For Action

Prioritizing TTC Asset State of Good Repair to Keep the System Moving Reliably – 2025 Capital Budget Outlook

Date: July 17, 2024
To: TTC Board
From: Chief Executive Officer

Summary

As outlined in the *TTC's Corporate Plan - Moving Toronto, Connections Communities*, priority investment in state-of good repair is a key objective to sustain a reliable transit system, and sets the foundation for attracting new riders and retaining customer loyalty. With one in four trips in Toronto on public transit, the TTC enables Toronto's population of 3.02 million to access employment, education, services and social connections through our integrated network of subway, bus, streetcar and Wheel-Trans services. Providing more than 100 plus interagency transit connections to GO Transit and 905 transit service providers, the TTC network is the most relied upon sustainable mobility service in the country, generating:

- 396 million rides in 2023, with up to 480 million rides forecasted by 2028; and
- 23% of Canada's transit ridership and 70% of transit ridership in the GTHA

Failure to maintain TTC assets in a state-of-good-repair will impact the quality and level of TTC services enjoyed by customers today. This report focuses on the critical capital needs to keep the existing system moving reliably.

TTC's Unfunded State-of-Good-Repair – $13.5B over 15 Years ($900 M Annual)

Focusing on the capital requirements alone, the *TTC's 2024-2038 Capital Investment Plan (CIP)* identified $47.9 billion in capital investment required over the next 15 years, of which $35.5 billion is unfunded. Approximately $13.5 billion in state-of-good repair, health & safety and legislated requirements ("SOGR") are unfunded over the next 15 years. Securing the $758 million federal matching funding for the Line 2 Replacement Trains, thereby unlocking the provincial commitment of $758 million, would reduce the total unfunded SOGR by $1.52 billion.

The scale of unfunded capital requirements in the CIP is substantial, which is why the TTC continues to place highest priority on meeting health and safety, legislative and state-of-good-repair needs first. This does not suggest that CIP requirements associated with service improvements, growth and aspirational initiatives are not important, but rather are dependent on the base system being maintained to achieve benefits of investment.

Immediate State-of-Good-Repair Priorities Requiring Funding

As an integrated network, each mode has immediate SOGR priority needs that are currently unfunded. These include, but are not limited to:

- **$1.52 billion** associated with two-thirds cost of the Line 2 replacement trains ($758 Million conditionally committed by Province)
- **$1.91 billion** for bus fleet replacement, bus fleet overhauls and associated infrastructure to address immediate five year needs at minimum;
- **$313.4 million** for Line 1 subway TR mid-life overhauls, and infrastructure programs for facilities (e.g. escalators, station renewals) and systems (e.g. communications, traction power) to address immediate five year needs; and
- **$149.2 million** for streetcar fleet overhaul programs in the first five years.

State-of-good-repair investments are time sensitive in nature. Funds need to be committed with sufficient lead time to deliver renewal or replacement works at the precise intervals along an asset's lifecycle (e.g. midlife overhaul and end-of-life replacement). Not investing in maintaining assets in a timely manner results a reduction in asset reliability and availability. Additional costs may be sunk in an attempt to prolong assets beyond their design life, however, assets will ultimately become so unreliable that they are no longer fit for purpose and must be decommissioned.

Further, long lead time fleet procurements require funding to be secured in advance. In the absence of predictable funding for critical procurements, additional risks and costs are introduced into capital planning efforts given interdependencies between fleet and systems infrastructure. Without sustained commitment to fund the state-of-good-repair of critical assets, the TTC will not be able to maintain current bus, Wheel-Trans, streetcar, or subway service levels, and would also be forced to scale back its workforce and operations.

The full capital requirements of the TTC over the next 15 years cannot be addressed by one order of government alone under the current municipal fiscal framework. Despite an increase in funding by the City of Toronto under the City Building Fund introduced in 2019, the scale of investment to address the needs of a system requiring asset renewal and to accommodate growth long term require predictable long-term funding streams to address effectively. The forthcoming Federal Permanent Public Transit Fund is one source of funding the TTC will need to maximize in order to start closing the funding gap in base system needs. Matching municipal funding will also be necessary to leverage forthcoming intergovernmental funding programs which historically identify a need for municipal contribution to eligible projects.

This report responds to the December 2023 Board direction to report back on priority needs within the CIP. The report recommends key government partners be advised of the immediate pressing state of good repair needs in advance of the 2025 budget cycle to keep Toronto's transit system moving reliably.

Recommendations

It is recommended that the TTC Board:

1. Endorse the state-of good-repair unfunded capital requirements as outlined in Attachment 1, as the first priority for investment utilizing new funding made available to the TTC by any order of government.

2. Forward this report to members of City Council, Government of Canada, and Province of Ontario to provide insight into the immediate critical capital priorities for the TTC.

Financial Summary

The recommendations do not have a direct financial impact. The report provides an outlook on the immediate financial pressures of the TTC within the 2024–2038 CIP, which will inform the context for the 2025 capital budget and planning process.

The 2024 – 2038 CIP identifies $47.9 billion in capital requirements across all modes and project categories. The 2024-2033 Capital Budget and Plan allocated $12.4 billion in funding. Approximately $35.5 billion is unfunded over 15 years, averaging at approximately $2.3 billion annually for all project categories in the CIP.

Of the total $47.9 billion identified over 15 years, approximately 46% of the plan, or $21.8 billion is associated with *health, safety, legislated and SOGR*. Of this category:

- Approximately $13.5 billion is unfunded over the next 15 years.
- Nearly half ($6.3 billion) of the SOGR unfunded amount is associated with Bus and Wheel-Trans modes;
- $1.52 billion unfunded within the subway program is associated with the 55 Line 2 replacement trains (provincial funding is not reflected in the CIP as conditional on matching federal share to be confirmed).

Attachment 1 provides a detailed breakdown of the $13.5 billion unfunded amount within the CIP associated with health, safety, legislated and state of good repair. The CIP is updated on annual basis to reflect updated cost estimates, changes in market conditions, adjustments due to capital coordination efforts, and as projects advance through the project development lifecycle (stage-gates), etc.

The Chief Financial Officer has reviewed this report and agrees with the Financial Impact Assessment.

Equity/Accessibility Matters

The TTC is important to creating access to opportunity and the conditions for an inclusive Toronto. The geographic coverage and seamless integration of the TTC's multi-modal system enables the TTC to serve equity-deserving communities across Toronto. TTC customers are diverse and use the system at different rates. For example, of the 3.2 million average weekday boardings pre-COVID:

- 27% were youth (15-24)
- 53% live in apartments
- 34% are not employed
- 24% make less than $40K
- 23% make more than $100K
- 32% do not own a car
- 58% identify as female
- 55% may be visible minorities

For many, public transit is a primary mode of mobility. The TTC's commitment to equity and accessibility is also reflected in how we plan and deliver our services, and we continue to seek ways to improve our approach. The TTC continues to work towards creating new partnerships and strengthening current ones based on respect and transparency, to foster and improve trust between the TTC and the community.

The TTC is committed to making Toronto's transit system barrier-free and accessible so that all customers can enjoy the freedom, independence, and flexibility to travel anywhere on the public transit system, regardless of ability. Inadequate financial support for public transit will have a significant impact on the achievement of an inclusive Toronto and region.

Innovation and Sustainability Matters

The TTC has two critical roles under TransformTO that must be delivered to help the City of Toronto achieve its goal of net zero GHG emissions by 2040. One is to decarbonize its operations, particularity the bus fleet, and the other is to substantially increase service frequency as one of the city-wide actions required to enable a modal shift towards public transit and active transportation.

Neither of these roles can be delivered without funding for state of good repair of existing transit assets. Without the necessary reductions in direct, indirect, and avoided emissions by the TTC, the City as whole will not be able to do its part to address the climate emergency.

Decision History

The following reflects relevant recent TTC Board decisions:

At its meeting on December 20, 2023, the TTC Board approved the 2024-2033 TTC Capital Budget and Plan of $12.398 billion over the 10-year period, with $1.369 billion approved in the 2024 Capital Budget and a 2024 Operating Budget of $2.568 billion gross and $1.231 billion net, with a 2024 total year-end workforce complement of 17,508 positions for the TTC.
Report: Staff Recommended 2024 TTC Conventional and Wheel-Trans Operating Budgets and 2024-2033 Capital Budget and Plan

Decision: Staff Recommended 2024 TTC Conventional and Wheel-Trans Operating Budgets and 2024-2033 Capital Budget and Plan

At its December 20, 2023 meeting, the TTC Board endorsed the 2024-2038 Capital Investment Plan of $47.9 billion, and 2024-2038 Real Estate Investment Plan Update. The TTC Board endorsed the plans, and requested staff to report back in 2024 with a review of the CIP that prioritizes categories of unfunded capital needs.
Report: TTC's 2024-2038 Capital Investment Plan: A Review of Unfunded Capital Needs
Decision: TTC's 2024-2038 Capital Investment Plan: A Review of Unfunded Capital Needs

Subsequently, on February 14, 2024, City Council approved an amendment to the TTC Board's approved 2024 TTC Capital Budget, reallocating $67.9 million for the Line 3 Scarborough Rapid Transit (SRT) Busway from permanent savings of $12.2 million from the SRT Life Extension/Transition project and $55.7 million from property acquisition funding reflected within the Line 1 Capacity Enhancement Project.
Report: City of Toronto 2024 Capital and Operating Budget
Decision: City of Toronto 2024 Capital and Operating Budget

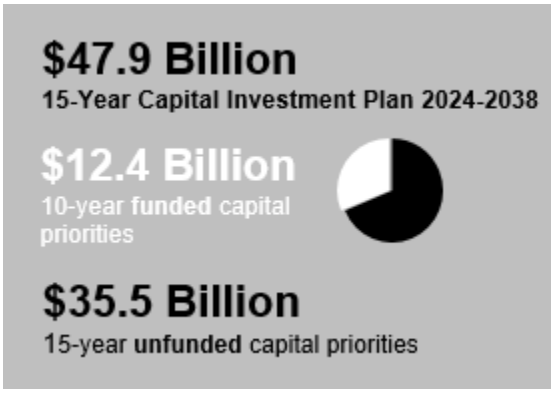
At its meeting on May 22, 2024, in accordance with the City's Carry Forward Policy, City Council approved an incremental carry-forward reduction of $1.2 million applied to the TTC's existing carry-forward funding of $180.5 million as submitted through the 2024 budget process.
Report: Adjustments to Capital Budget, Carry Forward Funding and Future Year Commitments
Decision: Adjustments to Capital Budget, Carry Forward Funding and Future Year Commitments

At its meeting on April 11, 2024, the TTC Board approved the TTC's 2024 Asset Management Plan (AMP). The AMP was provided in compliance with the Asset Management Planning for Municipal Infrastructure Regulation, O. Reg. 588/17 (as amended by O. Reg. 193/21) and details assets owned and managed by the TTC.
Report: 2024 TTC Asset Management Plan
Decision: 2024 TTC Asset Management Plan

At its meeting on May 16, 2024, the TTC Board approved the TTC's Corporate Plan *Moving Toronto, Connecting Communities, TTC Corporate Plan 2024-2028 & Beyond*, as the guiding document for the TTC's multi-year planning activities. Prioritizing State of Good Repair is a key objective of the plan (2.4), and is foundational to attracting new riders, retaining customer loyalty, and enabling transit as a mode of choice.
Report: TTC Corporate Plan 2024-2028 & Beyond: Moving Toronto, Connecting Communities
Decision: TTC Corporate Plan 2024-2028 & Beyond: Moving Toronto, Connecting Communities

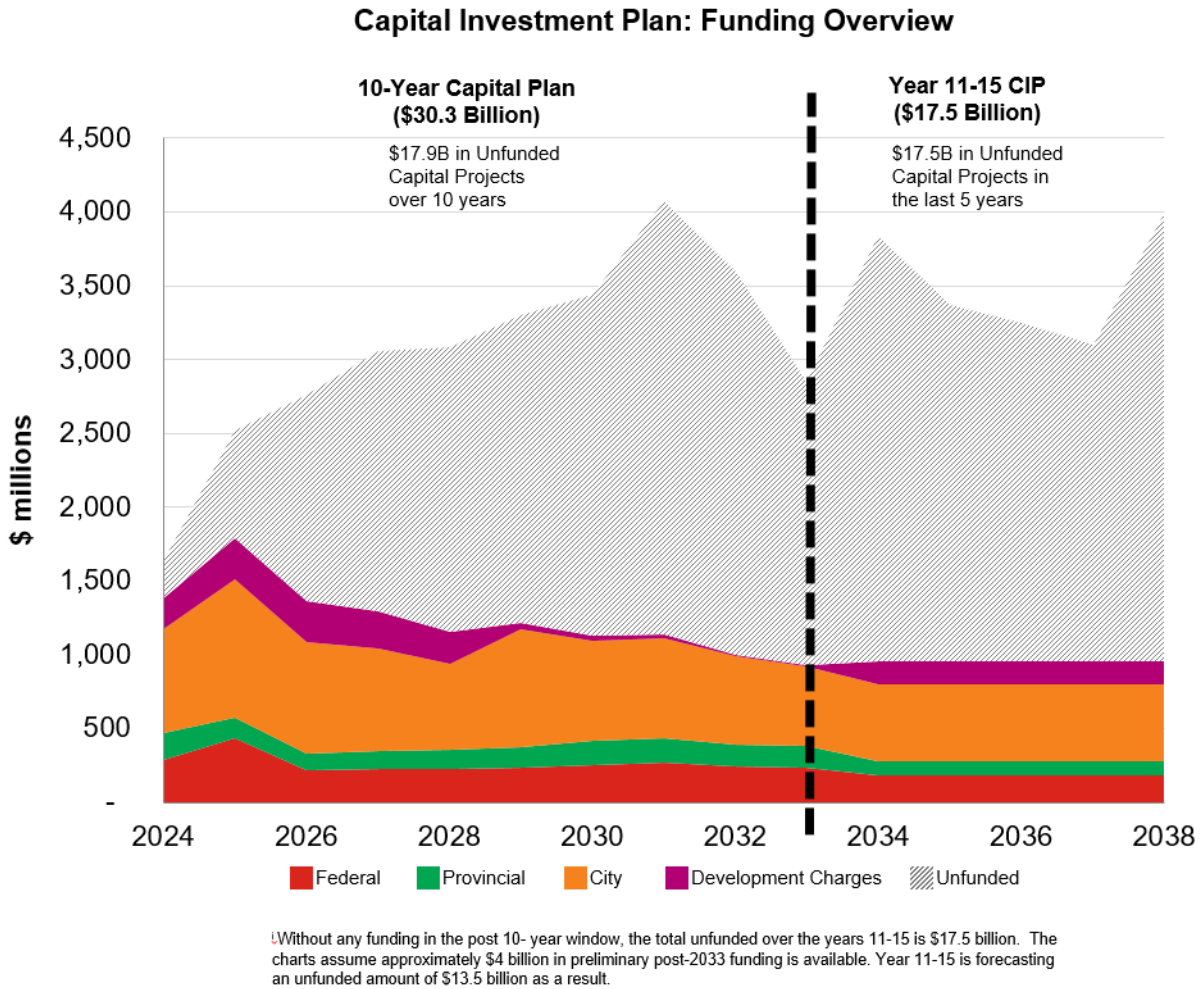
Issue Background

The TTC's Capital Investment Plan



In 2019, the TTC introduced the first 15-year Capital Investment Plan (CIP) which outlined capital requirements for the base transit system (distinct from transit expansion). As a rolling plan, the CIP is updated annually to reflect refined estimates based on changes to the timing of planned investments, capital planning progress made through project lifecycle stage gating, estimate updates to account for external economic factors (e.g. inflation, market conditions), and emergent capital needs based on updated asset condition assessments. The most recent update was presented to the TTC Board as part of the 2024 Budget process. The 2024-2038 CIP identified a total of $47.9 billion in investment required, of which $35.5 billion is currently unfunded.

Figure 1. 2024 - 2038, 15-Year Capital Investment Plan Funding Overview



Without any funding in the post 10- year window, the total unfunded over the years 11-15 is $17.5 billion. The charts assume approximately $4 billion in preliminary post-2033 funding is available. Year 11-15 is forecasting an unfunded amount of $13.5 billion as a result.

The TTC CIP organizes projects by project category, mode and asset type. Approximately 46% of the 15-year plan is associated with Health and Safety, Legislated and State of Good Repair needs. Projects funded as part of the growth and service improvement categories are primarily due to specific intergovernmental funding programs and/or City development charge funding sources that are designated for growth and improvement type programs. Table 1 provides a breakdown by category.

Table 1. 2024-2038 Capital Investment Plan by Program/Project Category

Priority	Category	Funded	Unfunded	Total	% of CIP
1	H&S, Legislated, SOGR	8.3	13.5	21.8	46%
2	Service Improvement	3.4	7.6	11.0	23%
3	Growth	0.8	4.9	5.6	12%
4	Transformational (PED, TransformTO)	-	9.4	9.4	20%
	Total	$12.4 B	$35.5 B	$47.9 B	100%

The information below summarizes key considerations when determining the recommended allocation of available funding to needs identified in the CIP. The capacity to deliver projects to plan is also assessed to ensure appropriate plans and resources are in place to effectively utilize scarce funding.

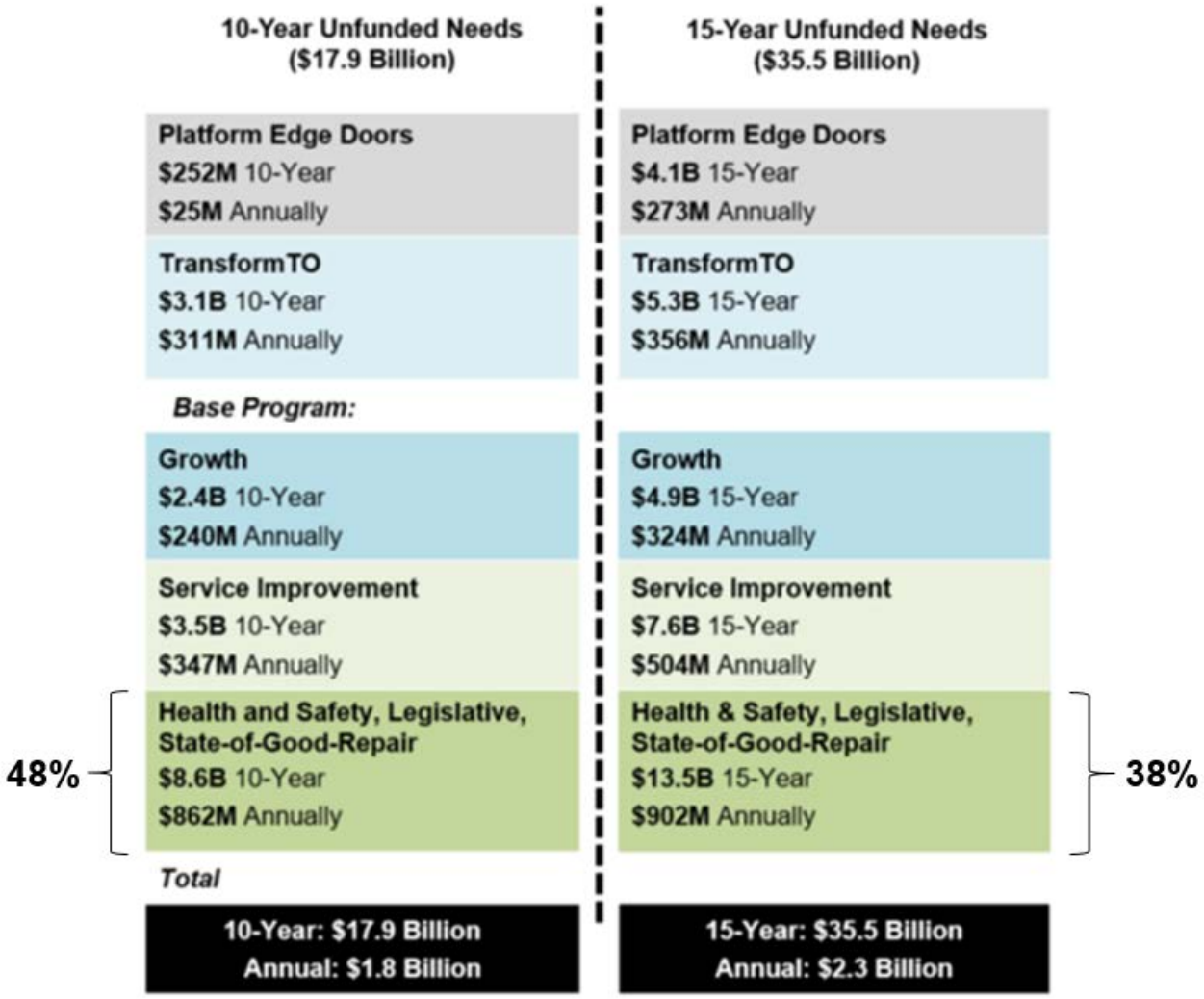
Category	Focus	Key Considerations In Allocation of Available Funding
Base Program – Health & Safety, Legislated and SOGR	Sustain Existing Base System	Informed by Asset Management Plan • Asset age, condition, lifecycle maintenance requirements; • Legislative Requirements; • Interdependencies between component parts of the network within each mode based portfolio (e.g. fleet, facility and signal infrastructure). • Capital Coordination with TTC SOGR and/or City works • Cost effectiveness
Base Program – Service Improvement and Growth	Prepare for Future Growth	Informed by the 5-Year Service Plan and 10 Year Outlook, and long range demand projections (influenced by population, employment, land use, etc.). • Forecasted Demand, • Social, Economic, Environmental Benefits • Customer Experience • Capital Coordination with TTC SOGR and/or City works • Interdependencies between component parts of the network within each mode based portfolio (e.g. fleet, facility and signal infrastructure). • Interdependencies with Provincial expansion projects (under construction and planned). • Cost effectiveness

Unfunded Capital Needs: $35.5 Billion over next 15 Years

After accounting for the TTC's approved 10-Year Plan of $12.4 billion, the TTC continues to face $35.5 billion in total unfunded needs over the next 15 years. The TTC has unfunded capital state-of-good-repair, health, safety and legislative base system requirements of $13.5 billion over the next 15 years, comprising 38% of the TTC's current $35.5 billion CIP unfunded requirements.

The balance in unfunded requirements ($22 billion) includes service improvement and growth projects to keep up with forecast demand, and long-term transformation initiatives that are aspirational in context of the overall CIP (e.g. TransformTO[1], Platform Edge Doors). The CIP does not include transit expansion priorities of the City which are not budgeted as TTC projects (e.g. Eglinton East LRT, Waterfront Transit).

Figure 2. 2024 - 2038 CIP: Unmet Capital Needs



[1] The cost for TransformTO in Figure 2 is a placeholder estimate, for the funding required to enable a 70% increase in bus service frequency only. TransformTO costs to increase service on streetcar and subway are being estimated and will be submitted to the Board for consideration once available.

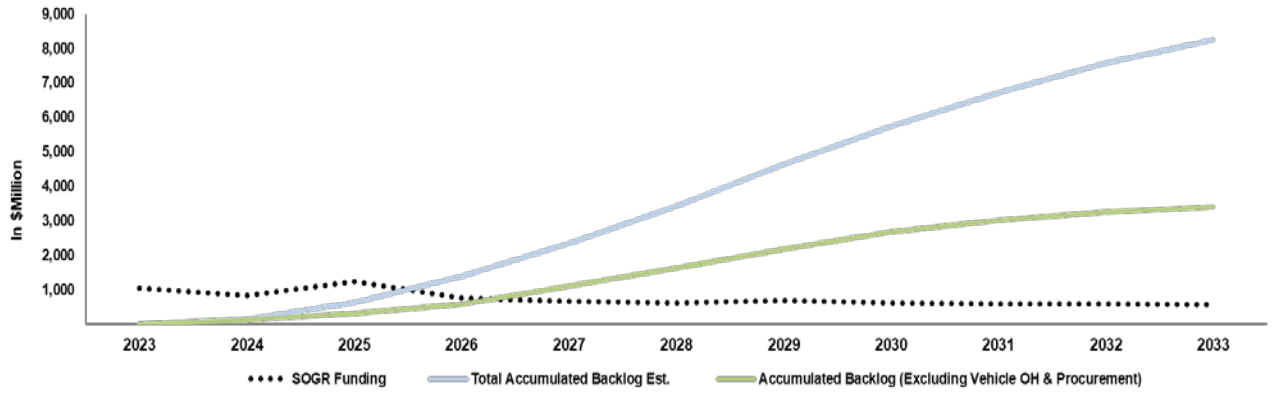
Comments

Priority Category #1: Health & Safety, Legislative and State-of-Good Repair

Managing the accumulated SOGR backlog is the first priority for the TTC. Unfunded SOGR amounts to $8.2 billion in the 10-year period, and a total of $12.97 billion, projected over the CIP's 15-year period. Adding Health & Safety and Legislative to SOGR needs, the 10-year requirement is $8.6 billion and the 15-year requirement is $13.5 billion.

Figure 4 outlines the impact lack of available funding has on these unmet needs. Starting from 2023, the backlog will grow from $16.83 million (or 0.1% of total asset value) to $8.6 billion (or 21.7% of total asset value) by 2033 if no additional funding is provided. Of this amount, $3.78 billion is attributable to the backlog of SOGR funding for TTC infrastructure; and $4.85 billion is associated with unfunded vehicle replacement and overhaul requirements.

Figure 3. SOGR Backlog 2023 - 2033



Together, investments in all modes to uphold the SOGR serve to:

- Ensure the seamless integration of the multi-modal network and support a quality customer experience;
- Mitigate against degraded service levels and service quality by ensuring asset availability, safety and reliability;
- Provide flexibility through the bus fleet in particular, to plan for rail closures to undertake critical maintenance, and mitigate the impact of unplanned events;
- Strengthen relationships with vendors through development of steady state procurement plans for fleet replacement and critical infrastructure; and
- Minimize workforce impacts and support productivity through steady state plans for critical maintenance and operations activities.

Immediate Priorities by Mode: Unfunded Health & Safety, Legislative and SOGR

Capital funding pressures exist simultaneously for all transit modes. It is necessary to balance investments across the network to ensure the system continues to function seamlessly. Table 2 provides the breakdown of total 15 Year SOGR needs by mode. Within that total, there are immediate pressures in each mode that require attention which have been highlighted in discussion below.

Table 2. Health & Safety, Legislative and SOGR Unfunded Needs in the 2024-2038 CIP

Mode	15 Year Total Unfunded H&S, Legis. SOGR	%
Bus and Wheel-Trans	**6,314.7**	47%
Subway	**3,989.8**	29%
Streetcar	**928.1**	7%
Facilities	**1,714.7**	13%
Network Wide	**590.4**	4%
Total	**13,537.6**	**100%**

Bus and Wheel-Trans:

The bus and Wheel-Trans modes account for nearly half (47%) of the SOGR backlog, with pressures starting in 2024 and 2025 to sustain steady state procurements for replacement vehicles as buses reach end of life, charging infrastructure, and preventative maintenance (bus mid-life overhauls). Immediate priorities include:

- **$1.82 billion** for the procurement of replacement buses, charging infrastructure and the bus-midlife overhaul program in the first 5 years.
- **$84 million** for the replacement of Wheel-Trans vehicles and associated infrastructure in the first 5 years.

As outlined in Attachment 1, investment is also needed in supporting infrastructure (bus hoists, maintenance equipment) and bus stop accessibility improvements. Combined, these investments intend to ensure steady state fleet procurements and associated infrastructure are implemented to maintain the bus fleet and avoid degraded service levels. The bus fleet is the most flexible transportation mode, and is critical to support maintenance work, and manage disruption to rail based modes. Failure to fully fund Wheel-Trans replacement buses will also have impact to TTC ability to meet accessibility needs of customers who rely on service.

Subway:

The CIP identifies approximately $4 billion over 15 years in investment required in subway SOGR programs. This includes the $1.52 billion (two-thirds cost) for the Line 2 replacement subway trains which currently remains unfunded in the 2024 CIP. Note, the provincial funding commitment of $758 million is conditional on the remaining $758 million in federal matching funds. As previously reported, a full funding commitment is

needed immediately to proceed with the RFP and enable the Line 2 modernization plan. See presentation: June 2024: Spotlight on New Subway Train Procurement.

In addition to the Line 2 trains, investment is needed in the next 5 years on the Toronto Rocket (TR) train mid-life overhaul to maintain the subway fleet serving Lines 1 and 4. Key subway infrastructure SOGR programs for facilities (e.g. escalators, station renewals) and systems (e.g. communications, traction power) also require investment.

In summary, immediate priorities to address subway SOGR include:

- **$1.52 billion** associated with two-thirds cost of the Line 2 replacement trains ($758 million conditionally committed by Province); and
- **$313.4 million** for Line 1 subway TR mid-life overhauls, and infrastructure programs for facilities and systems to address immediate five year needs.

Streetcar:

Streetcar SOGR requirements over the next 15 years amount to $0.93 billion. In the immediate term the priority is to secure funding of **$149.2 million for streetcar fleet overhaul programs** in the 2025 budget to enable work to begin over next five years.

The streetcar overhaul program is required to ensure ongoing reliability of the streetcars, reduce downtime, and improve the overall availability of the streetcar fleet. If these assets are unavailable, service may be augmented through the use of buses, but that only degrades service in the bus network and increases the strain on the operating budget. Please see above section regarding the unfunded requirements on bus.

Attachment 1 outlines investments in systems, equipment and linear infrastructure associated with the streetcar network, which are required post 2028 in the capital plan.

Facilities and Network Wide:

The Facilities Program includes garages, yards, carhouses and various other buildings that play a critical role in supporting one or multiple aspects of the TTCs integrated network. These assets all require facility renewal programs to ensure building assets, such as HVAC, boilers, roofs and structures are functional and maintained in a state-of-good-repair, but can also be retrofitted to reduce energy consumption. Approximately $637 million in various facilities works is identified in first five years.

The Network Wide Program is not mode specific, but includes assets that indirectly support the integrated network of transit services. The program includes information technology systems, renewable energy programs and energy storage systems. This portfolio also includes non-revenue vehicles fleet to enable the TTC workforce in performing operational, maintenance and core work. Approximately $235 million is identified across these programs in first five years.

Attachment 1 provides a break down by the key modes of the unfunded SOGR capital requirements, the risks and impacts of insufficient funding.

Capital Funding Needs and Opportunities

The TTC relies on capital funding from all orders of government. The 2024 -2033 approved 10-Year Capital Plan is funded predominantly through City funding sources. City funding represents nearly 67% of total capital funding for the TTC while provincial funding contributes 12% and federal funding provides 21%. The TTC's capital funding sources over the 10 years are summarized in Table 3 below.

Notably, within City funding sources, approximately $1.35 billion is from development charges which are specifically allocated to fund growth projects. The remaining $6.97 billion is available to address all project categories, but most notably Health & Safety, Legislative and SOGR.

Table 3. 2024 - 2033 Capital Funding Sources ($ Millions)

City of Toronto		Provincial		Federal	
8,324.1		1,434.7		2,637.7	
67%		12%		21%	
City Building Fund	5,173.3	PTIF II	380.6	PTIF II	420.4
Debt	1,443.3	Provincial Gas Tax	939.8	CCBF	1,817.0
Development Charges	1,349.8	Streetcar Program	114.3	Streetcar Program	142.2
TTC Internal / Other	296.1			Zero Emission Transit Fund	258.1
Reserve Draws	61.6				

With the exception of the Provincial Gas Tax and Canada Community Building Fund (CCBF), provincial and federal capital funding contributions in the plan are from one-time grant application programs which require matching municipal contributions. Examples of project based funding in the Capital Plan:

- $349 million in federal funding under the Zero Emission Transit Fund for 340 e-buses and 248 charging points (50%-50% federal, municipal matching program);
- $360 million in provincial and federal funding for the procurement of 60 new accessible streetcars and towards modernization of Hillcrest Facility (1/3 federal, provincial, municipal matching funding);
- Up to $1 billion in provincial and federal funding for the Bloor-Yonge Capacity Improvement project under the Investing in Canada Infrastructure Program (ICIP) (1/3 federal, provincial, municipal matching funding);

While these grant-based contributions to individual projects are appreciated, there remains a need for a long term sustainable funding solution for public transit that is predictable and supports long term planning for capital investment.

Intergovernmental Funding

The federal government has committed to $3 billion annual national transit funding through the Permanent Transit Fund starting in 2026. Program details are pending release. The TTC has participated in ongoing engagement on program design alongside industry partners. The TTC continues to advocate for accelerated priority funding commitments under the program, and to ensure SOGR including fleet replacement programs for all modes are deemed eligible project categories.

The priorities in this report will inform ongoing intergovernmental engagement at both the provincial and federal level to close the funding gap in the TTC's CIP with a focus on priority SOGR. To successfully leverage government grant funding, matching funding will need to be in place. The TTC has one-third municipal matching funding secured for Line 2 replacement subway trains, and a conditional one-third commitment from the province. Matching funding will be required for other critical fleet replacement programs (bus and Wheel-Trans) and this will inform recommendations to the Board on the 2025 budget.

Summary and Next Steps

This report focused on the first priority category of capital needs within the TTC's 2024-2038 Capital Investment Plan. The scale of investment needed is substantial. Within the CIP the highest priority is upholding the state of good repair and compliance with health, safety and legislated requirements. An estimated $13.5 billion over the next 15 years is unfunded, with immediate funding needed for subway and bus fleet replacement, and midlife overhauls across all fleet modes. Key subway infrastructure SOGR programs also have priority needs such as facilities and systems detailed in Attachment 1.

To address the TTC's highest critical SOGR needs the following is required:

- Ensure municipal matching funding is in place to leverage opportunities for intergovernmental funding under the new federal PTF or other grant programs.
- Secure required funding to uphold the SOGR needs of the TTC beyond fleet replacement.
- Prioritization of critical asset SOGR work within capital coordination efforts with the City of Toronto.

The TTC has made great strides to improve its capacity to deliver against plan, and ensure funding that is allocated to the TTC annually is effectively utilized. The TTC's capital spending rate for the year ended 2023 was 87.5%. The TTC will continue to make every effort to ensure effective utilization of limited funds available to address the highest priority needs of the TTC.

The information within this report will be used to guide future recommendations to the Board on any additional funding made available to the TTC by the City or other orders of government as part of the 2025 budget process.

Contact

Rich Wong, Chief Transportation and Vehicles Officer
Rich.Wong@ttc.ca, 416-393-3564

Bem Case, Executive Director, Innovation and Sustainability
Bem.Case@ttc.ca, 647-393-2385

Mark Del Vecchio, Director, Corporate Financial Planning and Analysis – Capital
Mark.DelVecchio@ttc.ca, 416-393-2633

Karen Thorburn, Executive Director, Corporate Initiatives
Karen.Thorburn@ttc.ca, 416-981-1122

Signature

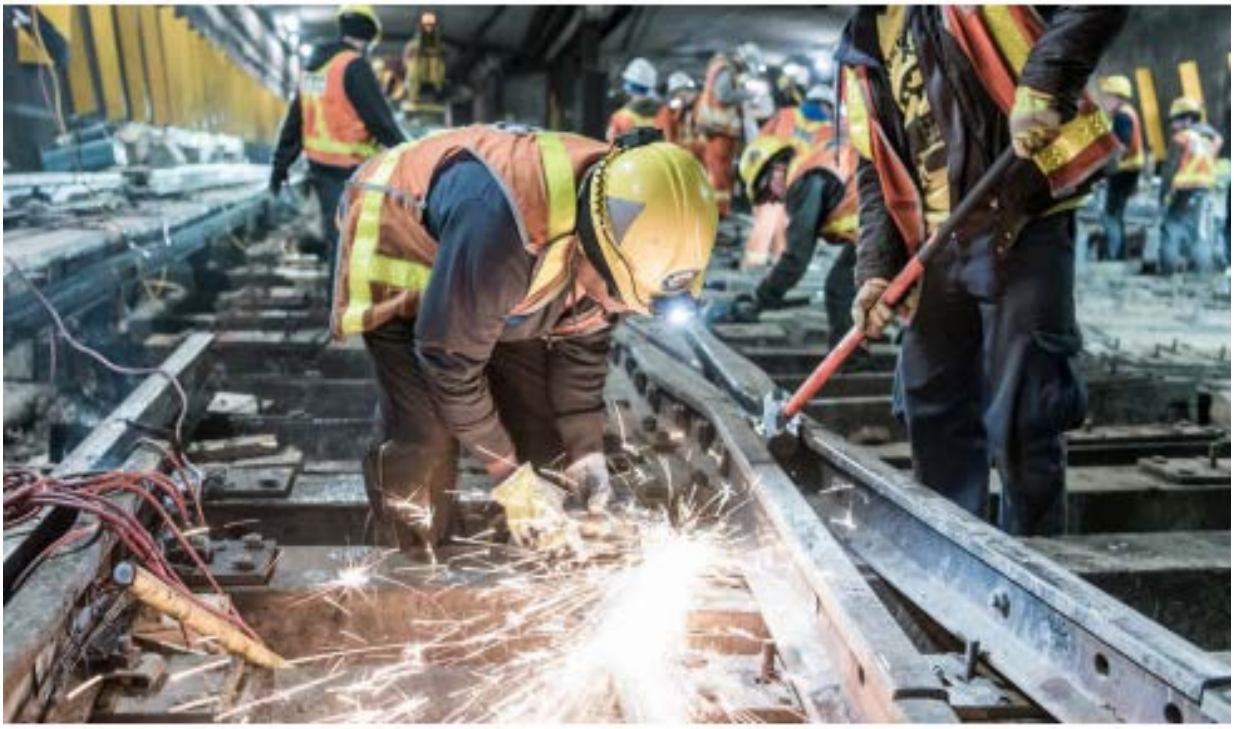
Richard J. Leary
Chief Executive Officer

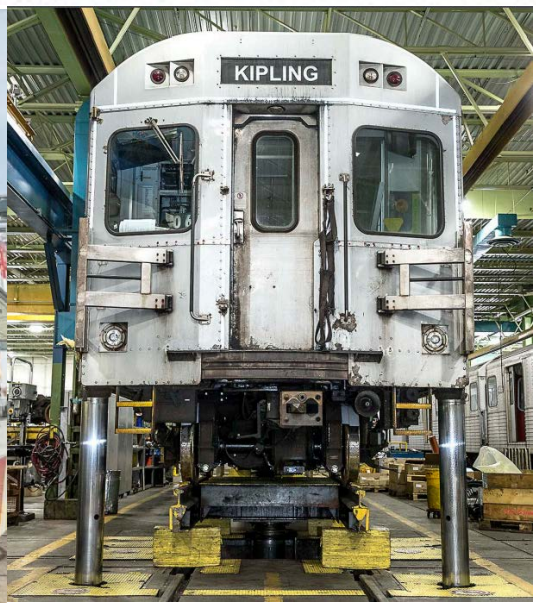
Attachments

Attachment 1 – Capital Investment Plan – Focus on Unfunded State-of-Good-Repair

Attachment 1

TTC Capital Investment Plan:
Focus on Unfunded State-of-Good-Repair





1. Bus and Wheel-Trans State of Good Repair Requirements

1. Introduction

Bus & Wheel-Trans
15 Year

Total CIP: $8.7B
Funded: $1.7B
Unfunded: $7.0 B
Unfunded SOGR: $6.3 B

TTC's bus fleet is the workhorse of the system and the most versatile fleet, critical for providing seamless transit across 160 bus surface routes. Approximately 60% of all TTC trips involve at least part of the journey on the bus network. In addition to regular service, the bus fleet provides replacement service for streetcar and subway modes for planned and unplanned events including construction, rail closures/diversions and city events.

Wheel-Trans is the City's para transit service that provides safe and reliable accessible transit option for persons with mobility limitations. Accessible transit service ensures dignity, fairness, and freedom of travel for all customers. In 2023, Wheel-Trans provided more than 3 million door-to-door trips.

Transforming & Electrifying Bus Service is a planned portfolio of investment within the TTC's Capital Investment Plan, which outlines **$8.7 billion** in investment over the next 15 years for both the bus and Wheel-Trans modes. Within that amount **$6.3 billion** (approx. 72%) is associated with unfunded health, safety, legislated and asset state of good repair needs. Included within this amount is addressing, the City of Toronto's commitment under its TransformTO Strategy, which requires transition of TTC's bus fleet to zero-emissions as we replace vehicles at end of life.

A shortfall in capital funds commences in 2024 and continues into the immediate 5-year financial window. Approximately **$1.9 billion** at minimum will need to be secured through the 2025 budget process to keep critical bus and wheel-trans fleet replacement and charging infrastructure procurements advancing on schedule. The bus mid-life overhaul program is also a key priority to advance on time.

2. Background

Effective asset management includes the following key components:

i. Bus replacement at end of life;
ii. Bus mid-life overhaul program; and,
iii. Preventative maintenance programs

TTC's buses are currently maintained to achieve a life cycle of 12-15 years. Buses at their end of life have accumulated over 1 Million KM in mileage and have been well used over their life cycle. As part of the asset management program, TTC designs its bus fleet plans with steady state procurement of replacement buses, overhauls and decommissioning. On average 120-150 buses are procured and decommissioned per year. The asset management program currently in place for the bus fleet ensures a predictable and stable workforce while it provides a reliable service for TTC customers. On average, the TTC is able to provide 103% bus availability on a daily basis. Reliability

exceeds targets with a rolling annual mean kilometres between delays (MKBD) of 35,361 KM and less than 1.5% of peak daily service result in a change off for electrical/mechanical defects.

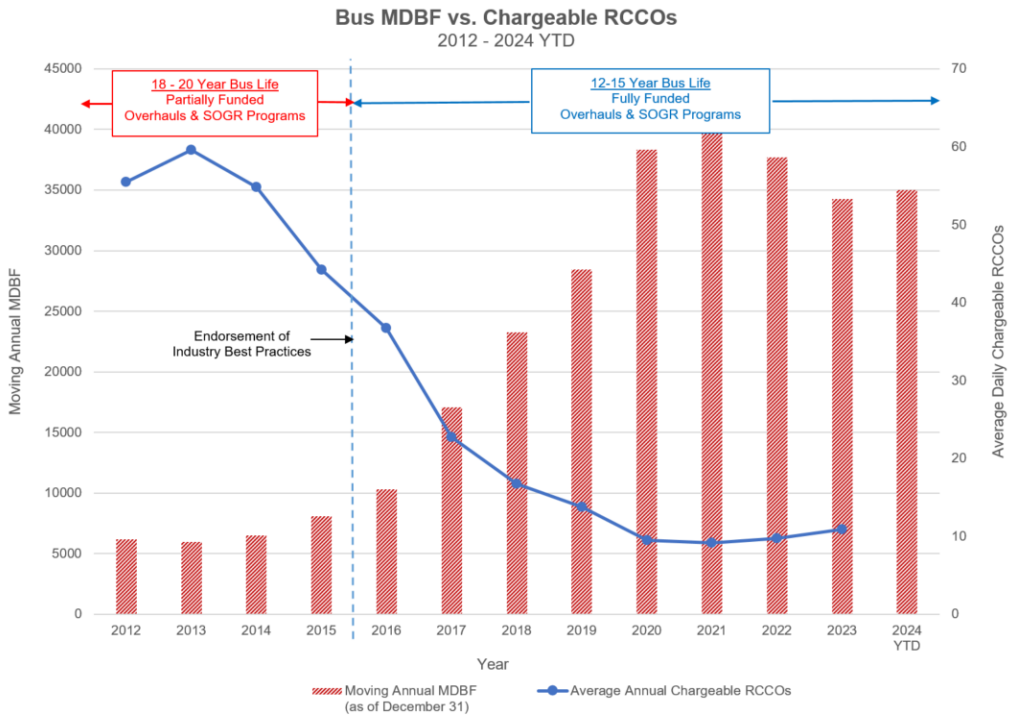
Pre- 2016 Bus Fleet Maintenance – Lessons Learned

Capital funding is imperative for an effective asset management program, quality bus fleet operations and seamless transit. Pre-2016, capital funding for the bus fleet did not support proper asset management resulting in unreliable and often unavailable bus service. Limited funds for new bus procurements necessitated the need to retain buses to 18-20 years of age which was well beyond their intended useful life. Similarly limited capital funding was provided for SOGR and mid-life overhaul programs.

The combination of these variables resulted in bus fleet reliability less than 6700 kilometres, over 50 road calls and change offs per day due to in-service failures, and towing charges up to $1 Million annually. Due to the poor performance of this fleet, buses could not be readily relied upon to provide coverage for disruptions to rail service or to properly support city events.

In 2016, at the October 28, 2015 Board meeting, industry best practices for the bus fleet were endorsed by the Board (Presentation Link). Since then, capital funding has been made available to ensure effective asset management plan are in place for the bus fleet. Improvements to the performance of the bus fleet since 2016 now support a seamless transit system and offers replacement service for rail service disruptions. The following graph depicts the reliability of the bus fleet from 2012 to 2024 year-to-date:

Figure 4. Bus MDBF vs. Chargeable RCCOs (2012-2024 YTD)



3. Immediate Priorities

The following section highlights the most immediate asset state-of good repair priorities within the next 5 years that require funding to be secured in the 2025 budget process.

Procurement of New Buses and Electrification Infrastructure

The 2024 - 2038 CIP includes the procurement of 2825 electric buses and associated charging infrastructure, which is inclusive of the 340 eBuses and 248 charge points funded under the federal Zero Emission Transit Fund. The Green Bus Program includes a mix of hybrid-electric and battery electric bus procurements as the TTC transitions to steady-state procurement of zero emissions buses starting in 2025 and an all zero emissions fleet by 2040. The capital funding shortfall for this program commences in 2024 and is shown in the table below.

Without committed funding, the bus service levels, and the quality of service will be greatly impacted. The use of bus replacements for rail closures and diversions, support city construction activities and events will become limited. Also directly impacted will be TTC's ability to comply with the City's TransformTO strategy.

Bus Midlife Overhauls

The TTC undertakes midlife bus rebuild to ensure the bus fleet will continue to provide reliable and safe service until the end of their lives. The bus midlife rebuild includes the overhaul of major mechanical systems (engine, transmission, suspension and door systems) and the overhaul of structural members, exterior body panels, and interior items (flooring, passenger seating and operator cab).

Bus Maintenance and Shop has conducted a study resulting in a 12-year bus lifecycle, with a major overhaul at the 6-year mark to ensure that the fleet will be maintained in a state-of-good-repair. Impacts to not having a properly funded bus overhaul program are similar to those of New Bus Procurements. Maintenance will transition to a fix on fail practice that results in declining vehicle and fleet reliability and availability. This eventually leads to a reduction in service.

Table 4. Unfunded Bus SOGR Requirements – First 5 Years

Immediate Priority	Impact of Not Investing	Funding Required
Procurement of Buses 580 approx.	The TTC will be faced with following options: • Extending the life of the bus fleet past its useful life through a Life Extension Program (Capital Investment Required); • Transition to a fix on fail maintenance practice and focus only on safety critical components and systems (i.e. declining reliability and availability); or, • Reduction of service • Limit to bus replacement services to support rail closures (also for maintenance work), city construction and events. • Reduction of vehicle commissioning and decommissioning workforce requirements.	$1.056 billion
Procurement of Electrification Charging Infrastructure 680 charge points approx. *note number greater than buses due to lead time to install before next tranche of e-buses.	The TTC will be faced with following: • reduction of bus service, and/or • Delayed implementation of green bus program and failure to achieve the TransformTO net zero target by 2040.	$574.2 million
Bus Midlife Overhaul Approximately 460 Overhauls and 950 Schedule Maintenance Plan (SMP)	• Maintenance will transition to a fix on fail practice that results in declining vehicle and fleet reliability and availability. • Repairs become safety critical focused and no longer reliability focused. Fleet reliability decreases resulting in: an increase of in-service failures; increase in maintenance backlog; decrease in vehicle availability; and an inability to meet peak service requirements. • Eventually leads to a reduction in service, increased crowding and passenger wait time • Reduction of mid-life overhaul scope of work with impacts to workforce requirements.	$193.3 million
Total		$1.824 billion

Wheel-Trans Bus Procurements and Charging Infrastructure

Wheel Trans buses are designed for a 5-7 year life cycle. On average, a Wheel Trans bus at end of life has accumulated more than 230,000 KM in mileage. By way of comparison, the average mileage per year travelled by Ontarians is 16,000 KM* (Stats Canada) or 160,000 KM over 10 years. Investment in new replacement vehicles is critical to continue an effective accessible transit service and ensure compliance with AODA. Capital shortfall for new replacement buses commences in 2026.

The eWT charging systems program is a part of the TTC's Green Bus Program. The eBus charging systems program will optimize the effective operation and functioning of electric Wheel-Trans buses to achieve zero emission by 2040. This consists of the implementation of electrification infrastructure at TTC Wheel-Trans lakeshore garage. A Request for Proposal is planned to be issued in Q3 2024 for the procurement of up to 10 battery-electric Wheel-Trans vehicles for delivery in 2025 to 2026. This pilot Wheel-Trans bus procurement will enable TTC to evaluate electric vehicles in TTC's operating environment to inform future bulk procurements. The eWT charging stations are unfunded commencing in 2025.

Table 5. Unfunded Wheel-Trans SOGR Requirements – First 5 Years

Immediate Priority	Impact of Not Investing	Funding Required
Wheel-Trans Replacement 118 approx. (68 Gasoline, 50 eBus)	• Like other fleets, the inability to replace buses within its proper asset life will result in a degradation/ reduction of service • Negative impact to customers who rely on service for medical appointments and treatments, etc. • Barrier to achieving transit accessibility; reduced social equity • By 2028, 40% of TTC's current fleet of 250 Wheel Trans buses will not have replacement vehicles; by 2029 increase to a shortfall of 86% of the fleet. • Reduction/ elimination of vehicle commissioning and decommissioning staff; and operators due to service impacts.	$52.2 million
Electrification Charging Infrastructure 113 approx.	The TTC will be faced with following options: • reduction of bus service, and/or • delayed implementation of green bus program and failure to achieve the TransformTO net zero target by 2040.	$31.5 million
Total		$83.7 Million

Table 6. Unfunded Bus and Wheel-Trans: SOGR Requirements in the Capital Investment Plan

Project	Description	H&S, Legislative and SOGR Cash Flow Requirements ($000's)							
		2024	2025	2026	2027	2028	5-Year Total	10-Year Total	15-Year Total
FLEET – UNFUNDED									
1. Purchase of Buses	Purchase of zero emissions conventional service buses to replace buses at end of asset life.	17,719	135,514	265,748	262,968	374,537	**1,056,486**	**2,669,577**	**4,019,208**
2. Bus Overhaul	Includes the mid-life rebuild of existing bus fleet, and Scheduled Maintenance Plan (SMP) work	1,010	29,558	68,915	66,492	27,340	**193,314**	**252,527**	**655,179**
3. Purchase of Wheel-Trans Buses	Purchase of accessible buses for WT service to replace buses at end of asset life	-	-	2,331	2,814	47,028	**52,174**	**168,219**	**351,463**
4. Other	Bus Hoists and bus cleaning infrastructure, and various bus maintenance equipment purchases	-	5,318	10,654	15,024	20,727	**51,723**	**131,643**	**144,569**
INFRASTRUCTURE – UNFUNDED									
5. Charging Systems - Buses	Bus charging system required for the operation of zero emission conventional buses	83,592	145,731	115,632	179,815	49,427	**574,198**	**722,263**	**942,987**
6. Charging Systems - WT Buses	Bus charging system required for the operation of zero emission Wheel-Trans buses	-	1,002	5,939	13,442	11,087	**31,469**	**40,921**	**40,921**
7. Facilities	Storage tank replacements and subsurface remediation for garages	-	1,248	1,002	2,100	1,791	**6,141**	**6,141**	**6,141**
8. Structures	Bus stop accessibility improvements and modifications to accommodate articulated buses	-	-	12,556	19,431	20,971	**52,957**	**142,635**	**154,202**
TOTAL BUS AND WHEEL-TRANS PORTFOLIO		**102,322**	**318,370**	**482,776**	**562,086**	**552,908**	**2,018,461**	**4,133,926**	**6,314,670**

2. Streetcar: Unfunded State of Good Repair Capital Requirements

1. Introduction

In 2023, the TTC's streetcar fleet operated on 13 routes, and served over 65.5 million passenger boardings. Some of Toronto's fastest growing neighbourhoods are served by the TTC's streetcar network. The streetcar service provides access to many of Toronto's cultural, sport, academic, health, and entertainment venues and services that make Toronto a vibrant place to live and visit.

Streetcar CIP 15 Year:

Total CIP: $2.31 B
Funded: $1.34 B
Unfunded: $0.97 B
Unfunded SOGR: $0.93 B

A reliable fleet is required for passenger demand, while providing an efficient mobility option for customers. At just over 30m in length, streetcars can block intersections and corridors if disabled due to mechanical and/or electrical issues, and a reliable fleet contributes directly to avoiding lengthy and sometimes challenging vehicle recovery resulting from in-service failures.

Supporting a Larger Streetcar Fleet is a planned portfolio of investment within the TTC's Capital Investment Plan, which outlines **$2.31 billion** in investment over the next 15 years. Within that amount **$0.93 billion** is associated with unfunded health, safety, legislated and asset state of good repair needs.

Capital funding for both the streetcar 8-year SOGR and the streetcar mid-life overhaul program are unfunded commencing this year. Similar to other revenue fleets such as buses, a lack of funding will significantly impact the quality and level of streetcar service in the years ahead.

2. Background

The 2024 – 2033 Capital Program includes the completion and close out of the purchase of 204 fully accessible articulated Low Floor Light Rail Vehicles (LFLRVs). This new fleet of streetcars has replaced the legacy fleet of Canadian Light Rail Vehicles (CLRVs) and Articulated Light Rail Vehicles (ALRVs). This fully funded program also includes the procurement of 60 additional streetcars, where vehicle delivery is scheduled from 2023 to 2025 to accommodate projected service demand as it was identified in the TTC's 5-Year Service Plan & 10-Year Outlook.

The design life for the streetcar fleet is 30 years and TTC's streetcar fleet, will be due for its mid-life rebuild beginning in 2030, with a prototype in 2028. TTC's streetcar fleet is currently operating over its reliability target of 35,000 km and less than 1.5% of peak daily service experiences an in-service failure.

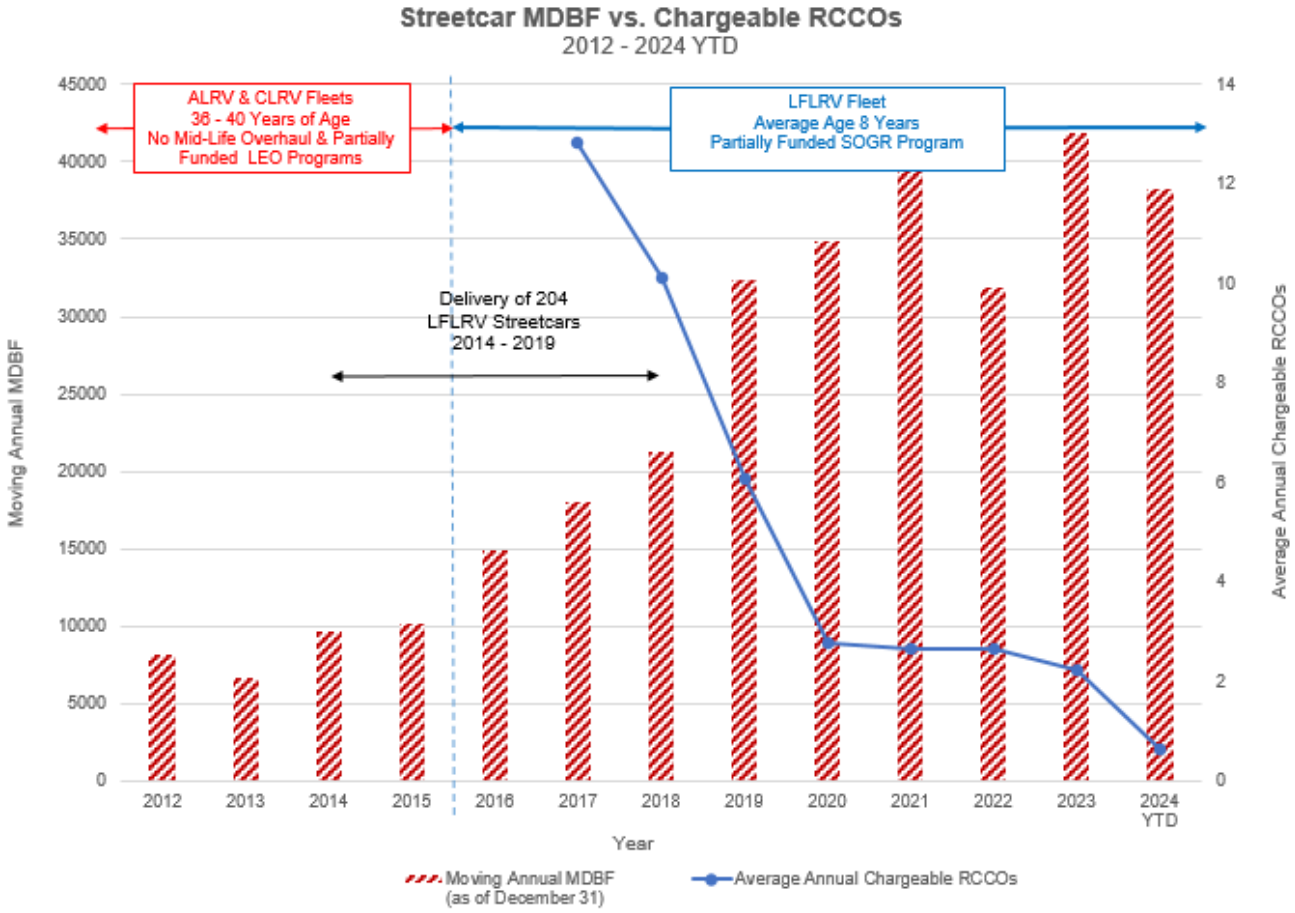
As part of an effective asset management program and due to the long-life expectancy of rail vehicles, SOGR programs are required at major intervals along the lifespan of streetcar vehicles. The first milestone and major program is the 8-year SOGR program.

Pre-LFLRV Streetcar Fleet – Lessons Learned

Similar to the bus fleet, the streetcar fleet also experienced past underfunding of capital programs. Prior to the LFLRV fleet, TTC's ALRV and CLRV streetcar fleet did not receive mid-life overhauls, was extended past their intended life cycles (more than 10 years) and received limited capital funds to perform life extension overhauls.

As a result, maintenance programs for these fleets focused on safety critical systems rather than vehicle reliability. Subsequently, service levels for both the ALRV and CLRV fleets were reduced from 2014 to 2016 from peak daily service levels of 209 to 138. To address this service degradation, bus backfill was required to supplement streetcar service. The following table is the history of the TTC's streetcar fleets

Figure 5. Streetcar MDBF vs. Chargeable RCCOs (2012 -2024 YTD)



3. Immediate Priorities

The following section highlights the most immediate asset state-of good repair priorities within the next 5 years that require funding to be secured in the 2025 budget process. The following tables reflect the 2024 approved budget submission.

Streetcar – 8 Year SOGR Program: To ensure that this new fleet is maintained in a state-of-good-repair (SOGR), a comprehensive overhaul program will be carried out. A SOGR prototype was completed 2021 with production completed on 10 LFLRV's completed in 2022. This program will incorporate work recommended by the manufacturer and work found necessary through service experience. The project scope includes maintenance of the train control and monitoring systems, couplers, brakes, wheel flange lubrication trucks propulsion, auxiliary electrical systems, HVAC, pantograph and trolley pole communication sanding, and carbody, etc.

Streetcar Midlife Overhaul – 16 Years: The streetcars were phased into revenue service starting 2014, and the vehicle manufacturer recommends undertaking a midlife overhaul at 16 years of life. The midlife overhaul is necessary to ensure safe and reliable operation for the remaining 14 to 16 years of life. The scope will include renewal of major systems, replacement of obsolete systems. Further, the overhaul provides an opportunity to incorporate advances in technology. This will ensure ongoing reliability of the streetcars, reduce downtime, and improve the overall availability of the streetcar fleet. While this overhaul is due beginning in 2030, technical planning and long lead times of components, parts and assemblies require TTC to commence planning now and prototyping a vehicle no later than 2028. Engineering work to define the scope and cost estimates will commence in 2024, subject to funding.

Table 7. Unfunded Streetcar SOGR Requirements - First 5 Years (2024- 2028)

Immediate Priority	Impact of Not Investing	Funding Required
Streetcar – 8 Year SOGR Program Approx. 121 Streetcars	• Reduced fleet reliability and asset availability if move to fix on fail practice • Degraded quality of service • Increased need for bus replacement on routes in order to meet service requirements (see unfunded bus requirements above.)	$87.2 million
Streetcar Midlife – 16 Years SOGR		$62.0 million
Total		$149.2 million

Table 8. Unfunded Streetcar: SOGR Requirements in the Capital Investment Plan

Project	Description	H&S, Legislative and SOGR Cash Flow Requirements ($000's)							
		2024	2025	2026	2027	2028	5-Year Total	10-Year Total	15-Year Total
FLEET - UNFUNDED									
1. Streetcar Overhaul	Comprehensive overhaul program to ensure the state of good repair of the streetcar fleet	1,000	18,534	64,108	25,251	40,329	**149,222**	**374,920**	**492,993**
2. Other Fleet	Maintenance and streetcar carhouse shop equipment required for TTC streetcars	712	-	-	635	1,008	**2,356**	**7,913**	**13,255**
INFRASTRUCTURE - UNFUNDED									
3. Systems	Traction power distribution systems, alternative traction feeds for intersections and rehabilitation of streetcar track switches	1,740	873	926	1,062	156	**4,757**	**5,356**	**57,766**
4. Linear Infrastructure	Surface track replacement for streetcar routes, reconstruction of streetcar overhead infrastructure and overhead pole replacement	-	-	-	-	-	**-**	**53,656**	**360,723**
5. Structures	TTC Streetcar Shelter Reconstruction	-	-	-	-	-	**-**	**-**	**3,333**
TOTAL		**3,452**	**19,407**	**65,035**	**26,948**	**41,492**	**156,335**	**441,845**	**928,071**

3. Subway: Unfunded State of Good Repair Requirements

1. Introduction

Subway CIP 15 YR:

Total CIP: $ $27.61 B
Funded: $7.94 B
Unfunded: $19.67 B
Unfunded SOGR: $3.99 B

TTC's subway system is the main arteries of the City of Toronto's transit network. In 2023, the subway fleet had approximately 304.2 million annual boardings.

Modernizing the Subway and Expanding Capacity is a planned portfolio of investment within the TTC's Capital Investment Plan, which outlines **$27.61 billion** in investment over the next 15 years. Within that amount **$3.99 billion** is associated with unfunded health, safety, legislated and asset state of good repair needs. Other unfunded components of this portfolio not discussed below include capacity enhancement programs and growth trains to address forecasted demand. These are also important projects to keep up with forecasted population growth, changes in land use that add more density near transit, and importantly transit expansion already underway. However, maintaining the base system in a state of good repair is foundational, and is therefore prioritized first for investment.

2. Background

TTC's subway network consists of three lines that act as major arteries in a multi-modal transit system. As part of an effective asset management program, the replacement of trains at end of life and the implementation of SOGR programs at major milestones are critical for the success of not only subway service but of the entire TTC network. Major delays on any given line can result in major traffic congestion on city surface routes, overcrowding on adjoining subway lines and a negative customer experience.

To maintain the subway fleet in a state of good repair, subway operations requires the replacement of Line 2 trains (T1 Trains). Subway fleets additionally require ongoing SOGR capital maintenance to keep the fleets safe and reliable through their service life.

3. Immediate Priorities

The following section highlights the most immediate asset SOGR priorities within the next 5 years that require funding to be secured in the 2025 budget process.

Line 2 Replacement Trains

As previously reported, to modernize Line 2, the TTC is seeking to advance the RFP for 55 replacement trains. The procurement will allow for future options to be exercised for growth trains for Line 1 and transit expansion (not represented in Table 9). The $1.52 billion required for the procurement of 55 replacement trains on Line 2 represents the total remaining funding requirement in the 15-year CIP. The Provincial government has committed to $758 million for the replacement trains, and this contribution is contingent on matching Federal funding. The City has approved a one-third share of funding.

If full funding for the T1 replacement fleet procurement is not secured by Q1 2025, additional SOGR interventions are required to keep the T1 fleet safe, reliable, and operational. This includes further SOGR program extension to 35 years; and implementing a 10 Year Life Extension Overhaul (LEO) program. The costs of these provisional programs are not included in the CIP. Available municipal funding for the trains and ATC on Line 2 would need to be redirected.

See following from the June 2024 TTC Board:

- Presentation: June 2024: Spotlight on New Subway Train Procurement
- Backgrounder: FAQ - Line 2 Subway Trains

Line 1 and Line 4 (Toronto Rockets) Subway Car Overhauls

The Capital Plan includes partial funding of $233 million over the 10-year period for the ongoing maintenance of the TR subway fleet. To maintain the trains in a state of good repair, comprehensive refurbishment programs are scheduled at various intervals of the assets life. This program incorporates work recommended by the Original Equipment Manufacturer/Car Builder and through TTC service experience. To fully fund the fleet overhaul program, incremental funding of $96.2 million in the first five years, and $253 million total over the 15-year period is required starting in 2026.

Deferral of this project could result in degraded reliability, a decline in availability, increased risk of failure, higher maintenance costs, and poor customer service on Lines 1 and 4. Stable long-term funding is required to establish reliable supply chains for long-lead-time materials in support of this program. Interruptions in funding can result in delayed procurement and material delivery, reduced productivity and work stoppages.

Subway Systems SOGR

The main categories of systems relevant to the Subway Portfolio are communications, signalling, and electrical/traction power. Many of the TTC's communications assets are outdated and showing signs of deterioration, the Line 2 fixed-block system has been in service in most sections for up to 58 years (commissioned between 1966 and 1980), and the present levels of funding for Electrical/Traction Power assets are insufficient given the rate at which the assets require replacement. Failure of one or more of these systems can lead to service disruptions and/or closures. The immediate requirement for funding identified in the CIP is $124.5 million in the first five years and $988.4 million over the 15-year period.

Subway Facilities SOGR

Rail maintenance facilities, which TTC has 4 of, include carhouses, interior and exterior storage tracks and power substations as well as one component and heavy repair shop. The TTC also has 70 active subway stations along with 157 passenger elevators, 7 freight elevators, and 329 escalators. While not an all inclusive list of the Subway Portfolio Facilities assets, the carhouses, subway stations and elevating devices require the most significant investment. In total, to maintain the state of good repair for subway facility assets, $454.4 million is required over the 15-year CIP, with the immediate requirement of $92.6 million needed in the first 5 years.

Table 9. Unfunded Subway SOGR Requirements - First 5 Years (2024- 2028)

Immediate Priority	Impact of Not Investing	Funding Required
Line 2 Subway Replacement Trains (55 Trains)	• Requires extending the life of the T1 fleet past its useful life through a Life Extension Program (Capital Investment Required); • Delayed modernization of Line 2 • Reduced fleet reliability and asset availability if move to fix on fail practice • Degraded quality of service, crowding, and service reliability impacts • Negative impacts to interdependent projects – no active train procurement to exercise options for future growth (Line 1, 2) and transit expansion (YNSE, SSE) • Increasing sunk costs	$1.52 billion (cash flowed over 15-year CIP)
Line 1 and Line 4 (TR) Subway Train SOGR Program	• Reduced fleet reliability and asset availability if move to fix on fail practice • Degraded quality of service • Disruption to supplier relationships – stable funding required to establish reliable supply chains for long-lead time materials. • Workforce impacts and reduced productivity due to disruptions in steady state program.	$96.2 million
Subway Systems SOGR Program	• Service disruptions and/or closures • Increased need for bus replacement in order to meet service requirements (see unfunded bus requirements above.)	$124.5 million
Subway Facilities SOGR Program	• Impacts to accessibility if elevators, escalators out of service; impacting customer and employee experience; • Station finishes in disrepair – create impacts to customer satisfaction and perception of system – potential downstream impacts to ridership retention.	$92.6 million
Total		$1.83 billion

Table 10. Unfunded Subway: SOGR Requirements in the Capital Investment Plan

Project	Description	H&S, Legislative and SOGR Cash Flow Requirements ($000's)							
		2024	2025	2026	2027	2028	5-Year Total	10-Year Total	15-Year Total
FLEET - UNFUNDED									
1. Purchase of Subway Cars	Purchase of 55 new subway trains to replace the aging T1 trains on Line 2 and meet ATC requirements	-	110,614	72,420	53,559	21,544	**258,136**	**1,265,767**	**1,591,496**
2. Subway Car Overhaul	Overhaul of the TR subway fleet to maintain state-of good-repair (Interdependent with #3)	-	-	30,666	31,651	33,931	**96,248**	**115,738**	**252,808**
3. Other Fleet	Engineering and shop equipment purchases to support subway SOGR work and maintenance of subway workcars (Interdependent with #2)	1,174	6,989	11,168	9,224	6,843	**35,399**	**67,797**	**110,304**
INFRASTRUCTURE - UNFUNDED									
4. Systems	Traction power, power distribution / electric systems, communications and signal systems	14,961	21,189	20,160	25,391	42,820	**124,521**	**393,737**	**988,359**
5. Facilities	Overhaul and replacement of pumps, elevators and escalators, subway facility and station finish renewal projects	-	2,895	8,151	32,747	48,850	**92,643**	**297,631**	**454,393**
6. Structures	Fire ventilation upgrade & second exits, bridges and tunnels structural rehabilitation programs and asbestos removal program	-	-	408	6,445	9,224	**16,077**	**56,914**	**394,592**
7. Linear Infrastructure	Subway track and turnout rehabilitation and rail grinding	-	-	-	-	-	**-**	**-**	**197,876**
TOTAL SUBWAY PORTFOLIO		**16,136**	**141,687**	**142,973**	**159,017**	**163,212**	**623,025**	**2,197,585**	**3,989,829**

4. Facility State of Good Repair Requirements

The facilities state of good repair requirements includes garages, yards, carhouses and various other buildings that play a critical role in supporting one or multiple aspects of the TTCs integrated network. These assets all require facility renewal programs to ensure building assets, such as HVAC, boilers, roofs and structures are functional and maintained in a state of good repair, but can also contribute to achieving Net Zero 2040 through retrofitting to reduce energy consumption. Failing to maintain these assets in a state of good repair could lead to safety issues, works refusals and/or partial to full closure of facilities, which could effect service depending on the facility impacted.

Table 11. Unfunded Facilities: SOGR Requirements in the Capital Investment Plan

Project	Description	H&S, Legislative and SOGR Cash Flow Requirements ($000's)							
		2024	2025	2026	2027	2028	5-Year Total	10-Year Total	15-Year Total
INFRASTRUCTURE - UNFUNDED									
1. Roofing Rehabilitation Program	Replacement of roofs at TTC facilities	-	1,775	21,665	34,615	36,169	**94,224**	**228,956**	**282,608**
2. Other Facilities Programs	Various facility renewal and construction projects, on-grade paving rehabilitation and Masonry Structure Restoration Program	-	11,126	57,529	115,958	116,819	**301,432**	**743,020**	**973,237**
3. Major Control Centre	Construction of new transit control to support TTC growth across various modes and ITS data centre requirements	-	-	22,135	82,617	136,613	**241,365**	**458,814**	**458,814**
TOTAL FACILITY PORTFOLIO		**-**	**12,901**	**101,329**	**233,189**	**289,601**	**637,021**	**1,430,790**	**1,714,659**

Roofing Rehabilitation Program

Many of the roof assets at TTC facilities (including subway and rapid transit stations, garages, carhouses, shops, substations, office buildings and other facilities) exceed the normal life expectancy. There is a need for a sustained replacement and rehabilitation program to avoid excessive maintenance costs, deterioration of building structures and detrimental effects on mechanical and electrical equipment through prolonged exposure to moisture. The program is currently under-funded as the CIP identifies a need for $94 million in the first five years and a total of $283 million over the 15-year CIP.

If replacement of roofing systems are not carried out, then deterioration will continue; leakage will increase, damage to the underlying building structures and equipment will increase and slippery conditions will be created at floor levels will result in unsafe conditions, operational delays, and increased annual maintenance costs

Facility Renewal Programs

Outside of property acquisitions and expansions, the CIP includes a myriad of facility renewal programs to ensure all are maintained in a state of good repair to optimize their use in support of the integrated network:

- 70 Subway Stations
- 69 Traction Power Substations
- 41 Maintenance and Storage Facilities
- 27 Bus and Streetcar Loops
- 72 Third Party Access Points at 30 Stations
- 17.4 Million Square Feet of Industrial Space
- 440,000 Square Feet of Office Space

The CIP identifies $973.2 million in unfunded requirements. Scope of the facility renewal programs range from heavy equipment replacement (HVAC, Boilers, etc.), structural repairs, safety system upgrades/replacement, staff rooms, including breakrooms, change rooms and washrooms, amongst a number of different assets. Failure to renew our facilities in a timely manner poses a number of risks that range from Occupational Health and Safety violations, works refusals and/or partial to full closure of facilities, which could effect service depending on the impacted facility.

Major Control Centre

The project contains components that are SOGR and Growth. The current Transit Control Centre is a centralized control centre for the operation of the TTC's subway, streetcar, and bus networks, including ancillary groups, such as Power Control, Special Constable Service, Equipment Control, and Technical Support. A new facility is proposed to become the primary control centre and accommodate the long-term TTC Transit Control and ITS Data Centre requirements to 2045. The existing facility would become a back-up facility. This is project is currently unfunded.

5. Network Wide State of Good Repair Requirements

Some of the assets that the TTC maintains do not support a specific mode, but indirectly support the integrated network of transit services. The table below summarizes the key Health and Safety, Legislative and SOGR investments, necessary to support Network Wide Assets.

Table 12. Unfunded Network Wide: SOGR Requirements in the Capital Investment Plan

Project	Description	H&S, Legislative and SOGR Cash Flow Requirements ($000's)							
		2024	2025	2026	2027	2028	5-Year Total	10-Year Total	15-Year Total
INFRASTRUCTURE - UNFUNDED									
1. IT Systems /Infrastructure	Various IT systems/software SOGR programs	1,201	9,639	25,489	38,722	28,660	**103,711**	**114,752**	**114,752**
2. Systems	Energy storage and renewable energy generation systems, and fall prevention systems to comply with City TransformTO	16,928	21,437	21,938	16,938	16,988	**94,228**	**154,867**	**216,832**
FLEET - UNFUNDED									
3. Charging Systems - Automotive Non Revenue Vehicles	Charging Systems for procurement of electric automotive non-revenue vehicles (Interdependent with #4)	-	4,712	3,609	5,992	1,461	**15,774**	**57,361**	**71,437**
4. Purchase of Automotive Non Revenue Vehicles	Procurement of service trucks, utility trucks, road rail overhead service trucks and various vehicles for various TTC departments (Interdependent with #3)	-	-	3,697	9,819	8,676	**22,193**	**98,129**	**187,330**
TOTAL NETWORK WIDE PORTFOLIO		**18,129**	**35,789**	**54,732**	**71,471**	**55,785**	**235,906**	**425,108**	**590,350**

Information Technology System / Infrastructure

Technology plays a crucial role. As a result, many business modernization initiatives and SOGR programs related to ITS Systems/Equipment are in-flight and fully funded. The constraints identified in this program mostly relate to the Corporate Camera Strategy and Delivery project, which is a Health and Safety initiative, initiated to develop a consistent, and centralized approach for implementation and oversight of TTC closed circuit television (CCTV) systems, policies and processes. It has the goal to integrate principles of reliability, customer and employee care across the organization into CCTV practice. If funded, the program will support the delivery of existing video-related projects, introduce innovative and effective applications of video technology.

Systems – Renewable Energy Project, Energy Storage Systems

In compliance with the City's Transform TO Net Zero 2040 strategy this program is categorized as 'Legislated'. The Renewable Energy Project aims to implement cost-efficient sources of renewable energy generation. Interdependent with renewable energy generation is the Energy Storage Systems (ESS) project, which can contribute to meeting electricity demand during peak times, when electricity is more expensive. The system gives the TTC the option to buy electricity during off-peak times and use it during peak times. Energy storage also helps provide resilience in extreme weather conditions since it can serve as a backup energy supply during power disruptions. Absent future investing in these projects, the TTC will not be able to reduce carbon emissions and air pollution from energy production, and would not be a resilient as planned during unexpected power outages.

Automotive Non-Revenue Vehicles

Automotive Non-Revenue Vehicles are used by various TTC departments. The program involves the procurement of service trucks, cargo vans, utility trucks, vacuum trucks, fuel trucks, pickup trucks, road rail overhead service trucks and various other types of vehicles based on user group requirements. The current fleet of vehicles have a design life that ranges from 7-15 years, but the actual average age of the fleet ranges from 8-20 years. The fleet plan takes into account vehicle usage, age, yearly conditions assessments and maintenance costs to determine the optimal replacement point. Due to a lack of funding, many non-revenue vehicles are kept beyond the recommended design life. Continuous underfunding of this program will result in higher maintenance costs for older units, and reduced efficiencies if user groups are unable to perform core work due to a lack of proper vehicles.

Automotive Non-Revenue Vehicles - Charging Systems

Interdependent with the purchase of Automotive Non-Revenue Vehicles, the purpose of the Charging Systems program is to implement electrification infrastructure to support the transition of the non-revenue fleet to zero emissions by the year 2040. The Program consists of the implementation of electrification infrastructure retrofits at various TTC facilities. The project requires $15.8 million over the next five years to keep pace with the proposed electric vehicles procurements as a replacement for the existing fleet.

Index of Figures and Tables