Form Revised: February 2005

TORONTO TRANSIT COMMISSION
REPORT NO.

MEETING DATE: September 27, 2012

SUBJECT: POTENTIAL FOR QUEUE-JUMP LANES ON FINCH, WEST OF KEELE, IN ADVANCE OF LRT CONSTRUCTION

ACTION ITEM

RECOMMENDATIONS

It is recommended that the Commission:

1. endorse the concept of queue-jump lanes for buses for the purpose of reducing delays to transit at congested intersections;

2. request the Public Works and Infrastructure Committee to direct City staff to report, in consultation with the TTC, on opportunities and locations to implement queue-jump lanes; and

3. forward this report to Councillors Shiner, Filion, Pasternak, Perruzza, Mammoliti, Crisanti, and Ford, to Toronto Transportation Services, and to Metrolinx, noting that:

    - typically, queue-jump lanes could not be implemented on Finch Avenue West much in advance of the construction of the Finch West Light Rail line (LRT), due to the length of time required to complete the necessary engineering and design work, to acquire the property that is required outside of the City-owned right-of-way, and to relocate underground utilities, such as hydro, telecom, and gas;

    - staff have investigated the extent to which the costs of widening Finch Avenue West intersections for queue-jump lanes, in advance of the LRT project, would be recoverable as part of the LRT project. The throw-away costs for constructing queue-jump lanes in both directions at a representative intersection -- Finch and Kipling -- would be in the order of $250,000, primarily the cost of constructing the transitions where the widened section of roadway would taper back to the more-narrow, existing roadway width;

    - these throw-away costs would be difficult to justify for temporary queue-jump lanes when there are many other excellent candidates for queue-jump lanes at congested major intersections on other roadways in Toronto where they would provide permanent, long-term benefits;

- a possible exception would be a potential queue-jump lane on Finch Avenue West in the eastbound direction on the approach to the off-ramp intersection on the east side of Highway 400 that would continue east to Oakdale Road. This queue-jump initiative would reduce delays to buses by an average of about four minutes, does not appear to require any property acquisition, and would cost in the range of $11 million, of which about $190,000 would be 'throw-away'; and

- any decision to pursue the advance construction of queue-jump lanes on Finch Avenue West would require detailed discussions with Metrolinx -- now responsible for LRT construction in Toronto -- to see if they would be agreeable to advancing funding for this construction as part of their contract and finance plans for the Finch West LRT.

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 improve 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 cost of constructing these queue-jump lanes may not be warranted in light of the fact that City Council had recently reaffirmed its support for a light-rail transit line on Finch Avenue West, west of Keele Street, and that Metrolinx plans to start construction of that light-rail line in 2016.

The Commission requested, among other things, a further report on "the estimated costs deemed to be recoverable were these improvements to be made west of Keele Street due to the imminent construction of the Finch West LRT (ie. engineering, surveying, structural costs)."

This report responds to that request.

DISCUSSION

The previous March 30, 2012 report discussed thirty intersections on Finch Avenue West where queue-jump lanes could be implemented in order to improve the reliability and speed of transit service on Finch Avenue. The re-design and re-construction of arterial-road intersections are complicated activities and, in the interests of practicality, the current report focuses on the major intersections on Finch Avenue West which have the highest levels of congestion and, therefore, where queue-jump lanes would have achieved the greatest reduction in congestion-related delays to buses. There are seven such major intersections on

Finch Avenue West, west of Keele Street, in addition to the off-ramp intersections at the Highway 400 interchange with Finch Avenue.

Effective Use of Money

Based on the most-recent information from Metrolinx, the Finch West LRT construction is planned to begin in 2016 and extend through 2020. Queue-jump lanes, if constructed at key intersections before the LRT construction begins, could provide significant service improvements -- reductions in congestion-related delays and improvements in overall service reliability -- on the 36 FINCH WEST bus route until LRT operation begins.

The widening required to implement the Finch West LRT is, at virtually every intersection, greater than is needed to implement queue-jump lanes. For this reason, from a cost-recovery perspective, the logical approach for construction of queue-jump lanes, in advance of the LRT, would be to build those lanes to the wider (ultimate) width which will be required for the LRT. This would avoid the very-significant 'throw-away' cost of widening the road just enough for queue-jump lanes, and then tearing up that new construction (curbs, catch-basins, etc.) a short time later to widen the road further for the LRT.

Time Constraints Are a Problem

There are a number of complicated tasks involved in widening major intersections to accommodate queue-jump lanes, in advance of the LRT, and they are time-consuming.

At most of the major intersections on Finch Avenue West, there is not sufficient City-owned property to allow the road to be widened to the ultimate LRT width. As had been indicated in the Environmental Assessment for the Finch West LRT project, it will be necessary to acquire property at most major intersections to accommodate the future design, including: the LRT right-of-way and passenger platforms in the middle of the road; the two through-traffic lanes; a separate left-turn lane; bike lanes in both directions; and sidewalk and boulevard areas on both sides of the street. The acquisition of property takes up to 15 months from the time the requirement has been accurately defined.

Implementation of queue-jump lanes at any intersection requires detailed knowledge of the final alignment of the curbs which will be built for the LRT. It is also necessary to fully understand the underground utilities that would have to be relocated as part of any widening of Finch Avenue West. There are underground utilities at most major intersections -- such as hydro, telecom, gas, water, and sewers -- in the areas near the edge of the road, which may have to be relocated in conjunction with any road widening. It must also be determined if the road widening would result in an acceptable increase in stormwater flows to existing sewers, or if there would have to be upgrades to the road drainage system.

Design of the alignment and utility mapping for the Finch West LRT was stopped at about the 20% completion stage in late 2010. This design and engineering work would have to be recommenced and would have to be developed to a much-more advanced state for the entire line before any construction of queue-jump lanes could begin at site-specific intersections. In light of these facts, it is doubtful that queue-jump lanes could be in place before the LRT construction starts in 2016.

Construction Staging

Metrolinx is planning to implement the Finch West LRT by 2020. This will require the simultaneous construction of various sections of the line. These sections must be far enough apart to allow traffic to be effectively managed to minimize, to the extent practical, construction-related disruptions. The construction of queue-jump lanes on Finch Avenue West, in addition to full LRT construction elsewhere on the street, would create increased disruption. This would be less efficient, and more disruptive, than doing all the construction required for the LRT in a given area at one time.

Throw-Away Costs for Queue-Jump Lanes at Major Intersections

The Finch-Kipling intersection was assessed, as an example of a major intersection, to identify the throw-away costs involved in widening Finch Avenue West to its ultimate LRT width, to accommodate queue-jump lanes in both directions as an interim use. The throw-away costs would be about $250,000, out of a total cost of reconstructing that intersection of approximately $19.8 million (2012 dollars). Those throw-away costs pertain to the cost of constructing the transition areas where the widened section of roadway tapers back to the more-narrow, existing roadway width. These transition areas would have to be again reconstructed when the rest of the roadway is widened as part of the LRT.

A Candidate Intersection Worth Pursuing: Finch Avenue West in the Vicinity of the Highway 400 Interchange

The eastbound direction on Finch Avenue West at the Highway 400 interchange -- shown in Exhibit 1 -- is the most-congested area on Finch West. Surveys recently conducted of bus travel times in peak traffic conditions, on the section between Arrow Road and Oakdale Road -- not including travel through those intersections themselves -- found that it took up to 11.5 minutes for eastbound buses to travel this one kilometre distance in the morning peak, and up to 9 minutes in the afternoon peak. If this section of the road were widened to the ultimate LRT configuration to allow implementation of queue-jump lanes, there would be significant benefits for transit operations.

This section of Finch Avenue West has fewer complications relative to other typical major intersections. There appears to be virtually no property acquisition needed in this area, and no major City utilities have been identified under the roadway in the area that would have to be moved to accommodate queue-jump lanes or the LRT. There are third-party underground utilities -- such as communication cables and buried hydro and gas lines -- near the edge of the road that would require relocation, and this would have to be co-ordinated as part of any road-widening contract. Construction of queue-jump lanes here would cost approximately $11 million, but almost all of this work would be re-usable. The throw-away costs for work that is not required for the LRT project would be limited to about $190,000.

If approval were provided to widen the road and implement queue-jump lanes by 2015, and if construction of the LRT in this area were left to the latter part of the construction schedule (2020), then these queue-jump lanes could provide a significant reduction in delay to buses on the 36 FINCH WEST bus route -- reducing eastbound delays to buses by about four minutes, on average. This is a very-significant reduction in delay for a single queue-jump lane

location. It is estimated that, with the queue-jump lane in place, it would be possible to provide improved service in the afternoon rush hour equivalent to adding a bus on the line. This would be like adding $340,000 of service to the line over a four-year period, with no actual change in operating costs.

Need for Advanced Funding from Metrolinx

Any decision to pursue early construction of queue-jump lanes at intersections on Finch Avenue West would require discussions with Metrolinx to determine if they would support advancing this specific aspect of funding and construction, in a way which would be compatible with their longer-term contract and finance plans for the Finch West LRT.

There Are Many Good Opportunities for Queue-Jump Lanes in Toronto

Although there has been no funding available for queue-jump lanes in recent years, TTC staff have a shortlist of 25 intersections with high bus volumes and significant delays due to traffic congestion. These were presented in staff's previous report on improving bus service on Finch Avenue:

- 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

With the possible exception of the eastbound direction on Finch Avenue West in the vicinity of the Highway 400 interchange, described above, if funding were to become available for queue-jump lanes in Toronto, staff would recommend that those funds not be directed to building queue-jump lanes on Finch Avenue West in advance of the LRT construction but, instead, funding priority should be given to this short-list of 25 excellent opportunities throughout the city.

City Staff's Current Position Opposes Implementing Queue-Jump Lanes

A long-list of potential queue-jump lanes had been developed earlier by TTC staff in response to a request from City of Toronto staff preparing the 2007 report, *"Sustainable Transportation Initiatives: Short-Term Proposals"*. That report was approved by City Council in 2007, and Council directed that City staff work 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 these. However, City staff recently issued a letter stating that they "…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.

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 in that plan as *Surface Transit Priority* corridors, 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, the implementation of queue-jump lanes is consistent with, and supported by the City's Official Plan.

It is recommended that the Commission request the Public Works and Infrastructure Committee to direct City staff to report, in consultation with the TTC, on opportunities and locations to implement queue-jump lanes. A principal focus of this further work should be on the areas that have been designated for growth as, in many cases, these areas are already subject to significant traffic congestion and this will worsen with increased development.

SUMMARY

An assessment of the feasibility of widening major intersections on Finch Avenue West to the ultimate width required for the Finch West LRT, to allow early implementation of queue-jump lanes in advance of LRT construction, suggests that the per-intersection 'throw-away' cost would be relatively small, in the order of $250,000. However, at most locations, this early implementation of queue-jump lanes does not appear to be practical due to the time constraints associated with property acquisition, detailed design, relocation and possible redesign of underground utilities, as well as the complications related to the ultimate staging of the LRT construction. More importantly, if funding were to become available for queue-jump lanes, staff would recommend it be used to construct queue-jump lanes at other congested intersections in the City where they would have permanent, long-term benefits.

One possible exception, where there would be significant benefits and fewer complications, is on Finch Avenue in the eastbound direction on the approach to the Highway 400 off-ramp and Oakdale Road. It might be feasible to complete these eastbound queue-jump lanes by 2015 and, if the LRT construction in this area were to be scheduled towards the end of the project, the queue-jump lanes could provide at least five years of benefit to the 36 FINCH WEST bus service.

Any decision to build any interim queue-jump lanes on Finch Avenue West would require a more-detailed technical review and funding agreement with Metrolinx.

There would be significant and perceptible benefits in identifying opportunities for and, ultimately, implementing queue-jump lanes at congested intersections in Toronto where there are no plans for LRT construction. City staff should be directed to report on this matter, with particular attention to those areas of the city that have been designated for growth and where existing congestion problems are expected to worsen.

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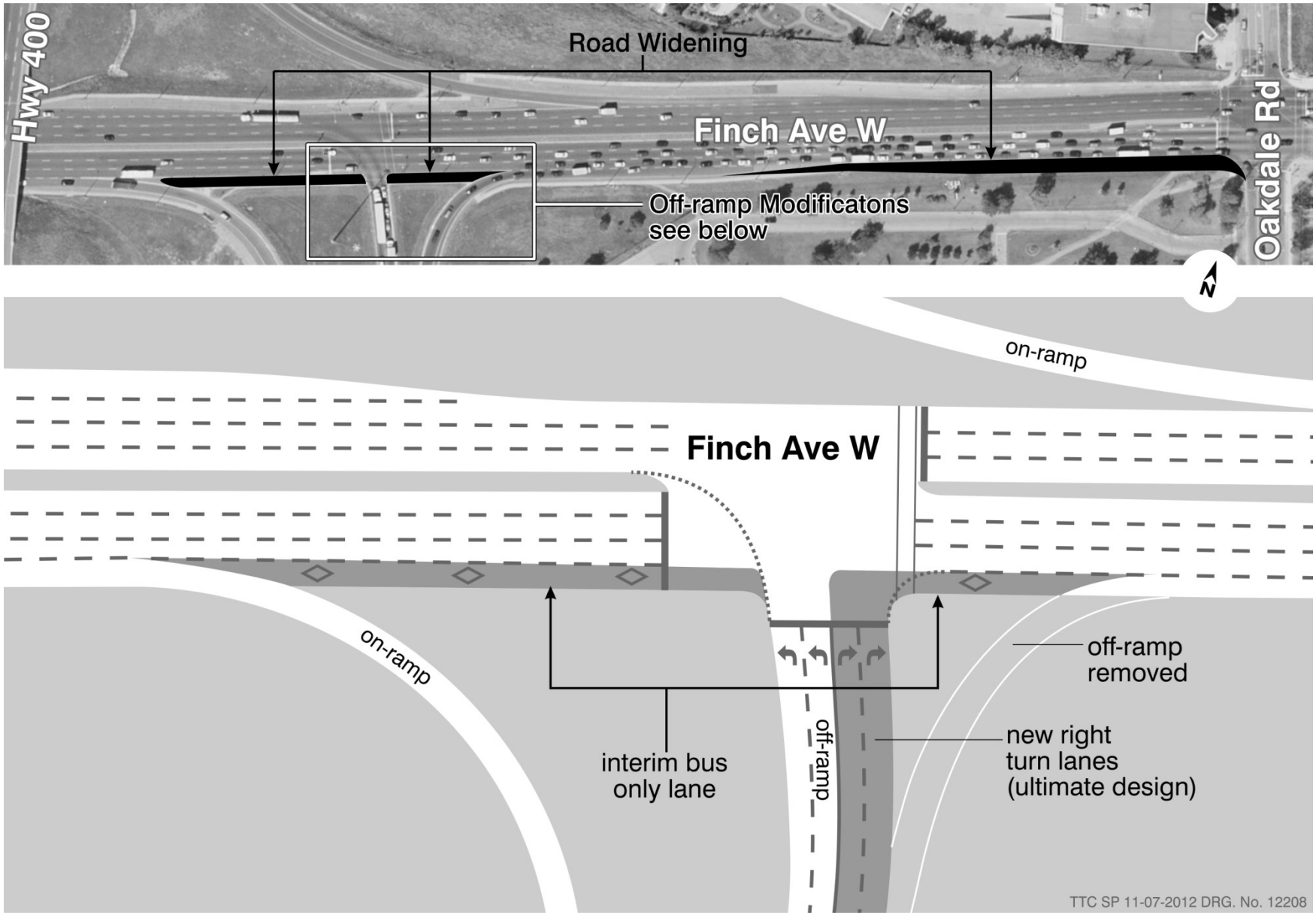
September 4, 2012
11-31-42

Attachments: Exhibit 1: Potential Queue-Jump Lane on Finch Avenue West
May 9, 2012 Letter from City of Toronto

Exhibit 1: Potential Queue Jump Lane on Finch Avenue West

At Highway 400 East Ramp and at Oakdale Road



TORONTO

Rod McPhail
Director,
Transportation Planning

City Planning
Gregg Lintern, Acting Chief Planner and Executive Director

Metro Hall
55 John Street
22nd Floor
Toronto, Ontario M5V 3C6

Tel: 416-392-8100
Fax: 416-392-3821
rmcphail@toronto.ca
toronto.ca

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