

Customer Key Performance Metrics, Trip Planning, and Real-Time Information Internal Audit Report

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Background:

Internal Audit reviewed the TTC's customer-facing service and performance information, focusing on two distinct and complementary areas: performance data and real-time service disruption notices arising from unplanned events. While both contribute to transparency and customer confidence, they serve different audiences, operate on different timelines, and support different decision-making needs.

The audit was conducted from July to December 2025 and included a customer survey (total survey respondents: 1,009) designed to gather feedback and sentiment directly from riders. Survey insights informed the audit's focus and helped distinguish between the types of information customers value for accountability versus those they rely on to manage trips in progress or during disruptions.

By identifying gaps between reported performance and actual customer experience, as well as discrepancies between service-disruption data and what customers encounter, this audit provides the TTC with actionable insights to strengthen transparency, enhance data quality, and improve the reliability of customer-facing tools. These improvements will support the TTC's strategic goals of improving customer satisfaction, attracting new riders, and retaining customer loyalty, and align with best practices in the transit industry.

Real-Time Service Disruption Information

Real-time service disruption information is time-sensitive and triggered by unplanned operational events. It is intended primarily for customers who are planning or undertaking trips, particularly when normal service is disrupted. When this information is accurate, timely, and actionable, it enables customers to respond effectively by adjusting routes, considering alternatives, and making informed travel decisions in real time.

This audit examined whether the TTC's disruption notices, trip planning data, and open data feeds accurately reflect real-time service conditions across the TTC-owned channels and third-party applications. When real-time information is incomplete, delayed, or inconsistent, customers may encounter service conditions that differ from what is communicated, leading to frustration, poor decision-making, and reduced confidence in the TTC's information systems.

It is critical to develop integrated real-time data ecosystems, where disruption notices, vehicle arrival predictions, and accessibility impacts are shared consistently across digital channels and open data platforms. Customers expect disruption information to be precise, location-specific, and dynamically updated throughout their journey. Aligning

the TTC’s real-time data infrastructure, disruption processes, and open data feeds with these expectations is essential to meeting evolving customer needs and supporting reliable trip planning.

Performance Data

Performance data, such as the key performance indicators (KPIs) published in the CEO’s Report, demonstrates organizational performance, supports accountability to the TTC Board and the public, and provides context on service reliability over time. Accurate and relevant performance reporting is essential for maintaining public trust, supporting oversight, and demonstrating progress against strategic objectives. This audit assessed whether the TTC’s publicly reported performance metrics meaningfully reflect the service conditions experienced by riders. Where KPIs do not capture customer-relevant outcomes, they risk limiting transparency and weakening the connection between reported results and lived experience.

Industry trends indicate a shift toward more customer-centric performance reporting, supported by interactive dashboards that allow users to explore performance by route and time of day. The TTC’s 2024-2028 Corporate Plan emphasizes similar priorities, including improved customer experience, service reliability, and accountability through enhanced performance measurement. Recent initiatives, such as the revised, mode-specific CEO’s Report and the development of a Customer Experience Dashboard, reflect progress in this area. However, alignment between reported performance and customer experience remains an area for improvement.

Scope:

The audit reviewed the key processes and systems associated with the customer focused KPIs and trip planning data, including procedures, KPI reporting and benchmarking, and customer journey data.

Number of Observations and Ratings:

| High | Medium | Low |
|------|--------|-----|
| 2 | 8 | 0 |

Summary of Results: Improvement Needed.

Overall Key ARC Observations/Recommendations:

1. Customer Trip Planning and Real-Time Information

ARC observed that the TTC has foundational real-time disruption data infrastructure in place, including General Transit Feed Specification Real Time (GTFS-RT) – a global standard used by transit agencies to share live service alerts to third-party applications, the TTC’s website advisory notices, TV screen disruption alerts, and other internal channels. However, real-time information still varies in completeness, accuracy, and consistency across these channels and third-party apps. These gaps reduce customers’ ability to make reliable and informed travel decisions during disruptions.

ARC recommends further strengthening the TTC’s real-time data ecosystem by improving alert structure and dissemination, enhancing prediction accuracy, resolving integration barriers, and ensuring consistent trip-planning information across digital platforms.

2. KPI Reporting

ARC noted that the TTC has taken positive steps, such as updating the CEO’s KPI Report (September 2025) and commencing Customer Experience Dashboard initiatives. However, the current CEO’s KPI Report still does not fully reflect rider experience. While the CEO’s KPI Report is designed primarily to support the TTC Board oversight and governance, further adjustments are needed to ensure the metrics and presentation are also meaningful to customers. Metrics used in KPI reporting are largely internal operational measures and are presented in aggregated form, making it difficult for customers to understand how day-to-day service performance aligns with their journeys.

ARC recommends expanding customer-centric metrics and strengthening alignment with the TTC’s service standards and peer-agency practices to improve transparency, accountability, and relevance to riders.

Management Action Plans:

Management acknowledges the findings and agrees that improvements are required to enhance customer-facing transparency and information reliability.

For trip-planning and real-time information, Management will continue strengthening open data quality, modernizing real-time prediction capabilities, improving alert logic and structured data, and enhancing digital customer touchpoints. These initiatives aim to improve data accuracy, consistency, and usefulness, helping riders make better decisions and reinforcing customer trust in the TTC’s communications.

For KPI reporting, Management will continue advancing the Customer Experience Dashboard and further refine KPI measures to incorporate journey-focused, customer-centric metrics aligned with internal metrics and peer-agency best practices.

High- (H) and Medium- (M) rated observations and implications, recommendations, and management actions are detailed as follows:

Observation #1 – Inconsistencies in the TTC’s Open Data Feeds Affect Third-Party Apps (H)

Observations and Implications:

- Survey results indicate that third-party trip planning tools are critical for riders, with more than half of respondents (52%) using Google Maps, followed by Transit App (33%).
- The absence of key information in the GTFS-RT feed leads to missed opportunities to provide timely and accurate alerts for improving customer decision-making and confidence. The audit revealed the following exclusions in the GTFS-RT data feed:
 - Real-Time Subway Location and Arrival Predications: Real-time subway location and arrival predictions are not in GTFS-RT; third-party apps default to scheduled times, reducing accuracy and transparency especially during disruptions.
 - Future Planned Diversions: Intentionally excluded from GTFS-RT to reduce clutter, limiting advance planning for riders.
 - Line 6 Integration: Real-time Line 6 vehicle location and arrival prediction data is owned by a Metrolinx vendor and access is limited due to firewall/security constraints, preventing the TTC from publishing via GTFS-RT. Third-party apps default to scheduled times, reducing accuracy and transparency especially during disruptions.
 - Custom/Unstructured Alerts: Use of custom alerts that omit critical structured fields (route, stops, disruption type) prevents complete propagation into GTFS-RT, creating fragmented customer experiences across the TTC and third-party channels. This presents a relatively low risk, as most disruption notices are adequately captured as structured alerts in GTFS-RT and custom alerts are infrequently used.

Recommendations:

- Integrate subway locations and arrival predictions into GTFS-RT.
- Include future planned service alerts in GTFS-RT with proper date tagging to control clutter.
- Resolve firewall/security issues with Metrolinx to obtain and publish Line 6 real-time data.
- When applicable, provide ongoing support to Transit Control by updating systems to reflect emerging business requirements with the goal of reducing custom alerts.
- Conduct a customer digital touchpoint analysis (catalogue channels, usage, ownership/costs, maintain/retire/add decisions) and align open data strategy and back-end capabilities with the desired customer experience.

Management Action Plans:

- ITS:
 - Assess technical feasibility for incorporating subway location and arrival predictions into GTFS-RT feed.
 - Update GTFS-RT feed to include future planned diversions/closures.
 - Resolve current technical barriers that prevent Line 6 real-time next vehicle data integration to enable the TTC to publish this data through its GTFS-RT.
 - Target Completion: Q4 2026.
- Marketing and Customer Experience:
 - Conduct customer experience digital touchpoint analysis (catalogue channels, assess usage/reliability, determine ownership/cost/strategic value and identify maintain/retire/add channels).
 - Target Completion: Q2 2026.

Observation #2 – Manual Detour Management and Unstructured Alerts Delay Accurate Disruption Communication (H)

Observations and Implications:

- Survey results show that the TTC's customers rely heavily on trip-planning applications, with 59% identifying alternative routes as one of the most valuable types of service alerts. Third-party applications rely on the TTC to update its GTFS feeds so detours appear accurately in their mapping tools. However, due to operational pressures and system constraints, detours are not consistently created, limiting these applications' ability to provide customers with reliable alternative routes and updated arrival times.
- Automated detour detection provided by an external contractor mitigates the gap, however, the contract expiration creates a continuity risk for accurate real-time detour data.

Recommendations:

- Resolve technical/usability issues in the detour creation tool and strengthen training and SOP compliance.
- Develop structured geospatial detour formats for GTFS-RT.
- Assess and mitigate continuity risk associated with the expiring contract providing automated detour detection capabilities.

Management Action Plans:

- ITS:
 - Resolve technical issues that currently hinder the effective use of the detour creation functionality.
 - Evaluate opportunities to expedite or automate detour creation.
 - Develop an in-house detour-detection solution that updates GTFS-RT.
 - Target Completion: Q2 2027.

Observation #3 – Enhance External Developer Collaboration to Support Accurate Trip-Planning Tools (M)

Observations and Implications:

- Updating the GTFS feed without a formal developer engagement strategy can result in inconsistent adoption of enhancements (e.g. new advisory types, feed changes) and underutilization of high-value data, such as APC crowding.

Recommendations:

- Formalize developer engagement (prioritize high-usage apps, establish communication and feedback channels, etc.) to drive consistent integration and feature adoption.

Management Action Plans:

- ITS has formalized the developer engagement strategy, established direct communications with major app providers, and introduced structured feedback/version control processes with priority collaboration for high-usage apps.
- Target Completion: Completed.

Observation #4 – Vehicle Arrival Time Predictions Across Modes can be Inconsistent and Inaccurate (M)

Observations and Implications:

- Survey results indicate that 50% of riders reported inaccurate in-trip information, with vehicle arrival times cited most frequently (36%).
- 42% of survey respondents ranked construction and traffic alerts among the most helpful service updates, yet these conditions are not reflected in the arrival time predictions for bus, streetcar and subway.
- Subway predictions rely on an internal algorithm that estimates arrival based on train distance and speed. However, the speed data comes from historical averages that have not been updated for more than a decade. The algorithm assumes trains travel at a constant speed between stations, overlooks slow zones and temporary restrictions, and does not leverage Automatic Train Control (ATC) data.
- Bus and streetcar arrival predictions are generated using two different algorithms, which leads to inconsistent arrival estimates across the network and creates confusion for customers. Management is working to synchronize these prediction sources, but achieving full synchronization may not be feasible in the near term due to the significant capital investment required according to Management. Both algorithms are limited when trip updates (such as added, cancelled, or detoured trips) are not accurately configured. Predictions shown on the TTC's TV screens and third-party apps are generally more reliable than predictions on LED screens because they incorporate additional service information.
- Line 6 is in the TTC's static GTFS feed that includes updated Line 6 stops and schedules, however, real-time data is still missing from the GTFS-RT. As a result, third-party applications, such as Transit App and Google Maps, can only display scheduled times, which leads to discrepancies between LED screens (which show real-time predictions) and app-based trip planning arrival estimates.

Recommendations:

- Modernize prediction models using real-time operational inputs (e.g. ATC, live slow-zone speeds).
- Explore opportunities to integrate traffic data sources (e.g. Waze/Google).
- Standardize surface prediction algorithm sources across the TTC's screens and third-party platforms.
- Refresh subway speed tables and implement dynamic adjustments.

Management Action Plans:

- ITS:
 - For subways:
 - Explore incorporating real-time operational data, such as speed estimates, slow zone speeds, and disruption impacts in improving arrival predictions.
 - Assess technical feasibility for incorporating subway locations and arrival estimates into the GTFS-RT feed.
 - For surface vehicles:
 - Assess the precision of arrival predictions using the accuracy tool available.
 - Assess the feasibility of integrating external traffic condition data in the arrival time estimates for surface routes.
- Target Completion: Q4 2026.

Observation #5 – Disruption Alerts Are Inconsistently Displayed on the TTC's TV Screens (M)

Observations and Implications:

- Disruption alerts displayed on the TTC's screens have a pre-defined alert dissemination logic that dictates where alerts are displayed.
- The current logic can potentially omit alerts from certain screens, creating gaps in customer awareness and leaving riders without the information they need to make informed travel decisions.
- This alert logic was originally intended to strike a balance between relevance and simplicity by showing only disruptions likely to affect a rider's journey, avoiding overwhelming customers with every active alert. Given the high volume of surface route disruptions, it is best practice and Management's objective not to show everything on every screen, but to present the most decision-relevant alerts at each location.
- Customers may experience a false sense of normal service since TV screens can display no service advisories, despite active disruptions being posted on the TTC website. TV screen messaging, such as "No service disruptions at this time" or "There are currently no disruptions on the network" can mislead customers.
- LED screens at Line 6 stations currently display subway closures and accessibility alerts, but exclude disruptions affecting connecting bus routes. The absence of connecting route information can lead to missed connections and poor trip planning.

Recommendations:

- Review and update alert logic to ensure connecting-route visibility at transfer stations.
- Add a disclaimer/indicator that screens may not represent a complete summary of all service disruptions.
- Consider a dedicated “all advisories” screen.
- Update Line 6 LED logic to include connecting bus alerts.

Management Action Plans:

- Marketing and Customer Experience:
 - Review alert logic/data feed design.
 - Develop guiding principles that identify the key information customers require at critical decision points, ensuring this is balanced with enhanced trip-planning insights to support timely and informed journey choices.
- Target Completion: Q1 2027.

Observation #6 – Accessibility Alerts Lack Clarity on Station Impact, Hindering Trip Planning for Riders with Disabilities (M)

Observations and Implications:

- 40% of survey respondents reported it is not easy to find accessibility information.
- Current notices list individual equipment outages rather than station-level accessibility, forcing riders to infer whether they can enter/exit/transfer.
- GTFS-RT does not treat escalators, elevators, stairs, exits, and entrances as transfer points, limiting automated re-routing for riders who require accessibility support in third-party applications.
- As a result, riders unfamiliar with station layouts may be left uncertain about whether they can complete their trip.

Recommendations:

- Accessibility alerts should shift to station-level accessibility statements (customer-impact language) supported by structured data that links equipment status to station accessibility and update GTFS feeds accordingly.

Management Action Plans:

- ITS:
 - Develop GTFS-Pathways (elevators, escalators, entrances) enabling within-station guidance and accessibility-aware routing in third-party applications.
 - Target Completion: Q3 2026.
- Marketing and Customer Service:
 - Consolidate accessibility information into a mobile-friendly, real-time map showing information about services at each location.
 - Target Completion: Q2 2026.

Observation #7 – Fragmented and Incomplete Service Advisory Communication Across the TTC-Owned Channels (M)

Observations and Implications:

- Service advisories are distributed across nine website pages on the TTC website. This decentralized structure makes it difficult for customers to quickly access all relevant information in one place.
- The TTC's internal trip-planning tool only displays scheduled service and excludes disruption advisories.
- The TTC's X (Twitter) account, @TTCnotices, omits some planned disruptions.
- The lack of a unified view increases the risk of missed information and undermines confidence in the TTC's communications during disruptions.

Recommendations:

- Consolidate advisory pages into a unified portal with intuitive navigation and complete, real-time disruption coverage.

Management Action Plans:

- Marketing and Customer Experience:
 - A mobile-friendly map (noted above) is nearing completion. It will show real-time information about services at each location and slow zones along routes.
 - A full website channel review has gone to Request for Proposal (RFP) and proposals are under review.
 - Target Completion: Q3 2027.

Observation #8 – KPI Report Needs More Customer-Centric Metrics to Reflect Rider Experience (M)

Observations and Implications:

- The CEO's KPI Report originated with a primary focus on internal executive oversight between the TTC Board, CEO and TTC Executives. Existing KPIs in this report may not be reflective of customer experience.
- Other transit organizations, such as MTA New York, MBTA Boston, Transport for London, Hong Kong MTR, Metrolinx, SFMTA San Francisco, and CTA Chicago, report customer-facing metrics in their public dashboards that go beyond traditional operational indicators.
- Management has initiated the development of a new Customer Experience Dashboard, and the September 2025 CEO's Report introduced revised metrics aimed at improving alignment with customer expectations and service performance.

Recommendations:

- Expand public KPIs to include customer-centric metrics and consider the use of common customer metrics used by other transit organizations.
- Develop the Customer Experience Dashboard.

Management Action Plans:

- Develop a Customer Experience Dashboard that includes metrics more reflective of rider experience.
- Target Completion: Q1 2027

Observation #9 – Aggregated KPI Reporting Masks Peak-Period Variability and Route-Level Gaps (M)

Observations and Implications:

- Survey indicated that 73% were interested in route-level metrics.
- The CEO's KPI Report aggregates performance into monthly averages, which masks variability during peak periods and across different routes.
- Metrics are weighted by time rather than passenger volume, and there is no clear segregation between peak/non-peak performance.
- Peer agencies provide interactive dashboards with filters by route, time of day, and day of week. This capability allows customers to align performance and the actual rider experience.

Recommendations:

- Develop interactive dashboards that can disaggregate KPIs by route and time of day.
- Add metrics that weigh KPIs by passenger volume.
- Highlight peak-period/localized challenges and leverage stop-specific, real-time performance for customers and internal accountability.

Management Action Plans:

- Develop a Customer Experience Dashboard that allows customers to disaggregate KPIs.
- Target Completion: Q1 2027

Observation #10 – Service Standards Not Reflected in Public KPI Reporting, Undermining Accountability (M)

Observations and Implications:

- The TTC's Service Standards outline a broad set of quality-of-service commitments, but several key metrics are not included in the public KPI reporting within the CEO's Report.
- Without a complete linkage between the Service Standards and publicly reported performance measures, customers cannot assess whether the TTC is meeting its stated service commitments. This gap weakens the effectiveness of KPI reporting as a mechanism for building trust, managing expectations, and supporting informed travel decisions.

Recommendations:

- Integrate key Service Standards metrics into public KPI reporting.

Management Action Plans:

- Integrate key service standards into the Customer Experience Dashboard following completion of the 2026 Service Standards Review Action.
- Target Completion: Q1 2027.