For Action

Improvements to Surface Transit Schedules

Date: June 12, 2019
To: TTC Board
From: Chief Customer Officer

Summary

This report requests the TTC Board's endorsement of an initiative to improve surface transit reliability by adjusting schedules to ensure that the TTC delivers service as planned and advertised. The adjustments will address systemic reliability issues resulting in a more punctual, consistent and dependable service for customers.

A new approach to scheduling has been tested on 11 routes with promising results. Further improvements to increase the reliability of surface transit schedules will begin this fall. Progress will be monitored and regularly reported in the Chief Executive Officer's Report.

Recommendations

It is recommended that:

1. The Board endorse the TTC's initiative to improve surface transit schedules.

Financial Summary

This report does not request additional funding from the Board.

On March 7 2019, City Council approved the TTC 2019 Operating Budget which included $4.3 million for service reliability and capacity improvements. The annualized operating cost of these service initiatives is $7.2 million which requires $2.9 million in funding which will be included in the TTC 2020 Operating Budget.

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

Equity/Accessibility Matters

Improvements to surface transit schedules will ensure that they reflect actual operating conditions as experienced by customers. This will make the conventional system more attractive to both existing and potential customers as it reduces service variability, wait times, and trip duration system-wide as demonstrated during the King Street pilot. It will support the Wheel-Trans 10-Year Strategy by facilitating reliable Family of Services transfers.

The improved schedules will also benefit equity-seeking groups and Neighbourhood Improvement Areas where consistent and dependable service is paramount in accessing employment, educational and cultural opportunities. It supports equity goals and objectives established by the City in the *Toronto Poverty Reduction Strategy* and *Toronto Strong Neighbourhoods 2020 Strategy*.

Decision History

At its meeting of December 16, 2015 the Board received a presentation on *Performance Based Service* that outlined the importance of schedules and industry-standard key performance indicators to improving service reliability.

http://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2015/December_16/Reports/CEO_Presentation.pdf

At its meeting of January 25, 2018 the Board endorsed the *Corporate Plan 2018-2022*. Deeply embedded in the *Corporate Plan* is the objective of providing a reliable service to customers.

https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2018/January_25/Reports/1_Corporate_Plan_2018-2022.pdf

Issue Background

The *Corporate Plan* outlines a vision and mission for the TTC “to provide a reliable, efficient, accessible and integrated bus, streetcar network.” It also identifies five critical paths to achieve this, including Critical Path 3 – Move more customers, more reliably. It commits the TTC to improve schedules and on-time performance so that routes reflect actual operating conditions, are better tuned to demand, and are more reliable for customers.

Customer and non-customer needs

The TTC carries out research to understand the needs of customers and non-customers alike. It has identified five shared needs that retain and attract customers: reliability, crowding, wait time, trip duration and affordability.

All five shared needs are closely related, but reliability and crowding are inseparable. Effective route management techniques and a resilient and accurate transit schedule ensures service is reliable and accommodates customer demand. The TTC has steadily made improvements to route management techniques as described in the following section. An effective transit schedule is comprised of two key components: accurate estimates of demand and cycle time— the time for an operator/vehicle to complete a round-trip. If the cycle time is insufficient, a transit schedule can not be delivered as planned resulting in customers experiencing unreliable service and higher levels of crowding than intended.

Customers value consistent and dependable schedules because it improves their trip planning, reduces wait times and reduces trip durations. This was demonstrated by the King Street pilot. A key outcome of it was more consistent and less variable service which resulted in tremendous increases in ridership.

Service reliability programs

Starting in 2015, the TTC has undertaken a multi-year, multi-faceted program to improve service reliability. The program includes the following initiatives:

- Route Management – new practices to deliver more reliable service
- Vehicle Reliability – operate reliable vehicles to minimize in-service failures
- Operating Practices – secure additional vehicle and operator resources
- Technology – leverage technology to make better decisions

These initiatives all focus on improving service reliability for customers. The program has resulted in successes. Mean distance between vehicle failures has increased by 100% on bus, short-turns have decreased by 33% and on-time performance has increased by 5%.

With the introduction of automated passenger counters and the new computer-aided dispatch/automatic vehicle location system over the last year, the TTC is now able to use this improved technology to make better decisions including applying new approaches to preparing reliable schedules.

Comments

Despite past approaches to preparing reliable schedules many routes are not delivering the service to customers as planned or advertised

Starting in 2015, the TTC has made a coordinated effort to update schedules to reflect actual driving conditions. Numerous approaches to determining the appropriate amount of cycle time (the time for a vehicle to complete a round trip) have been tested. A particular challenge has been maintaining a consistent service level over an operating period. This involves selecting a representative value for cycle time throughout the period that, in most cases, spans at least three hours despite changes in traffic congestion. The program has been successful as demonstrated by **Table 1**.

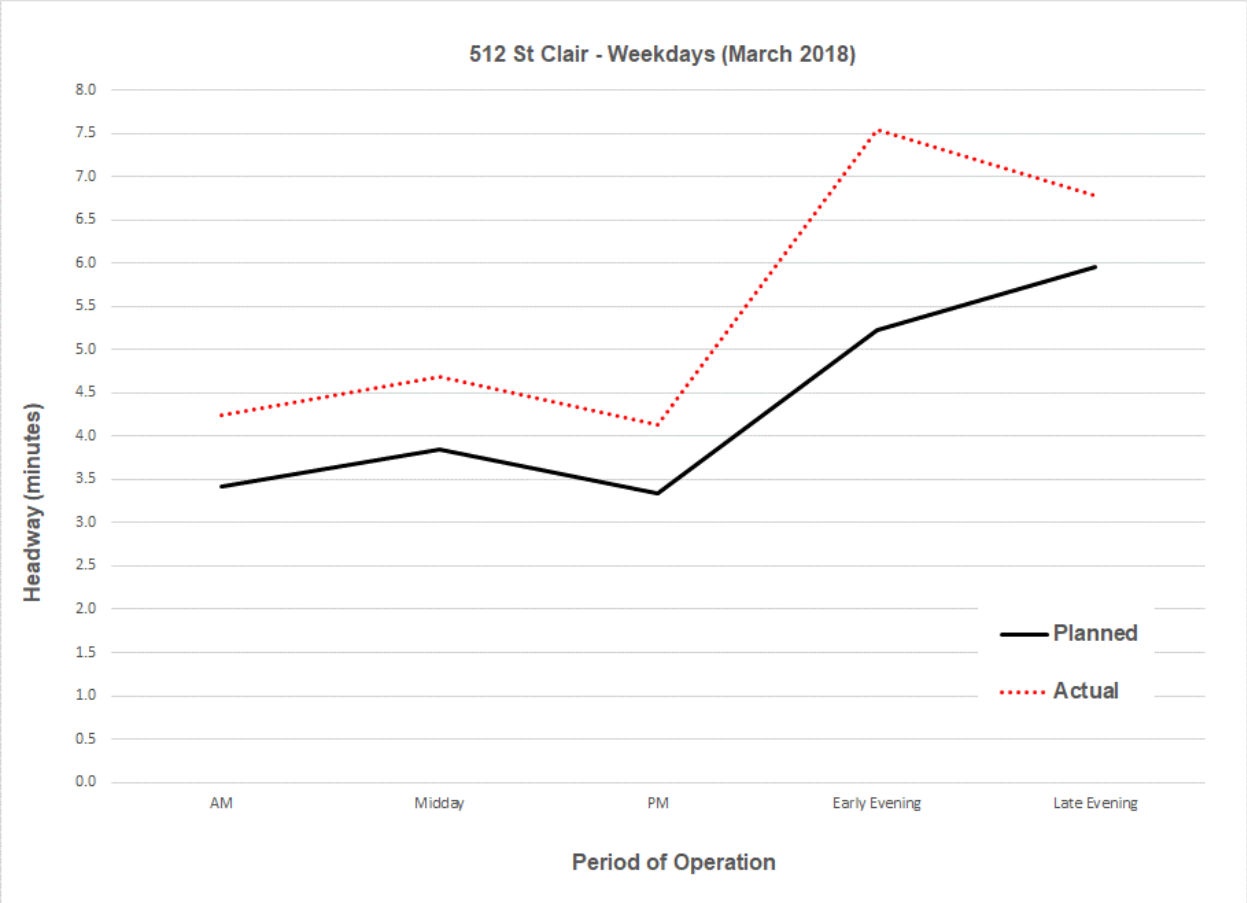
Table 1: Bus and streetcar service reliability metric (2016-2019)

Metric	Target	2016	2017	2018	2019 YTD*
Bus Services					
Short-turns	Decrease	38,539	25,916	25,059	8,894
On-time departures	90%	73.2%	75.6%	76.5%	74.2%
Streetcar Services					
Short-turns	Decrease	28,476	14,302	19,563	5,075
On-time departures	90%	47.8%	57.4%	56.8%	56.9%

* 2019 YTD performance affected by severe weather conditions.

Despite the reliability improvements to date, the vast majority of routes perform below target. There are more gains to be realized. When a route does not meet or exceed the reliability target it is not delivering the service to customers as planned or advertised. For example, **Figure 1** illustrates wider than planned headways on the 512 St Clair.

Figure 1: 512 St Clair – planned and actual headways (March 2018)



This variance is also reflected in planned and actual crowding levels as seen in **Table 2**.

Table 2: 512 St Clair – planned and actual crowding levels (March 2018)

Route	Morning Peak	Midday	Afternoon Peak	Early Evening	Late Evening
Planned	99%	119%	90%	108%	77%
Actual	105%	127%	96%	115%	82%

A new approach to preparing schedules to improve service reliability for customers will plan for actual operating conditions, some of which do not strictly meet TTC service standards.

The TTC is leveraging new technology and applying a new approach to preparing reliable schedules which includes setting cycle time at the 95th percentile of observed travel time along a route in a given period of operation. This is meant to ensure that operators have sufficient time to deliver service as planned and advertised during most of the operating period.

The TTC has tested this approach on 11 routes in 2019. The early results have been promising as seen in **Table 3** with improved schedules resulting in more on-time departures.

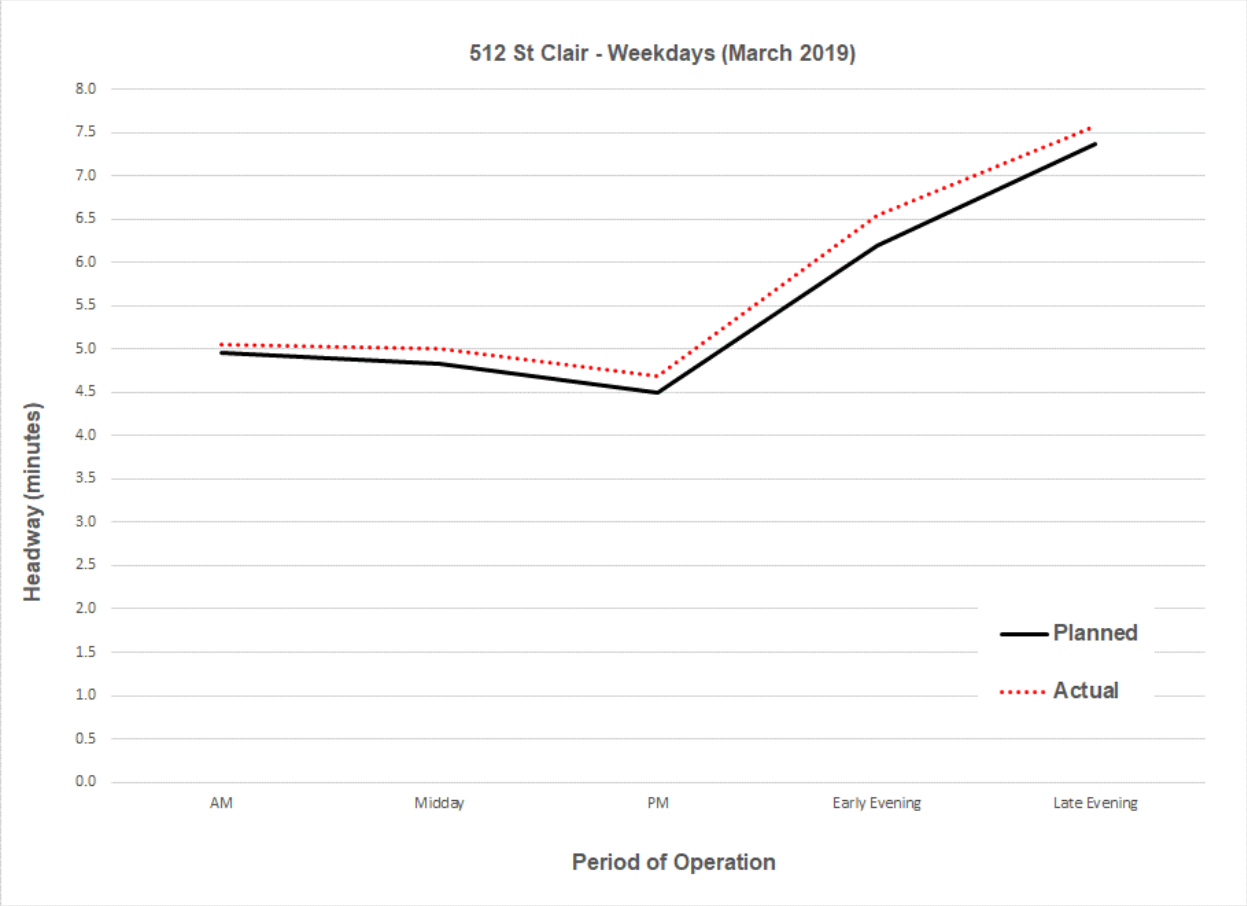
Table 3: Year-over-year improvements to on-time departures on 11 routes

Route	May 2018	May 2019	% Change
7 Bathurst	84.1%	90.4%	6.2%
9 Bellamy	75.3%	91.1%	15.8%
37 Islington	65.8%	86.7%	20.9%
66 Prince Edward	49.9%	76.0%	26.1%
72 Pape	71.4%	75.2%	3.8%
104 Faywood	81.0%	95.5%	14.5%
111 East Mall	91.7%	84.7%	(6.9%)
127 Davenport	67.0%	87.6%	20.7%
168 Symington	75.5%	92.9%	17.4%
512 St Clair	61.5%	91.8%	30.3%
937 Islington Express	-	79.4%	-
Total	70.0%	86.7%	16.7%

Performance on the 111 EAST MALL decreased due to layover issues. Challenges like these will be identified and resolved as the TTC goes through the process of matching schedules to operating conditions. Staff will be paying attention to the adequacy of cycle time, layover facilities and route management practices to ensure the initiative's success.

Figure 2 illustrates considerably less variance between planned and actual headways on the 512 ST CLAIR using the new approach.

Figure 2: 512 ST CLAIR – planned and actual headways (March 2019)



This is also reflected in the variance between planned and actual crowding levels as seen in **Table 4**.

Table 4: 512 St Clair – planned and actual crowding levels (March 2019)

Route	Morning Peak	Midday	Afternoon Peak	Early Evening	Late Evening
Planned	80%	82%	69%	78%	58%
Actual	81%	85%	72%	82%	59%

These gains have been realized by widening headways and/or adding resources. The TTC 2019 Operating Budget includes some funding to improve service reliability and capacity. It is not possible to bring all schedules that actually operate outside of the tolerances of service standards in line with them within existing funding. The new schedules will reflect actual operating conditions and will result in more reliable service for customers.

Implementation, monitoring and reporting

Further improvements to increase the reliability of surface transit schedules will begin this fall. The TTC will monitor and report on the performance of this initiative in the Chief Executive Officer's Report on a regular basis. The report will include updates on service reliability (e.g. short-turns and on-time departures), ridership impacts and customer responses and complaints.

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Signature

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