing harmful emissions and greenhouse gases resulting from transportation in big cities. In Toronto, residents have responded to these growing environmental concerns by increasingly turning to transit for their travel needs. Between 2004 and 2006, ridership on the TTC grew by 27 million riders, from 418 million per year to 445 million per year, and ridership is continuing to increase at a steady rate.

National concern over worsening traffic congestion and environmental damage culminated in two landmark events early in 2007. First, in March, 2007, the Government of Canada announced its intention to provide significant federal funding in support of public transit. In particular, it announced its new FLOW Funding program in support of a number of important transit initiatives in the Greater Toronto Area, including:

- expansion of York Region's VIVA dedicated bus lanes for bus rapid transit service, providing improved transit connections between York Region and Toronto
- Brampton Transit's bus rapid transit initiative, AcceleRide, providing improved transit connections between Brampton, Mississauga, York Region, and Toronto
- Mississauga Transit's Eglinton Avenue/Highway 403 bus rapid transit facility, providing improved transit connections between Mississauga, Oakville, and Toronto
- extension of the TTC's University-Spadina subway eight kilometres north, providing improved transit connections between York Region and Toronto; and
- initiation of Durham Region's Long-Term Transit Expansion Plan, to identify the best options for improving transit connections between Durham Region and Toronto

All of these GTA transit-improvement initiatives will serve to strengthen the long-established co-ordinated inter-regional transit services within the Greater Toronto Area, which feature 79 closely-integrated inter-regional bus routes and six inter-regional heavy-rail commuter routes.

The second landmark event, also in March, 2007, was the release of a "National Transit Strategy" by the Big City Mayors' Caucus of the Federation of Canadian Municipalities. The Strategy speaks to improving the liveability of Canada's major cities by attracting people out of their cars and onto transit, based on the provision of predictable, committed, long-term, program-oriented funding from senior levels of government. The Strategy is noteworthy because it reflects a consensus among all the major cities in Canada regarding the need for improving transit across the country, and regarding how such a program should be funded and managed.

The City of Toronto has a goal of being a world leader in combating climate change and global warming. The establishment of a network of fast, reliable, electric light-rail transport lines, to attract people out of their cars and onto environmentally-friendly public transport, is fundamental to this goal. Consistent with the spirit and intent of both of the national landmark events -- to improve the liveability and environmental sustainability of Canadian cities -- the City of Toronto has further developed its previous plans for environmentally-sustainable urban transit, and this is described here in this report.

DISCUSSION

The Importance of Transit to City-Building

The importance of excellent transit for the health and vitality of big cities is well documented. Transit helps cities be more liveable and vibrant by:

- providing increased mobility for people so that they can take advantage of the employment, educational, recreational, and many other opportunities cities offer
- improving air quality and, in doing so, improving people's health and their ability to enjoy outdoor spaces and activities
- freeing up road space for goods movement and reducing the wear-and-tear on city roads and the need to spend tax dollars on repairing and expanding road infrastructure
- ensuring the long-term economic stability and environmental sustainability by reducing climate-changing emissions and reliance on fossil fuels

The City of Toronto recognized the importance of transit and enshrined it in its Official Plan which was approved by the Ontario Minister of Municipal Affairs in 2006. The Official Plan is notably pro-transit in its orientation. The Official Plan says no new roads will be built in Toronto. Instead, all growth in travel

demand is to be carried on transit. The Official Plan recognizes the important relationship between transportation and land use: new population, employment, and development, are all to be located at existing rapid transit stations or along existing major transit corridors. This policy of intensification will allow more productive and efficient use of the City's infrastructure – including transit – and this reduces the amount of public tax dollars which will be required in the future to build new infrastructure. The Official Plan calls for improving the attractiveness and reliability of transit by giving transit more priority on the city's roads, through means such as rights-of-way for transit. This is shown in Exhibit 1, the map *Toronto Official Plan – Surface Transit Priority*, which is taken from the Official Plan.

Climate Change

Concerns over climate change and the negative economic, environmental, and social impacts associated with it have reached a flash-point with the Canadian public and internationally.

The Kyoto Accord, to which Canada is a signatory, commits Canada to reducing its greenhouse gas emissions, by 2012, to six per cent less than those produced in 1990 – yet emissions have risen by over 27 per cent since that time. The just-released report “Climate Change 2007” from the Intergovernmental Panel on Climate Change, representing the work of 2,500 scientists and 130 countries over six years, has clearly linked human activity to global warming, and it paints a troubling and detailed picture of the consequences. Extreme weather events, the hardships that they cause, and their link to global warming, are regular headline news stories.

A recent study on the sources of greenhouse gases and air pollutants in the City of Toronto indicates that close to 40 per cent of greenhouse gas emissions originate from the transportation sector. The vast majority of these emissions are from cars and trucks.

Encouraging residents to choose alternatives to the automobile for as many trips as possible must be a vital part of any action plan to reduce harmful emissions and address climate change.

National Transit Strategy

The National Transit Strategy, prepared by the Big City Mayors' Caucus of the Federation of Canadian Municipalities, presents a vision for sustainable urban transport in Canada's major cities. Its principles and objectives are inspirational, and are worth repeating here:

- to improve the global competitiveness, quality of life, and environmental sustainability of Canada's cities;
- to respond to the increasing mobility needs of Canada's cities;
- to require cities to have a council-approved land use and transportation plan which favours transit as the primary means of accommodating future travel demand, in order to be eligible to receive funding
- to provide the funding necessary to maintain and expand Canada's urban transit systems in order to accommodate population growth and to allow transit to attract a larger share of the total travel market
- to support increased transit use through federal government tax incentives
- to replace short-term, ad-hoc funding with longer-term, predictable funding commitments from all levels of government
- to support and fund leading-edge research pertaining to the achievement of cities' economic, social, and environmental priorities through the increased use of transit
- to ensure full accountability for all funding provided in support of transit

Toronto Transit City – Light Rail Plan

The City of Toronto has undertaken a number of studies and plans pertaining to the cost-effective expansion of transit as a means of making Toronto a more liveable and environmentally-sustainable city. These studies, mentioned earlier, include:

- City of Toronto Official Plan (2002)
- TTC Ridership Growth Strategy (2003)
- TTC Building a Transit City (2004)
- Mayor Miller's "Transit City" Platform (2006)

These various plans and studies have been distilled and consolidated into one high-level plan for light rail for Toronto. The plan, known as, ***Toronto Transit City – Light Rail Plan*** is illustrated in the map below.



The *Plan* calls for the development of a network of electric light-rail lines across Toronto. Fundamental to the plan is the seamless interconnection of the proposed new lines with each other, and with the city's existing rapid transit routes, including the planned extensions of the University-Spadina Subway to York University and York Region, and the Scarborough RT to Sheppard Avenue and the Malvern community. The *Plan* also provides the basis for the creation of a seamless Greater Toronto-wide network of rail and bus rapid transit services.

The *Plan* provides:

- much-faster travel between the major areas of Toronto, offering people a truly travel-time competitive and less-stressful alternative to private cars
- highly-reliable and frequent service in road space reserved for transit customers, eliminating the delays caused by operation in mixed traffic
- fully-accessible design, so that people with all levels of mobility can use the service with confidence and ease
- direct rapid transit links to areas that are currently far removed from rapid transit, including the north, west, and eastern areas of Toronto
- connections with all existing rapid transit routes and proposed extensions, to provide additional travel opportunities and the greatest possible integration of the new lines into the TTC rapid transit network
- connections or connection opportunities to the Greater Toronto regional transit network, including Mississauga, York Region, and Durham Region
- connection opportunities to all GO Transit rail lines

The *Plan* is premised on using light-rail transit technology. It rejects the costly and unwarranted reliance on new subway lines. Light rail transport costs a fraction of what it costs to build subways, and yet still offers significant advantages with respect to the environment and city-building. These include:

- Provision of the premium quality service – quiet, smooth, comfortable, fast, and reliable – which attracts people to ride transit
- Highly energy-efficient technology: light rail vehicles produce 92 per cent less CO₂ than autos and 83 per cent less CO₂ than diesel buses, and produce zero local-area or “tailpipe” emissions
- Ample capacity for projected ridership in all proposed corridors, with the capability to expand to meet increasing demands
- Demonstration of long-term and substantial commitment to quality transportation, to instil the confidence which landowners and investors need to invest in development and city-building, and the confidence which residents need to choose a transit-oriented lifestyle
- Creation of a strong and highly-recognizable presence which signifies the availability of high-quality transit
- Association with Toronto's streetcar heritage and the positive connotations which streetcars bring to the City and its transit system

There is a significant resurgence of light rail transport all over the world, in cities ranging from Portland to Paris and from Dallas to Dublin. As noted in the 2004 report *The Streetcar Renaissance – Its Background and Benefits*, commissioned by the TTC and the City of Toronto:

Using tried-and-true principles developed on this continent before the Second World War – and improved in Europe afterward – the streetcar has evolved into a modern, efficient and cost-effective transit mode. It is increasingly filling the intermediate-capacity niche between buses and heavy rail technologies.

The adoption of transit-oriented land use policies and guidelines is paramount in realizing the full benefits of modern streetcar service. Although intermediate in cost and capacity within the family of transit modes, modern streetcar systems are still higher-order transit solutions. They involve substantial investment and require substantial numbers of riders to justify their capital and service investment costs.

The attached Exhibit 2 shows several examples of new light rail vehicles operating in various cities around the world. These light rail services provide frequent, convenient, and accessible transit that is closely integrated into liveable and pedestrian-oriented cities.

The **Plan** is “high-level” in that it has not yet undergone the more-rigorous examination of environmental assessments or detailed engineering work. However, the corridors selected have been the subject of discussions at hundreds of public meetings during the Official Plan public consultation process. Additionally, each of the corridors has undergone the following analyses and investigations:

- Application of corridor selection and evaluation criteria, including physical feasibility, status in the Official Plan, existing and future ridership, and rapid transit coverage across the city
- Identification of a general routing alignment and approximate location of terminals and transfer connections
- Projected corridor ridership estimates, taking into account major ridership generators and destinations;
- Projected service levels and designs, including identification of vehicle requirements;
- Cost estimation, including identification of significant physical and geographic features along the route that would affect construction costs;

The **Toronto Transit City – Light Rail Plan** is summarised in the table below, and is described in greater detail in the following section.

Toronto Transit City -- Light Rail Plan					
Corridors and preliminary estimated costs and ridership					
Corridor	Terminals (preliminary)	Length, one-way, km	Estimated cost, millions, includes vehicles	Existing corridor ridership, per year, millions	Projected ridership in 2021, per year, millions
Don Mills	Steeles Ave– Bloor-Danforth Subway	17.6	\$675	13.7	21.2
Eglinton Crosstown	Kennedy Stn– Pearson Airport	30.8	\$2240	19.0	52.8
Etobicoke- Finch West	Yonge St– Highway 27	17.9	\$835	11.3	24.6
Jane	Steeles West Stn– Jane Stn	16.5	\$630	11.9	24.0
Scarborough Malvern	Kennedy Stn– Malvern/Morningside	15.0	\$630	9.6	14.1
Sheppard East	Don Mills Stn– Morningside Ave	13.6	\$555	10.0	16.5
Waterfront West	Union Stn/Exhibition– Long Branch	11.0	\$540	5.2	20.8

Each of the corridors contained in the *Plan* is described briefly here, together with the benefits and costs associated with each. The costs are approximate, and include the cost of light rail vehicles and the savings attributable to the smaller bus fleet that would be required. Costs have not been included in this report for light-rail vehicle maintenance facilities which would be required to support new light-rail lines.

Don Mills Corridor

This 18-kilometre long corridor would stretch along the Don Mills Road corridor from Steeles Avenue to the Don Valley, and then south to a connection with the Bloor-Danforth Subway. The corridor would provide fast and frequent north-south service over a busy transit corridor east of the Yonge Subway and west of the Scarborough RT. Light rail service would connect with the Sheppard Subway and the Sheppard East light rail corridor at Don Mills Station. A northerly extension could be built to provide direct service into York Region. Direct connections would be made to the Eglinton Crosstown light rail line, and through operation between the Don Mills and Eglinton Crosstown lines would be possible, potentially providing more transfer-free journeys for transit customers.

Light rail service would operate in the surface on dedicated rights-of-way. Estimated annual ridership in 2021 would be 21.2 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$675 million.

Eglinton Crosstown Corridor

This 31-kilometre long corridor would link Kennedy Station in the east with Pearson Airport and the Mississauga Transitway in the west, via a new light rail service that would stretch across Toronto. The corridor would provide a fast and frequent east-west service through the central part of Toronto, as well as important regional connections. The corridor would connect with the existing Bloor-Danforth, Yonge,

Scarborough RT and Spadina subways, and with the proposed new Scarborough Malvern, Don Mills, and Jane light rail corridors. In addition to connections to Mississauga in the west, the Eglinton Crosstown corridor could eventually connect with Durham Region in the east, via the Scarborough Malvern and Sheppard East light rail corridors.

Light rail service would operate on the surface in a dedicated right-of-way from Kennedy Station to approximately Laird Drive, then underground to Keele Street, and then again on the surface in a dedicated right of way to Mississauga and Pearson Airport. Estimated annual ridership in 2021 would be 53 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$2.2 billion.

Etobicoke-Finch West Corridor

This 18-kilometre long corridor would link Finch Station with northern Etobicoke. The light rail line would run west from Finch Station on the Yonge Subway along Finch Avenue. The line would end at or near Highway 27, Humber College, and the Humberwood community. The light rail service would replace a busy existing bus route, and would provide fast and frequent east-west service through the northern part of North York and Etobicoke. In addition to Finch Station on the Yonge Subway, the line would connect with Finch West Station on the Spadina Subway extension, and with the Jane light rail corridor. In the future, the Etobicoke-Finch West corridor could be extended farther west to Mississauga, or south to the Woodbine racetrack or Pearson Airport areas to provide important regional connections.

Light rail service would operate entirely in a dedicated surface right-of-way. Estimated annual ridership in 2021 would be 25 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$835 million.

Jane Corridor

This 17-kilometre long corridor would stretch along Jane Street from Steeles West Station on the Spadina Subway to the Bloor-Danforth Subway. The corridor would provide fast and frequent north-south service in the western part of Toronto along a very busy transit corridor. A northerly extension could be built to provide direct service into York Region. A short east-west segment would connect to the St Clair streetcar line at Keele Street. Direct connections would be made to Steeles West Station on the Spadina Subway, the Etobicoke-Finch West light rail line, the Eglinton Crosstown light rail line, the St Clair streetcar line, and the Bloor-Danforth Subway.

Light rail service would operate entirely on the surface in a dedicated right-of-way. Estimated annual ridership in 2021 would be 24 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$630 million.

Scarborough Malvern Corridor

This 15-kilometre long corridor would link Kennedy Station with northern Scarborough, Malvern, and the Morningside Heights community. The light rail service would run east from Kennedy Station on Eglinton Avenue, northeast on Kingston Road, and then north on Morningside Drive to the Malvern and Morningside Heights communities. The line would provide new high-quality light rail service along several busy existing transit routes, and would provide direct service to the University of Toronto at Scarborough and Centennial College's Ellesmere Campus. The Scarborough Malvern light rail line would connect with the Sheppard East light rail line at Morningside Drive and Sheppard Avenue, and light rail service could potentially be through-routed west or east on the Sheppard East corridor, increasing convenience for transit customers.

Light rail service would operate entirely on the surface in a dedicated right-of-way. Estimated annual ridership in 2021 would be 14 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$630 million.

Sheppard East Corridor

This 14-kilometre long corridor would extend rapid transit service east from Don Mills Station to northern Scarborough, Malvern, and, potentially, Durham Region. The light rail line would run east from Don Mills Station on the Sheppard Subway along Sheppard Avenue, replacing two busy existing bus routes, and providing fast and frequent east-west service through the northern part of Scarborough, with potential future regional connections. A key requirement of the selected route is the planned extension of the Scarborough RT to a new terminal at Sheppard Avenue in the Malvern community, which would provide important connections from Sheppard Avenue to Scarborough Centre and to the Bloor-Danforth Subway. At its eastern end, the Sheppard East corridor would connect with the Scarborough Malvern light rail corridor. A direct connection would be possible with GO Transit's Stouffville line. The Sheppard East corridor could eventually be extended farther east to Durham Region, and light rail service on the Sheppard East Corridor could be through-routed over the Scarborough Malvern Corridor to provide further transit connections.

Light rail service would operate from the underground transfer terminal at Don Mills Station, rising to the surface to operate the rest of the way in a dedicated right-of-way. Estimated annual ridership in 2021 would be 17 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$555 million.

Waterfront West Corridor

This 11-kilometre long corridor would link Union Station and Exhibition Place with Parkdale, High Park, and southern Etobicoke. The new light rail line would start from the existing Exhibition streetcar loop, and run west along the Gardiner Expressway/Lakeshore GO Train corridor to the existing Queensway and Lake Shore streetcar tracks, which would be upgraded where necessary to a dedicated surface right-of-way. The light rail service would provide fast and frequent east-west service from southern Etobicoke to Union Station along the waterfront. Eventual extensions could be made west into Mississauga and east from Union Station into the eastern waterfront.

Light rail service would operate entirely in a dedicated surface right-of-way. Estimated annual ridership in 2021 would be 21 million customer-trips. Order-of-magnitude cost of the corridor would be approximately \$540 million.

SUMMARY

The *Toronto Transit City – Light Rail Plan* should be endorsed as the basis and priority for rapid transit expansion in the City of Toronto. The plan would establish a network of fast, reliable, electric light-rail transit lines, to attract people out of their cars and onto environmentally-friendly public transport. The *Plan* would provide fast and reliable public transit service, increase the mobility of Toronto residents, would provide system-wide connections to existing and future rapid transit services, and would be seamlessly coordinated with Greater Toronto regional transit networks.

March 12, 2007

11-57-45

Attachments: Exhibit 1: *Toronto Official Plan – Surface Transit Priority*

Exhibit 2: Examples of Light Rail service







