



Breaking Through Grid Constraints for Heavy-duty EV Fleets

Toronto Transit Commission
McNicoll Garage Case Study



\$1.2M
cost saved

Deferred \$1.2 million in utility upgrade costs

14
months saved

Reduced timeline to operations by 8 -14 months

0.9 MW
charging capacity increase




Increased effective site capacity from 1,600 kW to 2,500 kW

Scaling Challenges in Medium and Heavy-duty Fleet Electrification

Fleet electrification often hits two roadblocks: insufficient power capacity and budget constraints. By deploying managed EV charging software and a battery energy storage system (BESS), PowerON enabled the Toronto Transit Commission (TTC) to defer over \$1.2 million in utility upgrades and reduce the timeline to operations by 14 months.

In addition to these immediate benefits, the heavy-duty fleet operator achieved long-term OPEX savings, and futureproofed their site for further expansion while unlocking new revenue opportunities through the installed assets.

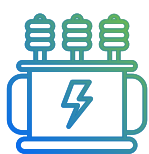
Key Project Stats:

 Number of vehicles	 Installed charging power	 Site power limit
36 40" buses (Class 8)	2,200 kW	1,600 kW

Challenges at McNicoll Garage

Canada's largest public transit operator, the Toronto Transit Commission (TTC), has partnered with PowerON Energy Solutions on a multi-phase program to electrify its fleet of over 2,000 buses operating across eight depots.

At the McNicoll Garage, located in Toronto's east end, Phase 1 of the project faced significant challenges due to the limited available power at the facility of 1,600 kW:



Insufficient power available to support the incoming fleet of 36 electric buses



Inadequate infrastructure to accommodate nine 150-kW DC fast chargers and existing site power load, requiring 2,000–2,200 kW of total demand



Excessive lead time exceeding 52 weeks for utility power upgrades at a cost of \$1.2 million.

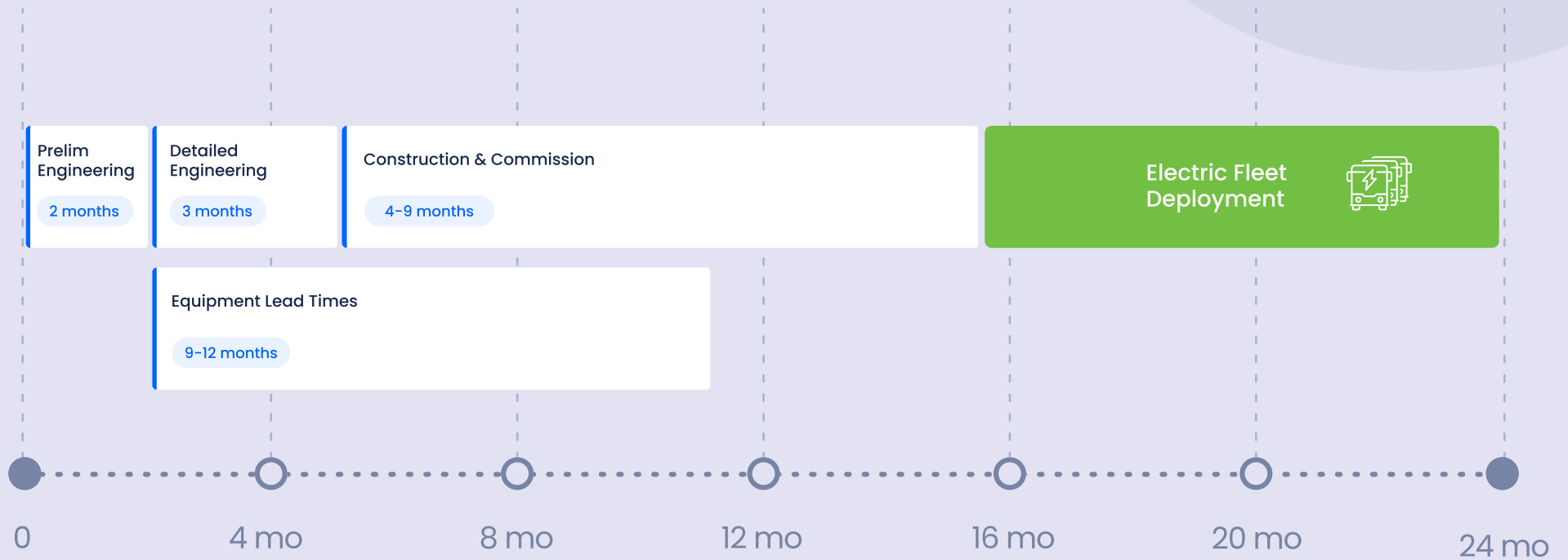
The Solution:

PowerON increased the effective depot peak grid capacity by **56%** without requiring utility service upgrade, from 1,600 kW to 2,500 kW for up to two hours a day using managed charging software and a 1.2 MWh battery. This solution enabled the TTC to deploy nine 150-kW DC fast chargers and 36 electric buses, eliminating the 14 month long lead time for utility upgrades and deferring \$1.2 million in associated costs.



PowerON Approach

Total Time: 12-15 Months



Traditional Approach

Total Time: 23-26 Months



Key features of the solution included:



Battery as a Power Buffer

Stores energy during off-peak hours and discharges it during high demand to reduce peak load and improve energy resilience.



Managed EV Charging

Employs real-time analytics and predictive modeling to forecast energy demand, dynamically adjust charging rates, and schedule charging during low-demand periods.



Integrated Control Systems

Optimizes charging schedules based on operational requirements and responds automatically to grid conditions and energy pricing signals.

This comprehensive approach minimizes depot energy costs while maintaining operational efficiency.



Looking Forward – Next Phase

With scalability in mind, the TTC was able to deploy more chargers and buses than initially planned, setting the stage for further expansion in Phase 2:



The assets deployed in this project will also provide recurring financial benefits for the TTC by unlocking the following potential revenue streams and operational savings:



Milestones and Benefits

By 2037, PowerON's solutions will support over 2,000 battery electric buses across eight TTC depots, including chargers, backup generation, transformers, BESS, and energy management software. This partnership enables the TTC to focus on its core mission—delivering public transit while PowerON manages the complexities of powering the vehicles. The McNicoll Depot project serves as a significant milestone in this long-term collaboration.

