Overview of Methodology

- a) Projected number of EVs from 2025-2040;
- b) Projected number of chargers required to support projected number of EVs; and
- c) Determine number and location of chargers based on neighbourhood suitability score.

Projected Number of EVs for the TransformTO Net Zero target 30 per cent by 2030

Two scenarios were modelled to determine the projections of the number of EVs in Toronto, business-as-usual and 100 per cent of ZEV Sales scenario.

The projections have been informed by identified factors that influence EV uptake:

- Vehicle sales
- EV model availability (high)
- Cost projections (high)
- Regional policies (high)
- Adoption traits of the user (weight varies by trait):
 - Income (high)
 - Education (high)
 - Number of vehicles (high)
 - Single-family dwelling owners (medium)
 - Access to public charging (medium)

The results show that by 2030 if 30 per cent of registered vehicles are EVs there will be 343,794 vehicles on the road. The projections also anticipate that 87 per cent vehicle sales will be electric, selling 66,184 in 2030. To ensure there's a network of chargers to support this number of EVs in 2030, 20,689 public Level 2 chargers and 1,379 DC fast chargers are projected to be required.

Business as Usual	2025	2030
EV Sales	6,280 (8 per cent)	8,760 (11 per cent)
EV Pop.	35,520 (3 per cent)	74,630 (6 per cent)
Public Level 3 Charging Ports	152	298
Public Level 2 Charging Ports	2,128	4,472
100 per cent EV Sales 2035	2025	2030
EV Sales	24,676 (32 per cent)	66,184 (87 per cent)
EV Pop.	60,144 (5 per cent)	343,794 (30 per cent)
Public Level 3 Charging Ports	241	1,375
Public Level 2 Charging Ports	3,609	20,628

Table 1: Forecasted EV Registrations and Charging Infrastructure

Source: Source: AECOM, 2021

Research has indicated that a ratio of 60 Level 2 chargers can supply the charging needs for 1,000 vehicles and four Level 3 chargers for 1,000 vehicles. It is also assumed that EV charging infrastructure is deployed one year before the forecasted adoption level.

Charging Infrastructure Site Suitability

Site suitability for the expanded network of EV chargers has been categorized into four modules that have been identified through research in EV adoption and EV infrastructure usage:

- Equity (low)
- Early adopters (medium)
- EV infrastructure (low)
- Land use and built environment (high)

Figure 1: EV Charger Siting Suitability Modules and Layers



Source: AECOM, 2021

Scores are assigned with a range of 0 to 10 with 10 indicating a high suitability for EV infrastructure. The different layers were factored into consideration when assigning a value to the hexagon.



Figure 2: EV Charger Siting Suitability Module and Layer Weighing

The entire city has been divided into hexagons that are approximately 250 square metres in size. Each data layer within the hexagon have been given a rating of 0 to 10, where a higher score represents a more desirable location for EV charging infrastructure. Data layers that represent the short-term interests and current needs of

Source: AECOM, 2021

EV infrastructure were prioritized. This modeling indicates that the yellow-coloured hexagons are higher suitability for EV charging, followed by dark blue with medium suitability, and light blue with this lowest level of suitability.



Figure 3: Site Suitability Results

Source: AECOM, 2021

Determining Number of Chargers Per Location

To assign potential charger port distribution within each specific forward sortation area (FSA), the recommended number of charging ports was distributed within the FSA depending on which parts of the FSA were assigned a low, medium, or high level of suitability for charging. In each FSA, the lowest category (light blue) received 15 per cent of the charging ports, medium category (dark blue) received 35 per cent, and high category (yellow) were assigned the remaining 50 per cent of the projected charging ports. Meaning, if an FSA requires 12 charging ports in a year, 15 per cent (2 ports) would go to the lowest category (light blue), 35 per cent (4 ports) would go to the medium category (dark blue), and 50 per cent (6 ports) would go to the highest category (yellow).

Once the number of chargers per suitability category was determined within each FSA, the total number of projected chargers per FSA divided by number of hexagons of a colour within the category determined number of chargers within each gridded hexagon.