

## **Streetcar Tracks and Cyclist Safety**

<b>Date:</b>	October 29, 2012
<b>To:</b>	Public Works and Infrastructure Committee
<b>From:</b>	Acting General Manager, Transportation Services
<b>Wards:</b>	All Wards
<b>Reference Number:</b>	P:\2012\Cluster B\TRA\TIM\pw12028tim

### **SUMMARY**

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This report responds to a request by the Public Works and Infrastructure Committee for the Acting General Manager, Transportation Services to report on strategies to make inactive and active streetcar tracks safer for cyclists. The presence of streetcar tracks is a reality that Toronto cyclists have been dealing with for more than 100 years. The Toronto Transit Commission currently has approximately 300 km of active streetcar tracks and 3.5 km of unused tracks. Streetcar tracks – active or inactive – present a potential hazard to cyclists, especially when wet. When a bicycle wheel drops into the track flange it causes the cyclist to lose control of the bicycle’s steering and sometimes results in a fall.

When streetcar tracks become inactive, the City’s current practice is to maintain the track allowance in good repair until it can be removed cost-effectively during road reconstruction or resurfacing. Most of the current unused track is located on roads that are included in Transportation Services 10-year Capital Plan and are programmed to be removed over the next seven years.

Staff have completed a review and assessment of possible measures that could be implemented immediately to address this problem and have concluded that there is no “simple fix” that will prevent cyclists from getting their wheels caught in streetcar tracks. Further work is therefore required, including the conducting of a survey of cyclists to better understand the extent of the problem and the implementation of a pilot project of possible mitigating measures, in order to have the required information to develop a comprehensive and effective strategy. The strategy must focus on three key areas: improving cyclists’ awareness and skills in cycling near tracks; providing guidance to cyclists at key locations; and in the case of inactive streetcar tracks, systematically removing or overlaying the tracks in a cost-effective manner.

## **RECOMMENDATIONS**

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### **The Acting General Manager, Transportation Services recommends that:**

1. City Council authorize and direct the Acting General Manager, Transportation Services, in consultation with the Toronto Transit Commission, to develop and implement a “streetcar tracks and cyclists” safety strategy that would include, but not be limited to:
  - a. Communicating safety tips when cycling near streetcar tracks;
  - b. Collecting and analyzing data on streetcar track-cyclist crashes; and
  - c. Conducting a Pilot Project to evaluate the effectiveness of pavement markings and/or signage to guide cyclists safely across streetcar tracks.

### **Financial Impact**

Funds for the removal of inactive streetcar tracks on Neville Park Boulevard, Adelaide Street, Richmond Street, York Street and Wellington Street, as described in this report, are contained within the Toronto Transit Commission and Transportation Services Approved 10-Year Capital Plans. The safety initiatives identified in this report (on-line survey, educational materials and pavement marking pilot project) can be accommodated within the Transportation Services Annual Operating Budget for Cycling Infrastructure and Programs.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

### **DECISION HISTORY**

The Public Works and Infrastructure Committee, at its meeting of September 12, 2012, referred a letter (PW17.9) from the Councillors of Wards 19 and 21, to the Acting General Manager, Transportation Services for a report to the Public Works and Infrastructure Committee on:

- Possible options, costs, best practices and new techniques for covering decommissioned streetcar tracks city-wide, including filling in the tracks, paving/asphalting the entire street and removing the tracks; and
- Possible options, costs, best practices and new techniques to make active streetcar tracks city-wide safer for cyclists.

### **ISSUE BACKGROUND**

Tragically, on Monday, July 6, 2012 a male cyclist, age 40, was fatally injured while travelling southbound on Wychwood Avenue just south of St. Clair Avenue West.

Reports indicate that the cyclist crashed near the streetcar tracks and struck his head on the road and was pronounced dead at the scene. The City is not privy to autopsy results or details with respect to the precise cause of death.

The Wychwood Avenue streetcar tracks were constructed in 1913 to provide access to the Streetcar Barn located on Wychwood Avenue south of St. Clair Avenue. The Toronto Transit Commission fully reconstructed Wychwood Ave in 1991 which remains in excellent condition from road surface and streetcar track perspectives. The tracks on Wychwood Avenue were decommissioned in 1992 after the Wychwood Streetcar Barn was closed.

## COMMENTS

### Options for Inactive Streetcar Tracks

The Toronto Transit Commission operates streetcar/light rail vehicles on approximately 300 km of tracks located within the centre lanes on Toronto streets. In addition, there are approximately 3.5 km of unused streetcar tracks as described in Table 1 below. When streetcar tracks are decommissioned the City’s current practice is to maintain the track allowance until the road is reconstructed. Transportation Services performs routine roadway maintenance to maintain the minimum standard of repair along the streetcar track allowance until major capital work occurs.

**Table 1 – Status of Inactive TTC Streetcar Tracks and Future Planned Work**

Street	Limits	Metres	Track Status	Program Year
<b>Wychwood</b>	St. Clair to 76 m north of Alcina	270	Single/Double Track Inactive	Not Programmed
<b>Neville Park</b>	Queen to 64 m south of Queen	64	Inactive – Temporary Overlay	2013 Removal w/ resurfacing
<b>Adelaide</b>	Charlotte to Victoria	1,602	Double Track Inactive	2019 Removal w/ resurfacing
<b>Richmond</b>	East of Yonge to York	575	South Track Inactive	2013 Removal w/ resurfacing
<b>York</b>	Wellington to Queen	407	West Track Inactive	2013 Removal w/ resurfacing
<b>Wellington</b>	Church to York	632	South Track Inactive	2014 Removal w/ resurfacing
<b>Kipling</b>	Kipling Loop	20	Inactive Tail Track	Not Programmed
<b>TOTAL</b>		3,522		

The most cost-effective time to remove decommissioned streetcar tracks is during a road reconstruction or resurfacing because the concrete track allowance must be excavated in order to remove the rails. The TTC is responsible for the removal and reconstruction of the streetcar track allowance and this work is coordinated with the planned capital works of Transportation Services, Toronto Water and utility companies. As Table 1 above illustrates, the unused streetcar tracks on Neville Park Boulevard, Adelaide Street, Richmond Street, York Street and Wellington Street will be removed over the next seven years.

There are two options for covering/removing inactive streetcar tracks in advance of a scheduled road reconstruction/resurfacing: direct overlay and partial reconstruction. A direct overlay applies a layer of asphalt over the full width of the roadway. The estimated cost for direct overlay on a 12.8 metre wide road, such as Wychwood Avenue, is \$500,000 per km. The estimated cost to overlay the 270 metres long streetcar track allowance on Wychwood Avenue is approximately \$135,000.

However, a direct overlay does not adhere to the concrete track allowance and steel rails as effectively as a standard resurfacing over an asphalt roadway because the concrete track allowance and steel rails cannot be ground to prepare the surface. As a result, the direct overlay has a limited life span and may have to be repeated several times before the road is reconstructed. An alternate permanent solution could be a partial reconstruction, which involves removal of the concrete track allowance and rails and reconstructing just this part of the roadway. The estimated cost for a partial reconstruction, based on a 7.0 metre wide track allowance, is \$1.85 million per km. A partial reconstruction of the Wychwood Avenue streetcar track allowance would cost approximately \$500,000.

Currently, the Wychwood Avenue roadway and streetcar tracks are in excellent condition and no work is planned in Transportation Services' and the Toronto Transit Commission's 10-Year Capital Works Programs.

### **Strategies for Improving Cyclist Safety Around Streetcar Tracks**

There are approximately 300 km of active streetcar tracks in Toronto, as illustrated in Appendix 1 – Streetcar / Light Rail Network. The presence of streetcar tracks on mixed-traffic streets is a reality that Toronto cyclists have been dealing with for more than 100 years. There are two potential hazards posed by streetcar tracks. The steel track surface can be extremely slippery, especially when wet. And second, when a bicycle wheel drops into the track flange it may cause a cyclist to lose control of the bicycle's steering, resulting in a potential fall. Crashes can occur mid-block when a cyclist is crossing a track parallel to his/her direction of travel, to make a left turn or to go around an obstacle in the curb lane. Crashes also occur at intersections and locations where turning tracks cross the path of a cyclist at an oblique angle.

The City has developed safety tips for cyclists on how to ride safely in the vicinity of streetcar tracks. These tips have been provided for more than three decades in

newsletters, the Toronto Cycling Map, safety booklets and on the City's website ([www.toronto.ca/cycling](http://www.toronto.ca/cycling)). The basic rule for cyclists is to cross streetcar tracks at or as close to a 90-degree angle as possible, preferably between 60- and 90-degrees. This is especially important when the tracks are wet or the cyclist is riding a bicycle with narrow tires.

Until recently there has not been reliable data on the frequency of cyclist crashes on streetcar tracks because these crashes generally do not involve a collision with a motor vehicle. In Ontario, only bicycle collisions involving a motor vehicle are required to be reported to police. The City of Toronto's 2003 Bicycle-Motor Vehicle Collision Study, which analyzed 2,571 bicycle collisions over a two-year period (1997 and 1998), did not find streetcar tracks to be a significant factor in bicycle collisions reported to the Toronto Police Service. However, a more recent study, "Bicyclists' Injuries and the Cycling Environment (BICE)," undertaken by the University of British Columbia Cycling In Cities Research Program in partnership with the University of Toronto, found that a significant number of Toronto cyclists were injured as a result of falling on streetcar tracks. The researchers interviewed 273 cyclists who visited the emergency departments of three downtown Toronto hospitals (Toronto General, St. Michaels, and Toronto Western) over an 18-month period in 2008 and 2009. Almost 30 percent of the injuries resulted from crashes involving streetcar tracks; in almost half of these "streetcar track crashes" the cyclist was taking evasive action to avoid a collision with a motor vehicle. Further analysis of the data is underway to learn more about the characteristics of the Toronto collisions.

The BICE study findings confirm the anecdotal "evidence." Most regular Toronto cyclists can recount a personal encounter with streetcar tracks. Even the most careful cyclists can inadvertently find themselves in a difficult situation between parked cars and the streetcar tracks on Toronto's narrow downtown streetcar streets. When parked cars occupy the curb lane, there is often too little space to cycle comfortably between the parked vehicles and the streetcar tracks. Sometimes the safest place to ride is between the tracks in the centre of the traffic lane, however, many cyclists are not comfortable occupying the full traffic lane or do not recognize their right to do so (also many drivers do not respect cyclists' right to occupy the full traffic lane).

Alta Planning + Design, a leading American consulting firm specializing in active transportation, conducted a best practice review in response to safety concerns about the City of Portland's new streetcar routes. Their study report, entitled "*Bicycle Interactions and Streetcars: Lessons Learned and Recommendations*", dated October 17, 2008, reviewed the experience of cities in Europe and North America and made several recommendations to improve safety for cyclists. The study was responding to concerns about Portland's new streetcar lines being installed in the right-hand traffic lanes where cyclists typically operate. The table included in Appendix 2 lists Alta Planning + Design's recommendations for Portland and compares them to Toronto's current practice.

Many cyclists have asked if there is a product that could be used to fill the streetcar track flange to prevent bicycle wheels from getting “caught” in the tracks. Flange filler products are available for heavy rail and are currently installed in a few skewed angle rail crossings along Toronto multi-use paths. These are typically installed on a short section of low-speed, low volume railway track crossing a road or multi-use path. However, there are no products appropriate for streetcar/light rail tracks. Streetcar/light-rail vehicles are much lighter and much more frequent than heavy rail vehicles and would be more likely to derail if the track flange was filled in. In their 2008 report, Alta Planning + Design states, “extensive experiments in Switzerland seem to indicate that flange filler is not appropriate for streetcar tracks.”

## **Conclusions and Next Steps**

There is no simple fix that will prevent cyclists from getting their wheels caught in streetcar tracks. An effective strategy must focus on three key areas: improving cyclists’ awareness and skills in cycling near tracks; providing guidance to cyclists at key locations; and systematically removing/overlaying unused streetcar tracks in a cost-effective manner.

### ***Cyclist Education and Awareness:***

- Review existing streetcar track safety information for cyclists (Toronto Cycling Map, [www.toronto.ca/cycling](http://www.toronto.ca/cycling) website) and develop a cyclist safety strategy in partnership with TTC and other cycling groups/organizations.
- Encourage Toronto’s many cycling groups and organizations to raise awareness among their members on how to cycle safely around streetcar tracks.
- Conduct an on-line survey of cyclists to collect more comprehensive data on cyclist crashes/incidents involving streetcar tracks to assist in targeting educational material and developing a pilot project to evaluate pavement markings at key locations.

### ***Cyclist Guidance:***

- Conduct a pilot project to evaluate pavement markings and/or signage at key locations to guide cyclists to cross streetcar tracks at a safe angle, including two-stage left turn bike boxes.

### ***Overlaying/Removing Inactive Tracks:***

- Continue to remove inactive streetcar tracks when the streets are scheduled for reconstruction and accelerate the road rehabilitation if feasible from a funding and capital coordination perspective.

Staff of the Toronto Transit Commission have been consulted in the preparation of this report.

## **CONTACT**

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## **SIGNATURE**

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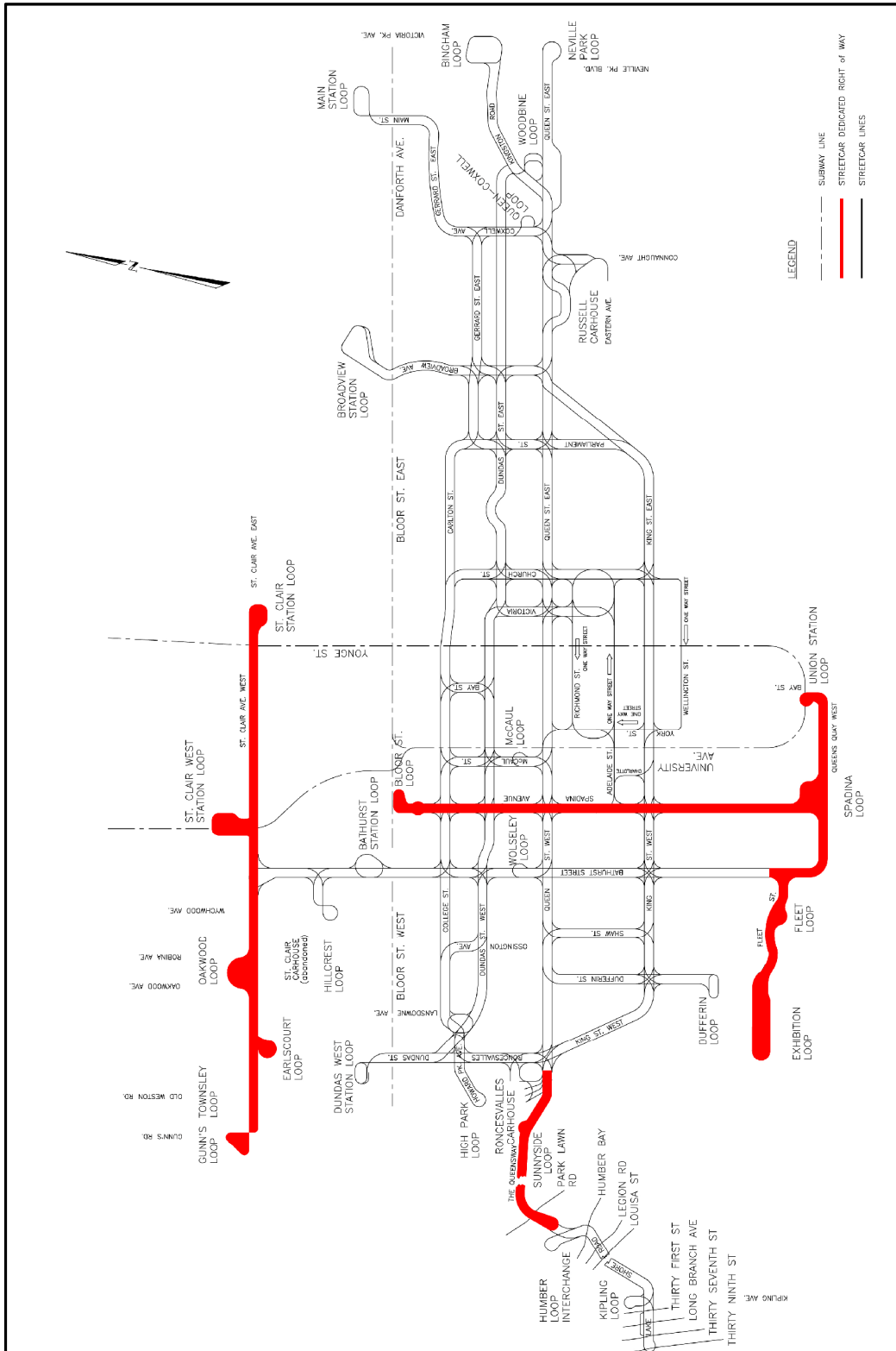
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## **ATTACHMENT**

APPENDIX 1 – Streetcar / Light Rail Network  
APPENDIX 2 – Recommendations of the "Bicycle Interactions and Streetcars Study"

APPENDIX 1

STREETCAR / LIGHT RAIL NETWORK





**APPENDIX 2**  
**Recommendations of the "Bicycle Interactions and Streetcars Study"**

<b>Recommendations for Portland</b>	<b>Toronto Comparison</b>
1. Align tracks on left side (one way street) or in centre lanes of multi-lane street as opposed to right side.	The standard design for Toronto (streetcar tracks in centre lanes of multi-lane streets or within their own right-of way) is consistent with this recommendation.
2. Separate bicycle travel from streetcar tracks to the extent possible by:	
A. Parallel bikeway facility	The Harbord-Hoskin-Wellesley bikeway provides a parallel route north of the 506-College-Carlton streetcar route. However, there are few opportunities for providing continuous east-west bikeways parallel to Toronto's other downtown streetcar routes on King, Queen and Dundas Streets. Parallel routes also will not prevent cyclists from continuing to use streetcar streets as long as their destination is on the streetcar street. For example, the Wychwood cyclist fatality occurred on a quiet residential street parallel to the Christie Street bicycle lanes (one block east).
B. Marked cycle tracks or bike lanes adjacent to streetcar tracks.	Bicycle lanes have been provided along the wider sections of College Street. The Richmond-Adelaide EA could establish cycle tracks on these streets with streetcar tracks. Providing bicycle lanes on most other streetcar streets (e.g., King, Queen, Dundas and the narrower section of College-Carlton Street) would significantly improve safety, however, it would require the removal of most of the on-street parking.

Recommendations for Portland	Toronto Comparison
<p>C. Platforms designed so that cyclists can bypass pedestrian zones without encountering waiting pedestrians.</p>	<p>Most of Toronto’s streetcar routes have TTC platforms or sidewalk waiting areas that achieve this recommendation. The new Roncesvalles design introduced a streetcar operation similar to Portland’s right-hand lane streetcar tracks. The Roncesvalles combination raised cycle track/TTC platforms were designed so that cyclists would not have to cross the tracks at streetcar stops.</p>
<p>D. Offer 90-degree track crossing whenever possible by positioning cycle track/bike lane with pavement markings/signage.</p>	<p>This recommendation has not been implemented in Toronto. Transportation Services will develop a pilot project to evaluate the effectiveness of pavement markings to guide cyclists across streetcar track at intersections. An on-line cyclists survey will be conducted to collect information about cyclists’ streetcar track incidents to assist in identifying the pilot project test-locations.</p>
<p>E. Provide indirect left-turn bike boxes to facilitate left turns.</p>	<p>This recommendation has not been implemented in Toronto. Indirect left-turn bike boxes are being installed on the Sherbourne Street cycle tracks. Indirect left-turn bike boxes could also be considered at key locations along streetcar routes. Potential locations will be identified through the on-line survey described above.</p>
<p>3. Create a policy framework that addresses bicycle safety issues.</p>	<p>Bicycle safety was a primary consideration in the planning for the future surface LRT routes on Eglinton, Sheppard and Finch - bicycle lanes are incorporated in the design. New light-rail lines are also being constructed within their own right-of-ways, which is much safer for cyclists.</p>

<b>Recommendations for Portland</b>	<b>Toronto Comparison</b>
4. Create supporting programs for education and wayfinding.	Bicycle safety messages are delivered through the annual Toronto Cycling Map, the Cyclometer newsletter, the <a href="http://www.toronto.ca/cycling">www.toronto.ca/cycling</a> website, and printed safety material. Transportation Services will work in partnership with the TTC and cycling organizations to review existing materials and develop a cyclist safety strategy regarding streetcar tracks.