



# Women Delivering Electric

An Edmonton transportation roadmap

October  
2024

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**PEMBINA**  
Institute

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The Pembina Institute is a national non-partisan think tank that advocates for strong, effective policies to support Canada’s clean energy transition. We use our expertise in clean energy analysis, our credibility as a leading authority on clean energy, and our extensive networks to advance realistic climate solutions in Canada.

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These acknowledgements are part of the start of a journey of several generations. We share them in the spirit of truth, justice and reconciliation, and to contribute to a more equitable and inclusive future for all.

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# Contents

- Executive summary ..... 1
- 1. Introduction ..... 1
  - 1.1 Policy background and context ..... 4
- 2. Jurisdictional scan..... 7
  - 2.1 Review of municipal actions to accelerate ZEV adoption..... 7
  - 2.2 Identification of equity-based measures in government-led ZEV programs ..... 8
- 3. Engagement..... 10
  - 3.1 Interview results ..... 10
- 4. Recommendations ..... 14
- 5. Conclusion..... 21
- Appendix A. Review of municipal actions to accelerate ZEV adoption..... 22
- Appendix B. Review of equity-based measures in government-led ZEV programs ..... 33
- Appendix C. Interview guide ..... 38

# Figures

- Figure 1. Sources of GHG emissions by sector in Canada, Alberta and Edmonton..... 2

# Tables

- Table 1. Key EV initiatives in Edmonton's Community Energy Transition Strategy and Action Plan .... 5
- Table 2. Recommendations to advance equitable EV adoption in Edmonton ..... 15
- Table 3. Scan of municipal actions to advance ZEV adoption ..... 22
- Table 4. Examples of ZEV programs with equity-based measures..... 33
- Table 5. Interview questions ..... 38

# Executive summary

In response to air quality issues and emissions from on-road transportation, governments are increasingly promoting the adoption of zero-emission vehicles (ZEVs) as a key component of a comprehensive sustainable transportation strategy. This study emphasizes the importance of engaging diverse groups and thoughtful planning to promote the equitable and widespread adoption of ZEVs and complements existing efforts by the City of Edmonton to uncover barriers to ZEV adoption. We focused our research on identifying the needs of small- and medium-sized enterprises in the ZEV transition and emphasized the engagement of women and gender-diverse entrepreneurs in Edmonton.

A comprehensive review of municipal policies and programs revealed several prominent measures to boost ZEV adoption:

- Enhancing financial support for ZEVs and charging equipment, and creating advantages to ZEV ownership, such as preferential parking.
- Amending bylaws to incorporate electric vehicle (EV)-ready requirements, and expanding public charging infrastructure and municipal-owned public chargers.
- Promoting and raising awareness of ZEVs through information campaigns and electrification of city fleets.

Approaches by governments to enhance access to ZEVs among equity-deserving groups were also reviewed and unveiled the following methods to direct programs and support among diverse communities:

- Reserving some or all of a program's funds for projects that directly support equity-deserving groups.
- Providing enhanced incentives to equity-deserving groups through bonuses applied on top of the base rebate amount or eligibility requirements that result in larger rebates for equity-deserving groups.
- Developing distinct funding streams and programs tailored to overcoming the unique challenges to ZEV adoption among equity-deserving groups.

Through our engagement of industry experts and women entrepreneurs in Edmonton and in other locations, we were able to unearth ZEV adoption challenges and potential solutions. Barriers included high costs, financial constraints, limited capacity, inadequate infrastructure, uncertainty about the technology and information gaps. Financial incentives, infrastructure development and education programs were proposed as solutions.

We experienced difficulties in carrying out our engagement approach as originally envisioned, with limited uptake by women-owned businesses in Edmonton. As a result, we had to

supplement our interview findings with those from interviews with women in three other provinces. Our experience led us to identify various practices for fostering effective outreach and engagement, including using a diverse range of outreach methods; allocating sufficient time, money and personnel; and making sure a participant knows the value of their contribution and is reimbursed

Based on our research, we developed seven theme-based recommendations for the City of Edmonton to promote ZEV transition in the municipality.

#### Theme: Enabling a comprehensive ZEV charging network

1. Establish EV-ready requirements in new buildings.
2. Provide support to retrofit existing homes and multi-unit residential and commercial buildings with charging infrastructure.
3. Enhance access to public charging infrastructure among those with the least access.

#### Theme: Lowering financial barriers to ZEV adoption

4. Advocate for the Alberta government to establish ZEV purchase incentives.
5. Explore complementary measures that create a financial advantage for ZEV ownership.

#### Theme: Raising ZEV awareness and knowledge

6. Launch informational campaigns to increase ZEV awareness and knowledge of existing support programs.
7. Advance electrification of municipal fleet vehicles to showcase leadership and increase awareness and trust in ZEV technology.

Adopting these recommendations will accelerate ZEV adoption across diverse businesses and among equity-deserving groups. Although focused on Edmonton, these measures may also be relevant to other municipalities and levels of government.

# 1. Introduction

On-road vehicles, including passenger cars and freight trucks, are a leading source of greenhouse gas (GHG) emissions in Canada. In 2022, transportation accounted for 22% of total GHG emissions in Canada, making the sector the second largest source of emissions after oil and gas.<sup>1</sup> In the province of Alberta, transportation also represents the second largest source of GHG emissions, and in cities like Edmonton transportation accounts for around a third of city-wide GHG emissions (see Figure 1).<sup>2,3</sup> While a key contributor to climate emissions, on-road vehicles are also a major source of air pollutants that impact health. Canadians are regularly exposed to traffic-related air pollution, (e.g., nitrogen oxides and fine particulate matter), which has been linked to adverse health outcomes, with those living in high-traffic areas (urban centres, major roadways) at greater risk of exposure.<sup>4</sup> Studies across Canadian cities have found increased levels of hospitalizations, premature death and illness due to exposure to traffic-related air pollutants.<sup>5,6</sup>

To address air quality concerns and emissions from on-road transportation, governments are promoting the use of zero-emission vehicles (ZEVs) as part of a broader sustainable transportation framework that also includes encouraging active, shared (e.g., car-sharing, ride-hailing) and public transportation. The switch from gas- and diesel-fuelled vehicles to those that are electric not only improves the air we breathe by limiting tailpipe emissions, but significantly reduces GHG emissions — driving an electric vehicle (EV) in Alberta is estimated to generate up to 41% fewer emissions than a fossil-fuelled vehicle in Alberta, with that number increasing as the province’s grid becomes less carbon intensive.<sup>7</sup>

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<sup>1</sup> Government of Canada, *National Inventory Report 1990-2022: Greenhouse gas sources and sinks in Canada – Part 1* (2024), 12. [https://publications.gc.ca/collections/collection\\_2024/eccc/En81-4-2022-1-eng.pdf](https://publications.gc.ca/collections/collection_2024/eccc/En81-4-2022-1-eng.pdf)

<sup>2</sup> Sarah McBain et al., *All Together Now* (Pembina Institute, 2024), 22. <https://www.pembina.org/sites/default/files/2024-07/All%20Together%20Now.pdf>

<sup>3</sup> City of Edmonton, “Mobility Choices.” [https://www.edmonton.ca/city\\_government/environmental\\_stewardship/transportation-choices](https://www.edmonton.ca/city_government/environmental_stewardship/transportation-choices)

<sup>4</sup> Health Canada, *Health Impacts of Traffic-Related Air Pollution in Canada* (2022), 3. [https://publications.gc.ca/collections/collection\\_2022/sc-hc/H144-91-2022-eng.pdf](https://publications.gc.ca/collections/collection_2022/sc-hc/H144-91-2022-eng.pdf)

<sup>5</sup> City of Toronto, *Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure* (2017). <https://www.toronto.ca/legdocs/mmis/2017/hl/bgrd/backgroundfile-108070.pdf>

<sup>6</sup> Metro Vancouver, “Health Impacts of Diesel Exhaust.” <https://metrovancover.org/services/environmental-regulation-enforcement/air-quality-regulatory-program/health-impacts-of-diesel-exhaust>

<sup>7</sup> City of Edmonton, “Making the Switch to an EV.” [https://www.edmonton.ca/city\\_government/environmental\\_stewardship/electric-vehicles](https://www.edmonton.ca/city_government/environmental_stewardship/electric-vehicles)



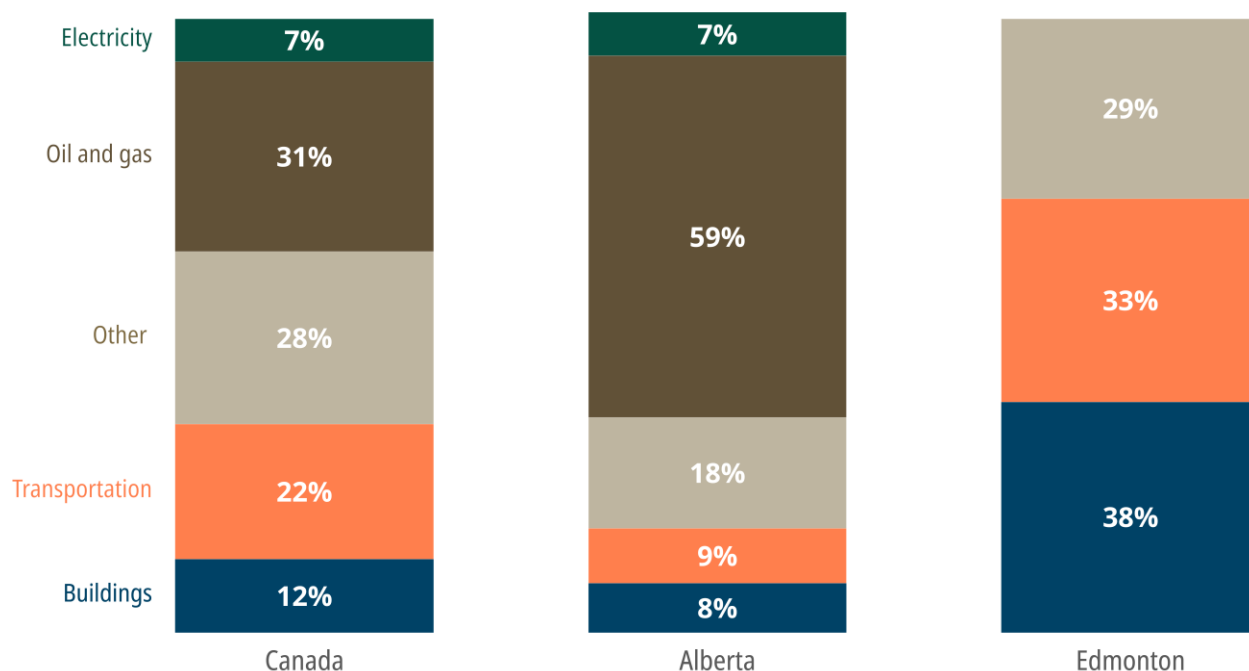


Figure 1. Sources of GHG emissions by sector in Canada, Alberta and Edmonton

Note: Other includes agriculture, waste, forestry and other land use. The methodology for collecting data may have differed among the sources.

Data sources: Government of Canada,<sup>8</sup> City of Edmonton<sup>9</sup>

ZEV sales continue to gain momentum in Canada.<sup>10</sup> Even in Alberta, where adoption has been slower than in other parts of the country, 14,189 EVs were sold as of March 2024, compared to 2,280 in 2020.<sup>11</sup> Car registrations continue to grow in cities and towns across Canada, including in Edmonton.<sup>12</sup> Nevertheless, barriers such as cost, access to charging infrastructure and lack of knowledge and familiarity with EVs remain. To achieve widespread uptake, it is crucial to understand these barriers and develop tailored solutions to support and encourage households, businesses and the public sector to switch.

<sup>8</sup> Government of Canada, *2024 National Inventory Report (2023)*, Annex 10: Canada's Greenhouse Gas Emissions Tables by Canadian Economic Sector, 1990-2022. <https://data-donnees.az.ec.gc.ca/data/substances/monitor/canada-s-official-greenhouse-gas-inventory/B-Economic-Sector/?lang=en>

<sup>9</sup> City of Edmonton, *Greenhouse Gas Emission Trends – Attachment 3*. <https://pub-edmonton.escribemeetings.com/filestream.ashx?DocumentId=149685>

<sup>10</sup> Electric Autonomy, “StatsCan reports Q4 2023 ZEV registrations at 12 per cent, fractionally lower than Q3.” <https://electricautonomy.ca/data-trackers/ev-sales-data/2024-03-12/statscan-q4-zev-registrations-12-per-cent/>

<sup>11</sup> Government of Alberta, *Motorized vehicle registrations – by fuel type as of March 31*. <https://open.alberta.ca/dataset/c5eb22a7-f3e6-41ce-8363-17d1ea979bc7/resource/fa3a0e4c-37a1-41b8-85c6-81a81d8a0720/download/tec-motorized-vehicle-registrations-by-fuel-type-2024.pdf>

<sup>12</sup> CTV News, “Albertans charging ahead with EVs as Calgary dealerships report record sales,” November 7, 2023. <https://calgary.ctvnews.ca/albertans-charging-ahead-with-evs-as-calgary-dealerships-report-record-sales-1.6634771>

With this study, the Pembina Institute aims to uncover barriers and determine what is needed to advance the uptake of ZEVs in Edmonton. Building on the City's previous work of identifying barriers,<sup>13</sup> this project is specifically focused on revealing the challenges among small- and medium-sized enterprises (SMEs). While existing research demonstrates that SMEs can face unique obstacles, they are often left out of discussions and engagement on potential solutions.<sup>14</sup> Our research strives, in particular, to engage women and gender-diverse entrepreneurs in Edmonton in order to develop customized solutions and recommendations that ensure an equitable transition to zero-emission transportation.

Women are underrepresented as business owners in Canada, accounting for just 15% of Canadian SMEs.<sup>15</sup> This results from a long history of systemic inequities and cultural norms, compounded by factors related to race, class, ability, gender identity, Indigeneity, language and citizenship. Even if significant steps are taken to address such inequities, social and gender norms, while slowly shifting, still affect the way women are perceived, included and supported in business. Research shows that businesses majority owned by women are less likely to be able to take on debt compared with all private sector businesses, and women and other diverse business owners are more susceptible to impacts from market disruptions.<sup>16,17,18</sup> Equity, therefore, needs to be considered when exploring how to advance the widespread transition to ZEVs given the high cost to transition and the unique and systemic barriers that women face as business owners in Canada.

In this report, we outline a transportation roadmap, with recommendations for the City of Edmonton on facilitating the ZEV transition among women-led organizations. Our

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<sup>13</sup> City of Edmonton, *Edmonton's Electric Vehicle Strategy* (2018), 38-44. <https://www.edmonton.ca/public-files/assets/document?path=pdf/edmontonelectricvehiclestrategy.pdf>

<sup>14</sup> Sarah McBain, "Integrating equity is critical to achieving a low-carbon transportation system," August 10, 2023. <https://www.pembina.org/blog/integrating-equity-critical-achieving-low-carbon-transportation-system>

<sup>15</sup> Statistics Canada, "Research Blog: Women-owned businesses in Canada." <https://www.statcan.gc.ca/en/blog/cs/wob>

<sup>16</sup> Statistics Canada, "Analysis on businesses majority-owned by various sub-population groups and visible minorities, first quarter of 2022." <https://www150.statcan.gc.ca/n1/pub/11-621-m/11-621-m2022005-eng.htm>

<sup>17</sup> TD, "Pandemic Stalls Women's Progress in Entrepreneurship." <https://economics.td.com/women-in-business>

<sup>18</sup> Guangying Mo, Wendy Cukier, Akalya Atputharajah, Miki Itano Boase, Henrique Hon, "Differential Impacts during COVID-19 in Canada: A Look at Diverse Individuals and Their Businesses." *Canadian Public Policy* (2020). <https://doi.org/10.3138%2Fcpp.2020-072>

recommendations are founded on thorough research that we did on advancing equitable and inclusive ZEV adoption<sup>19,20</sup> and insights gathered through these methods:

- A series of interviews with women entrepreneurs to uncover challenges related to vehicle electrification and to elicit feedback about municipal supports that would enable the transition.
- A comprehensive jurisdictional scan of programs and policies across cities that enhance the adoption of ZEVs, specifically noting those that prioritize equitable uptake and offer assistance to SMEs.

Although focused on Edmonton's business community, our recommendations may be relevant to other municipalities and levels of government. Further, as part of a broader study, we developed educational materials for businesses on operational, financial and infrastructure-related considerations regarding ZEV adoption. These materials can be found on the [Women delivering electric web page](#).

In the following sections of this report, we first outline the background and context of Edmonton's zero-emission transportation policy. We then present jurisdictional scans of (1) municipal programs and policies to promote vehicle electrification, and (2) provincial and state programs to facilitate access to EVs among equity-deserving groups. These are followed by a summary of findings from engagement with women-owned entrepreneurs in Edmonton and other locations and industry experts, after which we present key recommendations for the City of Edmonton.

## 1.1 Policy background and context

The City of Edmonton's 2018 Electric Vehicle (EV) Strategy<sup>21</sup> detailed a five-year plan to become an EV-ready city. The plan outlined six key areas for action:

- **Education and marketing:** Build awareness and support for EVs among Edmontonians and professionals in the car dealership industry.
- **Electric vehicle charging infrastructure:** Improve opportunities for residential and workplace EV charging, and develop local and long-distance EV charging networks.
- **Incentives and financial tools:** Provide non-permanent financial incentives for

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<sup>19</sup> Sarah McBain, *Zero-Emission Vehicle Awareness & Education: Towards inclusive and equitable outcomes in a decarbonized MHDV sector* (Pembina Institute, 2023). <https://www.pembina.org/reports/zev-awareness-education-mhdv.pdf>

<sup>20</sup> Colton Kasteel, *Zero-Emission Vehicle Awareness, Education, and Engagement: Advancing diversity, equity and inclusion* (Pembina Institute, 2022). <https://natural-resources.canada.ca/sites/nrcan/files/reports/ZEV%20DEI%20Report%20-%20EN%20-%20ACC.pdf>

<sup>21</sup> *Edmonton's Electric Vehicle Strategy*.

residents to reduce the cost of EV purchase and charging, and provide tangible benefits and advantages to EV ownership.

- **Regulations:** Leverage municipal regulations and processes to better support the advancement of EVs, and support the provincial and/or federal government in establishing a ZEV sales standard.
- **City leadership:** Maximize opportunities to transition the municipal fleet to EVs where feasible, and implement and showcase municipal EVs and infrastructure projects.
- **Collaboration, partnerships and advocacy:** Collaborate with the automobile industry, non-profit organizations, local car- and ride-sharing companies, utilities, academic institutions and the provincial and federal governments.

To measure progress across these six key areas, the plan proposed several key performance indicators, including installing 83 public charging stations and reaching 1,300 EVs registered in Edmonton by 2022. Other measures included that at least 50% of people indicate that they are knowledgeable about EVs in 2022, and 25% specify that they would purchase an EV.

The 2018 EV Strategy supports aspects of the Edmonton City Plan released in 2020.<sup>22</sup> In 2021, Edmonton released its Community Energy Transition Strategy & Action Plan,<sup>23</sup> which demonstrated that GHG emissions could be cut by up to 83% in Edmonton, with 28% of the reduction coming from transportation and urban planning. The plan outlines several major transportation and EV-related initiatives, summarized in Table 1.

Table 1. Key EV initiatives in Edmonton's Community Energy Transition Strategy and Action Plan

Timeframe	Initiatives
2021–2022	<ul style="list-style-type: none"> <li>• Accelerate Edmonton's EV readiness by supporting the installation of public EV charging infrastructure and providing EV charging incentives.</li> <li>• Transition Edmonton's bus fleet and mass transit technologies (e.g., rail) to electric or zero-emission fuel, including upgrading and building facilities to accommodate them.</li> </ul>
2023–2026	<ul style="list-style-type: none"> <li>• Identify and begin planning for potential car-free or low-emissions zones or corridors combined with improvements to active transportation and public realm improvements (e.g., parklets).</li> <li>• Collaborate and explore opportunities to use hydrogen in the goods movement sector, including piloting with post-secondary institutions a project to retrofit buses with hydrogen fuel cells .</li> </ul>

<sup>22</sup> City of Edmonton, *Edmonton City Plan (2020)*. [https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/City\\_Plan\\_FINAL.pdf](https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/City_Plan_FINAL.pdf)

<sup>23</sup> City of Edmonton, *Edmonton's Community Energy Transition Strategy & Action Plan (2021)*. <https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/EnergyTransitionStrategy2021-04-20.pdf?cb=1721423247>

	<ul style="list-style-type: none"> <li>• Support car, ride, bike and other micro-mobility sharing programs.</li> <li>• Transition the City's vehicles and motorized equipment to zero-emissions models, including upgrading facilities and installing fleet-charging infrastructure.</li> <li>• Create a just and equitable transition initiative for equity-seeking groups that identifies challenges, solutions and opportunities for participation.</li> </ul>
2027–2030	<ul style="list-style-type: none"> <li>• Support ZEVs via designated driving lanes, priority parking and other measures.</li> <li>• Develop an urban freight strategy that includes a focus on reducing emissions.</li> </ul>
2030	<ul style="list-style-type: none"> <li>• Complete a ZEV charging network.</li> </ul>

Edmonton has made progress on several actions outlined in Table 1, including the following:

**2021:** Released an implementation guide for its Bike Plan that outlines next steps and processes for building out a bike network.<sup>24</sup>

**2022:** Developed and implemented a first-of-its-kind carbon budget and has committed \$11.2 million towards electrifying the municipal fleet and \$100 million towards implementing the Bike Plan.<sup>25</sup> The City also partnered with EPCOR to launch Energizing Edmonton to support the installation of EV charging stations and announced the launch of a pilot program for hydrogen electric transit buses.<sup>26,27</sup>

**2023:** Allocated \$5 million in funding to improve public transit, with a focus on enhancing safety.<sup>28</sup>

**2024:** In partnership with the Government of Canada and the Canadian Urban Transit Research and Innovation Consortium, announced funding and other support towards electrification of Edmonton's transit fleet.<sup>29</sup>

<sup>24</sup> City of Edmonton, *The Bike Plan Implementation Guide 2021-2026* (2021).

<https://www.edmonton.ca/sites/default/files/public-files/BikePlan-ImplementationGuide.pdf>

<sup>25</sup> City of Edmonton, *Carbon Budget 2023-2026* (2022). <https://www.edmonton.ca/sites/default/files/public-files/2023-2026CarbonBudget1.pdf>

<sup>26</sup> EPCOR, "EV charging on the go with Encor by EPCOR." <https://www.epcor.com/products-services/encor/Pages/electric-vehicle-chargers.aspx>

<sup>27</sup> Global News, "Edmonton, Strathcona County launch pilot program for hydrogen-electric transit buses," September 24, 2022. <https://globalnews.ca/news/9154061/edmonton-strathcona-county-hydrogen-electric-bus-pilot-program/>

<sup>28</sup> CBC, "Edmonton using \$5M provincial grant to address transit safety concerns," September 14, 2023. <https://www.cbc.ca/news/canada/edmonton/edmonton-using-5m-provincial-grant-to-address-transit-safety-concerns-1.6967200>

<sup>29</sup> Mass Transit, "Joint investment of C\$1.29 million to help city of Edmonton, Alberta, plan for zero-emission transition," July 10, 2024. <https://www.masstransitmag.com/bus/vehicles/hybrid-hydrogen-electric-vehicles/press-release/55124961/infrastructure-canada-joint-investment-of-c129-million-to-help-city-of-edmonton-alberta-plan-for-zero-emission-transition>

## 2. Jurisdictional scan

Governments advance ZEV adoption through a combination of methods, including fiscal incentives, regulations (e.g., fuel economy standards, sales standards), strategic investments in charging infrastructure and research, public engagement and innovation. Research on strategies to accelerate equitable ZEV adoption notes the following measures that can be integrated into existing government policies and programs:<sup>30,31,32,33</sup>

- Revise fiscal incentive programs to ensure they reach those who need it most. Integrate eligibility items such as income in order to channel funding toward equity-deserving groups, and explore options to offer low-interest loans and grants for the purchase or lease of used ZEVs.
- Enhance access to charging infrastructure through amending building codes to ensure charger availability in multi-unit residential buildings, and invest in public charging stations. Prioritize locations within underserved communities, and incorporate accessible design principles (e.g., wheelchair accessible).
- Increase knowledge and confidence in ZEVs through outreach efforts targeting equity-deserving groups. Tailor the content to suit the cultural background of the intended audience and enhance access by translating it into various languages.
- Explore options to boost shared mobility options through public-private partnerships. Shared mobility programs can incorporate electrified vehicles and micro-mobility options to augment access to zero-emission transportation alternatives.

### 2.1 Review of municipal actions to accelerate ZEV adoption

Municipal ZEV policies and programs vary widely, but all reflect the importance of electrifying transportation to reduce GHG emissions. Certain cities, particularly Toronto, Vancouver and Montreal, have robust ZEV and transportation electrification strategies, while others, such as

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<sup>30</sup> Cambridge Systematics, Inc., *Colorado EV Equity Study*, prepared for the Colorado Energy Office (2022). <https://energyoffice.colorado.gov/sites/energyoffice/files/documents/FINAL%202022-CEO-CO%20EV%20Equity%20Study-2022-08-06.pdf>

<sup>31</sup> CSA Group, *Charging Ahead: Ensuring Equity and Reliability in Canada's Electric Vehicle Network* (2022). [https://www.csagroup.org/wp-content/uploads/CSA-ChargingInfrastructure-PublicPolicyReport-EN\\_Accessible.pdf](https://www.csagroup.org/wp-content/uploads/CSA-ChargingInfrastructure-PublicPolicyReport-EN_Accessible.pdf)

<sup>32</sup> Madeline Yozwiak, Sanya Carley and David M. Konisky, *Clean and Just: Electric Vehicle Innovation to Accelerate More Equitable Early Adoption* (ITIF, 2022). <https://itif.org/publications/2022/06/27/electric-vehicle-innovation-to-accelerate-more-equitable-early-adoption/>

<sup>33</sup> NESCAUM, *Expanding Equitable Access to Electric Vehicle Mobility* (2020). [https://www.nescaum.org/documents/expanding-equitable-access-to-ev-mobility-examples\\_9-21-20.pdf](https://www.nescaum.org/documents/expanding-equitable-access-to-ev-mobility-examples_9-21-20.pdf)

Ottawa and Winnipeg, are still developing their strategies. See Table 3 in Appendix A for details on municipalities and strategies reviewed.

Common measures include amending bylaws to incorporate EV-ready requirements, changing zoning laws to ensure that charging infrastructure can be abundant and accessible, building out public charging infrastructure (including city-owned public chargers), promoting and raising awareness of ZEVs, exploring options and partnerships to provide financial support for ZEVs and charging equipment, creating benefits to ZEV ownership (e.g., preferential parking) and setting targets for the electrification of city fleets and shared mobility options. Most cities have published targets for ZEV adoption, such as Toronto's goal to have 20% of all registered vehicles be electric by 2030, but not all of them have sufficient policies to meet these targets.

Several cities have considered how to promote equity in their measures to increase ZEV adoption. Notable examples include the following:

- The City of Seattle plans to investigate tax incentives to help small and women- and minority-owned businesses transition their fleets to ZEVs.
- Cities like Montreal and Portland intend to assess the impact of new transportation modes and policies to ensure equitable distribution of benefits and mitigation of potential adverse outcomes. The City of Vancouver has explored implementing a parking surcharge on new fossil fuel vehicles, with exemptions for ZEVs, older vehicles and those that cost less than \$40,000. Such exemptions encourage ZEV adoption, yet minimize adverse impacts to lower-income residents.
- Vancouver, Montreal and Portland, among other cities, aim to increase access to EV charging by targeting investments toward underserved communities and building out infrastructure in areas with the least access.
- Portland and Hamilton seek to create employment and training opportunities in the ZEV industry for equity-deserving groups, including those in the mechanical and manufacturing sectors. Similarly, San Jose aims to implement ZEV education programs that target disadvantaged communities where uptake is the lowest.

## 2.2 Identification of equity-based measures in government-led ZEV programs

Provincial and state governments in North America have also taken steps to enhance access to ZEVs among equity-deserving groups. Below, we present an overview of the programs we reviewed. See Table 4 in Appendix B for more program details.

Programs to encourage EV adoption include providing financial assistance for the purchase or lease of ZEVs, offering incentives for charging equipment and funding for public charging

facilities, and providing job training and delivering outreach programs to raise knowledge and awareness about ZEVs. To ensure that equity-deserving groups benefit from these programs, several methods are used to direct programs funds, including the following:

- **Reserving some or all the program funds** for projects that directly support equity-deserving groups. These projects could be carried out by non-equity-deserving groups or eligibility for funding could be restricted to equity-deserving groups .

**Example:** Oregon’s Community Charging Rebates Program reserves most (70%) of program funding for charging infrastructure projects located in disadvantaged and rural communities.

- **Providing enhanced incentives to equity-deserving groups** by offering bonuses on top of the base rebate amount for EV purchases or charging infrastructure, or using eligibility criteria to deliver larger rebates to equity-deserving groups.

**Example:** New Jersey’s Voucher Pilot for medium-duty and heavy-duty vehicles offers a 25% bonus on the base rebate amount for the purchase of an EV for small-business applicants, and an additional 4% bonus for certified women-, minority- or veteran-owned businesses.

- **Developing specialized funding streams and programs** that address the unique challenges to ZEV adoption among equity-deserving groups.

**Example:** California’s Truck Loan Assistance Program provides financing for small-business fleet owners who fall below conventional lending criteria and are unable to qualify for traditional financing for a ZEV.



# 3. Engagement

Several methods were used to engage with women-owned enterprises in Edmonton on barriers to ZEV adoption. Overall, engagement proved to be challenging, which required adjusting how it was done.

The initial scope of engagement in this study involved piloting a series of capacity-building sessions. The sessions were intended to bring together a cohort of women and gender-diverse entrepreneurs to participate in facilitated discussions about electrification over an eight-to-ten-month period. Various methods were used to identify and recruit potential participants for the pilot, including placing paid advertisements and broadcasting program information to various business and trade associations. However, reaching the target audience proved to be challenging and resulted in us having to change engagement approaches. Nevertheless, discussions with potential participations during recruitment efforts revealed key insights:

- Edmonton businesses were not familiar with the concept of ZEVs.
- Business owners didn't consider themselves ready to transition to a ZEV.
- Financial and time constraints were cited as reasons for not considering ZEV adoption.
- The perceived incentives and benefits of participating in a pilot over numerous months were not compelling.

We completed a series of interviews to gather feedback from women-owned enterprises in place of the sessions. Various methods were used to contact business owners (e.g., email, phone, social media); however, we had trouble in securing interviews. Here too, valuable insights were gained that can inform future efforts to foster effective engagement:

- Use diverse outreach methods; more methods help capture a larger audience.
- Allow for flexible scheduling.
- Establish timelines and allocate sufficient budget and resources to develop relationships and trust and to allow for multiple opportunities to participate and follow-up with participants.
- Demonstrate to the participants the value of their contributions and reimburse them for their time.
- Partner with community-based organizations that serve equity-deserving groups to leverage the relationships and trust that they've established with the target audience.

## 3.1 Interview results

Because of the difficulty in getting interviews, only a small sample of Edmonton-based businesses were consulted. We therefore supplemented our findings with interviews done by the

Pembina Institute of women-owned enterprises in Ontario, British Columbia and Saskatchewan. The overall findings represent the views of 14 women-owned enterprises.

We also consulted industry experts on the resources needed to enable businesses to transition to ZEVs.

### 3.1.1 Women-owned SMEs

Appendix C contains the full set of interview questions for the Edmonton businesses.

#### Operations

The women entrepreneurs primarily owned one vehicle. Most use light-duty and medium-duty vehicles for business purposes, including city deliveries. Though less common, a few own larger, heavier-duty vehicles to support their business operations that require travelling longer distances. Their daily travel needs ranged from 5 to 10 km on average for some, to more than 500 km for others.

#### Awareness and interest in ZEVs

Most interview participants have heard about ZEVs, but have not yet considered purchasing one. When asked if they would be interested in purchasing a ZEV, many expressed hesitancy, suggesting that they would require access to affordable models and charging infrastructure, needed clarity about the potential cost savings of owning one and wanted certainty that the vehicle would be reliable.

#### Barriers and challenges to ZEV adoption

##### High costs and limited financial capacity

Interview participants voiced concerns about the high upfront cost associated with ZEV adoption and were uncertain about the costs associated with maintenance and charging. They also commonly expressed concern about economic uncertainties, such as rising costs in other aspects of their business, that would exacerbate the challenges in adopting ZEVs.

##### Insufficient infrastructure and technological uncertainty

Inadequate access to charging infrastructure and the performance of ZEVs in cold climates were common concerns raised. Other perceived challenges were the potential limited availability of mechanics capable of maintaining ZEVs and uncertainty about the longevity of batteries. Several participants were unsure about how far ZEVs could travel (i.e., range).

## Information gaps and resource needs

Those interviewed suggested that there is insufficient information about the reliability of ZEVs, their safety and operational suitability in different climates. Participants expressed a limited understanding of current financial supports, and suggested that they would benefit from information about where and how to access charging infrastructure. Some indicated that they would like to see comparisons between ZEVs and conventional vehicles using various metrics.

## Measures and supports to enable ZEV adoption

Interviewees described a number of measures that would help lower barriers to adopting ZEVs. The following were among them:

- **Financial incentives:** Introduce tax benefits, grants or subsidies to offset high initial costs to ZEV adoption for SMEs.
- **Infrastructure development:** Expand charging infrastructure and prioritize installation along routes that are critical to business operations.
- **Education and support programs:** Offer educational resources tailored to small-business owners. Provide information through government websites and direct outreach.

### 3.1.2 Industry experts

#### Barriers and challenges to ZEV adoption

Industry experts interviewed noted that small businesses can face greater financial challenges to ZEV adoption compared with larger players since they have less access to capital. However, smaller businesses do have the advantage of being more agile. Because of a simpler organizational structure, they can make decisions to electrify their vehicles faster than a larger enterprise might.

Small businesses can also face greater capacity challenges. For example, they may lack the time and in-house expertise to apply for government rebate programs or develop a charging strategy. Small businesses may also not have the time to attend webinars and conferences about ZEVs, which can be both a source of information and an opportunity to establish relationships.

#### Measures and resources needed to support ZEV adoption

Interviewees shared that businesses that have successfully adopted ZEVs commonly used government funding, completed a charging strategy and fleet assessment, and engaged early on with utilities. Interviewees recommended that municipalities explore the following measure to enable ZEV adoption among small businesses:

- Expand access to public charging infrastructure and partner with local utilities to offer complementary charging assessments.
- Explore measures that create advantages for ZEVs in the city (e.g., zero-emission zones, parking permit exemptions, etc.)
- Foster partnerships between government entities, business associations and community-based organizations to facilitate knowledge exchange and capacity building.

### 3.1.3 Overall findings

The interviews of both the women entrepreneurs and the industry experts revealed a hesitancy to adopt ZEVs driven, in part, by the higher cost of these vehicles, limited access to infrastructure and a lack of information on the benefits and practical steps for making the transition. These findings align with previous research and underscore the need to address these barriers.

## 4. Recommendations

Our recommendations are based on the jurisdictional scans and interviews. The interviews revealed a cautious interest in ZEV adoption among women business owners, which is tempered by substantial barriers related to cost, infrastructure and technological uncertainty. Addressing these challenges through policy interventions focused on financial incentives, infrastructure development and education are crucial to fostering ZEV adoption for businesses that use transportation as a fundamental part of their operations.

The recommendations summarized in Table 2 and expanded on after the table should be led by the City of Edmonton in collaboration with identified partners. The recommendations support and align with the six action areas in Edmonton's 2018 Electric Vehicle Strategy (see section 1.1).

Each recommendation is accompanied by key implementation steps and considerations. By aligning policy efforts with industry-specific needs and leveraging collaborative partnerships, the City of Edmonton can pave the way for a more resilient, environmentally friendly transportation ecosystem while supporting the economic vitality of its small-business community.

Table 2. Recommendations to advance equitable EV adoption in Edmonton

Theme	Description	Recommendations	Implementation partners
Enabling a comprehensive ZEV charging network	Build on efforts to extend access to charging infrastructure, and work toward a comprehensive and equitable ZEV charging network by 2030.	<p>Recommendation #1: Establish EV-ready requirements in new buildings.</p> <p><i>Key implementation steps &amp; considerations</i></p> <ul style="list-style-type: none"> <li>• Develop requirements and guidelines for ZEV charging in new residential and non-residential developments. Amend appropriate zoning bylaws.</li> </ul>	<ul style="list-style-type: none"> <li>• Utilities</li> <li>• Utility commission</li> <li>• Municipal Climate Change Action Centre</li> <li>• Government of Alberta</li> <li>• Government of Canada</li> <li>• Condo and property management corporations</li> <li>• Charging network operators</li> </ul>
		<p>Recommendation #2: Provide support to retrofit existing homes and multi-unit residential and commercial buildings with charging infrastructure.</p> <p><i>Key implementation steps &amp; considerations</i></p> <ul style="list-style-type: none"> <li>• Identify and allocate funding to offer financial incentives for charging infrastructure retrofits in existing homes and multi-unit residential and commercial buildings.</li> </ul>	
		<p>Recommendation #3: Enhance access to public charging infrastructure for those with the least access.</p> <p><i>Key implementation steps &amp; considerations</i></p> <ul style="list-style-type: none"> <li>• Conduct comprehensive stakeholder engagement and undertake spatial analysis of current infrastructure access to determine charging needs and site locations in underserved communities.</li> </ul>	

Theme	Description	Recommendations	Implementation partners
Lowering financial barriers to ZEV adoption	Advance commitments to reduce the cost of ZEV purchases by increasing awareness of current financial supports and developing new and additional incentives.	<p>Recommendation #4: Advocate for the Alberta government to establish ZEV purchase incentives.</p> <p><i>Key implementation steps &amp; considerations</i></p> <ul style="list-style-type: none"> <li>• Collaborate with municipal governments to advocate for the development of an incentives program.</li> <li>• Encourage the inclusion of measures to enhance access to financial supports to those in most need.</li> </ul> <p>Recommendation #5: Explore complementary measures that create a financial advantage for ZEV ownership (e.g., differential parking fees or permits).</p> <p><i>Key implementation steps &amp; considerations</i></p> <ul style="list-style-type: none"> <li>• Investigate the potential of putting in place complementary measures and revising appropriate bylaws. Undertake stakeholder engagement and consider implementation on a trial basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Government of Alberta</li> <li>• Industry associations</li> <li>• Community organizations</li> <li>• Local businesses</li> <li>• Business improvement areas (BIAs)</li> </ul>
Raising ZEV awareness and knowledge	Engage in information campaigns to fill gaps in awareness and understanding of existing and new ZEV resources. Lead by example through the electrification and branding of municipal fleet vehicles.	<p>Recommendation #6: Launch informational campaigns to increase ZEV awareness and knowledge of existing support programs.</p> <p><i>Key implementation steps &amp; considerations</i></p> <ul style="list-style-type: none"> <li>• Identify potential funding to support campaign efforts. Partner with community-led organizations to do stakeholder mapping, and incorporate engagement principles to foster inclusive outreach.</li> </ul> <p>Recommendation #7: Advance electrification of municipal fleet vehicles to showcase leadership and increase awareness and trust in ZEV technology.</p> <ul style="list-style-type: none"> <li>• Incorporate visible branding on municipal ZEVs and encourage electric utilities to adopt and market electrified fleet vehicles. Use existing resources to guide further fleet electrification and identify funding opportunities for feasibility studies and capital projects.</li> </ul>	<ul style="list-style-type: none"> <li>• Community and non-profit organizations (e.g., Electric Vehicle Association of Alberta)</li> <li>• Industry associations</li> <li>• BIAs</li> <li>• Local businesses</li> </ul>

## Theme: Enabling a comprehensive ZEV charging network

Enabling access to ZEV charging is a major measure that municipalities are pursuing to accelerate ZEV adoption. Amending building codes to ensure charger availability in residential and commercial buildings, and investing in public charging infrastructure with underserved communities as the priority are main strategies to accelerate equitable ZEV uptake. We found that cities like Portland and Montreal are expanding public charging infrastructure in areas with limited access, while municipalities such as Vancouver and Toronto have adopted EV-ready building codes to ensure widescale access to charging in all new residential buildings.

Women-owned SMEs interviewed in this study expressed concerns about inadequate access to charging infrastructure, and industry experts advised that municipalities prioritize the expansion of charging infrastructure.

### Recommendation #1: Establish EV-ready requirements in new buildings.

To introduce EV-ready requirements to new residential and non-residential developments, the City of Edmonton should develop the requirements and guidelines for EV charging. Appropriate zoning bylaws can be amended, such as parking requirements in zoning or parking bylaws. A best practice guide developed on behalf of the BC Sustainable Communities Network provides instructions for and examples of bylaw amendments and technical requirements.<sup>34</sup> A guide to installing EV infrastructure in Alberta's multi-unit residential buildings prepared by the Pembina Institute can be used as an additional resource.<sup>35</sup>

### Recommendation #2: Provide support to retrofit existing homes and multi-unit residential and commercial buildings with charging infrastructure.

To support retrofitting existing homes and multi-unit residential and commercial (i.e., workplaces) buildings with charging infrastructure, the City of Edmonton should identify and allocate funding for charger equipment and installations. For example, the Government of Canada's Zero-Emission Vehicle Infrastructure Program (ZEVIP) distributes funding for ZEV infrastructure to municipal governments through various program streams.<sup>36</sup> Municipalities can

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<sup>34</sup> Brendan McEewn and AWS Engineering, "EV Ready" Requirements for New Buildings: A Best Practice Guide for BC Local Governments (2021). <https://www.peninsulacleanenergy.com/wp-content/uploads/2021/09/BC-Province-Canada-EV-Ready-Requirements-for-New-Buildings-Final.pdf>

<sup>35</sup> Steven Han and Jason Wang, *A Guide to Installing EV Infrastructure in Alberta's Multi-Unit Residential Buildings* (Pembina Institute, 2023). <https://www.pembina.org/reports/installing-ev-chargers-in-alberta-multi-unit-buildings.pdf>

<sup>36</sup> Government of Canada, "Zero Emission Vehicle Infrastructure Program." <https://natural-resources.canada.ca/energy-efficiency/transportation-alternative-fuels/zero-emission-vehicle-infrastructure-program/21876>



either be the ultimate recipient of the funding or serve as an intermediary, passing the funding on to other entities to develop charging stations.

To ensure program funds reach equity-deserving groups, some or all of the funding can be reserved for projects in underserved communities or eligibility criteria can be used to prioritize equity-deserving groups. For instance, larger rebates could be offered to businesses owned by women or minorities.

### Recommendation #3: Enhance access to public charging infrastructure for those with the least access.

To improve access to public charging for those with the least access, comprehensive engagement of stakeholders should first occur to understand infrastructure and mobility needs, complemented by a spatial analysis of current access to infrastructure to determine potential charging sites. Expanding curbside charging is one option that could be explored to provide charging access to those without dedicated off-street parking. Curbside charging often requires updates to municipal zoning codes and permitting processes. Enhancing access to public charging should also consider accessibility design principles (e.g., wheelchair accessible, security). This can be achieved by providing technical guidance and embedding requirements in the permitting process for charger installations.

## Theme: Lowering financial barriers to ZEV adoption

Governments promoting the uptake of ZEVs are establishing incentives and other measures to improve affordability and lower financial barriers. Cities like Portland and Seattle have identified that partnering with, and advocating for, other levels of government to develop ZEV purchase incentives are important to increasing the use of ZEVs. Other jurisdictions such as Montreal and Hamilton are using a complementary strategy, creating a financial advantage to ZEV ownership through measures such as preferential parking fees for ZEVs.

Women-owned SMEs have concerns about the high upfront cost with ZEV adoption, as we discovered during the interviews. Financial supports should be provided.

### Recommendation #4: Advocate for the Alberta government to establish ZEV purchase incentives.

The development and implementation of a ZEV purchase assistance program should be led by the Government of Alberta. In provinces that have incentives for light-duty ZEVs, rebates range from \$4,000 to \$7,000, and the amount offered may differ depending on the type of ZEV (i.e., battery electric vs. plug-in hybrid). Rebates for heavy-duty ZEVs are only offered in a few provinces (e.g., British Columbia, Quebec, Nova Scotia) with amounts ranging from \$3,000 to \$175,000, depending on the vehicle type (e.g., Class 2B-8). Municipalities, including Edmonton,

can collaborate on and advocate for such program development and encourage measures to ensure support reaches those who need it most. Options might include offering rebates for the purchase or lease of used ZEVs, integrating eligibility criteria (e.g., differential rebates based on income qualifications), or designating a portion of program funding for equity-deserving groups.

### Recommendation #5: Explore complementary measures that create a financial advantage for ZEV ownership.

The City of Edmonton should explore measures like differential parking fees or commercial parking permits for ZEVs. For example, ZEVs could get a parking pass or lowered rates in designated pay parking areas or preferential parking locations may be designated for ZEV use. Such measures would require examining and revising the City of Edmonton’s Traffic Bylaw 5590.<sup>37</sup> This process should start with stakeholder engagement to identify suitable locations and program requirements, and piloting the proposed measures might be considered. In addition, monitoring and enforcement measures should be established.

### Theme: Raising ZEV awareness and knowledge

There is broad uncertainty and a lack of awareness about ZEVs, including how they operate and what resources are available to help transition. Governments are commonly partnering with industry and other levels of government to build awareness and support for ZEVs through education programs. For example, San Jose has partnered with utility provider PG&E to train residents and employees on how to use chargers after their installation at multi-family buildings and small businesses. Other municipalities, like Mississauga, plan to increase ZEV awareness through test drives and other activities that demonstrate ZEV technology within communities.

### Recommendation #6: Launch informational campaigns to increase ZEV awareness and knowledge of existing support programs.

Funding to support campaign efforts may be available through Canada’s Zero-Emission Vehicle Awareness Initiative, which is open to municipal governments and other organizations.

Existing educational resources, such as the City of Edmonton’s Electric and Hydrogen Vehicle brochure,<sup>38</sup> could be more widely disseminated through engagement events and other forms of outreach led by the City and in partnership with community-led organizations. Other ZEV resources and educational tools tailored to the needs of businesses, such as those developed as part of this study (see examples on [Women delivering electric web page](#)), can be leveraged to raise awareness and confidence in ZEVs among Edmonton’s business community. Actions

<sup>37</sup> City of Edmonton, *Bylaw 5590*. <https://www.edmonton.ca/sites/default/files/public-files/C5590.pdf>

<sup>38</sup> City of Edmonton, “Electric Vehicles.”

[https://www.edmonton.ca/city\\_government/environmental\\_stewardship/electric-vehicles](https://www.edmonton.ca/city_government/environmental_stewardship/electric-vehicles)

should also be taken to raise awareness of ZEV purchase incentives currently available to Edmonton residents through the Government of Canada.

Foster engagement through practices that are both equitable and inclusive.<sup>39</sup> Among such practices are using a diverse range of media channels (e.g., radio, social media) and leveraging trusted messengers and community champions to amplify and share information and meet communities “where they are at.”

Facilitate opportunities for community groups to gain first-hand ZEV experiences, such as through ride-and-drive events. Such efforts could also be enhanced by offering technical assistance at other engagement events. Opportunities to increase the proportion of ZEVs in shared mobility alternatives (e.g., car- or bike-sharing programs) should also be explored as an option to increase first-hand ZEV experience, along with partnering with companies like Communauto, Lime or Bird Canada on such initiatives.

### Recommendation #7: Advance electrification of municipal fleet vehicles to showcase leadership and increase awareness and trust in ZEV technology.

The City of Edmonton should continue to electrify and incorporate visible branding on municipal ZEVs, and to encourage electric utilities to adopt and market electrified fleet vehicles. Showcasing municipal fleet electrification not only builds trust in ZEVs by demonstrating the technology in use to the public, but City procurement can also foster local demand that builds the capacity and capabilities of local supply chains.

Further fleet electrification should be informed by assessing current and forecasted municipal fleet utilization rates and costs. Gathering missing information would need to be one of the first steps if gaps exist in the fleet data. Assessing municipal facilities in collaboration with local utilities may also be required to identify infrastructure upgrades to support the installation of chargers.

The Federation of Canadian Municipalities’ Green Municipal Fund offers funding for feasibility studies and capital projects and provides resources on its website for municipalities to learn about how other jurisdictions have electrified their fleets.<sup>40</sup> The Government of Canada’s ZEVIP program also grants funding for infrastructure to support fleet electrification.

Early involvement and coordination across different city departments are critical in order to jump start further municipal fleet electrification initiatives.

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<sup>39</sup> *Zero-Emission Vehicle Awareness and Education: Towards inclusive and equitable outcomes in a decarbonized MHDV sector.*

<sup>40</sup> Green Municipal Fund, “Municipal Fleet Electrification.” <https://greenmunicipalfund.ca/municipal-fleet-electrification>

## 5. Conclusion

Engaging with diverse groups and thoughtful planning are critical to enable the equitable and widespread adoption of ZEVs, including mitigating the significant existing disparities. Our research aimed to supplement the existing work in the City of Edmonton to uncover barriers to ZEV uptake by identifying the needs of SMEs in the ZEV transition and placing particular emphasis on engaging women and gender-diverse entrepreneurs in Edmonton.

Women-led businesses that rely on vehicles for their operations face unique barriers that must be addressed to ensure their full participation in the ZEV transition. The supports that facilitate broader EV adoption — such as fiscal incentives, improved access to charging infrastructure and initiatives to increase education and confidence in ZEVs — are equally important for enabling women-led enterprises to embrace ZEVs. Achieving equitable outcomes requires that policies and programs prioritize inclusivity and accessibility.

Implementing the recommendations in this report can foster a more inclusive and effective transition to a zero-emission future.

# Appendix A. Review of municipal actions to accelerate ZEV adoption

Table 3. Scan of municipal actions to advance ZEV adoption

City	Strategy	Description	Key measures and programs
Canada			
Calgary	2023-2026 Climate Implementation Plan	Describes Calgary's near-term plans to decrease GHG emissions, electrify the city and reduce climate risk.	<ul style="list-style-type: none"> <li>• Leverage funding from other orders of government and private institutions to install public EV charging infrastructure.</li> <li>• Develop incentive programs for EV chargers in existing MURBs and non-residential public locations.</li> <li>• Implement the Green Fleet Strategy to reduce GHG emissions and electrify the City's fleet.</li> <li>• Implement the Calgary Transit Fleet Emission Reduction Plan, pending government funding.</li> <li>• Pilot hybrid and battery electric vehicles for the Calgary Police Service.</li> </ul>
	Calgary Climate Strategy: Pathways to 2050	Provides an updated roadmap to reach net-zero by 2050. Includes a program pathway to accelerate the transition to ZEVs.	<ul style="list-style-type: none"> <li>• Build local and regional public level 2 and level 3 charging infrastructure (2023 onwards).</li> <li>• Develop processes and financial incentives to support at-home charging, retrofits for EV charging infrastructure in MURBs, the purchase of EVs, and low- and zero- emissions fleet vehicles (2024-2030).</li> <li>• Require that all new residential buildings, 10% of new commercial buildings be built to an EV-ready standard by 2030.</li> <li>• Establish zero-emission transportation zones (2030 onwards).</li> <li>• All vehicles registered in Calgary are ZEVs by 2050.</li> </ul>

City	Strategy	Description	Key measures and programs
			<ul style="list-style-type: none"> <li>100% of all new livery transport passenger vehicles (taxi, limousine, rideshare) licensed to operate in Calgary are ZEVs by 2030.</li> </ul>
Hamilton	ReCharge Hamilton: Community Energy and Emissions Plan	Long-term plan to meet Hamilton's energy needs while reducing GHG emissions. Part of a broader set of policies to reach net-zero emissions by 2050.	<ul style="list-style-type: none"> <li>Commit to set requirements in zoning bylaws for EV infrastructure, especially charging stations.</li> <li>Commit to establish an EV strategy.</li> <li>Commit to working with local colleges and professional trade associations to develop plans to (re)train the mechanic workforce using an equity lens to support the shift from internal combustion engine vehicles to EVs.</li> <li>Change parking rules to incentivize EV access, e.g., by making more spots available to EVs and creating differential fee structures.</li> </ul>
	City of Hamilton Parking Master Plan	Provides direction on a strategic approach to parking policy, planning, financial sustainability and enforcement to align with other city-wide transportation and land-use planning policies.	<ul style="list-style-type: none"> <li>Commit to set requirements in zoning bylaws for EV infrastructure, especially charging stations.</li> <li>Commit to establish an EV strategy.</li> <li>Commit to working with local colleges and professional trade associations to develop plans to (re)train the mechanic workforce using an equity lens to support the shift from internal combustion engine vehicles to EVs.</li> <li>Change parking rules to incentivize EV access, e.g., by making more spots available to EVs and creating differential fee structures.</li> </ul>
Mississauga	Peel Zero Emission Vehicle Strategy	Describes a ZEV policy roadmap for the Peel Climate Change Partnership (PCCP). The PCCP includes the Regional Municipality of Peel (City of Mississauga, City of Brampton, and the Town of Caledon) and two conservation authorities.	<ul style="list-style-type: none"> <li>Expand access to public charging stations by installing them at municipal-owned facilities and conservation authority-owned lands, deciding on the distribution of new chargers with equity in mind and installing standardized wayfinding signage for ZEV charging stations.</li> <li>Increase awareness of ZEV options, incentives and infrastructure through campaigns like test drives and highly visible branding on municipal ZEVs.</li> <li>Enhance private investment in ZEVs through financial and non-financial incentives for businesses and residents.</li> </ul>

City	Strategy	Description	Key measures and programs
	Climate Change Action Plan	Lays out the broad priorities for Mississauga on climate change mitigation and adaptation for the coming years.	<ul style="list-style-type: none"> <li>Embed considerations for ZEV infrastructure in the planning process (e.g., allocating a minimum number of ZEV parking spots, establishing minimum charger requirements and working with utilities to manage electricity demand).</li> <li>Install EV charging infrastructure on city-owned properties.</li> <li>Develop a zero-emission vehicle strategy (see Peel ZEV Strategy).</li> </ul>
Montreal	Transportation Electrification Strategy 2021-2023	Details 61 actions, many related to EVs, and over \$885 million in dedicated funding to increase the use of electric modes of transportation. Includes specific targets and indicators for the City's progress on electrification.	<ul style="list-style-type: none"> <li>Offer \$13 million in funding to Montreal businesses linked to the electric mobility sector for their development.</li> <li>Mandate minimum ratios of public chargers in municipal parking lots with a focus on the neighbourhoods with the least access.</li> <li>Analyze all new policies with Gender-Based Analysis Plus (GBA+) to promote equity.</li> <li>Create plans to turn downtown Montreal into a low-emissions zone by 2030, including pilot projects before the target date and public consultations.</li> <li>In 2023, obligation to install electrical equipment necessary for EV charging in new residential buildings is enshrined in Urban and Mobility Master Plan, thus requiring all boroughs to incorporate such provisions into their regulations.</li> <li>Set preferential parking fees for electric vehicles and reserving parking spaces for electric vehicles.</li> <li>Develop a communications strategy to encourage electric modes of transportation and increase support for sustainable mobility.</li> <li>Install 1,000 new public level 2 chargers and 100 public Level 3 DCFC fast-chargers by 2025.</li> </ul>

City	Strategy	Description	Key measures and programs
			<ul style="list-style-type: none"> <li>• Plan to sign an agreement with private sector entities to further develop the off-street public charging network.</li> <li>• Change regulations to mandate the installation of EV-ready electricity systems in surface parking lots.</li> <li>• Support the electrification of freight transportation and urban logistics through delivery pilot projects and related research.</li> </ul>
Ottawa	Transportation Master Plan: Part 1 – Policies	Details plans for transportation development and operation up to 2046. Originally introduced in 2013, it was most recently updated in 2023. The Capital Infrastructure Plan currently under development will be added as part II of the master plan in 2025.	<ul style="list-style-type: none"> <li>• Commit to develop a new zoning bylaw that includes EV charging requirements for parking spaces and commit to explore options for more charging stations at City facilities.</li> <li>• By 2030, 90% of new vehicle purchases by Ottawa citizens and businesses will be electric.</li> </ul>
	Electric Vehicle Strategy (forthcoming)	In development. No confirmed release date.	N/A



Toronto	City of Toronto Electric Vehicle Strategy	Lays out a vision to achieve 100% of transportation using zero-emission energy sources by 2050, with an interim goal of 20% of all registered vehicles in Toronto being electric by 2030. Includes 10 main actions and outlines key performance indicators and next steps for these targets.	<ul style="list-style-type: none"> <li>• The Home Energy Loan Program (HELP) and High-Rise Retrofit Improvement Support Program (Hi-RIS) provide funding for retrofits, including for EV level 2 charging stations at people’s homes and in older multi-unit residential buildings (MURBs). The City is looking to expand these incentives outside of the residential sector and to dedicate additional funds to HELP and Hi-RIS.</li> <li>• Expand charging infrastructure through incentives, changes to regulations and public-private partnerships.</li> <li>• Explore ways to monetize GHG reductions from charging infrastructure via carbon offset credits.</li> <li>• Explore regulatory changes to reduce congestion and promote EV adoption, particularly through financial and non-financial incentives. This includes supporting the Toronto Green Standards for new developments to ensure parking spaces are EV ready and lowering barriers to the development of more sustainable buildings.</li> <li>• Develop a City workplace charging program and make any internally developed materials publicly available to support other workplaces in such a program. Making these chargers accessible to the public is also planned.</li> <li>• Reduce barriers to public charging infrastructure, e.g., by allowing overnight charging in underused lots, converting roadside lamps into chargers, and allowing reserved parking for charging in some neighbourhoods.</li> <li>• Advocate for EVs, both to other levels of government and to citizens and businesses. This includes developing citizen EV champion networks and partnering with NGOs.</li> <li>• Support EV research and innovation, particularly work that focuses on Toronto’s specific context.</li> <li>• Find ways to promote the economic benefits of EVs to consumers and businesses. Additionally, work to attract investment from EV companies in Toronto.</li> <li>• Explore an EV incentive for vehicles for hire (e.g., Uber cars) and push this industry to electrify through regulations.</li> </ul>
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City	Strategy	Description	Key measures and programs
	TransformTO Net Zero Strategy	<p>Outlines Toronto's plans to reach net-zero by 2040. EV specific targets include:</p> <ul style="list-style-type: none"> <li>• 30% of registered vehicles being electric by 2030</li> <li>• 220 level 3 and 3,000 level 2 public ports by 2025, and 650 level 3 and 10,000 level 2 public ports by 2030.</li> </ul>	<ul style="list-style-type: none"> <li>• Explore regulatory changes and pilots to reduce congestion and promote EV adoption, such as piloting a low-emission vehicle or zero-emission vehicle zone and exempting EVs from potential congestion charges.</li> <li>• Align the EV strategy to net-zero goals by increasing public EV charging infrastructure; increasing charging infrastructure at residential, commercial, institutional and industrial buildings; and reviewing the EV Strategy.</li> <li>• Determine options to incentivize EV adoption and disincentivize fossil fuel-powered vehicles.</li> <li>• Encourage the adoption of electric commercial and freight vehicles for last-mile deliveries.</li> <li>• Commit to only add zero-emission buses by 2025, transition 50% of the City's fleet to zero-emissions by 2030, and have a zero-emission fleet by 2040.</li> </ul>
Vancouver	Climate Emergency Action Plan	Features six "Big Moves," one of which is focused on ZEVs.	<ul style="list-style-type: none"> <li>• Aim for ZEVs to make up 50% of kilometres travelled on Vancouver's roads in 2030.</li> <li>• Establish a carbon pricing surcharge on parking permits for gas and diesel vehicles. The first iteration of the surcharge only applies to vehicles bought after 2022 with a minimum purchase price of \$40,000. Later iterations of the policy will reduce the minimum cost. This policy ensures that low-income citizens are not affected by the surcharge while also penalizing the largest private polluters.</li> <li>• Expand parking EV-readiness requirements to non-residential buildings. This will add to the existing residential EV-readiness requirements, particularly for the fast-charging hubs already required in large new rezonings.</li> <li>• Vancouver already requires that all new single-family residences have EV-ready parking places and that 100% of MURB stalls and 10% of commercial stalls be EV ready.</li> <li>• Install charging infrastructure at city facilities and electrify the City's fleet.</li> </ul>

City	Strategy	Description	Key measures and programs
			<ul style="list-style-type: none"> <li>Expand EV charging stations near homes for those without access to home charging and in existing residential rental buildings. This includes level 2 and 3 light pole chargers and level 1 chargers in residential parking areas. Equity will be a factor in how the City chooses to support these projects. A curbside extension charging cable licence program is part of this objective.</li> <li>Encourage the electrification of vehicles, particularly light-duty passenger fleets, public transit and urban freight.</li> </ul>
	Zero Emissions Economic Transition Action Plan	Developed by the Vancouver Economic Commission at the direction of the City of Vancouver. Outlines economic implications, opportunities and risks of the net-zero transition.	<ul style="list-style-type: none"> <li>Provide support for bulk-buying activities in retrofits and fleets.</li> <li>Find ways to assist in financing decarbonization efforts (e.g., switching to ZEVs).</li> <li>Promote zero-emission investments through Invest Vancouver.</li> <li>Establish a regional just transition council, as well as a local Black, Indigenous, People of Colour (BIPOC) sustainability practitioners' network.</li> </ul>
	<i>Additional actions not outlined in planning or policy documents.</i>	<i>Vancouver has several notable supports not detailed in the larger municipal plans that support EV adoption.</i>	<ul style="list-style-type: none"> <li>Provide funding up to \$93,000 to install City-owned EV infrastructure in existing rental buildings for use by tenants, provided the owner pays \$2,000. The City will also apply for additional funding from BC Hydro on the owner's behalf to streamline the process and remove barriers.</li> <li>Partner with EasyPark to provide reserved parking for EVs.</li> <li>Allow EVs to use the high occupancy vehicle lanes regardless of the number of occupants.</li> <li>Provide funding under the Commercial Curbside Electric Vehicle Charging Program to install level 2 and level 3 chargers for which businesses may charge a usage fee.</li> <li>Homeowners and landlords may apply for an EV charger cord cover licence for \$5 per year, which permits them to charge EVs on the street in front of their home by connecting to an extended charger from their houses, so long as it is covered by the approved cord cover.</li> </ul>

City	Strategy	Description	Key measures and programs
			<ul style="list-style-type: none"> <li>Allocates \$2.8 million in Budget 2024 to deploying EV chargers at public and private retail buildings. Another \$100,000 is allocated for other ZEV infrastructure and programs.</li> </ul>
Winnipeg	Transportation Master Plan 2050	Outlines policy direction to develop an integrated, multi-modal transportation system.	<ul style="list-style-type: none"> <li>Commit to create a zero-emission vehicle strategy with the goal of all car and truck sales being ZEVs by 2035.</li> </ul>
United States & Europe			
Oslo, Norway	Oslo's Climate Budget 2023	Covers the City's actions from 2023 to 2026. Outlines steps to reduce GHG emissions.	<ul style="list-style-type: none"> <li>Exempt EVs from the road toll ring until 2027. This road toll system puts a price on driving in the city centre and incentivizes zero-emission transportation.</li> <li>All City vehicles must be zero-emissions. If no zero-emission option exists, vehicles using the cleanest possible fuel may be used.</li> <li>Establish a zero-emission zone within the car-free living area at the centre of Oslo from 2023.</li> <li>Commit to finding ways to increase the proportion of electric cars among car-sharing vehicles.</li> <li>Install an additional 150 level 1 chargers, plus 10 level 2 and 3 chargers across the city.</li> <li>Offer subsidies for charging points in housing cooperatives and jointly owned properties through Oslo's Climate and Energy Fund.</li> <li>Legislate that all taxis must be zero-emissions by 2024. Specific chargers for taxis exist throughout Oslo.</li> <li>Offer incentives for zero-emission vans through subsidies for charging infrastructure, zero-emission van consolidation and loading facilities, and exclusively EV-reserved parking in downtown Oslo.</li> </ul>

City	Strategy	Description	Key measures and programs
Portland, Oregon, USA	Climate Emergency Workplan for 2022-2025	Lays out the priority actions up to 2025 to address climate change.	<ul style="list-style-type: none"> <li>• Introduce financial incentives for low-carbon transportation options, including EVs.</li> <li>• Adopt EV-ready building codes.</li> <li>• Increase access to public EV charging, especially through pursuing state and federal funding to catalyze investment in charging infrastructure. Target most the investments at BIPOC and low-income communities.</li> <li>• Make freight cleaner by adopting the 2040 Freight Plan (see below), which contains provisions to electrify trucks and shift last-mile freight modes.</li> <li>• Explore possibilities for last-mile urban logistics hubs, particularly ones with EV charging infrastructure.</li> </ul>
	Electric Vehicle Strategy	Aims to have 10–15% of all miles travelled by non-commercial vehicle on Portland's roads be by EVs by 2030. Outlines major policies the City aims to introduce to support vehicle electrification.	<ul style="list-style-type: none"> <li>• Double the number of publicly available EV chargers (level 2 and 3) by 2020. Electrify more of the City's fleet, with a goal of 30% electric by 2020.</li> <li>• Prioritize the electrification of bikes, buses and shared-use vehicles.</li> <li>• Explore EV parking and charging requirements in new construction projects, aligning with a commitment to incorporate EV-ready provisions into the building policies for affordable housing.</li> <li>• Develop a funding mechanism for city fleet chargers.</li> <li>• Partner with community-members and industry to develop a strategy to retrofit city buildings for EV charging.</li> <li>• Set EV signage and parking standards (e.g., set rates, time limits).</li> <li>• Create policies that broaden access to public charging, such as making it easier to access chargers on private property, having the City operate chargers on private property and creating streetlight-integrated chargers.</li> <li>• Partner with other governments and industry to develop EV purchase incentives, such as rebates and vouchers.</li> <li>• Connect SME EV manufacturers with qualified under- and unemployed residents. Through this work, make deliberate attempts to support and employ people of colour.</li> </ul>

City	Strategy	Description	Key measures and programs
			<ul style="list-style-type: none"> <li>Market Portland as a city that is building “Green” to increase EV business investment.</li> <li>Prioritize business development assistance to EV-related companies.</li> </ul>
	2035 Comprehensive Plan	Sets out the long-term plan for major public investments between 2015 and 2035.	<ul style="list-style-type: none"> <li>Prioritize investments in electric and other zero direct emissions vehicles, particularly for fleets and passenger vehicles.</li> <li>Ensure an equitable distribution of benefits from new mobility modalities, ensuring in particular that those with disabilities, communities of colour, women and geographically underserved communities benefit.</li> <li>Identify and mitigate potentially adverse impacts of new mobility vehicles and services (e.g., increased accident risk for blind people from quieter EVs).</li> <li>Find ways to prioritize automated EVs, particularly those carrying more passengers.</li> </ul>
	2040 Freight Plan	Outlines the City’s 20-year plan for multi-modal urban freight in Portland.	<ul style="list-style-type: none"> <li>Pilot America’s first regulated zero-emission delivery zone downtown, which will go into effect in Fall 2024. Integrate equity considerations for small and BIPOC-owned fleet operators.</li> <li>Create opportunities for public-private partnerships to support the construction of EV charging for freight vehicles.</li> <li>Set EV-ready requirements for new freight facilities.</li> </ul>
San Jose, California, USA	Pathway to Carbon Neutrality by 2030	Explains San Jose’s main objectives and policy goals for 2022 to 2030 for rapidly reaching their goal of net-zero by 2030.	<ul style="list-style-type: none"> <li>Increase access to EV charging citywide and especially at City facilities by installing more chargers.</li> <li>Modify rules so that only level 2 chargers require permits for installation.</li> <li>Implement EV education programs with a focus on disadvantaged communities where uptake is the lowest.</li> <li>Partner with PG&amp;E to implement EV rate plans with a separate meter for EV charging, guaranteed clean electricity and reduced peak fee hours to incentivize EV charging at off-peak hours.</li> <li>Secure external funding and resources.</li> </ul>

City	Strategy	Description	Key measures and programs
			<ul style="list-style-type: none"> <li>Encourage EV deliveries and use of zero-emission medium- and heavy-duty vehicles through campaigns promoting the vehicles and highlighting federal and state commercial incentive programs.</li> </ul>
Seattle, Washington, USA	Transportation Electrification Blueprint	Outlines Seattle's six main transportation goals and two-year steps to accelerate electrification and reduce pollution. Aims to provide more electric mobility options and ensure Seattle benefits from the energy transition.	<ul style="list-style-type: none"> <li>Investigate local tax incentives that could help small and women/minority-owned businesses transition fleets to EVs.</li> <li>Develop utility rate-based programs, incentives and rate structures for transportation electrification.</li> <li>Build out charging infrastructure for electrified buses, refuse fleets, freight trucks, and other high polluting/high mileage sectors.</li> <li>Develop a grid-infrastructure plan to modernize the electrical grid to support higher electricity demands from electrification.</li> <li>Advocate for local, state and federal policies to create revenue streams to incentivize the purchase of EVs, including personal vehicles and freight trucks.</li> <li>Mandate that all car-sharing services (like Uber) be electrified by 2030.</li> <li>Pilot an accessible electric-van sharing program for disabled people in marginalized communities.</li> </ul>
	Climate Strategy for Oslo Towards 2030	Lays out 16 priority action areas to make Oslo carbon negative by 2030.	<ul style="list-style-type: none"> <li>Offer a grant scheme that subsidizes the installation of at-home EV chargers.</li> <li>Make all private cars on the road emissions free by 2030 and all public transport emissions free by 2028. This is to be achieved through a mix of EVs and biofuel vehicles.</li> <li>Ensure that all public transport — particularly buses and ferries — are zero-emissions by 2028.</li> <li>Make all vans emissions free and all heavy transport emissions free or have them using sustainable and renewable fuel by 2030.</li> <li>Tighten requirements for maximum GHG emissions from commercial vehicles and offer benefits (such as preferential fee structures and access to infrastructure) to the lowest emitting vehicles.</li> <li>Make almost all port operations and traffic in the fjord emissions free by 2030.</li> </ul>

# Appendix B. Review of equity-based measures in government-led ZEV programs

Table 4. Examples of ZEV programs with equity-based measures

Jurisdiction	Program	Description
British Columbia	Go Electric BC	<ul style="list-style-type: none"> <li>Offers rebates for the purchase of a zero-emission, light-duty passenger vehicle.</li> <li>Offers rebates that vary based on income levels, with larger rebates given to those that earn less.</li> </ul>
	Go Electric Public Charger Program	<ul style="list-style-type: none"> <li>Provides rebates for public charging stations and installation costs.</li> <li>Offers enhanced rebates to applicants from Indigenous communities.</li> <li>Currently prioritizes applications from rural, northern and Indigenous communities.</li> </ul>
California	SB-372 Medium- and Heavy-Duty Fleet Purchasing Assistance Program: Zero-Emission Vehicles	<ul style="list-style-type: none"> <li>Establishes a purchasing assistance program for zero-emission medium- and heavy-duty vehicles.</li> <li>Requires a minimum of 75% of financing products offered under the program to be directed towards vehicle owners operating in an underserved community.</li> </ul>
	EnergIIZE Commercial Vehicles	<ul style="list-style-type: none"> <li>Establishes a commercial fleet infrastructure incentive program, with a distinct funding stream to support underrepresented and underserved communities.</li> <li>To be eligible for funding, a commercial fleet user must be a small business, a certified minority business, a school district in a disadvantaged community or low-income community, a tribal entity, or a transit agency that is in or has at least 50% of its fleet operations in a disadvantaged community.</li> </ul>



	HVIP Innovative Small e-Fleet (ISEF) Pilot	<ul style="list-style-type: none"> <li>Reserves US\$25 million within Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) to implement solutions to assist small fleets in making the transition to zero-emission medium- and heavy-duty vehicles.</li> <li>Offers privately-owned or non-profit trucking fleets with 20 or fewer trucks and an annual revenue of less than US\$15 million access to flexible financing options, as well as lease, rental and truck-as-a-service options with enhanced incentives and fuelling support.</li> </ul>
	California Capital Access Program (CalCAP)	<ul style="list-style-type: none"> <li>Offers up to 100% coverage on losses from certain loan defaults.</li> <li>Provides support to financial institutions when they underwrite small-business loans for air-quality-compliant vehicles to small-business fleet owners. Small-business fleet owners can receive more favourable loan terms from participating.</li> </ul>
	Truck Loan Assistance Program	<ul style="list-style-type: none"> <li>Offers financing opportunities for small-business fleet owners that fall below conventional lending criteria and are unable to qualify for traditional financing.</li> </ul>
	The Zero Emissions Vehicle Equity Training Project	<ul style="list-style-type: none"> <li>Funds projects that train technicians to repair and maintain alternative fuel vehicles.</li> <li>Aims to support EV curriculum and enhancements at community colleges, particularly those that cater to underserved and disadvantaged communities.</li> </ul>
	The Inclusive, Diverse, Equitable, Accessible and Local (IDEAL) ZEV Workforce Pilot	<ul style="list-style-type: none"> <li>Provides grant funding for projects that offer workforce training and development that supports zero-emission vehicles, infrastructure and related commercial technologies.</li> <li>Focuses on making training specifically available to priority communities and preparing dislocated, unemployed and new workforce entrants for ZEV careers.</li> </ul>
	CALeVIP	<ul style="list-style-type: none"> <li>Provides funding to install publicly accessible EV charging stations across California.</li> <li>Eligibility for funding commonly requires projects to support disadvantaged and low-income communities.</li> </ul>
Colorado	Fleet-ZERO	<ul style="list-style-type: none"> <li>Provides funding for the installation of charging infrastructure for fleet owners, independent owner-operators and charging providers.</li> <li>Enhanced incentives are available to disadvantaged businesses, minority-owned businesses and women-owned small businesses.</li> </ul>

	Clean Fleet Vehicle and Technology Grant Program	<ul style="list-style-type: none"> <li>• Offers incentives for new clean fleet vehicles, vehicle conversions and clean fleet technology.</li> <li>• Allows the stacking of enhanced incentives for eligible applicants, including businesses that are owned by service-disabled veterans, women or minorities, or are small or disadvantaged.</li> </ul>
Connecticut	Connecticut EV Charging Program	<ul style="list-style-type: none"> <li>• Offers rebates for public charging stations and installation costs.</li> <li>• Awards higher rebates for projects that support infrastructure in underserved communities.</li> </ul>
Massachusetts	MOR-EV Truck Program	<ul style="list-style-type: none"> <li>• Offers rebates for public and private purchases or leasing of qualified new commercial vehicles.</li> <li>• Adds an additional 10% bonus to the rebate amount for vehicles that are registered in or operate more than 50% of the time within census blocks that meet the State's Environmental Justice Income Criteria.</li> </ul>
	MOR-EV Used MOR-EV+	<ul style="list-style-type: none"> <li>• The Massachusetts Offers Rebates for Electric Vehicles (MOR-EV) program offers rebates on the purchase of a ZEV.</li> <li>• MOR-EV Used provides income-qualifying applicants vouchers for the purchase or lease of a used ZEV.</li> <li>• MOR-EV+ provides income-qualifying applications an additional rebate on top of the standard amount offered.</li> </ul>
New Hampshire	Charge Forward	<ul style="list-style-type: none"> <li>• Drive Electric NH and New Hampshire's Department of Environmental Services and partnered to host an EV demonstration project.</li> <li>• State leaders and others drove ZEVs in various cities and towns to raise awareness of the technology.</li> </ul>
New Jersey	Zero-Emission Incentive Program: Voucher Pilot for Medium Duty and Heavy Vehicles	<ul style="list-style-type: none"> <li>• Provides vouchers for the purchase of zero-emission medium- and heavy-duty vehicles.</li> <li>• Sets aside a portion of funding for small businesses, and offers a 25% bonus to small businesses. Offers a stackable 4% bonus per vehicle to certified women-, minority-, or veteran-owned businesses. Allows bonuses to be stacked for applicants meeting several bonus criteria.</li> </ul>
	Alternative Fuels Incentive Grants	<ul style="list-style-type: none"> <li>• Offers grants for the purchase or retrofitting of vehicles to operate on alternative fuels. Covers other associated costs, such as the cost to purchase and install necessary fleet or home refuelling.</li> <li>• Awards at least 20% of funding to a select list of entities, including businesses that are registered as a Small Diverse Business.</li> </ul>

New York State	New York Clean Transportation Prizes	<ul style="list-style-type: none"> <li>• Seeks to electrify transportation, reduce air pollution and enhance clean mobility in underserved communities in New York State.</li> <li>• Funds projects that demonstrate safe and convenient electric mobility options that meet the transportation needs of disadvantaged communities.</li> </ul>
	Medium- and Heavy-Duty EV Make-Ready Pilot	<ul style="list-style-type: none"> <li>• Provides incentives to medium- and heavy-duty vehicle operators to install charging stations.</li> <li>• Utilities can provide incentives of up to 90% of utility-side infrastructure costs and up to 50% of customer-side costs.</li> <li>• Prioritizes projects in disadvantaged communities.</li> </ul>
	Charge Ready NY 2.0	<ul style="list-style-type: none"> <li>• Offers incentives to public, private and not-for-profit organizations to install public charging facilities that are owned and operated by municipal or state government entities.</li> <li>• Incentives vary in amount based on location type and whether it is in a disadvantaged community. Offers a bonus to charging equipment owners at workplace of multi-unit dwelling locations who complete additional actions to promote EV adoption in their own fleets or with their employees/tenants.</li> </ul>
Oregon	Community Charging Rebates Program	<ul style="list-style-type: none"> <li>• Provides rebates for the cost of purchasing, installing and maintaining charging stations that are publicly accessible in parking locations, workplaces and multi-family housing.</li> <li>• Reserves most program funding (70%) for projects in disadvantaged and rural communities.</li> </ul>
	Forth Mobility Partnership	<ul style="list-style-type: none"> <li>• Partnership between the Oregon Department of Environmental Quality and Forth Mobility to raise awareness among low- and moderate-income communities of the department's rebates.</li> <li>• Communications materials were translated into diverse languages and disseminated at community events and gatherings.</li> </ul>
Pennsylvania	Alternative Fuel Vehicle Rebate Program	<ul style="list-style-type: none"> <li>• Provides rebates on the purchase of a zero-emission, light-duty passenger vehicle.</li> <li>• Recently lowered the maximum household income level eligible for a rebate, and lowered the income levels that qualify for an additional \$1,000 bonus.</li> </ul>

Washington State	EVs for EVERYONE	<ul style="list-style-type: none"> <li>• Provides rebates to low-income residents on the purchase or lease of a new or used ZEV.</li> <li>• Defines low income in relation to the federal poverty level in household income.</li> </ul>
	Washington State Electric Vehicle Charging Program	<ul style="list-style-type: none"> <li>• Administers funding for the cost of installing charging infrastructure for public use.</li> <li>• Eligible funding sites include multi-unit residential housing, underserved urban and suburban locations, and rural and tribal locations.</li> </ul>

# Appendix C. Interview guide

Table 5. Interview questions

Topic	Questions
Ownership and operations	<ul style="list-style-type: none"> <li>• How many vehicles do you currently use for your business?</li> <li>• How many kilometres do you typically travel in a day with your business vehicle?</li> <li>• What do you typically use your vehicle for (delivery, service vehicle, staff transportation, accessories, etc.)?</li> <li>• Where do you keep your business vehicle stored at the end of the day?</li> <li>• What is the make/model of your business vehicle(s)?</li> </ul>
Knowledge and awareness	<ul style="list-style-type: none"> <li>• Have you heard about or discussed electric vehicles in the past? <i>If yes, please elaborate on what you have heard/discussed.</i></li> <li>• Do you know of anyone who owns and/or operates an electric vehicle for personal use or their business?</li> <li>• Are you interested in purchasing an electric business vehicle in the future? What would be the benefits in your view?</li> <li>• Do you have any uncertainties about electric vehicles? And/or are there aspects about electric vehicles that you feel you need to know more about in order to feel confident in purchasing one?</li> </ul>
Barriers and knowledge gaps	<p><i>Financial</i></p> <ul style="list-style-type: none"> <li>• Do you have financial concerns about buying an electric vehicle for your business? <i>Please elaborate.</i></li> </ul> <p><i>Technological</i></p> <ul style="list-style-type: none"> <li>• If you were to consider buying an electric vehicle for your business, do you feel that you face any technology barriers or uncertainties? <i>Please elaborate.</i></li> </ul> <p><i>Infrastructure</i></p> <ul style="list-style-type: none"> <li>• Are you concerned about the availability of chargers if you were to drive an electric business vehicle? <i>Please elaborate.</i></li> </ul>

	<p><i>Safety</i></p> <ul style="list-style-type: none"> <li>• Do you have any safety concerns about electric vehicles? <i>Please elaborate.</i></li> </ul> <p><i>Informational</i></p> <ul style="list-style-type: none"> <li>• Have you experienced any difficulty getting information about electric vehicles? <i>Please elaborate.</i></li> </ul> <p><i>Importance</i></p> <ul style="list-style-type: none"> <li>• What would be the most important consideration to you, if you were to consider buying an electric business vehicle? <ul style="list-style-type: none"> <li>○ Financial</li> <li>○ Technological</li> <li>○ Infrastructure/charging</li> <li>○ Safety</li> <li>○ Informational</li> </ul> </li> </ul>
Policy support and needs	<ul style="list-style-type: none"> <li>• What do you think the City of Edmonton can or should do to support business owners like yourself in accessing electric vehicles?</li> <li>• Do you feel you face any unique challenges as a women business owner in Edmonton? <ul style="list-style-type: none"> <li>○ Do you feel that the challenges you've raised also impact your access to electric vehicles?</li> </ul> </li> <li>• Is there anything we missed that you would like to share?</li> </ul>



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