



STAFF REPORT ACTION REQUIRED

King Street Transit Pilot: Monitoring and Evaluation

Date:	October 16, 2017
To:	TTC Board
From:	Chief Executive Officer

Summary

The purpose of this report is to inform the TTC Board of the benchmarks of success for the King Street Transit Pilot, as directed at the June 15, 2017 TTC Board meeting.

The King Street Transit Pilot will improve priority for transit vehicles along the King Street corridor, between Bathurst Street and Jarvis Street. At its June 15, 2017 meeting, the TTC Board approved support for the proposed King Street Transit Pilot, and City Council approved the implementation of the pilot at its July 6, 2017 Council meeting. The target implementation date for the pilot is November 2017.

The TTC has worked with partner divisions at the City to develop performance metrics and an overall monitoring program for the King Street Transit Pilot. The program will provide a means for responding to operational issues during the pilot, and provide a method for evaluating the overall success of the pilot.

The success of the King Street Transit Pilot Project will be defined by improvements to transit performance informed primarily by three metrics: reliability, ridership and travel times.

Transit performance represents one important element of the overall pilot. As part of the broader evaluation and monitoring program, information will be collected on a wide range of other criteria such as vehicles (including volumes, travel times, intersection delay), changes in active transportation, impacts on safety for all modes, curbside space utilization (including deliveries), taxi operations, changes in both on-street and off-street parking activity, changes in economic activity and local business operations, compliance and enforcement, air quality and greenhouse gas emissions, use of the public realm, and public opinion.

In most cases, these metrics will be evaluated not only for King Street, but also for parallel and approaching routes, so that the impact of the pilot on the downtown as a whole can be understood.

Recommendations

It is recommended that the TTC Board:

1. Endorse this report and direct staff to provide a performance status report, for all the key performance indicators related to transit, on the King Street Pilot Project as part of the TTC CEO's monthly report to the Board.

Financial Summary

The King Street Transit Pilot is a City-led and funded initiative. There are no additional costs to the TTC to implement the monitoring and evaluation framework described in this report. Findings from the evaluation program will inform requirements for future service adjustments and help develop improved service plans that better meet customer's needs.

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

Accessibility/Equity Matters

The TTC has made significant progress in moving towards providing barrier-free, accessible transit services to all customers. New low-floor accessible streetcars are currently being deployed on King Street on the 514 Cherry route and subject to fleet availability, will be put into service on the 504 King route starting in the fall of 2017. All streetcar routes will have accessible streetcars by 2019. Wheel-Trans service will be maintained on King Street through the pilot area and new designated accessible pick-up and drop-off zones are being added to the corridor.

Decision History

At the July 11, 2016 TTC Board meeting, the TTC and City Planning presented on the importance of streetcars to Toronto's integrated transit network and introduced the King Street Transit Pilot Study (then called the King Street Visioning Study):

TTC Presentation – "The Importance of Streetcars in the TTC's Integrated Transit Network"

https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2016/July_11/Reports/9_The_Importance_of_Streetcars_in_the_TTC%27s_Integrated_Trans.pdf

City Planning Presentation – "King Street Visioning Study"

https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2016/July_11/Reports/10_King_Street_Visioning_Study_Merged_Updated.pdf

At the June 15, 2017 TTC Board meeting, the Board approved support for the King Street Transit Pilot between Bathurst Street to Jarvis Street:

http://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2017/June_15/Reports/8_Proposed_King_Street_Transit_Pilot_Bathurst_Street_to_Jarv.pdf

At the July 6, 2017 council meeting, Toronto City Council approved the implementation of the King Street Transit Pilot:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.EX26.1>

Issue Background

Earlier phases of work through TOcore and the King Street Visioning Study identified King Street as a priority corridor to improve mobility. The King Street Transit Pilot will prioritize transit by discouraging non-local vehicle traffic on King Street by prohibiting through-movements at key intersections. Left-turns from King Street will also be prohibited at all driveways and intersections for non-designated vehicles. Most transit stops in the pilot area will move to the far side of the intersection in a protected area on the curb lane. This will improve safety for customers, the boarding time at stops, and traffic signal co-ordination through intersections. In addition, it will facilitate right-turning movements by general traffic, reducing a potential source of conflict between motorists, streetcars and transit customers.



Figure 1: Intersection concept for King Street Transit Pilot

At the June 15, 2017 TTC Board Meeting, the Board approved support for the King Street Transit Pilot. The Board also approved a number of member motions, one which directed staff to report to the TTC Board on the benchmarks of success for the pilot project. This report responds to that directive.

Comments

The success of the King Street Transit Pilot Project will be defined by improvements to transit performance informed primarily by three metrics: reliability, ridership and travel times. The approach to data collection and analysis will weigh and compare the benefits and trade-offs to trip reliability, travel time and demand for all modes. In order to measure this, a holistic review of transit performance along with other travel modes will be done.

The TTC has worked with partner stakeholders, including Transportation Services, City Planning, the Toronto Parking Authority, the Financial District BIA, and the Entertainment District BIA to identify the data streams that will provide metrics to track and measure the impact of the project on criteria such as vehicles (including volumes, travel times, intersection delay), changes in active transportation, impacts on safety for all modes, curbside space utilization (including deliveries), taxi operations, changes in both on-street and off-street parking activity, changes in economic activity and local business operations, compliance and enforcement, emissions, use of the public realm and public opinion.

This will form an overall monitoring program to regularly report on the performance of the pilot. Monthly dashboards will be created to update the public on how the pilot is tracking in some of the key metrics. Thirteen metrics stemming from the three pillars of the pilot (improving transit, supporting economic prosperity and improving public space) have been identified.



Figure 2: The key pillars of the King Street Transit Pilot

Transit Metrics

There are three primary transit performance metrics that will be tracked to help measure the success of the pilot: reliability, ridership, and travel time.

Reliability

The reliability of transit service is defined by the variability of a customer's experience. This can be measured by their time spent waiting for service and/or on board the vehicle. The more variable a customer's time either waiting for service (relative to the schedule), and the more variable a customer's time spent travelling onboard the vehicle between locations, the more unreliable the transit service is. By improving the priority of transit on the road space, the variability of the service should decrease and provide customers a more consistent and evenly-spaced service, thereby saving on their journey time. The data for this metric will be compiled from the TTC's automatic vehicle location system.

Ridership

Ridership counts will be taken before and during the pilot for transit routes on King Street, as well as on the parallel Queen Street corridor. These counts will determine if there has been a change in the volume of people using public transit, and if the project has attracted new customers to transit. These ridership counts will provide detailed boarding and alighting information along the 504 King and 514 Cherry routes. New ridership information will also be collected on the 501 Queen, 502 Downtowner, and 503 Kingston Road routes.

Travel time

The absolute amount of time spent on transit will also be measured to determine what travel time savings the pilot achieves, based on average travel times and ridership over pilot segments by time of day. Similar to reliability, the data for this metric will be compiled from the TTC's automatic vehicle location system. This data will also be tracked for the 501 Queen, 504 King, 503 Kingston Rd. and 514 Cherry routes.

Table 1 summarizes the transit metrics and their different measures, and shows when, and where, the data will be collected.

Table 1: Transit Metrics and Measures for King Street Transit Pilot and Data Availability				
Metrics and Measures	Pilot Area Only (Bathurst-Jarvis)		Entire Route on King and Parallel Routes	
	Before	During	Before	During
1. Ridership				
i. Ridership counts	✓	✓	✓	✓
ii. Crowding and capacity	✓	✓	✓	✓
2. Travel time				
i. Absolute travel time	✓	✓	✓	✓
3. Reliability				
i. Headway variability	✓	✓	✓	✓
ii. Travel time variability	✓	✓	✓	✓
iii. On-time departure (at terminals) ¹			✓	✓
iv. On-time arrival (at terminals) ¹			✓	✓
v. Missed trips ¹			✓	✓
vi. Short-turns	✓	✓	✓	✓
4. Wheel Trans Operations				
i. Pick-ups and Drop-offs	✓	✓		
¹ Reporting subject to new schedules in place				

Other Metrics

While improved performance of transit is of primary importance to the success of the pilot, benefits realized on King Street cannot come as the result of unreasonable negative impacts to other modes of transportation, other routes, businesses or the public realm.

In addition, the TTC will engage with customers on the King Street corridor to understand reactions to the pilot program. At the preliminary analysis stage, historical data collected through the TTC's Customer Satisfaction Survey program and insights from the TTC segmentation study will be leveraged to profile 504 King streetcar customers. Travel behaviours and satisfaction with key performance indicators will be analyzed.

The data collected from the transit metrics will be considered together with other streams of data that will be collected for the pilot, in order to provide a comprehensive evaluation. This includes:

Table 2: Non-Transit Metrics and Measures for King Street Transit Pilot and Data Availability				
Metrics and Measures	Pilot Area (Bathurst-Jarvis and immediate approaches)		Parallel Routes	
	Before	During	Before	During
5. Traffic Volumes				
i. Intersection Turning Movement Counts	✓	✓	✓	✓
ii. Intersection Delay and Queue Lengths	✓	✓		
6. Traffic Travel Times				
i. "Big Data" GPS Travel Times	✓	✓	✓	✓
ii. Bluetooth Detector Travel Times	✓	✓	✓	✓
7. Safety				
i. Collision tracking for all modes	✓	✓	✓	✓

8. Curbside Utilization				
i. On-Street Parking	✓	✓	✓	✓
ii. Curbside Loading (Taxi, Delivery, Passenger Drop off, etc.)	✓	✓		
9. Off Street Parking	✓	✓	✓	✓
10. Compliance and Enforcement Data				
i. Intersection	✓	✓		
ii. Curbside	✓	✓		
11. Emissions	✓	✓	✓	✓
12. Economic Activity – Retail Sales Data	✓	✓	✓	✓
13. User and Stakeholder Opinion Surveys and Outreach	✓	✓	✓	✓

This program will involve monitoring not only King Street but also the parallel routes of Queen Street, Richmond Street, Adelaide Street, Wellington Street and Front Street, as well as intersecting north-south streets. Major arterials and some local residential streets will also be monitored to understand patterns of traffic diversion and how they impact the transportation network. Data collection methods will vary by the survey type, but will include automatic or video counts, field investigations, use of GPS vehicle tracking as well as perception surveys. The data collected and analyzed through the pilot will be updated as frequently as practical, based on complexity and cost of the collection methods. Table 3 provides an overview of data sources and frequency of updates.

Table 3: Data Sources and Frequency of Update		
Area	Data Description	Update Schedule
Streetcar Service	Travel Times	Monthly

Table 3: Data Sources and Frequency of Update		
Area	Data Description	Update Schedule
	Reliability	Monthly
	Ridership Details	Post-implementation, spring, then September
	Streetcar Delay	Post-implementation, and as needed
Volumes	Intersection Traffic Counts	Monthly
	Intersection Delay and Queue Length	Post-implementation, spring, then September
	Pedestrian Mid-Block Counts	Quarterly
Traffic Travel Times	HERE Data	Monthly
	Bluetooth	Monthly
Safety	Collisions	Quarterly
Wheel-Trans Operations	Pickups/Dropoffs	Quarterly
Emergency Services	Emergency Services Response Times	Quarterly
Curbside Utilization	On-Street Parking	Quarterly
	Deliveries	Post-implementation, spring, then September
	Taxi Utilization	Quarterly
Off-Street Parking (Toronto Parking Authority Lots)	Utilization Survey	Quarterly
On-Street Parking on Nearby Streets	Utilization Survey	Quarterly
Compliance &	Intersection	Quarterly

Table 3: Data Sources and Frequency of Update		
Area	Data Description	Update Schedule
Enforcement	Curbside	Quarterly
Emissions	Modelling Study	Once, at end of Pilot
Economic/Business	Retail Sales Data	Quarterly
Additional Data Sets	Weather	Monthly
	Unplanned Traffic Incidents	Monthly
	Planned Traffic Incidents	Monthly
	Major Events	Monthly

Appendix 1 represents a dashboard that will be used to track certain metrics that will be of interest to the public.

Conclusion

At its core, the King Street Transit Pilot project is about improving mobility on this key transit corridor in the downtown. King Street is a very busy corridor and has the highest ridership of any surface route in the city. The pilot project will prioritize streetcar service while facilitating local access and managing conflicts with curbside activities. The success of the King Street Transit Pilot Project will be defined by improvements to transit performance informed primarily by three metrics: reliability, ridership and travel times.

While improved performance of transit is of primary importance to the success of the pilot, the King Street Transit Pilot affects not just transit users, and therefore, requires a comprehensive evaluation of all travel modes. In order for the pilot to be successful, the improvements to people's transit experiences on King Street cannot come as a result of unreasonable negative impact to businesses, other road users or the public realm.

A joint report on the results of the pilot is scheduled to come to Council late 2018.

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Appendix 1: Draft Transit Performance Dashboard

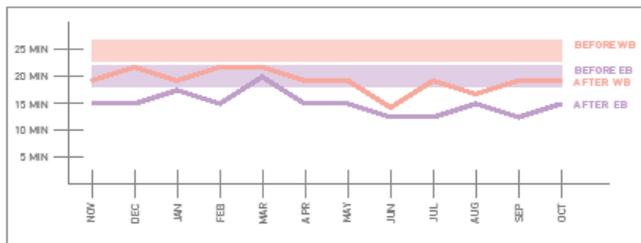
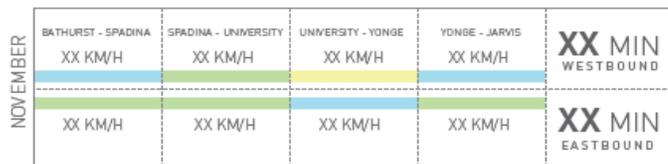
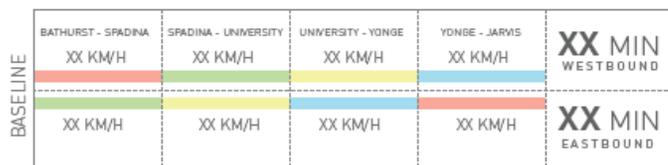
KEY PERFORMANCE INDICATORS (DRAFT)



KING STREET PILOT PROJECT
NOVEMBER 2017 DASHBOARD

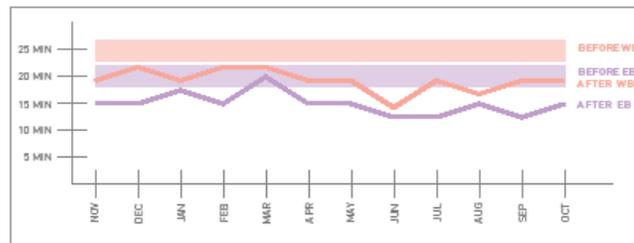
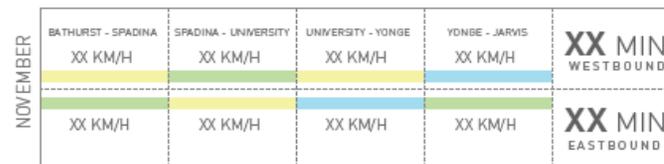
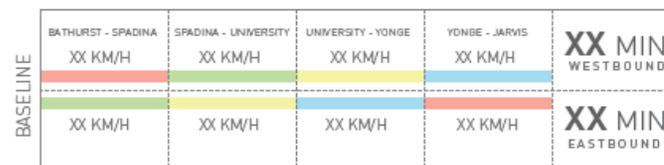
AVERAGE STREETCAR TRAVEL TIME

AM PEAK PERIOD (7-10AM)



X MIN
AVERAGE TIME SAVED

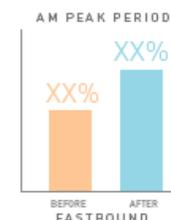
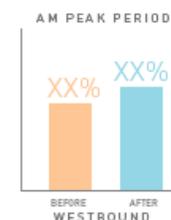
PM PEAK PERIOD (4-7PM)



X MIN
AVERAGE TIME SAVED

STREETCAR HEADWAY RELIABILITY

% of streetcars within acceptable headway



↑ XX%
AM RELIABILITY

↑ XX%
PM RELIABILITY

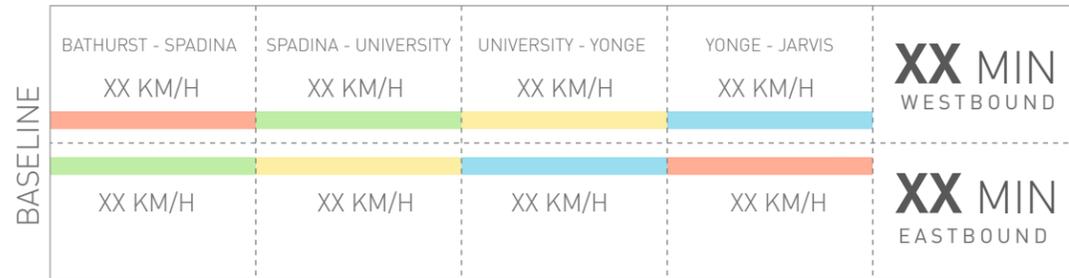
KEY PERFORMANCE INDICATORS (DRAFT)



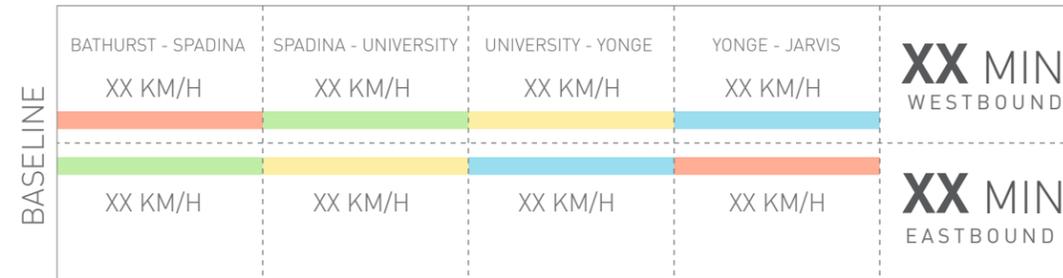
KING STREET PILOT PROJECT
NOVEMBER 2017 DASHBOARD

AVERAGE STREETCAR TRAVEL TIME

AM PEAK PERIOD (7-10AM)



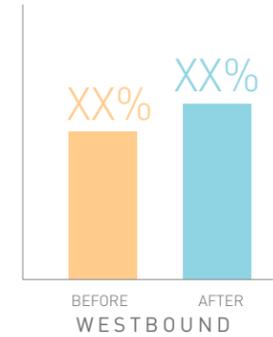
PM PEAK PERIOD (4-7PM)



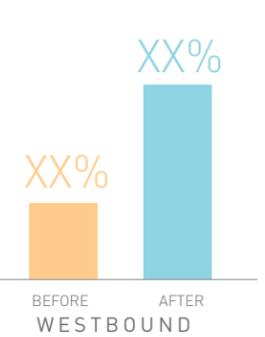
STREETCAR HEADWAY RELIABILITY

% of streetcars within acceptable headway

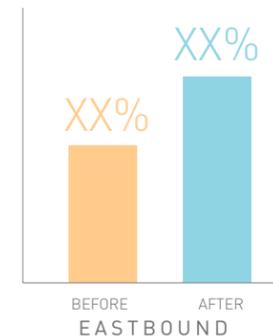
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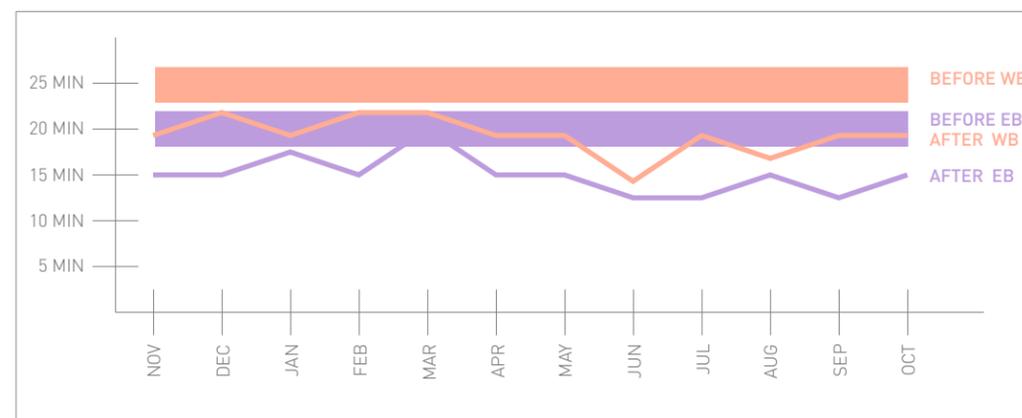
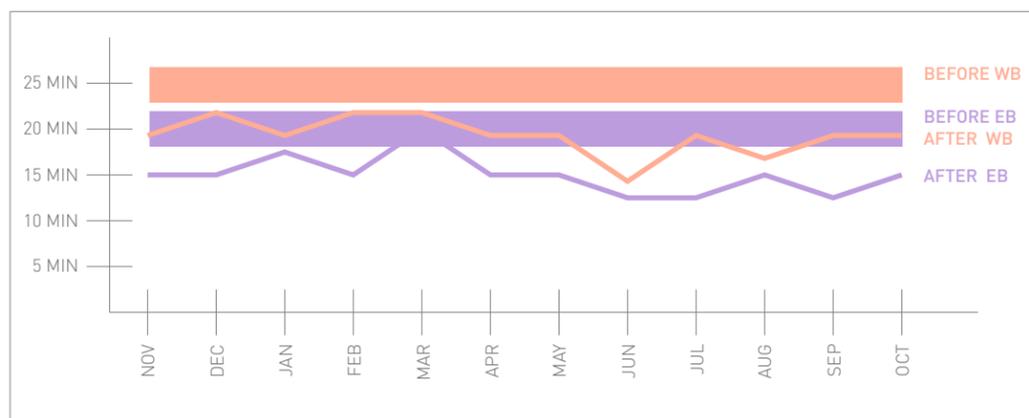
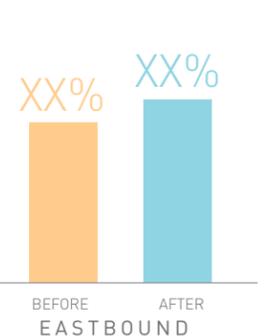
PM PEAK PERIOD



AM PEAK PERIOD



PM PEAK PERIOD



X MIN
AVERAGE TIME SAVED

X MIN
AVERAGE TIME SAVED