For Action

Improving LRT and Streetcar Speed and Reliability

Date: April 16, 2026
To: TTC Board
From: Chief Strategy and Customer Experience Officer

Recommendations

It is recommended that the TTC Board:

1. Direct staff to continue to:

    a. implement enhanced Transit Signal Priority strategies on Lines 5 and 6 and streetcar routes;

    b. review and implement operating rule changes related to Light Rail Transit and streetcar operating speeds;

    c. implement and expand Transit Signal Priority in the city to improve transit travel times; and

    d. perform a network-wide review of streetcar stop spacing informed by international benchmarks, service standards, and accessibility best practices.

2. Request that staff report back to the TTC Board in Q1 2027 with an update on LRT and streetcar speed and reliability initiatives.

Summary

As directed by the TTC Board through TTC11.8 and TTC11.9, staff are reporting back on ongoing initiatives to improve the speed and reliability of the TTC's streetcar and Light Rail Transit (LRT) networks. These initiatives are central to TTC's core mission of providing customers with reliable and efficient service, and supporting the 2026–2028 Ridership Growth Strategy.

To improve streetcar and LRT speed and reliability, TTC is advancing a suite of operational and infrastructure measures summarized in Figure 1. Compared to the initial opening, average afternoon peak round-trip travel time has improved by approximately 10 minutes on Line 5 and approximately 20 minutes on Line 6.

1. **Surface Transit Priority Measures Toolkit:** In partnership with Toronto Metropolitan University, a comprehensive framework is being developed to identify congestion and delay issues. This includes guiding a coordinated implementation of transit priority solutions, including curb regulations, transit lanes, turn restrictions, transit signal priority (TSP), and stop balancing.

2. **Streetcar Switch Modernization:** TTC continues to upgrade the current obsolete electrically controlled switches as part of an ongoing multi-year signaling modernization program with a focus on eliminating “stop-check-go” where feasible and safe to do so.

3. **Operating Rules Review:** A systematic review of speed-related operating rules is underway for streetcar and LRT.

4. **Transit Signal Priority Enhancements:** Recent TSP enhancements, including green extensions, red truncations, lagging left-turns, and phase rotation, have delivered travel time savings of up to 42% per intersection. In 2026, the TTC and the City project at least 70 new or updated installations, with long-term plans to expand TSP to over 800 intersections. Additional staffing and resources are expected to be modest and will be addressed through future capital and operating budget submissions, subject to board approval.

5. **Streetcar Stop Balancing:** A network-wide review of streetcar stop spacing is in progress, informed by international benchmarks and accessibility best practices. Recommendations will align with future updated Service Standards.

6. **Line Management Enhancements:** Interventions including dwell time reduction, improved line supervision, and terminal procedures, have reduced travel time and improved service reliability.

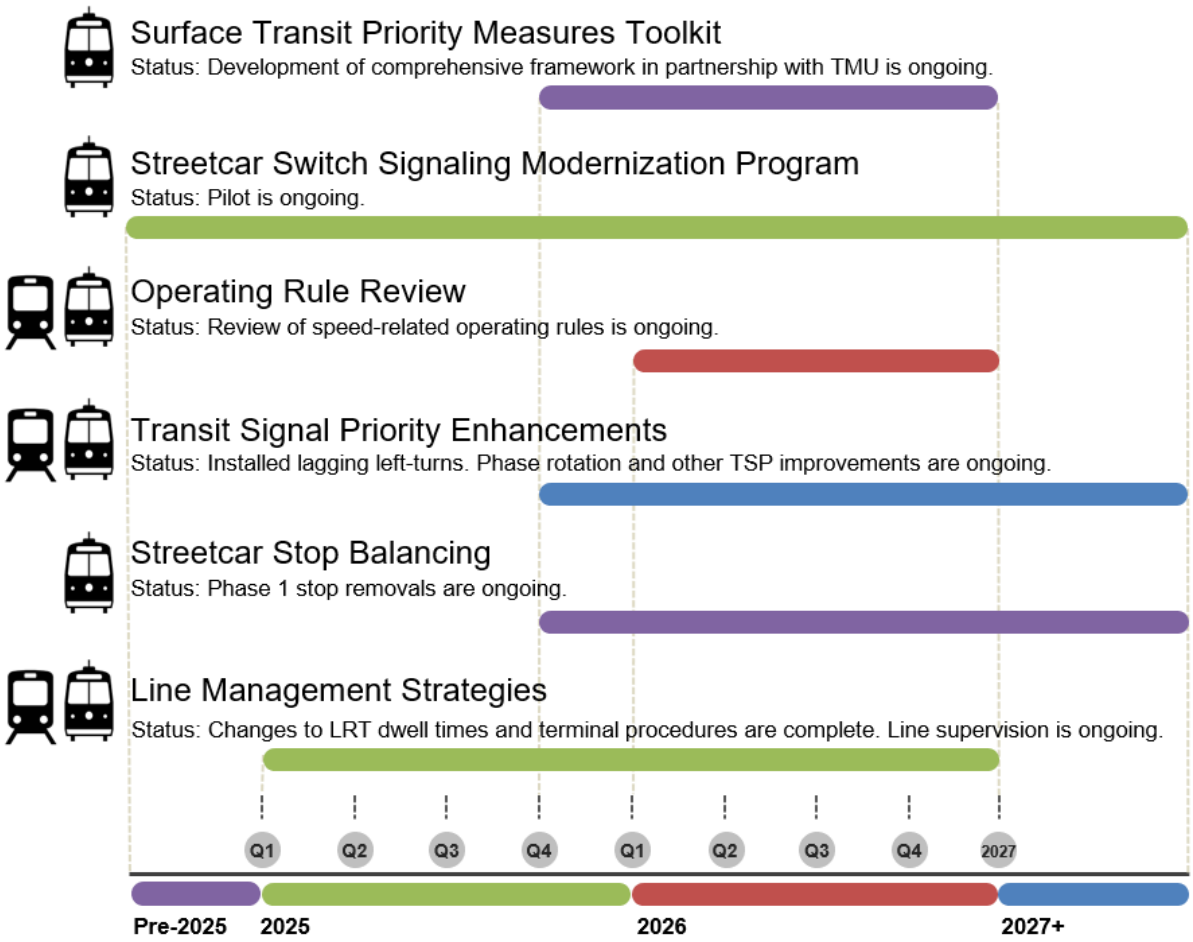

Figure 1: Current Timelines for Streetcar and LRT Initiatives

The TTC plans to report back on the progress of these initiatives in Q1 2027.

Background and Analysis

The TTC strives to continuously improve speed and reliability of its services for customers. The major initiatives that are underway include:

1. Surface Transit Priority Measures Toolkit

In partnership with Toronto Metropolitan University, a Surface Transit Priority Measures (TPM) Toolkit is being developed to baseline operating challenges, assess potential interventions, and examine industry best practices. The TPM Toolkit will form the basis of an action plan to improve bus and streetcar speed and reliability, bringing together different measures such as regulatory transit priority measures (curbside regulations, bus and streetcar priority lanes, and left-turn restrictions), TSP, queue jump lanes and transit stop balancing. It will highlight the processes for implementing these regulations in a Toronto context, considering locally focused challenges and opportunities.

Overall, the toolkit looks to formalize and document the available measures in the city, including many of those TTC has implemented in the past. Specifically for streetcar operations, some key measures include:

- *Curb restrictions:* Modernizing curbside restrictions (no stopping' / 'no parking') are a low-cost way to help streetcars as having parked vehicles in the curbside lane results in more general traffic occupying the same lane as the streetcar and increases weaving as traffic manoeuvres around parked vehicles or slows down to park
- *Left-turn restrictions:* Vehicles turning left from the shared streetcar lane can create significant delays for streetcar riders. Restricting left-turns can increase the throughput capacity of the shared streetcar lane as traffic does not come to a stop while a left-turning vehicle waits for a safe opportunity to turn.
- *Dedicated Streetcar Lanes and Priority Corridors:* Streetcar-only lanes provide unimpeded priority on corridors or lower the traffic volume in the lane. TTC continues to work with the City of Toronto to implement dedicated streetcar lanes and priority corridor projects through a variety of programs including RapidTO (which looks at whole corridors) and the queue jump lane program (which looks at short stretches of roadways).
- *Transit Signal Priority and Streetcar Stop Balancing:* Discussed further in Sections 4 and 5 respectively below.

As part of the TPM program moving forward, TTC is systematically reviewing the effectiveness of past measures (such as those on Dundas Street where travel times were reduced by as much as 20%) as well as developing a route-by-route plan for the streetcar network.

2. Streetcar Switches

TTC's streetcar network operates with a combination of electric and manual single-point switches. In response to TTC10.6 - Asset Management - International Association of Public Transport (UITP) Peer Review,, TTC continues to assess how to improve operations through switches, particularly eliminating "stop-check-go" which adds to customer journey time. Assessing the efficacy of changing streetcar turnouts to motorized double point switches, with locking detection and visual route indicators, is also part of this assessment.

To help eliminate "stop-check-go", TTC already has a signaling system modernization program underway. Prototyping is complete, and rollout will begin in yards, followed by mainline switches. The first phase includes outfitting all 264 low-floor light rail vehicles with onboard electronics, estimated to take up to two years, with full network retrofit expected to align with switch lifecycle timelines.

Speed increases through special trackwork (STW) are constrained by safety risks due to flange-riding configurations, non-dedicated ROW, and mixed traffic environments. A maximum speed of 10 km/h through STW is currently enforced to help prevent derailments, supported by historical incident analysis and engineering assessments.

3. Operating Rules Review

The TTC's streetcar network has operating rules to ensure safe operations, as outlined in the *Streetcar Rule Book*. Some of these operating rules restrict or impact streetcar speeds, including:

- 25 km/h speed limit entering signalized intersections and pedestrian crossovers.
- 10 km/h speed limit through special track work.
- 15 km/h when approaching a stationary streetcar on the opposite track.
- 25 km/h when operating through island platforms (e.g. St Clair and Spadina rights-of-way).
- 20 km/h when operating in underground stations.
- 20 km/h through pedestrian safety zones (e.g. Spadina Avenue near Sullivan Street).
- 15 km/h operating through troughs (i.e. under bridge structures).
- Only one streetcar at a time in an intersection with special track work.
- Stopping to ensure switches are set to the correct direction - "stop-check-go".
- Streetcar doors are permitted to re-open if the buttons are pressed.

The TTC is currently reviewing these operating rules and will ensure that customer safety is maintained while also removing unnecessary slowdowns. Similarly, LRT rules are outlined in the *ECLRT Rule Book* and *FWLRT Rule Book* – there is also a speed restriction of maximum 25 km/h limit entering intersections and through surface stop platforms on the LRT lines. For streetcar and LRT, this rule is currently being reevaluated – if operating speeds are changed for the LRT lines, Metrolinx will also have to support the changes by adjusting the speed profiles in their train signalling system for them to take effect.

4. Transit Signal Priority Enhancement

TSP has been installed on much of the streetcar network since the early 1990s. The TSP strategy that has typically been employed throughout the city includes:

- *Green Extensions and Red Truncations*: Dynamically changing the length of the traffic signal green times to provide longer greens or shorter reds for approaching transit vehicles. Most existing TSP installations use this strategy.

- *Phase Insertion*: Adding a special traffic signal phase for transit vehicles for transit vehicles to get a green light. This strategy has been implemented at some special locations across the City of Toronto.

- *Passive Transit Signal Priority*: Modifies the timing of traffic signals so that the progression of multiple traffic signals in a row would have green lights come up to favour public transit vehicles to create a "green wave". This strategy has been applied for the Line 3 Bus Replacement since 2023 and is also being implemented to complement other TSP strategies on Lines 5 and 6.

Figure 2 shows the current intersections with TSP in the city as of January 2026.

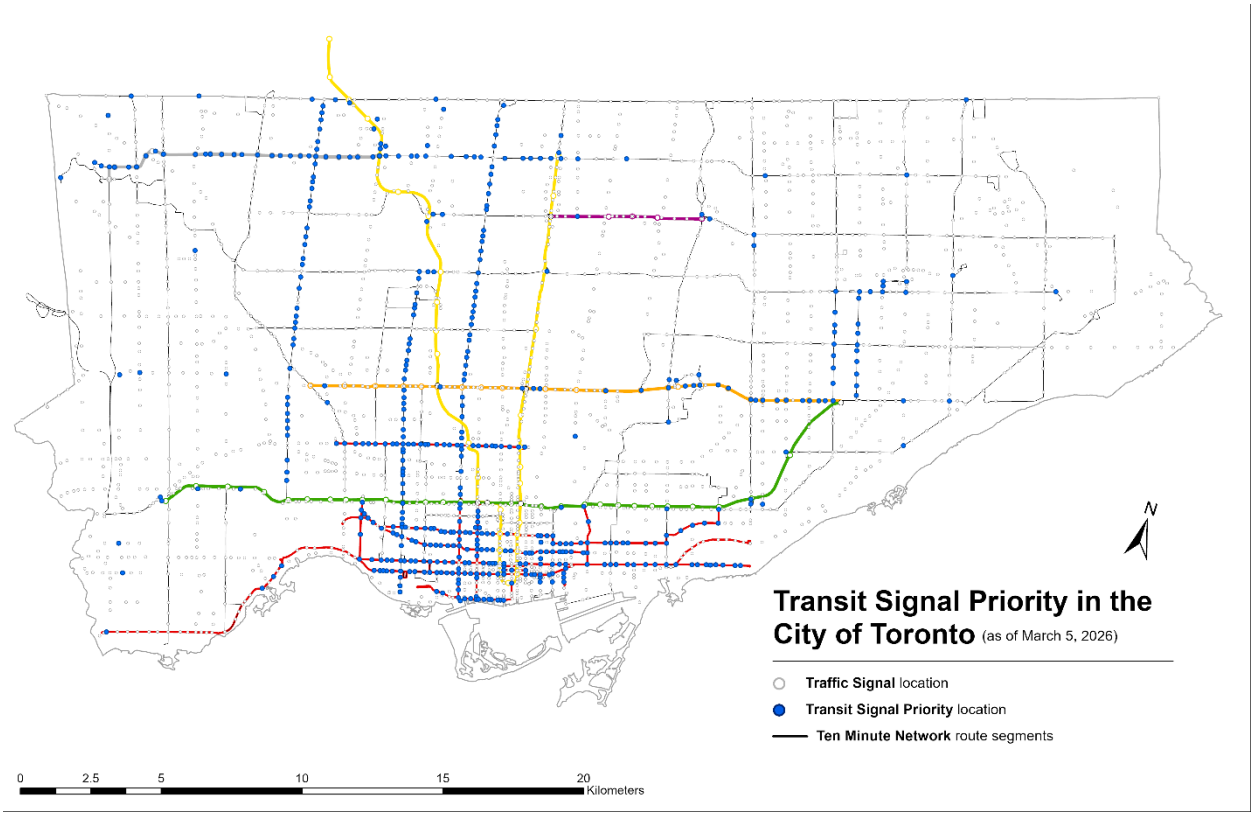

Figure 2: Transit Signal Priority Locations in the City of Toronto

For both Lines 5 and 6, the original TSP design delivered by Metrolinx involved only green extensions and red truncations. With the support of the TTC Board and Toronto City Council, City of Toronto staff and TTC are now also implementing:

1. *Lagging Left-turns:* Since February 2026, TTC and the City of Toronto began implementing lagging left-turns for Lines 5 and 6 with completion in March 2026. This changes the order of the traffic signal timing phases to have left-turns occur after the transit vehicle/through phase.

2. *Phase Rotation:* Dynamically changing the order of traffic signal timing phases to benefit approaching transit vehicles so they would face a green light sooner. These are typically implementable where there are advanced left-turns and right-turns that conflict with streetcar movements (i.e. dedicated streetcar rights-of-ways). This strategy was recently adopted by the City of Toronto in 2025 with implementations on Spadina Avenue at Dundas Street and College Street since February 2026

Since TSP implementations in February 2026 on Spadina Avenue at Dundas Street and at College Street, observed travel times reduced up to 30 seconds (42%) depending on the time of day. The lagging left-turn implementation on Spadina Avenue at King Street saw improvements of up to 10 seconds (9%).

Through the rest of 2026, TTC is working with the City of Toronto to fully implement phase rotation on Line 5, Line 6, 509 Harbourfront, 510 Spadina, and 512 St Clair. Installations will be prioritized to support operations ahead of FIFA World Cup (i.e. on 509 Harbourfront). All together, TTC and the City of Toronto are targeting enhancement

of 70 TSP locations in 2026. As operating rules are updated, TSP parameters for green extensions and red truncations, as well as for traffic signal progression (i.e. green waves), will need to be updated to improve system efficacy.

Additional Resources Required
In 2026, the City of Toronto brought on external consultant support to help accelerate and deliver TSP improvements for Lines 5 and 6. Both City of Toronto Transportation Services and TTC require additional staff resources to ensure that internal capacity is in-place to sustain and expand the TSP program in future years. With expanded resources, staff will have the required capacity to ramp up delivery beyond 2026, with the long-term objective of equipping over 800 signalized intersections on the top 20 busiest transit routes to support faster, more reliable transit service.

5. Streetcar Stop Balancing

The majority of TTC's streetcar routes have an average stop spacing ranging from 230 to 360 metres – over half are below the guideline from TTC's Service Standards of 300 to 400 metres.

The TTC compared the average stop spacing and speeds of streetcars routes in Toronto to international peers, as shown in Figure 3.

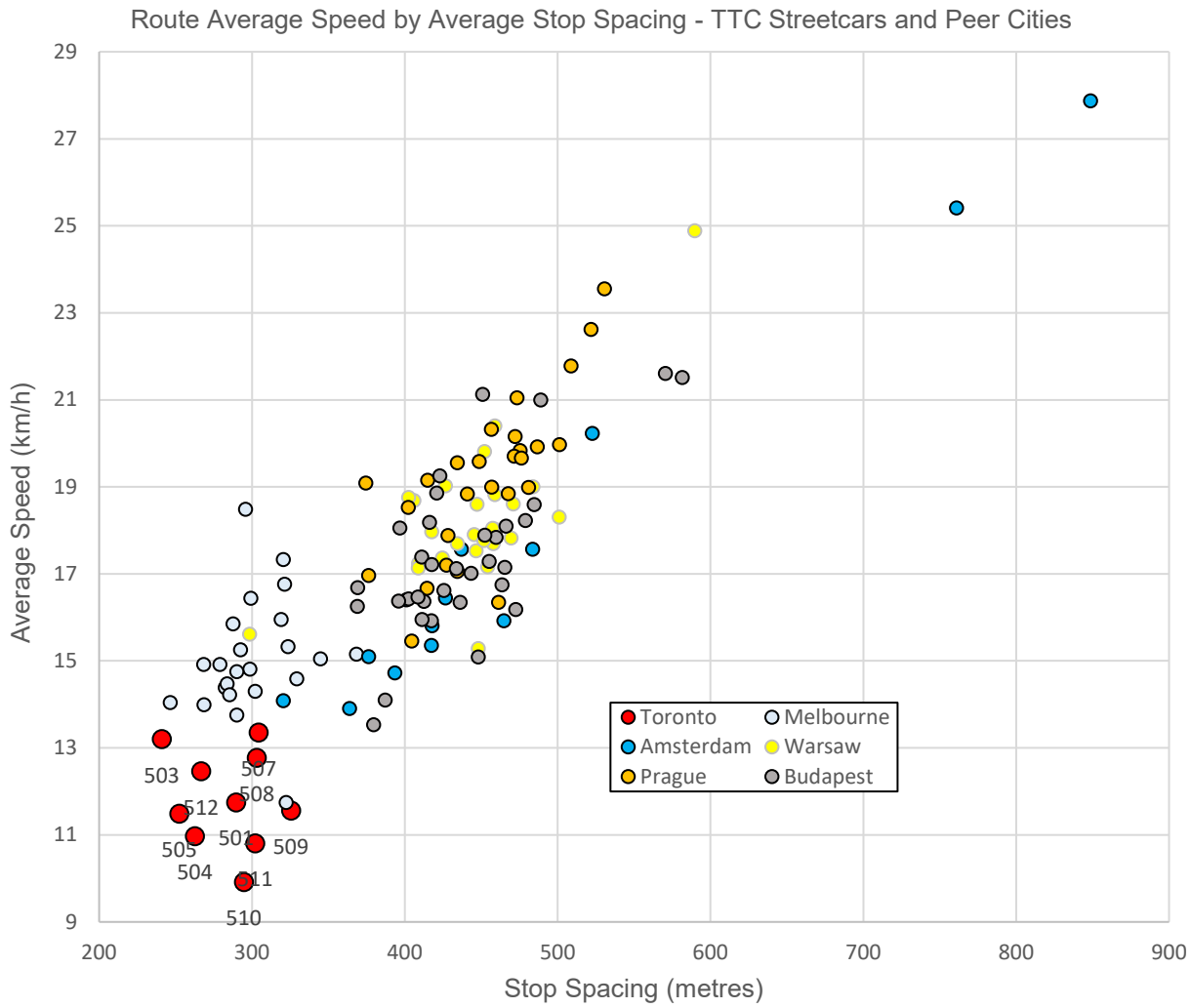

Figure 3: Route Average Speed by Average Stop Spacing - TTC Streetcar and Peer Cities

The early findings from a streetcar network study that TTC is working with Monash University on showed that Toronto streetcars are slower, even compared to agencies with similar stop spacing such as Melbourne. Other peers with more spaced-out stops (in the range of 400 to 600 metres) have average speeds that are 15% to 50% faster than TTC routes.

To address these speed and reliability issues, the TTC is undertaking a systematic review of stop spacing, on a route-by-route level, which will form a part of other curbside and left-turn regulatory changes proposed through the TPM Toolkit work as a comprehensive plan to revitalize streetcar service. This stop review will balance accessibility needs with international best practices and our existing service standards.

6. Line Management Enhancements

Streetcar – Bunching and Gapping Project
The Bunching and Gapping project aims to improve service performance and is centred on bunching (vehicles too close together) and gapping (vehicles too far apart) that disrupt service regularity, reduce capacity, and lower customer satisfaction. As part of the project, a collection of bus and streetcar routes were initially selected to be focused

on – for streetcars, the 506 Carlton and 512 St Clair were included, with the pilot being expanded to all streetcar routes in March 2026.

The factors that contribute to bunching and gapping vary, including operator behaviour, customer incidents, traffic congestion, city events, construction, and operational factors, such as door and ramp operations.

The bunching and gapping project focuses on providing increased route supervision, operator management, and enhanced coordination with partners from the City of Toronto. Under this model, one Transit Control Route Supervisor was assigned to each route, thereby ensuring that service could be proactively managed and providing operational lessons learned to inform future system-wide reliability improvements.

The TTC is also partnering with York University to develop and deploy an AI-enabled tool that provides real-time monitoring, predictive analytics, and actionable recommendations to reduce vehicle bunching and service gaps. The initial release integrates real-time data, schedule information, and crowding metrics, with future enhancements expected to incorporate additional data sources. The tool began being piloted in December 2025 and is continuing to be evaluated for improvements to headway reliability.

LRT Operations
Since opening of both Lines 5 and 6, TTC has continued to observe and improve line management strategies. These initiatives are outlined below:

- Minimizing dwell times at stops;
- Continuing proactive communication with supervisors and Transit Control staff to focus on ensuring line on time performance;
- Deploying additional staff to assist with newer operators on the lines;
- Providing additional targeted operator training; and
- Adding extra operators to provide “step backs” (i.e. adding additional operators who are ready to operate the LRT at the ends of line) to ensure that late trips do not impact subsequent trips.

These initiatives have improved the average round-trip travel times as shown in Figure 4 and Figure 5. Compared to initial opening, Line 5 has improved by about 10 minutes and Line 6 has improved about 20 minutes.

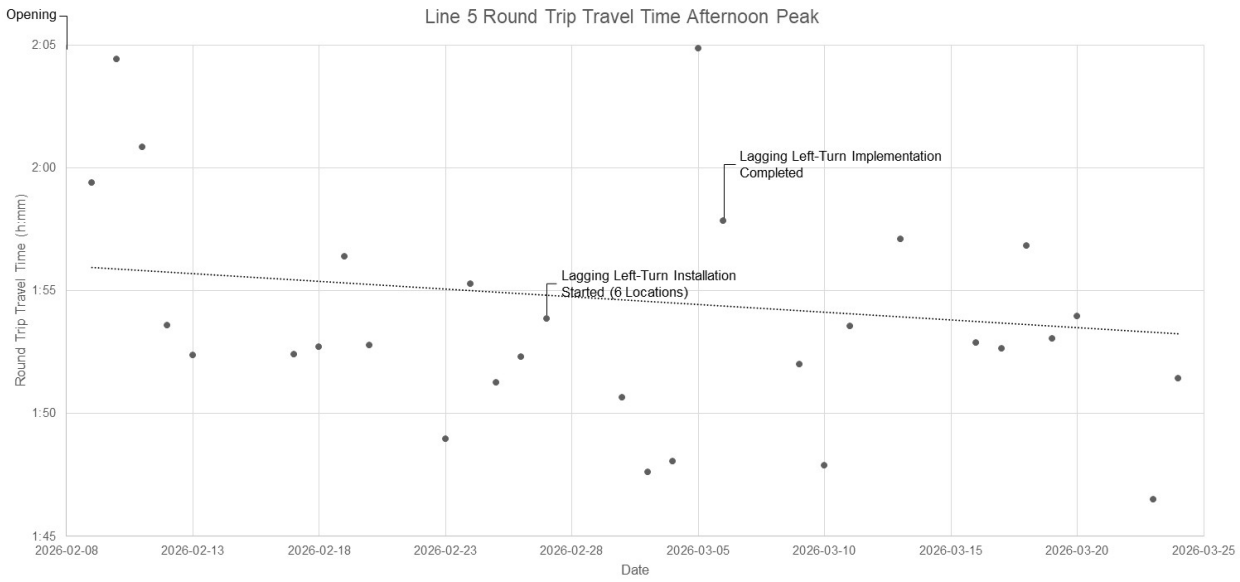

Figure 4: Line 5 Average Round Trip Travel Time (Afternoon Peak Weekdays)

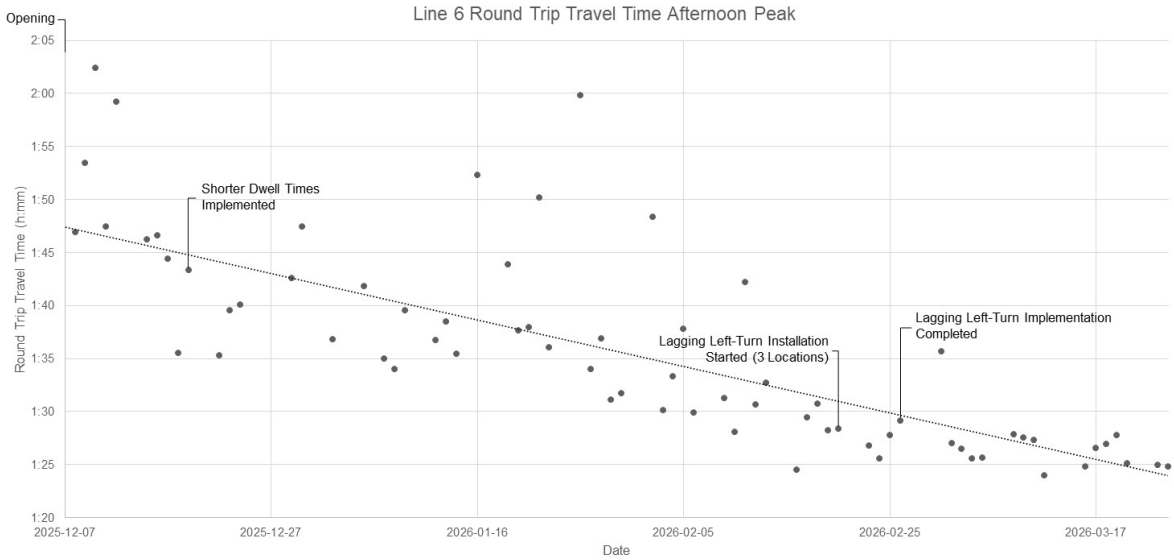

Figure 5: Line 6 Average Round Trip Travel Time (Afternoon Peak Weekdays)

LRT Service Frequency

On Line 5 and Line 6, service frequencies are determined by the parameters set in each of the respective Operating Agreements that outline operating hours, periods of service, the number of vehicles to be operated per period, the respective running time total per period, and the objective headway. This is different than the rest of the TTC network which is guided by the Service Standards.

As the LRT lines graduate from “soft launch” conditions, additional periods of service and levels of service will be added. Any further changes will be implemented in accordance with the processes specified within the Operating Agreements.

Diversity, Equity and Inclusion Matters

The speed and reliability of TTC's surface transit network plays a critical role in advancing the TTC's equity and accessibility objects. Improving travel times and reliability across the transit network provides benefits to all Toronto residents but is particularly important for groups with a higher reliance on transit, such as people with low income, women, shift workers, and equity-seeking groups. This is seen in how mode choice differs among people with different characteristics, such as income; Toronto households with an income of below $60,000 per year report relying on transit for 25% of their trips, compared to a city-wide average of 18% of trips being made on transit[1].

Taking transit is not a choice for some groups in Toronto, meaning that improvements to service can meaningfully improve the ease and speed that they are able to travel around the city. For example, access to a vehicle differs significantly by income; 47% of Toronto households with an income below $60,000 per year do not own a vehicle, compared to 21% of Toronto households with an income above $60,000[2]. Gender can also impact reliance on transit; 28% of women eligible for a driver's license in Toronto do not have one, compared to 16% of men[3].

Improving the speed of transit reduces travel times, increasing connectivity between homes, work, school, health services, cultural services, and other destinations. It increases the number of job opportunities that can be accessed within the same travel time, which can increase economic mobility for all residents, but is particularly impactful on those reliant on transit as their main method of transportation.

Improving the reliability of transit results in predictable service with consistent travel times, reducing the amount of variability in trip times for transit riders. This reduces the risk of being late for work or appointments and helps reduce the occurrence of riders turning to costly alternatives like ride-hail services due to the unpredictability of transit travel times. Improving the reliability of the surface network also strengthens the Wheel-Trans Family of Services model by making the conventional network a more reliable part of door-to-door journeys for customers using accessible services.

Improving transit speed and reliability may also support higher levels of economic activity in communities that experienced significant economic challenges during the construction of LRT lines. Enhancements to transit service in those communities help to build public trust and confidence in the TTC's streetcar and LRT networks.

This report outlines initiatives to improve the speed and reliability of the TTC's streetcar and LRT networks, which are key elements of the surface transit network. Of the 33 Neighbourhood Improvement areas (NIAs) in the City of Toronto, 18 are served by at least one streetcar or LRT route. Improving the transit speed and reliability of these routes will improve the NIAs connectivity to the rest of the city and increase access to economic opportunities, one of the key domains of NIA designation.

[1] Transportation Tomorrow Survey, 2023 – Income range of household, primary travel mode of trip.
[2] Transportation Tomorrow Survey, 2023 – Income range of household, number of vehicles in household.
[3] Transportation Tomorrow Survey, 2023 – Gender of person, possession of drivers license.

Innovation and Sustainability Considerations

Both LRT and Streetcar modes are zero-emission vehicles that promote sustainability in the City of Toronto. Further improving the speed and reliability of these modes will further improve their sustainability by consuming less energy, while also increasing the competitiveness of public transit over private automobiles further improving sustainability and moving the City of Toronto's TransformTO 2040 Net Zero Strategy.

In addition, the technologies being applied to improve streetcar and LRT operations, specifically in TSP leverage new technologies and strategies.

Corporate Plan Alignment

The initiatives in this report advances transit service in Toronto to be more effective for customers and strengthens the TTC's role in shaping Toronto's mobility landscape by advancing the 2024-2028 Corporate Plan. They advance Strategic Direction 2: Attract New Riders, Retain Customer Loyalty, especially the actions in 2.3 Focus on the Basics of Service Reliability, Predictability and Speed; and the broad goals in Strategic Direction 3: Place Transit at the Centre of Toronto's Future Mobility.

Financial Impact

The initiatives discussed in this report are funded by a combination of TTC's capital and operating budgets, as approved by the TTC Board at its meeting on January 7, 2026, and by City Council at its meeting on February 10, 2026.

With regards to TSP, funding is approved through the Transit Priority Measures project in the 2026-2035 Capital Budget and Plan and has $48.8 million allocated over the 10-year program as shown in Table 1 below.

Table 1 – Transit Priority Measures 2026-2035 Capital Budget and Plan

Project (000's)	2026 Budget	2027	2028	2029	2030	2031 - 2035	10-Year Total
Transit Priority Measures	10,307	6,876	7,898	5,180	3,350	15,226	48,837

In addition to TSP, the Transit Priority Measures capital program also delivers the queue jump lanes program, priority corridor upgrade program, and regulatory transit priority measures program.

Any future implementation costs will be considered through the annual budget process, ensuring that incremental funding requests support the achievement of the priority actions identified.

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

Contact

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Attachments

Attachment 1 – Decision History

The following are several directions and reports by TTC Board and various City of Toronto Councils and Committees:

2025.TTC.10.6: Asset Management - International Association of Public Transport (UITP) Peer Review - Management Response
As part of the previous International Association of Public Transport (UITP) report, there were two key recommendations that were related to Streetcar Speed and Reliability. These were responded to by TTC management. The recommendations and responses were:

1. **Streetcar Switches:** the UITP recommended that key switches on the Streetcar network be converted to motorized two-switch operations that are activated by the destination or route transmitted from the vehicle. As part of the TTC management's response, it was noted that TTC will assess the effectiveness and feasibility of upgrading streetcar turnouts to motorized two-switch operations with locking detection and visual route indicators, activated by vehicle-transmitted routing data.
2. **Operational Speeds of Streetcars**: UITP recommended a review of streetcar operations through intersections as well as a streetcar priority scheme to help improve speed and reliability. As part of the TTC management's response, TTC committed to investigate the feasibility and sustainability of these initiatives including a review of TTC's operating rules.

2025.TTC.11.8: An Urgent Need to Speed Up New LRT Routes
The TTC Board directed the TTC to look at improvements for the new Light Rail Transit (LRT) Lines 5 and 6 including transit signal priority, service frequency, and line management. They also directed TTC to review existing TTC and City of Toronto policies that govern speed restrictions for LRTs.

2025.TTC.11.9: Further Recommendations to Speed Up Streetcars
As part of this motion, the TTC Board directed the TTC to look at improvements for streetcar operations, including removal of on-street parking, left-turn restrictions, and line management. They also directed TTC to review existing TTC and City of Toronto policies that govern speed restrictions for streetcars.

2025.TE.27.51 – Transit Priority Measures to Support the 505 Dundas 6-Minute Network
Toronto East York Community Council and City Council adopted transit priority measures to support the new 6-minute service on the 505 Dundas streetcar. These measures included a collection of curbside restrictions during the peak hours and turn restrictions at critical parts of the day to support streetcar operations.

2025.IE.25.12: Speeding up the Spadina Streetcar
The Infrastructure and Environment Committee and City Council requested that Transportation Services look at the feasibility of adjusting signal timings to allow the 510 Spadina streetcar to proceed through intersections before left-turning vehicles.

2025.MM.35.15: Speeding Up Light Rail Transit and Streetcars

City Council adopted this motion to request that Transportation Services staff, in collaboration with the TTC, provide a progress update of the different motions related to speeding up LRTs and streetcars.