

**REPORT FOR ACTION****The City of Toronto 2019 - 2023 Green Fleet Plan (The Pathway to Sustainable City of Toronto Fleets) and 2014-2018 Green Fleet Plan Results and Wrap-Up**

Date: September 19, 2019

To: General Government and Licensing Committee

From: General Manager, Fleet Services

Wards: All

SUMMARY

The Pathway to Sustainable City of Toronto Fleets (henceforth referred to as the "Plan") is an overview of a five-year plan for City fleets to address climate mitigation and adaptation with strategies for transitioning City fleets to sustainable, climate resilient, low-carbon operations.

This Plan is a continuation of the work undertaken with the Consolidated Green Fleet Plan (2014-2018) with an expanded scope. Through the 2014-2018 Plan, City Fleets have already surpassed the City's 2020 emissions reduction target of 30 per cent.

RECOMMENDATIONS

The General Manager, Fleet Services recommends that:

1. City Council adopt The Pathway to Sustainable City of Toronto Fleets Plan in Attachment 1, which supersedes all previous City of Toronto Green Fleet Plans, as the framework to achieve the following goal and three objectives:
 - a. Goal: Sustainable, climate resilient, low-carbon City fleets.
 - b. Objective 1: Transition 45 per cent of City-owned fleet to low-carbon vehicles by 2030.
 - c. Objective 2: 65 per cent greenhouse gas reduction by 2030 (from 1990 levels).
 - d. Objective 3: 80 per cent greenhouse gas reduction by 2050 (from 1990 levels).
2. City Council direct the General Manager, Fleet Services to:
 - a. coordinate the implementation of The Pathway to Sustainable City of Toronto Fleets Plan, in consultation with Management staff of other City of Toronto fleets;

- b. track the progress made in achieving the established objectives and report regularly as part of TransformTO City-wide progress reports and updates; and
 - c. provide a comprehensive report on The Pathway to Sustainable City of Toronto Fleets progress and a Plan update every four years, with the first one to be delivered in the second quarter of 2023.
3. City Council direct the General Manager, Fleet Services, to include \$0.123 million for The Pathway to Sustainable City of Toronto Fleets Plan in the 2020 Operating Budget of Fleet Services for consideration amongst all other priorities.
4. City Council direct the General Manager, Fleet Services, to include \$9.291 million for The Pathway to Sustainable City of Toronto Fleets Plan in the 2020-2029 Capital Plan of Fleet Services for consideration amongst all other priorities.
5. City Council delegate to the General Manager, Fleet Services, authority to negotiate and execute and to amend as and when necessary, any agreements necessary to give effect to the implementation of The Pathway to Sustainable City of Toronto Fleets Plan, on terms and conditions satisfactory to the General Manager, Fleet Services, and the City Solicitor.
6. City Council direct the Fire Chief and General Manager, Toronto Fire Services, and the Toronto Paramedic Services Chief to direct their staff to actively participate in the implementation of The Pathway to Sustainable City of Toronto Fleets Plan.
7. City Council request the Toronto Transit Commission Board, the Toronto Police Services Board, the Toronto Community Housing Board of Directors, the Exhibition Place Board of Governors, the Toronto Zoo Board of Management, the Toronto Parking Authority Board of Directors, and the Toronto Public Library Board to adopt and implement the Pathway to Sustainable City of Toronto Fleets Plan.

FINANCIAL IMPACT

The total projected capital cost for Fleet Services, relating to the Centrally Managed Fleet, over five years will be \$9.951 million as outlined in Table 1a below.

Table 1a - Annual Capital Cash Flow by Initiative (2019 - 2023) (in \$ millions)

Capital Funding Requirements	2019	2020	2021	2022	2023	Total Capital Cost
(1) Electric Vehicles (EV)	0.114	0.219	0.637	0.241	0.203	\$1.414
(2) EV Charging Infrastructure	0	1.080	1.080	0.900	0.900	\$3.960

Capital Funding Requirements	2019	2020	2021	2022	2023	Total Capital Cost
(3) CNG Collections Trucks	0.480	0.060	0.510	0.750	2.310	\$4.110
(4) Fleet Sharing Program	0.066	0.020	0.044	0.156	0.181	\$ 0.467
Total Capital Requirement	0.660	1.379	2.271	2.047	3.594	\$ 9.951

(1)(2) - Part of \$8.187 million submission under the City of Toronto Green Infrastructure Call Out for intergovernmental funding opportunities.

(3) - To be funded from the Solid Waste vehicle and equipment replacement fund.

(4) - Full implementation of the initiative utilizing technology to improve vehicle utilization (approved by Council on June 26-29, 2018 -

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2018.GM28.25> and May 14 and 15, 2019 -

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2019.AU2.3>).

The estimated capital funding required to implement this Plan is \$9.291 million between 2020 and 2023, of which \$5.661 million of the projected capital requirements is unfunded and \$3.630 million will be funded from the Solid Waste Vehicle Reserve (XQ1014), as outlined in Table 1b below.

Table 1b - Annual Capital Funding Sources (2019 - 2023) (in \$ millions)

Capital Funding Sources	2019	2020	2021	2022	2023	Total Capital Cost
Vehicle and Equipment Reserve (XQ0003)	0.114	0	0	0	0	\$ 0.114
Solid Waste Vehicle Reserve (XQ1014)	0.480	0.060	0.510	0.750	2.310	\$4.110
Car Share Technology on City Vehicles (CFL057)	0.066	0	0	0	0	\$ 0.066
Unfunded	0	1.319	1.761	1.297	1.284	\$ 5.661
Total Capital Cost	0.660	1.379	2.271	2.047	3.594	\$ 9.951

The total projected operating cost for Fleet Services over five years will be \$1.221 million as outlined in Table 2 below.

Table 2 - Annual Operating Funding Requirements by Initiative (2019 - 2023) (in \$ millions)

Operating Funding Requirements	2019	2020	2021	2022	2023	Total Operating Cost
Fleet Sharing Program - Third-party System Support	0.039	0.018	0.091	0.182	0.274	\$0.604
Fleet Sharing Program - Two (2) Program Support Positions	0	0.104	0.163	0.170	0.178	\$0.615
Annual Operating Cost	0.039	0.123	0.255	0.353	0.451	\$1.221

The 2019 operating funding requirement was funded from the Car Share Technology on City Vehicles Fund (CFL057). The estimated operating funding required to implement this Plan is approximately \$0.084 million for 2020 and is included in Fleet Services' 2020 Operating Budget submission for consideration. All annual operating costs will be included in future year Fleet Operating Budget submissions for consideration.

Due to the nature of the recommended strategies and actions, the full magnitude of potential financial impact will depend on the funding availability, and availability and successes of the associated technologies. Most importantly, the potential environmental and financial benefits associated with these investments will continue to increase with broader application and will continue for years to come.

Table 3a - Projected Financial and Environmental Benefits (2019 - 2023)

Projected Operating Savings and Emissions Reductions (2019 - 2023)	2019	2020	2021	2022	2023	Total Operating Savings (in \$ millions)	GHG Reduction (kilograms of carbon dioxide equivalent, CO2e)
Improved Vehicle Fuel Efficiency (Fuel)	0.179	0.173	0.167	0.162	0.157	\$0.838	2,072,844
Electric Vehicles (Fuel)	0.092	0.264	0.642	0.838	1.239	\$3.075	2,890,583
Electric Vehicles (Maintenance)	0.016	0.047	0.114	0.148	0.219	\$0.544	0
CNG Vehicles (Fuel)	0.672	0.682	0.741	0.865	1.062	\$4.022	6,472,839
Fleet Share Program	-0.051	0.024	0.319	0.587	0.785	\$1.664	3,405,479
Total	\$0.908	\$1.190	\$1.983	\$2.600	\$3.462	\$10.143	14,841,745

Indicated 2020 savings are reflected in Fleet's 2020 Operating Budget submission and will be included in future year submissions.

Table 3b - Projected Financial and Environmental Benefits (Estimated Over Assets Lifetime)

Projected Financial and Environmental Benefits (Estimated Over Assets Lifetime ¹)	Operating Cost Savings (in \$ millions)	GHG Reduction (kilograms of carbon dioxide equivalent, CO ₂ e)
Fuel and Maintenance (Electric Vehicles)	\$14.581	28,905,825
Fuel (CNG)	\$4.023	6,472,839
Fuel (fuel efficient vehicles)	\$0.837	2,072,864
Fleet Sharing Program (2020 - 2023)	\$1.572	3,351,424
Total	\$21.013	40,802,952

(1) - Estimated life cycle of an electric vehicle is 10 years, and 6 years for a CNG truck.

The financial implications of this Plan for the TTC, Toronto Police, Toronto Fire, Toronto Paramedics, Toronto Community Housing, Toronto Zoo, Exhibition Place, Toronto Parking Authority, and Toronto Public Library are being addressed in each Division/Agency's existing Capital Programs and Operating Budgets.

The Chief Financial Officer and Treasurer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

At its meeting on June 10, 11, 12 and 13, 2014 City Council adopted the City of Toronto Consolidated Green Fleet Plan 2014 – 2018.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2014.GM30.12>

At its meeting on July 4, 5, 6 and 7, 2017, City Council adopted TransformTO: Climate Action for a Healthy, Equitable and Prosperous Toronto, which included the target to transition 45 per cent of the City-owned fleet to low-carbon vehicles by 2030.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4>

On June 4, 2019, the City of Toronto's Resiliency Office released its first Resilience Strategy in preparation for the threats of climate change facing the City.

https://www.toronto.ca/ext/digital_comm/pdfs/resilience-office/toronto-resilience-strategy.pdf

COMMENTS

The current levels of greenhouse gas (GHG) and air pollutants emissions are a major global concern given the associated environmental, social, and economic impacts. The interaction of many factors that contribute to climate change creates a complex challenge. This challenge needs to be combated with an approach that incorporates efforts to address climate mitigation and climate adaptation. Greenhouse gas emissions generated as a by-product of business activities are a form of waste and as such a form of business inefficiency, and reducing them is an efficiency measure.

With the scale and urgency of required actions, this Plan lays out a pathway to sustainable and resilient City Fleets. The strategies and actions provide feasible paths to reach the established objectives. These paths will utilize different green technologies and fuels, including renewable energy sources, and efficient fleet management practices. 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.

Accomplishments (Consolidated Green Fleet Plan 2014-2018 Outcomes)

The City of Toronto Consolidated Green Fleet Plan (2014 -2018) was one of the key contributing factors to the City's overall environmental achievements, and has been recognized for its successes, as well as an example of effective local leadership on climate mitigation.

During this period, City Fleets focused on investing in upgrading vehicles and equipment to more efficient and low carbon options. Significant improvements were achieved in fleet efficiency, including vehicle right-sizing, retrofitting, driver training, and reducing non-value added travel. This has enabled the reduction of GHG emissions by approximately 27 million kilograms of carbon dioxide equivalents (CO₂e), a 9 per cent decrease, during the 2014 – 2018 period. As a result, City Fleets have already surpassed the City's 2020 emissions reduction target of 30 per cent.

The City of Toronto has been established as a Canadian leader in testing and adopting green vehicle technologies and fuels and efficient fleet management practices:

- Vehicle selection criteria includes total life-cycle cost, operational viability, available fuel options and environmental impacts;
- Standard diesel transit buses are being replaced by hybrid-electric buses;
- Heavy duty waste collection diesel trucks are being replaced by compressed natural gas (CNG) trucks (120 CNG trucks in fleet as of January 31, 2019 – 48 per cent of all collection units);
- Auxiliary batteries, anti-idling devices, inverters, LED emergency lights, and other technologies for vehicles and equipment that reduce fuel consumption and emissions have been installed on a large number of vehicles and equipment:
 - 171 ambulances and emergency response vehicles are equipped with anti-idling devices;

- 16 Fire Services aerial trucks and 102 additional City-wide vehicles are equipped with auxiliary power units as an idle reduction technology;
- 428 Police patrol vehicles are equipped with auxiliary power units as an idle reduction technology;
- 127 new units are equipped with engine start-stop technology for reducing idle time;
- 759 hybrid vehicles and equipment have been adopted in areas with high operational utilization;
- Continued fleet optimization and right-sizing:
 - Light duty vehicles were replaced with more fuel efficient and battery-electric vehicles;
 - Police vehicles were replaced with smaller engine vehicles where viable;
 - Waste and recycling trailers replaced by lighter aluminum units (21 per cent weight reduction with an estimated 5 per cent fuel reduction of the towing vehicle);
 - 11 modular type III ambulances were equipped with hybrid electric drive-train systems;
- 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;
- The City's eco-driving campaign was developed in 2015 for both the G and D class. All City staff permitted to operate a City vehicle are provided with eco-friendly driving tips, including trip planning and driving behaviours;
- Car sharing and bike sharing programs for City staff as alternative modes of transportation were implemented;
- Vehicles were substituted with bicycles where operationally viable:
 - Toronto Police have utilized 420 bicycles for neighbourhood patrols, avoiding the use of up to 100 police patrol vehicles as a result;
- City Fleets have increased the bio-based component of diesel fuel from the mandatory 4 per cent to 5 per cent of the total volume.

The key actions taken during the 2014-2018 period had an associated capital expenditure of \$4,619,890. The estimated operating cost savings for the same period of \$3,490,530 were reflected in the Approved Operating Budgets and will have ongoing impacts to future operating budgets. Associated GHG reduction was approximately 7 million kilograms, representing 26 per cent of the total City Fleets' GHG reductions during this period.

The total anticipated operating savings over the expected asset life of the vehicles and technologies purchased is \$16,597,997, with the total estimated GHG reduction of approximately 31 million kilograms. A breakdown of these costs and savings is shown in the table below.

Green Fleet Plan 2014-2018 Estimated Financial and Environmental Impact

Initiative	No. of Units	2014-2018 Capital Cost / (Saving) (in \$ millions)	2014-2018 Operating Cost / (Saving) (in \$ millions)	2014-2018 GHG Reduction (CO2e - kg)	Projected Vehicle Lifetime Operating Savings (in \$ millions)	Projected Vehicle Lifetime GHG Reduction (CO2e - kg)
CNG Collection Trucks	116	3.480	-1.125	1,641,133	-7.109	10,563,627
Fuel Efficient Vehicles	73	-0.730	-0.082	189,214	-0.608	1,401,700
Vehicles with Engine Start-Stop (ESS) Technology	127	0	-0.304	440,014	-2.436	3,520,115
Auxiliary Power Units	102	0.816	-0.136	397,999	-1.078	3,183,991
Ambulance and Emergency Response Vehicles Anti-Idling Devices	171	0.551	-0.664	1,657,973	-1.390	3,207,840
Police Vehicles Auxiliary Power Units	428	0.374	-1.159	2,627,731	-3.554	8,047,500
Fire Aerial Trucks Auxiliary Power Units	16	0.128	-0.021	62,431	-0.423	1,248,624
Total	1,033	\$4.620	(\$3.491)	7,016,495	(\$16.598)	31,173,397

The Pathway to Sustainable City of Toronto Fleets

The Pathway to Sustainable City of Toronto Fleets (Plan) provides an overview of the City of Toronto Fleets' objectives in addressing climate mitigation and adaptation with strategies for transitioning City Fleets to sustainable, climate resilient, low-carbon operations. The Plan is a product of continuing close cooperation of City Fleets that articulates a collective vision of the path to a sustainable future.

The scope of the Plan includes approximately 98 per cent of all City owned motor vehicles and equipment, managed and operated by Fleet Services Division (Centrally-Managed Fleet), 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.

This multi-agency City-wide Plan focuses on reducing the environmental impacts of more than 10,000 motor vehicles and equipment owned and operated by the City of Toronto. It does not include Toronto Transit Commission streetcar or subway vehicles, or vehicles owned and operated by private companies who contract with the City.

Goal and Objectives

Goal	Sustainable, climate resilient, low-carbon City fleets
Objective 1	Transition 45% of City-owned fleet to low-carbon vehicles by 2030
Objective 2	65% greenhouse gas reduction by 2030 (from 1990 levels)
Objective 3	80% greenhouse gas reduction by 2050 (from 1990 levels)

Meeting these objectives requires significant capital investments in green technologies and fuels, and innovative improvement strategies for operational and management practices. A wide range of green vehicle technologies and fuels, with distinct advantages and challenges, different operational applicability, and at various stages of development, presents a very complex situation for green, efficient, and sustainable vehicle and fuel selection and implementation. Investments in green technologies are often most viable when vehicles that have reached the end of their life cycle are replaced with solutions that balance economic, environmental and social impacts. As a result, our focus will be on maximizing the use of renewable and sustainable fuels that alleviate or balance environmental and economic concerns throughout the production, distribution, and consumption process. The approach to alternative fuels includes addressing both fueling infrastructure and operational requirements before a broader implementation can be undertaken.

As the largest municipal fleet in Canada, and one of the largest in North America, City of Toronto Fleets play an important leadership role in advancing technologies that aim to significantly reduce environmental impacts, improve vehicle efficiency, reliability, and safety, while reducing life-cycle costs and associated impacts. The City of Toronto will continue to demonstrate leadership to ensure the greening of our fleets and the transition to sustainable, resilient, low-carbon City operations.

Contributing Strategies and Actions

- Continue to assess and evaluate the range of commercially viable power sources for vehicles through a fuel neutral approach. This approach will ensure selected vehicle and equipment options are consistently the most viable for the City operations, and economically, environmentally, and operationally sustainable.
- Fleet asset management and state of good repair will take into account both climate change mitigation and adaptation to ensure sustainability and avoid future costs and service disruptions.
- Improve operational preparedness for extreme weather and other shocks, and our capacity to recover from them with minimal service disruptions.
- Incorporate climate change mitigation and adaptation in our business continuity planning, to ensure climate-resilient operations and services.
- Working with various industry and government agencies to develop strategies and policies that enable the adoption of electrified transportation. We are collaborating with other City divisions and agencies, including Toronto Hydro, on the development of electrified transportation projects.
- TTC Green Fleet Program:
 - Clean diesel buses - Clean diesel buses emit 40 per cent less GHG emissions than the older conventional buses in the fleet. The last clean diesel bus was delivered in 2018.
 - Hybrid-electric buses - Hybrid buses are the new TTC standard for bus replacement and fleet growth. The first 255 hybrid buses are scheduled to be delivered by the end of 2019. Hybrid-electric buses consume 25 per cent less fuel and emit approximately 30 per cent less GHG emissions than clean diesel.
 - All-electric buses - First 60 all-electric buses (eBuses) are scheduled to be delivered by March 31, 2020. Based on the TTC's current procurement plan (full funding sources yet to be identified), the bus fleet will be 50 per cent zero-emissions by 2030 and 100 per cent zero-emissions by 2040.
 - Wheel-Trans Para Transit Fleet - The TTC is currently developing a Green Wheel-Trans Bus Procurement Plan, consistent in approach as was undertaken in the development of the Green City Bus Procurement Plan.
 - Non-Revenue Automotive Fleet - The TTC has begun greening its non-revenue fleet in 2019 with the procurement of the first 20 hybrid-electric SUV's. Staff are developing a green fleet plan, to work in conjunction with and support of our revenue operations.
- 220 passenger vehicles in the Centrally-Managed Fleet are planned for replacement by electric vehicles during the next five years.
Heavy duty waste collection diesel trucks continue to be replaced with compressed natural gas (CNG) trucks.
- Continue to improve our fleet management and utilization practices through vehicle right-sizing, trip planning and optimization, retrofitting, efficient maintenance practices, vehicle sharing, and driver training.
- Explore the feasibility of implementing technologies that enables City vehicles to collect dynamic local air pollution data. This can enable the City to implement specific and targeted local climate actions where they can make the most significant difference for public health.

- Continue to expand the use of the existing car share, bike share and cargo bike programs, and other viable emerging alternative modes of transportation for our operations.
- Collaborate with other City divisions and agencies on the development of driving automation systems policies and projects in a manner that increases the number of low-emission vehicles and equipment in City Fleets, or reduces overall impacts.
- Work with our clients and business partners to raise awareness of environmental, economical, and social aspects, manage risk, and develop solutions.
- Demonstrate accountability and transparency in regularly disclosing our progress in implementing these strategies and achieving established objectives.

Implementation

This Plan is a living document, and is part of the City's efforts toward making Toronto a sustainable, resilient, low-carbon city of choice, as outlined in the [TransformTO](#), Toronto's climate mitigation action plan and [Toronto's Resilience Strategy](#), Toronto's first climate adaptation plan. 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's also dependent upon building existing partnerships with federal and provincial legislators, 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.

To ensure the Plan remains flexible and well positioned to adopt and take advantage of current and future low-carbon technologies, fuels, and practices, and government regulations to address the climate mitigation and adaptation, the General Manager, Fleet Services will provide an update to the Plan every four years. This will coincide with four-year terms of City Council, with the next update planned for the second quarter of 2023.

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 City-wide updates. Comprehensive reports on the Plan progress will be provided at the time of the Plan updates, first update scheduled for the second quarter of 2023. 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.

CONCLUSION

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. This Plan will further highlight the leadership of the City of Toronto, increase public and stakeholder confidence, and provide a model for other municipalities and businesses in the Greater Toronto Area and beyond.

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SIGNATURE

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ATTACHMENTS

Attachment 1: The Pathway to Sustainable City of Toronto Fleets