Main Questions:

* How can we best support municipalities to advance EV uptake and readiness in their corporation and within a community as a whole?
* What are the opportunities that can be done on a municipal level and on a regional level?

Main first step: Bring other stakeholders.

Levels to work on:

* Corporation
* Municipality to insure EV readiness in our community
* Regional level

Presentations:

[**Framework for municipal zero emission vehicle deployment**](https://www.pollutionprobe.org/wp-content/uploads/Probe-Delphi-Municipal-ZEV-Framework-Report.pdf)

The report is a generic guide “how to?” develop a framework with major actions and includes:

* 1. Introduction is on transportation role in climate change, currently available ZEVs and charging options, environmental, social and economic benefits of ZEVs, current ZEV adoption levels in Canada and globally
  2. Section 2 – stakeholder list
  3. Section 3 – matrix of actions
     + Category of actions
     + Actions
     + Which stakeholder is most appropriate to connect during these actions
  4. Section 4 – fundamental steps when developing strategies
     + Setting goals/principles
     + Developing baseline data
     + Stakeholder consultation plan
     + Choose sequencing actions
  5. Section 5 – best practises – Montreal, QB, North Vancouver, BC, and Portland, OR, USA
  6. Appendices – detailed definition of each actions, barriers and how they can be addressed

[**Zero Emission Vehicle Charging in Multi-Unit Residential Buildings and for Garage Orphans**](https://www.pollutionprobe.org/wp-content/uploads/ZEV-Charging-in-MURBs-and-for-Garage-Orphans-1.pdf)

Objectives:

* Identify key barriers opportunities and potential solutions
* Map best practises and successful initiative that address the challenges associated with EV charging in MURBs and Garage Orphans
* Develop a set of practical actions based on identified barriers and solutions

1. Study Background
   1. Significant proportion of population in major urban centres reside in MURBs or are garage orphans
   2. Majority of EV charging occurs at home (80%)
   3. MURB residents and garage orphans are potential mainstream adopters of EV technologies but face unique charging-related barriers
2. Methodology
   1. Literature review and
   2. Regulatory-related content
   3. Matrices of action provide framework to visualize key actions and potential roles for stakeholders
3. Report Outline
   1. **SECTION ONE**: Canadian Context for ZEV Charging in MURBs and for Garage Orphans
   2. **SECTION TWO:** Barriers, Solutions and Best Practices
   3. **SECTION THREE:** Matrix of Actions
   4. **APPENDIX A:** Dwelling Types and Distribution
   5. **APPENDIX B:** Municipal and District Initiatives and Activities
4. Key Barriers
   1. **Grid Preparedness & Charging Infrastructure**: electrical grid capacity and EV charging infrastructure
   2. **Building Design & Physical Infrastructure:** physical design of building and location of electrical infrastructure
   3. **Education & Awareness:** EV awareness for consumers, building owners, condo boards/strata councils and property managers
   4. **Regulatory & Policy:** codes, standards, acts, process policies and bylaws
   5. **Financial:** installation and operational costs and ability to charge for electricity
   6. **Other:** those barriers that do not fit easily within other categories
5. Role of the municipality
6. Potential Actions
   1. Grid Preparedness & Charging Infrastructure –
      1. Built network for on street charging
      2. install EV charging infrastructure in neighbourhood municipal parking lots, community centres or schools
      3. Develop bylaws (including permitting) that allow for curbside EV charging station
   2. Building Design & Physical Infrastructure
      1. Installation and preferential use of nearby public charging infrastructure to address overnight charging needs
      2. Pilot programs that promote the use of new technologies
   3. Education & Awareness
      1. Provide more targeted information for building owners, property management and condo boards/strata councils to reference
      2. Undertake educational campaigns targeting various stakeholder groups
      3. Develop public education materials to improve general knowledge about EV charging
   4. Regulatory & Policy
      1. Incorporate supportive language in OP and other documents
      2. Use zoning or parking bylaws
      3. Include model requirements for EV ready parking spaces and buildings electrical capacity in National Building Code
   5. Financial
      1. Provide financial incentive to MURB residents
      2. Provide financial incentives specific to rental apartments

Questions:

1. Are there any recent changes or regulatory decisions in Ontario in regards to legal requirements for EV charging installations?
   1. Provincial government removed the requirements for EV chargers for new single-family and commercial buildings. The federal government, however may incorporate these requirements in the National Building Code. This is uncertain as of now. The best way to handle this is to push the Green Development Standards, where for new MURBs it has a good case, as it is very expensive the retrofit.
2. EV chargers in existing condo buildings – how to deal with?
   1. Plug’n Drive has created a [guide](https://www.plugndrive.ca/wp-content/uploads/2018/08/Make-Your-Condo-EV-Ready-Guide.pdf) summarizing actions that condo board, tenants and property managers can do. **There is a need of a template of procedures that can be taken?** In new building, Tridel is doing it, you check that you want a EV charge and they build based on demand.
3. What about walking and biking? – We got to do everything: hydrogen, biking, electrifying transit, sharing e-school busses… and all alternatives

**City of Toronto Electric Mobility Strategy**

1. TransforTO
2. Strategy Phase 1
   1. Assessment Phase Overview
      1. Review and document the state of electric mobility in Toronto;
      2. Identify barriers, opportunities and best practices regarding electric mobility;
      3. Identify and preliminarily engage key stakeholders to contribute to Strategy development; and,
      4. Summarize findings in Assessment Phase report.
3. Strategy Goal – contract with Dunsky
   1. Address barriers
   2. EV charging Infrastructure
   3. Policy and Regulation
   4. Access and affordability
   5. Strengthen local economy
   6. Support local innovation

Questions:

How do you choose EV charging station? – there is a host of criteria – high concentration of MURBs, snow plowing opportunities and others

Group purchase of vehicle owners data? – interesting in understanding where is EV already up take within the community

[**Peel Region Climate Change Master Plan and Green Fleet Strategy**](https://www.pollutionprobe.org/wp-content/uploads/ZEV-Charging-in-MURBs-and-for-Garage-Orphans-1.pdf)

Background:

* In 2017, Council stepped up to the challenge by endorsing a commitment to adapt and mitigate the affects of climate change.
* Recent declarations of a ‘climate emergency’

The Plan:

Goal: Get to Implementation Plan

How:

1. Recommended Outcomes
   1. Reduce GHG emissions
      1. Deep Energy Retrofits
      2. Transportation
      3. Renewable projects
      4. Water and Waste water
   2. Getting to Region to prepare
      1. Vulnerability of assets
      2. Cooling (LTC and residential portfolios)
      3. Zero emissions back-up power
      4. Green infrastructure – treating trees as assets, green roofs, water infiltration targets
   3. Build Capacity
      1. Embedding climate change considerations into budget processes and establishing work objectives through the PMP
      2. Develop tools for scenario analysis
      3. Standards – resiliency and energy performance into BCAs and technical specs
      4. Climate action toolkit
      5. Orientation program and job descriptions
      6. Cross organizational training program
      7. Innovation fund
      8. Mini-conference – share BPs
   4. Invest
      1. Increase risk tolerance for pilot projects (leveraging grants to reduce financial risk)
      2. Revolving fund (reinvesting savings)
   5. Monitor and Report
2. Proposed Targets
3. Guiding Principles
4. 10-year Horizon (2020-2030)
5. Actions, Costs, Timelines & Roles

Are you ready to embrace the POSSIBILITIES? Climate Change in Peel Region [(video)](https://www.youtube.com/watch?v=g57fbUv4wyE)

**Peel Region’s Green Fleet Strategy**

1. Background
   1. Technical study
   2. Scenarios
2. Emission Inventory
3. Equipment Composition
4. Historical Fleet Initiatives
   1. Resourcing
   2. Fleet Monitoring and Data Analysis
   3. Alternative and Renewable Fuel Research and Transitioning
   4. Procurement, Green Vehicle Specifications and Vehicle Selection Hierarchy
   5. Stakeholder Engagement, Education and Outreach, and Fleet Operational Best Practices
5. Strategy Technology and Fuel Summary
   1. High focus on battery electric vehicles in light-duty fleet over time
   2. Alternate fuels (ethanol and biodiesel) in short and medium-term
   3. Transitions to compressed natural gas and renewable natural gas in medium and heavy-duty fleet and equipment
6. Initiatives Completed and Underway
7. Automatic Vehicle Location – provide good reporting on utilization and stats
8. Battery EV – 19 units, estimated to reduce GHG impact by 26 tCO2e/year
9. E85 Fuel Pilot – 20 units, about 30% more fuel used for same distance travelled (less energy per L) which was expected
10. E85 Fuel Expansion – to 220 PW vehicles
11. Hybrid Ambulance Pilot - Just over 6 year payback from fuel savings
12. Anti-Idle Campaign and PW Challenge - Pilot will inform behavioural opportunity and where technology interventions
13. Expending Green Fleet success via collaboration opportunities: sharing data and resources; procurement support

**Ontario Power Generation: EV Charging Options and Models**

1. OPG Overview
   1. Ontario’s largest and lowest-cost energy provider
   2. Produces almost 50% of electricity in Ontario
   3. Over 99% of OPG’s power is free of smog / carbon emissions
   4. Committed to ensuring our energy production is reliable, safe and environmentally sustainable today and for the future
2. Electrification Development Program
   1. OPG forecasts 25-45% of electricity demand growth over the next 20 years could be EVs
   2. Where does charging happen?
      1. Residential (64-80%)
      2. Workplace and Retail
      3. Public
         * Does public charging represent a promising revenue stream? - Probably not anytime soon
         * Are chargers a destination in themselves? - Probably not
         * Should public charging be free? – No
3. Who needs public charging?
   1. Visitors
   2. MURB residents
   3. Commuters
4. Considerations for locating chargers:
   1. Is it convenient? MURBs nearby? Highways?
   2. What will people do while they’re charging? Are there washrooms? Food? Retail?
   3. Does it feel safe at night? Does it feel comfortable?
   4. Is it accessible at all times?
   5. Is the parking paid? Enforced?
   6. Will other chargers drink your milkshake?
   7. How much will it cost to install?
5. Model – Shared risk! Which means we will cover part of the cost of the charger, installation … and you give us site – but we are picky about the site.

**Plug’n Drive**

* + - 1. Electricity:

1. Nuclear = 58%
2. Hydro= 23%
3. Renewables= 9%
4. Natural Gas = 10%

One of the ideal things about our particular electricity grid in Ontario is that we run a lot of base load on nuclear and hydro which means that we have a big surplus in the night, which means that we dump it in other jurisdictions (New York State). EVs can do an economic favor as using EV charging at night which will avoid the waste of electricity dumped in somewhere in a lost. If we get substantial people to do this at night – it levels the use of this assets which will reduce electricity price for everyone. The option to opt-in rate will fit everyone needs and wishes. Case studies show that it is a win-win-win process.

* + - 1. Barriers to EV Uptake:

1. **Consumer Knowledge. Education is needed about the ease, benefits and cost savings of driving electric.**
2. **Range anxiety: Public and workplace charging is needed**
   * + 1. Benefits of EVs:
3. Save Money ($2000 (approx.) annual savings on fuel and maintenance)
4. Reduce GHG emissions (up to 90% (equivalent to gas car)
5. Go to Distance (1 charge per week – 200 km of range on a full charge)
6. For everyone (40 + models starting at $20,000 (after incentives)
   * + 1. Facts:
7. 33% bought EV car after visiting Plug’n Drive (in a first 6 months after the visit)
8. EV sales in Canada for 5 years there is increase from 10,000 (2014) to 100,000 (2018)
9. 5.1 million Electric Cars Worldwide
10. Estimation by Bloomberg 2040 – 60M EVs per year
11. The Province of Ontario invested $13 million in an electric school bus pilot project
12. New Federal incentive announced March 19, 2019: $5000 Incentive on EV under $45k (base model price)
13. Used EV incentive - $1000!
14. Vehicles to Grid or “V to X” exists and it is developing market!
    * + 1. Take out ideas:
           1. Education first!
15. Lunch and Learn at the Workplace
16. Vehicle orientation sessions for fleet vehicles
17. Host an Event at the EVDC with Test Drives

Action Items:

1. Organize a webinar where the National Building Code will share about their step approach to net zero addressing the EV infrastructure as well.
2. Collectively to work with municipalities to advance Green Development Standards
3. Consultations with developers and home builders
4. Support the understanding of Bill 68 from legal perspective – case studies
5. Peel Region engagement with the Police – share more about it
6. Identifying regional work plan
   1. connect with utilities
   2. understanding more about selling back to the grid
7. Get access to MTO – EV ownership data and share within network - Group purchase of vehicle owners data
8. EV Pilot projects for EV public transit - Toronto, Brampton, York Region, Whitby - Put together webinars of results from these pilots
9. EV Charging Network Providers to share their service by webinar