



TRANSITCITY

# Transit City Bus Plan

August 2009



TORONTO TRANSIT COMMISSION

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# TRANSITCITY BUS PLAN



## EXECUTIVE SUMMARY

The Toronto Transit Commission operates a highly-integrated, multi-modal transit network. Buses, streetcars, and subways provide service across Toronto in a strong grid pattern that provides excellent access to public transit for Toronto residents. The TTC works to continually improve the effectiveness of this transit network. The City of Toronto's *Official Plan* also states that the city must evolve to become much more transit-oriented.

A great deal of planning and design work is underway relating the *Transit City Light Rail Plan*, subway expansion, and other new streetcar/light rail routes. These new rail projects are critical to improving the attractiveness of Toronto's transit system, and in serving areas of new development. It is important to keep in mind, however, that 60% of all TTC customers make part or all of their trip by bus. This resulted in 300 million bus customers in 2008. It is important to continue to introduce improvements to bus service wherever possible, in order to keep bus transit an attractive option for the public. This report, the *Transit City Bus Plan* has been undertaken to further that objective.

The Plan recognizes that good bus service has many components. The first section of the Plan outlines initiatives which have been recently implemented or are currently underway, and the second section presents new initiatives which are proposed as part of this *Transit City Bus Plan*.

## BUS INITIATIVES CURRENTLY UNDERWAY AT THE TTC

Major service increases were implemented in November 2008 across the TTC network, to reduce peak-period crowding levels and reduce waiting times on bus routes. Service levels during peak periods were increased on 62 routes. New off-peak service was added on 86 bus routes so that these routes operate at all daytime and evening times.

Service reliability is being improved through more-precise location tracking of buses, to allow Route Supervisors to make quicker and more-effective service adjustment decisions. Improved route supervision techniques and equipment are also being tested, including the use of portable vehicle-locating-tracking devices for on-street supervisors.

The TTC is continuing its ongoing progress towards accessibility for all customers. The bus fleet will be accessible by year-end 2010, except for a few older buses required for ongoing ridership growth. Bus platform accessibility will be provided at ten stations by the end of 2010, allowing customers barrier-free access to and from the street. A full replacement of the non-accessible streetcar fleet is underway. A total of 27 subway stations have been marked accessible through the "Easier-Access" initiative. Retrofitting of the remaining 41 non-accessible subway stations to accessible status continues.

An investment of \$800-million has been made over the past five years to renew the conventional bus fleet. Over 1,450 low-floor accessible buses are being introduced during the period 2003 to 2010, bringing the average age of the fleet down from 14.1 years in 2003, to 5.5 years in 2010. The new buses have many improved customer amenities.



There is a new initiative to make better use of input from the TTC's front-line employees in order to ensure that service is reflective of current operational challenges and best meets customers' needs.

The TTC's Next Vehicle Arrival system will provide real-time electronic notification of next vehicle arrival times. Development of a computerized Service Disruption Notification system will provide real-time customer notification of bus service disruptions so that customers can adjust their travel plans accordingly.

The TTC, City of Toronto, and regional transit agencies are continuing work on Bus Rapid Transit (BRT) proposals, including buses running on exclusive rights-of-way. Progress on BRT will allow customers to benefit, due to reduced trip times and improved service reliability.

The entire fleet of Wheel-Trans buses is being replaced during the period 2008 to 2014, and an additional 51 buses are being introduced for service growth. The new buses will have improved customer amenities. The number of unaccommodated requests for Wheel Trans trips is declining, and schedule adherence is improving. A new scheduling system will be fully implemented in 2011, with resulting productivity improvements which will allow for more customer service capacity.

### **NEW BUS INITIATIVES: THE TRANSIT CITY BUS PLAN**

The *Transit City Bus Network* (TCBN) consists of 21 key routes which will have significantly-enhanced bus service. These routes have been selected based on several factors including ridership, geographic location, local population/employment data, and network connectivity. The network includes corridors that have significant potential for increased transit ridership and to encourage transit-oriented redevelopment.

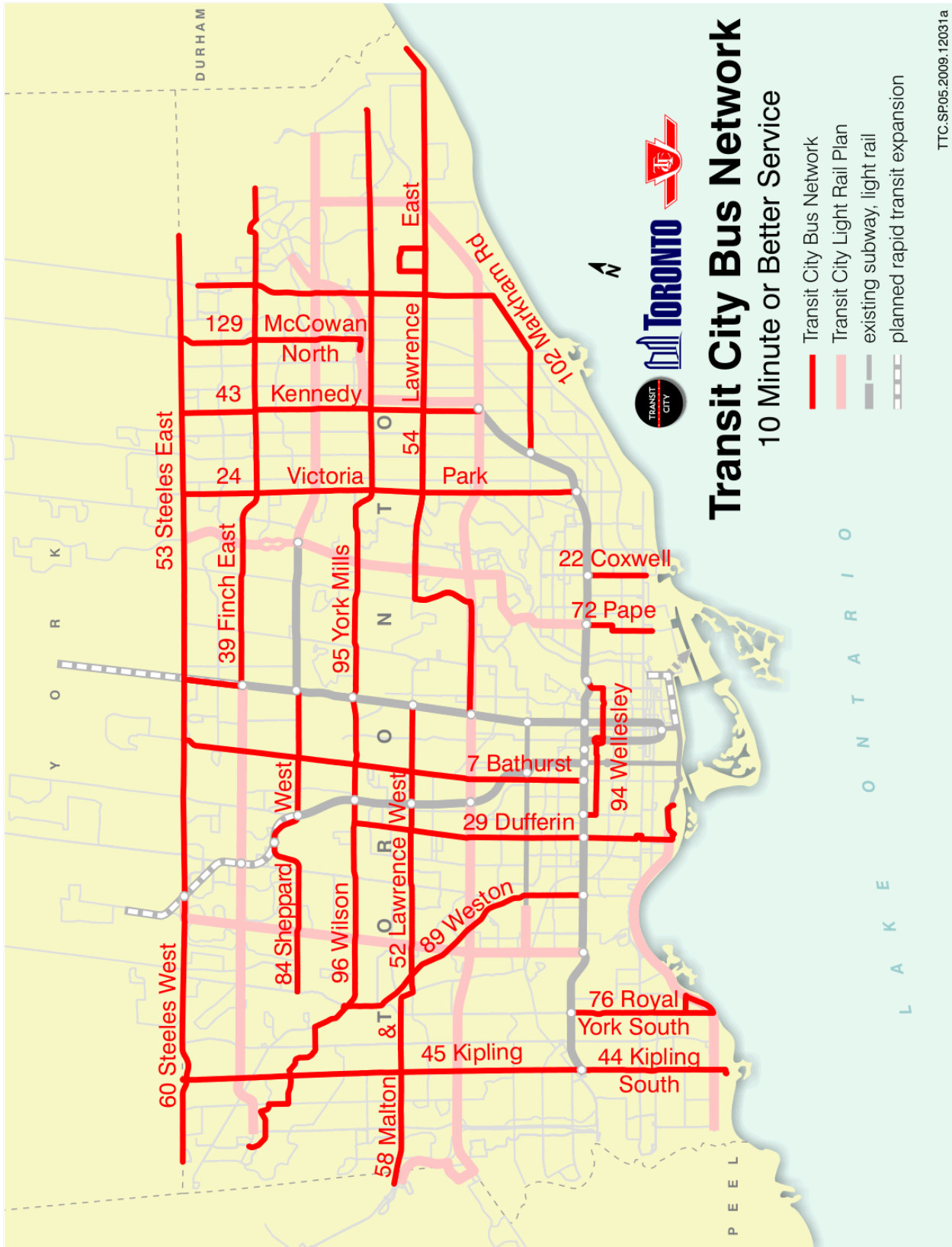
The Transit City Bus Plan will bring about these service improvements:

**Ten-Minute-or-Better Service on TCBN Routes:** Service on all 21 TCBN routes will be provided every 10 minutes or better, during the daytime and evening, to reduce waiting time for customers and to allow spontaneous trip making, without the need to consult a schedule. This is shown in Exhibit E-1. Most of the service improvements will be at off peak times. This improvement is projected to attract approximately 1.8 million new customer-trips each year. Approximately 29 million customer-trips are now made each year on these routes, and these customers will benefit from shorter waiting times. Operating costs will increase by approximately \$10.1 million per year and fare revenue will increase by approximately \$3.1 million per year, for a net annual cost increase of approximately \$7.0 million. Four additional peak buses will be required, at a capital cost of approximately \$2.4 million.

*It is proposed that this "Ten-Minute-or-Better" service be implemented in the fall of 2010.*



Exhibit E-1: "Ten-Minute-or-Better" Service



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**Enhanced Express Service on TCBN Routes:** New or enhanced express bus service will be introduced on 15 of the 21 *Transit City Bus Network* routes. This is shown in Exhibit E-2. On those routes with existing express branches, service will be increased, and new express service will be added at off-peak times. On the other routes, new express service will be added during the peak periods from Monday to Friday.

It is projected that this “enhanced express bus service” will attract approximately 2.0 million new customer-trips each year. Up to 54 million customer trips are now made on these services and will benefit from faster and more-frequent service. Operating costs will increase by approximately \$11.4 million per year, and fare revenue will increase by approximately \$3.6 million per year, for a net annual cost increase of approximately \$7.8 million. Fifty-six additional peak service buses will be required, at a capital cost of approximately \$33.5 million.

This service will be implemented in the fall of 2014, when system-wide bus requirements begin to decline due to implementation of *Transit City* light rail lines.

The *Transit City Bus Plan* also calls for improvements on routes other than those which make up the *Transit City Bus Network*:

**Enhanced Express Bus Service on Future Transit City Light Rail Lines:** In order to improve service for customers along future Transit City light rail lines, it is proposed that enhanced express bus service be operated on the three Transit City light rail line corridors where LRT construction will not begin in the near term. These corridors are 35 JANE (Jane LRT), 25 DON MILLS (Don Mills LRT), and 116 MORNINGSIDE (Scarborough Malvern LRT). Existing express services will be increased so that they operate more frequently, and new express service will be operated. All three services will operate from approximately 6:00 a.m. to 10:00 p.m. Monday to Friday, and during the daytime on Saturdays, Sundays, and holidays.

Provision of this interim express service in the Jane, Don Mills, and Morningside corridors is projected to attract approximately 1.3 million new customer-trips each year. Approximately 21 million customer-trips are currently made each year in these corridors, and these customers will benefit from faster and more-frequent service. Operating costs will increase by approximately \$8.4 million per year, and fare revenue will increase by approximately \$2.3 million per year, for a net annual cost increase of approximately \$6.1 million. Seventeen additional peak service buses will be required at a capital cost of approximately \$10.2 million.

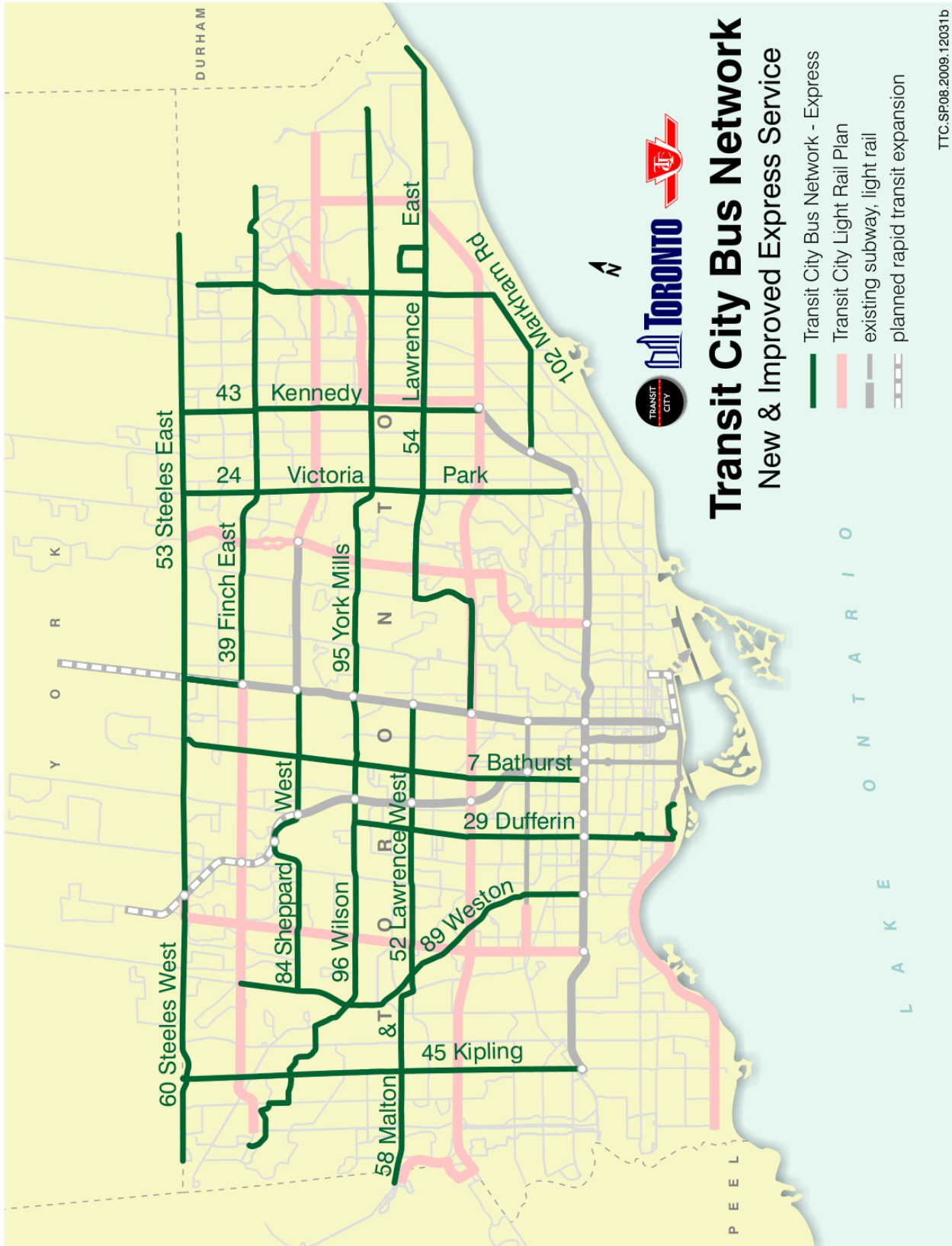
*It is proposed that this enhanced express bus service on future LRT lines be implemented in the fall of 2011. These interim express services will end when the light rail services begin operation.*

**Twenty-Minute-or-Better Service on All Routes Outside the *Transit City Bus Network*:** As part of the *Transit City Bus Plan*, it is proposed that the remaining final phase of the TTC’s *Ridership Growth Strategy* (RGS) be implemented. This will change the TTC’s minimum service level standard for bus and streetcar routes so that virtually all services are scheduled to operate every 20 minutes or better, at all times.





Exhibit E-2: Express Service



# Transit City Bus Network

## New & Improved Express Service

- Transit City Bus Network - Express
- Transit City Light Rail Plan
- existing subway, light rail
- - - planned rapid transit expansion

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This initiative will increase service levels on approximately 75 TTC routes. Most new or improved services will be at off-peak times. Approximately 2.7-million new customer-trips each year will be attracted to the TTC. Approximately 18-million customer-trips are made on these services each year, and these customers will benefit from shorter waiting times and less crowding. Operating costs will increase by approximately \$19.8 million per year, and fare revenue will increase by approximately \$4.9 million per year, for a net annual cost increase of approximately \$14.9 million. Twelve additional peak buses will be required, at a capital cost of approximately \$7.2 million.

*It is proposed that this "Twenty-Minute-or-Better" service initiative be implemented in two stages: half in September of 2011, and the remainder in September of 2012.*

**More Shelters for Better Customer Comfort:** The provision and maintenance of transit shelters is managed by the City of Toronto. The City's transit shelter program has limited funding for the installation of new shelters throughout the city. In order to improve customer comfort, TTC staff have identified those *Transit City Bus Network* stops which serve over 100 boarding customers daily, and which do not presently have shelters. This review indicated that there is physical space at 31 of these locations to allow for the installation of shelters. In view of the importance of customer comfort and convenience as one aspect of the *Transit City Bus Network*, additional shelters should be provided at these stops.

Additionally, there are bus stops without shelters on other routes which are not part of the *Transit City Bus Network*. Customers would have a more pleasant travel experience if these stops were also equipped with shelters.

Additional capital funding of \$2,500,000 would allow the installation and maintenance of 75 additional transit shelters at locations where suitable space exists.

*It is proposed that the Transit City Bus Plan include the installation of 75 additional transit shelters at selected locations.*

**Promoting the Transit City Bus Plan:** In order to ensure that people are aware of the TTC's *Transit City Bus Plan*, and will be more likely to take advantage of these improved services, it will be important to undertake a marketing campaign with particular emphasis on the 10 minute-or-better service and the new express services which will be provided on *Transit City Bus Network* routes. TTC staff are reviewing possible new unique bus stop markers for the *Transit City Bus Network*. Changing the colour of existing markers will cost \$100,000, and introducing larger markers (to include unique graphics) will cost \$435,000.

*It is proposed that the Transit City Bus Plan include a marketing and promotion initiative in order to ensure good public awareness of these significant service improvements.*



## **MORE ROUTE SUPERVISION FOR BETTER SERVICE QUALITY**

As part of the ongoing analysis and review of TTC Route Supervisory practices, it has been concluded that additional on-street supervisors will be needed in order to achieve and maintain a higher-level of service quality. Direct face-to-face communications between operators and supervisors and in-field monitoring of services will achieve greater service reliability and customer-focussed operations. During the five-year period 2009-2013, this Plan calls for an additional 65 on-street supervisors. Of this total, 13 have already been approved and introduced. The remaining additional 52 on-street supervisors will be introduced during the period 2010-2013. The total annual cost, once all supervisors are in place, will be \$4.5 million per year.

*It is proposed that 52 additional on-street Route Supervisors be introduced during the period 2010-2013.*

## **BETTER TECHNOLOGY & FACILITIES FOR BETTER CUSTOMER SERVICE**

### **More Transit Signal Priority for More-Reliable, Faster Service**

Giving priority to buses or streetcars at intersections, through the provision of Transit Signal Priority technology, allows the traffic signal to detect an approaching bus and then adjust the signal timing to allow the bus to proceed through the intersection with reduced red-light delay. This results in faster service for customers and also increases the capacity of the route without adding vehicles, because existing vehicles can complete more round trips faster. In this way, transit signal priority improves productivity and avoids or defers future cost increases.

There are currently 2,200 signalised intersections in Toronto, almost all of which have transit service operating through them. Of this total, approximately 350 are equipped with transit signal priority. TTC and City staff are proposing, as part of this *Plan*, that 1,130 additional intersections on 53 bus routes be equipped with transit signal priority intersections by the end of 2013. Full installation of transit signal priority by the end of 2013 will produce the equivalent capacity of 46 additional morning peak buses, 39 mid day buses, and 53 afternoon peak buses. It is estimated that 50 per cent of this new peak capacity can be realized as capital savings (fewer buses) and operating savings (fewer operators). The transit signal priority installations will improve service for approximately 155 million customer-trips each year.

The total installation cost of this accelerated signal priority program is \$41 million. Current work on this technology means that \$10.2 million has been previously budgeted and approved. Capital savings due to the reduction of buses will equal \$13.7 million and operating efficiencies (fewer operators) will equal \$2.1 million per year. The resulting net capital expense will be \$17.1 million.

*It is proposed that Transit Signal Priority be implemented at 1,150 signalised intersections by 2013 as part of the Transit City Bus Plan.*



### Queue-Jump Lanes to Help Buses Through Congested Intersections

Major intersections are significant 'pinch-points' for traffic flow. Buses often experience long queues of traffic on the intersection approach, and are typically delayed within these queues. A queue-jump lane – a bus by-pass lane – can be created by building (or extending an existing) right-turn-only lane on the intersection approach. A bus approaching the intersection can move through more quickly by using this lane to "jump"

the queue of stationary traffic. Reliability improves because every bus which travels through the intersection will be able to proceed through in a more-consistent fashion, thereby, helping to maintain even spacing between buses.

The current five-year TTC capital budget includes \$1 million per year for the construction of queue-jump lanes at problem locations. As part of the *Transit City Bus Plan*, a five-year plan has been established between the City and TTC, whereby 10 queue-jump lanes will be constructed at selected locations between 2010 and 2014 (2 per year). The first two locations will be:

- westbound on Finch Avenue approaching Don Mills Road; and
- eastbound on Finch Avenue approaching Victoria Park Avenue.

*It is proposed that ten queue-jump lanes (two per year) be constructed commencing in 2010. TTC and City staff will work together to prioritize locations for each year.*

### Better Bus Facilities at Stations for Improved Customer Convenience and Comfort

Bus routes often experience their highest customer volumes where they connect at subway stations. Here, large numbers of customers wait for buses, or transfer between services. It is, therefore, important that bus-waiting or transfer facilities at stations have reasonable levels of comfort, amenities, and shelter. To ensure this, the Transit City Bus Plan has initiated a review of all bus facilities at subway stations to identify those which warrant upgrades. This work will be ongoing for a number of years. The first five initiatives, which are indicative of the types of modest station improvements which should be done, are listed here:

- improve the passenger environment at Victoria Park Station bus platform by providing an additional enclosed waiting area;
- improve the quality of customer transfers between bus and subway street entrances at Lansdowne Station by installing enclosed waiting areas at the entrances;
- improve the passenger environment at Don Mills Station bus platform by providing increased lighting;
- reduce the crowding and congestion of customers at the single door on the north side of Royal York Station by providing a sliding power door; and



- reduce the risk of snow/ice falling onto customers entering/exiting at Dupont Station street entrances by installing canopies over the entrance doors.

These five projects will require capital funding of \$4 million to implement.

*It is proposed that these five station improvements be constructed in 2010-2014, with future station improvements to be identified.*

### **OTHER IMPROVEMENTS STILL TO COME**

There will continue to be, new means by which the TTC will improve the quality of its bus services. These efforts will be ongoing for many years. Here are two examples of current opportunities which could help the TTC to provide more attractive service to customers:

- “customer-friendly” communications, information, and entertainment systems: Applications will include interactive display screens on-board buses or/at stops, as well as web-based applications for use on home computers, cell phones, etc.; and
- introduction of a technology-based “Smart Bus” system. This will consist of consolidating on-board information/monitoring systems to provide real-time two-way information both for customer benefits and for operational efficiency. The applications could include:
  - o real-time connecting route information;
  - o real-time vehicle diagnostics and passenger volume data; and
  - o monitoring of destination signs to ensure proper information displays for customers.

### **IMPLEMENTATION AND COST SUMMARY**

The approximate costs and proposed implementation timelines of all the new initiatives contained in the *Transit City Bus Plan* are summarized in Exhibit E-3. This Plan represents a considerable investment in bus operations which are a very important part of Toronto’s transit system. The value of TTC bus services is often overlooked, but they are used for almost 400 million customer-trips each year. The Transit City Bus Plan ensures that these important services will remain an attractive and viable travel option for travellers in Toronto.



**Exhibit E-3: TRANSIT CITY BUS PLAN  
SUMMARY OF COSTS AND IMPLEMENTATION TIMING**

PROJECT	ANNUAL OPERATING COST INCREASE (All costs in 2009 dollars) (Does not include additional fare revenue)					
	2010	2011	2012	2013	2014	Future years
Ten-Minute-or-Better Service on <i>Transit City Bus Network</i>	\$1.0M	\$10.1M	\$10.1M	\$10.1M	\$10.1M	\$10.1M
Express Service on <i>Transit City Bus Network</i>	-	-	-	-	\$3.8M	\$11.4M
Express Service on Three Future LRT Routes (*)	-	\$2.8M	\$8.4M	\$8.4M	\$8.4M	\$8.4M until LRT implementation
Twenty-Minute-or-Better Service – <i>Ridership Growth Strategy</i>	-	\$3.3M	\$13.2M	\$19.8M	\$19.8M	\$19.8M
Operating Efficiencies due to Bus Savings (Transit Signal Priority)	-	(\$0.8M)	(\$1.5M)	(\$2.1M)	(\$2.1M)	(\$2.1M)
Additional On-Street Supervision	\$1.1M	\$2.5M	\$3.8M	\$4.4M	\$4.5M	\$4.5M
<b>TOTAL</b>	<b>\$2.1M</b>	<b>\$17.9M</b>	<b>\$34.0M</b>	<b>\$40.6M</b>	<b>\$44.5M</b>	<b>\$52.1M(*)</b>

(\*) This service and the full \$8.4 million annual cost will end when future LRT routes (Jane, Don Mills, and Scarborough Malvern) are implemented.

PROJECT		NEW CAPITAL COSTS (All costs in 2009 dollars)							TOTAL	Notes
		2009	2010	2011	2012	2013	2014			
Transit Signal Priority	Installation	\$1.8M	\$5.1M	\$12.0M	\$12.0M	\$10.1M	-	\$41.0M		
	Capital Savings (Buses)	-	-	(\$1.8M)	(\$4.1M)	(\$4.1M)	(\$3.7M)	(\$13.7M)	1	
	Prior Approved Funding	(\$1.8M)	(\$2.1M)	(\$2.1M)	(\$2.1M)	(\$2.1M)	-	(\$10.2M)		
	<b>NEW NET ADDITIONAL CAPITAL COST</b>	<b>\$0.0M</b>	<b>\$3.0M</b>	<b>\$8.1M</b>	<b>\$5.8M</b>	<b>\$3.9M</b>	<b>(\$3.7M)</b>	<b>\$17.1M</b>		
Station Improvements		-	\$1.4M	-	\$1.7M	\$0.6M	\$0.3M	\$4.0M	2,3	
Additional Shelters		-	\$0.5M	\$0.5M	\$0.5M	\$0.5M	\$0.5M	\$2.5M		
Additional Buses for Service Improvements		-	\$2.4	\$16.1M	\$1.2M	-	\$33.5M	\$53.2M	4	
<b>TOTAL</b>		<b>\$0.0M</b>	<b>\$7.3M</b>	<b>\$24.7M</b>	<b>\$9.2M</b>	<b>\$5.0M</b>	<b>\$30.6M</b>	<b>\$76.8M</b>		

Note 1: Assumes 50% of capacity created can be saved with fewer buses.  
Note 2: Future projects to be investigated for 2011-2014 Capital Program  
Note 3: Project costs are included in 2010-2014 Capital Program budget submission.  
Note 4: Costs included in 2010-2014 TTC Bus Fleet Plan



## 1.0 INTRODUCTION

The Toronto Transit Commission operates an integrated, multi-modal transit system consisting of buses, streetcars, and subway. Collectively, these services provide a high level of mobility and transportation for Toronto residents. The TTC is continually working to improve the quality and effectiveness of the services which it provides. This is particularly important in light of the City of Toronto's *Official Plan*, which states that Toronto must become a more transit-oriented city in which people make more and better use of its transit system, as well as other sustainable modes of transportation such as walking and cycling.

Over the last two years, the TTC has embarked on a number of highly-visible initiatives to improve the quality and availability of transit services in Toronto. The most noteworthy of these include the *Transit City Light Rail Plan*, which calls for the implementation of seven new light rail transit lines, to bring accessible, comfortable, and environmentally-sustainable rapid transit services to all parts of the city in the form of 120 kilometres of exclusive transit rights-of-way. Also underway is detailed design for an extension of the Spadina Subway north to Steeles Avenue and beyond into York Region.

While these initiatives will bring many benefits to all travellers in the City of Toronto, and attract many new customers to Toronto's transit system, it is important to remember that 60% of all TTC customers use bus services for at least part of their trip-making. In 2008, 300 million customer-trips were made on TTC bus services. Bus services are the most "local" of all TTC services, bringing transit access and mobility to the vast majority of neighbourhoods in Toronto. A very large percentage of TTC customers use buses to connect to the rapid transit services and for local travel within communities. Buses are very much the "grass roots" of the TTC system. It is, therefore, very important for the TTC to also improve the quality and availability of its bus services. The purpose of this report is to describe the initiatives which the TTC is taking or proposes to take in order to achieve that objective. The report is divided into two main sections:

- initiatives already underway or planned in order to improve TTC bus services; and
- new initiatives to further improve the quality and attractiveness of TTC bus services.



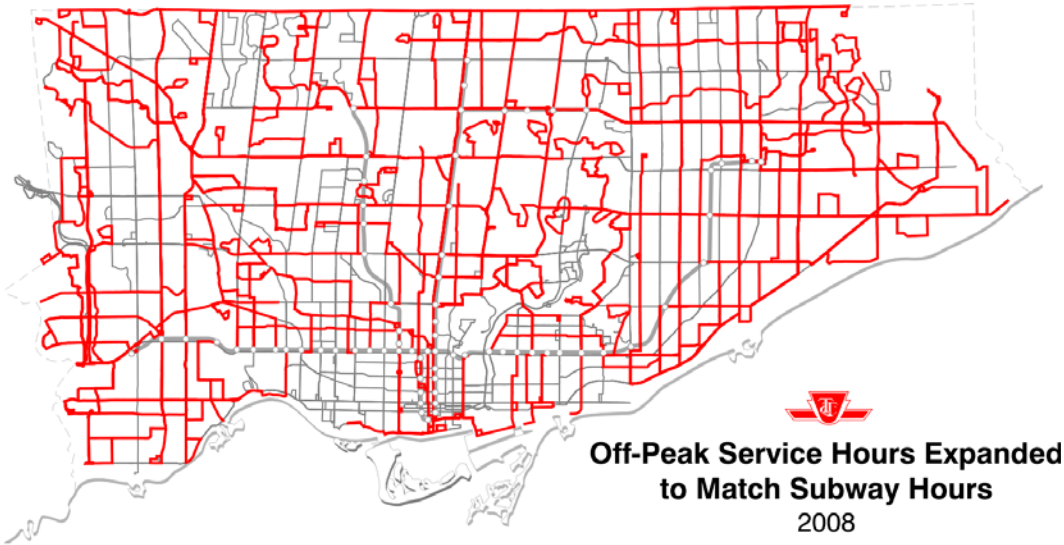
## 2.0 CURRENT TTC INITIATIVES TO IMPROVE BUS SERVICE

### 2.1 MORE-FREQUENT BUS SERVICE, MORE HOURS OF THE DAY

The TTC has learned, through direct input from customers and through market research, that one of the most fundamental and important aspects of service provision is that service be available during most hours of the day and evening – seven days per week – so that people know that their services will always be there, when they need them, and people can plan their complete travels on using transit. Additionally, people prefer that their transit services be as frequent as possible, with crowding kept to tolerable levels.

In response to this, in November 2008, the TTC implemented its largest-ever improvements to bus service availability and frequency. New off-peak service was added on 86 bus routes so that these services operate at all daytime and evening times throughout the week. This is shown in Exhibit 1.

Exhibit 1: New Off-Peak Service



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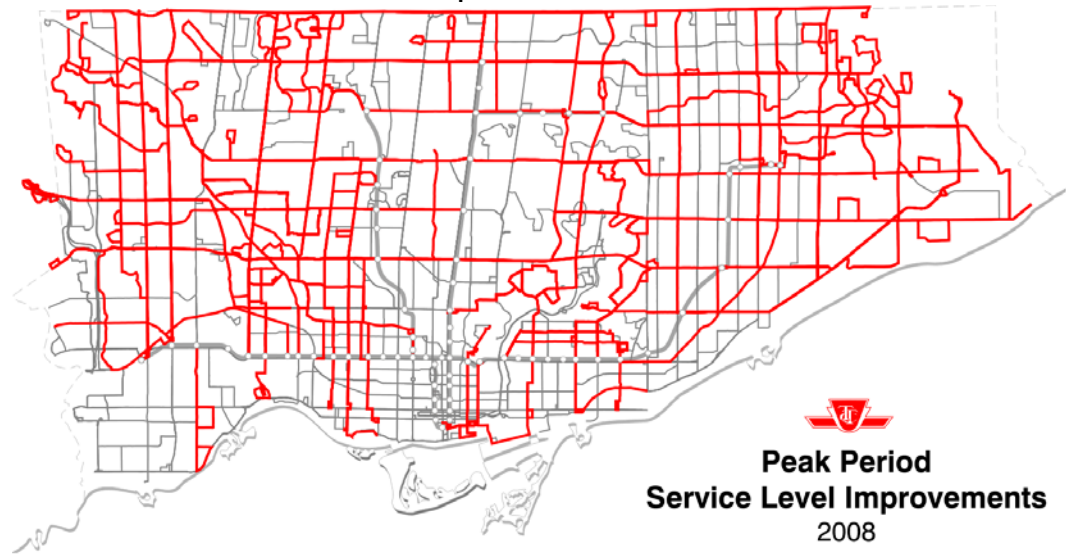
Service levels during peak periods were increased on 62 routes, and the planned average crowding levels in peak periods were reduced by 10 per cent. These service improvements are shown in Exhibit 2.

Improvements such as these are critical to keeping existing TTC customers satisfied, and to attract new customers to Toronto's transit system.





Exhibit 2: Peak-Period Service Level Improvements



## 2.2 MAKING BUS SERVICE MORE-RELIABLE, BETTER QUALITY

### 2.2.1 Hiring Excellent Front-Line Employees

The position of Bus Operator requires many skills including effective interpersonal communications, customer service, stress management, and safe driving. Given these demands, and the importance of the Bus Operator for the TTC system, an outside consultant has been engaged to conduct a review of the recruitment and selection processes for Bus Operators. Included in the proposed system is the introduction of standardized tests for operator applicants. To date, these test instruments have been administered on a pilot basis, and the results are being evaluated through a comprehensive validation study. In addition, a “performance-oriented structured interview” methodology has also been introduced. The goal of these initiatives is to ensure that the best applicants are selected, with a corresponding benefit to customers.

### 2.2.2 Customer-Focussed Training

The TTC regularly reviews and adjusts training programs in order to ensure that they are current, relevant, customer-focussed, and reflective of real-life situations and challenges. Customer service training for operators was expanded by increasing the Bus Operator recertification program from two to three days. The additional day focuses on customer service and accessibility issues. The accessibility component includes a visit by a representative from the TTC’s Advisory Committee on Accessible Transportation (ACAT).



The training program for new Route Supervisors is currently being re-developed. For 2010, plans are to improve the on-the-job training component of this training program, and to expand the syllabus to increase the focus on accessibility and on direct supervision of transit operators. Plans are also underway to deliver additional customer service training to all existing Route Supervisors in 2010. Ongoing development and refinement of training programs will continue beyond 2010.

### 2.2.3 Front-Line Workers: Eyes and Ears of the TTC

The TTC recognizes that employee engagement is important in providing the best possible customer service. In support of this, two significant initiatives are underway:

- The TTC has introduced its “Work Safe, Home Safe” campaign to achieve improvement in safety performance, internal communications, and corporate culture. The campaign is based on the belief that employees’ collective safety performance will be improved if there is a system-wide awareness of safety and on reducing risk exposures; an open and honest environment for communicating; and if employees are valued and treated respectfully by management. Customers will benefit from safety improvements, and from the better service which comes from good employee morale.
- Recognizing that front-line employees often have excellent knowledge of customers’ preferences and in-field operating challenges, a formalized consultation process is being established which will ensure ongoing communications between operating divisions and other departments. The process will focus on improving customer service by identifying warranted refinements to service levels, operations, supervision, and other aspects of service delivery.

### 2.2.4 More-Reliable Buses, More Accessible, More Amenities

TTC customers want to travel in clean, modern, comfortable, and accessible vehicles. Together with municipal, provincial, and federal funding partners, the TTC has made a significant investment of \$800-million in the last five years in new buses. In 2003, the average age of the bus fleet was 14.1 years. Over the next five years, over 1,200 new low floor accessible buses were introduced. This reduced the average age of TTC buses to 6.4 years in 2008. Further progress will be made this year and next, with the addition of 250 more new accessible buses, bringing the average age down to 5.5 years in 2010. Newer buses mean more-reliable service and more-modern riding environments.

A number of new customer amenities are now being provided on TTC buses including: improved heating and air conditioning; cushioned seating; automatic audible and visual stop announcements; and security cameras. These vehicles also include enhanced operator controls, and a variety of technical improvements.

This progress is illustrated in Exhibit 3 below:



Exhibit 3: Average Age of Vehicles



### 2.2.5 Route Supervisors Help Make it Happen

The traditional technology used by Route Supervisors to monitor bus location and adjust service from a central location is known as the Communications Information System (CIS). This system was designed in the 1970's using technology which has significant limitations. Modern Global Positioning System (GPS) technology is now being introduced at the TTC, and will provide improved bus location information, thereby allowing for better service adjustment decisions for the benefit of customers.

Exhibit 4 below shows a Route Supervisor at a CIS console. The monitor on the left shows the traditional bus-tracking display, which is limited in terms of accuracy and the amount of information it provides. The monitor on the right shows the GPS-based map display which is more-accurate and more "user-friendly". Several other new service adjustment capabilities will also be provided as part of this upgrading of the vehicle-locating system. This upgrade will be fully functional prior to year-end 2010.



**Exhibit 4: Route Supervisor at CIS console**



The GPS-based upgrade will also allow for the introduction of portable vehicle-locating units with which bus location can be monitored in real-time, by on-street Route Supervisors. This will allow these supervisors to make better service-adjustment decisions because they will be able to see how the route is operating outside of their immediate field of vision. For example, a Route Supervisor

positioned at a busy intersection interacts with both operators and customers, but may not be able to see buses more than one block away in either direction. Without the benefit of the “bigger picture”, that supervisor may direct a bus to short-turn or to hold at an intersection, not knowing that following buses are close behind. However, with better GPS-based information, that supervisor will know that other buses are approaching, and may direct the operator to carry on without short turning, thereby improving service to customers. Prototype mobile tracking units are being tested presently, and further development in this area will continue. Exhibit 5 below shows a Route Supervisor interacting with an operator, while using the portable unit device to assess service elsewhere on the route.

**Exhibit 5: Route Supervisor interacting with a Route Operator**



These important technological improvements for route supervision are complementary to, and provide valuable assistance to the proposed increase in the number of on-street Supervisors.

Additional route management initiatives are focussed on a pilot program which commenced in April 2009. A group of Route Supervisors have been

dedicated to on-street supervision duties for two routes (7 BATHURST and 29 DUFFERIN) during both peak and off-peak periods. A variety of new service-adjustment practices are being evaluated as part of the pilot program.



The TTC is also investigating new route performance measures in an effort to ensure that service quality is accurately measured and managed accordingly. A Route Performance Index, based on the measures listed below, is being pursued:

- Safety:
  - o collisions and injuries
- Customer Satisfaction:
  - o complaint trends and analysis
- Service Quality:
  - o on-time performance / actual versus scheduled service
  - o percent of scheduled service delivered
  - o actual versus scheduled running time
  - o unscheduled short-turns

### 2.2.6 Improving and Expanding Wheel-Trans Specialized Service

Wheel-Trans, the TTC's specialized transit service for people unable to use conventional transit services, continues to grow, and a variety of operating improvements are being introduced, all with the intent of improving service to the customer. The main improvements are:

- The entire fleet of low-floor buses (147 buses at year-end 2008) is being replaced during the period 2008 to 2014, as vehicles come due for retirement. An additional 51 buses are being introduced for growth purposes, prior to year-end 2010. The total number of low-floor buses will increase from 147 to 197 (34 percent increase), during the period 2008 to 2010.
- The new buses (see Exhibit 6) include a variety of new customer amenities including: better lighting, a lower first step, full kneeling at both front and rear, more clearance for larger mobility aids, and customer-to-operator "request assistance" buttons.
- A total of 2.4-million trips are expected to be accommodated in 2009, an increase from 2.1-million in 2008.
- The unaccommodated rate for 2009 is forecast to be one per cent, much improved from the two per cent of prior years.
- In 2009 year-to-date, schedule adherence is much improved. The traditional measure of buses running on-schedule has increased from 86 per cent in 2008 to 94 per cent in 2009 (January-June both years).
- A new scheduling system is to be in place by 2010, with full real-time capability anticipated in 2011. The system will improve productivity which will, in turn, free up resources for additional service. Waiting and travel times for customers are also expected to be reduced.



Exhibit 6: New Wheel-Trans Buses



### 2.3 MAKING BUS SERVICES ACCESSIBLE FOR EVERYONE

The TTC, working closely with its Advisory Committee on Accessible Transportation (ACAT) is moving towards its objective of a transit system which is accessible to everybody.

At the end of 2008, 1,498 conventional transit buses (86 percent of fleet) and 127 of 168 bus routes were accessible. An additional 130 new accessible buses for 2009 are currently being delivered, and a further 120 new accessible buses will be added to service in 2010. These initiatives will result in the TTC's bus fleet being substantially accessible by 2010. Higher-than-projected growth in ridership may require that a small number of non accessible buses be kept in the fleet after 2010. If this happens, then these buses will be replaced with new accessible buses as quickly as possible.

TTC bus routes connect with subway stations so, in order for the accessible bus initiative to allow customers to take advantage of the entire TTC system, the connecting subway stations must also be made accessible. The TTC is working towards making all of its subway stations accessible through the established "Easier Access" initiatives. To date, 27 subway stations have been made accessible, and this will increase to 30 stations by 2010.

Further work is underway to make all street-level bus platforms accessible through the installation of automatic sliding doors, Easier-Access fare gates, and improved signage. By the end of 2009, this work will be complete at seven stations: High Park, Runnymede, Old Mill, Castle Frank, Rosedale, Wellesley, and Keele. Three more stations – Lawrence East, Greenwood, and Donlands – will have these accessibility features in place by the end of 2010. All stations will be made accessible by 2020, or sooner if funding is provided.

All new subway stations will be accessible, and will be consistent with the TTC's standards for accessible transit facilities.





## 2.4 MAKING BUSES BETTER FOR THE ENVIRONMENT

The TTC is committed to operating a bus fleet which helps achieve the City's environmental objectives of reducing greenhouse gases, as part of Toronto's *Climate Change Action Plan*.

The TTC now has approximately 800 diesel-electric hybrid buses in operation throughout Toronto. This means that approximately 40 percent of the TTC's bus fleet consists of hybrid buses. These buses feature electric propulsion, with electricity being generated, in part, by a smaller diesel engine compared to regular diesel buses. This results in fewer greenhouse gas emissions. The current hybrid fleet is being equipped with improved batteries for on-board storage of electrical power. The new batteries will reduce bus weight by over 2000 pounds, which is expected to reduce fuel consumption and reduce wear on roads. These new batteries will also be more energy-efficient, which is expected to further improve fuel efficiency and reduce emissions. All hybrid buses will be equipped with these new batteries by year-end 2010.

All new diesel buses acquired by the TTC are equipped with the most-advanced exhaust-treatment equipment available. This, together with the TTC's use of ultra-low sulphur fuel, means that TTC buses now achieve significantly-improved emission performance.

The TTC is currently investigating the possible acquisition of articulated buses beginning in 2011, and is preparing specifications for issue to suppliers. These buses would be expected to provide additional benefits regarding overall greenhouse gas reductions.

The TTC has a strong interest in environmentally-supportive all-electric buses and is carefully tracking the development of this technology for industry-wide application. The TTC will continue to monitor and assess new technologies as they are developed, in order to further improve the environmental performance of its bus fleet.

## 2.5 IMPROVING CUSTOMER AMENITIES AND SERVICE INFORMATION

A number of Information Technology initiatives are underway to provide customers with information to allow them to plan their TTC trips in advance, as well as stay informed about the status of their selected routes so that they can make spontaneous decisions about their travel.

### 2.5.1 Service Disruption Notifications

As with any major transit system operating in a big city, TTC services get delayed or disrupted due to traffic conditions, construction, etc. The new service disruption notification system keeps customers aware of such situations by automatically sending





them an email. This system is currently in place for subway service, and it will be expanded to bus services, with initial limited introduction in late 2009. The amount and type of information sent will be progressively increased as the system is fully developed.

Current plans call for messages being sent to customers' computers, cell phones, and other devices. In the longer term, these messages will also be displayed on message boards at selected bus shelters and on-board vehicles. A trial of these information screens will commence in 2010.

### 2.5.2 Next Vehicle Arrival System: Making Travel More Predictable

This concept provides real-time information to customers at a stop/station about when the next bus, streetcar, or subway train will arrive. Throughout 2009, most subway stations have been equipped with next subway train information on the subway platform level. It has also been implemented on a pilot basis at the streetcar platforms at Spadina Station and Union Station. Work is continuing, including plans to provide next vehicle information for bus services by means of email/text messaging, message boards at shelters/stations, the internet, and on-board vehicles.

Exhibit 7 shows samples of "Next Bus Arrival" displays designed for bus platform areas at subway stations, and Exhibit 8 shows how this information will be provided inside a bus shelter at busy stops.

Exhibit 7: Next Vehicle Arrival Display at Subway Station Bus Platform Area



Exhibit 8: Next Vehicle Arrival Display in Bus Shelter



**2.5.3 New Internet Trip Planning: “Your Trip, Your Way”**

Customers who want information to plan their TTC trips in advance have traditionally done so by accessing individual route schedules on the TTC website (almost 13 million web page visits in 2007) or by a phone call to TTC Customer Information. However, planning a TTC trip in advance will be greatly improved through the TTC’s new internet trip planning system on the TTC website. It will allow customers to quickly plan their full trip from origin to destination, including any specific customer preferences or requirements. This system will, of course, have internet accessibility.

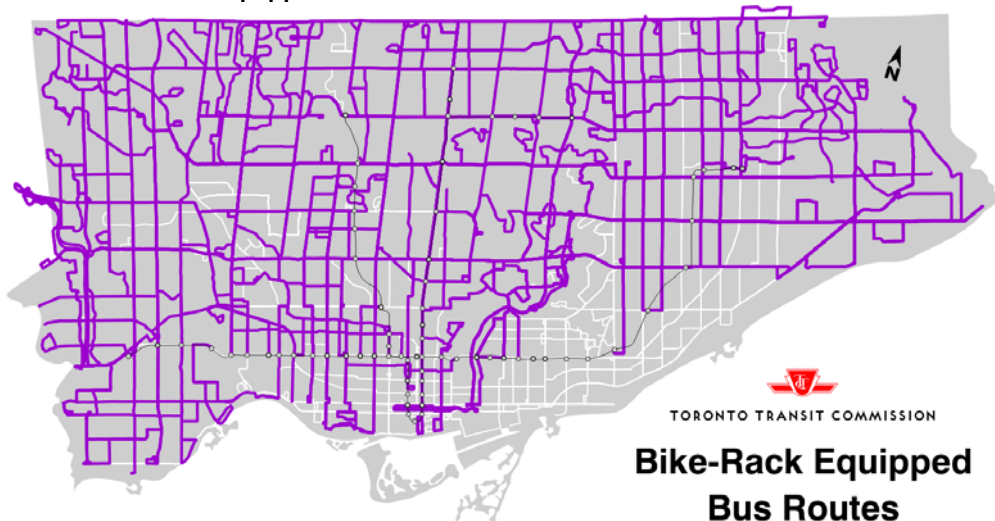
**2.5.4 Bicycle Commuters: Get on the Bus!**

The TTC is making significant progress on its initiative to better accommodate bicycle users, with over half of all existing bus routes offering bicycle rack service. By the end of 2010, substantially all routes will be equipped. Exhibit 9 shows the network of bike rack equipped routes as of August 2009.

To further facilitate bike commuting on the TTC, the TTC has developed a draft design standard for secure bicycle parking. A test of such a facility will be done as part of the renovations to Victoria Park Station. Secure bike parking may then be considered for inclusion in the designs for other new or renovated rapid transit stations. The current design for secure bicycle storage facilities is similar to that illustrated in Exhibit 10.



Exhibit 9: Bike-Rack Equipped Routes



TORONTO TRANSIT COMMISSION

### Bike-Rack Equipped Bus Routes

August 2009

TTT-0204-0000-100004

Exhibit 10: Concept for a Secure Bicycle Storage Facility



TORONTO TRANSIT COMMISSION

## 2.6 BUSES AS RAPID TRANSIT

### 2.6.1 Special Lanes for Buses

High Occupancy Vehicle (HOV) and/or Bus-Only lanes are currently provided at several locations throughout Toronto. Although they help buses move more quickly in highly congested areas, there is high degree of non-compliance whereby motorists who do not have enough passengers to qualify as an “HOV” vehicle, use the lanes anyway. The public perceives that this can be done with little risk of being caught by police because of limited enforcement. This reduces the benefit of these lanes for transit. Therefore, the implementation of additional HOV lanes is not being actively pursued at this time.

As with HOV lanes, non-compliance of Bus-Only lanes by motorists makes them less effective. The benefits of Bus-Only lanes might be improved through greater enforcement, using cameras mounted at wayside points, or on the front of TTC buses. Cameras could record autos which are illegally in a Bus-Only lane, and Highway Traffic Act (HTA) charges could be laid in a fashion similar to what is now done with red light violations. Approval for this type of enforcement would be required from the provincial government, including an amendment to the Highway Traffic Act. Further assessment of this improvement to Bus Only lanes will continue, but implementation in the short-term will not be possible.

### 2.6.2 Bus Rapid Transit (BRT) Facilities in Toronto and Beyond

Bus Rapid Transit consists of exclusive bus roadways on physically-separated lanes, which allow buses to move in a fast and reliable way without obstruction. Large volumes of bus riders can be accommodated with improved travel times. Exhibit 11 illustrates a BRT operation in British Columbia.

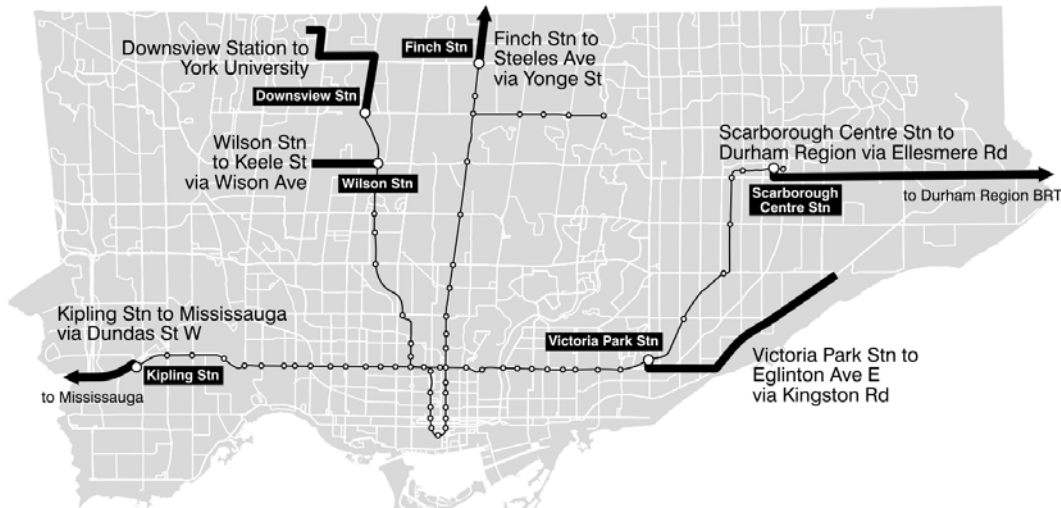
Exhibit 11: BRT Operation in British Columbia



Road allowance limitations in urban areas create challenges for BRT implementation because there is often not enough room for a physically-separated bus facility, together with other road uses such as automobile lanes, bicycles lanes, sidewalks, and landscaping. This is particularly true in older parts of the City with narrower streets. Nonetheless, BRT has the potential to bring about cost-effective service and operational improvements, and, so, the TTC and the City are working on a number of BRT opportunities.

Current BRT planning activities are shown in Exhibit 12 and are summarized below.

#### Exhibit 12: Current BRT Proposals in Toronto



#### York University Bus Rapid Transit

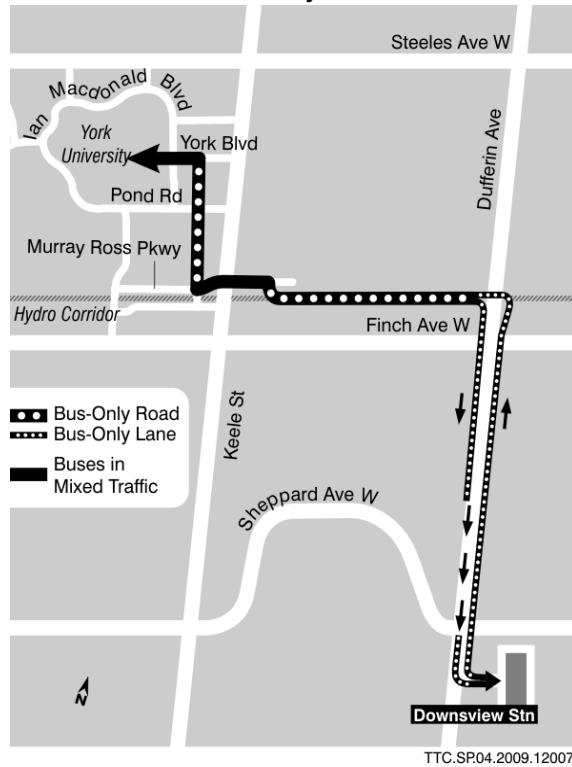
A BRT facility is scheduled to become fully operational between Downsview Station and York University in the fall of 2009. The detailed alignment is shown in Exhibit 13. This BRT will accommodate one of the TTC's busiest bus routes (the 196 YORK UNIVERSITY ROCKET), carrying over 22,000 customer-trips per day. This route is currently subject to significant delays related to traffic congestion. Once the BRT is implemented, the travel time for customers on buses between York University and Downsview Station will be reduced by approximately 25 percent.

This BRT will provide quick and reliable bus travel between Downsview Station on the Spadina Subway and York University. As can be seen, this first BRT will consist of segments with different operational characteristics: a bus-only road, bus-only lanes, and bus operation in mixed-traffic.





Exhibit 13: York University BRT



**Kingston Road-Danforth Bus Rapid Transit**

An Environmental Assessment Study is being done pertaining to Transit Improvements on Kingston Road. The study is focussing on a possible BRT service on Danforth Avenue and Kingston Road connecting to Victoria Park Station. The study is part of an ongoing initiative on the part of City Planning and the local community to revitalise the Kingston Road corridor. If approved and constructed, this BRT would improve bus speed and reliability in the corridor and link with the Scarborough-Malvern *Transit City LRT* line planned for Eglinton Avenue East and Kingston Road north of Eglinton.

Exhibit 14: Kingston Road Danforth BRT



## Yonge North Bus Rapid Transit

Yonge Street, north of Finch Avenue, carries a large volume of TTC and regional buses – approximately 120 per hour in the busiest times. An Environmental Assessment Study was initiated to introduce a BRT on this road segment, operating from Finch Station into York Region. The Yonge BRT concept would provide bus operations in dedicated lanes in the middle of the road allowance. The BRT lanes and associated customer loading platforms would be physically separated from traffic. The BRT would also have special passing lanes for buses within it, so that an express bus could pass a stationary bus serving a platform.

**Exhibit 15: Yonge BRT**



Metrolinx and York Region have brought forward a proposal to extend the Yonge Subway north to Richmond Hill, and, if this were to proceed, it would obviate the need and rationale for the BRT on this section of Yonge Street. Confirmation of funding for the subway extension has not been received, however, and, if the subway extension does not get funded, then work will resume on the Yonge BRT.

## Potential Additional BRT Facilities

There are a number of BRT concepts or projects, which have been proposed either as part of the Metrolinx Regional Transportation Plan or in conjunction with specific major developments in Toronto which are currently in the early review stages. These include:

- a BRT running east from Scarborough City Centre into Durham Region on Ellesmere Avenue and Highway 2;
- a BRT from Kipling Station via Dundas Street west into Mississauga, and connecting with bus services on Highway 427; and
- a BRT from Wilson Station to Keele Street to provide the capacity and service quality needed to make transit a very attractive travel option for a major re-development planned for the provincially-owned property on the south-west corner of Keele Street and Wilson Avenue.





## 3.0 NEW TTC INITIATIVES TO IMPROVE BUS SERVICE

### 3.1 THE "TRANSIT CITY BUS NETWORK"

There is widespread acceptance of the fact that good-quality, attractive transit service brings significant environmental and social benefits to urban areas. In support of the City's very important environmental, social, mobility, and land use objectives, as laid out in Toronto's *Official Plan*, the TTC has implemented a number of service and fare initiatives to further attract riders and to make transit usage a part of daily life for Toronto area residents. The *Ridership Growth Strategy* (RGS) report of March 2003, presented a detailed set of principles and recommendations. Most of the recommendations of that study have already been implemented.

This *Transit City Bus Plan* builds on the underlying principles of the *Ridership Growth Strategy* which states, very simply, that, in order to attract and maintain customers, transit service must be reliable, frequent, easily-accessible, and have competitive travel times. Flowing from these principles, the *Transit City Bus Plan* presents new service improvement initiatives, with associated recommendations and implementation plans. This study supplements the RGS by improving service on a specified network of core bus routes – *Transit City Bus Network* (TCBN) which provides coverage and inter-connectivity throughout the city. The intent is to establish a network of high-quality service corridors which will be available during all daytime and evening hours, every day of the week, to encourage and attract people living or working nearby to travel on these routes and the network as a whole and, in so doing, help them to adopt transit oriented lifestyles.

#### 3.1.1 Development of the *Transit City Bus Network*

The *Transit City Bus Network* has been developed to complement the *Transit City Light Rail Plan*. It includes corridors which were not selected for light rail service but which offer significant opportunities to generate transit ridership and encourage transit oriented redevelopment in the City. Twenty-one of the TTC's 148 bus routes were selected using the following criteria and procedures:

- TTC bus routes were evaluated and ranked according to a ratio of "Population/Employment per route kilometre". This is a measure of total potential market including both residential and business populations, within a 300-metre distance from the route.
- All routes were evaluated and ranked according to a ratio of "Customers per route kilometre". This is a measure of "existing ridership density"; in other words, a measure of route ridership.
- A composite ranking was developed, encompassing both ratios noted above, and routes were ranked accordingly.



- The highest-ranking existing routes were cross-checked with the City's *Official Plan* regarding compliance with the "Surface Transit Priority Network" and support for designated "Avenues" and growth centres.

A qualitative assessment was made to ensure that the resulting network provided equitable coverage to most areas of the city. Other selection factors included compatibility with the RGS network, and with *Transit City* LRT/subway networks. Accessibility was a key consideration, and this was managed through the fact that every bus route is already accessible, or will be, by year-end 2010.

**Exhibit 16: *Transit City* Bus Network (TCBN) Routes, and Relevant Selection Data**

TCBN ROUTE	Total Ridership Rank Out of 148 Routes	Transit Priority Corridor in Official Plan?	Serves Growth Areas in Official Plan?	Population & Employment Per Route Kilometre	Customers Per Route Kilometre
7 BATHURST	24	Yes	Yes	2600	700
22 COXWELL	69	No	No	3600	1600
24 VICTORIA PARK	21	Yes	No	2700	800
29 DUFFERIN	3	Yes	Yes	3000	1600
39 FINCH EAST	8	Yes	Yes	2400	1200
43 KENNEDY	37	No	No	1700	500
44 KIPLING SOUTH	60	No	Yes	1400	700
45 KIPLING	27	No	Yes	1600	600
52 LAWRENCE WEST/ 58 MALTON	22	No	Yes	2400	700
53 STEELES EAST	19	Yes	No	1200	600
54 LAWRENCE EAST	11	No	Yes	2100	600
60 STEELES WEST	15	Yes	No	1500	800
72 PAPE	54	No	No	3500	1400
76 ROYAL YORK SOUTH	50	No	No	2100	800
84 SHEPPARD WEST	35	Yes	Yes	1800	600
89 WESTON	40	No	Yes	2200	700
94 WELLESLEY	44	No	No	5900	800
95 YORK MILLS	17	Yes	No	1500	600
96 WILSON	18	Yes	Yes	2000	600
102 MARKHAM RD	28	Yes	No	1800	500
129 MCCOWAN NORTH	31	Yes	Yes	2600	900
<b>TCBN AVERAGE</b>				<b>2300</b>	<b>800</b>



### 3.1.2 Network of Ten-Minute-or-Better Service Bus Routes

The TTC has provided a minimum service level on the subway for many years, with service never being less frequent than every six minutes. More recently, a minimum 30-minute service on all surface routes has been introduced.

For all 21 TCBN routes, this concept is being taken one step further, with the concept that service on these routes be provided at least every 10 minutes, during all daytime and evening hours, every day, to allow spontaneous trip making, without the need to consult a schedule. This network is shown in Exhibit 17. People in Toronto will be able to rely on the *Transit City Bus Network* for frequent, reliable service at virtually any time of the day.

Most of the service improvements will be at off peak times (two of the routes, 29 DUFFERIN and 39 FINCH EAST, already have service every 10 minutes or better at all times). This major service improvement is projected to attract approximately 1.8 million new customer trips each year. Approximately 29 million customer-trips are now made each year on these routes, and these customers will benefit from shorter waiting times. Operating costs will increase by approximately \$10.1 million per year, and fare revenue will increase by approximately \$3.1 million per year, for a net annual cost increase of approximately \$7.0 million. Four additional peak buses will be required, at a capital cost of approximately \$2.4 million.

*It is proposed that the "Ten-Minute-or-Better" service be implemented in the fall of 2010.*

### 3.1.3 New and Improved Express Services

Express bus service is popular with TTC customers, because it provides a faster and more comfortable trip. New or enhanced express bus service will be introduced on 15 of the 21 *Transit City Bus Network* routes. The *Transit City Bus Plan* express network is shown in Exhibit 18. The remaining six routes (22 COXWELL, 44 KIPLING SOUTH, 72 PAPE, 76 ROYAL YORK SOUTH, 94 WELLESLEY, and 129 MCCOWAN NORTH) are too short in length to benefit from express buses.

On TCBN routes with existing express branches (39 FINCH EAST, 45 KIPLING, 53 STEELES EAST, 54 LAWRENCE EAST, 60 STEELES WEST, 95 YORK MILLS, and 96 WILSON), the express service will be increased by at least 10 percent and, in some cases, new express service will be added at off-peak times. On the other TCBN routes (7 BATHURST, 24 VICTORIA PARK, 29 DUFFERIN, 43 KENNEDY, 52 LAWRENCE WEST / 58 MALTON, 84 SHEPPARD WEST, 89 WESTON, and 102 MARKHAM ROAD) new express service will be added during the peak periods from Monday to Friday.

It is projected that these "enhanced express bus services" will attract approximately 2.0 million new customer-trips each year. Up to 54 million customer-trips are now made on these services and will benefit from faster and more-frequent service. Operating costs will increase by approximately \$11.4 million per year, and fare revenue will increase by approximately \$3.6 million per year, for a net annual cost increase of approximately



\$7.9 million. Implementation of these express services is scheduled for the fall of 2014. This will coincide with the opening of the first *Transit City* light rail lines, when very busy bus routes such as the 36 FINCH WEST and the 85 SHEPPARD EAST will be changed over from bus operations to light rail. This decision to not implement the new express services until there is a reduction in the need for buses elsewhere will avoid a “spike” in the total demand for buses and avoid a short-term spike in the demand for bus garage space. The capital cost of the 56 buses needed for the express services will be approximately \$33.5 million.

*It is proposed that this “enhanced express” service be implemented in fall of 2014.*

### **3.1.4 Service Improvements on Routes Other Than the *Transit City* Bus Network**

#### **3.1.4.1 Enhanced Express Bus Service on Future *Transit City* LRT Lines**

In order to improve service for customers along future *Transit City* light rail lines, it is recommended that enhanced express bus service be operated along three of the *Transit City* LRT corridors on which LRT construction is not planned in the near term. These corridors are 35 JANE (Jane LRT), 25 DON MILLS (Don Mills LRT), and 116 MORNINGSIDE (Scarborough-Malvern LRT).

Existing express services (35 JANE and 116 MORNINGSIDE) will be increased so that they operate more frequently and more often, and new express service will be operated on the 25 DON MILLS route. All three services will operate from approximately 6:00 a.m. to 10:00 p.m. Monday to Friday, and during the daytime on Saturdays, Sundays, and holidays. This interim network is shown in Exhibit 19.

Provision of this interim express service in the Jane, Don Mills, and Morningside corridors is projected to attract approximately 1.3 million new customer-trips each year. Approximately 21 million customer-trips are made each year on these corridors, and these customers will benefit from faster and more-frequent service. Operating costs will increase by approximately \$8.4 million per year, and fare revenue will increase by approximately \$2.3 million per year, for a net annual cost increase of approximately \$6.1 million. Seventeen additional peak service buses will be required at a capital cost of approximately \$10.2 million. The requirement for this additional express service will end when the LRT services in these corridors begin operation.

*It is proposed that this enhanced express bus services for future LRT lines be implemented in the fall of 2011.*

Similar interim express bus improvements were examined but are not being proposed for the other *Transit City* LRT corridors currently served by bus routes, because LRT construction will begin on these routes in the very near future. Major civil construction invariably requires traffic management schemes which would prevent the customer benefits of such express services from being realized. However, these corridors are among the busiest and most important in the entire TTC system, and it is critical that service quality be kept at the highest possible level during construction. Therefore,



throughout the construction period, bus operations in these corridors will be closely monitored and action will be taken to adjust operations in order to maintain service reliability. This includes the following routes: 85 SHEPPARD EAST (Sheppard East LRT), 36 FINCH WEST (Etcobicoke-Finch West LRT), and 32 EGLINTON WEST / 34 EGLINTON EAST (Eglinton Crosstown LRT).

#### **3.1.4.2 Twenty-Minute-or-Better Service on All Routes Outside the *Transit City Bus Network***

As part of the *Transit City Bus Plan*, it is recommended that the remaining phase of the TTC's *Ridership Growth Strategy* be implemented. This will change the TTC's minimum service standard for bus and streetcar routes so that virtually all services are scheduled to operate every 20 minutes or better, at all times.

This initiative will increase service levels on 75 TTC routes, almost all at off peak times. Approximately 2.7-million new customer-trips each year will be attracted to the TTC. Approximately 18 million customer-trips are made on these services each year, and these customers will benefit from shorter waiting times and less crowding. Operating costs will increase by approximately \$19.8 million per year and fare revenue will increase by approximately \$4.9 million per year, for a net annual cost increase of approximately \$14.9 million. Twelve additional peak service buses will be required, at a capital cost of approximately \$7.2 million.

*It is proposed that this "Twenty-Minute-or-Better" service improvement be implemented in two stages: half in the fall of 2011, and the remainder in the fall of 2012.*







Exhibit 18 – Transit City Bus Plan – New & Improved Express Bus Service





Exhibit 19 – Express Service on Future LRT Lines



### 3.1.5 Implementation and Cost of New and Improved Services

Exhibit 20 below, presents the relevant cost and benefit details of all the *Transit City Bus Plan* service improvements. All costs are shown in 2009 dollars.

The implementation plan for these service improvements is presented in Exhibit 21, together with their applicable capital costs. All costs are shown in 2009 dollars.

**Exhibit 20: Summary of Service Improvements**

Route	AM peak buses	Weekly hours	Annual gross direct cost	Customer-trips with a benefit, each year	New customers, per year	New revenue, per year	Annual net direct cost
<b>TEN MINUTE SERVICE ON TCBN ROUTES</b>							
7 Bathurst	0	40	\$162,000	346,400	13,700	\$24,400	\$137,600
22 Coxwell	0	50	\$202,000	563,900	20,700	\$36,900	\$165,100
24 Victoria Park	0	70	\$283,000	924,300	50,100	\$89,300	\$193,700
29 Dufferin	10 minute service already in effect						
39 Finch East	10 minute service already in effect						
43 Kennedy	0	200	\$808,000	2,634,700	163,000	\$290,400	\$517,600
44 Kipling South	0	80	\$323,000	567,200	47,300	\$84,400	\$238,600
45 Kipling	3	160	\$646,000	3,453,900	97,900	\$174,500	\$471,500
52 Lawrence West/58 Malton	0	140	\$566,000	1,622,900	106,400	\$189,600	\$376,400
53 Steeles East	0	70	\$283,000	516,200	23,700	\$42,200	\$240,800
54 Lawrence East	0	140	\$566,000	1,688,000	81,300	\$144,900	\$421,100
60 Steeles West	0	310	\$1,252,000	4,898,700	318,400	\$567,300	\$684,700
72 Pape	0	30	\$121,000	187,500	9,500	\$17,000	\$104,000
76 Royal York South	0	70	\$283,000	689,300	28,000	\$49,800	\$233,200
84 Sheppard West	0	130	\$525,000	1,291,800	74,400	\$132,700	\$392,300
89 Weston	0	60	\$242,000	616,700	20,200	\$35,900	\$206,100
94 Wellesley	1	200	\$808,000	2,319,900	160,200	\$321,000	\$487,000
95 York Mills	0	80	\$323,000	585,100	27,700	\$49,400	\$273,600
96 Wilson	0	260	\$1,050,000	1,640,100	105,500	\$188,000	\$862,000
102 Markham Rd	0	380	\$1,454,000	3,543,800	357,300	\$636,700	\$817,300
129 McCowan North	0	50	\$202,000	413,300	31,500	\$56,200	\$145,800
<b>Subtotal</b>	<b>4</b>	<b>2500</b>	<b>\$10,099,000</b>	<b>28,502,600</b>	<b>1,756,800</b>	<b>\$3,130,600</b>	<b>\$6,968,400</b>
<b>NEW OR ENHANCED EXPRESS SERVICE ON TCBN ROUTES</b>							
7 Bathurst	6	440	\$1,778,000	4,241,700	349,800	\$623,400	\$1,154,600
24 Victoria Park	6	170	\$687,000	2,307,500	162,200	\$289,000	\$398,000
29 Dufferin	5	270	\$1,091,000	8,156,100	318,200	\$567,000	\$524,000
39 Finch East	2	190	\$768,000	8,955,600	17,400	\$31,000	\$737,000
43 Kennedy	3	110	\$444,000	1,328,500	109,300	\$194,800	\$249,200
45 Kipling	2	190	\$768,000	3,086,500	13,600	\$24,200	\$743,800
52 Lawrence West/58 Malton	5	180	\$727,000	2,250,900	170,300	\$303,500	\$423,500
53 Steeles East	2	70	\$283,000	2,441,500	4,800	\$8,500	\$274,500
54 Lawrence East	5	360	\$1,454,000	5,642,800	114,900	\$204,800	\$1,249,200
60 Steeles West	2	70	\$283,000	2,484,700	61,700	\$109,900	\$173,100
84 Sheppard West	3	110	\$444,000	1,674,600	91,300	\$162,700	\$281,300
89 Weston	4	120	\$485,000	1,418,100	94,100	\$167,600	\$317,400
95 York Mills	2	190	\$768,000	4,094,500	39,500	\$70,400	\$697,600
96 Wilson	6	250	\$1,010,000	2,787,300	161,700	\$288,100	\$721,900
102 Markham Rd	3	110	\$444,000	2,012,600	118,800	\$211,600	\$232,400
<b>Subtotal</b>	<b>56</b>	<b>2830</b>	<b>\$11,434,000</b>	<b>53,882,900</b>	<b>1,827,600</b>	<b>\$3,256,500</b>	<b>\$8,177,500</b>
<b>ENHANCED EXPRESS BUS SERVICE ON FUTURE TRANSIT CITY LRT LINES</b>							
Jane	4	640	\$2,586,000	8,500,200	488,300	\$869,200	\$1,716,800
Don Mills	9	835	\$3,373,000	8,763,100	582,700	\$1,036,300	\$2,334,700
Scarborough Malvern	4	595	\$2,404,000	4,161,200	210,000	\$374,300	\$2,029,700
<b>Subtotal</b>	<b>17</b>	<b>2070</b>	<b>\$8,363,000</b>	<b>21,424,500</b>	<b>1,281,000</b>	<b>\$2,281,800</b>	<b>\$6,081,200</b>
<b>TWENTY MINUTE SERVICE - RIDERSHIP GROWTH STRATEGY</b>							
20 min service - first phase	10	2450	\$9,898,000	9,110,000	1,365,000	\$2,432,300	\$7,465,700
20 min service - second phase	2	2450	\$9,898,000	9,110,000	1,365,000	\$2,432,300	\$7,465,700
<b>Subtotal</b>	<b>12</b>	<b>4900</b>	<b>\$19,796,000</b>	<b>18,220,000</b>	<b>2,730,000</b>	<b>\$4,864,600</b>	<b>\$14,931,400</b>
<b>GRAND TOTALS</b>	<b>89</b>	<b>12,300</b>	<b>\$ 49,692,000</b>	<b>122,030,000</b>	<b>7,595,400</b>	<b>\$ 13,533,500</b>	<b>\$ 36,158,500</b>



Exhibit 21: *Transit City Bus Plan – Service Improvements: Implementation Plan and Costs*

	Annual Operating Budget Increase	Annual Net Direct Cost	Additional Operators Required	Capital Cost (Additional Service Buses)	Implementation Timeline
Ten-Minute Service On TCBN Routes	\$10.1M	\$7.0M	80	\$2.4M	Fall 2010
Enhanced Express Service On TCBN Routes	\$11.4M	\$7.9M	90	\$33.5M	Fall 2014
Enhanced Express Service on Future <i>Transit City</i> LRT Routes	\$8.4M	\$6.1M	60	\$10.1M	Fall 2011
Twenty-Minute Service on non-TCBN routes	\$19.8M	\$14.9M	140	\$7.2M	Phase One - Fall 2011 Phase Two – Fall 2012

### 3.1.6 More Shelters for Better Customer Comfort

Transit shelters at bus stops provide an added degree of comfort and some perceived safety/security benefit to customers who are waiting for a bus. The City of Toronto is responsible for managing the installation and maintenance of shelters. Approximately 4,500 of 10,000 existing bus and streetcar stops have shelters.

Many current shelters are of an older style and are being replaced by newer/upgraded shelters with benches, signage, lighting, and provision for future installation of the “Next Bus Arrival” system. City staff are managing both this replacement program, and the provision and installation of 30-to-40 new shelters per year at stops which do not currently have them.

In order to improve customer comfort, TTC staff have field-checked all *Transit City Bus Network* service stops which serve over 100 customers daily, and which do not presently have shelters. This review determined that there is enough space at 31 of these locations to allow for provision of a shelter. Two of these locations serve 400 or more daily boardings, two serve between 300 and 400, seven serve 200-to-300, and 20 serve 100 to-200. As an example, Exhibit 22 shows the eastbound stop on Sheppard Avenue at Keele Street, where there is room for a shelter to improve comfort for over 300 customers who wait for buses every day at this stop.



Exhibit 22: Eastbound Stop on Sheppard Avenue at Keele Street



City staff will work with the TTC in the installation of new shelters within their available resources. Additional shelters can be provided sooner – in the range of 15 per year – at a cost of approximately \$30,000 per location. The *Transit City Bus Plan* proposes that 75 new shelters be provided at locations identified by TTC, and where adequate space exists, during the period 2010-2014. This would cost an additional \$2.5 million in capital funding.

*It is proposed that 75 additional transit shelters be installed in the years 2010-2014, over and above the shelters which are being installed through the City's existing program of shelter installation.*

### 3.1.7 Getting the Message Out

TTC staff will undertake a marketing campaign in support of the implementation of the *Transit City Bus Network* (TCBN) and for the other service improvements described in this report. The TCBN campaign will focus on the service improvements of the new ten minute or-better service and the new and enhanced express bus services. Every effort will be made to accommodate such promotional activities within existing budgets.

Consideration will be also given to introducing new, unique bus stop markers for TCBN routes. Existing stop markers could be modified in one of several ways:

- the existing format could be replaced with a new colour format (estimated cost of \$100,000): or
- the existing markers could be extended with an additional indicator that the stop is part of the *Transit City Bus Network* (estimated cost of \$435,000): or
- stop markers could be fully re-designed in order to improve the display of information, along with a suitable TCBN marker. Cost would exceed the cost of extending existing markers.



Consideration will also be given to a possible re-design of the InfoPost schedules along the TCBN routes. Focus groups will be used to assess the effectiveness of possible unique bus stop markers and 'new look' InfoPost schedules.

## 3.2 MORE ROUTE SUPERVISION FOR BETTER SERVICE

Effective route supervision is fundamental to the provision of good service. Route Supervisors undertake many types of work, all geared to ensure good service reliability:

- co-ordinate emergency response;
- monitoring/adjustment of service on several routes simultaneously, based on computer reporting of bus locations (Communications Information System (CIS));
- field-monitor routes throughout the city during all service hours; and
- respond on-street to emergencies, and customer service issues.

On-street supervision is key to providing good customer service because:

- customers are able to speak face-to-face with supervisors to get immediate assistance and resolution regarding a variety of issues including service queries, and emergency incidents (injuries, collisions, route diversions, lost articles, etc);
- it allows direct observation of whether operators are keeping to schedule, are being courteous with customers, and are properly spaced relative to buses ahead and behind;
- on-street Route Supervisors can be positioned at strategic locations during busy periods to manage the flow of each and every bus through that strategic point by either holding the bus or by allowing the bus to proceed; and
- it allows direct observation of crowding and scheduling issues, with real-time adjustments as well as development of longer-term solutions.

Exhibit 23 below shows a Route Supervisor addressing a customer's concern, via radio communication to another TTC location. This immediate availability and direct involvement is much appreciated by customers.





Exhibit 23: Route Supervisor Assisting a Customer



Exhibit 24 below shows an on-street Route Supervisor discussing a service adjustment decision directly with an Operator. The Route Supervisor is using the portable vehicle locating unit described earlier in this report. This allows the on-street Route Supervisor to improve service not only at the location where they are stationed, but also at other locations along the route.

Exhibit 24: Route Supervisor and Operator



These actions help achieve better service reliability (through more-even spacing of buses and less “bunching”), reduced dwell times at stops, and a reduction in short-turned buses. In view of these benefits of on-street supervision, and as part of the ongoing analysis and review of supervisory practices, it has been concluded that additional on-street Route Supervisors are needed. Between 2009 and 2013, it is planned that an additional 65 Route Supervisors will be provided for on-street duties. Of this total, 13 have already been approved and introduced. The remaining additional 52 on-street Route Supervisors would increase operating costs by \$4.5 million annually. Implementation would be on a phased basis as follows:

- o 2010: 17 additional on-street Route Supervisors;
- o 2011: 15 additional on-street Route Supervisors;
- o 2012: 15 additional on-street Route Supervisors; and
- o 2013: 5 additional on-street Route Supervisors;
- o TOTAL: 52 additional on-street supervisors

*It is proposed that 52 additional on-street Route Supervisors be deployed during the period 2010-2013.*

### 3.3 TECHNOLOGY TO HELP IMPROVE BUS SERVICE

#### 3.3.1 Priority for Buses at Traffic Signals

Significant portions of travel time can be spent waiting on-board buses which are stopped at traffic signals. Transit Signal Priority (TSP) has proven to be effective in reducing these delays and thereby improving travel times for customers. TTC buses and streetcars emit an electrical signal which allows them to be detected on the approach to a signal priority equipped intersection. The traffic control system, upon detection of an approaching transit vehicle, adjusts the signal timings to either hold the signal on green until the transit vehicle travels through the intersection, or shortens the green signal on the side street, so that the approaching transit vehicle gets a green signal sooner. TSP can also be used to expedite or extend special signal phases (such as a left-turn green-arrow phase) to benefit transit. TSP is currently in place on: 29 DUFFERIN, 7 BATHURST, 35 JANE, 75 SHERBOURNE and 36 FINCH WEST bus routes. TSP is also provided at most intersections on streetcar routes.

Providing Transit Signal Priority at a given intersection means that each bus will get through that intersection more quickly. When enough intersections are equipped along a route, the fact that buses get through each intersection more quickly means that every bus will complete its full trip along the route more quickly. This, in turn, means that each bus will operate at a faster speed, thereby providing more trips. The end result is more daily trips (which means more customer capacity) being provided by the same number of buses. Alternatively, the same customer capacity could be maintained





with fewer buses on that route, allowing some buses to be saved or re-invested elsewhere.

Transit Signal Priority also allows more regular and consistent operation through intersections, so there will be an overall improvement in reliability (more even spacing and less bunching) over the whole route.

### 3.3.2 Major Transit Expansion of Transit Signal Priority in Toronto

There are approximately 2,200 signalized intersections in Toronto, almost all of which have transit service operating through them. Approximately 350 intersections are already equipped with Transit Signal Priority. In the past, the TTC and the City of Toronto have jointly installed signal priority at a rate of about 40 intersections per year. The *Transit City Bus Plan* calls for an acceleration of this program, so that signal priority will be provided at an additional 1,150 intersections by 2013, for a total of 1,500 signal-priority-equipped intersections. This total does not include the 200 additional intersections which will be equipped on the *Transit City* light rail lines as part of the construction of the *Transit City Light Rail Plan*. The new 1,150 installations will include:

1. 450 locations along the *Transit City Bus Network* (TCBN) routes;
2. 500 selected locations on other “busy” bus routes, generally those which carry over 7,000 riders per day; and
3. 200 infill locations throughout the city where buses encounter significant left-turn delays, and of other intersections which were omitted when signal priority was originally installed due to traffic management.



Those routes to be equipped are listed in Exhibit 25; and one illustrated in Exhibit 26.

<b>Exhibit 25: Transit Signal Priority Implementation TCBN ROUTES</b>	
7 Bathurst (already equipped)	22 Coxwell
24 Victoria Park	29 Dufferin (already equipped)
39 Finch East	43 Kennedy
44 Kipling South	45 Kipling
52 Lawrence West	53 Steeles East
54 Lawrence East	60 Steeles West
72 Pape	76 Royal York South
84 Sheppard West	89 Weston
94 Wellesley	95 York Mills
96 Wilson	102 Markham Rd
129 McCowan North	
<b>Total TCBN Routes: 450 Intersections</b>	

<b>NON-TCBN ROUTES</b>	
6 Bay	12 Kingston Rd
16 McCowan	17 Birchmount
21 Brimley	23 Dawes
37 Islington	38 Highland Creek
41 Keele	42 Cummer
46 Martin Grove	47 Lansdowne
57 Midland	58 Malton
63 Ossington	64 Main
68 Warden	70 O'Connor
73 Royal York	191 Highway 27 Rocket
79 Scarlett Rd	86 Scarborough
87 Cosburn	90 Vaughan
100 Flemingdon Park	110 Islington South
111 East Mall	112 West Mall
117 Alness/105 Dufferin North	133 Neilson
161 Rogers Rd	165 Weston Rd North
168 Symington	
<b>Total Non-TCBN Routes: 500 intersections</b>	
<b>Isolated/Infill Locations: 200 intersections</b>	

<b>TOTAL TRANSIT CITY BUS PLAN LOCATIONS: 1150 Intersections</b>
<b>Transit City LRT: 200 Intersections</b>





### 3.3.2.1 Relocating Stops to the “Away” Side of Intersections Can Make Signal Priority Work Better

There are specific major intersections where the time that a bus requires to serve a near side stop is so long and variable, that signal priority cannot be made to work effectively. This is because it is very difficult to accurately predict when the bus will be finished serving the stop and be ready to travel through the intersection. A green light can be extended for the maximum length of time available, and the bus might still not get through the intersection. In such cases, traffic on the side street, often including other transit routes, has been delayed unnecessarily.

At these locations, it will be beneficial to relocate the stop from the approach side to the away side of the intersection, which removes the variability of passenger service time. In many cases, however, a bus bay will have to be built at the away side, so that a stopped bus will not block following traffic, or cause the traffic to back up into the intersection. This measure can also assist the overall operation of an intersection where there are a large number of right-turning autos that may be delayed behind buses serving a bus stop on the approach side.

One of the priority routes proposed for TSP is 39 FINCH EAST. A total of 19 approach-side stops on this route should be relocated to bays on the away side (both directions at seven intersections, plus on five cross-streets). The total estimated cost is \$2.0 million and has been included in the capital budget. Before/after traffic studies at these locations will identify the net benefit per location and will allow for appropriate decisions on this measure for future routes.

### 3.3.3 Transit Signal Priority Improves Productivity, Efficiency

The result of the new signal priority installations will be that buses will travel faster, and with greater regularity, along the routes, thereby providing capacity increases without requiring the purchase of additional buses. Full installation of Transit Signal Priority by the end of 2013 will produce the equivalent capacity of 46 additional morning peak buses, 39 mid-day buses, and 53 afternoon peak buses. It is estimated that 50 percent of this new peak capacity can be realized as capital savings (fewer buses) and operating savings (fewer Operators) which can either be removed from the respective budgets or re-invested elsewhere to improve service on other routes. Overall, the Transit Signal Priority installations will improve service for approximately 155 million customer trips each year due to faster and more-reliable travel.

Exhibit 27 below lists the approximate number of new Transit Signal Priority installations to be provided each year.



Exhibit 27: Transit Signal Priority Implementation Summary

	Number of New TSP Installations	Capacity Created (Number of Equivalent Buses Per Weekday)		
		AM	MIDDAY	PM
2009	60	3	3	3
2010	100	4	4	5
2011	350	16	12	18
2012	350	14	13	16
2013	290	9	7	11
<b>TOTAL</b>	<b>1150</b>	<b>46</b>	<b>39</b>	<b>53</b>

The total capital cost of the expanded signal priority program is approximately \$41.0 million, of which \$10.2 million has been previously budgeted and approved to fund the already-existing less intensive installation program. Capital savings, due to the reduction in the requirement in buses, will equal \$13.7 million. The net capital cost, therefore, of the expansion of this program is \$17.1 million.

*It is proposed that Transit Signal Priority implementation be expanded to include an additional 1,150 signalised intersections by 2013.*

### 3.3.4 Queue-Jump Lanes to Speed Buses at Busy Intersections

Queue-jump lanes represent another tool for improving the productivity and regularity of bus operations: they can be very effective at reducing delays at intersections.

A queue-jump lane may be created by lengthening an existing right-turn lane at an intersection (or creating a new lane). This allows buses to by-pass a long queue of cars in the adjacent through-lanes, and then merge back into through traffic as they travel through the intersection. An illustration of this is shown in Exhibit 28.

Exhibit 28: Example of Queue-Jump Lane Configuration

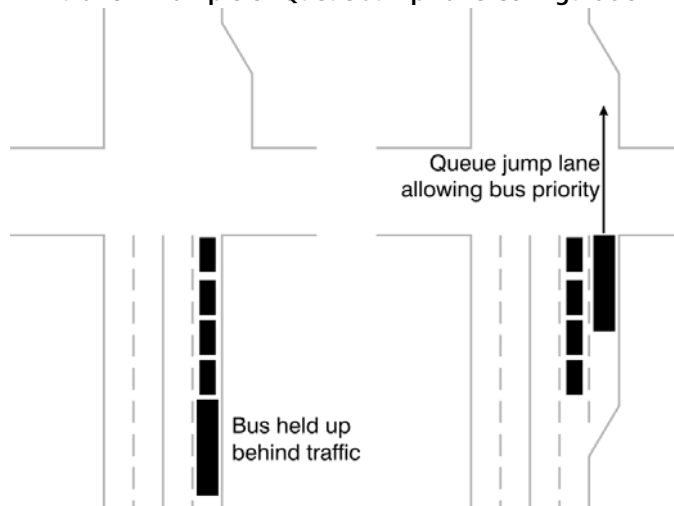


Exhibit 29 shows a bus delayed by autos ahead. Provision of a queue-jump lane would allow that bus to bypass the cars on the approach to the intersection.

Exhibit 29: Bus Held in Traffic



A limited number of queue-jump lanes have been implemented in Toronto to assist bus operations in specific locations. These are generally short roadway sections in areas of very-high bus density and are summarized in Exhibit 30 below:

Exhibit 30: Existing Queue-Jump Locations in Toronto

LOCATION	DESCRIPTION
Westbound Finch Avenue, approaching Finch Station	"Bus Only" designation. Terminates at bus entrance to Finch Station. Scheduled to be extended in 2009.
Westbound Steeles Avenue, approaching Don Mills Road.	"Right Turn Only, Buses Excepted" designation.
Westbound Eglinton Avenue, approaching Yonge Street	Centre median lane is "Buses Only" to allow for buses to pass traffic congestion en route to Eglinton Bus Terminal.
Eastbound Eglinton Avenue, approaching Eglinton West Station.	Centre median lane is "Buses Only" to allow for buses to pass traffic congestion en route to Eglinton West Bus Terminal.
Exit roadway from Don Mills Station through Fairview Mall to Sheppard Avenue	"Bus Only" designation allows buses to bypass auto congestion from Fairview Mall, to access Sheppard Avenue.
Southbound Don Mills Road, approaching Don Mills Station	Allows buses to bypass auto congestion en route to Don Mills Station.

Toronto City Council, in 2007, issued a directive to review "opportunities to introduce transit queue jump lanes and farside bus bays to improve transit service at congested intersections, keeping in mind the impact of these facilities on sidewalks and landscaping at these locations."





**3.3.4.1 Selection Process for Creation of New Queue-Jump Lanes**

Candidate locations for queue-jump lanes are developed by identifying intersections where there is significant congestion and delay to approaching buses and where property exists within the road allowance to allow the construction of longer right-turn lanes, without negatively affecting trees or sidewalks.

All TCBN routes were examined to identify potential candidates for new queue-jump lanes. The following locations appear to have the potential to provide significant benefit to large volumes of transit customers, with no obvious physical/property constraints. This list will be refined based on ridership trends, traffic studies, and delays encountered by TTC buses.

**Exhibit 31: Twenty Priority Queue-Jump Locations for TCBN Routes**

Dufferin approaching Lawrence	NB	Steeles approaching Woodbine	EB
Dufferin approaching Lawrence	SB	Finch approaching Kennedy	WB
Finch approaching Bayview	WB	Lawrence approaching Dufferin	WB
Finch approaching Bayview	EB	Lawrence approaching Caledonia	WB
Finch approaching Warden	WB	Lawrence approaching Dufferin	EB
Finch approaching Warden	EB	York Mills approaching Leslie	EB
Finch approaching Don Mills	WB	York Mills approaching Bayview	WB
Finch approaching Victoria Park	EB	Steeles approaching Bathurst	WB
Ellesmere approaching McCowan	WB	Steeles approaching Jane	EB
Finch approaching Victoria Park	WB	Steeles approaching Don Mills	EB

Traffic surveys have been completed for some of these locations, to quantify the expected benefits. The results are summarized in Exhibit 32 below:



Exhibit 32: Anticipated Benefit of Selected Queue-Jump Facilities (Minutes:Seconds)

QUEUE-JUMP LANE LOCATION	EXISTING MAXIMUM PEAK-HOUR DELAY	PROJECTED MAXIMUM PEAK-HOUR DELAY	EXISTING AVERAGE PEAK-HOUR DELAY	PROJECTED AVERAGE PEAK-HOUR DELAY
Finch Avenue westbound approaching Don Mills Road	3:08	1:12	1:29	0:27
Finch Avenue eastbound approaching Victoria Park Avenue	2:34	0:54	1:04	0:15
Finch Avenue westbound approaching Bayview Avenue	3:31	1:13	1:43	0:32
Finch Avenue eastbound approaching Bayview Avenue	2:49	1:13	1:16	0:35
Dufferin Street southbound approaching Lawrence Avenue	1:47	1:13	1:09	0:26
Dufferin Street northbound approaching Lawrence Avenue	1:55	1:11	0:58	0:29

### 3.3.4.2 Cost and Implementation of Queue-Jump Lanes

As part of the *Transit City Bus Plan*, TTC and City staff have developed a five-year plan to design and construct ten queue-jump lanes (two per year) during the period 2010–2014. The travel time savings and reliability improvements shown in Exhibit 32 for intersections on the 39 FINCH EAST service make these attractive candidates to lead off implementation. The most-promising locations are westbound on Finch Avenue at Don Mills Road, and eastbound on Finch Avenue at Victoria Park Avenue. These two locations will be pursued for construction in 2010. The locations for future years will be identified based on updated traffic assessments and input from Operations personnel.

Funding of \$1 million per year is available in the existing TTC capital 2010-2013 program.

*It is proposed that a five-year plan to implement ten queue-jump lanes (2 per year) during the period 2010-2014 be started in 2010.*



### 3.4 SMALL IMPROVEMENTS AT SUBWAY STATIONS FOR BETTER CUSTOMER SERVICE

Most TTC bus routes experience their heaviest passenger volumes where they meet rapid transit lines at subway stations. Therefore, these stations should provide a good level of passenger amenities and comfort in their bus terminal areas. The *Transit City Bus Plan* has initiated a program whereby every subway station which provides bus facilities will be reviewed from customers' perspectives, with the goal of identifying improvements related to customer, comfort and convenience. This review will be completed by year-end 2010. Improvements will be assessed through basic cost/benefit analyses, for possible inclusion in future capital budget cycles. Although some improvements were identified as being warranted for customer convenience, they are not being recommended at this time due to upcoming extensive station reconstruction or service changes which will result from initiatives such as the *Transit City Light Rail Plan*. Kennedy and Scarborough Centre stations are examples of this. Here are some examples of small improvements which should be undertaken for customer comfort.

**Victoria Park Station: Provide Enclosed Waiting Area at Bus Bays**  
**Station Used by 15,700 Riders Per Day**  
**Timing: 2010**  
**Estimated Cost: \$1.4 million**

Victoria Park Station is currently undergoing a major renovation, including being made accessible. Although an enclosed waiting area will be provided at the north end of the bus area, no enclosed waiting area has been provided along the north-south platform where most bus platforms are located. The high volume of customers waiting for buses at or near these platforms will be exposed to the elements. To improve customer comfort, an enclosed waiting area should be provided in this area, integrated into the new station structure. The concept is illustrated in Exhibit 33.

**Exhibit 33: Victoria Park Subway Station**



**Lansdowne Station: Improve Customer Convenience of Bus-Subway Transfer Areas****Station Used by 8,000 Riders Per Day****Timing: 2012****Estimated Cost: \$1.7 million**

The east-side entrance at Lansdowne Station is set far back from the curb, requiring customers awaiting a northbound bus to do so without protection from the elements. The west-side entrance is similarly problematic. To address this, the station entrance enclosures should be expanded towards the sidewalk, and equipped with overhead canopies. This will provide more-convenient connections to and from buses, and customers will benefit from protection from the elements. Currently, 4,200 customers per day transfer between the bus and subway at the east entrance, and 3,800 do so at the west entrance.

**Exhibit 34: Lansdowne Subway Station East Side****Current stop configuration, providing no shelter for intending customers****Existing East Entrance****Proposed Expanded East Entrance**

**Exhibit 35: Lansdowne Subway Station West Side**



Lansdowne West Side – Existing



Lansdowne West Side - Proposed

**Don Mills Station: Improve Passenger Waiting Environment with Improved Lighting**

Station Area Used by 35,500 Riders Per Weekday

Timing: 2013

Estimated Cost: \$550,000

Lighting at Don Mills Subway Station bus level, outside of the enclosed waiting area, is minimal. The light dispersion is obstructed by many large columns. The resulting environment is uncomfortable. This project will bring the light level to 105 lux, only slightly higher than the current TTC design standard of 100 lux.

**Exhibit 36: Don Mills Subway Station Lighting Level**



Current lighting at Don Mills Station



Current lighting at York Mills Station

*Objective: Increase lighting levels at Don Mills Station to the same as at York Mills Station*



### Royal York Station: Reduce Congestion of Customers at Single-Door at 73 Royal York Bus Platform

Station Used by 14,800 Riders Per Weekday

Timing: 2014

Estimated Cost: \$100,000

Royal York Subway Station is a small facility which serves many customers and is subject to peak-period congestion. The existing single "butterfly" door for this platform is inadequate. An extra doorway will facilitate an orderly flow of customers. The automatic sliding door will also improve the accessibility of the station. A similar modification was made several years ago on the south side platform at the station.

Exhibit 37: Royal York Subway Station Customer Congestion





**Dupont Station: Reduce Risk of Snow/Ice Falling Onto Customers Entering/Exiting Each Entrance Used by 7,500 Riders Per Day**

**Timing: 2014**

**Estimated Cost: \$200,000**

Dupont Station has two street entrances, one on either side of Dupont Street. Above each doorway is a curved roof on which snow/ice can accumulate and, possibly, slide down onto a customer passing through the doorway. Provision of small canopies will eliminate this potential risk.

**Exhibit 38: Dupont Subway Station**



Dupont – Existing



Dupont – Proposed

### 3.5 OTHER INITIATIVES YET TO COME

The *Transit City Bus Plan* contains proposals to improve the quality of bus service within context of current TTC operations. The TTC must, however, continue to look for possible future improvements. With emerging technologies, there is opportunity for development of new ways to improve the customer experience, and to gain efficiencies. Here are examples of such opportunities:

- “Customer-Friendly” On-Board Communications/Entertainment Systems: Applications could include interactive display screens on-board buses/at stops, and also web based applications for use on home computers/cell phones etc. A wide range of customer-engaging applications can be considered (contests, promotions, real time customer surveys, social networking).
- Introduction of a Technology-Based “Smart Bus” System: This would allow a consolidation of on-board information/monitoring systems to provide real-time, two way information. The applications could include:
  - real-time connecting route information;
  - automatic setting and monitoring of destination-signs to ensure proper information display;
  - real-time passenger boarding and alighting data; and
  - real-time vehicle diagnostics.



## 4.0 SUMMARY OF INITIATIVES, COSTS, AND TIMING

Here is a summary of the new initiatives presented within the *Transit City Bus Plan*:

1. Ten-Minute-or-Better Service on Transit City Bus Network (TCBN) Routes: It is proposed that service on the designated TCBN routes be improved so that buses will be scheduled to operate every ten minutes or better, during all daytime and evening hours, seven days per week, and that this service improvement be implemented in the fall of 2010.
2. Enhanced Express Bus Service on TCBN Routes: It is proposed that additional express service be implemented on 15 of the 21 TCBN routes, starting in the fall of 2014.
3. Enhanced Express Bus Service on Future Transit City LRT Lines: It is proposed that interim express bus services be implemented on the 35 JANE (Jane LRT), 25 DON MILLS (Don Mills LRT) and 116 MORNINGSIDE (Scarborough Malvern LRT) routes -- corridors which will have future light rail lines but which will not have LRT construction in the short term, and that these express services be implemented in the fall of 2011.
4. Twenty-Minute-or-Better Service on All Routes Outside the TCBN: It is proposed that service be improved on all TTC bus routes so that service will be scheduled to operate every 20 minutes or better, during all daytime and evening hours, on virtually every TTC route, and that this service improvement be implemented in two equal stages: fall of 2011, and fall of 2012.
5. More Shelters for Better Customer Comfort: It is proposed that 75 additional transit shelters be installed at specific busy stops where adequate space is available, during the period 2010-2014, and that these be in addition to new shelters installed through the City's existing installation program.
6. More Route Supervision for Better Quality: It is proposed that 52 additional on-street Route Supervisors be deployed during the period 2010-2013.
7. More Transit Signal Priority for Faster, More-Reliable Service: It is proposed that Transit Signal Priority be implemented at 1,150 intersections during the period 2009 to 2013.
8. Queue-Jump Lanes: It is proposed that a five-year plan be implemented to construct ten queue-jump lanes (two per year) commencing in 2010.
9. Improvements to Bus Facilities in Subway Stations: It is proposed that customer amenity improvements be undertaken at five subway stations to improve customer comfort and convenience, in the 2010-2014 period. All remaining stations with bus facilities will be assessed from a customer perspective in 2010, to identify other warranted improvements.



Exhibit 39 presents a year-by-year summary of operating and capital costs, for all new initiatives of *Transit City Bus Plan*.

Exhibit 39: *TRANSIT CITY BUS PLAN*  
SUMMARY OF COSTS AND IMPLEMENTATION TIMING

PROJECT	ANNUAL OPERATING COST INCREASE (All costs in 2009 dollars) (Does not include additional fare revenue)					
	2010	2011	2012	2013	2014	Future years
Ten-Minute-or-Better Service on <i>Transit City Bus Network</i>	\$1.0M	\$10.1M	\$10.1M	\$10.1M	\$10.1M	\$10.1M
Express Service on <i>Transit City Bus Network</i>	-	-	-	-	\$3.8M	\$11.4M
Express Service on Three Future LRT Routes (*)	-	\$2.8M	\$8.4M	\$8.4M	\$8.4M	\$8.4M until LRT implementation
Twenty-Minute-or-Better Service – <i>Ridership Growth Strategy</i>	-	\$3.3M	\$13.2M	\$19.8M	\$19.8M	\$19.8M
Operating Efficiencies due to Bus Savings (Transit Signal Priority)	-	(\$0.8M)	(\$1.5M)	(\$2.1M)	(\$2.1M)	(\$2.1M)
Additional On-Street Supervision	\$1.1M	\$2.5M	\$3.8M	\$4.4M	\$4.5M	\$4.5M
<b>TOTAL</b>	<b>\$2.1M</b>	<b>\$17.9M</b>	<b>\$34.0M</b>	<b>\$40.6M</b>	<b>\$44.5M</b>	<b>\$52.1M(*)</b>

(\*) This service and the full \$8.4 million annual cost will end when future LRT routes (Jane, Don Mills, and Scarborough Malvern) are implemented.

PROJECT		NEW CAPITAL COSTS (All costs in 2009 dollars)							TOTAL	Notes
		2009	2010	2011	2012	2013	2014			
Transit Signal Priority	Installation	\$1.8M	\$5.1M	\$12.0M	\$12.0M	\$10.1M	-	\$41.0M		
	Capital Savings (Buses)	-	-	(\$1.8M)	(\$4.1M)	(\$4.1M)	(\$3.7M)	(\$13.7M)	1	
	Prior Approved Funding	(\$1.8M)	(\$2.1M)	(\$2.1M)	(\$2.1M)	(\$2.1M)	-	(\$10.2M)		
	NEW NET ADDITIONAL CAPITAL COST	\$0.0M	\$3.0M	\$8.1M	\$5.8M	\$3.9M	(\$3.7M)	\$17.1M		
Station Improvements		-	\$1.4M	-	\$1.7M	\$0.6M	\$0.3M	\$4.0M	2,3	
Additional Shelters		-	\$0.5M	\$0.5M	\$0.5M	\$0.5M	\$0.5M	\$2.5M		
Additional Buses for Service Improvements		-	\$2.4	\$16.1M	\$1.2M	-	\$33.5M	\$53.2M	4	
<b>TOTAL</b>		<b>\$0.0M</b>	<b>\$7.3M</b>	<b>\$24.7M</b>	<b>\$9.2M</b>	<b>\$5.0M</b>	<b>\$30.6M</b>	<b>\$76.8M</b>		

Note 1: Assumes 50% of capacity created can be saved with fewer buses.  
 Note 2: Future projects to be investigated for 2011-2014 Capital Program  
 Note 3: Project costs are included in 2010-2014 Capital Program budget submission.  
 Note 4: Costs included in 2010-2014 TTC Bus Fleet Plan



TRANSITCITY

