

TORONTO TRANSIT COMMISSION REPORT NO.

MEETING DATE: June 29, 2012

SUBJECT: OPPORTUNITIES FOR IMPROVED BUS SERVICE ON
FINCH AVENUE - FOLLOW-UP REPORT #2

ACTION ITEM:

RECOMMENDATIONS

It is recommended that the Commission forward this report to Councillors Shiner, Filion, Pasternak, Perruzza, Mammoliti, Crisanti, and Ford, to Toronto Transportation Services, to the City's Public Works and Infrastructure Committee, and to Metrolinx, noting that:

- the frequency of service on the 36 FINCH WEST bus route will be improved during four off-peak periods of operation currently experiencing overcrowding, beginning in September, 2012;
- as soon as the TTC receives its initial fleet of articulated buses in 2014, the standard buses which are now operated on the 36 FINCH WEST bus route will be replaced with articulated buses, which provide greater ability to accommodate surge or uneven passenger demand and which will reduce the annual cost of operating this route by \$1 million;
- there are 12 candidate locations for queue-jump lanes on Finch Avenue West, east of Keele Street, which, if implemented, would improve the speed and reliability of transit service on Finch Avenue, and would cost approximately \$8 million to construct;
- queue-jump lanes are a proven way to achieve significant reductions in delays to buses at congested intersections, and there are many locations throughout the city where queue-jump lanes would provide measurable and perceptible improvements; most of these locations would achieve greater benefits than would be achieved at the 12 locations identified on Finch Avenue West;
- if funds were made available for queue-jump lanes, then such lanes should be implemented starting where the greatest benefits could be achieved, and this report contains a short-list of 25 potential strong candidate locations in the TTC bus system, including two of the twelve locations on Finch Avenue West;
- queue-jump lanes were one of the initiatives identified by City Council, in 2007, as a means of improving transit operations in Toronto, as discussed in the

Council-approved report entitled, *"Climate Change, Clean Air, and Sustainable Energy Action Plan"*; Council directed City staff to consult with the TTC to identify opportunities and locations to implement queue-jump lanes;

- in May, 2012, City Transportation Services and City Planning issued a letter stating that they are opposed to the implementation of queue-jump lanes in areas of intensification (major arterial roads designated as "Avenues" downtown, the centres, secondary plans areas) where congestion affects transit operations, thus creating a roadblock to the implementation of queue-jump lanes in Toronto; and
- any interest in pursuing queue-jump lanes in Toronto will likely require support and direction from City Council to supersede the position adopted by City Transportation Services and City Planning.

FUNDING

This report has no effect on the TTC's operating or capital budgets.

BACKGROUND

At its meeting on March 30, 2012, the Commission considered a report entitled, *"Opportunities for Improved Bus Service on Finch Avenue – Follow-Up Report"*, which explained that it would be possible to significantly increase the speed and reliability of the 36 FINCH WEST bus route by constructing queue-jump lanes at thirty intersections along the route. That report indicated that the \$25-to-\$30 million capital investment of constructing these queue-jump lanes may not be warranted in light of the fact that City Council had recently re-affirmed its support for a light-rail transit line on Finch Avenue, west of Keele Street, and that Metrolinx plans to start construction of that light-rail line in 2016.

The Commission requested staff to, among other things, report back on:

- improvements that could be made to service on the 36 FINCH WEST bus route using existing resources;
- the 36 FINCH WEST route receiving priority for articulated buses in 2013 or sooner;
- moving forward with queue-jump lanes on Finch Avenue, east of Keele Street;
- the specific costs associated with constructing queue-jump lanes on Finch Avenue, east of Keele Street; and

- a survey of other locations in the TTC bus system that might benefit more from any investment in queue-jump lanes.

This report responds to those requests.

DISCUSSION

Service Improvements on the 36 FINCH WEST Bus Route

The TTC has an established process of continually monitoring ridership levels on all routes in its system, and adjusting service levels and capacities, as necessary, to match those changing ridership levels. TTC staff set service levels on all routes based on Commission-approved crowding standards which are applied in a consistent and equitable way across the entire system. This process has identified ridership increases on the 36 FINCH WEST bus route, which are resulting in overcrowding during four off-peak periods of operation. These overcrowding conditions will be addressed through service improvements which are now being scheduled for September, 2012. The service improvements will result less crowding and more-frequent service during these times of the week:

Monday to Friday	9:00 am to 3:00 pm
Monday to Friday	10:00 pm to 1:00 am
Saturdays	10:00 pm to 1:00 am
Sundays and Holidays	7:30 am to 7:00 pm

These service improvements will cost approximately \$450,000 annually in direct operating costs, and are included as part of the \$9.2 million budgeted in 2012 to respond to projected system-wide ridership.

Crowding levels on the TTC system can be reduced, overall, by allocating more funding for service. If the Commission were interested in this, then staff could advise on the cost implications of lowering the crowding standards for all routes in the system. However, staff recommend against applying unique or special standards to any one individual route such as the 36 FINCH WEST route.

Use of Articulated Buses on the 36 FINCH WEST Bus Route

The TTC's current plans call for the purchase of 153 articulated buses for delivery in 2014 and 2015. Articulated buses have higher capacity which helps increase productivity and efficiency, with minimal effects on passenger waiting times, when used on high-frequency routes. The table below lists the routes where the operation of articulated buses is expected to provide the greatest benefit and, therefore, where articulated buses are planned for operation.

Planned Use of Articulated Buses

<u>Proposed Routes for Articulated Bus Operation</u>	<u>Number of Articulated Buses Required During Morning Peak</u>
29 Dufferin	24
7 Bathurst	15
116 Morningside	13
25 Don Mills	25
36 Finch West	25
85A Sheppard East	19

The 36 FINCH WEST route is one of the top five routes for the assignment of articulated buses and, based on the current delivery schedule and assignment plans, articulated buses will begin operating on that route in 2014. The operation of articulated buses will result in a \$1 million annual reduction in the operating cost of the 36 FINCH WEST route.

Queue-Jump Lanes on Finch Avenue West, East of Keele Street

Thirty intersections were identified in the March 30, 2012 report as candidates for queue-jump lanes on Finch Avenue West. The Commission accepted that the benefits from implementing queue-jump lanes on Finch Avenue, west of Keele Street, would be short-lived given the plans to begin construction of a light-rail transit line there starting in 2016. However, seven of the 30 candidate intersections for queue-jump lanes are east of Keele Street, where there are no near-term plans to replace the bus service with light rail and, therefore, where the benefits to bus service would be expected to continue in the foreseeable future. The Commission requested that staff report on moving forward with those candidate queue-jump lanes east of Keele Street.

One of the candidate locations -- the westbound approach to Keele Street -- has been excluded here because it is currently planned that westbound buses would use Tangiers Road -- the first street east of Keele Street -- to access the new bus terminal being built as part of the Finch West Subway Station.

Twelve potential queue-jump lanes were identified at these seven intersections:

- in both directions at Bathurst, Goldfinch/Torresdale, Wilmington, Dufferin, Champagne/Alness; and
- in the westbound direction only at Chesswood and at Tangiers

The conceptual designs for three of these queue-jump lanes -- in both directions at Bathurst Street and in the westbound direction at Dufferin Street -- include a widening of the road on the far side -- ie. the away side -- of the intersection to allow the bus stop to be placed there. The demand at these bus stops are high and variable, and placing the stop in a bus bay on the far side of the intersection, as opposed to the current approach-side location, would increase the capacity and effectiveness of the queue-jump/right-turn lane by avoiding having buses stopped to serve customers while the signal is green.

Based on preliminary design work, it is estimated that the cost to construct the queue-jump lanes at these twelve locations would be \$8 million. It is estimated that these queue-jump lanes, if implemented, would reduce round-trip delays on this portion of the 36 FINCH WEST bus route by three minutes.

If a decision were made to implement these queue-jump lanes, TTC staff would have to take the following steps:

- obtain acceptance from City staff;
- include the necessary funds within the 2014-2019 capital budget;
- undertake more-detailed modelling of each of the twelve queue-jump locations in order to prioritize them by relative benefit/cost; and
- obtain formal approval from the City to construct the queue-jump lanes at these twelve locations.

Identifying the "Best" Locations for Queue-Jump Lanes – Maximising Benefit/Cost

There are a number of broad criteria used to identify locations where queue-jump lanes would provide the greatest benefit relative to construction cost -- ie. -- the best benefit/cost ratio. A roadway would not be considered for implementation of queue-jump lanes where this would result in the road being more than seven traffic lanes wide, in the interest of urban design and pedestrian scaling. The major identifying criteria are:

Intersections with the Greatest Delay: Queue-jump lanes typically provide the greatest benefit at the intersection of two arterial roads, where there is greater competition for green time because of high traffic volumes on both roadways and, typically, requirements for more special phases, such as left-turn green arrows. These conditions result in long traffic queues. Among arterial/arterial intersections, the benefits of queue-jump lanes would be greatest where buses experience delays of more than one signal cycle -- ie. -- where buses are not able to get through the intersection on the first green signal provided, and must wait for a second or third cycle.

Intersections with the Greatest Potential Customer Benefit: Peak-period traffic congestion levels are high on most of the major arterial roadways on which the TTC's busiest bus routes operate, so queue-jump lanes should be a priority at those specific locations where the highest number of customers would benefit from the reduction in delay. For example, one of the very worst areas of peak-period congestion-related delays is on Dufferin Street, on the northbound approach to Steeles Avenue West. In the afternoon period peak, it can be difficult to determine where the northbound queue actually ends: the long line of slow, stop-and-go traffic typically extends for several blocks, and often all the way down to Finch Avenue. However, this would not be a high priority for queue-jump lanes because there are only four northbound TTC buses per hour travelling through this intersection. By comparison, a higher priority would be the intersection of Dufferin Street with Lawrence Avenue. At that intersection, the delays are significant -- buses are subject to multi-cycle delays in both directions -- and the introduction of queue-jump lanes would benefit a high volume of passengers carried on the more than 20 buses per hour which travel through the intersection.

Approaches to Rapid Transit Terminals: Priority should be given to implementing queue-jump lanes in the vicinity of rapid transit stations -- where bus routes converge, and where customer volumes are very high.

Locations with Lower Implementation Cost: An important consideration in selecting good candidates for queue-jump lanes is cost of implementation. In addition to considering greatest customer benefit, the benefit/cost ratio can be improved if the cost of implementing queue-jump lanes is lower because the construction can be kept relatively simple. For example, by selecting locations where there is already a right-turn lane that can be extended, rather than creating an entirely-new right-turn/queue-jump lane, the high marginal cost of widening the road at the intersection itself can be avoided. Similarly, costs are kept lower by selecting locations where there is sufficient City-owned property for a road widening, and by choosing locations where a widening will not require relocation of major utilities, such as poles with overhead power transmission cables.

There can be opportunities to implement queue-jump lanes at very-low cost by incorporating their construction within other planned City road construction projects. For example, in the 1990's, the TTC had funded a short, westbound queue-jump lane on Finch Avenue East on the approach to Finch Station (see Exhibit 1). However, westbound traffic often backed up from Yonge Street back to the traffic signals at Kenneth Avenue -- the first intersection east of the station -- and buses still experienced significant delays, sitting in the westbound through-traffic lane waiting to get into the queue-jump lane. Several years later, City of Toronto staff had planned major modifications to the intersection of Finch Avenue and Kenneth Avenue and, with work already taking place on the northwest corner of that intersection, the City accommodated the relatively-low additional cost of extending the queue-jump lane back to the intersection, as also shown in Exhibit 1.

Exhibit 1

Lengthened Queue-Jump Lane

Eastbound on Finch Ave E Approaching Finch Station



TTC SP 21-06-2012 DRG. No. 12207



TTC staff can also request the City to include queue-jump lanes as a condition of approval of a major development. We have had little success in such requests because as explained later in this report, the concept of road widenings for queue-jump lanes has been largely rejected by City staff in areas of intensification because, they may conflict with other City objectives such as minimizing pedestrian crossing distances, and maximizing sidewalk widths and space for street trees or other landscaping.

Priority Locations for Queue-Jump Lane Implementation

With no funding available for queue-jump lanes in recent years, there has been little purpose in doing the detailed assessment of the benefits and costs associated with the very-long list of potential queue-jump lanes that TTC staff have identified throughout the City. However, staff have developed the following shortlist of 25 intersections with high bus volumes and significant delays due to traffic congestion. All but five of these were previously listed in the 2009 TTC report entitled, *"Transit City Bus Plan"*.

- Dufferin at Lawrence, both directions
- Finch East in both directions at Bayview, Warden, Victoria Park
- Finch East, westbound at Don Mills and at Kennedy
- Finch West, eastbound at Dufferin
- Finch West, westbound at Tangiers
- Lawrence at Dufferin, both directions
- Lawrence at Caledonia, westbound
- York Mills at Leslie, eastbound
- York Mills at Bayview, westbound
- Steeles East, eastbound at Woodbine and at Don Mills
- Steeles West, westbound at Bathurst
- Steeles West, eastbound at Jane
- Ellesmere, westbound at McCowan
- Wilson, westbound at Wilson Heights (first street east of Wilson Subway Station)
- Markham at Lawrence, both directions

In the event that funding were to become available for queue-jump lanes, staff would recommend that those funds not be directed to the twelve locations identified on Finch Avenue West. Instead, this short-list of 25 locations should be given priority for funding. This shortlist of intersections includes two of the 12 locations on Finch Avenue West, east of Keele Street, mentioned above -- eastbound at Dufferin Street, and westbound at Tangiers Road.

City of Toronto Staff's Position on Queue-Jump Lanes

The above list of potential queue-jump lanes was developed by TTC staff in response to a request from City of Toronto staff preparing the report, *"Sustainable Transportation Initiatives: Short-Term Proposals"*. That report was approved by City Council in 2007, and

Council's approval included a directive that City staff consult with TTC staff to identify opportunities for the introduction of transit queue-jump lanes and far-side bus bays to improve transit service in congested intersections. More recently, TTC staff developed a framework for evaluating and selecting the best opportunities to introduce transit queue-jump lanes, while recognizing the issues of pedestrian crossing distances and streetscaping, and have been attempting to move forward on this issue with City of Toronto staff. Recently, City staff issued a letter stating that the City "generally cannot support queue-jump lanes in areas identified for growth in the Official Plan (downtown, centres, avenues, and secondary plan areas) because of their detrimental impact on the pedestrian environment and public realm." The letter, dated May 9, 2012, is attached.

The City's seemingly more hard-line stance presents challenges to the possible introduction of this globally-accepted means of improving transit operations in highly-congested urban areas. To be clear, queue-jump lanes are globally-accepted because of their benefit to all road users including private car users. Additionally, a number of City roadways which are designated as "Avenues" in the Official Plan are also designated as part of that plan's *Surface Transit Priority Network*, where priority measures are to be provided for transit, including "reserved or dedicated lanes for buses". Given that queue-jump lanes are, in effect, intersection-specific bus lanes, City staff's current position would seem to contradict this aspect of the City's Official Plan.

TTC staff will continue to attempt to reach a constructive resolution with City staff on this matter, including the proposed framework for balancing the competing needs of road users that the TTC has attempted to implement with the City. It is possible that City Council will have to provide support and direction for queue-jump lanes.

SUMMARY

The 36 FINCH WEST bus route will benefit from service improvements planned for this September, and from the introduction of articulated buses planned for 2014.

There are twelve locations on Finch Avenue West, east of Keele Street (where LRT implementation is not imminent), where queue-jump lanes could be implemented, at a cost of \$8 million, and where significant improvements to speed and reliability of service could be achieved. However, there are several other locations throughout the city where implementation of queue-jump lanes could achieve even greater customer benefits. Therefore, if funding were to become available for queue-jump lanes, that money should be invested where it would achieve the greatest benefits, and not be specially earmarked for Finch Avenue West.

City of Toronto staff have issued a formal position statement which opposes the implementation of queue-jump lanes in most areas planned for intensification. Therefore, if there is interest in implementing queue-jump lanes, it may become necessary for City Council

to provide support and direction for queue-jump lanes, in order to supersede the City staff position on this matter.

June 19, 2012
11-31-42

Attachment: May 9, 2012 Letter from City of Toronto



City Planning
Gregg Lintern, Acting Chief Planner and Executive Director

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Director,
Transportation Planning

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May 9, 2012

Mr. Sameh Ghaly, Chief Capital Officer
Toronto Transit Commission
5160 Yonge Street, 13th Floor
Toronto, ON M2N 6L9

Dear Mr. Ghaly:

Re: Queue Jump Lanes

I am writing to express the City's position with respect to recent proposals for the introduction of queue-jump lanes at various City intersections in connection with several TTC projects and development applications. Most recently, the question of the benefits and impacts of queue-jump lanes has emerged as a significant issue in the ongoing planning and design work for the Eglinton-Scarborough Crosstown (ESC) rapid transit line.

The City has concerns with the impact of these facilities and generally cannot support queue-jump lanes in areas identified for growth in the Official Plan (Downtown, Centres, Avenues and Secondary Plan Areas) because of their detrimental impact on the pedestrian environment and public realm. Queue-jump lanes increase the roadway width at intersections, thus increasing pedestrian crossing distances across the intersection. Queue-jump lanes also reduce or eliminate the public boulevard beside the sidewalk for considerable distances in proximity to intersections. Current City policies and guidelines allocate this space to street trees, landscaping and other streetscape elements that provide amenity and quality to all users.

Specific to the ESC, it is important to note that the vast majority of riders will access the ESC line by walking, or transfer to the ESC at an intersection. With the anticipated increase in pedestrian activity, the need for more generous and improved pedestrian areas at intersections and bus stops is even more evident. A high-quality pedestrian environment and public realm is vital to the success of both the transit line and future private-sector development along the line.

Given the significant pedestrian and public realm impacts noted above, the benefits of queue-jump lanes need to be clearly articulated and quantified by the TTC in order for us to consider their implementation. To date, the TTC has not identified how queue-jump lanes and bus lay-bys will be utilized from a service planning perspective, and the operational effectiveness of queue-jump lanes that also function as right-turn lanes has not been presented. Impacts to surface vehicle and pedestrian activity have not been adequately investigated or documented, as intersections with high pedestrian volumes will impede vehicles from making right turns, contributing to surface transit delays. Pedestrian volumes along Eglinton Avenue are anticipated to increase considerably with the introduction of the LRT and the intensification of development, increasing this delay over time.

By way of example, attached are the proposed lane configurations for stations at Keele and Dufferin Streets. The resulting impact to sidewalks and the public realm is not an acceptable urban treatment.

The City continues to have concerns with respect to queue-jump lanes as outlined above. The upcoming site plan applications for the ESC should be adjusted accordingly by removing queue jump lanes that cut into the public realm and reduce sidewalk space. Queue-jump lanes will only be considered in unique circumstances where the demonstrated benefits clearly outweigh the impacts. The southbound queue-jump lane at Midland and Eglinton Avenues is a good example of a situation where the introduction of the queue jump lane will assist with bus operations particularly when the SRT is taken out of service for up to three years and bus volumes will increase substantially at this location. At this particular location, it is possible to acquire additional public right of way or building setback to mitigate the impact of adding a queue jump lane.

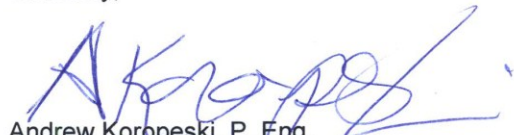
In general, however, the City will not support the provision of queue-jump lanes unless there is a demonstrated justification to their benefit, with consideration of all modes.

Sincerely,



Gregg Lintern,
Acting Chief Planner and Executive Director
City Planning

Sincerely,



Andrew Koropeski, P. Eng.
Acting General Manager
Transportation Services

Attachments

Copy: Rod McPhail – Director, Transportation Planning, City Planning
John Mende – Director, Capital Infrastructure Management
Mitch Stambler – Chief Planning Officer, TTC
James Fraser – Director, Program Management, TTC
Gary Carr – Chief Engineer, TTC