



Platform Edge Doors Study – Outcome of Feasibility and Business Case Studies

Date: June 23, 2025
To: TTC Board
From: Chief Capital Officer

Summary

The purpose of this report is to outline the outcome of a system-wide study on Platform Edge Doors (PEDs) and other technologies being considered for implementation at existing TTC subway stations. PEDs are identified in the TTC's Corporate Plan in *Action 3.1.4, Evaluate Opportunity to Integrate Platform Edge Doors into Subway Improvements*.

A new approach is necessary to manage the interface between TTC customers, communities, and subway train operations, which reduces service disruption caused by track intrusions. PEDs have been identified as a potential mitigation strategy to prevent unauthorized track entry and injury incidents that affect subway operations and enhance customer safety.

The study aimed to assess the benefits of retrofitting 74 existing subway station platform levels, including interchange station platforms across Subway Lines 1, 2 and 4, with a Full-Height PED system. The PEDs study was comprised of three phases:

- Preliminary Investigation: It reviewed the conditions of existing subway stations.
- Feasibility Study: It assessed retrofitting the existing subway station platform with PEDs.
- Business Case: It quantified benefits, costs, and socioeconomic impacts.

A one-size-fits-all approach will not be considered. The type of PEDs for each station will be determined based on station-specific needs and drivers, including community dynamics. In addition to Full-Height PEDs, various technologies were reviewed as part of this study, including Sensor-Based Track Intrusion System, Guideway Intrusion Detection System, Partial-Height PEDs, and Rope-Based Platform Screen Doors.

The implementation of PEDs at existing stations will require extensive planning, with the majority of the work taking place at track level during non-operating hours and will need to be implemented alongside ongoing State of Good Repair (SOGR) work in subway tunnels and stations. Implementation of the PED system as part of major works, such as Bloor-Yonge Capacity Improvements (BYCI) will minimize operational and customer disruptions while addressing cost and schedule efficiency.

Extensive subway station closures and station bypasses will be necessary to effectively complete track-related work for the PED system and to minimize the challenges. Partial and full closures of subway lines and stations were used in Paris, Hong Kong, Singapore, Copenhagen, and Seoul's Metros to successfully retrofit the PED system in existing stations.

The PEDs study recommends a pilot installation be undertaken at one or more stations with various structure types to identify and mitigate implementation challenges. This would require the TTC to seek funding and approval to implement a pilot installation. A pilot implementation at TMU Station (currently Dundas) is recommended to evaluate impact, refine design, and address challenges before a broader rollout. Additional PEDs integration at Bloor-Yonge Station is also being reviewed, but currently unfunded.

Recommendations

It is recommended that the TTC Board:

1. Receive the PEDs Study report.
2. Approve addition of PEDs requirements, including operational and technical system requirements to the TTC Design Manual and Master Specifications for implementation at future new stations.
3. Direct staff to include funding based on estimates for the implementation of a pilot installation at TMU Station (Dundas) as part of the 2026 budget submission.
4. Approve ongoing planning work, including prioritizing stations for implementation of appropriate technologies based on specific needs and drivers of each station.

Financial Summary

Funds for the PEDs Study is included in the TTC's 2025-2034 Capital Budget and Plan under Capital Program 3.9 – Platform Edge Door Study, as approved by the TTC Board at its meeting on January 10, 2025, and by City Council at its meeting on February 11, 2025. The total project budget is \$1.55 million comprising of \$1.45 million to the end of 2024 and \$99,000 in 2025.

The total capital cost for the implementation of the PEDs system for Lines 1, 2 and 4 is estimated at \$4.1 billion, with average costs of \$44 million to \$55 million for two platforms of a station based on the preliminary (Class 5) cost estimate, which includes a cost escalation to the midpoint of construction projected in 2036. The estimated cost was also included in the 2025-2039 Capital Investment Plan and remains unfunded. Subject to the approval of the recommendations of this report and available funding room available, \$44 million will be included in the 2026-2035 Capital Budget and Plan submission for the implementation of a pilot installation at TMU Station (Dundas) for Board consideration. The preliminary cost estimate does not include the ATC interface. This will be further reviewed and discussed with the Line 1 ATC supplier as the PEDs project progresses and an implementation strategy is developed.

The Executive Director – Finance has reviewed this report and agrees with the financial impact information.

Equity/Accessibility Matters

A cornerstone of the TTC's current Corporate Plan is accessibility, and as a proud leader in providing accessible public transit in Toronto and surrounding municipalities, the TTC is committed to ensuring reliable, safe, accessible and inclusive transit services for all its customers. Accessible transit can be enhanced through the implementation of PEDs. The primary purpose of PEDs is to separate the trainway from the customer platforms to provide a safer environment and protect customers and transit employees, including people with disabilities on the platform, from the track environment.

The Advisory Committee on Accessible Transit (ACAT) is one of the members of the PEDs steering committee. The ACAT Design Review Subcommittee has also reviewed and provided input and constructive feedback on the PEDs study. All ACAT comments were addressed to the greatest extent possible in the study.

Decision History

In 2010, the TTC Board directed staff to continue planning for PEDs installation and include the required budget in the 2011-2015 Capital Budget Submission. The following link provides the previous PEDs reporting:

[Initial Platform Edge Doors Business Case – September 30, 2010](#)

In 2015, Toronto City Council directed the TTC to consider improvements to customer safety and suicide prevention:

[OM3.1 – Suicide Prevention in Toronto \(2014.HL34.2\)](#)

May 16, 2024 – TTC Corporate Plan 2024-2028 & Beyond: Moving Toronto, Connecting Communities

The report introduced the Corporate Plan as the strategic guiding document for the TTC. The Board received and approved the Plan, which identified Platform Edge Doors as a key action, 3.1.4 Evaluate Opportunity to Integrate Platform Edge Doors into Subway Improvements. The Corporate Plan also identified safety and customer experience as key elements, which the implementation of PEDs would support.

[TTC Corporate Plan 2024-2028 & Beyond: Moving Toronto, Connecting Communities.](#)

Decision: [TTC Board Decision](#)

Issue Background

Platform Edge Doors (PEDs) improve subway safety and service by preventing track access, thus reducing injuries, fatalities, staff trauma, and service disruptions.

The TTC has been exploring PEDs since a preliminary study in 2009. In 2010, the TTC Board directed staff to plan and budget for PEDs in future capital submissions.

Concerns about suicide prevention, emphasized by a 2014 Toronto Public Health report, led to a 2015 Toronto City Council amendment. Subsequently, the TTC has been allocating estimated funding in the Capital Investment Plan for implementation of the PEDs for both new and existing stations. The TTC also commenced the PEDs study and implemented a comprehensive Suicide Prevention Program. This includes Crisis Link phone access on subway platforms to connect those contemplating suicide with a Distress Centres of Greater Toronto counsellor, interventions by TTC employees trained to recognize the signs of suicidal behaviour and on how to respond, and mental health support for employees, particularly Subway Operators impacted by such incidents. The TTC's PEDs study has since undergone multiple high-level reviews, which have also considered alternative platform safety technologies.

Comments

The PEDs study consisted of three phases: Preliminary Investigation, Feasibility Study, and Business Case study for the retrofitting of the existing subway station platforms across Lines 1, 2, and 4 with a PED system.

1. Preliminary Investigation

The investigation reviewed previous studies and documented conditions at each station, refining classifications for better identification of installation solutions.

2. Feasibility Study

The Platform Edge Door Study Feasibility Report, presented in Appendix A, assessed the retrofitting of existing subway station platforms with PEDs, including necessary major rehabilitation or structural modifications. Implementing the PEDs in existing stations would be a lengthy process, estimated to exceed 20 years, contingent on full funding. Key challenges identified include:

- Modification of existing platform structure Structural retrofitting;
- Relocation of existing services and installation of necessary services; and
- Extensive station closures and bypasses as the work takes place at or near track level.

A cost estimate for retrofitting all targeted stations is approximately \$55 million on average per station over the project's lifetime.

The study also reviewed other technologies, including Sensor-Based Track Intrusion System, Guideway Intrusion Detection System, Partial-Height PEDs, and Rope-Based Platform Screen Doors:

- 1) Sensor-based and Guideway Intrusion Detection Systems: Detects unauthorized track access and attempts to stop trains; less expensive, but prone to false alarms and unable to fully prevent access.
- 2) Partial-Height PEDs: Offer a partial barrier; less secure as individuals could climb over or throw objects.
- 3) Rope-Based Platform Screen Doors: A new product that consists of metallic wire ropes and structural posts; limited suppliers and no proven track record.

These technologies will be reviewed upon Board approval and evaluated for suitability as station-specific solutions, based on factors, such as customer occupancy levels, frequency of unauthorized track access and track-related incidents, the presence of the existing services, and the extent of required structural modifications. The Guideway Intrusion Detection System technology will be used on Line 5 Eglinton and Line 6 Finch West and its operational benefits and impacts will be assessed to inform the development of future strategies associated with this technology. The evaluation of full-height PEDs and alternative technologies are summarized in Table 1.

The study completed an evaluation of PED systems currently in service in other transit agencies and recommended several PED suppliers. Evidence from other transit agencies suggests that PEDs significantly reduce incidents, including suicides.

3. Business Case

The business case study, presented in Appendix B, has identified the following benefits of implementing PEDs:

- Avoided injury and loss of life, which could result in social cost savings of \$92 million annually.
- Passenger delay reductions, which could provide a cost saving of \$16 million per year in passenger delay.
- Emergency response cost savings, which could result in annual savings of \$19 million.
- Employee health improvements, which could lead to a cost saving of \$0.8 million in insurance claims and losses to the TTC each year.

Life cycle costs are estimated at \$2.2 billion to \$2.4 billion, with benefits exceeding costs, resulting in a net present value of more than \$500 million and a benefit-cost ratio of up to 1.24. Installation is projected to begin in 2026, provided that funding is secured, extending over 20 years, with construction during off-peak hours. The cumulative benefits would offset costs by 2062, 14 years post-completion.

The study concludes that the implementation of the full-height PEDs system throughout the subway network can mitigate unauthorized track intrusion, customer delay, injury and loss of life, and improve the reliability and efficiency of subway services by reducing operational delays, protect customers and transit Operators, improve users' perception, and enhance the TTC's public image.

Table 1 – Evaluation of Considered Technologies:

Evaluation Criteria / Assigned Weight (0 – 1)	Full-Height Platform Edge Doors	Partial-Height Platform Edge Doors	Sensor-Based Track Intrusion System (including Guideway Intrusion Detection System)	Rope-Based Platform Screen Doors
Safety and Security (1)	SCORE: 9 Safest and most secure option. Fully isolates the trackway from the platform area (floor to ceiling).	SCORE: 7 Not as safe/secure as full-height PEDs, but still significantly safer and more secure than existing conditions. Partially isolates the trackway from platform areas. Passengers seeking unauthorized track access may be able to climb over.	SCORE: 4 Does not prevent access to the trackway in any way. Provides some level of safety/security by detecting when a person enters the trackway and attempts to stop trains (but they may or may not stop in enough time to prevent collision).	SCORE: 5 Not as safe/secure as full-height PEDs, but still significantly safer and more secure than existing conditions. Fully isolates the trackway from platform areas (floor to ceiling). However, people can still insert their arms, legs, or objects/debris through the cables.
Cost (0.8)	SCORE: 2 Most expensive option, but most comprehensive solution.	SCORE: 3 Almost as expensive as full-height PEDs. Some costs are saved in materials, but only marginally cheaper than full doors due to installation/structural costs.	SCORE: 8 Likely the least expensive option, but not the same type of product as full-height, partial-height, and rope-based PEDs since no trackway access prevention provided.	SCORE: 5 Less expensive than full-height PEDs and partial height PEDs, but likely more expensive than track intrusion systems.
Complexity of Installation (0.6)	SCORE: 3 Most complex to install. Platform reconstruction work likely required.	SCORE: 4 Almost as complex to install as full-height PEDs. Platform reconstruction work likely required, but possibly less than full-height PEDs.	SCORE: 7 Least complex to install. Conduits/cabling and ATC integration is required, but no platform edge reconstruction work required.	SCORE: 6 Platform reconstruction work may be required, but likely less than full/half-height PEDs.

Evaluation Criteria / Assigned Weight (0 – 1)	Full-Height Platform Edge Doors	Partial-Height Platform Edge Doors	Sensor-Based Track Intrusion System (including Guideway Intrusion Detection System)	Rope-Based Platform Screen Doors
Potential Impact to Operations (0.8)	SCORE: 8 Low probability of impacting operations.	SCORE: 7 Low probability of impacting operations.	SCORE: 2 False positive detections (birds, small animals, debris blowing onto tracks, objects thrown onto tracks, weather, etc.) would fully stop revenue service for the impacted line. Future low headway likely impacted.	SCORE: 4 Potentially has a low probability of impacting operations but has not been service proven in many locations.
Flexibility for Future Upgrades (0.5)	SCORE: 4 Costly modifications required if new trains with different train door spacing/sizing are procured or if additional cars are added to train consist sizes.	SCORE: 4 Large space between support posts allows for high level of flexibility for train stopping accuracy and future train door spacing/sizing. Costly modifications required if additional cars are added to train consist sizes.	SCORE: 8 High level of flexibility. System does not rely on train door spacing/sizing or train consist size.	SCORE: 6 Large space between support posts allows for high level of flexibility for train stopping accuracy and future train door spacing/sizing. Costly modifications required if additional cars are added to train consist sizes.
Service Proven References (0.7)	SCORE: 9 Numerous service-proven references from all over the world in many different climates.	SCORE: 9 Numerous service-proven references from all over the world in many different climates.	SCORE: 6 Numerous service-proven references from all over the world in many different climates.	SCORE: 2 A few test bed projects have been completed. Only one multi-station system has been commissioned for revenue service operation (Sofia Metro in Bulgaria).
Total Weighted Score	27.1 (Highest)	25.7 (Second Highest)	24.4 (Third Highest)	20.2 (Fourth Highest)

The PEDs study recommends a pilot installation at one or more stations with various structure types to identify and mitigate implementation challenges. The pilot project will refine the design requirements, including prequalification of the door manufacturers, identify constraints, refine risks, cost, schedule, and lessons learned for each type of station's structure, and obtain customer feedback. In addition, this will validate operations and maintenance impacts and generate public interest and support before planning and budgeting for the remaining stations across the system.

TMU Station (Dundas) is recommended for the PED pilot installation for the following reasons:

1. High incidence of track intrusions: The station experiences many unauthorized track entries and track-related incidents, making it a priority station for safety enhancements.
2. Strategic location and ridership volume: Given its status as one of the busiest stations in the downtown core, TMU Station offers an optimal location for evaluating the operational impact and effectiveness of PEDs under high-traffic conditions.
3. Integration with ATC: The station is located on Line 1, where the ATC system has been installed and is instrumental for the successful implementation of PEDs.

The preliminary PED system cost estimate does not include the ATC interface, which is instrumental for PED control and supervision. This will be further reviewed and discussed with the Line 1 ATC supplier, with an implementation strategy and costs developed based on PED types, delivery plan, and schedule. Interface with PEDs is a bid option for Line 2 ATC procurement.

The addition of PEDs to the BYCI project scope is currently unfunded. Cost, schedule, and operational impacts due to the addition of PEDs will be assessed during the Development Phase, incorporating outcomes of the system-wide PED study and subsequent direction from this Board report. The BYCI findings will be reported to the Board by Q1/Q2 2026.

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Signature

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Attachments

Appendix A – Platform Edge Doors Study – Feasibility Report

Appendix B – Platform Edge Doors Study – Business Case

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