TORONTO TRANSIT COMMISSION
REPORT NO.

MEETING DATE: January 23, 2008

SUBJECT: 501 QUEEN STREETCAR ROUTE: ISSUES AND SOLUTIONS

RECOMMENDATIONS

It is recommended that the Commission support the actions as described in this report and as summarized as follows:

(1) TTC staff have implemented the following initiatives to immediately improve service reliability on the 501 QUEEN streetcar route:

- customer-focussed route management short-turn practises;
- assignment of "service assistance crews" (SAC) to the line to assist in responding to service irregularities, either by the insertion of gap cars to the gap in the route or by taking over for the Operator, thereby reducing short-turns;
- assignment of additional supervisors to the route;
- workforce availability issues at the streetcar divisions have been addressed to ensure adequate workforce to allow the consistent delivery of service;
- careful monitoring of vehicle assignments to the route to minimise the use of smaller CLRV's; and,

(2) Note the following:

- it is extremely challenging to operate reliable and regular fixed-rail transit service in a mixed-traffic environment where the TTC has no control over the multitude of factors which delay or obstruct service;
- TTC staff have been concerned about, and have taken various measures to improve the quality of service on all of the TTC's streetcar lines, for a number of years;
- TTC staff attended a public meeting on December 4, 2007, pertaining to the quality of service offered on the 501 QUEEN streetcar route;
- TTC staff also attended a second meeting on this topic, on December 10, 2007, called by Councillor Bussin, and attended by representatives of the local

Business Improvement Areas (BIA's) and residents' associations for the Ward 32 Beaches-East York area;

- TTC staff are committed to test various means by which the quality of the 501 QUEEN streetcar route (and all other streetcar routes which operate in mixed traffic) may be improved, and these are described in this report; and,

(3) Note that staff will report back no later than May, 2008 on:

- the improvement on service reliability as a result of the actions being implemented;

- the status of other reviews/studies as set out herein;

- specific actions that we recommend be considered by the Toronto Police Services Board and the City of Toronto to address the issues that are under their control; and,

(4) Forward this report to Councillors Grimes, Saundercook, Perks, Giambrone, Pantalone, Vaughan, Rae, McConnell, Fletcher, Bussin, and Ashton; to City of Toronto Transportation Services, and to the Toronto Police Service.

FUNDING

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

BACKGROUND

The operation of high-frequency, high-capacity fixed-rail transit service in mixed-traffic roadways is anomalous to Toronto. Virtually every new light rail (streetcar) line being built anywhere in the world today is constructed in physically-separated exclusive rights-of-way, where the service is protected from the many different users and activities which occur on a public street. Nowhere else in the world do transit properties attempt to run services – with frequencies comparable to the two-minute service provided during the morning peak-period on the 504 KING streetcar route – where the service is subjected to traffic congestion, collisions on the tracks, left-turning vehicles, courier trucks and double-parked cars blocking the tracks.

To better understand the problems which this situation creates, imagine how much less reliable the TTC's subways would be if, instead of operating in their own tunnels where the TTC has control over its operating environment, the subways were to operate on Yonge Street itself and would have to stop and wait behind cars trying to make a left-turn. The point here is that no one should underestimate the difficulties in trying to operate a regular, reliable service on fixed rail in mixed traffic.

Nonetheless, it is also true that there are a number of factors over which the TTC does have control and which affect the quality of the streetcar service which we operate: route management practices, scheduling and crewing, vehicle reliability, route structure, and adequacy of workforce. TTC staff are sensitive to the issue of quality of service, notably the regularity and reliability of service. To this end, five years ago, the TTC initiated a formal process of service reliability measurement – schedule deviation – intended to allow continual monitoring of the reliability of service, so that routes can undergo a process of continual measurement and improvement.

In 2001, staff presented a report – in the context of efforts to improve the quality of service on the 504 KING route – in which ten different actions – all within the control of the TTC – were outlined. These ranged from track-switch maintenance and cleaning practices, to better educating streetcar operators about signal priority, to use of rear-door loading, to testing the removal of one of the two sets of double seats in the rear section of 15 metre-long Canadian Light Rail Vehicle (CLRV) streetcars in order to allow better and faster movement within the streetcars. Of the ten, seven have been fully or partially implemented. The others have not been for various operational or financial reasons.

In June, 2007, the management of the TTC's streetcar services were brought under the jurisdiction of the Subway Operations area – creating the new Rail Operations group – in order to allow the streetcar operations to benefit from the skills and experience of operating fixed-rail services which have been developed within the subway operations area. This new group has already been examining means by which to improve the quality of all streetcar services.

In July, 2007, the Commission received a petition documenting public dissatisfaction with the quality of service on the 501 QUEEN streetcar route, and demanding improvements to it, with particular emphasis on the east end of the route in the Beach.

As an outcome of that petition, a public meeting on this topic was convened by the Rocket Riders – a transit advocacy group – on December 4, 2007. The meeting was attended by five TTC staff members, Chair Giambrone, and about 100 members of the public. At that meeting, transit advocates James Bow and Steve Munro presented their opinions and analyses regarding problems on the 501 QUEEN streetcar route, TTC staff presented their perspectives on the matter, and there was a lengthy question-and-answer session in which members of the public asked questions of TTC staff. At the meeting, TTC staff committed to study and implement possible means of improving the quality of service on that route.

Subsequently, on December 10, 2007, Councillor Bussin convened a smaller meeting, on the same topic, consisting of TTC staff, and representatives of local BIA's and residents' groups. At that meeting, TTC staff re-stated the commitment to examine various means by which to improve the quality of service, and said that they would be presenting a report on the topic at the January 23, 2008 Commission meeting. This is that report.

DISCUSSION

Staff have categorized the problems and possible approaches to these problems into three groups:

- Within the control of the TTC
- Within the control of the City of Toronto
- Within the control of the Toronto Police

Each problem and possible approach or solution is described briefly here.

Within the Control of the TTC

Route Management

The managing of the operations of the route – ensuring that the cars are safely and reliably operated, that they are evenly spaced, that service is provided where and when it should be – is one of the most important actions within the control of the TTC, and has the most direct influence on the quality of the service provided to customers. Staff are reviewing and revising their objectives that govern route management. The quantitative measures used to monitor service reliability are being improved and increased, and the tools used to co-ordinate the service and measure the results are being reviewed and updated.

Automatic Vehicle Location System

The TTC's Communications Information System (CIS) is an automatic vehicle location system (AVL) that, among other functions, allows route supervisors to remotely track the location of the streetcars, communicate with operators, and generate reports to measure the performance of the service. CIS is a legacy system that was first developed in the 1970s, and which does not now have the accuracy or features of the newer AVL systems that are now common in the transit industry. Work will occur in 2008 to update and upgrade this system in order to achieve the functionality needed for effective route management.

Operator Work Assignments

The regulations governing the work assignment of streetcar operators are enshrined in the TTC's collective agreement with its labour union, and are also determined by agreed past practice. These requirements affect the provision of service because operator shift changes and breaks must be accommodated at certain times and places. Drawing on successful recent changes in subway operations, TTC staff are experimenting with the use of additional operator crews that are designed to assist in service reliability. These "Service

Assistance Crews" are used, for example, to replace operators ending their shifts and thus allow the streetcar, and its customers, to continue along the way, instead of short-turning.

Aging Equipment

The TTC's streetcar fleet is ageing, and is becoming less reliable and more prone to breakdown. When a car breaks down in service, severe delays result, and within a short period of time can affect many of the customers on the route. When insufficient numbers of cars are available for service because of unplanned maintenance, the resulting missing cars reduce the capacity provided on the route and cause gaps in the scheduled service. When the higher-capacity streetcars – 23 metre-long Articulated Light Rail Vehicles (ALRVs) – that are used on the 501 QUEEN route are unavailable and are replaced by the lower-capacity CLRVs, crowding and further delays result. The ALRVs are approaching 20 years of age and are overdue for a "mid-life" overhaul that is required to make them last until their planned replacement by new streetcars later next decade. This mid-life overhaul will improve the reliability of the vehicles. The first overhauled car is planned to be in service in 2009, with all 52 ALRVs completed in 2011. Currently, staff are conducting cost-benefit studies concerning increasing the scope of the mid-life overhaul, to further improve the reliability of the ALRVs. Until the overhaul is completed, maintenance practices will focus on improving the reliability of the fleet as much as possible, and maintenance planning and schedules will be examined to determine if availability of the ALRVs can be increased during the busy times of the day. It is also important to note that the Request for Proposals for the procurement of 204 LRT cars has been issued, and that our plan is to place an order for these new streetcars in the fall of 2008 with new vehicles arriving in Toronto in 2010.

Route Structure

The 501 QUEEN route which, at the time ran between Neville Park Loop and Humber Loop, was changed in 1995 to combine it with the former 507 LONG BRANCh route, which ran between Humber Loop and Long Branch Loop. This route change made the route longer, by adding the section on Lake Shore Boulevard, to the Queensway and Queen Street portion of the route. The change eliminated a transfer at Humber Loop for several thousand customers each day, and restored all-day through service to downtown from Lake Shore Boulevard. As development has increased west of Humber Loop, this transfer-free through service is more-important now than in the past. The longer route is more difficult to manage, however, and the service reliability on the Lake Shore Boulevard section of the route is worse than when provided by the former isolated 507 LONG BRANCH service. TTC staff are examining options to split the 501 QUEEN route into two or more shorter routes, and if a satisfactory revised route structure is identified, it can be implemented on a trial basis in the fall of 2008.

Assignment of Streetcar Types to Routes

The TTC has a limited number of the larger, higher-capacity ALRVs. These bigger streetcars are best used on high-demand routes where their capacity can be fully exploited, and they are most effective when used in combination with all-door loading, such as is afforded through the Proof-of-Payment (POP) fare system. The use of such larger-capacity streetcars, operating further apart than would be the case if smaller streetcars were used on the same route to carry the same demand, allows greater stability of operation, with less conflict between closely-spaced streetcars, and less likelihood that the spacing of streetcars will result in the City/TTC signal priority system working at odds with effective streetcar operations.

Proposals have been made to use the shorter CLRV streetcars on the 501 QUEEN route in order to provide more-frequent service, and to provide greater supervisory flexibility. TTC staff will re-examine the relative merits of both operating scenarios to determine if the 501 QUEEN route would operate more-reliably if it were equipped with CLRVs, and to consider the effects on other routes of changing from CLRVs to ALRVs. Additionally, staff will review the need, the pros and cons, as well as the impact of reassigning ALRV's from other routes to Queen 501.

Workforce Shortages

For the past few years, the TTC has been unable to ensure that enough operators are available to operate its service. This problem has affected all three modes of service – buses, streetcars, and the subway – and was the result primarily of higher-than-expected ridership. When sufficient operators are not available, service is cancelled, and the resulting problems – reduced capacity and gaps in the service – are identical to those experienced when there are not enough vehicles available. Since mid-2007, a plan and funding has been in place to resolve the operator shortages, and sufficient new operators are now being hired and trained such that by mid-2008 it will be possible to run all planned services across the TTC system.

Within the Control of the City

There are actions that could be taken by the City of Toronto that would improve service reliability on the 501 QUEEN and many other TTC routes. In general, the City's Official Plan is highly-supportive of initiatives that give priority to public transit. The Official plan includes "building blocks", or no-cost, policy-based changes that can give more priority to public transit. The TTC needs the City to put as many of these in place as possible, to improve transit service. These include:

- Changing traffic signal design philosophy to favour the movement of the maximum number of people;

- Expand and improve transit signal priority to improve its effectiveness for transit service, consistent with favouring the movement of the maximum number of people;

- Cease the installation of closely-spaced traffic signals, which slows down transit service and negates signal priority;

- Prohibit automobile left-turns from streetcar tracks;

- Prohibit right-turns at high-pedestrian-volume intersections, as the delays to turning automobiles force following traffic into the streetcar lane;

- Reduce or eliminate on-street parking on streetcar routes, which forces traffic into streetcar lanes;

- Expand peak-period parking prohibitions on streetcar routes;

- Limit short-term (special event) and long-term (construction) lane closures, which reduce capacity and cause congestion and slower transit operating speeds; and

- Implement transit right-of-way concepts, such as those proposed for the downtown portion of the 504 KING route.

Within the Control of the Toronto Police

A number of issues that affect the reliability of the service are under the control of the Toronto Police Service. These issues need to be addressed to make service more-reliable on the 501 QUEEN route, and on many other TTC routes.

- Non-compliance of reserved transit lanes, HOV lanes:

  The King Street Reserved Streetcar Lanes (originally designated between Dufferin Street and Parliament Street and now in place from Dufferin Street to John Street and from Jarvis Street to Parliament Street) are routinely ignored by motorists. This problem occurs in all of the curb bus lanes currently in operation elsewhere in the City as well.

- Non-compliance of existing municipal by-laws:

  In September, 2000 TTC staff arranged and paid for a ten-week police blitz of traffic regulations along the 504 KING streetcar route, from Bathurst Street to Sherbourne Street. The police issued 7200 violations, mostly for illegal turns and parking. Illegal activities resumed unabated at the end of the blitz.

- Illegal blocking of intersections by traffic trying to sneak through gridlocked intersections. This obstructs cross-street traffic, including transit service.

- Illegal parking and loading during peak-periods, and at all times in prohibited intersection areas. As experienced in the September 2000 traffic blitz such illegal activities will continue to happen, and delays to transit will not be reduced.

- Illegal left-turns from streetcar tracks. There has been success in a small number of cases to have left-turns from streetcar tracks prohibited at highly-problematic locations. However, such prohibitions do not work. At King Street and Widmer Street (west of Spadina), left-turns are prohibited in peak-periods. TTC staff have documented widespread flouting of this prohibition, including observing 42 illegal left-turns in one hour in the afternoon peak-period.

- Parked vehicles obstructing streetcar tracks, especially in winter. Even where parking is permitted, on occasion motorists park too far from the curb, and block the streetcar tracks. This is especially a problem after major snow storms, when piled snow at the curb reduces the effective width of the parking lane. More than two dozen delays a day to streetcar service were recorded during the week after the December 16, 2007 snow storm. A public education campaign to reduce obstructive parking was launched, but problems persist.

Implementation and Timing of Changes

Transit operations in general, and streetcar operations in particular, are far more complex than one might think, and they may react in unpredictable ways to changes in operating practices or environments. Therefore, any attempt to improve the quality of service by making changes must be carefully and systematically implemented and measured in order to allow understanding of the consequences – positive and negative – of the change. Therefore, staff intend to implement the following measures on a test basis, and to carefully monitor and evaluate the changes:

1) Route Management Short-Turning Practises: Until recently, short-turning was more-often done to ensure streetcars were in place and on schedule, as opposed to ensuring that service on the line was as reliable and consistent as possible from a customer perspective. Customer-focused guidelines have now been implemented which are based on adhering to the scheduled time between streetcars. These new guidelines will also serve to regulate and limit short-turning practises. Performance measurements are being established to more-accurately monitor service performance and the achievement of these important new route management guidelines. These performance measures include the number and location of short turns and headway deviation measures.

2) Service Assistance Crews (SAC): Service Assistance Crews (SAC) are additional trained operators which can be strategically located along problematic routes in order to assist in the provision of more-reliable and consistent service, and to minimize the need to short-turn or otherwise inconvenience customers. Service Assistance Crews are sometimes equipped with a bus or streetcar in order to be able to fill in a gap in service, but they are sometimes intended to take over the operation of another vehicle in order to address specific operator logistics. Service Assistance Crews have been in place on the subway since mid-2006 and have proven to be an effective method of improving service quality. Commencing in December 2007, staff began testing the use of Service Assistance Crews on the 501 QUEEN route to see if similar improvements in service quality can be achieved.

3) Assignment of Route Supervisors: A review of route supervisor assignments on the 501 QUEEN route is currently underway. Recently, an additional supervisor has been allocated to the central portion of the route which allows the supervisors in the east and west ends to focus on utilizing Service Assistance Crews to improve service consistency and to further reduce short-turning and other disruptions. Additional supervisory resources, on a test basis, will be allocated to implement additional improvements to route management practises, such as ensuring that streetcars leave terminals as evenly spaced as possible, consistent with scheduled headways. The testing of these various changes to route management practises will be measured to understand their effects on service quality. It is anticipated that the additional supervisory resources and the testing process will be in place by the end of February. The need for the permanent assignment of additional supervisors to the 501 QUEEN route will be assessed as part of the test.

4) Workforce Availability: Over the past few years, the trained workforce for streetcar operations has not kept up with the requirements for service, and this has resulted in the need to cancel some scheduled service. This workforce shortage resulted primarily from greater-than-anticipated workforce requirements associated with surging ridership levels. This issue has been addressed as steps have been taken to ensure that the streetcar operator workforce is adequate to allow consistent delivery of service.

5) Vehicle Maintenance and Availability: The number of streetcars available for service has been limited by the age of the fleet and the need for increasing maintenance on the streetcars to ensure an acceptable level of reliability. Recently, the number of streetcars required for service has been reduced because of track construction on certain routes, which requires that streetcars be replaced by buses. This has freed-up streetcars for use on other non-construction routes. As a result, there have been fewer situations where service has been cancelled due to the unavailability of equipment. Although streetcar availability has increased overall, the additional streetcars available have been primarily CLRVs. The 501 QUEEN service levels are based on the operation of ALRVs. Therefore, the equipment assigned to the 501 QUEEN route will be more-carefully monitored to ensure that the use of CLRVs is

minimized. ALRV fleet availability will improve over time as newly-overhauled ALRV's enter service beginning in 2009.

6) Automatic Vehicle Location Systems (AVL): As described earlier, the TTC's automatic vehicle locating system, known as the Communication Information System (CIS), is a legacy system used by the TTC to locate and monitor vehicles along each route. First implemented on a test basis in the 1970's, the system is now old and relatively outdated, and it lacks the precise vehicle-tracking and performance-monitoring capabilities of newer AVL systems. There are budgeted plans in 2008 to upgrade CIS, and it is anticipated that, by the end of 2008, significant improvements will have been made to vehicle-tracking and performance-monitoring capabilities of this system, which will assist in overall route management of the 501 QUEEN route.

7) Route Structure: The 501 QUEEN route is the longest route in the TTC system – at approximately 24 kilometres in each direction. This makes the route harder to manage and control and, because it is one whole continuous route, disruptions which occur at one end of the line often ripple across the whole line and result in disruptions as far away as the opposite end of the line. A study is underway to determine if the line would operate more-reliably if it were split into two or more sections which would operate independently of each other. The revised routes would have an overlap in the central area so that customers who wish to travel through and past the central area could transfer between the services in this overlap section. It is anticipated that this study will be completed by late summer 2008.

Elements of each of the first five of these test measures have already been implemented and will be fully implemented by the end of February, 2008. The others will follow at appropriate intervals, depending on measurement and evaluation of the preceding measures. A post-implementation review of the effectiveness of these tests will be presented to the Commission when sufficient information has been gathered to allow such an evaluation to be done. Staff will also report back on future measures to be tested when the necessary work has been completed.

SUMMARY

It is very difficult to reliably and consistently operate a busy streetcar route in a mixed-traffic environment. In many cases the factors that delay or obstruct service are outside the control of the TTC. TTC staff have identified and are implementing a number of measures that will improve service on the 501 QUEEN route, and on other streetcar routes.

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January 18, 2008
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