CAPITAL INVESTMENT PLAN

Making Headway

Capital Investments to Keep Transit Moving

2019–2033

headway

(/ˈhed wā/) *noun*

1. forward movement or progress, especially when the way is difficult.
2. the average interval between trains, streetcars, or buses. The shorter the headway, the more passengers carried per hour.

Making Headway — Capital Investments to Keep Transit Moving

January 2019

From the Chief Executive Officer

In January 2018, the TTC published a new Corporate Plan that clearly laid out our priorities for the next five years. At the top of the list was transforming for financial sustainability. “Fiscal sustainability,” we said, “depends on our ability to fund what the TTC is being asked to deliver over the long term.” We committed to providing better budget information for improved long-term decision-making. Over the past 12 months, we have undertaken a massive, multi-department review of all of our assets. The result is this Capital Investment Plan.

Toronto’s transit system is hailed as among the most multi-modal systems in the world, with seamless integration between buses, streetcars, Wheel-Trans and the subway. The TTC’s interdependent network of fleet, track, power, maintenance and other infrastructure moves more than half a billion people annually.

Funding for critical maintenance and system improvements is necessary. Projects that have been approved are still awaiting funding. Line 2 Capacity Enhancement is unfunded. Buses past 2021 are unfunded. The expansion of Bloor-Yonge Station, which is needed to accommodate ridership growth even before planned transit expansion, is unfunded.

The TTC Way, which was introduced in our Corporate Plan, establishes clear guidelines for how we at the TTC work with each other, with customers and with our partners, including our funding partners. We respect each other’s expertise, work together to achieve our common goal, offer solutions rather than roadblocks and seek outcomes that work for everyone.

It’s in that spirit that we submit this Capital Investment Plan and look forward to continuing the conversation.

Richard J. Leary
Chief Executive Officer
Toronto Transit Commission

Table of Contents

The Transit Imperative

Every weekday, about 1.7 million rides are taken on Toronto's public transit system, which is one of the most integrated multi-modal transit networks in the world. It carries our customers to work, to school, to appointments, to cultural events, to meetings with friends and meals with family, to their communities and back home again.

Accounting for 85 per cent of all transit trips in the GTA, the TTC is the primary public sector connector of people, leisure, services and employment in an economy that represents 20 per cent of Canada's total GDP. As such, it plays a unique role in the vibrancy and health of our province and our nation.

Canada's largest city is a place where multi-modal mobility thrives, regional economic opportunities and cross-boundary travel boom, new development abounds and emissions targets are met. But continuing to realize these benefits depends on the investments we make in transit.

A backlog of deferred maintenance has grown, putting the safety, accessibility and sustainability of our transit system at risk despite the need to move more customers more reliably than ever before.

Delivering the future we all want requires a new approach to predictable, sustainable funding for capital investments.

It is easy for the need to invest in our base transit system to be overshadowed by the need to fund transit expansion. But investing to properly maintain and increase the capacity of our current system is arguably even more important.

Population growth and planned transit expansion projects such as SmartTrack, the Relief Line South, the Line 2 East Extension to Scarborough and new LRT lines on Eglinton and Finch West will add hundreds of thousands more customers to Toronto's transit network.

The result will dramatically increase pressure on a system already grappling with an aging fleet, outdated signals on key subway lines, inadequate maintenance and storage capacity, and tracks and infrastructure in need of constant repair.

Without the investments outlined in this Plan, service reliability and crowding will worsen, as the maintenance backlog grows and becomes more difficult and costlier to fix. This is the fate now faced by some other major transit systems in North America that allowed their assets to badly deteriorate.

Our customers, our city, our province and our nation can't afford to let that happen.


126 CHRISTIE
TO CHRISTIE STN
TD
salsa
TORONTO
Festival

This Capital Investment Plan provides a full and clear view of what is required to keep transit in Toronto moving, based on the province's Regional Transit Plan and the Council-approved plans of the City of Toronto.

In 2014, the TTC began including "unfunded projects" in its annual budget submissions. These included necessary state-of-good-repair, safety, legislated, reliability-improvement and capacity-enhancement projects for which funding had not been provided. Despite the TTC's and the City's efforts to advocate with other levels of government, the list has grown each year.

In line with its commitment to transform for financial sustainability, the TTC redesigned its capital budgeting process over the course of 2018, including asset-based budgeting and capital projections based on asset life. All departments embarked on a comprehensive review of base capital needs over the next 15 years. The results are summarized in this Plan.

This document is not a fully costed, detailed budget. In many cases, the estimates are preliminary. Given the scale of the investment required, however, it would be irresponsible to delay conversations about funding until estimates are exact.

What are base capital investments?

Base capital investments are investments in our current fleet, facilities and infrastructure, as distinct from planned expansion projects like new subway extensions. Base capital investments include undertaking major state-of-good-repair maintenance to preserve current levels of service, replacing vehicles, infrastructure and equipment at the end of their life, and making improvements to support projected ridership demand.

How accurate are capital cost estimates?

In many cases, the estimates in this Plan are preliminary rough order-of-magnitude projections intended for planning purposes only. The planning and design of large capital projects proceeds through a series of "stage gates," which increase certainty and accountability and reduce risk. At each gate, estimates are further refined. As a result, these estimates will inevitably be subject to change.

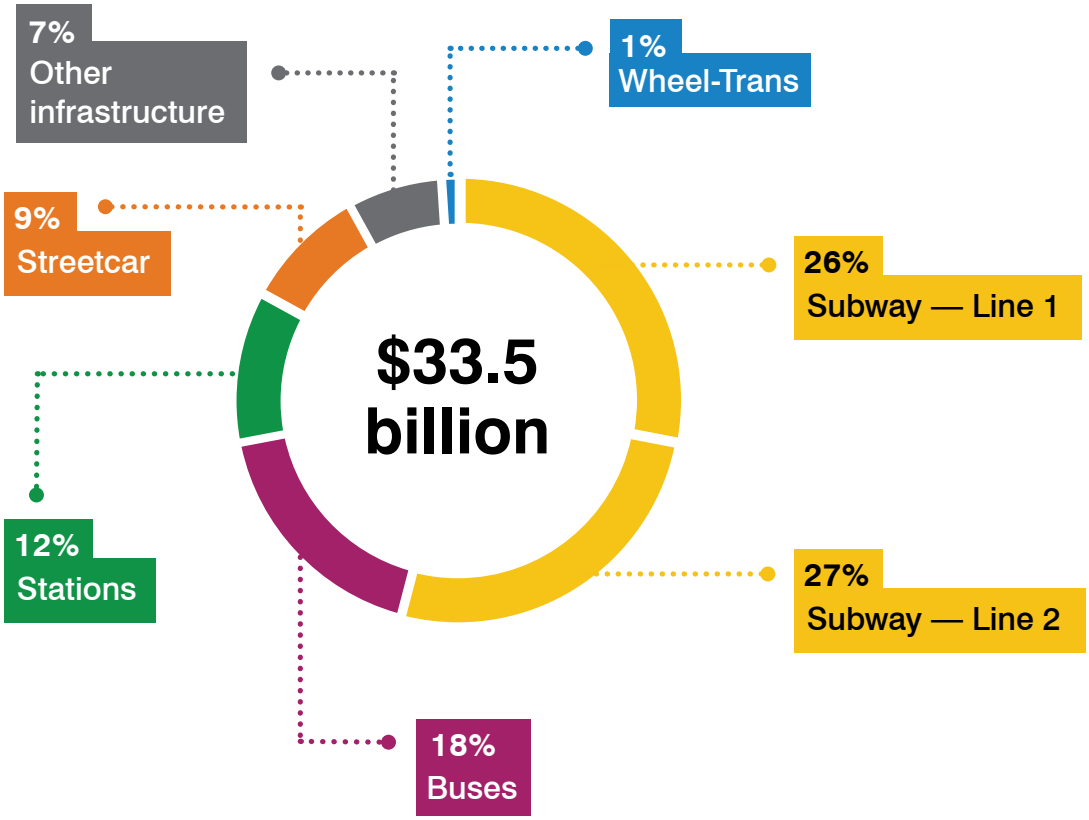
What is the time horizon?

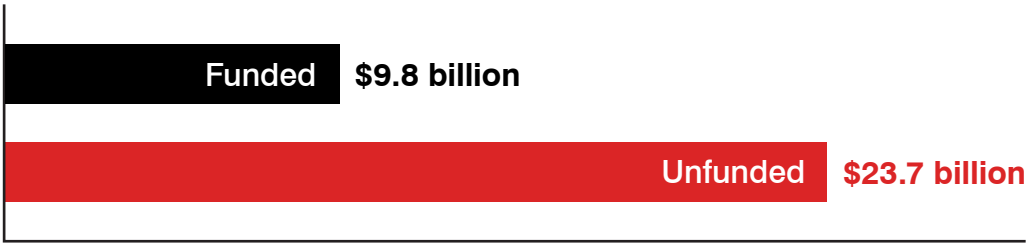
Traditionally, TTC Capital Budgets cover a 10-year period. To enable long-term decision-making, predictable and sustainable funding and a proactive approach to maintenance based on the useful life of our assets, this Capital Investment Plan extends the horizon to 15 years, through 2033.

2019–2033

Investment Summary

Required Base Capital Investment Outlook 2019–2033





For funding details, see the Appendix.

Funding for TTC capital projects comes from the federal gas tax, the Public Transit Infrastructure Fund (PTIF), provincial gas tax, City of Toronto property tax-supported debt funding and capital reserves and development charges. For a breakdown of funding sources, see page 71.

Investment Highlights

Subway	Line 1	$8.9 billion total 76% unfunded
	Line 2	$9.1 billion total 75% unfunded
Buses	New and replacement buses	$3.7 billion total 85% unfunded
	New garages	$1.3 billion total 70% unfunded
Stations	Bloor-Yonge Station expansion	$1.1 billion total 100% unfunded
	Easier Access & accessibility improvements	$0.9 billion total 11% unfunded
	Platform edge doors (as possible)	$1.3 billion total 100% unfunded
Streetcars	New and replacement streetcars	$0.9 billion total 58% unfunded
	Hillcrest Complex (under consideration)	$0.9 billion total 100% unfunded
Wheel-Trans	New and replacement buses	$0.3 billion total 55% unfunded
Other Infrastructure	Information systems	$0.8 billion total 50% unfunded
	Facilities	$0.7 billion total 36% unfunded

These major investments reflect $29.9 billion of the $33.5 billion total.

2019–2033

Keeping Transit Moving: Base Capital Investments

Subway

Buses

Stations

Streetcars

Wheel-Trans


Cornerstones
SAFETY & SECURITY
ACCESSIBILITY
SUSTAINABILITY

Cornerstones

Three values form the cornerstones for capital investments at the TTC.

Safety & Security

Our fleet, stations, facilities and infrastructure must be safe for our customers, employees and the public. Base capital investments include legislated health and safety measures, the introduction of new safety features such as turn warnings on buses and streetcars and potentially the installation of Platform Edge Doors, which form a barrier between customers and subway tracks. Security is embedded in the design of our stations, fleet, infrastructure, systems and facilities.

Accessibility

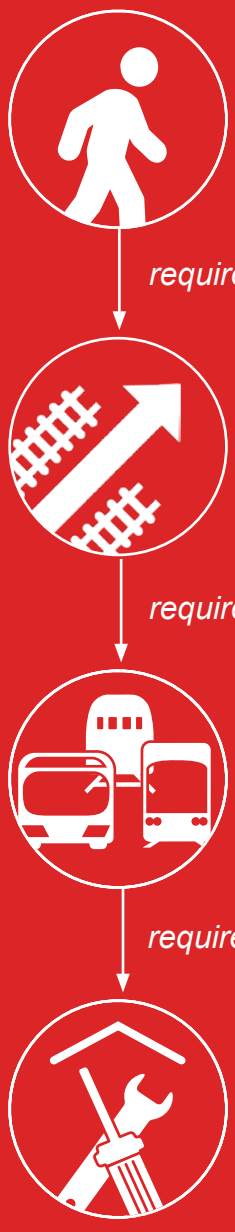
In accordance with the Human Rights Code in Ontario and the Accessibility for Ontarians with Disabilities Act, 2005 (AODA), accessibility features are embedded in all fleet and station investments and include the Easier Access program, which is making all subway stations accessible by 2025. We are transforming the TTC's integrated network of subway, bus, streetcar and Wheel-Trans service into a flexible and accessible Family of Services.

Sustainability

Keeping assets well maintained is critical to safety and reliability, as well as to reducing capital and operating costs in the long run. Base capital investments are designed to preserve the quality and maximize the life of our transit system's assets. This includes a preventative and predictive approach to maintenance, rooted in Enterprise Asset Management.

What's needed to move more customers more reliably?

Capital investments deliver on "Moving more customers more reliably," a critical path in the 2018–2022 TTC Corporate Plan.



More Customers

Population growth and planned transit expansion in and around Toronto means more customers taking the TTC.

require...

More Capacity

Improvements to track, signals, power and stations make it possible for the TTC fleet to move through the system faster and more reliably.

requires...

More Fleet

A larger fleet of accessible subway cars, buses, Wheel-Trans vehicles and streetcars deliver the benefit of increased capacity to move more customers per hour.

requires...

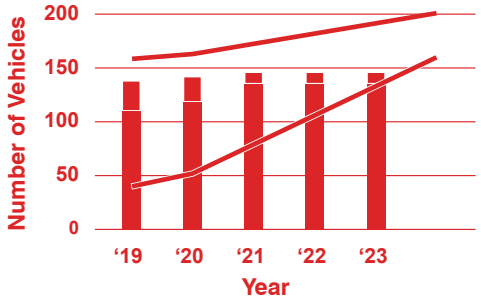
More Maintenance & Storage

More garages, shops, carhouses and yards maintain and store the larger fleet.

Understanding the Charts

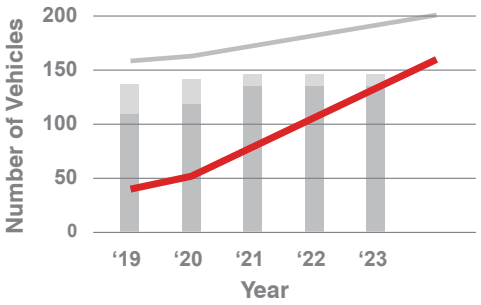
Service needs, fleet size and maintenance and storage capacity illustrate base capital needs over the next 15 years

Illustrative Example



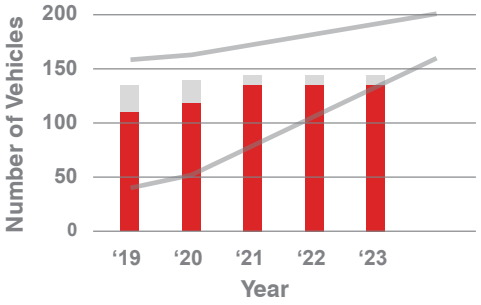
Service Needs

Number of vehicles required to meet ridership demand



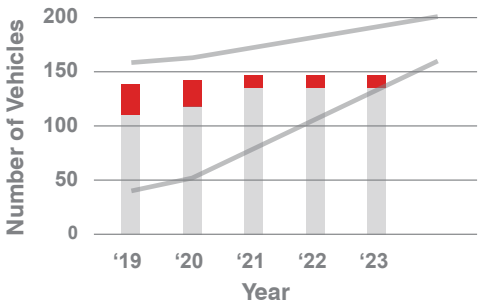
Vehicles in Service

Planned number of vehicles in service



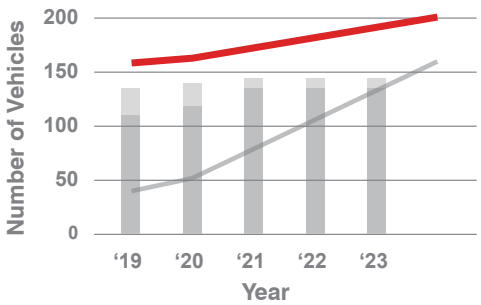
Spare Vehicles

Number of extra vehicles available to fill in for those in need of repair or to meet other service needs. Industry standard is 18–22 per cent.



Storage Capacity

Number of vehicles for which there would be sufficient storage



Base Capital Investments

Subway

Today

289 million
subway boardings each year

876
subway cars

1,000+
customers per 6-car train

96 million
kms travelled annually

4
train yards

The subway is the backbone of the GTA's transit system, arriving every two to six minutes at 75 different stations. It's also a backbone of regional transportation. One in five of all GO Transit riders regionally use Toronto's subway for part of their trip.

Toronto's subway is a complex system of trains, tracks and tunnels that must be maintained, a signalling system that governs how quickly and closely together trains can run and a traction power infrastructure (also known as "third rail" electricity) — augmented by the work trains, pumps, substations, shops and yards that keep it all running. If one part of the system fails or fails to keep up, the entire system slows down.

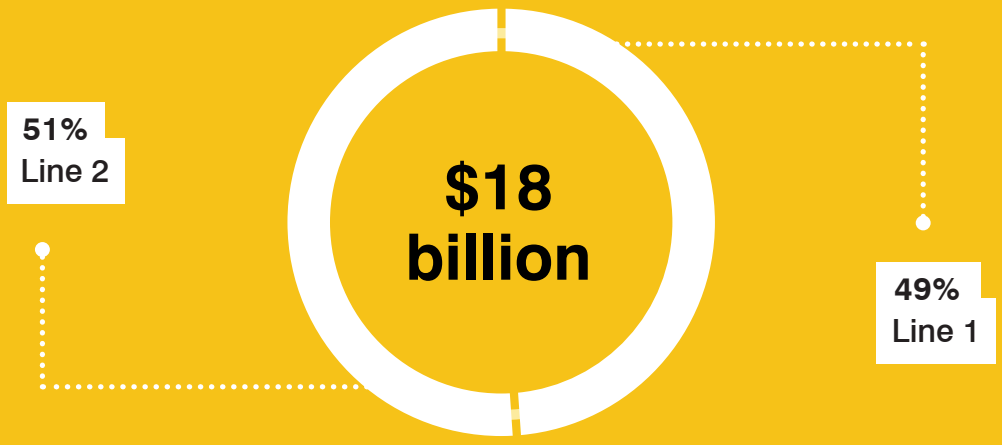
Unless key decisions are made now, population growth and planned transit expansion projects will collide with an outdated signal system, obsolete subway cars and tracks and tunnels in need of repair.

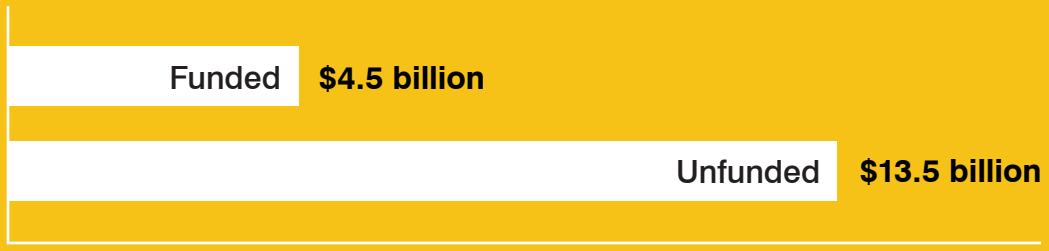
Increasing capacity and improving the reliability of the TTC's oldest subway lines, accounting for 85 per cent of all subway kilometres travelled, will be critical.

Subway

Investment Summary

Required Investment Outlook 2019–2033



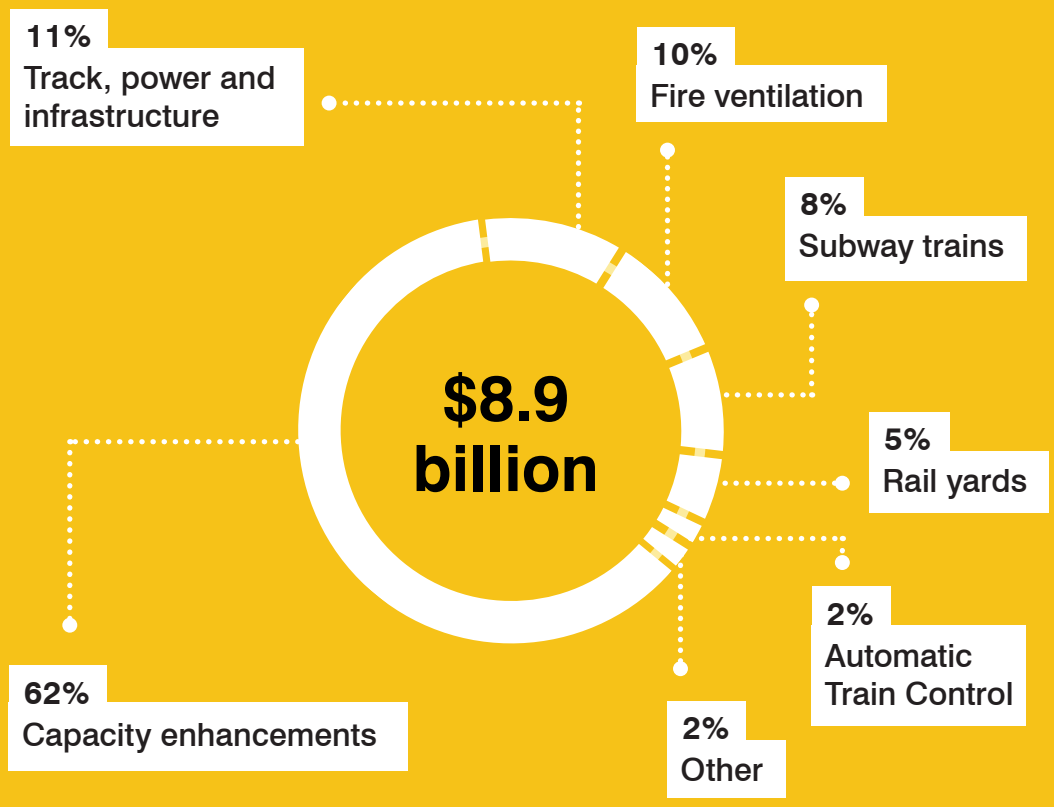


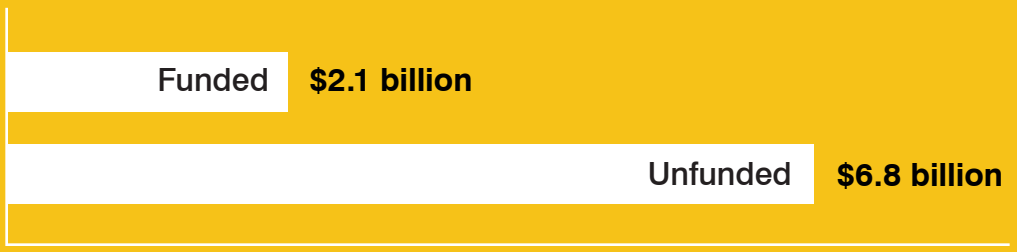
Includes $0.1 billion for Line 4. For funding details, see the Appendix.

Subway

Line 1

Required Investment Outlook 2019–2033



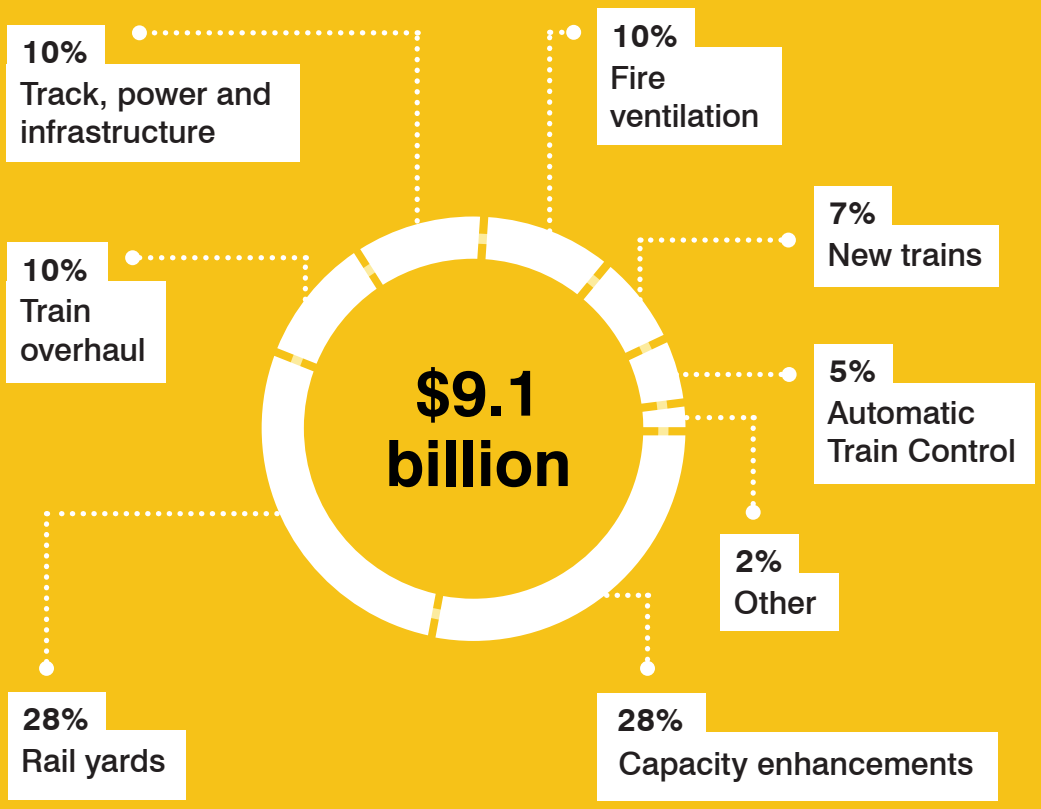


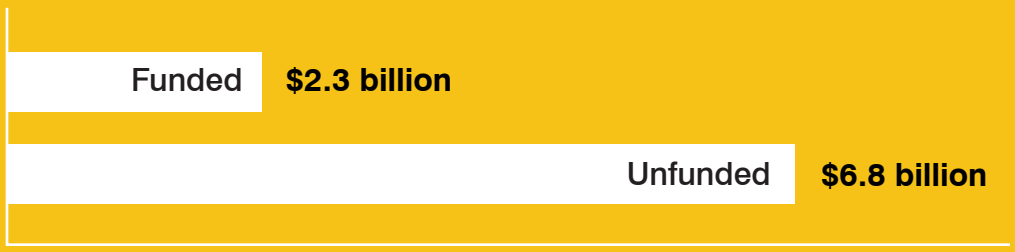
For funding details, see the Appendix.

Subway

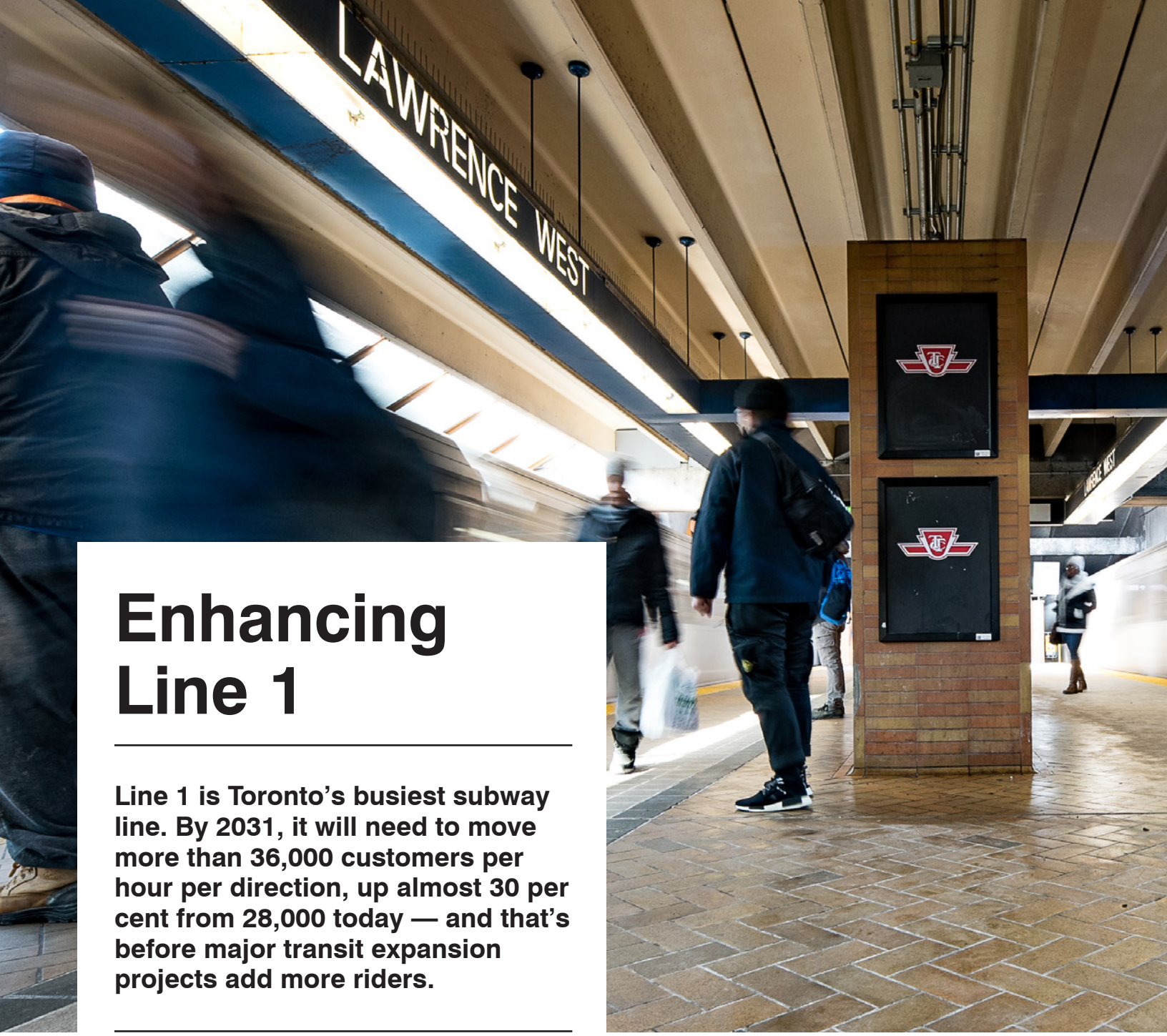
Line 2

Required Investment Outlook 2019–2033





For funding details, see the Appendix.



Enhancing Line 1

Line 1 is Toronto's busiest subway line. By 2031, it will need to move more than 36,000 customers per hour per direction, up almost 30 per cent from 28,000 today — and that's before major transit expansion projects add more riders.

+ Complete the installation of Automatic Train Control (ATC) so that more trains can safely run closer together with more consistent travel times, increasing capacity.

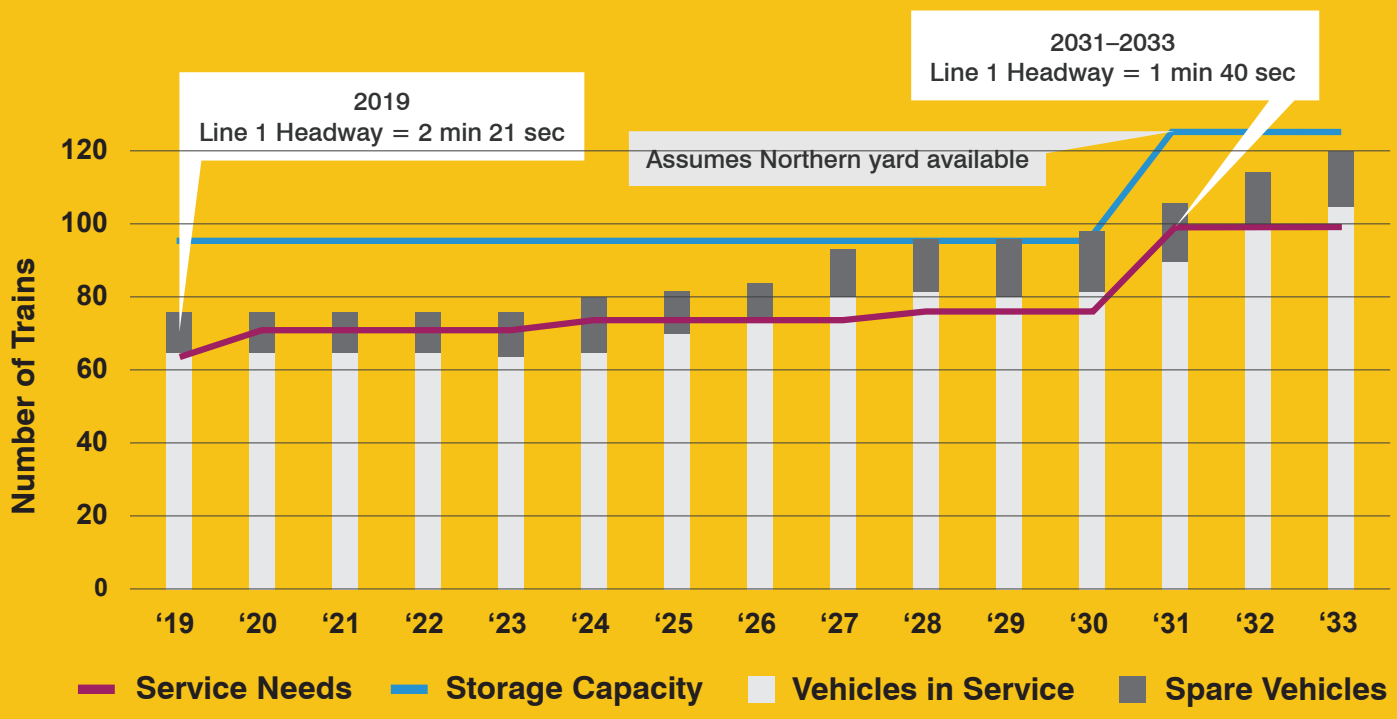
+ Upgrade traction power to support more trains running on the line.

+ Purchase 44 new subway trains, translating into a more than 50 per cent increase in the size of the Line 1 fleet.

+ Make safety-related improvements, such as expanding more emergency exit buildings and installing new or upgraded fan plants.

+ Establish a new train yard and repair and maintenance facility in the north end to accommodate the larger fleet.

+ Modify station layout and second exits to improve station capacity.



Benefits of investing

+ Trains that come 40 per cent more often during rush hour on Line 1

+ Less crowded trains and platforms during rush hour

+ Fewer delays, improved reliability and more consistent travel times

+ Sufficient maintenance and storage capacity to support transit expansion

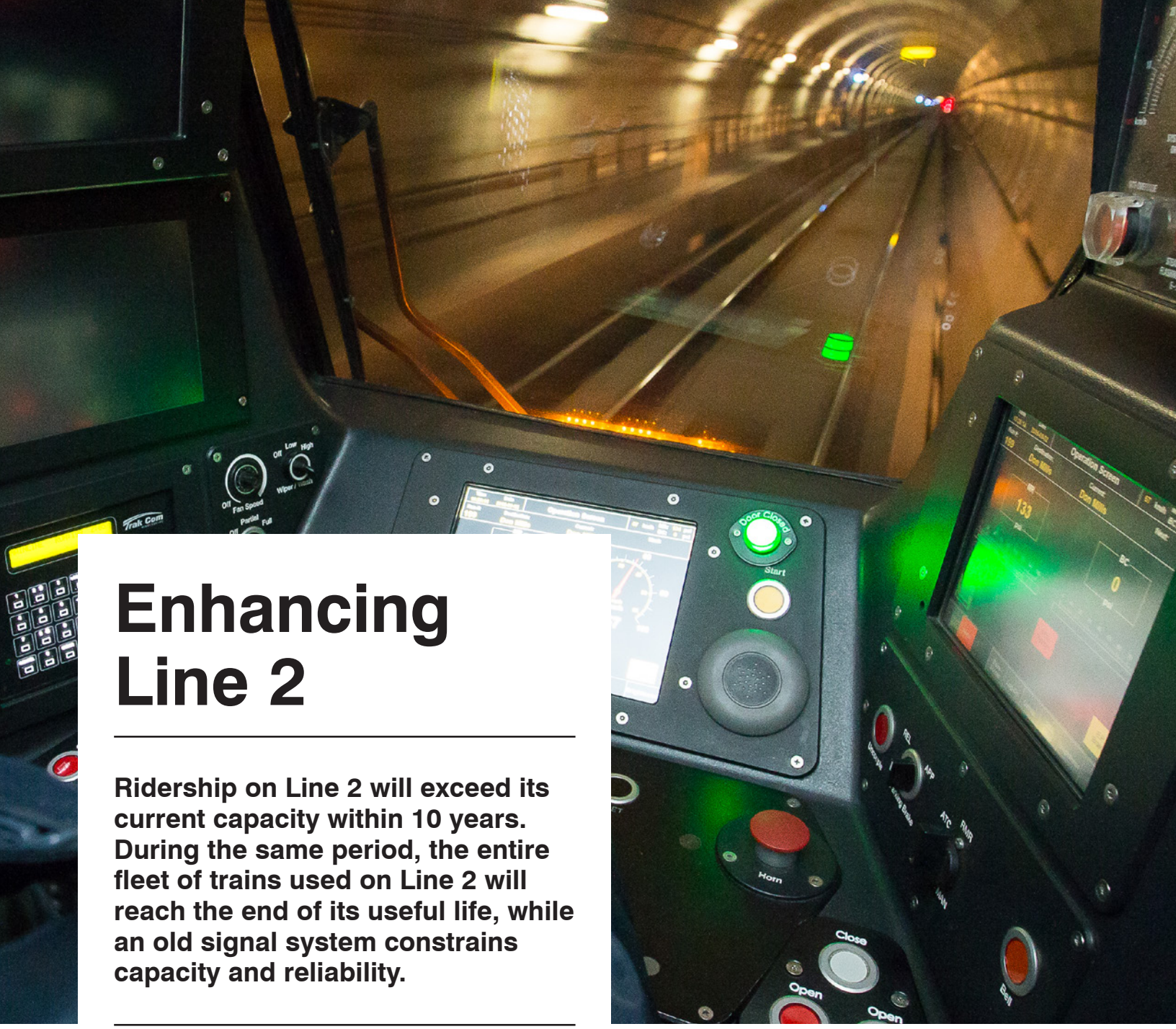
Risks of failing to invest

+ More subway delays as reliability declines

+ Longer wait times between trains

+ Trains so crowded that at times they bypass stations during rush hour

+ Insufficient capacity to support increased ridership from transit expansion projects



Enhancing Line 2

Ridership on Line 2 will exceed its current capacity within 10 years. During the same period, the entire fleet of trains used on Line 2 will reach the end of its useful life, while an old signal system constrains capacity and reliability.

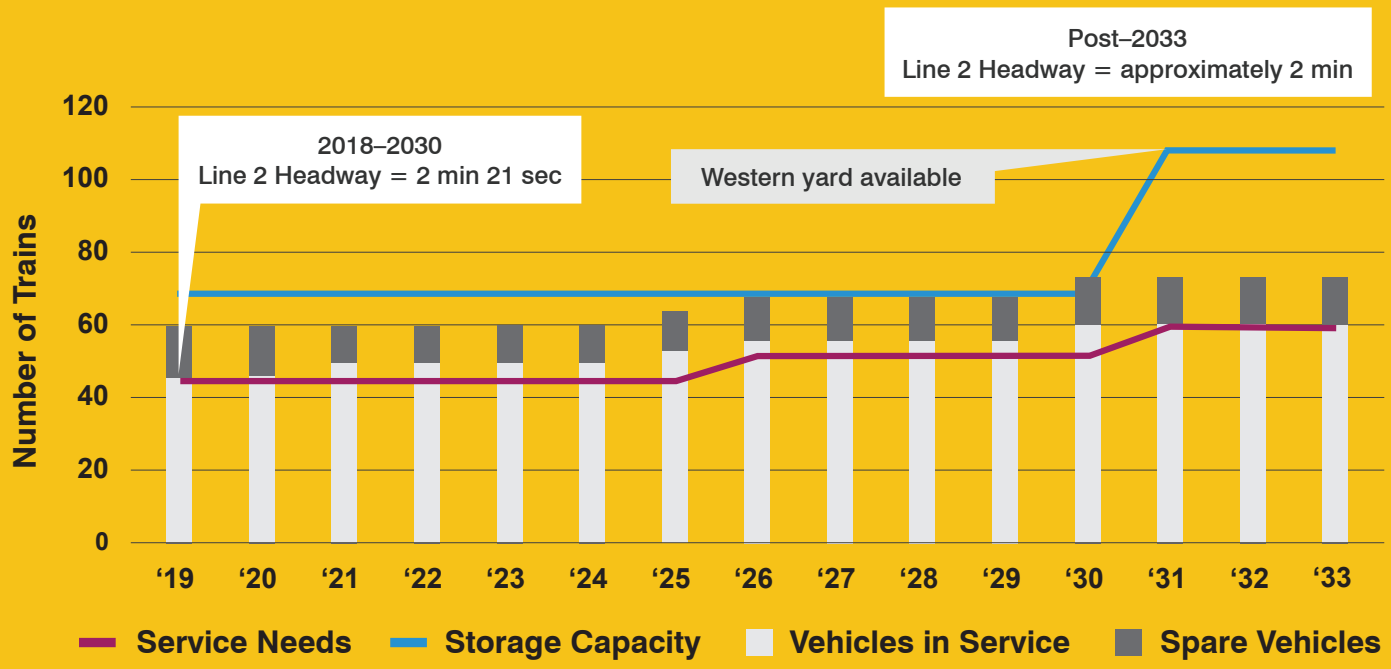
+ As with Line 1, install Automatic Train Control (ATC), to allow for safe, faster, more consistent travel times, once ATC-equipped trains are in service.

+ Upgrade traction power to support more trains running on the line.

+ Make safety-related improvements, such as expanding more emergency exit buildings and installing new or upgraded fan plants.

+ Overhaul 30-year-old trains to extend their useful life by another ten years.

+ Establish a new Western train yard near Kipling Station for storage and maintenance of the larger fleet of Line 2 cars.



Benefits of investing

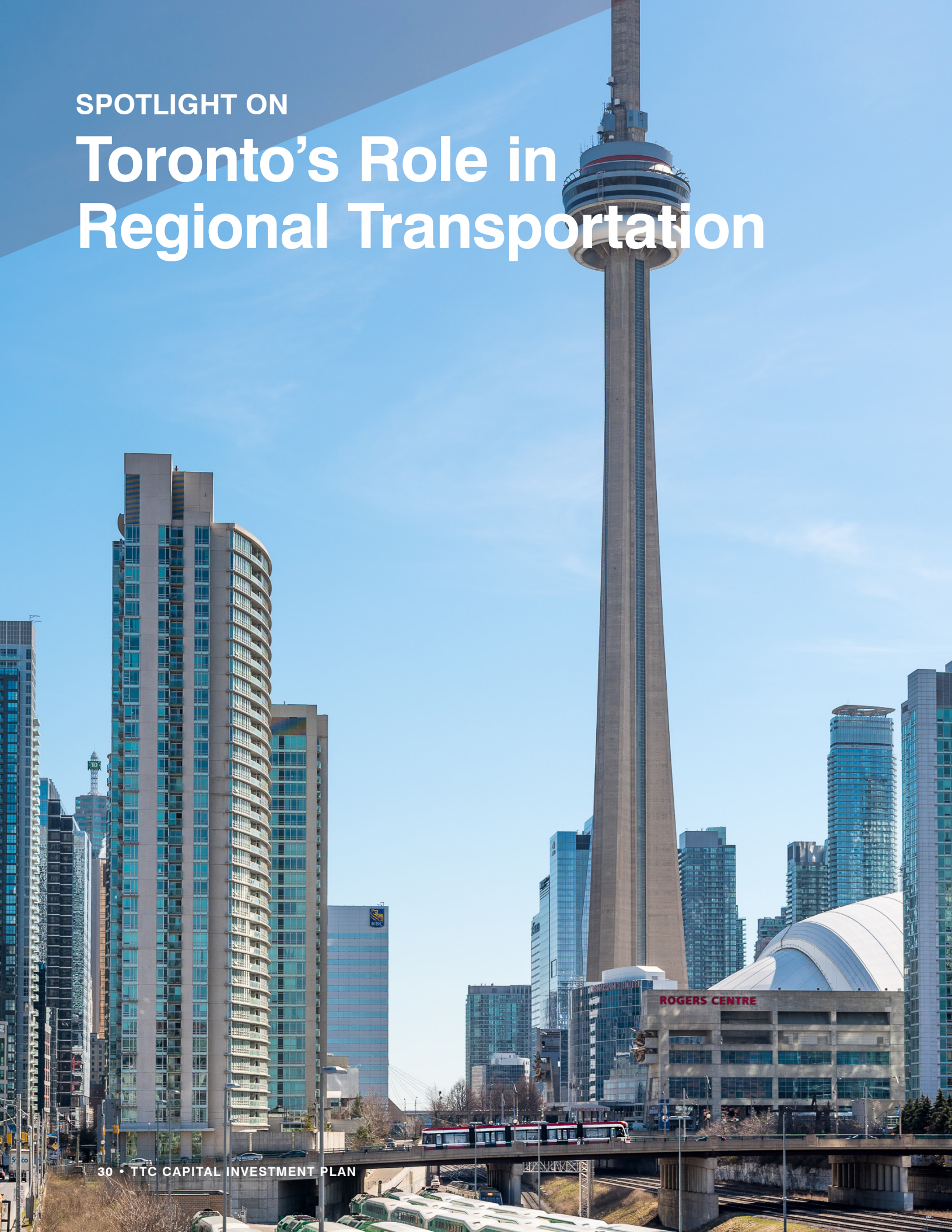
+ Less crowded trains
+ Fewer delays, improved reliability and more consistent travel times
+ Sufficient maintenance and storage capacity to support transit expansion

Risks of failing to invest

+ More subway delays as reliability declines
+ Longer wait times between trains
+ Increased crowding on Line 2
+ Closing stations during crowded peak periods
+ Aging fleet in need of repair means safety issues and higher maintenance costs

SPOTLIGHT ON

Toronto's Role in Regional Transportation



Because it serves the nation's largest city, Toronto's transit system plays a unique role.

As Toronto and the region around it grow, so too does pressure on the TTC as a regional transit provider along with GO Transit, UP Express, MiWay in Mississauga, YRT / Viva, Durham Region Transit and Brampton Transit.

89%
of TTC ridership is from within Toronto

85%
of all transit rides in the GTA are on the TTC

24%
Portion of regional commuters to Toronto who take transit (highest of comparable cities)

87
Regional transit routes, including GO Transit, connect to TTC services

Base Capital Investments

Buses

Today

456 million
bus boardings annually

2,000+
buses

142 million
kms travelled annually

1 million
kms travelled by the average bus over its 13-year life

60%
reduction in the frequency of bus breakdowns since 2014

7
garages

60 per cent of all people who travel on the TTC take a bus for at least part of their trip. In fact, buses carry more customers than any other TTC mode, including the subway.

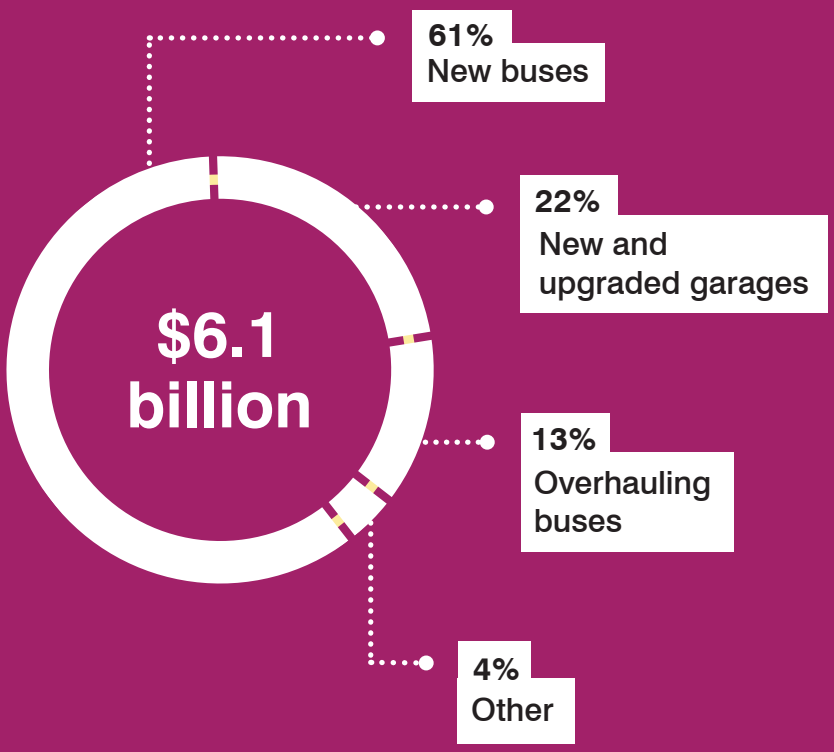
Keeping Toronto moving with our current fleet of more than 2,000 buses is a feat of proactive maintenance. Over the course of its 13-year life, the average TTC bus will travel one million kilometres. To make the most of its fleet, the TTC completely overhauls every bus when it is six years old — from rebuilding the engine and transmission, to replacing panels and repainting the exterior, to refurbishing flooring and seats. The rebuild alone typically costs as much as $400,000; the cost of a new electric bus is more than $1 million.

The next 15 years will see a dramatic shift in the technology and fuel consumption of our bus fleet. With the City committed to an 80 per cent reduction in greenhouse gas emissions by 2050, the TTC is also leading the way with a zero-emissions bus fleet target of 2040.

Buses

Investment Summary

Required Investment Outlook 2019–2033

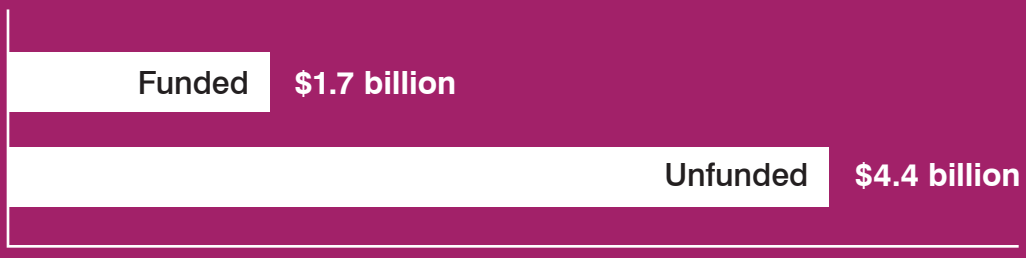


Key Investments

2,300
low/zero emissions buses purchased

2,500
buses overhauled at mid-life

2
new bus garages



For funding details, see the Appendix.

New buses to maintain current service

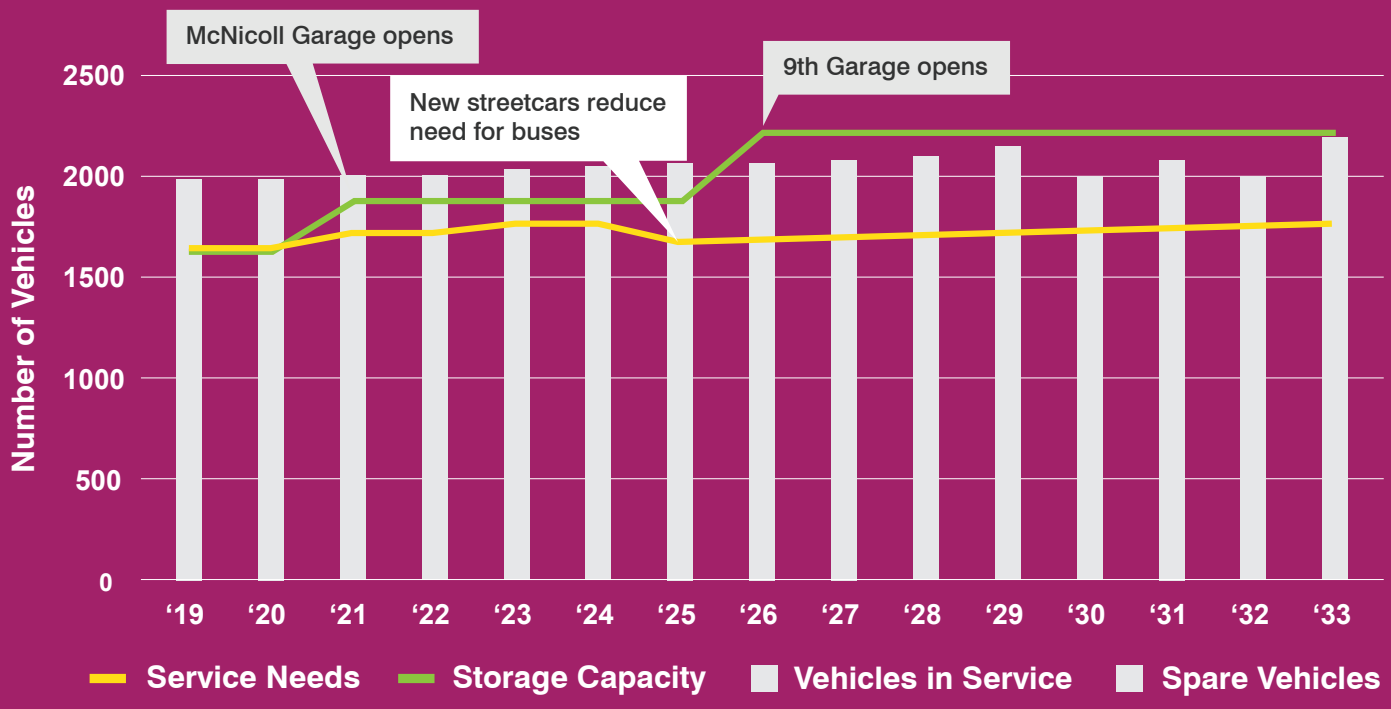
Simply maintaining our current fleet size will require purchasing between 120 and 160 buses every year to replace retiring vehicles, but there is currently limited bus funding in 2021 and 2022 and no funding thereafter. Accommodating increased ridership will require an additional 15 buses per year. At the same time, we are determined to transition to zero emissions technology as soon as practical.

+ Purchase 2,300 new low/zero-emissions buses at a total cost of nearly $3.7 billion, representing a complete replacement of our fleet as older buses reach the end of their 13-year useful life. By moving to steady-state procurement for new buses — which means buying them in similar quantities every year — we limit sudden spikes in our capital funding needs and increase the efficiency of our maintenance operations.

+ By 2025, all new bus procurement will be zero emissions. In 2033, our bus fleet will emit only 43,000 tonnes of CO_2, compared to 247,000 tonnes in 2019 — an 83 per cent decrease in annual emissions.

+ All buses will be accessible, with low floors, to make it as easy as possible for those with accessibility needs to use our service and transfer to and from buses, streetcars, subway and Wheel-Trans, as part of the TTC Family of Services.

+ Build two new garages at a remaining cost of more than $600 million: McNicoll Garage, which is already under construction, and a ninth bus garage, which will include the ability to maintain, charge and store electric vehicles.



Benefits of investing

+ More frequent service
+ Less crowded buses on key routes
+ Improved service reliability for customers
+ Reduction of 1.7 million tons of CO2

Risks of failing to invest

+ Not enough buses means cancelled routes and less frequent service
+ Increased breakdowns of aging fleet mean more delays, poor customer service and higher maintenance costs
+ No buses to relieve crowding on overcrowded routes
+ No buses to provide service in the event of streetcar or subway disruptions
+ Continued pollution and failure to meet climate targets

SPOTLIGHT ON

Making Best Use of Resources

Capital Project Delivery

In 2021, we will complete a four-year plan to advance our project, program and portfolio management and bring the TTC in line with best-in-class public sector project management practices. This includes learning from the delivery of recent major projects like the Toronto-York Spadina Subway Extension.

Enterprise Asset Management

A key element of the TTC's 2018–2022 Corporate Plan is the transition to Enterprise Asset Management for all of its major asset classes, based on a 30-year-plus outlook on assets. This means advancing preventative and predictive maintenance, so vehicles and infrastructure fail less often and last longer and customers can keep moving more reliably.

Operating Efficiency

The TTC receives a low government operating subsidy per rider compared to other major transit systems in the US and Canada. Only 32 per cent of the TTC's direct operating costs are subsidized, compared to 41 per cent in New York, 44 per cent in Montreal and 81 per cent in Los Angeles.

Derived from CUTA/APTA 2017 Annual Agency Profiles

Base Capital Investments

Stations

Today

75
stations

200,000+
daily passengers at Bloor-Yonge Station

333
escalators

113
elevators

The TTC's 75 stations serve more than the subway. They let customers transfer seamlessly to and from buses, streetcars and Wheel-Trans, giving Toronto its uniquely well-integrated transit network. Stations such as Union, Finch, Kennedy and Kipling are major multi-modal transit hubs, connecting customers with other regional transit systems.

The safety, security, accessibility and sustainability of our system is only as robust as our stations. Working elevators make stations accessible for those with mobility devices, while working escalators allow the steady flow of passengers. Safe, well-designed platforms and public spaces make it easy for customers to quickly get on and off trains. Digital signage allows us to communicate directly with customers, while cameras and other security infrastructure keep the system safe. All of this requires investments in maintaining a state-of-good-repair.

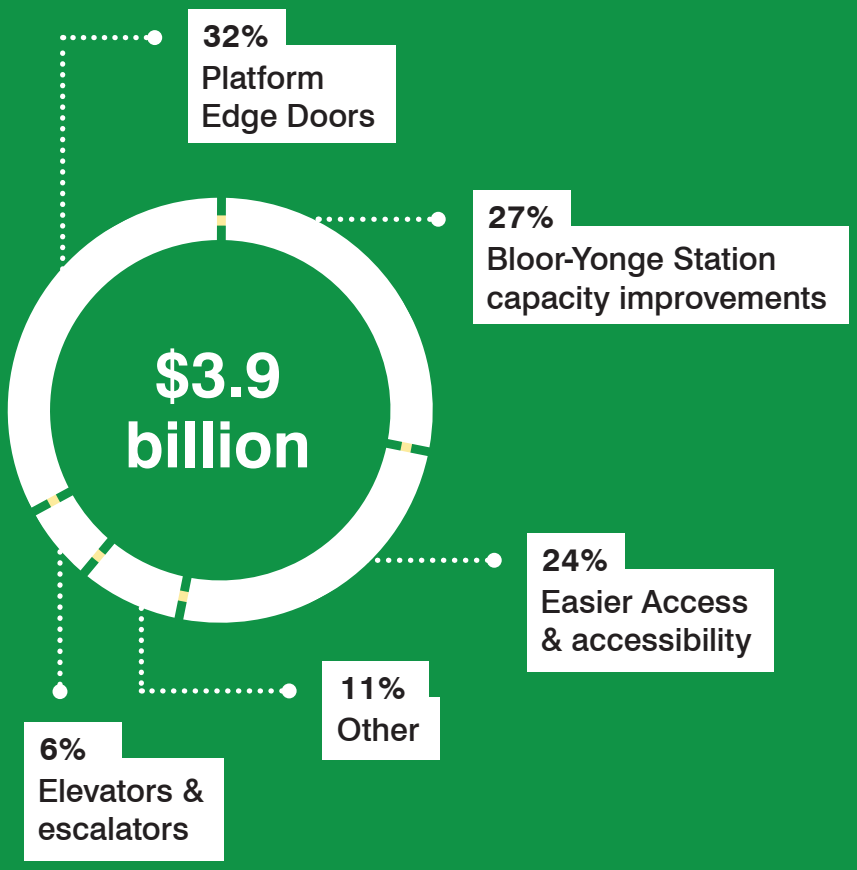
For instance, the TTC operates more escalators and elevators than any other public entity in Canada. Hundreds of escalators and elevators are reaching the end of their useful life, which will mean more breakdowns, inconvenienced customers and climbing maintenance costs. Overhauling an escalator can extend its life by as much as 25 years.

In the coming years, regional growth and transit expansion will bring more people into stations and add to rush hour crowding. We must ensure our stations can safely and accessibly support the increased flow of passengers.

Stations

Investment Summary

Required Investment Outlook 2019–2033

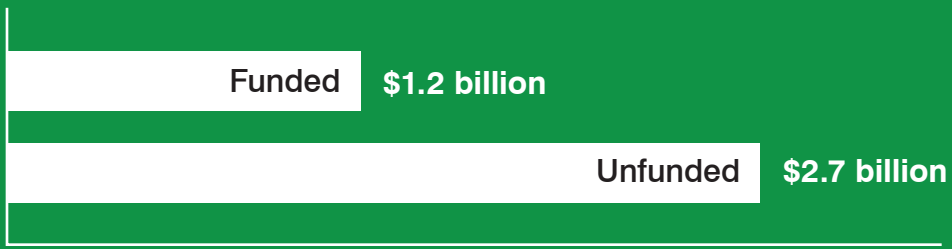


Key Investments

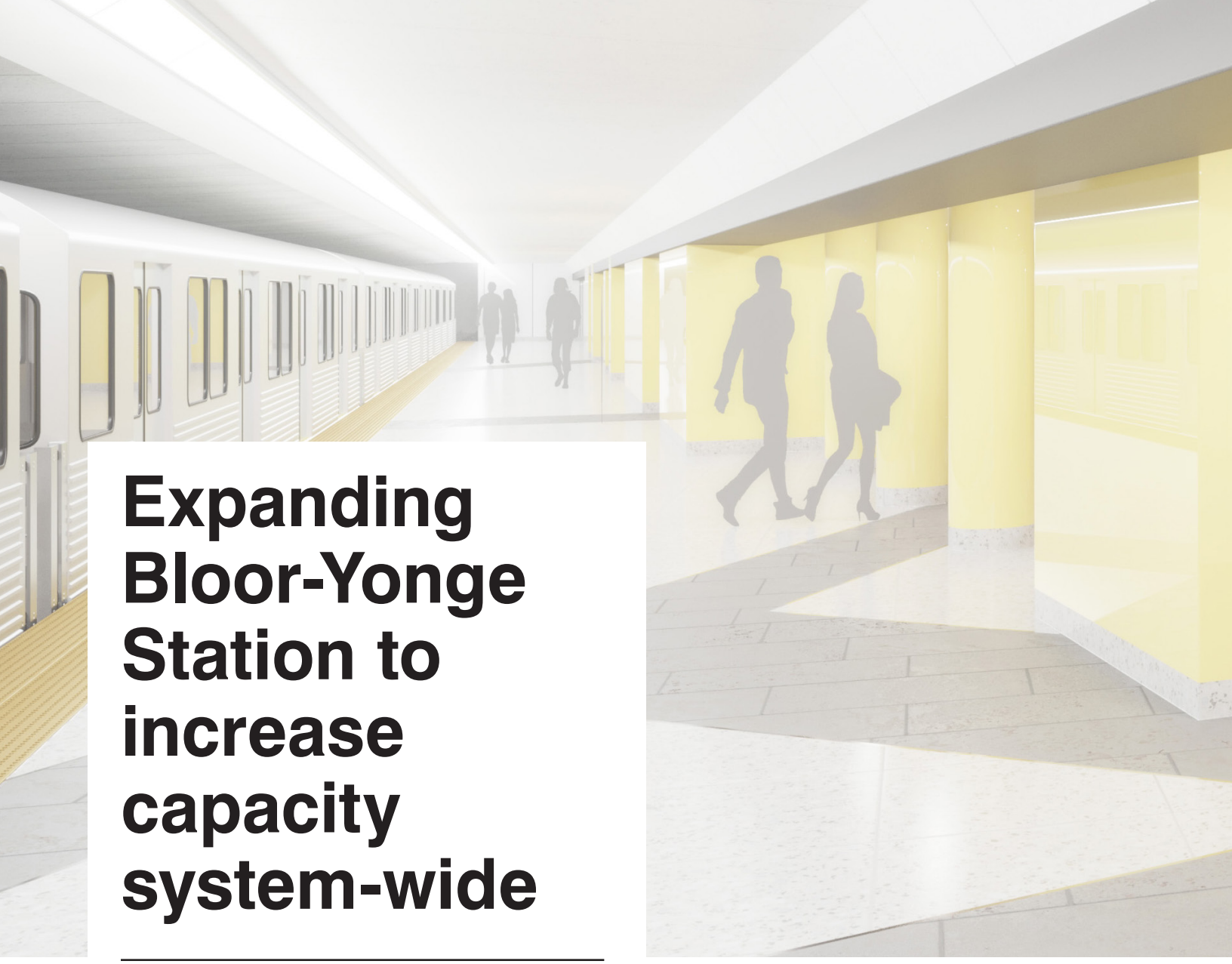
Bloor-Yonge Station
expanded

Platform Edge Doors
installed (as possible) on Lines 1 & 2

AODA-compliant
all stations by 2025



For funding details, see the Appendix.



Expanding Bloor-Yonge Station to increase capacity system-wide

More than any other station, capacity and crowding at Bloor-Yonge Station impacts the customer experience: if it's too crowded, trains can't pick up and drop off quickly, and the entire line slows down. The advantages of Line 1 and 2 capacity enhancements, as well as of transit expansion, depend on enhancing Bloor-Yonge Station.

+ Similar to Union Station, construct a second platform serving Line 2, which currently suffers from extremely limited platform space.

+ Expand public areas to make it easier for customers to move through the station and move away from platforms.

+ Provide more and wider staircases, escalators and elevators to carry more people and improve flow throughout the station.

Benefits of investing

+ Less frequent overcrowding at Bloor-Yonge Station, with customers more evenly distributed along platforms

+ Trains dwelling in station for less time, as customers get on and off more quickly

+ More frequent trains on Line 1 and Line 2

Risks of failing to invest

+ Extreme overcrowding at Bloor-Yonge Station

+ Increased safety concerns due to crowded platforms

+ A decrease in frequency of trains on Line 1 and Line 2 during rush hour, despite other capacity enhancement efforts

Station repairs and improvements to keep customers moving

While Bloor-Yonge poses the most significant challenge, the next 15 years will require widespread improvements at most of our stations — from capacity enhancements that improve passenger flow to the final phase of our efforts to make all TTC stations accessible by 2025.

+ Make improvements at a number of stations to accommodate more customers and allow them to clear more quickly from platforms, enabling more frequent service. For instance, work at Eglinton Station to accommodate the introduction of Line 5 Eglinton will be complete in 2021.

+ The Easier Access program, which includes installing elevators, accessible fare gates, automatic sliding doors and other improvements, will make all subway stations accessible by 2025, up from 45 accessible stations today, at a remaining fully funded cost of $590 million.

+ Consider installing platform edge doors (PEDs) on Lines 1 and 2 as possible. PEDs form a barrier between customers and tracks, with sliding doors that open automatically in alignment with train doors. This improves the safety of the subway system in several ways, including reducing suicide attempts, risk of accidental falls and litter that can cause track fires.

+ Overhaul or replace hundreds of escalators and elevators that are at or approaching the end of their useful life, at a cost of more than $200 million.

Benefits of investing

+ Stations that are easier to move through, including to and from platforms

+ Stations that are more accessible to people of all abilities, enabling passengers to use the entire TTC Family of Services

+ Reduced suicide attempts and fewer track-level injuries with platform edge doors

+ More frequent trains during rush hour, as customers get on and off more quickly

+ Improved accessible signage and way-finding

Risks of failing to invest

+ More crowded stations

+ More frequent escalator and elevator outages that slow passengers and hamper accessibility

+ Increased safety concerns due to crowded platforms

SPOTLIGHT ON

Changing Landscape, Emerging Options

Advancing technology and changing customer behaviour present both challenges and opportunities for our public transit system. The sharing economy and the rise of on-demand services mean customers have more options and higher expectations than ever before.

The coming years will see a new level of pressure to provide transit that is both highly reliable and seamlessly integrated with all transportation options, whether those are personal, public or commercial.

Ride-hailing

Companies like Uber and Lyft are providing customers with flexible, responsive transportation options at the touch of a screen. Unfortunately, they can also increase congestion if not well integrated with public transit. In the future, transit will both need to compete for customers with companies like these and work with them to help make travel more efficient for customers.

Vehicle Automation

The City of Toronto is taking a transit-centric approach to vehicle automation and advanced driver assistance systems, starting with features like turn warnings and auto-braking on vehicles to make our streets safer. By 2050, vehicle automation will be central to improving the reliability, efficiency, safety and seamlessness of transit.

Mobility-as-a-Service

The future of mobility lies in seamless integration of different transportation options. This could mean allowing customers to stitch together multiple modes of transportation, such as bike-share, subway and a taxi or ride-hailing company, and easily plan, book and pay for their trip from end to end.

Base Capital Investments

Streetcars

Today

91 million
streetcar boardings each year

84,000
customers daily on 504 King, the busiest streetcar route

248
streetcars

10
streetcar routes

11.4 million
kms travelled annually

3
carhouses

As the largest streetcar network in North America, Toronto's 10 streetcar routes criss-cross the downtown core, complementing subway and bus service to provide transit coverage in the city's densest areas. The King Street Transit Pilot, which saw the number of customers carried by the city's busiest streetcar route balloon from 65,000 to 84,000 per day, revealed the demand that can be unlocked by giving streetcars priority through traffic.

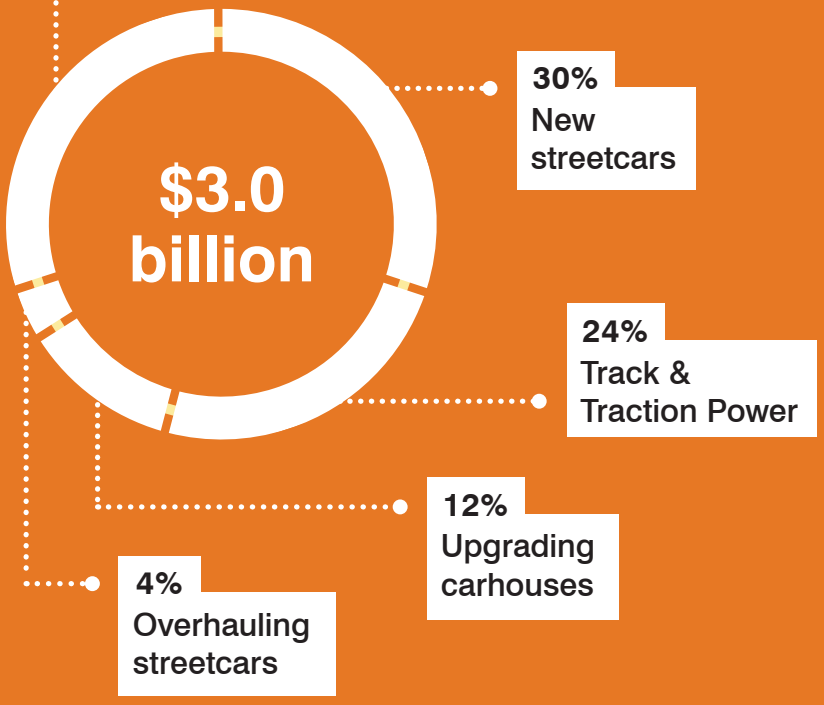
Keeping our streetcar network moving is a complex dance involving streetcars, track and 177 kilometres of overhead wire. Our oldest streetcars are now over 40 years old and will be completely removed from service by 2021. Our new Bombardier streetcars are longer, larger and more accessible; they also use nearly 50 per cent more power, which increases demand on our overhead wires. Every four years, a streetcar undergoes at least a partial overhaul to keep it reliable and increase its useful life.

In recent years, delays in streetcar deliveries have meant that service normally provided by streetcars has been provided by buses on a number of routes. The coming years will require returning to and then surpassing previous levels of streetcar service to meet ridership demand.

Streetcars

Investment Summary

Required Investment Outlook 2019–2033



For funding details, see the Appendix.

Key Investments

204
streetcars delivered, completing current order

Up to 100
additional streetcars purchased to accommodate ridership growth

Hillcrest Complex converted
to streetcar-only maintenance and storage (under consideration)

100 additional streetcars and investments in reliability

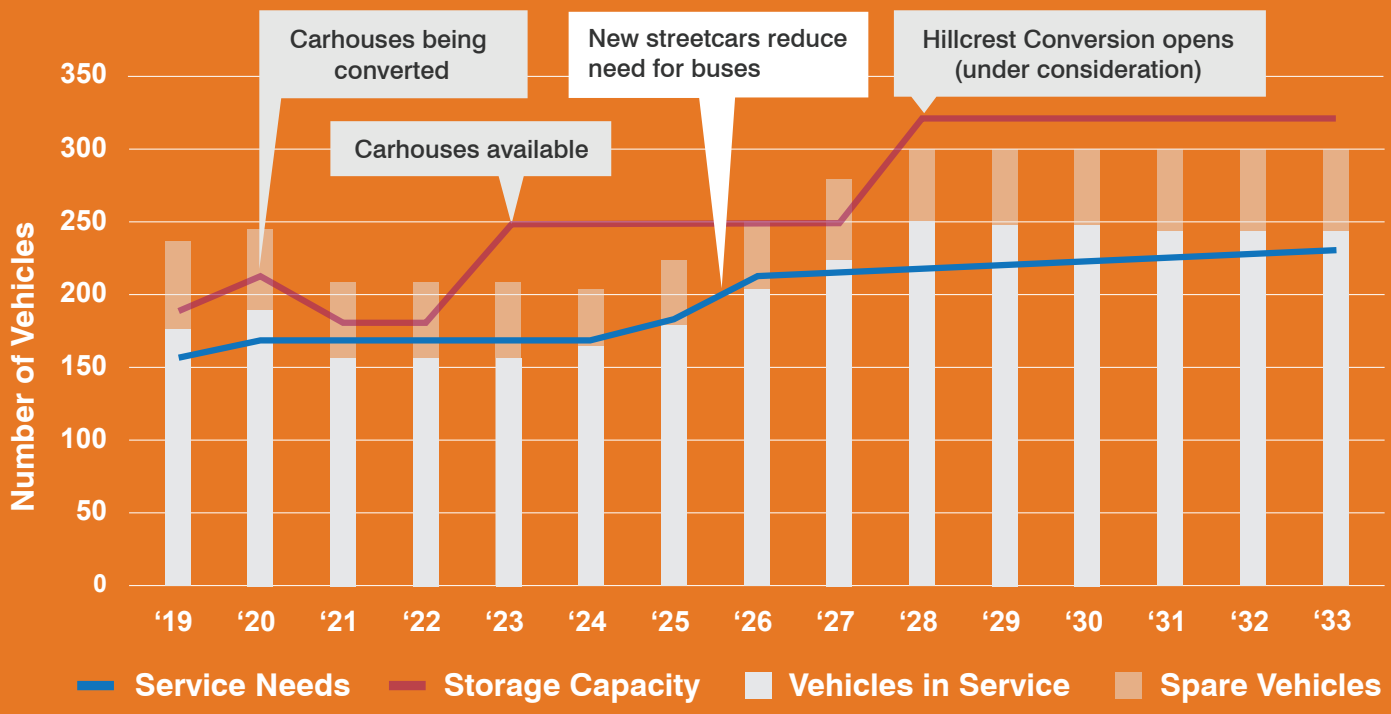
To maintain current service and meet ridership demand, we must buy new streetcars and pro-actively maintain them as they age, fix track, upgrade overhead electricity and ensure we have enough space to maintain and store our fleet.

+ Purchase streetcars on a schedule that uses economies of scale to reduce purchase price per vehicle. This involves completing the current purchase of 204 streetcars, plus approximately 100 additional streetcars from 2025 to 2028 to meet demand, at a cost of $510 million.

+ Consider converting and expanding Hillcrest Complex, which is currently used to repair buses and streetcars, to a streetcar-only maintenance and storage facility at a cost of approximately $900 million. This would provide a five-fold increase in the TTC's capacity to overhaul streetcars. The carhouses at Roncesvalles and Russell are being retrofitted to accommodate new streetcars.

+ All streetcars will be accessible, with low floors, to make it as easy as possible for customers of all abilities to travel using the TTC Family of Services.

+ To support the increased power required by larger streetcars, upgrade to pantograph technology, which replaces single trolley poles with broader contacts for more reliable and powerful transfer of electricity to streetcars.



Benefits of investing

+ Improved service reliability for customers
+ More frequent streetcar service at peak times on key routes
+ More reliable streetcars with longer useful lives due to increased capacity for overhauls
+ Increased speed of streetcars due to transit priority measures
+ Safer streets, with the introduction of streetcar features like turn warnings and auto-braking

Risks of failing to invest

+ Slower streetcars due to insufficient power
+ Failing reliability that must be taken over by buses
+ More frequent breakdowns due to insufficient maintenance facility capacity
+ Increased crowding on key streetcar routes

SPOTLIGHT ON

Working with Partners to Deliver

Coordinating Projects to Minimize Inconvenience

To minimize inconvenience to customers, we're working with the City on improving the coordination of capital projects. We're also working to achieve a consistent, coordinated process for fast-tracked permitting and site plan approvals to deliver transit projects.

Working with Toronto's Utilities to Get Work Done Faster

Maintaining and making improvements to our infrastructure requires close cooperation with Toronto's utilities. Upgrading the electricity grid to power our subway trains or charge our electric buses depends on Toronto Hydro; upgrading subway pumps depends on Toronto Water. The better we work together, the faster we get work done.

Collaborating with City of Toronto Transportation Services

Transportation Services plans, constructs and manages the city's transportation infrastructure. We work closely together on everything from transit priority measures like the King Street Transit Pilot to the location of bus and streetcar shelters.

Working with Provincial Partners to Keep Toronto Moving

We're working closely with Metrolinx and Infrastructure Ontario. This includes ensuring the connection between LRT lines and the subway system is as smooth as possible and providing supplemental bus service as construction on projects like Line 5 Eglinton continues.

Base Capital Investments

Wheel-Trans

Today

45,000+
active registrants

264
Wheel-Trans buses

11,000+
daily trips

5
community bus routes

For customers with disabilities, Wheel-Trans is far more than a transportation option. It is a lifeline to shopping, appointments, family, friends, culture, employment and services that would be extremely difficult to get to otherwise.

While the Wheel-Trans fleet of accessible vehicles shares the infrastructure used to maintain our conventional buses, they have a shorter useful life, which requires replacing the fleet more than twice between now and 2033.

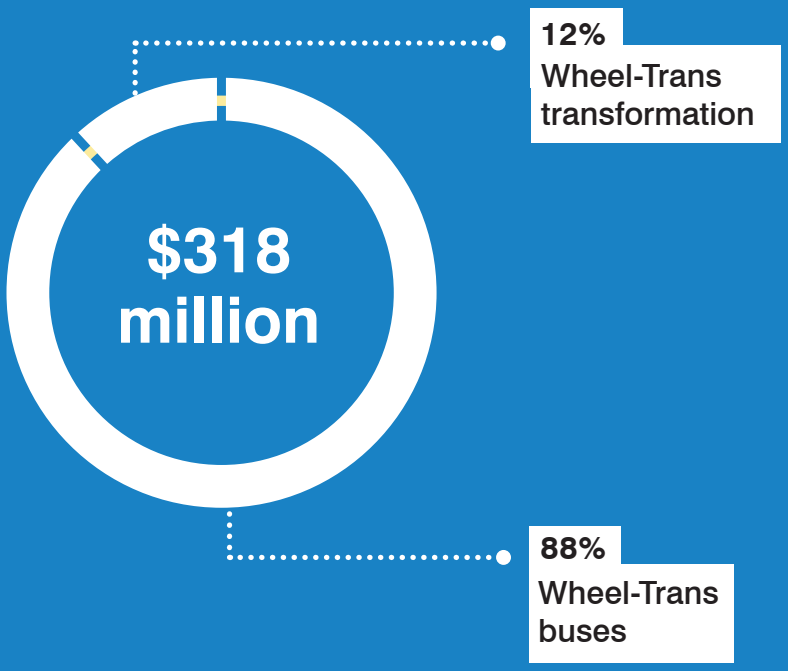
In 2017, in accordance with the AODA, eligibility for Wheel-Trans was expanded to include customers with cognitive, sensory and mental health disabilities, in addition to those with physical disabilities. This increased demand for Wheel-Trans services, which will grow further as Toronto's population ages.

Meanwhile, Wheel-Trans is becoming part of a much more flexible, on-demand system of integrated mobility, which includes accessible buses, streetcars and subways, as part of the TTC Family of Services initiative. This includes a new scheduling and dispatch system that will provide the most efficient trip solution for customers utilizing the TTC Family of Services, allowing them to book a trip on demand.

Wheel-Trans

Investment Summary

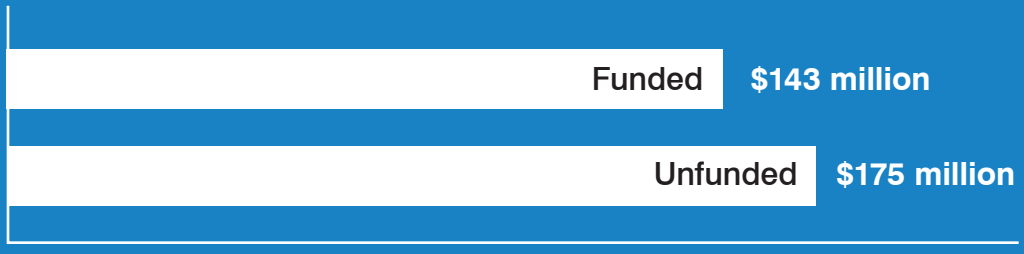
Required Investment Outlook 2019–2033



Key Investments

829
new Wheel-Trans buses

Transformation
to enable passengers to use the entire TTC Family of Services



For funding details, see the Appendix.

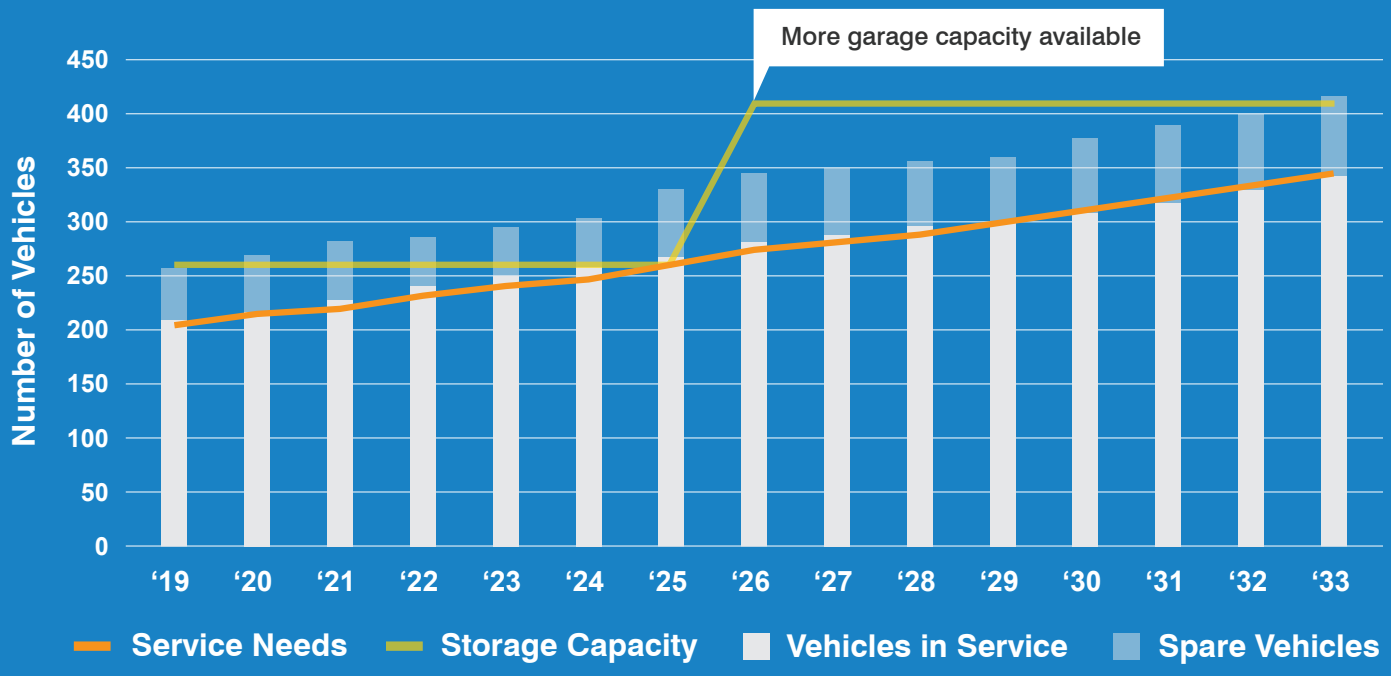
829 Wheel-Trans buses to keep up with demand

To meet an expected increase in demand of nearly 75 per cent over the next 15 years, Wheel-Trans requires a larger fleet.

+ Purchase 829 Wheel-Trans buses, to both replace buses at the end of their useful life and grow the operating fleet by nearly 60 per cent.

+ Increased fleet will use the maintenance capacity freed up elsewhere when the ninth bus garage opens.

+ Wheel-Trans transformation includes a suite of investments required to make our system AODA-compliant and enable an accessible TTC Family of Services. This includes Access Hubs: clean, dry, well-lit points where Wheel-Trans customers can transfer to conventional buses and streetcars.



Benefits of investing

+ Sufficient Wheel-Trans service to provide responsive, on-demand service to all registrants as part of the TTC Family of Services

+ Integration with the conventional transit system

+ Improved reliability of new fleet

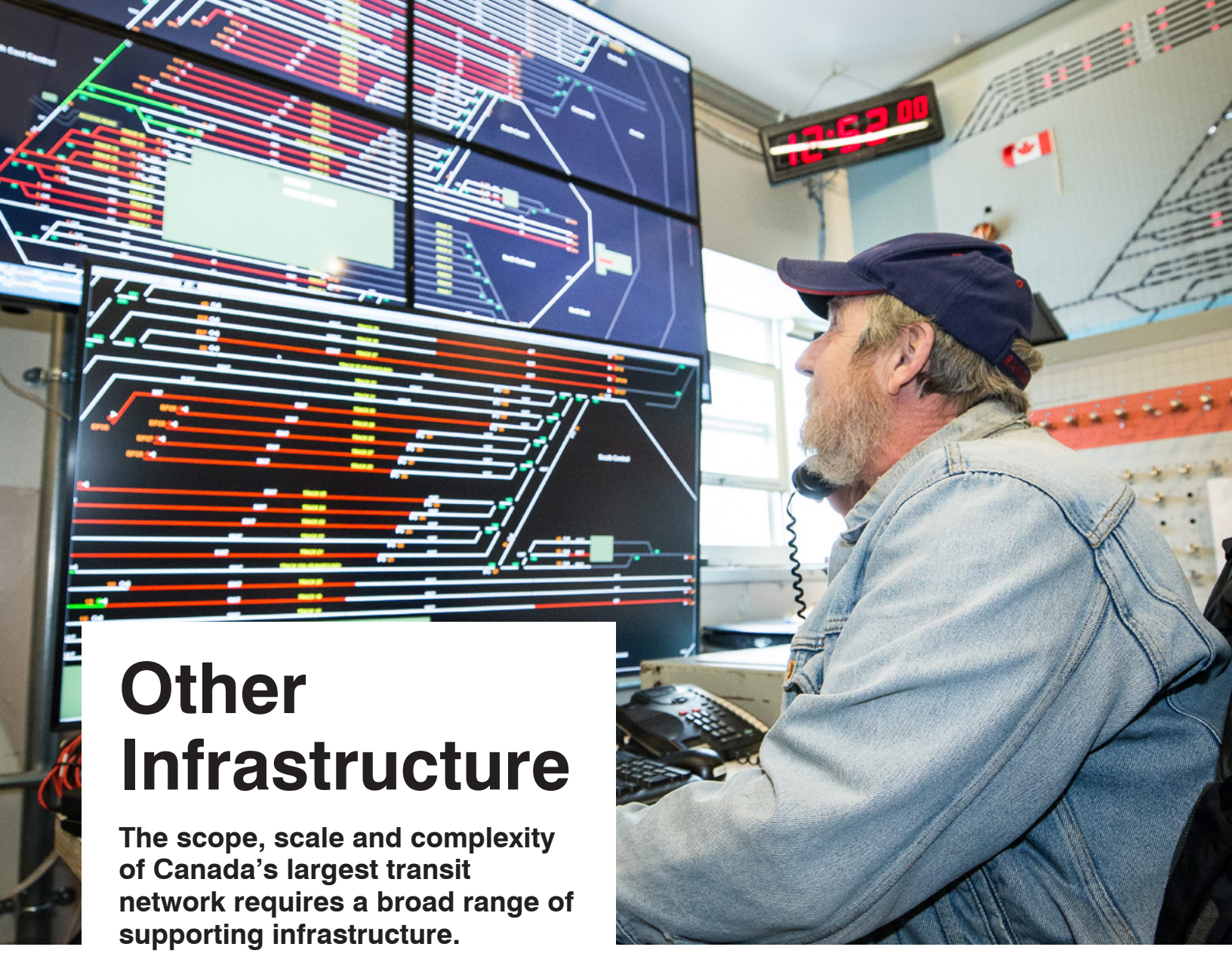
Risks of failing to invest

+ Not enough Wheel-Trans service to meet demand; inability to provide on-demand service to those who need it

+ Failure to deliver the first and last mile of the TTC Family of Services for those with disabilities

+ Failing reliability as fleet ages beyond its useful life

+ Increased use of contract taxis and sedan companies



Other Infrastructure

The scope, scale and complexity of Canada's largest transit network requires a broad range of supporting infrastructure.

New Transit Control Centre

A new Transit Control Centre will make the entire system more resilient and enhance system security, ensuring service can keep running despite major unplanned events or disruptions.

Modern IT systems and infrastructure

Replacing outmoded legacy processes with new core management systems will make the TTC more efficient, while real-time data on the location and status of vehicles enables improved service.

Consolidated offices

Bringing together staff who are currently scattered across leased locations throughout Toronto will save money, increase efficiency and improve collaboration.

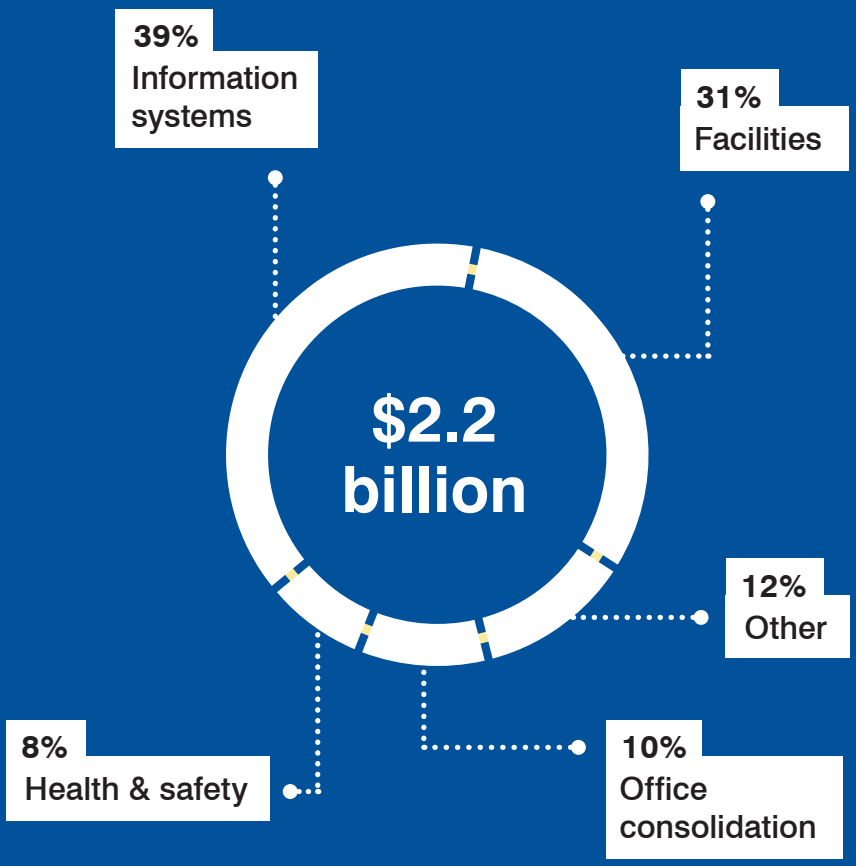
Legislated health & safety

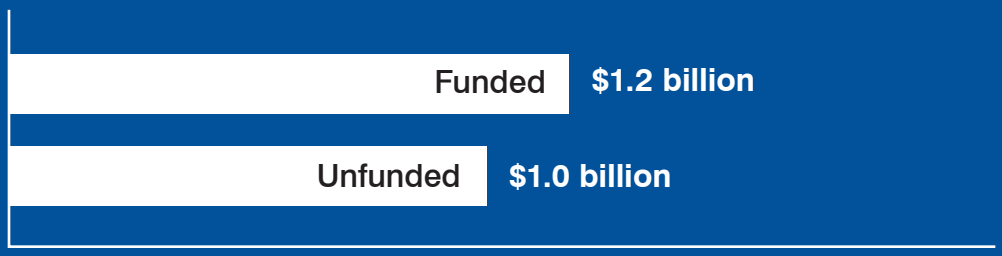
Investments like standby generators, hazardous waste storage rooms and storage tank replacement in line with current regulations make the system safer for customers and employees.

Other Infrastructure

Investment Summary

Required Investment Outlook 2019–2033





For funding details, see the Appendix.

SPOTLIGHT ON

Planned Expansion

New rapid transit lines (that are proposed or under construction) will relieve crowding, build stronger regional connections and support the GTA's growth. But their success depends on base capital investments to strengthen and enhance the capacity of the current system.

Line 2 East Extension

This easterly extension of Line 2, currently being planned and designed by the TTC and City, will provide a direct connection between Kennedy Station and Scarborough Centre Station.

Line 3 Relief Line

This new subway line is currently being planned by the TTC, City and Metrolinx. The approved southerly portion, which is undergoing preliminary design, will connect Line 2 at Pape Station with Line 1 at Queen and Osgoode Stations. A future northerly portion will extend north from Line 2 at Pape Station to connect with Line 5 Eglinton and beyond.

SmartTrack Stations*

Building on existing heavy rail infrastructure and leveraging the province's investment in GO expansion, SmartTrack will include six new GO stations on the Stouffville, Lakeshore East and Kitchener GO corridors.

Yonge Subway Extension

This northerly extension of Line 1, currently being planned by the TTC, City, York Region and Metrolinx, will extend from Finch Station to Highway 7 in Richmond Hill, with connections to York Region Transit and GO Transit.

Waterfront Transit

Several coordinated streetcar projects are in planning or design to improve and expand surface transit along the waterfront. These include new lines on Cherry Street, Broadview Avenue, the East Bayfront and the Portlands; improved connections to Line 1 at Union Station; a new connection through Exhibition Place; a future Humber Bay line and various operational improvements at key locations.

Line 5 Eglinton*

This new light rail transit line will run across Eglinton Avenue from Mount Dennis to Kennedy Station, including a 10 km underground section through the middle of the city.

Line 5 Eglinton East and West Extensions

These extensions of the Line 5 Eglinton light rail transit line will connect to Pearson Airport in the west and Malvern Town Centre in the east.

Line 6 Finch West*

This light rail transit line will run along Finch Avenue West, linking Finch West Station on Line 1 with Humber College.

Line 7 Sheppard East*

This planned light rail transit line will run along Sheppard Avenue East, linking Don Mills Station on Line 4 with Morningside Avenue.

***Being built by Metrolinx**

This map reflects the planning priorities of the City of Toronto, as presented to City Council on March 31st, 2016, and is a vision of what future rapid transit in Toronto could look like. The map does not reflect the level of funding commitment or analysis undertaken to date. The map includes both TTC and Metrolinx transit lines, which form a new, integrated transit network within the City of Toronto. Ownership of the transit lines is not depicted in the map.

*Future line names, route alignments and station/stop names are subject to change.

Funding the Future

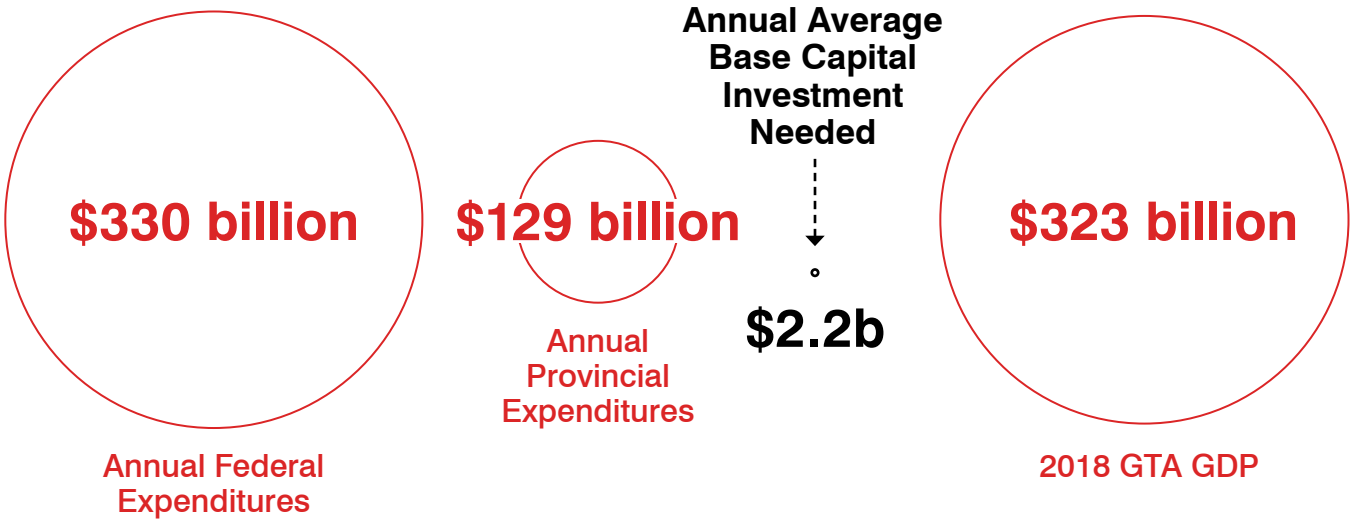
Investments to keep transit moving are investments in ensuring our region remains vibrant, keeps growing and continues to be among the most attractive places to live in the world.

If we fail to invest, we will see very real consequences. Our buses could start breaking down more often as they operate beyond the end of their useful life; trains could start regularly bypassing Bloor-Yonge Station due to crowding; congestion across the GTA will worsen. Both productivity and the quality of life in the GTA will suffer, and we will have failed to meet the challenges of population growth, climate change and true regional mobility.

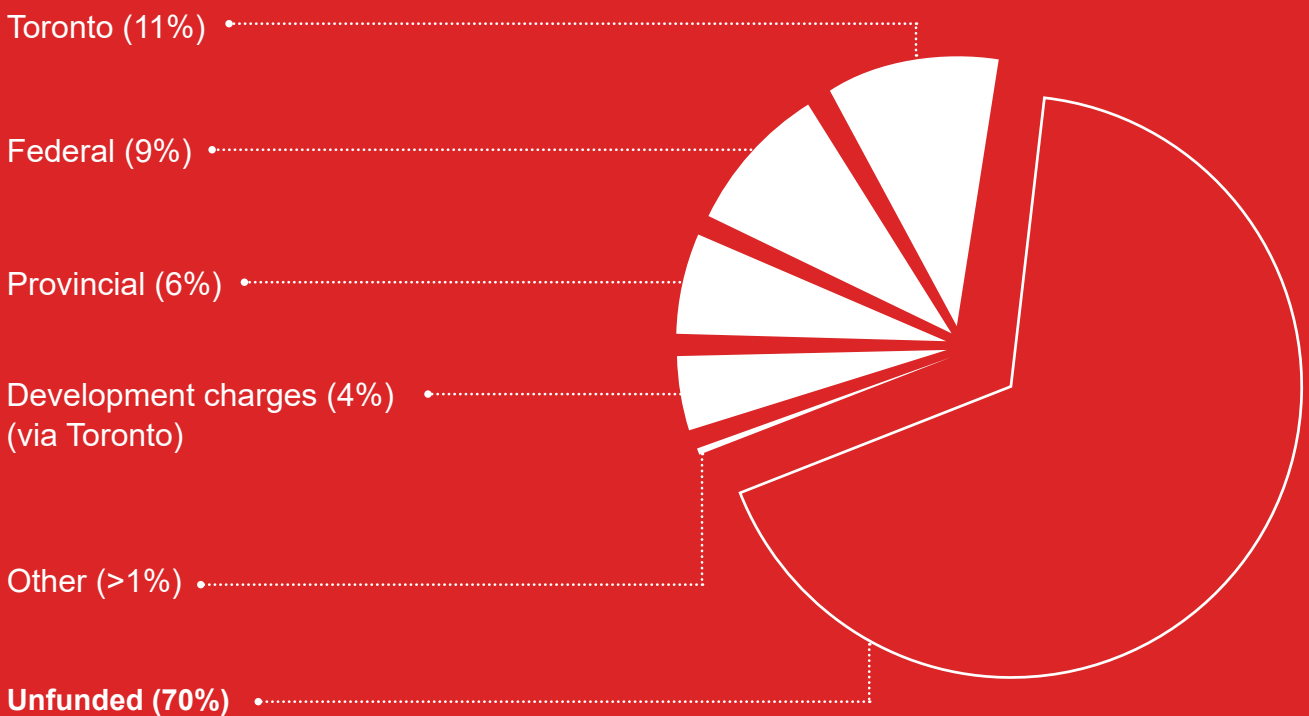
Prior to 1998, the City and the Province equally subsidized a portion of TTC direct operating costs. Since then, the City has been responsible for a steadily increasing share, rising to 85 per cent today. As a result, operating the TTC has accounted for one third of the growth in the City's net expenditures over the past 10 years and even more when property tax-supported debt service costs are included.

Now, with approximately 70 per cent of our base capital needs in the next 15 years currently without funding, it's clear that a new approach to funding is needed: one that more fully engages all levels of government to deliver predictable and sustainable funding.

Relative Size of Investment Needed



Current Sources of TTC Capital Funding



Federal Government

Includes funding from the federal gas tax and programs such as the Public Transit Infrastructure Fund (PTIF)

Provincial Government

Includes funding from the provincial gas tax and participation in funding programs like the Light Rail Vehicle (LRV) funding program

City of Toronto

Includes debt funding in which the principal and interest is paid through property taxes

Development Charges

Includes fees collected from private developers by the City to help pay for the cost of infrastructure and services that the new development benefits from

SPOTLIGHT ON

Different Models of Funding Transit

Public Transit Infrastructure Fund (PTIF)

PTIF is a good example of what's possible when different levels of government work together. A Government of Canada program delivered by Infrastructure Canada to provide dedicated and reliable funding for new capital programs, it provides federal funding that must be matched by other levels of government.

Toronto benefited from PTIF Phase 1. Building on that success, PTIF Phase 2 is unlocking nearly $8.9 billion in federal and provincial funding to support projects such as the Line 2 East Extension, the planning and design of the Relief Line South and the Waterfront Transit Network Plan. This is being complemented by additional municipal funding.

How are other regions rising to the challenge?

Boston is paid by utility companies, like telecommunications companies laying fibre optic cables, for leveraging their tunnels and other infrastructure. With the rollout of the 5G network in Canada, transit organizations could lease real estate to allow the installation of cell towers for a recurring fee.

Chicago charges a 15-cent tax on each trip with a company like Uber or Lyft.

London uses a congestion charge that applies to all drivers entering central London between 7 am and 6 pm.

Los Angeles levies a half-cent sales tax that funds transit.

Montreal is using a hybrid public-private partnership model.

Portland recently used land value capture, increasing taxes in areas where there is likely to be an increase in property values due to transit investment, to fund a new streetcar line.

Sydney is selling air rights, which means allowing private developers to build around and above new stations. In fact, this model is being used to fund GO Transit's Mimico Station.

Vancouver taxes parking and is adding an annual increase of five to 10 cents to fares to pay for capital investment.


109

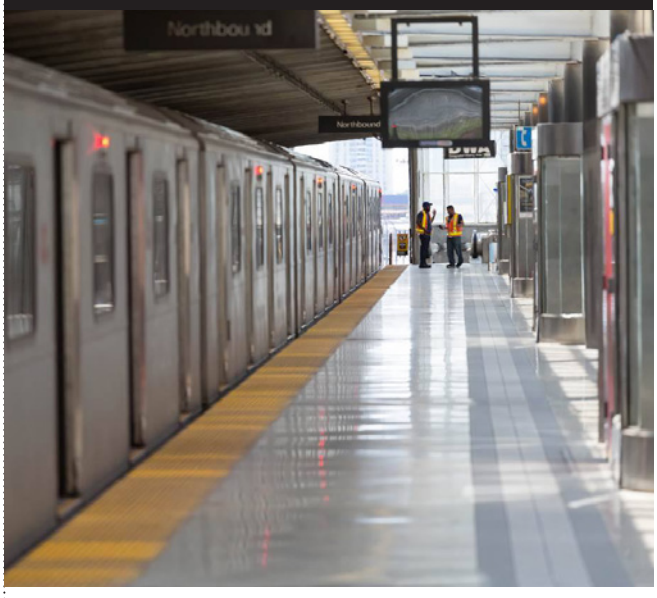
Let’s make headway to keep transit moving.

Investing to maintain our system and increase its capacity will keep our city and our region vibrant, growing and healthy. That will require new approaches to funding transit that are predictable and sustainable and that see new cooperation, creativity and commitment among all levels of government.

We look forward to continuing the conversation.

15 year OUTLOOK

2019–2023



Base Capital Investments

Completion of the initial delivery of low-floor streetcars

McNicoll bus garage opens

Completion of Automatic Train Control on Line 1

Planned Transit Expansion

Line 5 Eglinton opens

Line 6 Finch West opens

2024–2028

Zero emissions for all new buses

Ninth bus garage opens

AODA compliance for accessible stations & system

Line 2 East Extension to Scarborough opens

SmartTrack stations open

Line 5 Eglinton Extensions open

2029–2033

Line 1 capacity enhancements complete

Line 2 capacity enhancements complete

Western subway yard opens

Northern subway yard opens

Relief Line South opens

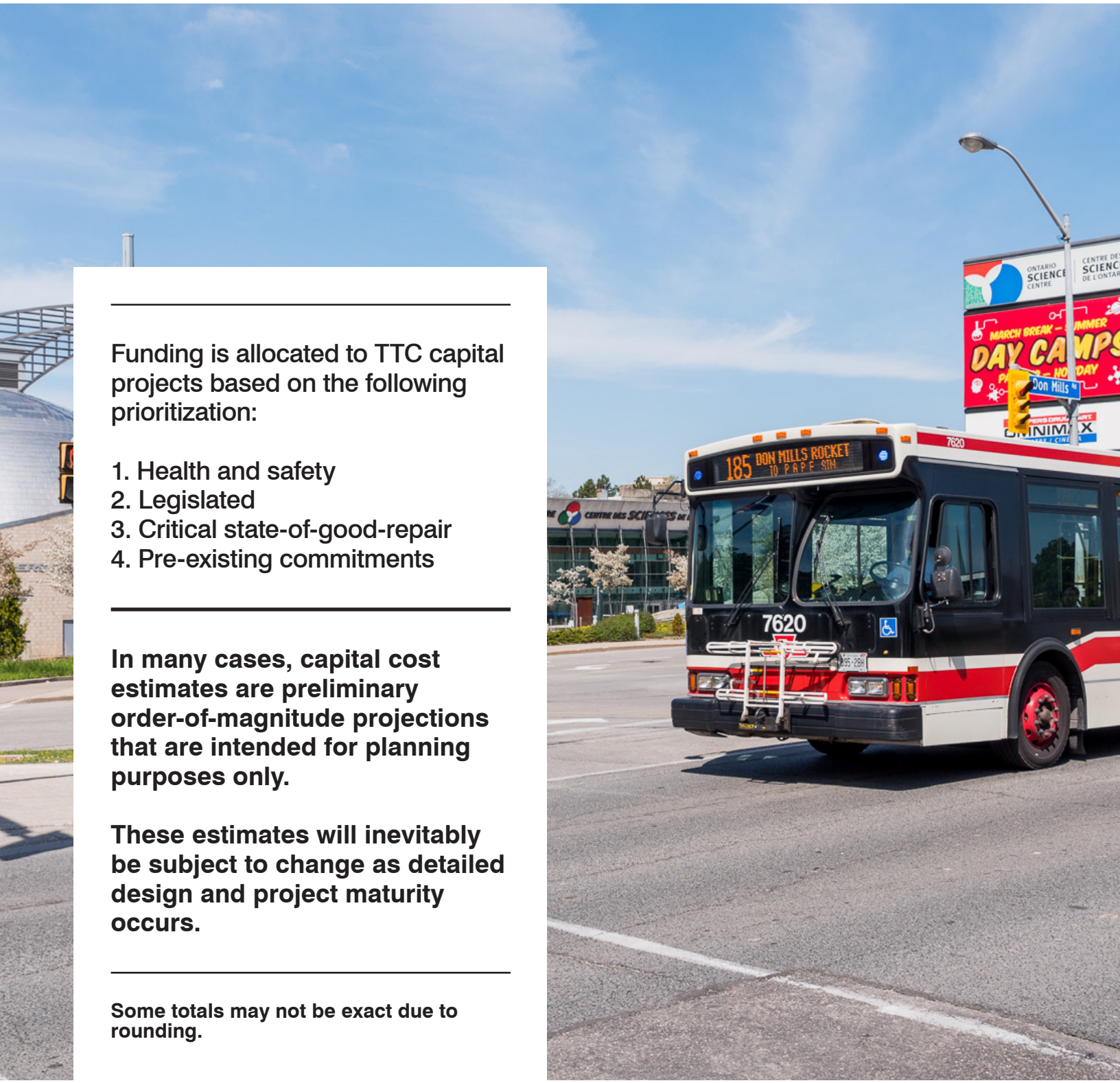
Line 7 Sheppard East Line opens

Line 1 Yonge Subway Extension opens

Waterfront Transit network complete

APPENDIX

Base Capital Requirements



Funding is allocated to TTC capital projects based on the following prioritization:

1. Health and safety
2. Legislated
3. Critical state-of-good-repair
4. Pre-existing commitments

In many cases, capital cost estimates are preliminary order-of-magnitude projections that are intended for planning purposes only.

These estimates will inevitably be subject to change as detailed design and project maturity occurs.

Some totals may not be exact due to rounding.

Project	Description	$ Billions		
		Estimated Cost	Funded	Unfunded
Subways				
Line 1				
Line 1 Capacity Enhancement	Increasing capacity through purchase of new trains, new northern yard and other station infrastructure enhancements	$5.50	$0.00	$5.50
Automatic Train Control (ATC) Resignalling – Line 1	Increasing capacity by reducing headway, providing more reliable service	$0.22	$0.22	$0.00
Subway Track	Subway track and turnout rehabilitation, rail grinding, rail vehicle-based inspection system	$0.33	$0.29	$0.04
Traction Power	Replacement of electrical systems that power the subway, including substation electrical and cable rebuilds	$0.10	$0.04	$0.06
Subway Infrastructure	Maintenance of bridges and tunnels, communications, signal systems	$0.49	$0.28	$0.21
Fire Ventilation Upgrade	Increasing the capacity of the subway fire ventilation system and constructing second exits	$0.91	$0.85	$0.06
Toronto Rocket / T1 Rail Yard Accommodation	Increasing subway train storage capacity at Wilson and Davisville Yards	$0.48	$0.12	$0.35
Purchase of Subway Trains — Ridership Growth and ATC — post 2028	Purchase of new subway trains to meet ATC requirements and ridership growth forecasts	$0.43	$0.01	$0.41

Project	Description	Estimated Cost	Funded	Unfunded
Subway Train Overhaul	Overhaul of the subway fleet to maintain state-of-good-repair	$0.22	$0.16	$0.06
Other Subway	Work car purchase and overhaul, subway asbestos removal, pump and lighting replacement	$0.17	$0.12	$0.05
Line 1 Total		**$8.85**	**$2.10**	**$6.75**
Line 2				
Line 2 Capacity Enhancement	Increasing capacity through purchase of new trains, traction power upgrades and other station infrastructure enhancements	$2.50	$0.00	$2.50
Automatic Train Control (ATC) Resignalling — Line 2	Increasing capacity by reducing headway, providing more reliable service	$0.43	$0.01	$0.42
Subway Track	Subway track and turnout rehabilitation, rail grinding, rail vehicle based inspection system	$0.33	$0.29	$0.04
Traction Power	Replacement of electrical systems that power the subway, including substation electrical and cable rebuilds	$0.10	$0.04	$0.06
Subway Infrastructure	Maintenance of bridges and tunnels, communications, signal systems	$0.49	$0.28	$0.21
Fire Ventilation Upgrade	Increasing the capacity of the subway fire ventilation system and constructing second exits	$0.91	$0.85	$0.06
Toronto Rocket / T1 Rail Yard Accommodation	Increasing subway train storage capacity at Greenwood, Keele Yard and Kipling tail tracks	$0.24	$0.12	$0.12

Project	Description	Estimated Cost	Funded	Unfunded
Purchase of Subway Trains (T1 replacement)	Initial payment for the end-of-life replacement of the existing subway train fleet. This project will continue beyond the 15 year horizon.	$0.68	$0.00	$0.68
Subway Train Overhaul	Overhaul of T1 subway trains every 5 years to maintain a state-of-good-repair	$0.22	$0.16	$0.06
Other Subway	Work car purchase and overhaul, subway asbestos removal, pump and lighting replacement	$0.17	$0.12	$0.05
T1 Life Extension Overhaul	25 year overhaul of T1 subway trains starting in 2022 and ending in 2027 to extend their useful life	$0.72	$0.38	$0.33
Western Yard	Purchase of land, construction of maintenance and storage facility and connection to the main line to meet growth	$2.27	$0.04	$2.23
Line 2 Total		**$9.07**	**$2.30**	**$6.77**
Line 4				
Maintaining State-of-Good-Repair	**General maintenance to ensure a state-of-good repair on Line 4**	**$0.10**	**$0.10**	**$0.00**
Subways Total		**$18.1**	**$4.5**	**$13.5**

Project	Description	Estimated Cost	Funded	Unfunded
Bus				
Bus Procurement Program	Purchase of diesel, low-floor, low/zero emissions buses	$3.70	$0.55	$3.15
Ninth Bus Garage	Construct a double garage that will allow for several years of growth	$0.53	$0.20	$0.33
Purchase of Automotive Non-Revenue Vehicles	Purchase of vehicles used by TTC staff for transit enforcement, plant maintenance, etc.	$0.11	$0.04	$0.07
Bus Overhaul Program	Mid-life rebuild of Orion and Nova bus fleets, including engine, transmission and suspension	$0.81	$0.61	$0.20
Bus Garages	McNicoll bus garage completion, construction of collision centre and heavy-overhaul bus facility, garage upgrades	$0.78	$0.19	$0.59
Other Bus	Transit signal priority measures, bus stop improvements, autonomous vehicle program	$0.13	$0.07	$0.06
Bus Total		**$6.06**	**$1.65**	**$4.41**

Project	Description	Estimated Cost	Funded	Unfunded
Stations				
Bloor-Yonge Capacity Improvements	Construction of additional platforms, escalators and elevators to improve vertical circulation	$1.07	$0.01	$1.06
Station Rehabilitation	Roofing rehabilitation on subway, rapid transit stations and station finish renewal	$0.30	$0.24	$0.06
Elevator and Escalator Overhaul and Replacement	Replacement, modifications and upgrades to escalators and elevators to extend their useful life	$0.23	$0.14	$0.09
Easier Access Phase III (AODA) and Enhanced Station Access	Installing elevators to make all stations accessible by 2025 and additional future elevator installations	$0.94	$0.84	$0.10
Platform Edge Doors	Installation of doors on subway platforms to prevent passengers accessing subway tracks	$1.26	$0.00	$1.26
Other Stations	Station transformation, subway station fire alarms, bus platform ventilation	$0.14	$0.03	$0.11
Stations Total		**$3.94**	**$1.26**	**$2.68**

Project	Description	Estimated Cost	Funded	Unfunded
Streetcar				
Purchase of 204 Streetcars	Purchase of 204 accessible articulated low-floor streetcars	$0.37	$0.37	$0.00
Purchase of 60 Streetcars for Ridership Growth (in 2026 or 2027)	Purchase of 60 accessible articulated low-floor streetcars for growth	$0.36	$0.00	$0.36
Purchase of Streetcars for Ridership Growth (2027–2031)	Purchase of additional streetcars to meet ridership growth forecast from 2027–2031	$0.15	$0.00	$0.15
Streetcar Overhaul Program	Comprehensive overhaul program to ensure the state-of-good-repair of the new streetcar fleet	$0.13	$0.13	$0.00
New Streetcar Maintenance and Storage Facility	Consideration of the conversion of the Hillcrest complex to streetcar-only with additional track and upgrading the Harvey Shop	$0.90	$0.00	$0.90
Surface Track and Traction Power	Ongoing surface track replacement and traction power upgrades	$0.73	$0.51	$0.22
Streetcar Facility Upgrades	Enhancements to streetcar facilities	$0.35	$0.05	$0.30
Streetcar Total		**$3.00**	**$1.06**	**$1.94**

Project	Description	Estimated Cost	Funded	Unfunded
Wheel-Trans				
Purchase of Future Wheel-Trans Buses / Transformation	**Replacement of "Friendly" bus fleet and additional facilities based on the Family of Service model**	**$0.32**	**$0.14**	**$0.17**
Other Infrastructure				
Facilities	Renewal projects for facilities, furniture, office equipment, paving and new industrial space	$0.68	$0.44	$0.24
Information Systems	New Transit Control and ITS Centre, implementation of SAP, VISION, Enterprise Asset Management	$0.84	$0.42	$0.42
Office Consolidation	Start of consolidation of office space to increase efficiency and reduce occupancy costs	$0.21	$0.00	$0.21
Health, Safety and Security Infrastructure	Storage tank replacement, backflow preventors, standby generator procurement	$0.18	$0.14	$0.03
Other Infrastructure	Shop equipment, culvert rehabilitation, service planning and completing the implementation of the PRESTO farecard program	$0.27	$0.15	$0.11
Other Infrastructure Total		**$2.17**	**$1.16**	**$1.01**
TOTAL		**$33.50**	**$9.77**	**$23.73**

Of the $33.5 billion total, $23.9 billion is expected in the 10-year planning period reflected in the 2019–2028 Capital Budget and Plan.