For Action

Supply of Battery-Electric Paratransit Buses and Green Bus Program Update

Date: February 24, 2025
To: TTC Board
From: Executive Director – Innovation and Sustainability

Summary

The Wheel-Trans Green Bus Program's objective is to meet the requirements outlined in the City of Toronto's TransformTO Net Zero Strategy, which defines a pathway to achieve net zero Greenhouse Gas (GHG) emissions in Toronto by 2040. This objective is further supported by the TTC's 2024-2028 Corporate Plan's Strategic Direction 4, *Transform and Modernize for a Changing Environment* through the Innovation and Sustainability Strategy, which includes actions to minimize environmental impacts and build resiliency for a climate-changed future such as TTC's Green Fleet Program and its resultant transition to Net Zero. This requires the TTC to adopt modern technology and embed sustainable practices as we renew aging fleet and infrastructure.

This report recommends the award of a contract for the supply and delivery of five battery-electric paratransit buses to pilot these vehicles for Wheel-Trans service, at a total value of $5.55 million, inclusive of HST, to commence the TTC's transition from gasoline to electric paratransit vehicles.

Delivery of these vehicles is planned to be completed by 2026 in line with the approved Wheel-Trans fleet plan. This will be followed by a two-year evaluation of the pilot vehicles, which will help inform, through lessons learned from the pilot program, the steady-state bulk procurement planned to commence in 2028.

With this plan, and subject to pilot results and funding, the TTC aims to have its Wheel-Trans fleet fully electrified by 2040. Staff will report back to the Board with the results of the pilot program.

Recommendations

It is recommended that the TTC Board:

1. Authorize the award of a contract for the supply of five battery-electric paratransit buses to Damera Bus Sales Canada Corporation at a total cost of $5,550,252.50 inclusive of all estimated contract costs including spare parts, special tools, contract change allowance, and HST.

Financial Summary

Based on the planned delivery schedule, Table 1 below summarizes the projected annual expenditure forecast over the contract's term.

Table 1: Contract Expenditure Forecast by Year and Total Term ($000s):

	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	Total Contract Amount
Five Battery-Electric Paratransit Buses (Quantity)	1	4			**5**
Contract Expenditure (without HST)	1,609	2,860			4,469
Non-Rebatable HST (1.76%)	28	50			78
Total Contract Expense	1,637	2,910			**4,547**
Rebatable HST	181	322			503
Change Allowance		100	150	250	500
Total Authority, including HST	1,818	3,332	150	250	**5,550**

Funding for this contract expenditure is included in the TTC's 2025-2034 Capital Budget and Plan under Program 4.11 Purchase of Buses, Purchase of Electric WT Buses – Pilot, as approved by the TTC Board at its meeting on January 10, 2025 and by City Council on February 11, 2025.

The total project budget for the purchase of the battery-electric paratransit buses is approximately $8.4 million, comprising of projected year-end spending of $0.4 million to the end of 2024, and annual cashflow funding from 2025-2028 totalling $8 million as presented in Table 2 below. Other project costs in addition to the recommended contract costs includes Consultant fees, Engineering and Project Management Labour, other external costs, and contingency allowance.

Table 2: Battery-Electric Paratransit Buses Pilot - 2025-2034 Capital Budget and Plan ($000s)

	LTD Actuals to 2024	2025 Budget	2026	2027	2028	10-Year Total
Purchase of Electric WT Buses - Pilot	389	2,298	5,304	194	233	8,029

To efficiently operate these battery-electric vehicles, charging infrastructure is required to be in place at the Lakeshore garage six months prior to vehicle deliveries.

The total project budget for the purchase of Electric Wheel-Trans Charging Systems is approximately $1.3 million, comprising of life-to-date costs to the end of 2023 of $0.2 million, projected year-end spending of $0.7 million to the end of 2024, and annual cashflow funding from 2025-2028 totalling $0.4 million, as presented in Table 3 below.

Table 3: Electric Wheel-Trans Charging Systems - 2025-2034 Capital Budget and Plan ($000s)

	LTD Actuals to 2024	2025 Budget	2026	2027	2028	10-Year Total
Electric Wheel-Trans Charging Systems	955	370	-	-	-	370

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

Equity/Accessibility Matters

Equity, diversity, inclusion, and accessibility (EDIA) is a focus area under the TTC's Corporate Plan 2024-2028, targeting the ongoing application of equity, diversity, inclusion, and accessibility in day-to-day work. As a leader in providing accessible public transit in Toronto, the TTC is also committed to supporting individuals with accessibility needs by working towards a barrier-free service.

This procurement included evaluation criteria that allocated points to the proponent's commitment to procurement equity, diversity, inclusion, and accessibility.

Accessibility:
Procuring new battery-electric paratransit buses provides an opportunity to improve designs through the systematic identification and removal of barriers.

Throughout the design and development process, the TTC will verify that vehicles are compliant with relevant accessibility standards under the Canadian Standards Association (e.g. CSA D437 standard for accessible transit buses) and the Integrated Accessibility Standards – Part IV (Transportation Standards) under the Accessibility for Ontarians with Disabilities Act.

The TTC strives to exceed minimum requirements through active engagement with the Advisory Committee on Accessible Transit (ACAT) to address the unique needs of as many individuals as practicable. This collaboration starts at the contract requirements stage and progresses through the design and evaluation stages of all transit vehicle procurements. The TTC will continue to work with ACAT and seek new opportunities to advance the TTC's efforts toward a barrier-free transit system when adopting sustainable innovation technologies.

With the primary goal of ensuring a fully accessible vehicle that meets our customers' needs, ACAT was consulted during the Request for Information phase, and their input from vehicle layout reviews was included in the Request for Proposal. The TTC is committed to continuing to engage and solicit ACAT feedback throughout the piloting phase and the next round of future procurements.

Decision History

At the February 10, 2022 TTC Board Meeting, staff presented a report with a confidential attachment proposing the negotiating position for a contractual agreement with PowerON for the provision of services required to decarbonize TTC's operations, fleet, and facilities. The Board approved the proposed negotiated terms with PowerON and granted delegated authority to the CEO to enter into the TTC-PowerON Principal Agreement with an upset limit amount of $69.8 million inclusive of all taxes, and amend the TTC-PowerON Principal Agreement upset limit up to $591 million inclusive of taxes subjected to the receipt of additional funding

Report: Principal Agreement with PowerON Energy Solution LP (OPG) to Decarbonize TTC Operations, Fleet, and Facilities

Decision: Principal Agreement with PowerON Energy Solutions LP (OPG) to Decarbonize TTC Operations, Fleet, and Facilities

At the July 14, 2022 TTC Board meeting, staff presented a report which provided updates and next steps on the Green Bus Program and Green Wheel Trans Bus program with emphasis on status of eBus procurements, Canadian content requirements and the economics of advancing the eBus adoption. The Board received the report for information and directed staff to report back to the TTC Board in January 2023 on the status of the eBus procurement through the CEO's Report.

Report: Green Bus and Wheel-Trans Green Bus Program Update

Decision: Green Bus and Wheel-Trans Green Bus Program Update

At the May 8, 2023 TTC Board meeting, staff presented a report recommending authorization for the procurement of fifty-two (52) 6m gasoline Wheel-Trans buses; and an update regarding TTC's Green bus transition strategy. The Board received the Green Bus Program Update for information and approved a contract amendment with Creative Carriage for the supply and delivery of 52, 6m ProMaster Wheel-Trans buses in the amount of up to $14,022,402.00 inclusive of all estimated costs, contract change allowances and applicable taxes.

Report: Wheel-Trans Green Bus Program - Procurement Amendment Authorization for the Purchase of Wheel-Trans Vehicles (ttc.ca)

Decision: Wheel-Trans Green Bus Program - Procurement Amendment Authorization for the Purchase of Wheel-Trans Vehicles (ttc.ca)

Issue Background

With a current fleet of 263 buses, TTC's Wheel-Trans department provides over four million door-to-door, specialized transit trips each year in the City of Toronto and supports over 42,000 registered customers eligible to receive such specialized services. As part of the annual capital budget process, a rolling 10-year fleet plan is updated based on adjustments made to the service level forecast and fleet condition.

In 2017, the TTC took steps towards reducing GHG emissions by replacing its Wheel-Trans Friendly diesel-fuelled 9m vehicles through the introduction of 6m, and later 7m, gasoline-fuelled ProMaster vehicles. The replacement of these older Friendly vehicles at the end of their life followed asset management practices and contributed to TTC's sustainability goals. In November 2023, the last of the legacy Friendly diesel buses was decommissioned. This major milestone resulted in a significant improvement in air quality for Wheel-Trans customers and TTC workers. From the first procurement of gasoline ProMaster vehicles in 2017 to the decommissioning of the last Friendly vehicle in 2023, a reduction in GHG emissions by approximately 32% was realized.

Comments

Wheel-Trans Green Bus Program Overview

Wheel-Trans Bus Fleet Electrification Roadmap

The strategy for electrifying the Wheel-Trans fleet begins with the procurement and delivery of five pilot battery-electric paratransit buses (2025-2026), which this report recommends for award.

Upon delivery of these pilot vehicles, their performance will be evaluated within TTC's operating environment against certain criteria over a two-year period. This will aid documentation of lessons learned which will inform technical and commercial specifications for future bulk procurement.

The vehicles will be evaluated against the following criteria: system compatibility, vehicle performance, vendor performance, operator experience, customer experience, maintainability, accessibility, charging system, and total lifecycle costing. Staff will report back to the Board with Preliminary and Final evaluation reports after the first and second years of the evaluation period, respectively.

To maintain fleet growth and replacement requirements as part of the Wheel-Trans 10-Year Strategy, the steady-state bulk procurement of battery-electric paratransit buses will commence in 2028, subject to funding approval.

With the last gasoline vehicle to be delivered in 2029 and the continued steady-state procurement of battery-electric paratransit buses, a fully electrified fleet is expected by 2040 after the last set of gasoline vehicles has reached end-of-life. A summary of program milestones from 2025-2040 is shown below, providing an overview of how the TTC will achieve a fully electrified Wheel-Trans fleet by 2040.

Table 4: 2025-2040 Wheel-Trans Fleet Plan including Program Milestones

	2025	2026	2027	2028	2029	2030	2031-2035	2036- 2040
Program Milestones for Battery-Electric Paratransit Bus Procurement	Contract Award Vehicle Delivery	Vehicle Delivery	Pilot Evaluation RFP for Bulk Purchase	Pilot Evaluation Completion	Vehicle Delivery	Steady State Procurement		Fully electrified fleet by 2040
Gasoline Buses (Delivery)	38	25	12	58	10			
Gasoline Buses (Retirement)	30	27	9	62	78	45	138	
Battery-electric Buses (Delivery)	1	4		12	70	46	176	178

In addition, a cross-functional effort is underway by staff to evaluate the optimum fleet mix as it relates to vehicle sizes including introduction of sedans, and the potential benefits which would include reduction in capital and operating cost and accelerating the transition towards the zero emissions target.

Key Benefits of the Wheel-Trans Electrification

The transition from the diesel-fuelled Friendly vehicle fleet to the gasoline-fuelled ProMaster vehicle fleet resulted in a 32% reduction in GHG emissions.

Continuing on the path to reduce GHG emissions with the procurement of battery-electric paratransit buses for Wheel-Trans includes potential benefits as listed in Table 5.

Table 5: Benefits of the Wheel-Trans Electrification

Benefit	Description
Accessibility	A purpose-built mini-bus, with a full low-floor, improved interior configuration and layout and overall improved accessibility over the 6-meter ProMaster gasoline vehicle.
Service Impact	Improved vehicle reliability which would be assessed through the two-year evaluation. Lessons learned from the pilot program will inform future bulk procurements.
Environmental Impact	When the fleet is fully electrified by 2040, a reduction of 100% of greenhouse gas emissions will be achieved, when compared to 2017.
Financial Impact	Throughout the bus operating life span, fuel and cost of ownership savings are expected to offset the higher upfront capital cost of procuring these vehicles, thus improving the organization's financial sustainability in the long term.
Others	Quieter operations, particularly important around low noise zones, such as near hospitals and schools, and overall positive public image. Advances the adoption of new technologies and innovations to modernize the fleet and better serve our customers.

Procurement Process and Award Recommendation

A non-binding competitive Request for Proposal (RFP) was publicly advertised on the Merx website as well as TTC's Bonfire Portal as of July 22, 2024, for companies to submit proposals for the Supply of Battery-Electric Paratransit Buses. Eighteen companies downloaded copies of the proposal documents. During the proposal period, one addendum was issued. As a non-binding procurement process, there is no proposal validity date.

The RFP and evaluation process was defined by the following three stages:

- Stage 1 – Pass/Fail Submission
- Stage 2 – Commercially Confidential Meetings (CCM)
- Stage 3 – Final Submission

Stage 1: Pass/Fail Criteria

Stage 1 consisted of a review to determine if the forms and content submitted by the proponents comply with all the pass/fail requirements. Only proponents that achieve a "Pass" on all the criteria identified would be considered qualified proponents and would be invited to proceed to Stage 2 of the procurement process.

Three proponents submitted the Stage 1 forms by the submission deadline of August 9, 2024. The submissions from City View Bus Sales & Service Limited (CityView), Damera Bus Sales Canada Corp (Damera) and Overland Custom Coach (2007) Inc. / Woodall Nicholson Group (Overland) successfully passed all requirements of Stage 1, were considered qualified proponents, and were invited to participate in Stage 2.

Stage 2: Commercially Confidential Meetings (CCMs)

Stage 2 consisted of optional, non-scored confidential meetings, in which each qualified proponent was allowed to have a meaningful dialogue regarding the commercial terms and technical requirements with TTC. Proponents were invited to submit any comments, questions or propose any revisions to the commercial and technical terms by the CCM submission deadline of August 30, 2024. The material submitted would be the basis for these meetings.

On August 30, 2024, Overland advised that they would no longer be participating in the RFP process.

Damera submitted their CCM material by the deadline, and TTC held their meeting on September 12, 2024.

CityView did not submit any material by the deadline and no meeting was held. However, the RFP also permitted proponents to submit a written request for changes or clarifications for TTC's consideration and could also request their written submission be considered confidential. CityView submitted confidential written requests for TTC's consideration, and TTC provided written responses concluding on September 19, 2024.

Following the written confidential clarifications and CCM meeting, PCM issued an addendum that included the revisions to the RFP resulting from Stage 2.

Stage 3: Final Submission

Stage 3 consisted of the evaluation of both qualitative rated criteria and pricing. Staff evaluated the proposals in the following forms and weightings:

Rated Criteria Category for Supply of Battery Electric Paratransit Buses	Weighting (%)
Form 5 – Battery-Electric Paratransit Bus Evaluation Summary	47.50
Form 6 - Battery Requirement Evaluation	15.00
Form 7 - Responses to Procurement Equity, Diversity, Inclusion & Accessibility and Green Procurement	7.50
Form 8 - Pricing	30.00
Total Weighted Score	**100**

Both remaining proponents submitted their Stage 3 forms by the Final Submission Deadline of September 27, 2024.

Only proponents that achieved a total minimum weighted score of 45.50 out of the maximum 70 (i.e. 65%) allocated to qualitative rated criteria would have their pricing forms opened. At the conclusion of Stage 3, Damera was the only proponent to achieve the minimum 45.50 weighted score, and as the top-ranked Proponent, they are being recommended for the award of the contract.

The RFP states that TTC intends to award up to a maximum of ten buses, subject to the availability of funds and that spare parts will be awarded at TTC's sole discretion, as needed. The award amount includes the purchase of five buses, spare parts, special tools, initial configuration changes and an allowance for additional configuration changes to the buses after the design review stage.

To provide a peer exchange of best practices that will aid the planning and adoption of zero-emission paratransit vehicles with other transit agencies, the RFP requirements were shared with the Ontario Public Transit Association Zero Emission Bus (OPTA/ZEB) committee. Transhelp (Peel Regional Transit) also collaborated with the TTC on the development of the RFP and participated in the proposal evaluations. In addition, the RFP included an Adoption Agreement which allows other public transit agencies in the province of Ontario to procure vehicles from the successful proponent(s).

Following the contract award, staff will continue to monitor new market options and technological advancements in battery-electric paratransit vehicles.

Charging Infrastructure

A key interdependency to the electrification of the Wheel-Trans fleet is the associated charging infrastructure. The charging infrastructure is critical to ensure the battery-electric paratransit buses have the electrical power needed to connect conditional-eligible customers to wherever they need to go in the City.

TTC currently has an agreement with PowerON Energy Solutions LP, a subsidiary of Ontario Power Generation, to install the charging infrastructure required to support the battery-electric paratransit buses at the Wheel-Trans Lakeshore garage facility.

In August 2022, the Principal Agreement between TTC and PowerON was executed. Under this agreement, PowerON will undertake the engineering, procurement, delivery, installation, management, operations, maintenance, and renewal of the charging infrastructure. PowerON has already completed the detailed design and is working with TTC to finalize the design, procurement, and commission required charge points by Q3 2025, ahead of the battery-electric paratransit bus deliveries.

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