

2023 UPDATE

# SUSTAINABLE CITY OF TORONTO FLEETS PLAN



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SUSTAINABLE  
CITY OF TORONTO  
FLEETS PLAN

## 2023 UPDATE

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# EXECUTIVE SUMMARY

As Canada's largest city, Toronto has a responsibility to rise to the challenges created by climate change while providing leadership in climate mitigation and adaptation. To achieve the City's Vision, "Toronto is a clean, green and sustainable city", we must invest in and accelerate high priority emission reduction areas identified in the TransformTO - Critical Steps for Net Zero by 2040 targets and actions. This means significantly reducing and ultimately eliminating our consumption of fossil fuels by transitioning City Fleets to zero emission vehicles. The City's climate mitigation and adaptation initiatives must continue to expand to meet the needs of a growing population, while contributing to environmental, economic, and social objectives, and equitable outcomes for our residents.

This document provides an update to the Sustainable City of Toronto Fleets Plan (The Plan) goal and objectives in addressing climate mitigation and adaptation with strategies for transitioning City Fleets to sustainable, climate resilient, net zero operations. It also provides a progress report on City Fleets' prior and current strategies and initiatives, changes in environmental circumstances, and external drivers and barriers.

Transitioning City Fleets to sustainable, resilient, net zero operations is a critical part of the City's plan to transition to net zero emissions by 2040, and it directly contributes to the City's corporate and strategic priorities.

City Fleets' climate mitigation and adaptation strategies and actions have been recognized for its successes and as an example of effective local leadership on climate action. To-date, we have eliminated approximately 190 metric kilotons of greenhouse gas emissions, a 42% reduction from 1990 levels.

Toronto's approach to greening its Fleets will contribute to both significantly reducing greenhouse gas emissions and improving near- and long-term health and socioeconomic conditions of our most disadvantaged and vulnerable residents, and our community as a whole. This will further highlight Toronto's positive transformative response to growing challenges of environmental sustainability and resilience, social equity, and just economic development.

The Plan continues to build on strong engagement and collaboration, and shared expertise and experience of City Fleets and its key partners and stakeholders. The scope of the Plan includes more than 10,000 vehicles and equipment managed and operated by Fleet Services Division, Toronto Transit Commission (TTC), Toronto Police Service, Toronto Fire Services, Toronto Paramedic Services, Toronto Community Housing, Exhibition Place, Toronto Zoo, Toronto Parking Authority, and Toronto Public Library. It does not include Toronto Transit Commission streetcar and subway vehicles, or vehicles owned and operated by private companies who contract with the City.

Achievement of the Sustainable Fleets goal and objectives requires the engagement and cooperation of City divisions, agencies, and corporations who operate City vehicles and equipment included in the scope, and those that are providing invaluable support services to City Fleets.





Climate change continues to be one of the most urgent issues facing humanity today. Scientific data shows that the past decade was the hottest on record, and the year 2020 was more than 1.2°C hotter than the average pre-industrial levels. Despite the 2020 industrial slowdown, the amount of CO<sub>2</sub> in the atmosphere reached record levels in 2020, hitting 417 parts per million in May<sup>(1)</sup>. Left unchecked, climate change threatens to disrupt our systems and daily lives on a far greater scale and magnitude, with consequences that will be felt for generations to come.

Greenhouse gases emitted today will persist in the atmosphere for thousands of years and the impacts of those emissions are borne by society at large. Failure to reduce emissions and mitigate its impacts will compound the damage emissions have already created and continue to negatively impact the environment, people, and economy.

Scientific data accumulated over the last few decades, clearly indicates a wide range of significant adverse health effects caused by air pollution, ranging from respiratory symptoms to development of diseases and premature mortality. The global loss of life expectancy from long-term exposure to ambient air pollution exceeds that of infectious diseases, and it stands to get exponentially worse.

City vehicles are an essential component of the delivery of City programs and the provision of public services. However, following buildings, vehicle are the second highest source of the City's corporate emissions. Accelerated transition of City Fleets to sustainable, resilient, net zero operations is a critical part of the City's plan to reach net zero emissions by 2040, and it directly contributes to the corporate and strategic priorities<sup>(2)</sup>. This will also generate up to an estimated \$400 million<sup>(3)</sup> in avoided social and economic damages resulting from City Fleet greenhouse gas emissions, including improving near- and long-term health and socioeconomic conditions of our residents, and our community as a whole. It will also fully integrate environmental stewardship into our daily activities and closely align with and contribute to the City of Toronto's Environmental, Social and Governance (ESG)<sup>(4)</sup> performance management framework. And it will further highlight Toronto's positive transformative response to growing challenges of environmental sustainability and resilience, social equity, and just economic development.

## 2.1 GUIDING PRINCIPLES

This Plan is guided by Toronto's vision of being a clean, green, and sustainable city that is investing in quality of life socially, economically, culturally and environmentally to make Toronto a desirable place to live, prosper and visit. Achieving this long-term vision while delivering our day-to-day services with excellence is City Fleets main focus. Furthermore, this plan supports and contributes to several key corporate priorities, strategies, and initiatives.

### CLIMATE EMERGENCY<sup>(5)</sup>

This Plan identifies clear and decisive actions to invest in and accelerate City Fleet emission reduction areas and achieve net-zero state by 2040. Sustainable and resilient City Fleet will be a foundation for delivery of quality services and value over the long term, and will help build a better, more sustainable, more resilient and equitable society.

### TRANSFORMTO – CRITICAL STEPS FOR NET ZERO BY 2040<sup>(6)</sup>

TransformTO Net Zero Strategy responds to the climate emergency by setting a course for net zero GHG emissions community-wide by 2040. It also identifies the City's role and commitment to quickly moving the City's own buildings, vehicles, waste, decision making processes, and other practices along the path to net zero. Objectives and key actions identified in the Sustainable City Fleets Plan represent a clear commitment to transitioning City Fleets to zero emission vehicles and operations by 2040, including 45% reduction in GHG emissions by 2025, and 65% by 2030.

### CORPORATE STRATEGIC PLAN<sup>(2)</sup>

The City of Toronto's Corporate Strategic Plan is guided by City Council's vision, Toronto's motto, and the Toronto Public Service's mission. It establishes two corporate priorities and four strategic priorities to guide our organization in the coming years.

Transitioning City Fleets to sustainable, resilient, net zero operations plays a critical role in tackling climate change and building corporate resilience. Improved Fleet management, and efficient use of City Fleet assets, will also result in reduced costs and better service delivery by enabling transition to simple, reliable, efficient, and equitable services that anticipate changing customer needs.



## 2.2 KEY BENEFITS

City Fleets' transition to zero emission vehicles will carry a significant upfront cost. However, the long term environmental, economic, and social benefits are far more significant. The associated strategies and initiatives will have a material impact in a number of areas critical for the City and its residents.

### CLIMATE MITIGATION AND ADAPTATION IMPACT

Transitioning City Fleets to sustainable, resilient, net zero operations by 2040 will eliminate approximately 244 metric kilotons of greenhouse gas emissions. This will generate up to an estimated \$400 million<sup>(3)</sup> in avoided social and economic damages resulting from City Fleet greenhouse gas emissions, including improving near- and long-term health and socioeconomic conditions of our residents. It will also fully integrate environmental stewardship into our daily activities and closely align with and contribute to the City of Toronto's Environmental, Social and Governance (ESG) performance management framework.

### EQUITY IMPACT

Climate change discussions have for most part focused on its physical impacts manifested through climate hazards. Growing evidence indicates that like pandemic and similar global disasters, climate change has lasting socioeconomic impacts on everyone, but far more distressing for socially and economically disadvantaged and marginalized people.

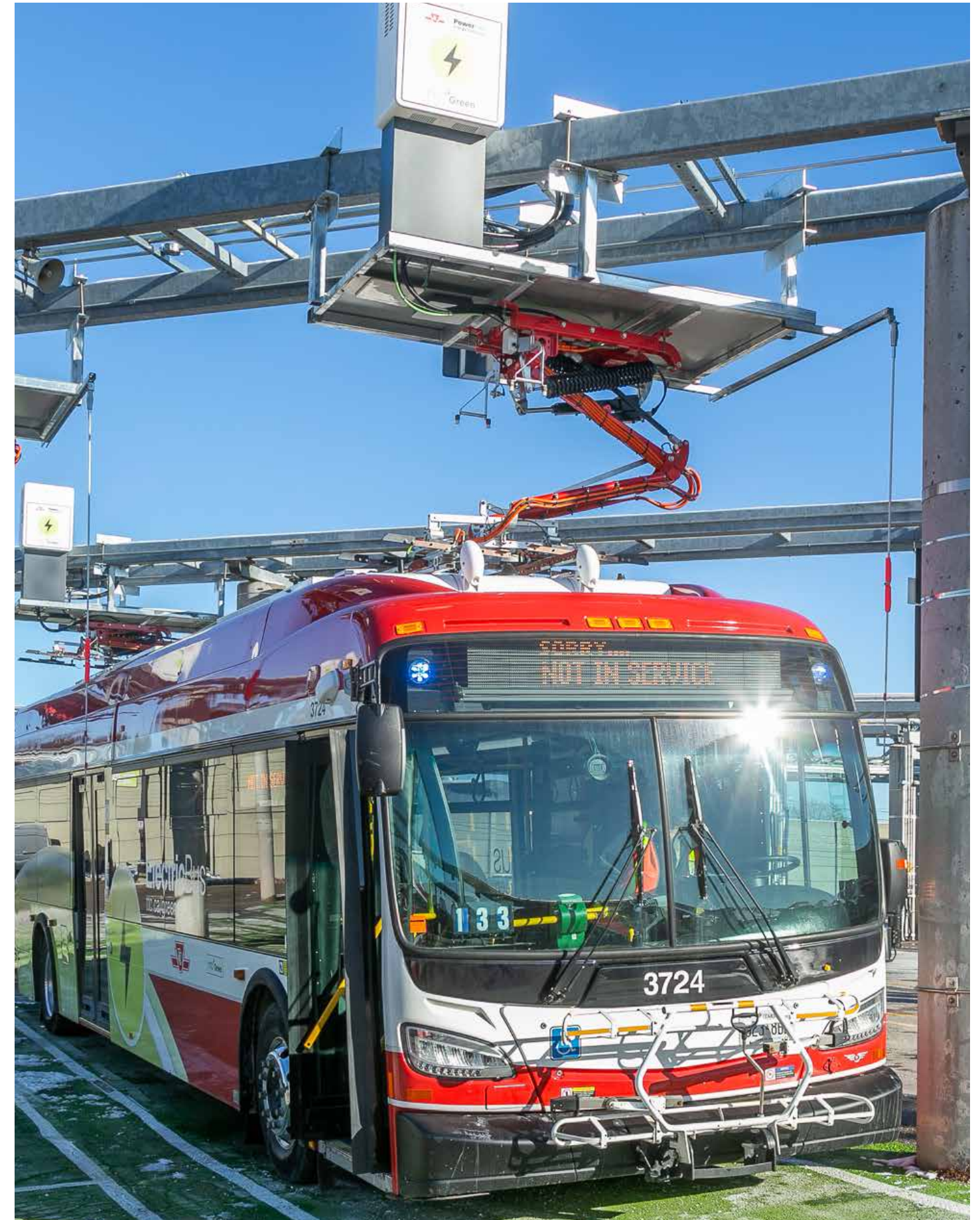
Communities with disadvantaged and marginalized people face much higher concentrations of air pollution and associated health impacts, compounding the existing challenges. These communities are generally more vulnerable to adverse health effects which frequently undermines their economic position in both near- and long-term.

Addressing climate vulnerability of marginalized communities must be an integral component of City's policies and strategies aiming to protect and enhance equity, and strengthen the social, economic, and physical conditions city-wide. This Plan has the capacity to significantly accelerate City Fleets' emissions reductions and contribute to improving near- and long-term health and socioeconomic conditions of our most vulnerable residents and our community. This will further highlight Toronto's positive transformative response to growing challenges of

environmental sustainability and resilience, social equity, and just economic development.

### OTHER KEY BENEFITS

- › **Improved Health** - Reduced vehicle emissions and noise pollution contribute to healthier communities.
- › **Improved Safety** - Improved vehicle safety features and vehicle utilization will help improve staff and community safety.
- › **Public and stakeholder relations** - Organizations are under increasing pressure from key stakeholders, including public, to not only measure and report their carbon footprint but also to demonstrate how climate-related risks and opportunities are identified, assessed, implemented, and adequately managed.
- › **Resilient supply chains** - Climate change and extreme weather events can significantly disrupt supply chains and damage facilities. Climate change can also result in increased prices for key resources, including energy. Mitigating these risks is one of the key priorities that will further incentivise adoption of sustainable technologies and fuels within City operations.
- › **Vehicle market transition** - By modeling how to electrify a corporate vehicle fleet, City Fleets could play an important role in the market transition to zero emission vehicles, including lowering barriers to ZEV adoption.
- › **Corporate sustainability**
  - Improved asset management, and efficient use of City assets, will result in reduced costs and better service delivery.
  - Demonstrates City's leadership on sustainability to our employees, community, businesses, and other municipalities and levels of government.
  - Ability to fully explore and establish partnership opportunities with other levels of government, businesses and organizations who have a shared interest in managing resources and supply chains to ensure future availability.
- › **Compliance** - Strengthens the readiness for responding to existing carbon regulations and preparing for future policies compliance.
- › **Innovation** - Sustainability can drive innovation in services, business processes, and energy-efficient infrastructure.







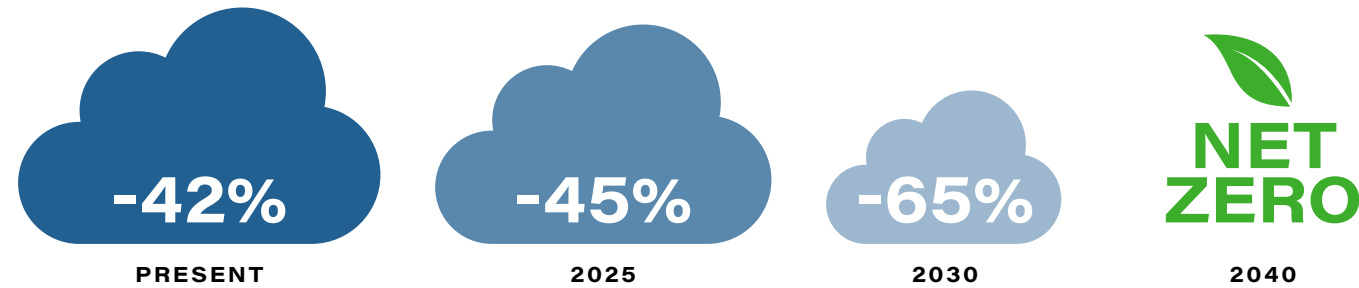
## OUR EXPERIENCE AND SUCCESS

# 3.0

City Fleets' climate mitigation and adaptation strategies and actions have been recognized for its successes and as an example of effective local leadership on climate action. Initiatives undertaken by City Fleets made a significant contribution to overall City emissions reductions. To-date, we have eliminated approximately 190 metric kilotons of greenhouse gas emissions, a 42% reduction from 1990 levels. The City of Toronto has been established as a Canadian leader in testing and adopting zero emission vehicle technologies, alternative fuels, and efficient fleet management practices:

- › Toronto Transit Commission (TTC) has gained valuable experience from its last procurement of 255 hybrid electric buses and 60 fully electric buses. The TTC has applied the lessons learned from these procurements and the head-to-head evaluation of the 60 fully electric eBuses to refine the bus technical and commercial specifications. In February 2022, the TTC awarded a procurement of 336 hybrid electric buses for delivery in 2023. In addition, an RFP was issued in April 2022 for the supply and delivery of 240 electric buses for delivery in 2024 and 2025.
- › The TTC worked in partnership with Toronto Hydro on the installation of required charging infrastructure for the existing fleet of 60 electric buses. As the TTC continues its path to full electrification of the bus, Wheel-Trans, and non-revenue vehicle fleets, this infrastructure must be expanded accordingly. The TTC is working with PowerON Energy Solutions LP and Toronto Hydro to ensure on-time upgrade of the local grid distribution system and implementation of required infrastructure at TTC sites.
- › Fleet Services is undertaking a major expansion of City's corporate electric vehicle (EV) charging infrastructure to enable and support accelerated transition of City Fleets to zero-emission vehicles (ZEV), and help with broader promotion and adoption of EVs in Toronto, and the Greater Toronto and Hamilton region. The primary user group of the corporate charging network will be City-owned vehicles (excluding TTC revenue vehicles). The network will also enable the expansion of the City's existing workplace charging program, and will be made accessible to public where feasible. The expanded City of Toronto corporate EV charging station network is expected to have 850 charge ports available by 2025 at more than 100 City locations.

## EMISSIONS REDUCTION



**“TO-DATE, WE HAVE ELIMINATED APPROXIMATELY 190 METRIC KILOTONS OF GREENHOUSE GAS EMISSIONS, A 42% REDUCTION FROM 1990 LEVELS.”**

- › As part of the interim steps in transitioning City's medium and heavy-duty vehicles to zero emission vehicles, we continue to focus on the use of renewable and sustainable fuels:
  - Starting in 2020, City Fleets have implemented seasonal use of biodiesel blends B5, B10, and B20;
  - Heavy duty waste collection diesel trucks continue to be replaced with compressed natural gas (CNG) trucks;
  - Hybrid vehicles and equipment have been adopted in areas with high operational utilization;
  - Auxiliary batteries, anti-idling devices, inverters, and other technologies for vehicles and equipment that reduce fuel consumption and emissions have been installed on many vehicles and equipment.



- › Starting in 2022, any light duty vehicle being purchased by the City will be an electric version, where operationally feasible.
- › Toronto Fire Services has designed and ordered two fully electric fire pumper trucks. When delivered, Toronto Fire Services will evaluate the opportunity to expand the deployment of electric pumper trucks, within the Fire Services heavy fleet. These trucks represent the latest in green, energy-efficient technology for the daily use of fire services.
- › Toronto Fire Services has already implemented idle reduction technology on 35 heavy fire trucks. Idle reduction technology is included in all current and future truck order specifications, with another 27 heavy trucks currently on order that include this technology. All new and replacement heavy fire trucks moving forward will include idle reduction technology as a specification requirement.
- › Toronto Fire Services is also transitioning to hybrid vehicle technology for all District Chief emergency response vehicles and will continue to transition to hybrid and/or electric vehicles, across the small vehicle fleet, wherever feasible and possible.
- › Toronto Paramedic Services has a fleet of 115 hybrid ambulances and employs anti-idle technology in all 332 ambulances. In addition, solar panels are installed on 215 vehicles which alleviate load on electrical systems and reduces demand and fuel consumption. Many of these innovations in green technology have been partially funded by provincial and federal grants.
- › Toronto Paramedic Services has also been evaluating the availability of an all-electric ambulance that can be certified by the Ministry of Health to operate in Ontario.
- › Toronto Police is continuing with conversion to hybrid vehicles while testing operational viability of fully electric vehicle models.
- › Toronto Police also continues to utilize more than 400 bicycles for neighbourhood patrols, avoiding the use of up to 100 police patrol vehicles as a result.
- › As part of its vision to become the world's best provider of sustainable parking, bike share and last mile mobility experiences, Toronto Parking Authority is executing an ambitious rollout plan for Electric Vehicle charging across the City of Toronto. The plan includes the installation of over 500 Electric Vehicle charging stations at Toronto Parking Authority off-street parking locations by the end of 2024 and a minimum of 50 additional on-street public Electric Vehicle charging stations before the end of 2023. The provision of Electric Vehicle charging services is a key component of Toronto Parking Authority's transformation to a mobility services provider, supports the City of Toronto's Net Zero Strategy and will support Toronto Parking Authority's growth and financial returns over the long-term.
- › Work has been completed to install 117 Electric Vehicle chargers across eleven Toronto Parking Authority off-street parking facilities by the end of 2022. A further 175 Electric Vehicle chargers are planned for installation across 18 off-street facilities in 2023, which will bring the total of off-street chargers in operation at Toronto Parking Authority facilities by the end of 2023 to nearly 300.
- › Beginning in 2023, Toronto Parking Authority will assume responsibility for all on-street Electric Vehicle charging, which includes the transfer of 47 chargers from Toronto Hydro-Electric Systems Limited to Toronto Parking Authority. As directed by City Council, Toronto Parking Authority will also be responsible for delivering a further 50 on-street chargers by the end of 2023 bringing the total number of on-street chargers to nearly 100 by the end of 2023.
- › Continued implementation and utilization of telematics technology on City vehicles contributed to improved vehicle utilization, better fuel efficiency, reduced idling, lower emissions, improved safety and operational cost savings.





# SUSTAINABILITY PLAN 4.0

This City-wide Plan's goal is to transition City Fleets to sustainable, resilient, net zero operations by 2040, including 45% emissions reduction by 2025, and 65% by 2030. The scope of the Plan includes more than 10,000 vehicles and equipment managed and operated by Fleet Services Division, Toronto Transit Commission (TTC), Toronto Police Service, Toronto Fire Services, Toronto Paramedic Services, Toronto Community Housing, Exhibition Place, Toronto Zoo, Toronto Parking Authority, and Toronto Public Library. It does not include Toronto Transit Commission streetcar and subway vehicles, or vehicles owned and operated by private companies who contract with the City.

The Plan continues to build on the achievements of the City Fleets' previous and current strategies, enabled and sustained by strong engagement and collaboration, and shared expertise and experience of City Fleets and its key partners and stakeholders.

City Fleets will continue to demonstrate leadership in adopting and advancing different zero emission vehicle technologies, renewable energy sources, and efficient fleet management practices that aim to significantly reduce environmental, social, and economic impacts of Fleet operations, and improve vehicle efficiency, reliability, and safety. They are designed to ensure that City Fleets are fully optimized, utilized, and maintained efficiently, while remaining cost effective, resilient, and sustainable for decades to come.



# 4.1 OBJECTIVES AND KEY ACTIONS

## OBJECTIVE 1 Transition 20% of City-owned fleet to zero emission vehicles by 2025, and 50% by 2030

Key Actions:

- › Accelerate transition to zero emission vehicles (ZEV) through planning, coordination, and collaboration, informed by divisional & agency mission, ZEV model availability, and funding;
- › Expand vehicle charging infrastructure - Installing sufficient charging infrastructure to support rapid vehicle deployment to meet the ZEV targets will be a significant challenge that requires an integrated, City-wide strategy and long-term view that includes:
  - Continue to engage with all City divisions, agencies & corporations managing and operating City vehicles, and Toronto Hydro, and conducting a comprehensive assessment of City sites and fleet locations in order to plan for efficient deployment of necessary charging infrastructure, energy storage technologies, and required supporting services; and
  - Continued fleet, building, facility and site energy managers collaboration to plan for future charging infrastructure requirements, for new developments and upgrades of existing City facilities.
- › Optimize fleet management and improve efficiencies:
  - Determining an optimum fleet inventory for the delivery of City programs and the provision of public services, emphasizing elimination of underutilized, old, or redundant vehicles from the City's fleet inventory and increasing the proportion of ZEV;
  - Expanding use of vehicle telematics and using fleet operational data to inform fleet planning and vehicle acquisition strategies; and
  - Improving collection, analysis, reporting, and application of asset-level fleet data.
- › Build, promote, and sustain the culture of climate action and sustainability:
  - Build internal capacity through engagement, education, and training on corporate sustainability, climate adaptation, and environmental stewardship;
  - Promote and expand cooperation and shared learnings based on successful ZEV deployment in City Fleets; and
  - Encourage and recognize outstanding performance, including incorporation of sustainability objectives in the performance plans, where appropriate.
- › Identify staffing resource requirements for effective implementation of the Sustainable City Fleets Plan goal and objectives;
- › Engage with business, non-profit, and community organizations, and provincial and federal governments to share best practices for addressing more challenging or complex emissions reduction opportunities.

## OBJECTIVE 2 Resilient Fleet Assets and Operations by 2040

Key Actions:

- › Continue to incorporate climate resilience into City Fleet management processes:
  - Identify major mission critical facilities, infrastructure, and operational assets;
  - Identify and prioritize adaptation strategies that increase the climate resilience of mission critical facilities, infrastructure, and operational assets based on identified vulnerabilities;
  - Ensure City Fleet capital projects for new buildings and existing buildings undergoing major renovations are planned, designed, and constructed to be resilient to climate change impacts and to support City's zero emission Fleets;
  - Identify critical third-party services and supply chains and ensure their climate resiliency; and
  - Increase and improve climate change and resilience education of City Fleet employees, including use of new technologies.
- › Fleet and facility managers will continue to collaborate to manage the increasing buildings electricity demands and loads, and implementation and expansion of integrated and coordinated operation and management of building systems and vehicles.

## OBJECTIVE 3 Net Zero Procurement by 2040

Key Actions:

- › Maximize the procurement of sustainable services, products, and materials;
- › Enhance sustainable procurement - The City's purchasing power is one way that the City can make environmentally sustainable and equitable investments for today:
  - Align procurement policies with TransformTO Net Zero objectives;
  - Require major suppliers to publicly disclose emissions and set reduction targets.
- › Strengthen City procurement process to minimize risks associated with climate change:
  - Strengthening lifecycle cost approaches, where feasible and applicable, to include the social cost of GHG (SC-GHG), the incremental future economic damages caused by each tonne of carbon pollution, can be a valuable tool in identifying investments that are compatible with the low-carbon economy of the future.

Meeting these objectives requires significant capital investments and innovative improvement strategies for operational and management practices.





## 4.3 MONITORING AND REPORTING

The Fleet Services Division General Manager will be responsible for coordinating and monitoring the implementation of the strategies and actions, reviewing progress, and making recommendations to the Fleet Management Steering Committee (FMSC) for the Plan updates, including directional changes as required, subject to review and approval by the FMSC.

The progress of established strategies and actions will be reported regularly as part of the TransformTO updates. Comprehensive reports on the Plan progress will continue to be provided at the time of the Plan updates. The reports will include recent developments and results of strategy implementation, the status, trends, and rates of progress. It will also include changes in environmental circumstances, external drivers and barriers, and any updates to the current goal and objectives.

## 4.2 IMPLEMENTATION

Achievement of the objectives outlined in this Plan will require the engagement and cooperation of City divisions, agencies, and corporations who operate City vehicles and equipment to ensure success. It is also dependent upon building existing partnerships with federal and provincial governments, community groups, businesses, and foundations, in addition to forging new partnerships. Accountability and continued engagement will be crucial in the implementation, further development, and success of this Plan.





# FLEET PROFILES

# 5.0

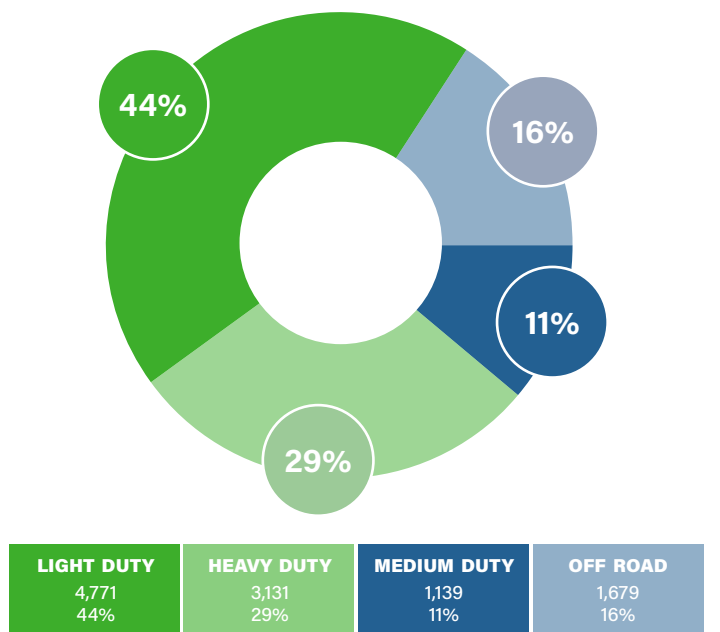
**TORONTO**

Call **3-1-1**

City of Toronto has the largest municipal fleet in Canada, and one of the largest and most diverse fleets in North America. These assets include more than 10,000 different vehicle categories including motorcycles, passenger vehicles, pick-up trucks, vans, fire trucks, ambulances, sanitation trucks, street sweepers, transit buses, construction equipment, dump trucks, tractor trailers, ice resurfacing machines, crane and tower trucks, vacuum trucks and many other specialized units. They are allocated across four weight classification categories, light-duty, medium-duty, heavy-duty, and off-road.

Zero emission vehicles currently account for 7% of the total City-owned vehicles.

## CITY OF TORONTO FLEET COMPOSITION





# “CITY OF TORONTO HAS THE LARGEST MUNICIPAL FLEET IN CANADA, AND ONE OF THE LARGEST AND MOST DIVERSE FLEETS IN NORTH AMERICA.”

The **Fleet Services Division (FSD)** purchases, manages, and maintains a fleet of approximately 4,400 motor vehicles and equipment, and approximately 900 trailers and other non-motorized units.

The **Toronto Transit Commission (TTC)** is the most heavily-used urban mass transit system in Canada, and the third largest in North America.

**Toronto Police** fleet inventory consists of 1,626 vehicles and 420 bicycles, the majority of which operate on three shifts, 365 days a year.

**Toronto Fire** is the largest fire department in Canada and the fifth largest municipal fire department in North America.

**Toronto Paramedic Services** operates a fleet of 382 motor vehicles to meet its operational needs. The fleet consists primarily of ambulance and emergency response vehicles.

**Toronto Community Housing** fleet is managed by Fleet Services Division and it primarily consists of light duty passenger vehicles and vans.

**Toronto Exhibition Place** fleet mostly consists of passenger vehicles (20%) and various off-road vehicles and equipment (80%).

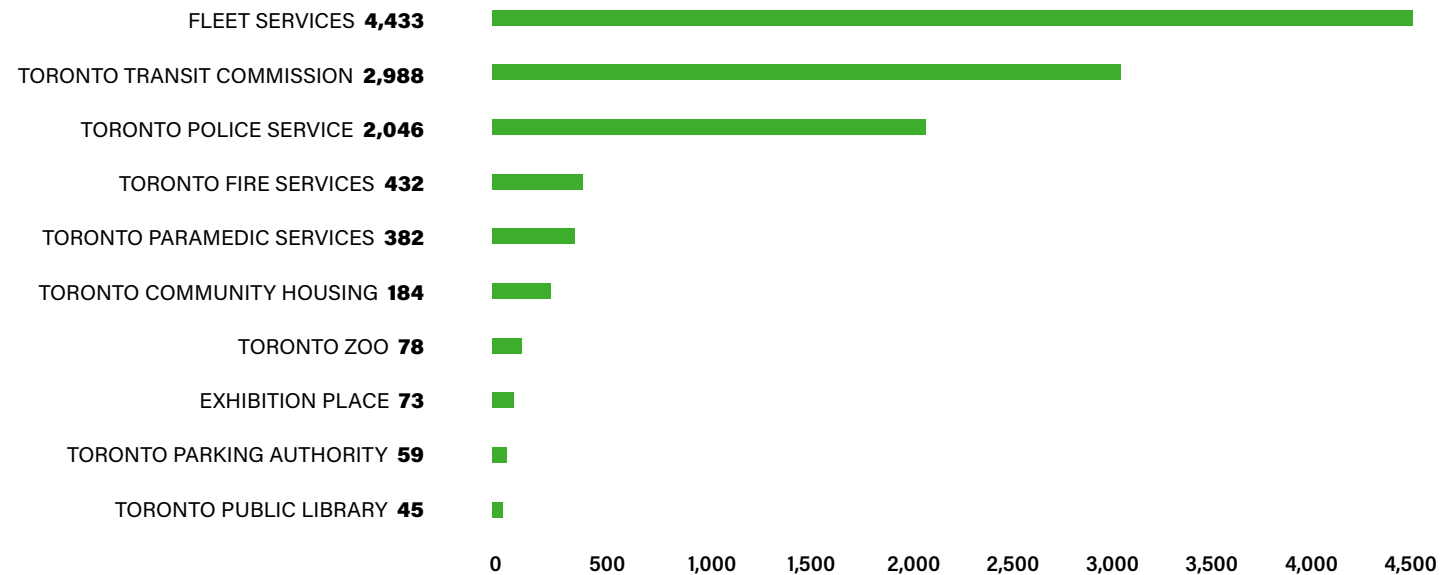
**Toronto Zoo** fleet mostly consists of various off-road vehicles and equipment.

The **Toronto Parking Authority** fleet consists of 59 service vehicles, which are primarily light duty vans and pick-ups.

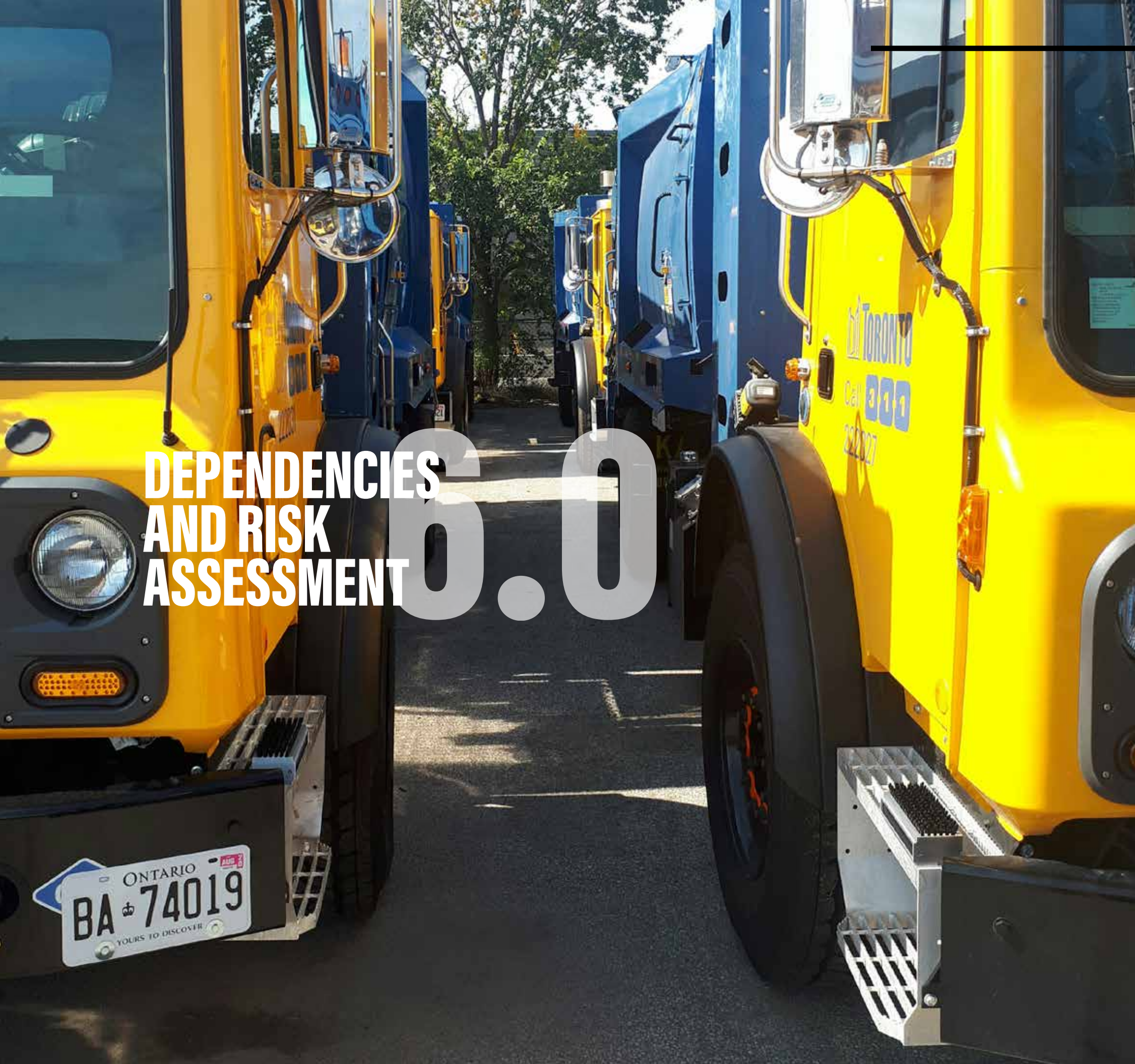
**Toronto Public Library** is North America’s busiest urban public library system. Toronto Library fleet is managed by Fleet Services Division with 62% of it being light duty vehicles, 23% medium duty vans and trucks and 15% heavy duty trucks including bookmobiles.

## CITY OF TORONTO FLEETS

City’s vehicles and equipment are managed and operated by:







# DEPENDENCIES AND RISK ASSESSMENT 6.0

Accelerated transition of City Fleets to sustainable, resilient, net zero operations is a critical part of the TransformTO - Critical Steps for Net Zero by 2040 targets and actions. Climate change inherent complexity has created strong and complex dependencies between government, business, organizational, and public responsibilities.

Following are some of the key identified internal and external dependencies and risks:

- › **Industry Readiness** – City’s ability to procure zero emission vehicles (ZEV) is largely dependent on the auto industry readiness to produce and supply viable ZEV options and quantities, especially for medium and heavy-duty vehicles.
- › **Funding** – Various types of economic pressures continuing to create a very challenging financial conditions for the City and other levels of government. Without required funding, City Fleets will not be in the position to timely and sufficiently transition to zero emission vehicles resulting in not meeting TransformTO goals and objectives.
- › **User Adoption** – Addressing user adoption of ZEV and supporting technologies through education, and availability and access to the charging stations, are critical to the successful transition to ZEV and net zero operations.
- › **Government Regulations** – Federal and provincial regulations and mandates regarding zero emission vehicle (ZEV) sales are critical part of a larger policy package to address both supply and demand barriers to ZEV uptake, especially for medium and heavy-duty vehicles.
- › **Geopolitical situation** – With the degree of global economic connectivity and dependency, current geopolitical instability or additional major geopolitical developments have a potential for continued and profound disruption of resource availability and supply chains.
- › **Energy and other natural resources availability and dependency** – Any significant energy and other key natural resources availability and dependency would significantly impact the availability of low and zero-emission technologies and their implementation and sustainability.
- › **Population growth** – Significant increase in the current city population growth would put additional pressure on the City infrastructure and resources.
- › **Workforce** – Availability of skilled labour and aging workforce could significantly impact our essential knowledge transfer and ability to keep up with the pace of technological and business developments required to meet the established goals and objectives.



# 7.0

## REFERENCES

- (1) World Meteorological Organization – The State of the Global Climate 2020
- (2) City of Toronto Corporate Strategic Plan
- (3) Environment and Climate Change Canada - Canada's Approach on the Social Cost of Greenhouse Gases
- (4) City of Toronto Environmental, Social & Governance Performance
- (5) City of Toronto Climate Emergency Declaration
- (6) TransformTO – Critical Steps for Net Zero by 2040



## ACKNOWLEDGEMENTS

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### PARTICIPATING FLEETS

Toronto Fleet Services Division  
Toronto Transit Commission  
Toronto Police Service  
Toronto Fire Services  
Toronto Paramedic Services  
Toronto Community Housing  
(managed by Fleet Services Division)  
Exhibition Place  
Toronto Zoo  
Toronto Parking Authority  
Toronto Public Library  
(managed by Fleet Services Division)