Low Carbon Communities

COMMUNITY-BASED PLANNING & DESIGN FOR THE ELECTRIFICATION OF TRANSPORT SYSTEMS IN RURAL MUNICIPALITIES

Dalhousie Transportation Collaboratory

NOVA SCOTIA
DALHOUSIE UNIVERSITY
DALTRAC DALHOUSIE TRANSPORTATION COLLABORATORY

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1. PROJECT OVERVIEW & CONTEXT

This project, *Community-Based Planning and Design for the Electrification of Transport Systems in Rural Municipalities,* supports rural communities in Nova Scotia as they explore strategies for low-carbon transportation. Led by the Dalhousie Transportation Collaboratory (DalTRAC) and funded by the Low Carbon Communities (LCC) program through the Nova Scotia Department of Natural Resources and Renewables, the project focused on planning for the electrification of transportation infrastructure, understanding local needs, and advancing community-based climate solutions.

DalTRAC is a multidisciplinary research lab dedicated to advancing transportation engineering and planning practices throughout Nova Scotia and beyond. Over the past decade, DalTRAC has developed data tools and research to support transportation planning at local, regional, and national levels.

To deliver the project, DalTRAC worked closely with a network of rural communities and regional organizations, including the Town of Yarmouth and the Municipality of Colchester. Through stakeholder engagement, case study research, and community workshops, the project supported local planning efforts and helped build capacity for transportation electrification. In doing so, it contributed to Nova Scotia's broader climate goals while promoting equitable, accessible, and sustainable mobility for all residents.

Project Scope & Goals

The primary goal of the project was to assist Nova Scotia in meeting its climate targets by helping rural municipalities transition to low-carbon transportation systems.

The project co-developed the following deliverables:

A template for electrification of transportation strategies for rural municipalities

Micro-level design concepts to plan, design, and locate public charging for specific communities of interest

Public transit fleet conversion strategies

Partnerships & Stakeholders

The key partnerships for the project included the following organizations:

Project Approach & Activities

The project adopted a collaborative, community-centered approach to assess opportunities for rural transportation electrification in Nova Scotia. By engaging directly with municipalities, regional organizations, and other key stakeholders, the project aimed to identify local needs, challenges, and context-specific solutions that supported a just and achievable transition toward low-carbon transportation.

Stakeholder Workshops

Three in-person workshops were held across the province (in Halifax, Yarmouth, and Colchester) to gather insights from rural municipal leaders, community organizations, provincial agencies, and energy providers. These sessions focused on identifying barriers, co-developing strategies, and building momentum around rural electric mobility.

Rural Community Case Studies

The project examined rural communities across Canada to identify best practices for electric vehicle infrastructure and services. Case studies of Nova Scotian partner communities were also developed to assess local transportation systems, infrastructure gaps, and opportunities for low-carbon fleet transitions.

Planning Framework & Toolkit Development

Insights from workshops, meetings, and case studies informed the development of a planning framework and toolkit to guide rural transportation electrification. The toolkit provides practical guidance for planning and implementing EV infrastructure in partner communities and can be adapted for use in other rural contexts.

Pre-Project Engagement Sessions

Stakeholder Roundtable – November 2023 (Virtual)

This session explored rural transportation electrification opportunities in Nova Scotia. Participants emphasized the importance of community-specific solutions, supportive policies, tourism-related benefits, and strong partnerships. Key themes included:

- Economic and tourism potential of destination EV charging
- Infrastructure gaps and reliability concerns in rural settings
- Broader access to EVs and charging for all residents

Rural Electrification Transport Priority Areas Roundtable – June 2024 (Virtual):

This session focused on refining project direction and shaping funding proposals. Participants discussed roles, priorities, and support mechanisms to advance rural electrification. Key outcomes included:

- Identification of interested municipal partners such as Yarmouth and Antigonish
- Recognition of the connection between electrification and community transportation
- Support for a regional engagement strategy and a knowledge-sharing network

These early, collaborative engagements were essential to developing a project grounded in community participation, aimed at delivering meaningful and actionable rural transportation electrification strategies.

Additional details on stakeholder roundtables are provided in Appendix A.

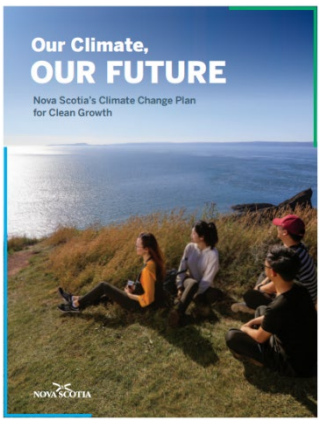
Advancing Provincial Goals & Supporting Rural Communities

The project supports *Our Climate, Our Future*, Nova Scotia's climate change plan, by supporting several key provincial objectives:

- Expand EV charging infrastructure
- Improve access to community transportation outside the Halifax Regional Municipality (HRM)
- Electrify public transportation systems (Government of Nova Scotia, 2022).

Actions from Our Climate, Our Future	Supported by the Project
Action 35: *Build more EV charging stations so Nova Scotians can access them when and where needed.*	✓
Action 39: *Increase access to community transportation outside HRM and CBRM.*	✓
Action 40: *Electrify public transit across the province.*	✓

(Government of Nova Scotia, 2022)



2. CURRENT STATE OF TRANSPORTATION ELECTRIFICATION

Nova Scotia is increasingly experiencing the impacts of climate change, including more frequent and severe storms, rising sea levels, and prolonged periods of heat and drought (Government of Nova Scotia, 2022; 2025). These shifts, driven largely by fossil fuel combustion, which accounted for nearly 90 percent of Nova Scotia's greenhouse gas emissions in 2020 (Government of Nova Scotia, 2022), have prompted the province to commit to reducing greenhouse gas emissions by 53 percent below 2005 levels by 2030 and achieving net zero by 2050 (Government of Nova Scotia, 2022). With transportation accounting for roughly 35 percent of provincial emissions (Canada Energy Regulator, 2024), transitioning to electric vehicles (EVs) is critical to meeting these targets. Within the sector, passenger light trucks (e.g., SUVs and pickups) accounted for 28.4 percent of transportation emissions, followed by cars (16.8%) and heavy trucks (15.9%) (Canada Energy Regulator, 2024).

Nova Scotia is at a pivotal stage in advancing sustainable transportation. While urban areas have made considerable progress in EV adoption and infrastructure development, rural communities continue to face distinct challenges such as longer travel distances, limited public transportation options, and insufficient charging infrastructure. Understanding these differences is essential to ensuring an equitable transition. This chapter examines the current state of rural electrification in Nova Scotia, identifies key challenges and opportunities, and explores how local contexts can inform future policy and planning solutions.

Why Rural Transportation Matters

Nova Scotia has a large rural population, with 41.1 percent of residents living outside urban centers as of 2021 (Statistics Canada, 2022). Data from the Nova Scotia Travel Activity (NovaTRAC) 2022–2023 survey shows that 93.1 percent of households own at least one vehicle, with an average of 1.63 vehicles per household (Habib, 2024). Rural residents rely heavily on private vehicles, as public transit is often unavailable and essential services are spread out, resulting in over 85 percent of rural commutes being made by single-occupant drivers (Habib, 2024). On average, Nova Scotians make 3.2 trips per weekday, with households averaging 4.7 trips per day, highlighting a consistent demand for travel and the need for accessible, low-carbon transportation options (Habib, 2024).

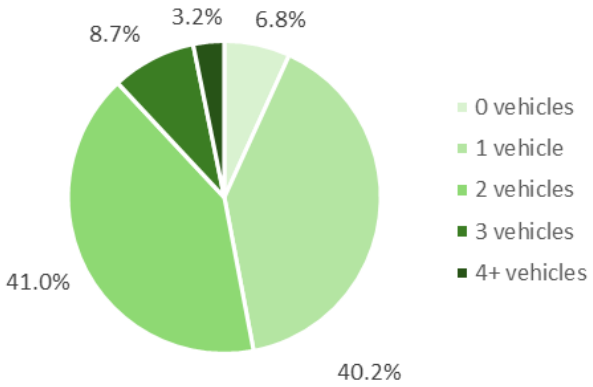


Figure 1: Vehicle ownership per household (Habib, 2024)

In Halifax, nearly 69 percent of residents commute alone by car, whereas rural areas exhibit public transit usage of less than 2 percent (Nova Scotia Department of Finance, 2022). The average Nova Scotian makes

3.2 trips per weekday, many of which are discretionary and vehicle-dependent (Habib, 2024). The lack of transit options outside the HRM leaves rural residents with few viable alternatives.

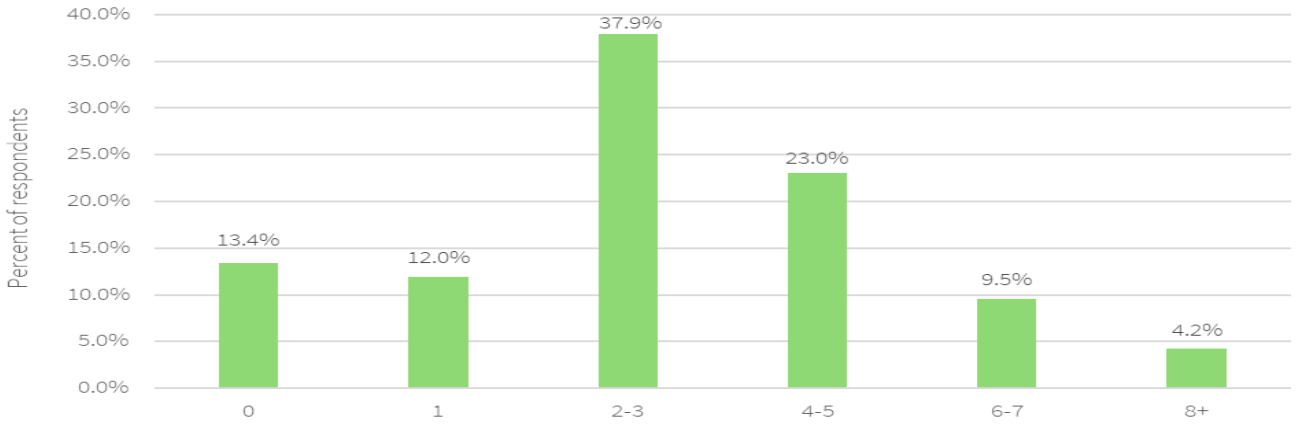


Figure 2: Distribution of daily trips per person in Nova Scotia (Habib, 2024)

Urban-Rural Infrastructure Divide

Urban centers like Halifax have benefited from extensive public transit, early EV fleet pilots, and micro-mobility options such as e-bikes. In contrast, rural communities have faced:

- Limited public transportation,
- Sparse EV charging networks,
- Greater reliance on personal vehicles, and
- Longer average travel distances (Ghani, 2025).

These disparities have made electrification efforts in rural areas particularly challenging and have highlighted the need for targeted policy support. Data collection in rural areas was also challenging. Of the over 4,800 responses received for the 2022–2023 NovaTRAC survey, only 27.1 percent came from rural residents, indicating lower participation outside urban centers (Ghani, 2025).

The Evolution of EV Policy & Adoption

Nova Scotia's EV adoption was minimal before the introduction of government incentives. In 2020, EVs made up just 1 percent of new vehicle sales, well below the North American average (Electric Mobility Canada, 2019). Only 389 EVs were registered in the province by the end of 2019 (Dunsky Energy Consulting, 2020), hindered by limited vehicle inventory and a sparse charging network, including 66 Level 2 chargers and 17 fast chargers province-wide at the time.

Despite this, interest is growing. NovaTRAC data shows that 44.8 percent of residents see EVs as cost-effective in the long run, but only a third are willing to pay more upfront (Habib, 2024).

Federal & Provincial Support

Recent federal and provincial programs have started to close this gap:

Federal Programs	Provincial Programs
ZEV Infrastructure Program (ZEVIP): Funding for 84,500 EV chargers and 45 hydrogen refuelling stations nationwide (Government of Canada, 2025).	Electrify NS Rebate Program: Provided light-duty EV rebates through spring 2025 (NextRide, 2025).
ZEV Rebates Program (iZEV): Provided rebates of up to $5,000 toward EV purchases, supporting over 546,000 vehicles before the program was paused in March 2025 (Transport Canada, 2025a; 2025b).	EV Boost Program: Supported the installation of more than 250 Level 2 chargers in rural areas (Clean Foundation, 2021).
Zero-Emission Transit Fund (ZETF): $2.75 billion to electrify school and public transit fleets across Canada (Nova Scotia Federation of Municipalities, n.d.).	

These programs align with Nova Scotia's climate targets, which include reducing greenhouse gas emissions by 53 percent from 2005 levels by 2030, achieving net zero emissions by 2050, and ensuring that 30 percent of new vehicle sales are zero-emission by 2030 (Environment and Climate Change Canada, 2024).

Infrastructure & Smart Technology Advancements

Nova Scotia Power's smart grid pilot project integrates solar energy, battery storage, and electric vehicle charging to create a more responsive and modernized energy network. As part of this initiative, 120 smart chargers were installed across the province to encourage off-peak energy use (Nova Scotia Power, 2025c). Additionally, Nova Scotia Power and PlugShare have developed a provincial EV charging map that identifies 72 fast-charging ports at 26 sites. Many of these locations are positioned along rural highways and major tourist corridors, highlighting the link between rural tourism and access to reliable charging (Nova Scotia Power, 2025b).

Building Public Awareness & Interest

Public engagement has increased through initiatives such as Next Ride, which provides electric vehicle test drives and outreach events in rural Nova Scotia (Clean Foundation, 2023). These programs play a key role in communities where exposure to EVs remains limited. NovaTRAC survey data shows that 8.6 percent of respondents intend to purchase an electric vehicle within the next five years, with growing interest also reported in hybrid and plug-in hybrid models (Habib, 2024).

Barriers to EV Adoption

Significant challenges still limit EV uptake in rural communities, including distinct travel behaviours, infrastructure constraints, and awareness gaps (Habib, 2024).

What is Holding Nova Scotians Back?

The NovaTRAC survey identified several key barriers to electric vehicle (EV) ownership in Nova Scotia. As shown in Figure 3, the most commonly cited obstacle was the high purchase price (30.8%), followed by limited public charging infrastructure (19.0%) and concerns about driving range (15.5%) (Habib, 2024).

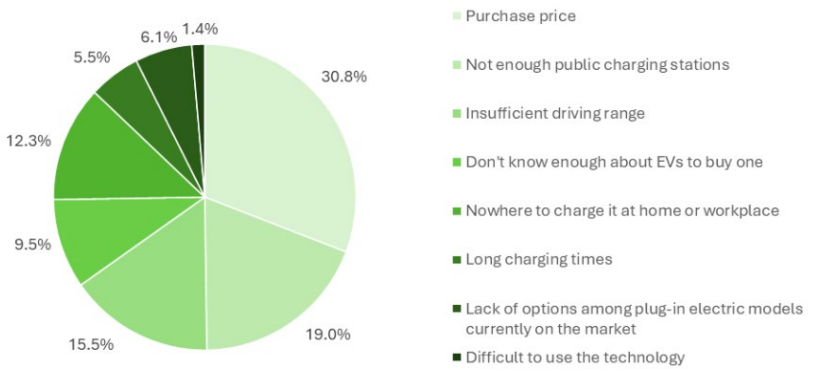


Figure 3: Reasons for not owning an EV (Habib, 2024)

Despite a growing awareness of the long-term cost benefits of EVs, only 33 percent of respondents indicated they were willing to pay more for an electric vehicle (Habib, 2024). These findings suggest that affordability, charging accessibility, and range confidence remain the primary challenges to widespread EV adoption in the province.

Policy Measures to Support EV Adoption

Survey responses also showed strong support for purchase and lease rebates (36.6%) and public charging stations along highways (23.6%) as the most effective policy measures to encourage EV adoption (Habib, 2024). These preferences align with the barriers described earlier and highlight the need for policies grounded in evidence and shaped by community input.

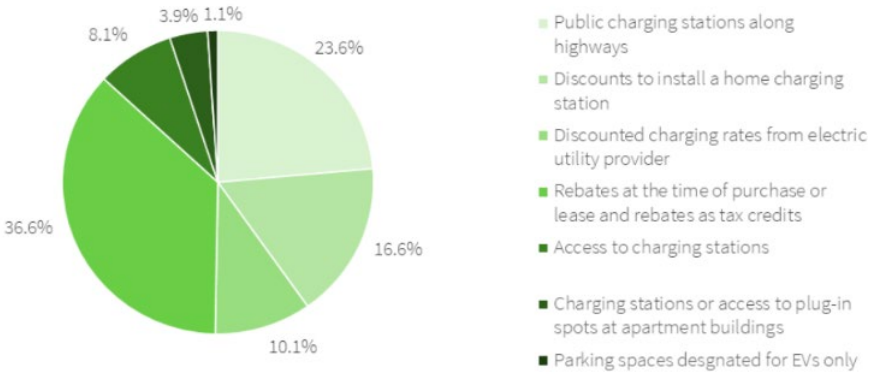


Figure 4: Policies to encourage EV adoption (Habib, 2024)

They also reinforce the importance of partnerships in developing solutions that meet local needs and support Nova Scotia's transition to clean transportation.

3. CURRENT CONDITIONS & SELECTED BEST PRACTICES

Current Conditions in Nova Scotia Communities

Town of Yarmouth

Population and Context

- Population: 6,829 (Statistics Canada, 2023)
- Rural community centred on port activity and the lobster fishing industry

EV Infrastructure

In 2025, Yarmouth had 29 public charging ports, including 16 Level 2 and 13 Level 3 chargers, with about 24 percent offering free charging (Charge Hub, 2025). The town was also selected for additional Level 3 chargers through the provincial network (Town of Yarmouth, 2025).

Policies and Incentives

The 2010 Active Transportation Master Plan and 2021 Climate Change Mitigation Action Plan supported sustainable mobility (Town of Yarmouth, 2010; 2021). Electric school buses introduced in 2023 contributed to local emissions reduction efforts (Yarmouth School Department, 2023).

Barriers and Opportunities

Limited transit and reliance on personal vehicles remain challenges. Recent charging investments, municipal fleet electrification, and tourism activity create opportunities to expand EV adoption.

Municipality of Colchester

Population and Context

- Population: 51,476 (Statistics Canada, 2023a)
- Predominantly rural region with strong agricultural activity

EV Infrastructure

Colchester planned to expand its charging network in 2025 with a focus on Level 2 chargers (Municipality of Colchester, 2025a).

Policies and Incentives

The 2025 Municipal Planning Strategy included EV charging provisions across zoning categories and encouraged reduced auto dependency (Municipality of the County of Colchester, 2025a). A Regional Transit Feasibility Study assessed opportunities to improve mobility and reduce emissions (Municipality of the County of Colchester, 2025b).

Barriers and Opportunities

High reliance on personal vehicles and limited public transit present ongoing challenges. Updated zoning

and active transit planning provide opportunities to strengthen EV infrastructure and support lower-emission mobility.

Learning from Canadian Case Studies: Best Practices

The following case studies highlight how rural and mixed urban-rural municipalities across Canada are approaching electric vehicle adoption through planning, partnerships, and targeted investments.

Case Study 1: District of Saanich, British Columbia

Municipal Profile

- Population: 117,735 (Statistics Canada, 2023b)
- Mixed urban-rural municipality on Vancouver Island with strong personal-vehicle reliance

Key Actions

Saanich introduced its Electric Mobility Strategy in 2020, targeting a 50 percent reduction in emissions by 2030 and net-zero by 2050 (District of Saanich, 2020a). Actions included early fleet electrification, a shared EV program, and a 2021 e-bike rebate program that helped shape the provincial BC E-Bike Rebate Program. Regulatory measures such as the 2020 EV Off-Street Parking Bylaw required EV-ready infrastructure in new developments, and partnerships with the Capital Regional District and the BC Ministry of Transportation supported regional implementation (District of Saanich, 2020b).

Progress and Outcomes

By 2025, Saanich had installed more than 100 public charging stations, demonstrating significant progress toward expanding local EV infrastructure (District of Saanich, 2025).

Case Study 2: Municipality of West Perth, Ontario

Municipal Profile

- Population: 9,038 (Statistics Canada, 2023c)
- Rural Southwestern Ontario municipality with long travel distances and limited transit options

Key Actions

West Perth joined a regional coalition in 2022 to expand EV charging across Southwestern Ontario, proposing 17 DC fast chargers and 13 Level 2 stations to improve rural access and support inter-community travel (County of Wellington, 2022). Municipal initiatives under the Greenhouse Gas Reduction Plan included installing eight Level 2 chargers since 2023, planning for Level 3 expansion, and beginning fleet transition with one EV and plans to replace six to nine pickup trucks by 2029, reducing emissions by 7,841 to 34,752 kilograms annually (Municipality of West Perth, 2024). The municipality also introduced an electric ice resurfacer to further reduce emissions.

Progress and Outcomes

By 2024, West Perth operated eight public chargers and advanced early fleet electrification, demonstrating meaningful progress through regional collaboration (Municipality of West Perth, 2024).

Case Study 3: Town of Canmore, Alberta

Municipal Profile

- Population: 15,990, including about 3,890 permanent residents (Statistics Canada, 2023d)
- Tourism-based rural community in Alberta's Bow Valley with high vehicle dependency

Key Actions

Canmore participated in the 2016 Peaks to Prairies initiative, which established a 1,400 kilometre EV charging network across southern Alberta. The town received Level 2 and Level 3 chargers through this program, serving 137 users in the first three months (Grebeldinger, 2020). Local actions included adding chargers and municipal EVs through the Municipal Climate Change Action Centre's EV Charging Program. In 2024, the town adopted a Climate Emergency Action Plan introducing EV-ready requirements for new developments, municipal fleet planning, a charger installation incentive, and a community EV car-share program (Town of Canmore, 2024; Town of Canmore, n.d.).

Progress and Outcomes

Canmore's charging infrastructure is now integrated into a broader regional network that supports tourism mobility and contributes to local climate goals.

Key Insights & Summary of Findings

The case studies show that with coordinated planning, strong partnerships, and targeted investments, rural and mixed urban-rural municipalities can make meaningful progress toward electric mobility. Despite differences in geography and population, Saanich, West Perth, and Canmore each demonstrate how communities can leverage regional collaboration and external funding to advance electric vehicle adoption.

Common challenges across these municipalities include limited public transit, strong reliance on personal vehicles, and the need for accessible charging infrastructure that can serve both residents and visitors. Together, these examples illustrate the important role rural municipalities can play in supporting broader climate goals.

Overall, the case studies provide practical guidance for other communities seeking to reduce transportation emissions, expand access to sustainable mobility options, and encourage the transition to electric vehicles.

A summary of these findings is provided in Appendix B.

4. WHAT WE HEARD REPORTS

This project focused on gathering insights to support rural transport electrification planning in Nova Scotia. As part of this work, DalTRAC hosted a series of workshops that engaged a broad range of stakeholders, including rural municipalities, non-governmental organizations, and provincial government departments. These sessions helped identify key priorities, barriers, and opportunities related to rural electric vehicle adoption across the province.

Electrification Workshop #1 | Halifax, NS

Presentation

DalTRAC hosted the first interactive workshop on May 16, 2025, at the Halifax Central Library. Dr. Ahsan Habib opened the session with a presentation on rural transport electrification, highlighting key findings from the 2022–2023 NovaTRAC survey and prior engagements. These included:

- Interest in EV adoption, with roughly one-third of respondents considering future EV purchases
- The need for rural-specific strategies
- Infrastructure-related challenges
- Opportunities to align EV infrastructure with land use, community design, tourism, and local economic activity

The presentation also showcased examples of electrification projects and policies from other provinces to illustrate potential pathways for rural Nova Scotia.

Figure 5: Workshop presentation

Workshop Session #1

This session explored how to "Develop Electrification Strategies for Rural Nova Scotia Municipalities" through three activities.

Activity 1: Picture Yourself Using an EV

Process: Participants drew themselves driving, charging, or observing an EV.

Results: Drawings reflected varied interactions with EVs across private vehicles, public transit, and active transportation. Key insights included:

- The value of visible EV branding on transit vehicles
- The role of e-bikes and scooters in rural mobility
- Strong interest in renewable energy sources such as solar and wind for supporting electrification

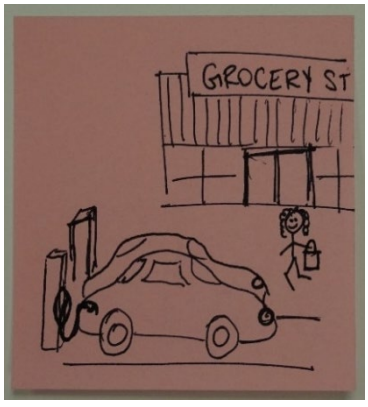


Figure 6: A drawing of EVs charging station locations

Activity 2: Benefits of Rural Transport Electrification

Process: Groups identified potential benefits and documented them on chart paper.

Results: Participants identified benefits including:

- **Environmental:** reduced reliance on fossil fuel electricity generation and lower GHG emissions
- **Economic:** long-term cost savings from EV maintenance and fuel
- **Health:** Improved air quality, benefiting vulnerable populations such as the elderly
- **Safety:** Features like lower centres of gravity and improved crumple zones increase vehicle stability and safety
- **Community:** Enhanced transportation accessibility through use of e-bikes and scooters

Figure 7: Terms describing benefits of electric transportation

Activity 3: Principles for Rural Electrification Strategies

Process: Participants proposed guiding principles using sticky notes.

Results: Recurring themes included:

- **User Experience:** comfort, accessibility, flexibility, and equity
- **Environmental Stewardship:** reduced emissions, lower energy use, and ecosystem protection
- **Renewable Energy:** preference for electricity from solar, wind, and other renewable sources

Workshop Session #2

This session identified short- and long-term strategies to support rural municipalities in advancing toward Canada's 2050 net-zero target.

Activity 1: Short-Term Strategies (0 to 5 Years)

Process: Participants discussed short term strategies achievable within approximately five years. Working in groups, they recorded ideas on chart paper and presented them to the room.

Figure 8. Participants discussing potential short-term strategies

Results: Discussions emphasized several themes:

- Incentives and financial supports, including EV rebates, rural EV rideshare programs, and initiatives for electrifying fishing vessels
- Municipal partnerships for shared bus procurement, shared charging infrastructure, and pilot projects

- Updated bylaws to encourage EV infrastructure in new developments
- Public engagement campaigns to increase awareness and acceptance
- Expanding access to used EVs and exploring early fleet sharing models to reduce upfront costs
- Launching small pilot projects to test local interest and inform future initiatives

Activity 2: Long-Term Strategies (10+ Years)

Process: Participants examined strategies that would take place over a longer time horizon of ten or more years. Groups documented their ideas and shared them with the workshop.

Results: Participants identified a range of long-term priorities:

- Diversifying energy sources with investments in solar, wind, and tidal energy; participants noted Nova Scotia's "Wind West" initiative as an example of political momentum
- Shifting to low-emission construction practices
- Strengthening collaboration across municipal, provincial, and federal governments
- Expanding and prioritizing rural public transit to support long-term equity and accessibility

Figure 9. Participants discussing long-term rural electrification strategies

Activity 3: Rural Electrification Strategy Circle of Support

Process: Participants placed their name tags on the Rural Electrification Strategy Circle of Support diagram to indicate their interest in future involvement with rural electrification initiatives.

Results: Participants positioned themselves under one of four categories:

- Becoming a Champion
- Actively Participating in the RESAlliance
- Keep Me Informed
- Cheering from the Sidelines

This activity helped identify stakeholders interested in ongoing collaboration and future involvement in the RESAlliance.

A summary of these findings and a photo gallery are provided in Appendix C.

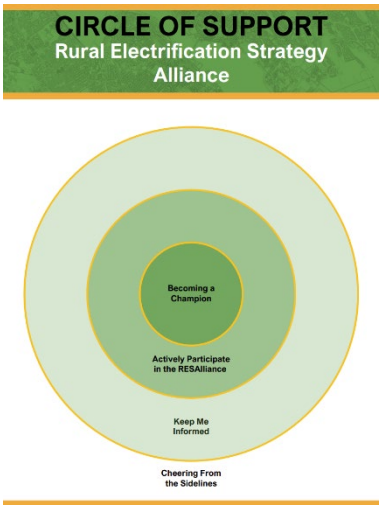


Figure 10: The RESAlliance Circle of Support

Electrification Workshop #2 | Yarmouth, NS

Presentation

DalTRAC hosted the second interactive workshop on July 15, 2025, at the IGNITE Atlantic coworking office in Yarmouth, Nova Scotia. Dr. Ahsan Habib opened the session with a presentation on transportation

electrification, following the same structure as the Halifax workshop. The presentation reviewed key findings from the 2022–2023 NovaTRAC survey, insights from earlier engagement sessions, and examples of electrification initiatives from across Canada.

Workshop Session #1

This session focused on brainstorming ideas for "Developing Electrification Strategies for Rural Nova Scotian Municipalities" through three activities.

Activity 1: Picture Yourself Driving, Charging, or Watching an EV

Process: Participants drew themselves interacting with an EV on sticky notes, which were later displayed for group discussion.

Results: Drawings reflected participants using private electric vehicles, including charging and driving electric cars and bicycles. Key insights included:

- The importance of visible and accessible charging infrastructure
- Interest in advanced EV technologies such as autonomous driving features

Most drawings depicted private vehicles rather than public transit, which may reflect the limited visibility and service levels of rural transit systems compared to larger centres such as Halifax.

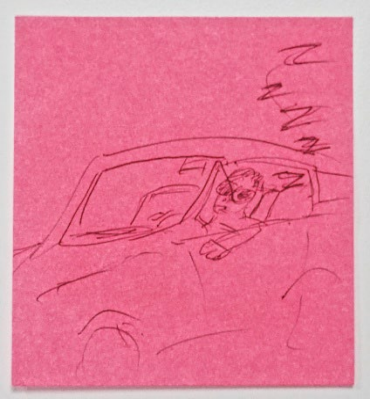


Figure 11: A participant's drawing of them using an autonomous EV

Activity 2: Benefits of Electrifying Rural Transport Systems

Process: Participants worked in small groups to identify potential benefits of electrifying transportation in rural areas. Each group recorded and presented its points.

Results: Identified benefits included:

- Environmental: lower air and noise pollution
- Financial: lower fuel costs, stable electricity prices, reduced maintenance, and potential for vehicle-to-home power
- Human Well-Being: improved air quality, enhanced safety from lower centres of gravity, and increased mobility through smaller electric vehicles such as e-bikes

Participants also noted that EV adoption could help rural communities appear more progressive and improve their attractiveness to new residents.

Activity 3: Principles That Should Guide a Rural Electrification Strategy

Process: Participants identified guiding principles for rural transportation electrification using sticky notes, which were then grouped for discussion.

Results: Contributions reflected several themes:

- Clean Energy: support for renewable electricity sources and climate action planning
- Financial Feasibility: emphasis on realistic, affordable projects with clear returns
- Use of Existing Resources: repurposing land and corridors for charging, and building partnerships to reduce upfront costs
- Improving Transit: electrifying transit fleets to improve service quality, reliability, and equity, including opportunities to coordinate with neighbouring municipalities
- Charging Options: ensuring varied, accessible charging choices for residents, businesses, and visitors

Figure 12: Brainstorming guiding principles for rural electrification

Workshop Session #2

The second session focused on identifying EV strategies for achieving net-zero goals across both private and public transportation systems.

Activity 1: Short- and Long-Term Strategies for Net-Zero Emissions

Process: Participants worked in groups to outline short term strategies (within five years) and long-term strategies (beyond ten years). Ideas were recorded on chart paper and shared with the room.

Results: Participants proposed strategies such as:

- EV Fleet Transition: setting goals for public and private fleets, including proposed milestones of 25 percent by 2030, 65 percent by 2040, and 100 percent by 2050
- Increasing Charging Accessibility: expanding charging locations on municipal property, incentivizing private investment, and repurposing brownfield sites for charging hubs
- Partnership Building: leveraging collaborations with neighbouring municipalities and governments to lower procurement and maintenance costs
- Additional Strategies: improving interregional transit, integrating multimodal design, and delivering public awareness campaigns

Activity 2: Strategies to Electrify Bus Services and Install EV Chargers

Process: Participants reflected on public transit in their communities and explored strategies for electrifying bus services and expanding charging infrastructure. Groups documented ideas on chart paper for discussion.

Results: Strategies discussed included:

- Site Conversion: repurposing brownfield sites as transit and charging hubs, with consideration of remediation needs
- Provincial Standards and Assistance: establishing a coordinated procurement body for EVs and charging equipment, allowing smaller municipalities to loan compatible vehicles when needed
- Incentives: exploring municipal incentives for private charging investments and reduced electricity rates from Nova Scotia Power to support EV infrastructure development

Figure 13: Discussing bus electrification

Activity 3: Rural Electrification Strategy Circle of Support

Process: Participants indicated their level of interest in supporting rural electrification by placing their name tags on the Rural Electrification Strategy Circle of Support diagram.

Results: Please refer to the results from Workshop #1

A summary of these findings and a photo gallery are provided in Appendix D.

Electrification Workshop #3 | Colchester, NS

Presentation

DalTRAC hosted its third interactive workshop on November 20, 2025, at the Truro Library. As in the previous workshops, Dr. Ahsan Habib opened the session with a presentation introducing transportation electrification. The presentation highlighted findings from the 2022–2023 NovaTRAC survey, insights from earlier engagement sessions, and case studies on municipal fleet electrification from Canada and the United States.


Figure 14: Dr. Habib presenting

Workshop Session #1

The first session centered on developing "Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester." Participants drew on their experiences and knowledge through three activities.

Activity 1: Picture Yourself Driving, Charging, Riding, or Watching an EV

Process: Participants drew themselves interacting with an EV in their community. Sticky notes were displayed for group discussion.

Results: Drawings showed participants driving EVs, charging vehicles, and riding or charging electric bicycles. Many illustrations featured single-occupant electric pickup trucks. This pattern reflects Colchester's rural context, where pickup trucks are widely used by residents and the municipal fleet, and single-occupant travel is common. These realities shaped how participants envisioned their transportation experiences.

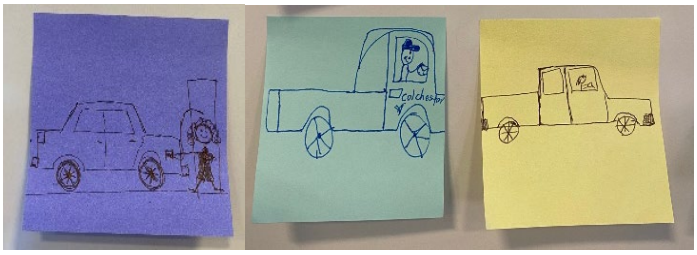


Figure 15: Three participant drawings of using and charging an electric vehicle

Activity 2: Benefits of Electrifying the Municipal Fleet

Process: Participants discussed potential benefits of municipal fleet electrification in small groups and recorded ideas on chart paper for group review.

Results: Identified benefits included:

- Environmental: lower greenhouse gas emissions and reduced environmental footprint
- Safety: improved air quality, reduced hazard risks, fewer tipping incidents, and safer indoor-use vehicles
- Financial: lower long-term operating costs and increased access to funding
- Leadership: demonstrating municipal commitment to sustainability and encouraging broader community adoption

Figure 16: A group discussing EV benefits

Activity 3: Guiding Principles for Municipal Fleet Electrification

Process: Participants brainstormed guiding principles for municipal fleet electrification using sticky notes, which were later grouped for discussion.

Results: Guiding principles identified include:

- Climate Action: prioritizing emissions reduction and energy-efficient practices
- Financial Feasibility: ensuring long-term cost effectiveness and responsible investment
- Right-Sizing: evaluating vehicle needs and redistributing vehicles to optimize usage rather than defaulting to pickup trucks
- Education: raising awareness of EV benefits and challenges among staff and residents
- Cautious Implementation: adopting phased approaches for vehicle replacement and charger installation
- Service Delivery Maintenance: ensuring electrification efforts maintain or improve municipal service standards

Figure 17: Terms used as guiding electrification principles

Figure 18: Participants writing down their guiding principles

Workshop Session #2

This session focused on developing strategies and identifying challenges specific to electrifying the municipal fleet in Colchester County.

Activity 1: Challenges for Municipal Fleet Electrification in Colchester

Process: Participants discussed challenges based on their experience in Colchester and recorded ideas on chart paper for group discussion.

Results: Challenges discussed include:

- Rural Context and Travel Requirements: long distances, unpredictable daily routes, and diverse vehicle needs; agricultural machinery adds complexity
- Charging Infrastructure and Logistics: limited chargers, high installation costs, winter reliability issues, and uncertainty around optimal locations
- Vehicle Availability: limited EV models suitable for heavy-duty or specialized tasks; supply chain constraints and insufficient local maintenance services
- Organizational and Cultural Challenges: resistance to change, attachment to existing fleet vehicles, and difficulty adjusting daily routines
- Financial and Policy Barriers: high upfront costs, limited funding, and lower priority given to electrification
- Emergency and Reliability Concerns: ensuring vehicles are ready for rapid response during emergencies with limited charging time

Activity 2: How Would You Plan Municipal Fleet Electrification?

Process: Participants identified methods and steps for electrifying the municipal fleet based on operational knowledge, infrastructure needs, and financial considerations. Ideas were recorded and presented to the group.

Results: Plans presented by participants included:

- Education and Communication: explaining the rationale for electrification and using local data to demonstrate benefits
- Phased Implementation and Right-Sizing: testing EVs for appropriate use cases, prioritizing smaller or lower mileage vehicles (such as forklifts or warehouse vehicles), and setting achievable early goals
- Vehicle Evaluation and Management: creating a vehicle database to track kilometres driven and fuel use, and establishing benchmarks for investment decisions based on lifecycle, cost, and operational needs

Figure 19: Group discussion on EV plans

Activity 3: Rural Electrification Strategy Circle of Support

Process: Participants indicated their level of interest in supporting rural electrification by placing their name tags on the Rural Electrification Strategy Circle of Support diagram.

Results: Please refer to the results from Workshop #1

A summary of these findings and a photo gallery are provided in Appendix E.

Summary of Findings

DalTRAC's workshops in Halifax, Yarmouth, and Colchester County generated key insights to support rural transportation electrification across Nova Scotia. Engagement with municipalities, community groups, industry representatives, and residents brought forward diverse perspectives and practical ideas for advancing low-carbon mobility.

Participants emphasized that electrification must reflect the unique contexts of rural communities. While environmental, economic, and health benefits were widely recognized, participants stressed the need for approaches that are financially realistic, operationally feasible, and aligned with local priorities. Common challenges included limited charging infrastructure, high upfront costs, supply constraints, and gaps in technical expertise. Participants also identified opportunities such as right-sizing municipal fleets, repurposing land for charging infrastructure, integrating renewable energy sources, and ensuring service delivery is maintained or improved.

Communities highlighted electrification needs beyond personal vehicles, including public transit buses in Halifax, fishing vessels in Yarmouth, and equipment such as forklifts in Colchester County. These examples reinforce the importance of tailoring strategies to local transportation patterns and economic activities.

Across all workshops, participants highlighted the value of phased implementation, strong partnerships, targeted incentives, and clear communication with residents and staff. Education and data-driven planning were identified as essential for building support and demonstrating long-term benefits. Interest in

remaining involved through the RESAlliance indicates growing momentum toward a coordinated and sustainable approach to rural transportation electrification.

Overall, workshop feedback shows that the sessions successfully increased awareness, strengthened collaboration, and provided meaningful opportunities for learning and discussion.

Workshop Evaluation Results

All three workshops concluded with an anonymous evaluation form to gather participant feedback. Across the sessions, 23 participants completed the surveys, providing insights into workshop content, facilitation, and overall value. Feedback indicated that participants found the workshops informative, well-organized, and useful for understanding the opportunities and challenges of rural transportation electrification. Many respondents noted that the interactive activities supported meaningful discussion and helped connect electrification concepts to local contexts.

Participant interest in continued engagement was reflected through the Rural Electrification Strategy Circle of Support. Across the three workshops, 6 participants identified as interested in becoming Champions, 4 expressed interest in actively participating in the RESAlliance, 8 preferred to remain informed, and 1 indicated support from the sidelines. This distribution reflects a strong core of engaged stakeholders alongside broader interest in continued involvement.

The full set of evaluation responses is included in Appendix F.

5. ELECTRIFICATION STRATEGIES FOR RURAL MUNICIPALITIES

This chapter was developed as a toolkit for a 'municipal electrification strategy', derived from an extensive consultation process in Halifax and Yarmouth. The strategy is specifically designed for the Town of Yarmouth; however, it can serve as a flexible framework for rural municipalities across the province. While rooted in local engagement, the strategy is designed to be adaptable, reflecting the shared needs, challenges, and opportunities that emerged throughout the project's workshops. Rural electrification requires practical, staged approaches that account for community capacity, operational realities, and the diversity of transportation needs in rural regions. The detailed workshop plan and processes for municipal consultation can be found in *Appendix D*.

Vision Statement

To advance a practical and inclusive transition toward transportation electrification in rural municipalities by strengthening partnerships, improving charging accessibility, and ensuring that electrified mobility solutions are affordable, reliable, and sustainable. This transition aims to reduce emissions, enhance regional connectivity, and support community resilience while aligning with Nova Scotia's 2050 net-zero goals.

Benefits of Transportation Electrification

Rural municipalities identified advantages across environmental, economic, social, and institutional dimensions.

Environmental Benefits

- Reduced greenhouse gas and air pollutant emissions
- Lower transportation noise, enhancing quality of life
- Increased use of renewable energy sources to support charging needs

These benefits support rural communities' broader climate commitments and contribute to cleaner, healthier environments for residents.

Institutional and Regional Benefits

- Stronger collaboration among municipalities, utilities, provincial agencies, and community partners
- Opportunities to develop coordinated regional charging and transit networks

Participants repeatedly emphasized that regional approaches could reduce costs, expand service coverage, and improve long-term planning.

Economic Benefits

- Long-term savings for residents and municipalities through reduced fuel and maintenance costs
- Greater budget stability by limiting exposure to fluctuating fuel prices
- New opportunities for local trades, renewable energy industries, and clean-technology businesses

Economic resilience was a recurring priority during stakeholder discussions, particularly for rural communities seeking to diversify local economic activity.

Social and Community Benefits

- Expanded mobility options through smaller electrified modes such as e-bikes, scooters, and golf carts
- Visible municipal leadership that builds trust and supports long-term sustainability goals
- Increased attractiveness to new residents and businesses

Electrification is viewed as a way to improve rural quality of life while supporting demographic and economic revitalization.

Electrification Action Items

The following strategies reflect a practical and scalable approach to rural electrification. They are structured into short-term and long-term components, enabling municipalities to build momentum while planning for deeper systems change over time.

Short Term Strategies (0 to 5 Years)

Assessment and Planning

- Conduct EV infrastructure assessments to identify priority charging locations and evaluate grid capacity in collaboration with Nova Scotia Power
- Complete feasibility and cost studies to determine total cost of ownership and financial viability for municipal fleets

Infrastructure and Land Use

- Repurpose municipal or underused sites, such as brownfield properties, for charging and fleet facilities
- Prioritize installation of initial chargers at community hubs, municipal buildings, tourism sites, and key regional connectors

Fleet and Procurement

- Pilot electrification of light-duty municipal vehicles using available federal and provincial funding
- Explore shared procurement opportunities with neighbouring municipalities to reduce costs

Partnerships and Collaboration

- Establish a RESAlliance working group to coordinate procurement, share best practices, and pursue collective funding

Community Awareness and Engagement

- Launch educational campaigns to share information on EV incentives, costs, benefits, and operational considerations
- Address common concerns related to reliability, winter performance, and rural charging needs

Long Term Strategies (5 to 15 Years)

Infrastructure Expansion

- Develop a network of chargers across key regional corridors, tourism destinations, and intermunicipal connectors
- Pair charging stations with on-site renewable energy systems to improve energy independence and reduce grid strain

Fleet and Transit Transition

- Electrify local and intermunicipal transit services through phased implementation
- Establish long-term vehicle replacement schedules that prioritize cost efficiency and emissions reduction

Provincial Coordination and Standards

- Advocate for standardized procurement frameworks for EVs and charging equipment
- Promote interoperability across municipal and regional charging networks

Capacity Building and Workforce Development

- Provide training for electricians, fleet managers, mechanics, and planners to build local technical capacity

Monitoring and Reporting

- Track progress using measurable benchmarks such as fleet conversion percentages, charger installation numbers, and GHG reductions
- Report progress to councils, staff, and residents to support transparency and ongoing engagement

Integration into Municipal Planning

- Embed electrification actions within municipal transportation plans, climate action strategies, and asset management frameworks

6. DESIGN GUIDELINES FOR ELECTRIC CHARGING STATIONS

This chapter outlines design guidelines for electric vehicle charging stations in rural Nova Scotia. The guidance is informed primarily by a best practice review and jurisdictional scan of EV charging standards and planning approaches from multiple jurisdictions, including Canada, the United States of America, and the European Union. These regions were selected due to shared challenges related to rural geography, climate conditions, infrastructure capacity, and long-distance travel. This chapter also incorporates insights from stakeholder workshops involving municipal staff, transit providers, provincial agencies, and energy sector partners. These perspectives, combined with international best practices, inform a practical framework tailored to the needs and capacities of rural communities in Nova Scotia.

Planning Considerations for EV Infrastructure

Expanding EV infrastructure in rural regions requires deliberate, community-focused planning. While EV adoption continues to increase, public charging infrastructure remains heavily concentrated in urban areas, leaving many rural communities underserved (Natural Resources Canada, 2024). Addressing this gap is essential to ensure equitable access, support inter-community and long-distance travel, and connect rural towns, service centres, and tourism corridors to the broader provincial and national EV network.

Through strategic planning, phased implementation, and strong partnerships, rural communities can address infrastructure and capacity constraints while supporting emissions reduction, local economic development, and regional connectivity.

Understanding EV Infrastructure Basics

Electric vehicle charging infrastructure is generally categorized into three types based on charging speed and power output: Level 1, Level 2, and Direct Current Fast Charging (DCFC or Level 3) (Nova Scotia Power, 2025a). Each charger type serves different user needs and is suited to specific locations depending on parking duration, travel behaviour, and electrical capacity.

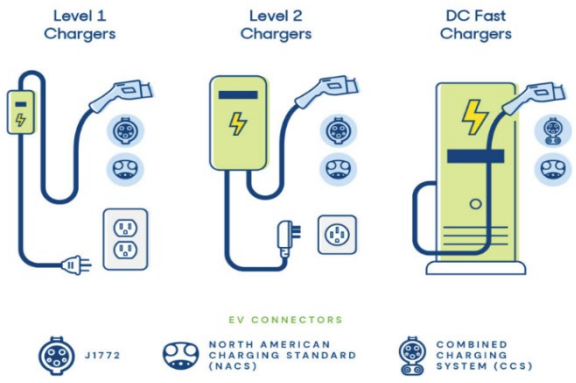


Figure 20: EV Charger Types (EnergyRight, 2023)

Charger Types and Technical Specifications

Level 1 (Standard Outlet Charging)

Level 1 charging uses a standard 120V outlet and provides approximately 3 to 8 kilometres of range per hour. This option is best suited for residential use where vehicles remain parked for extended periods and

daily travel distances are short. Level 1 chargers are often portable and require minimal installation (EV Assist, 2022; Nova Scotia Power, 2025a).

Level 2 (Residential and Commercial Charging)

Level 2 chargers operate on a 240V circuit and typically provide between 16 and 97 kilometres of range per hour. These chargers are the most common public charging option in Nova Scotia and are well suited for workplaces, community facilities, and long-term parking locations (Halifax Regional Municipality, 2021; Nova Scotia Power, 2025a).

Level 3 (Direct Current Fast Charging)

DC fast chargers deliver power ranging from 25 kW to 350 kW and can add up to 250 kilometres of range in approximately one hour. These chargers are intended for high-demand locations such as highways, travel hubs, and major tourism destinations where drivers require rapid charging (Halifax Regional Municipality, 2021; Nova Scotia Power, 2025a; U.S. Department of Transportation, 2022).

Most electric vehicles in Canada use the J-plug connector for Level 1 and Level 2 charging. Tesla vehicles use the North American Charging Standard (NACS), though adapters allow compatibility with J-plug chargers (BC Hydro, 2024).

Charger Type	Best Use Case
Level 1	Homes with short commutes
Level 2	Workplaces, community centres, long-term parking
DCFC	Highways, gas stations, retail, tourism areas

(Halifax Regional Municipality, 2021)

Selecting an appropriate mix of charger types depends on expected parking duration and user demand. Local users benefit most from Level 2 chargers, while regional and long-distance users require access to DC fast chargers along key corridors and destinations (Dunsky Energy Consulting, 2020).

Figure 21: Locations for EV Chargers (EnergyRight, 2023)

Local & Regional Users: Matching Chargers to Demand

Different user groups place different demands on charging infrastructure. Local users, including residents and municipal staff, benefit from Level 2 chargers located at workplaces, libraries, and community centres where vehicles remain parked for several hours. Regional users, such as tourists and inter-community

travellers, require faster charging options at highway rest areas, ferry terminals, and transit hubs. Communities that serve both local and regional functions benefit from a balanced mix of charger types to accommodate diverse charging needs (Natural Resources Canada, 2024).

EV Charging Network Planning

Effective EV infrastructure planning requires attention to both physical installation and digital connectivity. In rural contexts, where charging options are limited, visibility and reliability are especially critical. Networked charging stations connected via Wi-Fi or cellular service allow chargers to appear on platforms such as PlugShare and ChargeHub, making them discoverable and usable for drivers travelling through or within rural areas (Alberta Municipalities, 2025). Without this connectivity, chargers may be functionally invisible to users.

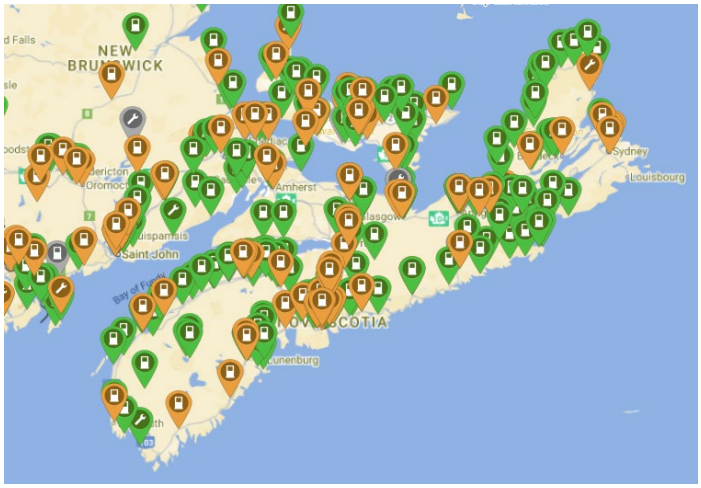


Figure 22: EV Chargers in Nova Scotia (Nova Scotia Power, 2025a)

Networked chargers also support ongoing software updates, performance monitoring, and maintenance alerts, improving system reliability and reducing downtime. These features are particularly important in rural areas where service disruptions can significantly affect user confidence (Nova Scotia Power, 2025a; BC Hydro, 2024). In addition, networked systems allow municipalities to collect usage data, which can inform future investments, system expansion, and funding applications.

Key benefits of networked charging stations include improved visibility on charging applications, real-time monitoring and maintenance alerts, reduced range anxiety, and access to data that supports long-term infrastructure planning (Alberta Municipalities, 2025; Nova Scotia Power, 2025a).

Smart Grid Nova Scotia: A Case Study

Nova Scotia Power's Smart Grid initiative demonstrates how integrated technology can support EV adoption across both urban and rural contexts. The initiative deployed 120 smart chargers managed through a mobile application that allows users to schedule charging during off-peak hours, track energy consumption and costs, and receive system updates and notifications.

This approach helps manage grid demand while offering EV owners greater flexibility, particularly in rural areas where charging options may be limited. Nova Scotia Power also used PlugShare data to strategically install 72 charging ports across rural communities, prioritizing tourism hubs and transportation corridors. Additional high-speed chargers are planned for deployment in 2025 (Nova Scotia Power, 2025c). Together, these tools illustrate how data-driven planning and user engagement can support the development of a reliable provincial charging network.

Planning & Partnerships

Partnership Opportunities

Public-private partnerships play a critical role in expanding EV charging infrastructure in rural areas. Local governments, utilities, businesses, and community organizations each contribute resources, expertise, and capacity that can help transform underused sites into valuable community assets (U.S. Department of Transportation, 2025).

Figure 23: Partnership Opportunities (BC Hydro, 2024)

The Role of Site Hosts

Reliable charging networks depend on committed site hosts. Suitable hosts may include local businesses such as restaurants or cafes, tourist attractions, municipal buildings, community centres, universities, parks, and trailheads. Hosts may operate charging stations directly or partner with third-party providers for installation, maintenance, and payment systems (U.S. Department of Transportation, 2025). In return, hosts often benefit from increased foot traffic, as EV drivers typically spend time nearby while charging.

Figure 24: Site Hosts (plugshare.com)

Supporting Local Business and Tourism

EV charging infrastructure can support local economic development by attracting EV drivers to nearby businesses and services (U.S. Department of Transportation, 2025). Locating chargers near ferry terminals, trailheads, heritage sites, and tourism destinations can enhance visitor experiences and strengthen rural tourism networks.

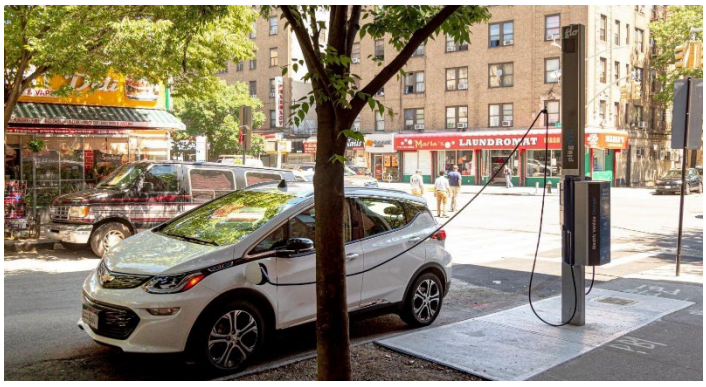


Figure 25: Supporting Local Business (act-news.coms)

Municipal Considerations

Municipal governments play a central role in enabling EV infrastructure through zoning, permitting, and design standards (BC Hydro, 2024). Clear municipal policies help streamline approval processes, reduce uncertainty for partners, and support coordinated infrastructure deployment (U.S. Department of Transportation, 2025).

Community Engagement and Promotion

Community engagement is essential to successful EV planning. Early outreach helps build public support, identify local priorities, and address concerns related to cost, reliability, or land use (Joint Office of Energy and Transportation [JOET], 2024). Effective communication should emphasize local benefits such as cleaner air, support for local businesses, and improved access to services and tourism.

Best practices for engagement include setting clear and transparent goals aligned with community values and involving a diverse range of voices early in the planning process (JOET, 2024).

Choosing & Preparing Sites

Selecting the Right Locations

In rural communities, strategic site selection is critical due to the smaller number of available chargers compared to urban areas. Priority locations include grocery stores, community centres, downtown areas, parks, tourist destinations, and major highway corridors that support interregional travel and reduce range anxiety (Halifax Regional Municipality, 2021; Natural Resources Canada, 2024).

Figure 26: Choosing the Right Location (hydroottawa.com)

Municipalities can approach site selection through three complementary strategies: corridor planning along major highways, community planning informed by local engagement, and site-level planning that prioritizes visible and frequently visited locations such as town centres or trailheads (U.S. Department of Transportation, 2025).

Site Selection Criteria

Effective charging sites are accessible twenty-four hours a day, well-lit, easy to locate from the roadway, and situated near amenities such as restrooms, food options, or reliable cell service. Sites should also be located near regular pedestrian or vehicle activity to support safety and visibility (BC Hydro, 2024).

Municipalities can use site selection checklists, travel demand studies, and public surveys to better understand local needs and travel patterns. These tools support data-driven decision making and help avoid underutilized installations (BC Hydro, 2024).

Rural Design Considerations

Designing EV charging infrastructure for rural contexts requires flexibility and adaptability. Best practices include modular layouts that accommodate varying space constraints, flexible design templates suited to different site types, and clear signage that directs users to nearby services and amenities (BC Hydro, 2024; Bullis, 2022; JOET, 2024).

Infrastructure Limitations & Upgrades

Grid and Energy Requirements

Installing EV chargers, particularly DC fast chargers, can place significant demands on local electrical systems (U.S. Department of Transportation, 2025). In many rural communities, existing grid infrastructure may require upgrades to transformers, power lines, or local wiring. These upgrades can be challenging due to limited budgets, technical capacity, or staffing resources (U.S. Department of Transportation, 2025).

To address future energy demands, grid upgrades should be planned alongside anticipated growth in charging needs. Smart charging systems can help distribute electricity use during off peak hours or periods of high renewable generation, reducing emissions and limiting the need for costly grid expansions (Zero Emission Vehicles Ireland & Department of Transport, n.d.).

Typical grid planning considerations include upgrading transformers, extending electrical wiring, installing smart grid technologies, and working closely with utility providers to project future load requirements (U.S. Department of Transportation, 2025).

Managing Energy Demand

Time of use pricing and off-peak charging incentives can help manage peak demand while maintaining affordable operations and supporting environmental objectives (Zero Emission Vehicles Ireland & Department of Transport, n.d.).

Weather Protection

Rural charging stations must be designed to withstand local weather conditions. Recommended features include shelters or canopies, durable materials suited to regional climates, and non-slip, well-drained pavement to ensure year-round usability (BC Hydro, 2024).

Figure 27: Weather Protection (plugshare.com)

Wayfinding, Safety & Security

Clear and consistent signage improves usability and builds user confidence. Signage should be high-contrast, symbol-based, accessible to users with varying literacy levels, and visible from main roads and within communities. While Nova Scotia does not yet have standardized EV signage, adopting a uniform approach across the province is recommended. Charging applications such as PlugShare should provide real time information, location details, and support contacts (BC Hydro, 2024).

Figure 28: Wayfinding (westcoastgreenhighway.com)

Proper lighting is critical for safety, particularly in remote areas or during nighttime use. Recommended lighting levels include 108 lux at the front of chargers at 1.5 metres, tapering to 32 lux over 18 metres, with a minimum of 32 lux on sides and rear areas. Energy-efficient LED fixtures with automatic controls are recommended, with pole heights ranging from 14 feet in residential areas to 17 feet along highways (BC Hydro, 2024).

Security features should include continuous surveillance cameras, clear signage indicating monitoring, and strategically positioned equipment to deter theft or vandalism, particularly in isolated locations (JOET, 2024).

Cybersecurity Considerations

Because EV charging infrastructure is digitally connected and increasingly critical, municipalities should prioritize cybersecurity. Recommended practices include incident reporting protocols, collaboration among stakeholders, and future proofing infrastructure to allow for security updates over time (Mol et al., 2022).

Accessibility & Equity

EV infrastructure should be designed to serve all users, including individuals with disabilities and those without access to home charging. Key features include wide and level parking areas with curb cuts and ramps, chargers installed at reachable heights, clear multilingual signage, and twenty-four-hour access in well-lit locations (BC Hydro, 2024).

Figure 29: Accessible EV Charging (transportandenergy.com)

In rural areas, renters and residents living off-grid often face barriers to installing private chargers, making shared public infrastructure especially important. Research indicates that 25 percent of people with

disabilities in the United Kingdom would consider an EV without accessible infrastructure, increasing to 61 percent when accessibility is improved (Transport Canada, 2024).

Equity-focused planning also requires attention to user-friendly payment systems, digital literacy, language barriers, and physical hazards such as uneven terrain (BC Hydro, 2024; Transport Canada, 2024).

Cost, Revenue, & Operations

Successful EV charging networks balance usability, equity, and financial sustainability by ensuring access in rural and underserved communities, offering a mix of charger power levels matched to user needs, placing chargers in accessible and high-traffic locations, and implementing clear usage policies to encourage turnover (Dunsky Energy Consulting, 2020; Natural Resources Canada, 2024).

In areas with lower utilization, financial sustainability can be supported through partnerships with local businesses and tourism operators, government grants and subsidies, and user-based revenue models such as charging fees, idle fees, or subscriptions (U.S. Department of Transportation, 2025).

Modern charging systems support multiple payment options, including app-based payments, QR codes, and tap-to-pay credit or debit cards. Data sharing among municipalities, utilities, and service providers supports improved planning, monitoring, and system management (BC Hydro, 2024).

Figure 30: Payment Modes (JOST, 2024)

Promoting good user etiquette through signage that encourages timely unplugging, avoidance of blocked charging stalls, and adherence to posted time limits can help reduce conflict and improve charger availability as EV adoption increases (Halifax Regional Municipality, 2025; Nova Scotia Power, 2025b).

Key Insights & Summary of Findings

This chapter highlights that expanding EV charging infrastructure in rural Nova Scotia requires approaches that reflect local context, capacity, and travel patterns. Effective charging networks depend on matching charger types to user needs, ensuring visibility and reliability through networked systems, and integrating infrastructure into existing community and transportation corridors.

The findings also emphasize the importance of partnerships, municipal leadership, and inclusive design in supporting equitable access and long-term performance. Together, these insights provide a practical foundation for developing charging infrastructure that supports rural mobility, economic activity, and Nova Scotia's broader electrification goals.

7. CONCLUSION

This project demonstrates that rural transportation electrification in Nova Scotia is both achievable and necessary when approached through locally grounded planning, strong partnerships, and phased implementation. Through a combination of stakeholder engagement, rural case studies, strategy development, and design guidance, the project provides municipalities with practical tools to navigate the transition to low-carbon transportation systems while reflecting the realities of rural geography, infrastructure capacity, and travel behaviour.

Findings from workshops in Halifax, Yarmouth, and Colchester County underscore that electrification pathways must be tailored to community context. Rural municipalities face distinct challenges including longer travel distances, limited public transit, constrained charging infrastructure, and higher upfront costs. At the same time, participants consistently identified clear opportunities to reduce emissions, lower long-term operating costs, improve air quality, and strengthen local and regional mobility through targeted investments in electric vehicles, charging infrastructure, and fleet transitions.

The electrification strategies and municipal fleet roadmaps developed through this work illustrate the value of incremental, right-sized approaches. Rather than one-size-fits-all solutions, successful rural electrification relies on prioritizing appropriate vehicle types, repurposing existing municipal assets, coordinating regionally, and aligning investments with operational needs and available capacity. The emphasis on partnerships, including collaboration among municipalities, utilities, provincial agencies, and local businesses, emerged as a critical enabler for overcoming financial and technical barriers.

Design guidelines for electric charging stations further reinforce the importance of visibility, reliability, accessibility, and equity in rural contexts. Lessons from best practices and jurisdictional scans highlight that effective charging networks must integrate physical infrastructure with digital connectivity, resilient design, and inclusive access. When combined with municipal leadership and community engagement, these design considerations support infrastructure that is trusted, well-used, and adaptable over time.

Collectively, the outcomes of this project support Nova Scotia's broader climate and transportation goals while offering a transferable framework for other rural communities. By centering local knowledge, fostering collaboration, and providing clear planning and design guidance, this work contributes to a coordinated and sustainable pathway for rural transportation electrification across the province.

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APPENDIX A – PRE-PROJECT STAKEHOLDER ENGAGEMENT

This appendix summarizes early stakeholder engagement activities conducted prior to the submission of the funding application for the Community Based Planning and Design for the Electrification of Transport Systems in Rural Municipalities project. These engagements informed the project rationale, scope, and design by identifying shared priorities, challenges, and opportunities related to rural transportation electrification in Nova Scotia.

Stakeholder Roundtable - November 2023 | Virtual

A virtual stakeholder roundtable was held in November 2023 to explore early considerations related to rural transportation electrification in Nova Scotia. Participants included representatives from rural municipalities, provincial government departments, nongovernmental organizations, and energy and transportation related sectors. The session focused on identifying broad system-level issues prior to formal project development.

Key themes raised during this session included:

- The need for community specific electrification approaches rather than applying urban-based models in rural contexts
- Infrastructure gaps, including limited charging availability and concerns related to reliability and maintenance
- The economic and tourism potential of destination-based charging in rural and coastal communities
- Equity considerations, particularly access to charging for residents without home charging options
- The importance of partnerships among municipalities, utilities, and provincial agencies

This session helped establish a shared understanding of the challenges facing rural electrification and highlighted opportunities that could be explored through a coordinated project approach.

Rural Transport Priority Areas Roundtable - July 2024 | Virtual

A second virtual roundtable was convened in July 2024 to further refine project direction prior to funding submission. Building on the earlier discussion, this session focused on clarifying priorities, roles, and areas of readiness for advancing rural transportation electrification.

Key outcomes from this session included:

- Identification of municipalities expressing interest in deeper engagement, including Yarmouth and Antigonish

- Recognition of the link between electrification initiatives and broader community transportation needs
    - Support for a regional engagement approach rather than isolated municipal efforts
    - Interest in establishing mechanisms for knowledge sharing and collaboration across communities
- Compared to the November 2023 session, discussions reflected a shift from broad issue identification toward alignment on potential pathways for action and engagement

Cross Session Insights

Across both pre-project engagement sessions, several common themes consistently emerged:

- The importance of tailoring electrification strategies to rural geography, travel patterns, and infrastructure capacity
- The need to address charging reliability and long-distance travel concerns
- Strong interest in partnership-based approaches involving multiple levels of government and sectoral actors

At the same time, the sessions differed in emphasis. The November 2023 roundtable focused on defining challenges and opportunities, while the July 2024 roundtable emphasized coordination, municipal interest, and readiness to move forward. Together, these discussions demonstrated a progression from problem framing to early project shaping.

Contribution to Project Development

These early engagements played a foundational role in shaping the project prior to funding approval. Insights from both sessions informed:

- The selection of focus communities for subsequent engagement
- The design of interactive workshop activities
- The emphasis on phased implementation and regional collaboration
- The creation of a shared learning and coordination framework

By grounding the project in early stakeholder input, these engagements helped ensure that the resulting approach reflects local priorities and practical considerations relevant to rural transportation electrification in Nova Scotia.

APPENDIX B – CURRENT CONDITIONS & CANADIAN BEST PRACTICES

Summary of Findings

Rural and mixed urban-rural communities in Nova Scotia and across Canada are advancing electric mobility through localized planning, targeted investments, and strategic partnerships. The examples of Yarmouth, NS; Colchester, NS; Saanich, BC; West Perth, ON; and Canmore AB highlight several consistent themes that can inform rural electrification efforts.

Current Conditions in Rural Nova Scotia

Yarmouth and Colchester demonstrate the varied but shared challenges of rural electrification.

- Both communities rely heavily on personal vehicles and have limited public transit options
- Each municipality has begun expanding charging infrastructure, updating local policy frameworks, and exploring opportunities to reduce transportation emissions

Yarmouth's growing charging network and early fleet electrification efforts show momentum supported by provincial investments. Colchester's planning updates and transit feasibility work highlight the role of land-use and mobility planning in enabling future EV readiness.

Best Practices from Canadian Case Studies

The Canadian case studies illustrate how rural and small municipalities are progressing through coordinated action:

Planning and Strategy Development

- Saanich advanced electrification through a comprehensive Electric Mobility Strategy, setting clear emissions targets and integrating EV-ready requirements in new developments
- West Perth participated in a multi-municipality regional strategy that enabled a coordinated approach to rural charging needs
- Canmore aligned local action with a regional charging network, ensuring connectivity for residents and visitors

Investment in Charging Infrastructure and Fleets

- All three municipalities made early investments in public charging and municipal fleet electrification
- Infrastructure growth, ranging from Saanich's extensive network to West Perth's and Canmore's rural charging expansions, reflects increasing EV readiness

Role of Partnerships

Municipalities partnered with regional organizations, utilities, provincial programs, and federal funders to accelerate implementation and access external expertise.

Cross-Cutting Challenges

Across all communities, three challenges consistently emerged:

- Limited public transit service, reinforcing reliance on personal vehicles
- Long distances between destinations, particularly in rural areas
- Need for accessible and reliable charging infrastructure for both residents and visitors

These conditions shape the pace and type of electrification efforts in rural settings.

Overall Insight

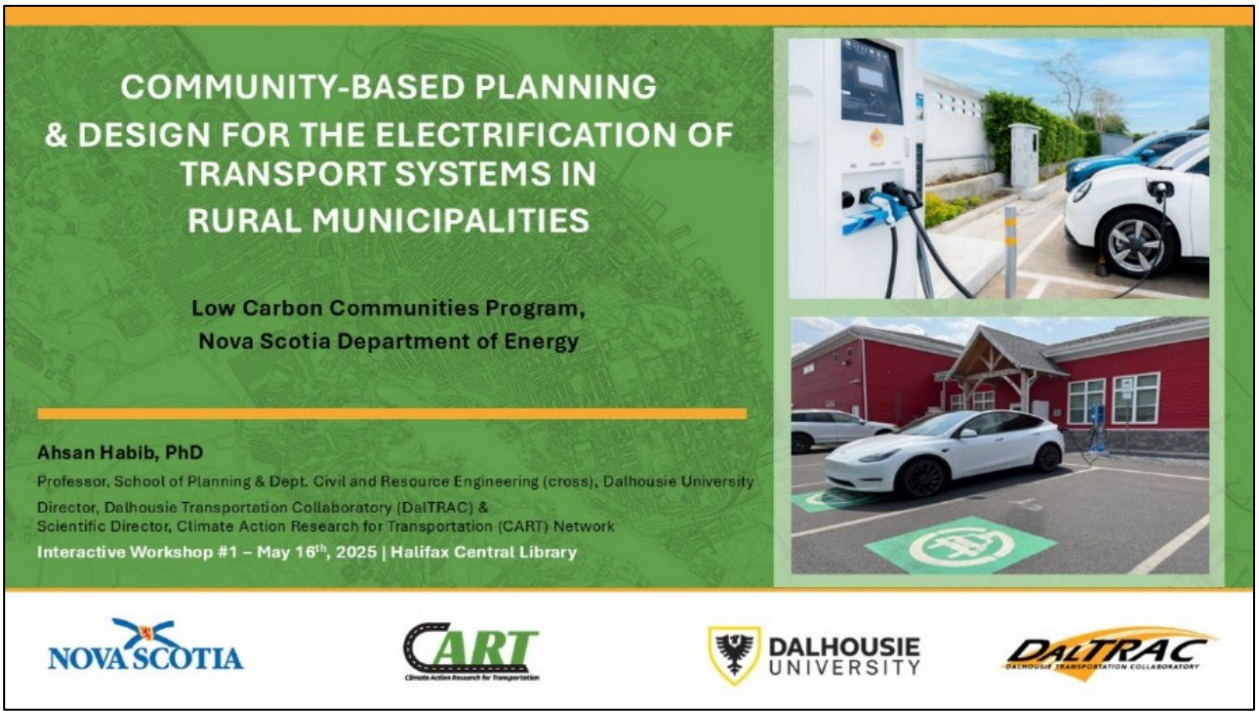
The cases demonstrate that rural communities can play a meaningful role in advancing electric mobility when investments, planning, and partnerships are aligned. While their contexts vary, each municipality shows that progress is achievable through clear strategies, collaborative approaches, and sustained commitment to infrastructure development.

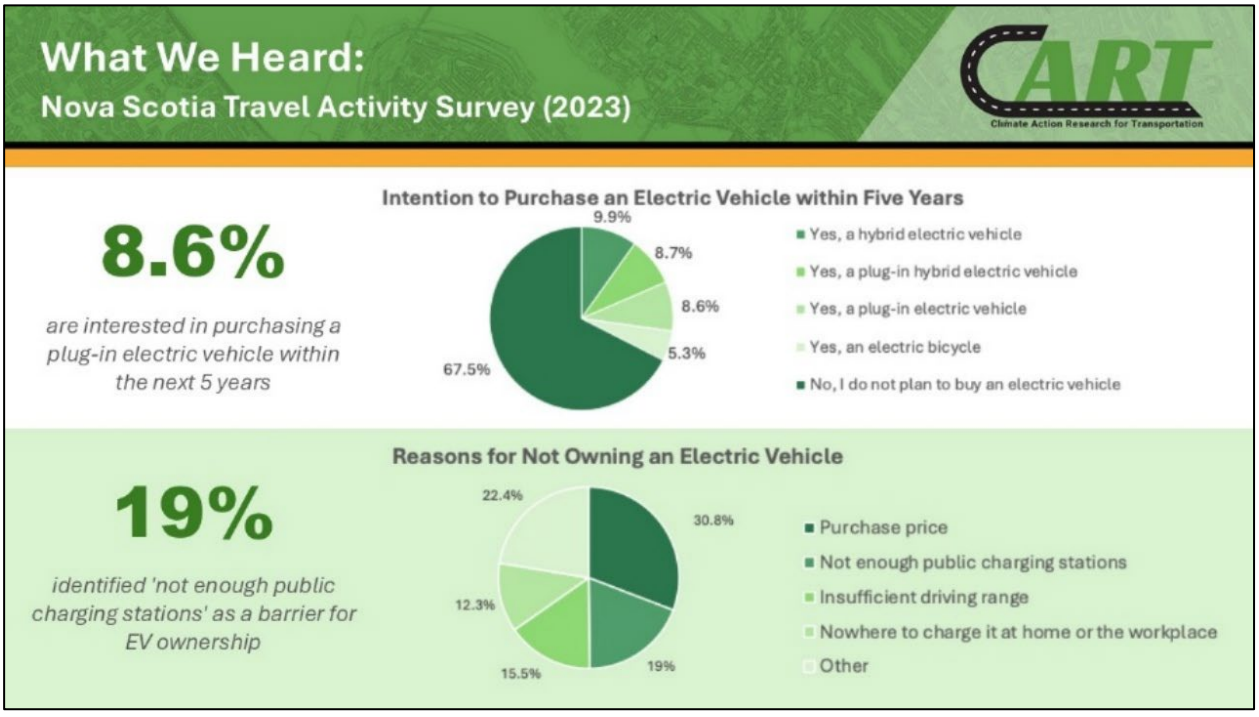
About the Project

This strategy was developed as part of the Community-Based Planning and Design for the Electrification of Transport Systems in Rural Municipalities project, led by Dalhousie Transportation Collaboratory (DalTRAC) and funded by the Low Carbon Communities (LCC) program through the Nova Scotia Department of Natural Resources and Renewables. The project engaged rural communities across the province to co-design local electrification strategies.

APPENDIX C - HALIFAX WORKSHOP, MAY 2025

1. Workshop Slide Deck





What We Heard:
Community Partners & Stakeholders (Nov 2023/June 2024)

CART Climate Action Research for Transportation

EV challenges:

- Lack of 'electrification strategies' and guidelines thereof
- Reliability of charging stations; Responsibility – Who should own chargers and maintain them? Location – Where should chargers be located? Communication with public– Where they are located and how to use them?
- Availability between rural communities
- What are the strategies for public transport, given supply chain issues?

Interesting/Key Ideas:

- What are the critical strategies to promote EV in rural municipalities? How do we integrate newer transport infrastructure with surrounding built environment in rural communities?
- How to design EV charging infrastructure to promote local economy, tourism?

chargehub.com

Project Overview

CART Climate Action Research for Transportation

Project Goal & Objectives

Co-develop community-based strategy template and design frameworks to help electrify transport systems across rural Nova Scotian communities.

Objective #1	Objective #2	Objective #3
Co-develop a "strategy template" for electrification of transportation systems in rural municipalities including public transportation	Develop micro-level design concepts to plan, design and locate public charging stations for specific communities of interest (e.g. Town of Yarmouth)	Generate shareable knowledge for communities in Nova Scotia

Community Transportation Network · Ecology Action Centre · Municipality of the County of Antigonish · Clean Foundation · JRTA Joint Regional Transportation Agency · Town of Amherst Nova Scotia · Yarmouth On the Edge of Everywhere / Partout, à partir d'ici

Project Overview

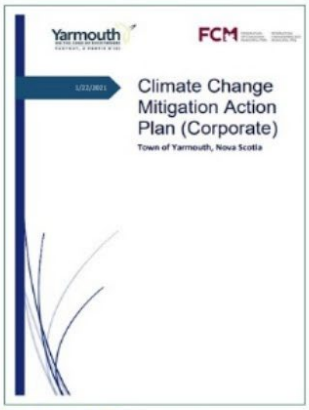
Project Process

Research & Planning

- Review of plans, strategy and design documents across Canada
- Multiple case studies to help create strategies and a design framework

Workshops/Focus Groups

- We will conduct up to three stakeholder workshops/focus groups at Dalhousie University and in partner communities



Sample of Plans Mentioning EVs in Rural NS

- County of Kings' *Strategic Plan*
- Town of Yarmouth's *Climate Change Mitigation Action Plan (Corporate)*

Canadian Strategies to Support EVs

	Ontario	British Columbia

Entire Province	• **Funding to Increase EV Charging Stations**
	  o EVCharge ON Program
	• **Access to High Occupancy Lanes** (via green license plate) regardless of the number of passengers
		• **Funding to Increase EV Charging Stations**
		  o Clean BC Go Electric Public Charger Program
		• **Access to High Occupancy Lanes** (via vehicle decal) regardless of the number of passengers
		• **Rebates** for passenger vehicle, fleets, heavy duty vehicles, and e-bikes

Urban	• **Electrify Municipal Fleets (blend of EV+ hybrid)**
	  o E.g. Hybrid + EVs in Toronto and Waterloo
	• **Electrify Public Transportation**
	  o E.g. 60 e-buses in Toronto
	• **Increase EV Chargers on City-Owned Land**
	  o E.g. Toronto and Ottawa support this approach
		• **Electrify Municipal Fleets (blend of EV + hybrid)**
		  o E.g. Hybrid + EV fleets in Vancouver and Victoria
		• **Electrify Public Transportation**
		  o E.g. 15 electric buses in Vancouver
		• **Increase EV Chargers on City-Owned Land**
		  o E.g. Vancouver and Nanaimo support this approach

Rural	• **Creating a Network of EV stations**
	  o E.g. 12 EV charging stations (Level 2 + 3 chargers) to be built in the Owen Sound region
		• **Creating a Network of EV stations**
		  o E.g. 3 regional districts around Kootenay added 40 Level 2 chargers

NS Strategies for EV Chargers

Urban

- Extensive network of public Level 2 & Level 3 in city centres. These chargers are often found in community centres and parking lots

Level 2 EV Chargers in the Halifax Seaport Parking Lot

Rural

- Fewer charging stations, but there is a growing network along highways and near community hubs

Level 2 EV Charger at Mahone Bay's Fire Hall

NS Strategies for Electric Public Transportation

Urban

- Electrifying municipal fleets, including vehicles, buses, and ferries.
- Support micro-mobility
  (e.g. a two-year pilot project for shared e-bikes and scooters is launching in May 2025)

HRM EV Bus (Healy, 2024)

Rural

- Electrify municipal fleets. For regions with public transportation, some municipalities are beginning to electrify their public buses

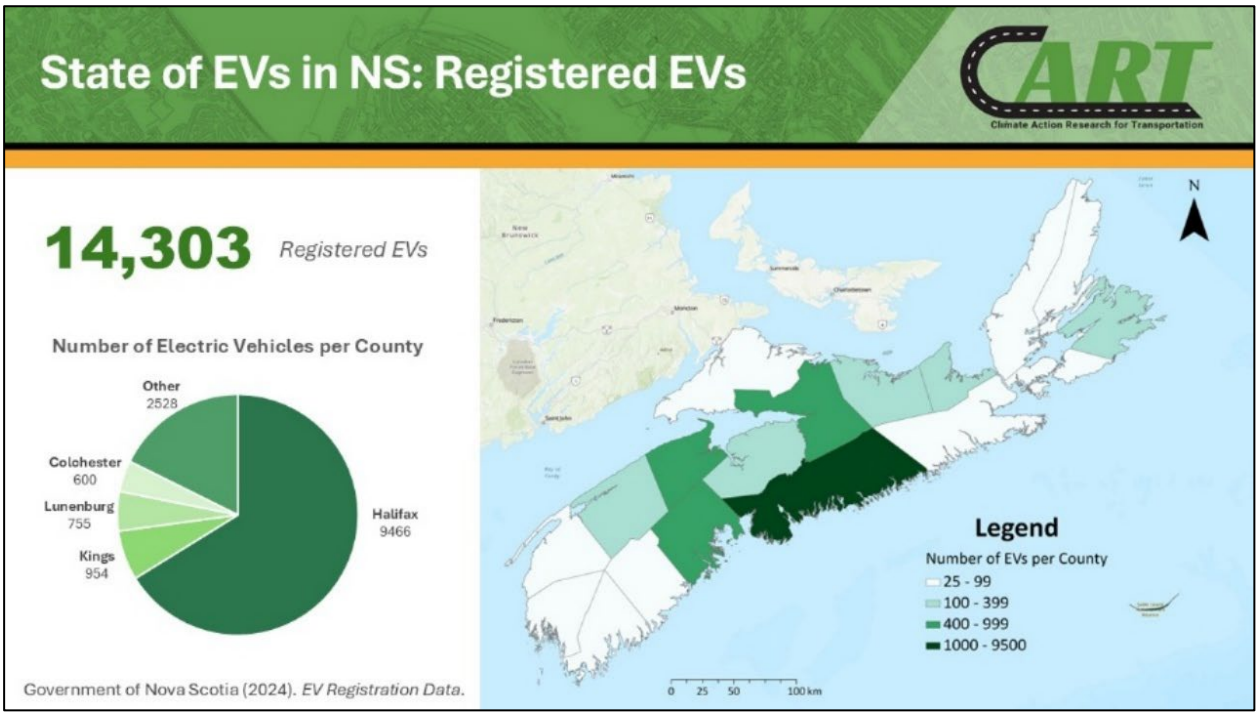
The governments of Canada, Nova Scotia and Cape Breton Regional Municipality invest in a greener transit facility and new electric buses

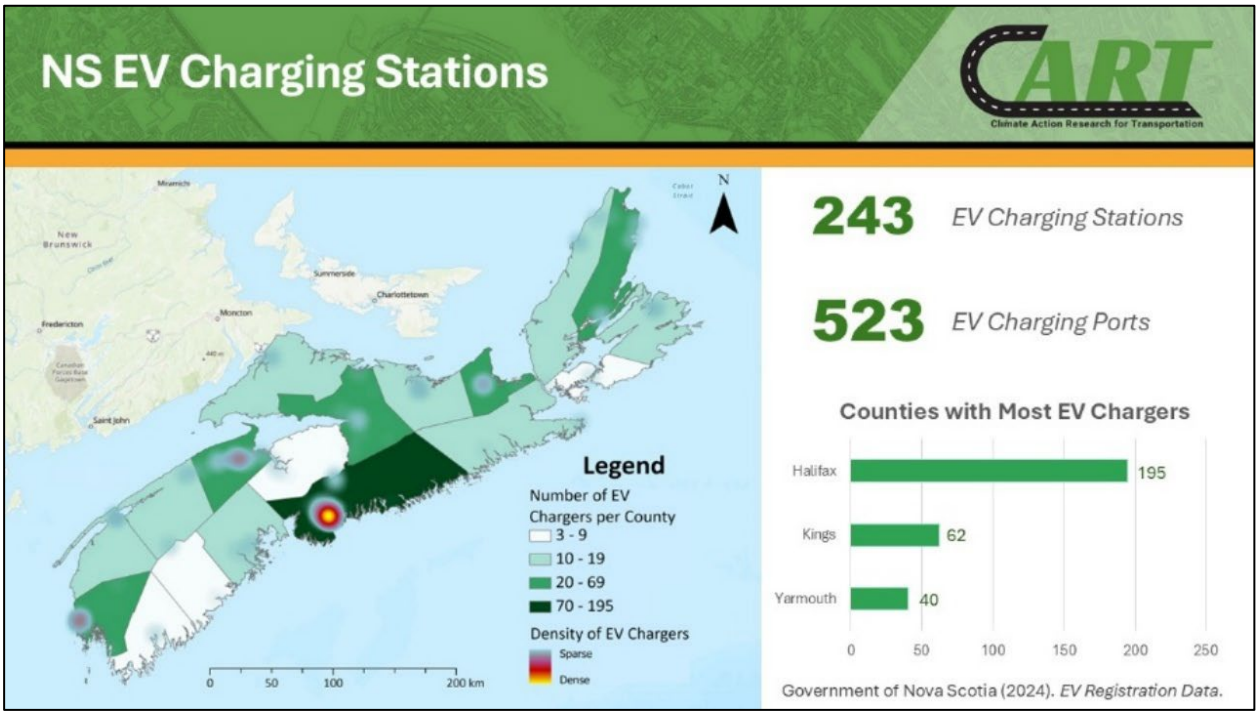
From: Housing, Infrastructure and Communities Canada

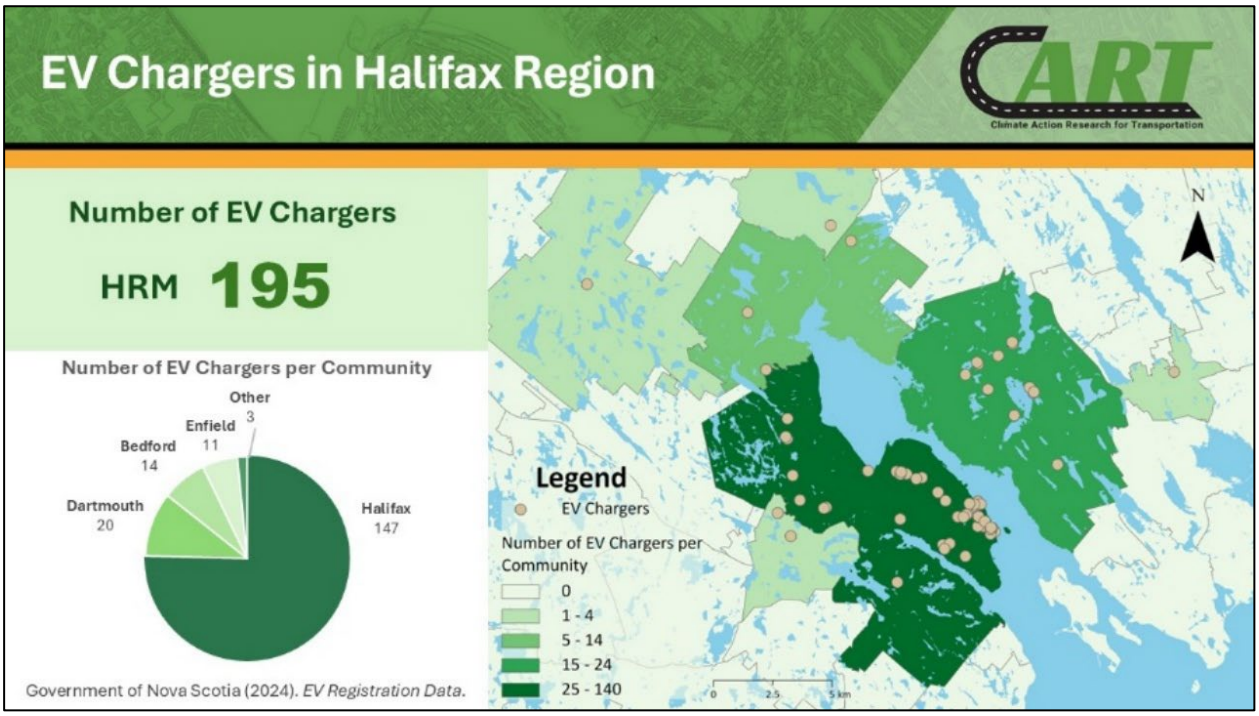
News release

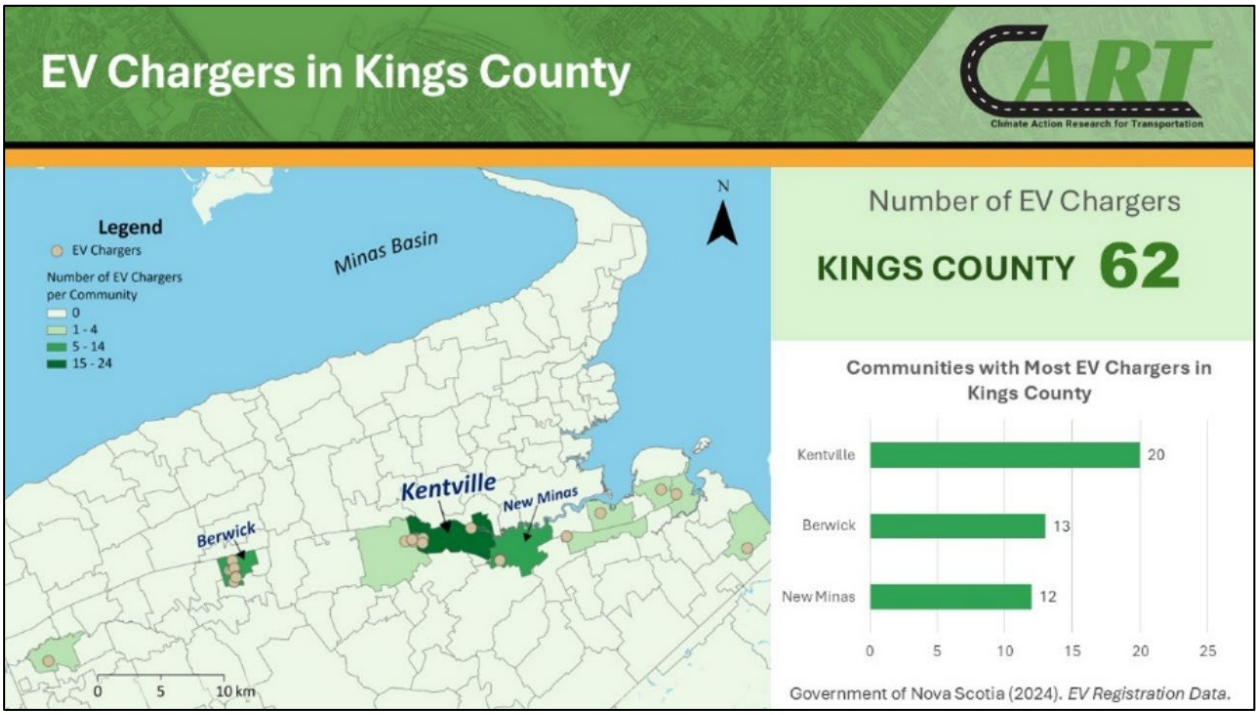
Sydney, Nova Scotia, November 15, 2023 — Transit Cape Breton will have new electric buses and an upgraded bus maintenance facility thanks to the combined investment of $54 million from the Governments of Canada, Nova Scotia and Cape Breton Regional Municipality.

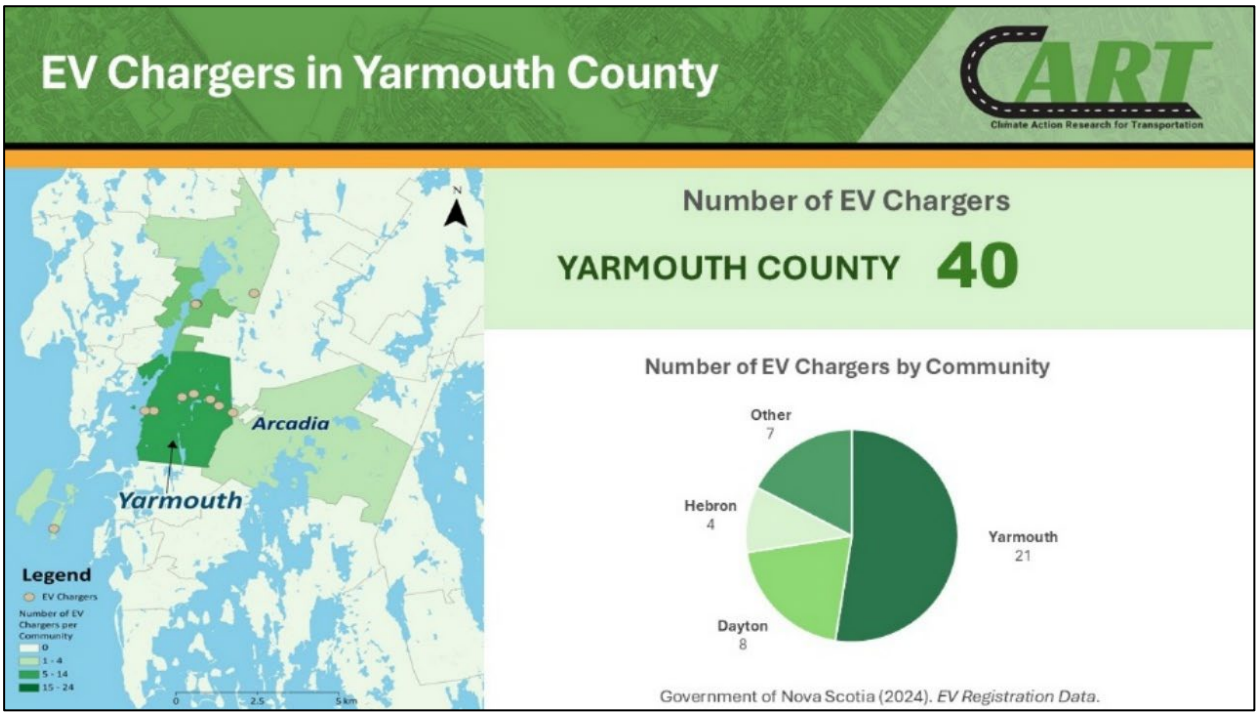
Cape Breton has purchased 6 electric buses (Government of Canada, 2023)

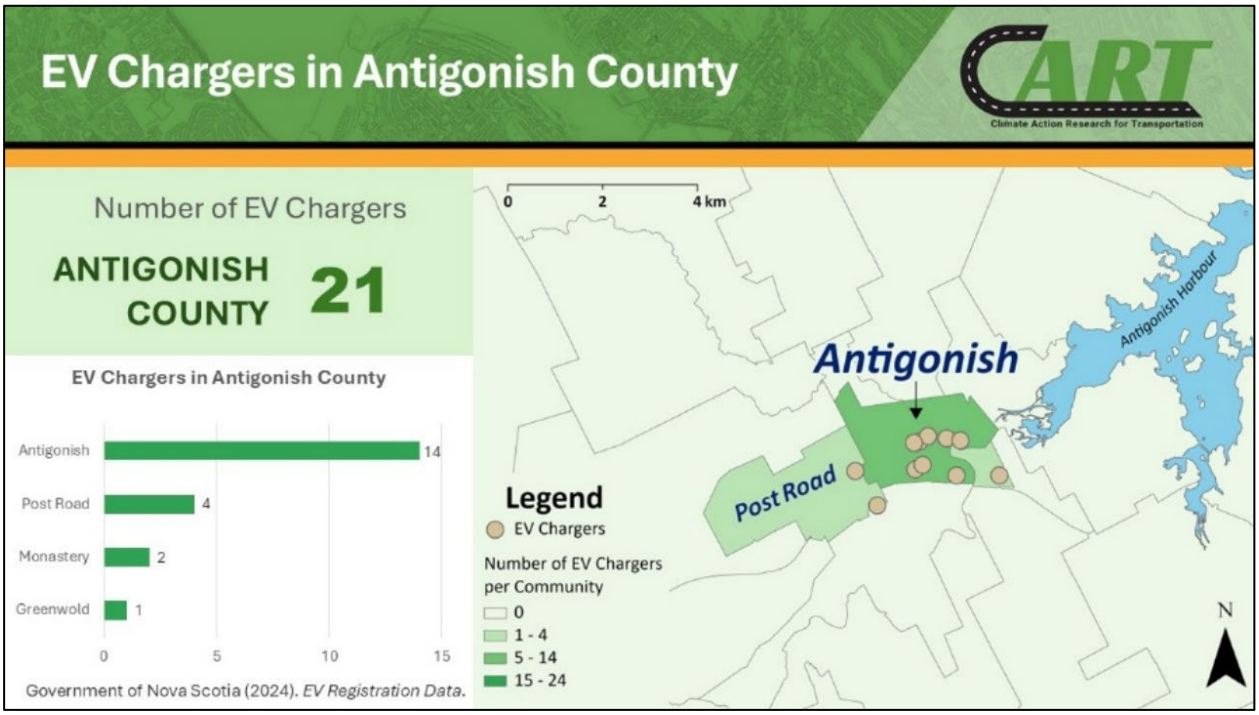

State of EVs in NS: Registered EVs
CART
Climate Action Research for Transportation
14,303
Registered EVs
Number of Electric Vehicles per County
Other
2528
Colchester
600
Lunenburg
755
Kings
954
Halifax
9466
N
Legend
Number of EVs per County
25 - 99
100 - 399
400 - 999
1000 - 9500
0 25 50 100 km
Government of Nova Scotia (2024). EV Registration Data.


NS EV Charging Stations
CART
Climate Action Research for Transportation
N
Legend
Number of EV Chargers per County
3 - 9
10 - 19
20 - 69
70 - 195
Density of EV Chargers
Sparse
Dense
0 50 100 200 km
243
EV Charging Stations
523
EV Charging Ports
Counties with Most EV Chargers
Halifax
195
Kings
62
Yarmouth
40
0 50 100 150 200 250
Government of Nova Scotia (2024). EV Registration Data.


EV Chargers in Halifax Region
CART
Climate Action Research for Transportation
Number of EV Chargers
HRM 195
Number of EV Chargers per Community
Other 3
Enfield 11
Bedford 14
Dartmouth 20
Halifax 147
Government of Nova Scotia (2024). EV Registration Data.
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
25 - 140
N


EV Chargers in Kings County
CART
Climate Action Research for Transportation
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
Minas Basin
Kentville
New Minas
Berwick
0 5 10 km
N
Number of EV Chargers
KINGS COUNTY 62
Communities with Most EV Chargers in Kings County
Kentville 20
Berwick 13
New Minas 12
0 5 10 15 20 25
Government of Nova Scotia (2024). EV Registration Data.


EV Chargers in Yarmouth County
CART
Climate Action Research for Transportation
Arcadia
Yarmouth
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
0
2.5
5 km
N
Number of EV Chargers
YARMOUTH COUNTY 40
Number of EV Chargers by Community
Other
7
Hebron
4
Yarmouth
21
Dayton
8
Government of Nova Scotia (2024). EV Registration Data.


EV Chargers in Antigonish County
CART
Climate Action Research for Transportation
Number of EV Chargers
ANTIGONISH COUNTY 21
EV Chargers in Antigonish County
Antigonish
14
Post Road
4
Monastery
2
Greenwold
1
0
5
10
15
Government of Nova Scotia (2024). EV Registration Data.
0
2
4 km
Antigonish
Post Road
Antigonish Harbour
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
N

Workshop Plan

1 **Session #1:**

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

- 2 Individual Activities; 1 Group Activity

Break with Refreshments (20 min)

2 **Session #2:**

Laying the Foundation for Community-Based Electrification Strategies (50 minutes)

- 2 Group Activities; Report back
- Building the RESAlliance; Workshop Evaluation

Session #1

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

ACTIVITY #1

[INDIVIDUAL] **Draw a picture of yourself driving, charging, or watching an electric vehicle in your community.** (10 minutes)

Session #1

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

ACTIVITY #2

[GROUP] **What are the benefits of electrification of transport systems in rural municipalities?** (20-minute discussion)

Session #1

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

ACTIVITY #3

[INDIVIUDAL] **In your opinion, what are the principles that should guide rural electrification strategies in your community?** (10 minutes)

Break with Refreshments

COMMUNITY-BASED PLANNING & DESIGN FOR THE ELECTRIFICATION OF TRANSPORT SYSTEMS IN RURAL MUNICIPALITIES

Low Carbon Communities Program, Nova Scotia Dept. Energy

Session #2

Laying the Foundation for Community-Based Electrification Strategies
(50 minutes)

ACTIVITY #1

[GROUP] **What short term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?** (10-minute discussion)

Session #2

Laying the Foundation for Community-Based Electrification Strategies
(50 minutes)

ACTIVITY #2

[GROUP] **What long term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?** (10-minute discussion, 10-minute reporting of short- and long-term strategies as a group)

Session #2

Laying the Foundation for Community-Based Electrification Strategies
(50 minutes)

ACTIVITY #3

[INDIVIUDAL] **Building the RESAlliance?** (10 minutes)


THANK YOU
[INDIVIDUALLY] Please complete the workshop evaluation survey
(5 minutes)
DALHOUSIE UNIVERSITY
CART
NOVA SCOTIA
DALTRAC

2. Session Sheet

SESSION 1:

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities?

(45 Minutes)

This session focuses on advancing rural transport electrification strategies by exploring the benefits, guiding principles, and big ideas for Nova Scotia's rural municipalities.

ACTIVITIES:

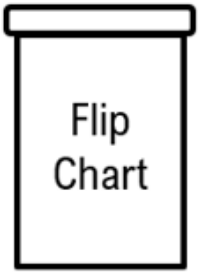
1

[Individual] Draw a picture of yourself driving, charging, or watching an electric vehicle in your community.

Use the stick notes provided.

10 minutes

2



[Group] What are the benefits of electrification of transport systems in rural municipalities?

Within your group, discuss and document a summary with bullet points on the provided flip chart sheet.

20-minute discussion

3

[Individual] In your opinion, what are the principles that should guide a Rural Electrification Strategy in your community?

Write keywords on the provided sticky notes and post them under the correct heading on the wall to help build a collective word cloud.

10 minutes

Break with Refreshments
20 minutes

Project funded by Low Carbon Communities, Nova Scotia Department of Energy

SESSION 2:

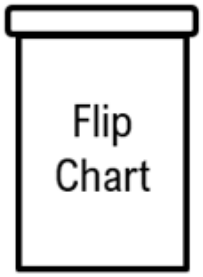
Laying the Foundation for a Community-Based Rural Electrification Strategy (RES)

(45 Minutes)

This session develops short—and long-term strategies rural municipalities can adopt to reach net-zero by 2050.

ACTIVITIES:

1

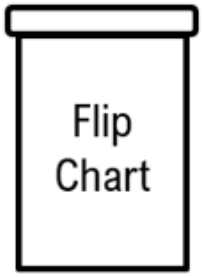


[Group] What short-term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?

In your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion

2



[Group] What long-term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?

In your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion

10-minute reporting of short- and long-term strategies with the whole group

3

[Group] Building the RESAlliance

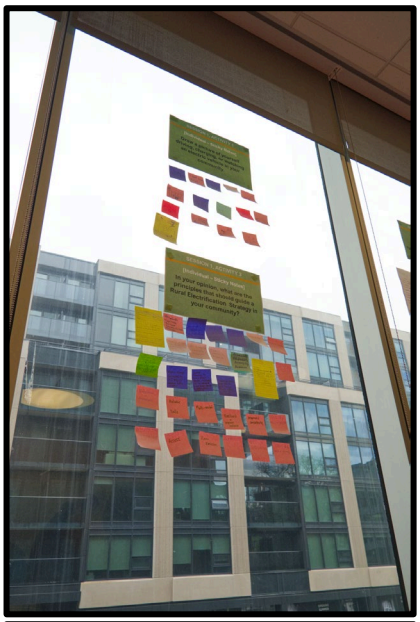
If you would like to join the RESAlliance and participate in this project, please place your name and email address in the correct section of the circle of support.

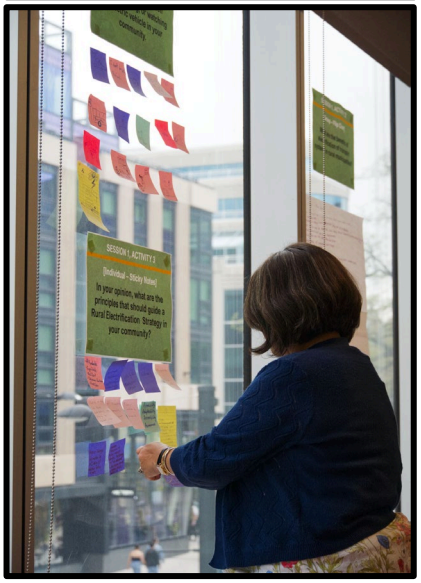
10-minutes

[Individually] Please complete the workshop evaluation survey
5-minutes

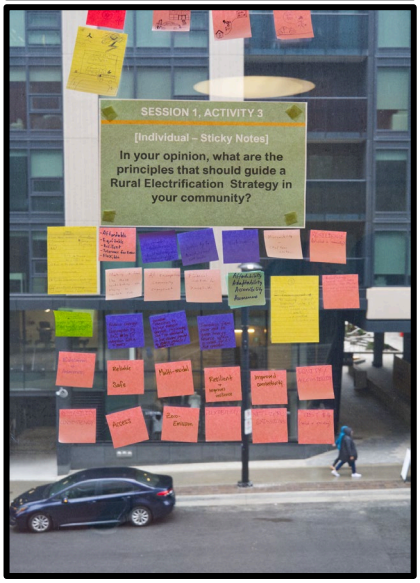
3. Photo Gallery

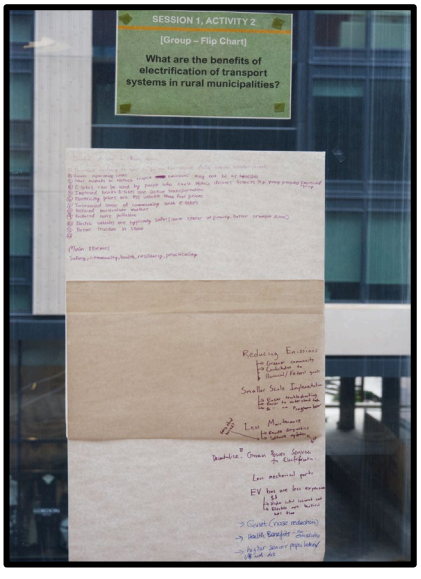

NS Strategies for Electric Public Transportation
Urban
Electrifying municipal fleets, including vehicles, buses, and ferries.
Support micro-mobility
Rural

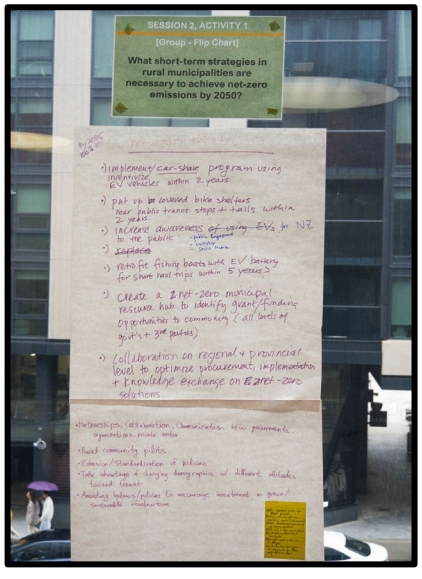


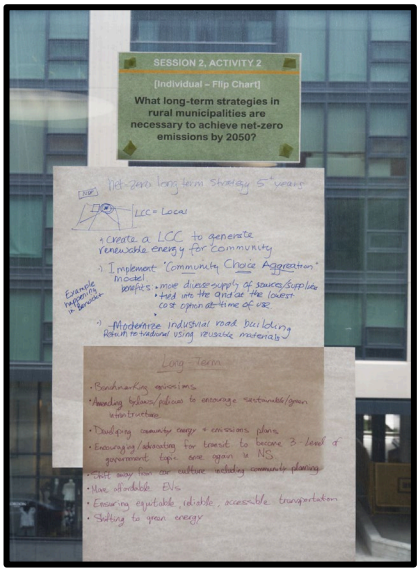

SESSION 1, ACTIVITY 3
[Individual – Sticky Notes]
In your opinion, what are the principles that should guide a Rural Electrification Strategy in your community?


SESSION 1, ACTIVITY 1
[Individual – Sticky Notes]
Draw a picture of yourself driving, charging, or watching an electric vehicle in your community.


SESSION 1, ACTIVITY 3
[Individual – Sticky Notes]
In your opinion, what are the principles that should guide a Rural Electrification Strategy in your community?


SESSION 1, ACTIVITY 2
[Group – Flip Chart]
What are the benefits of electrification of transport systems in rural municipalities?


SESSION 2, ACTIVITY 1
[Group - Flip Chart]
What short-term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?


SESSION 2, ACTIVITY 2
[Individual – Flip Chart]
What long-term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?

APPENDIX D - YARMOUTH WORKSHOP, JULY 2025

1. Summary of Findings

Community-Based Electrification Strategy

Vision Statement

To advance a practical and inclusive transition toward transportation electrification in Yarmouth and surrounding rural municipalities by building local partnerships, improving charging accessibility, and ensuring that electrified mobility solutions are affordable, reliable, and sustainable. This transition aims to reduce emissions, enhance regional connectivity, and strengthen community resilience while aligning with Nova Scotia's 2050 net-zero goals.

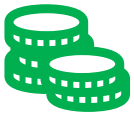
Benefits Identified for the Community

Environmental

- Reduces greenhouse gas and air pollutant emissions, contributing to cleaner air and lower regional carbon footprint
- Decreases noise pollution from transportation, improving quality of life in residential and downtown areas
- Supports the use of clean, renewable energy sources to power vehicles and charging infrastructure.

Economic

- Offers long-term cost savings for both residents and municipalities through reduced fuel and maintenance costs
- Stabilizes operating budgets by lowering exposure to fluctuating fuel prices
- Creates opportunities for local trades, renewable energy suppliers, and clean-technology businesses

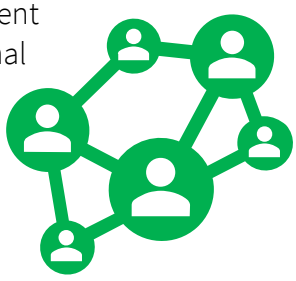


Social & Community

- Enhances accessibility through smaller electric mobility options (e-bikes, scooters, golf carts) that do not require driver's licenses
- Demonstrates municipal leadership and commitment to sustainability, strengthening public trust and community pride
- This makes rural communities more attractive to new residents and businesses, contributing to local economic revitalization

Institutional & Regional

- Encourages collaboration among municipalities, provincial agencies, and utilities to share costs and technical expertise
- Supports development of integrated, regional transit and charging networks across Southwest Nova Scotia



Action Items

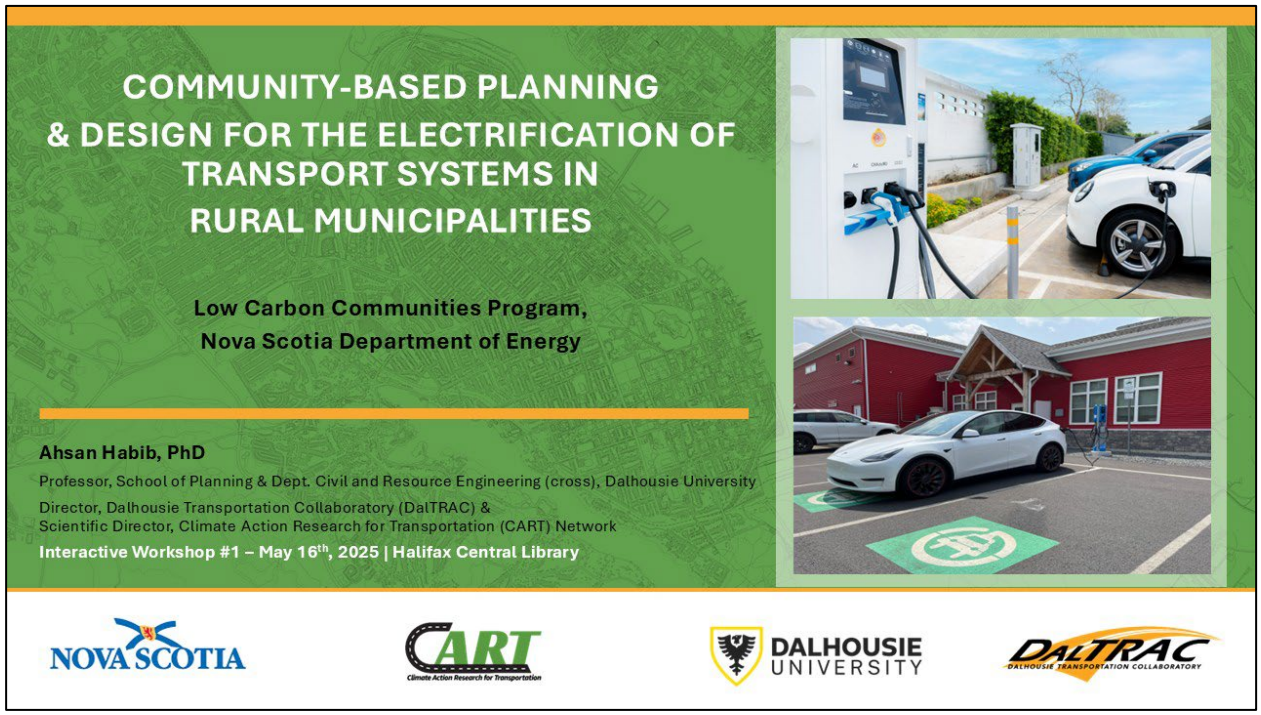
Short-Term Strategies (0-5 Years)

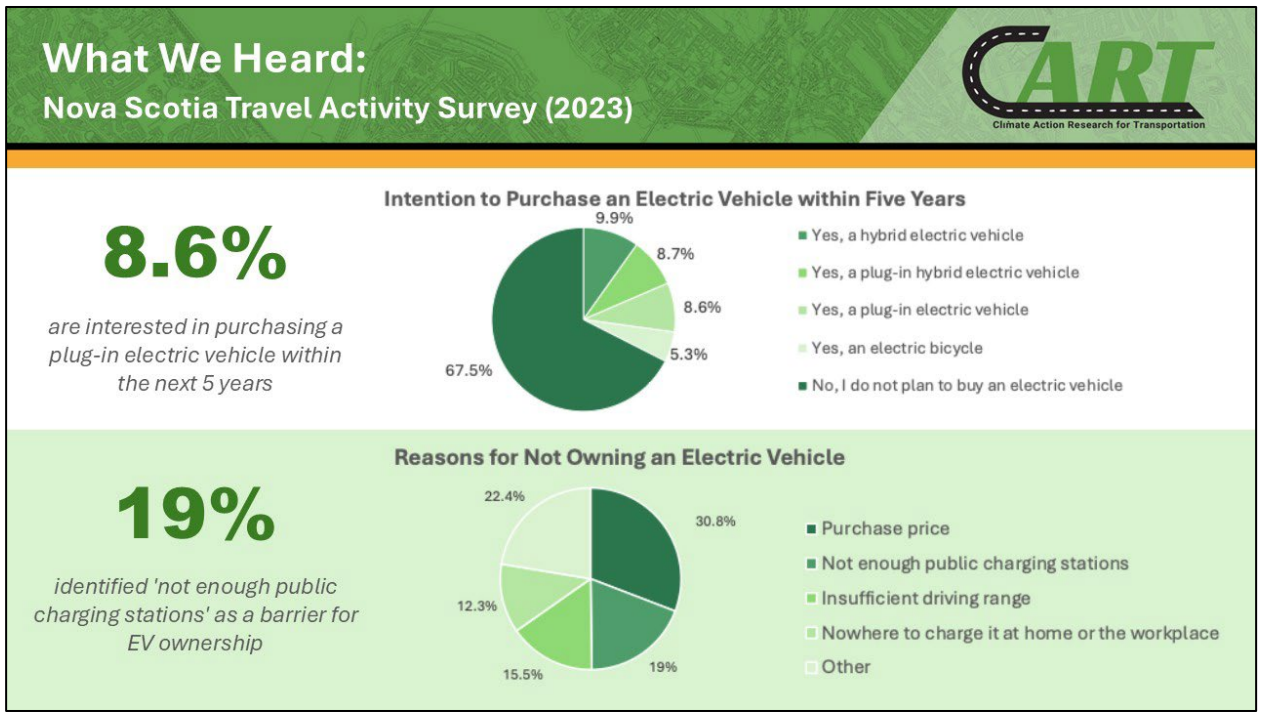
- Conduct EV Infrastructure Assessment: Identify priority charging locations (e.g., municipal buildings, ferry terminals, community hubs) and assess grid capacity in collaboration with Nova Scotia Power
- Repurpose Existing Sites: Explore brownfield and municipal properties for conversion into charging and fleet facilities to minimize new land use and costs
- Pilot Municipal Fleet Electrification: Begin gradual transition of light-duty municipal vehicles, supported by federal and provincial funding programs
- Public–Private Partnerships: Collaborate with local businesses, developers, and utilities to co-fund and maintain charging infrastructure
- Community Awareness and Engagement: Launch campaigns to share information on EV incentives, cost savings, and charging options, while addressing skepticism about electrification in rural contexts
- Feasibility and Cost Studies: Evaluate total cost of ownership and payback for electrification projects to ensure financial viability
- Establish the RESAlliance Working Group: Strengthen collaboration among municipalities to coordinate procurement, share best practices, and pursue joint funding opportunities

Long-Term Strategies (5-15 Years)

- Expand Charging Network: Develop a network of chargers across key regional corridors and tourism destinations, including partnerships with adjacent municipalities
- Electrify Transit Services: Work toward electrifying local and intermunicipal bus routes, beginning with pilot programs supported by the province
- Create a Provincial Procurement and Standards Framework: Advocate for standardized EV and charger specifications to streamline procurement and vehicle sharing among rural municipalities
- Integrate Renewable Energy Sources: Pair charging stations with solar or small-scale renewable power generation to reduce grid strain and enhance energy independence
- Workforce Development: Provide training opportunities for local electricians, fleet managers, and maintenance staff in EV and charging technologies
- Monitor and Report Progress: Establish measurable benchmarks (e.g., % of fleet electrified, number of chargers installed, GHG reductions) and regularly communicate outcomes to stakeholders
- Incorporate Electrification in Municipal Planning: Embed EV infrastructure and fleet transition goals in municipal transportation and climate action plans

2. Workshop Slide Deck





What We Heard:
Community Partners & Stakeholders (Nov 2023/June 2024)

CART Climate Action Research for Transportation

EV challenges:

- Lack of 'electrification strategies' and guidelines thereof
- Reliability of charging stations; Responsibility – Who should own chargers and maintain them? Location – Where should chargers be located? Communication with public– Where they are located and how to use them?
- Availability between rural communities
- What are the strategies for public transport, given supply chain issues?

Interesting/Key Ideas:

- What are the critical strategies to promote EV in rural municipalities? How do we integrate newer transport infrastructure with surrounding built environment in rural communities?
- How to design EV charging infrastructure to promote local economy, tourism?

chargehub.com

Project Overview

CART Climate Action Research for Transportation

Project Goal & Objectives

Co-develop community-based strategy template and design frameworks to help electrify transport systems across rural Nova Scotian communities.

Objective #1	Objective #2	Objective #3
Co-develop a "strategy template" for electrification of transportation systems in rural municipalities including public transportation	Develop micro-level design concepts to plan, design and locate public charging stations for specific communities of interest (e.g. Town of Yarmouth)	Generate shareable knowledge for communities in Nova Scotia

Community Transportation Network – Connecting Nova Scotians; Ecology Action Centre; JRTA Joint Regional Transportation Agency; Municipality of the County of Antigonish; Town of Amherst Nova Scotia; Clean Foundation; Yarmouth On the Edge of Everywhere / Partout, à partir d'ici

Project Overview

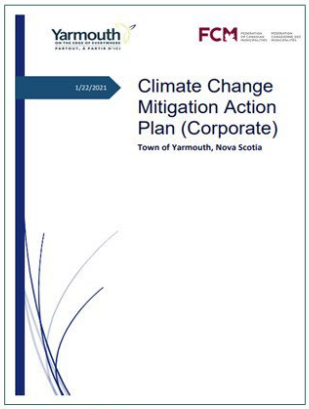
Project Process

Research & Planning

- Review of plans, strategy and design documents across Canada
- Multiple case studies to help create strategies and a design framework

Workshops/Focus Groups

- We will conduct up to three stakeholder workshops/focus groups at Dalhousie University and in partner communities



Sample of Plans Mentioning EVs in Rural NS

- County of Kings' *Strategic Plan*
- Town of Yarmouth's *Climate Change Mitigation Action Plan (Corporate)*

Canadian Strategies to Support EVs

	Ontario	British Columbia

Entire Province	• **Funding to Increase EV Charging Stations**
	  o EVCharge ON Program
	• **Access to High Occupancy Lanes** (via green license plate) regardless of the number of passengers
		• **Funding to Increase EV Charging Stations**
		  o Clean BC Go Electric Public Charger Program
		• **Access to High Occupancy Lanes** (via vehicle decal) regardless of the number of passengers
		• **Rebates** for passenger vehicle, fleets, heavy duty vehicles, and e-bikes

Urban	• **Electrify Municipal Fleets (blend of EV+ hybrid)**
	  o E.g. Hybrid + EVs in Toronto and Waterloo
	• **Electrify Public Transportation**
	  o E.g. 60 e-buses in Toronto
	• **Increase EV Chargers on City-Owned Land**
	  o E.g. Toronto and Ottawa support this approach
		• **Electrify Municipal Fleets (blend of EV + hybrid)**
		  o E.g. Hybrid + EV fleets in Vancouver and Victoria
		• **Electrify Public Transportation**
		  o E.g. 15 electric buses in Vancouver
		• **Increase EV Chargers on City-Owned Land**
		  o E.g. Vancouver and Nanaimo support this approach

Rural	• **Creating a Network of EV stations**
	  o E.g. 12 EV charging stations (Level 2 + 3 chargers) to be built in the Owen Sound region
		• **Creating a Network of EV stations**
		  o E.g. 3 regional districts around Kootenay added 40 Level 2 chargers

NS Strategies for EV Chargers

CART
Climate Action Research for Transportation

Urban

- Extensive network of public Level 2 & Level 3 in city centres. These chargers are often found in community centres and parking lots

Level 2 EV Chargers in the Halifax Seaport Parking Lot

Rural

- Fewer charging stations, but there is a growing network along highways and near community hubs

Level 2 EV Charger at Mahone Bay's Fire Hall

NS Strategies for Electric Public Transportation

CART
Climate Action Research for Transportation

Urban

- Electrifying municipal fleets, including vehicles, buses, and ferries.
- Support micro-mobility
  (e.g. a two-year pilot project for shared e-bikes and scooters is launching in May 2025)

HRM EV Bus (Healy, 2024)

Rural

- Electrify municipal fleets. For regions with public transportation, some municipalities are beginning to electrify their public buses

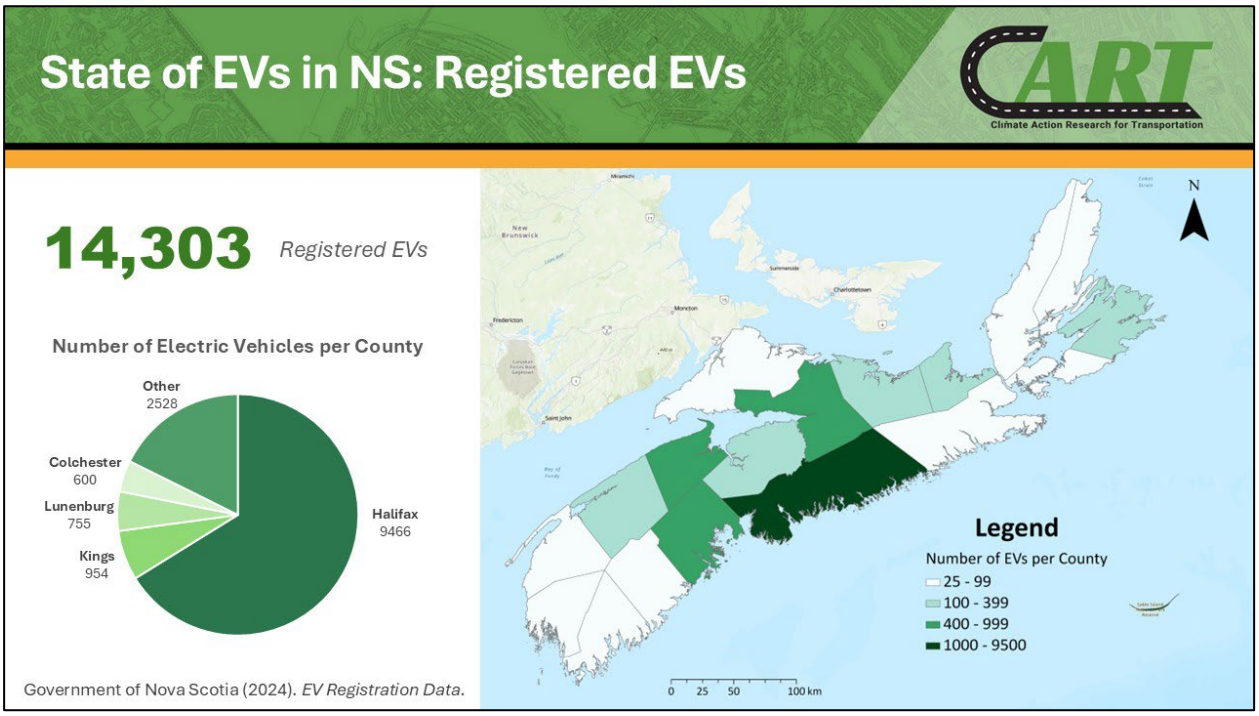
The governments of Canada, Nova Scotia and Cape Breton Regional Municipality invest in a greener transit facility and new electric buses

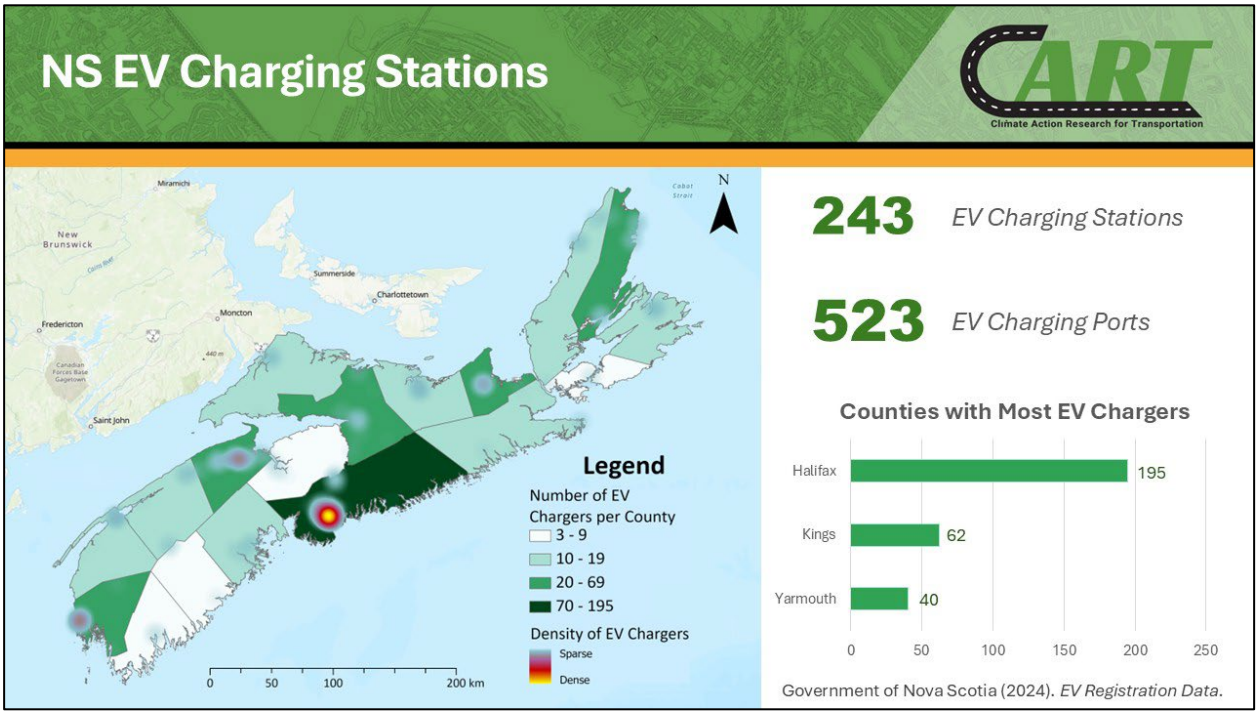
From: Housing, Infrastructure and Communities Canada

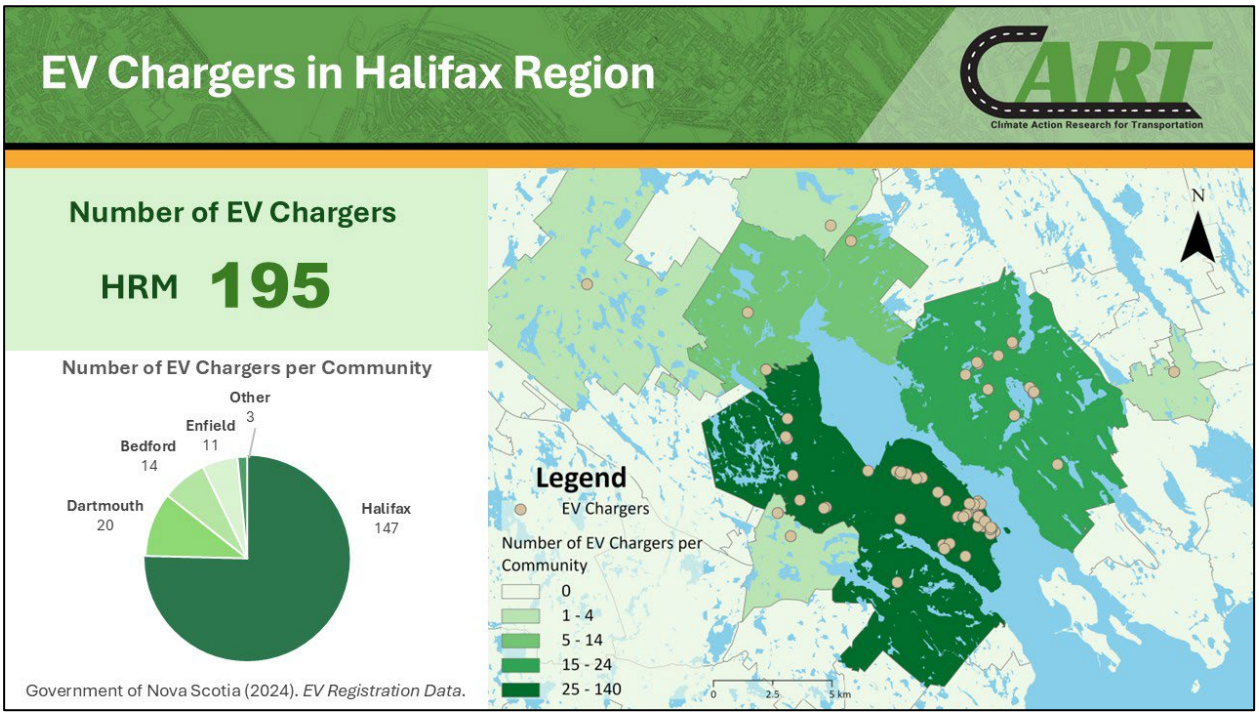
News release

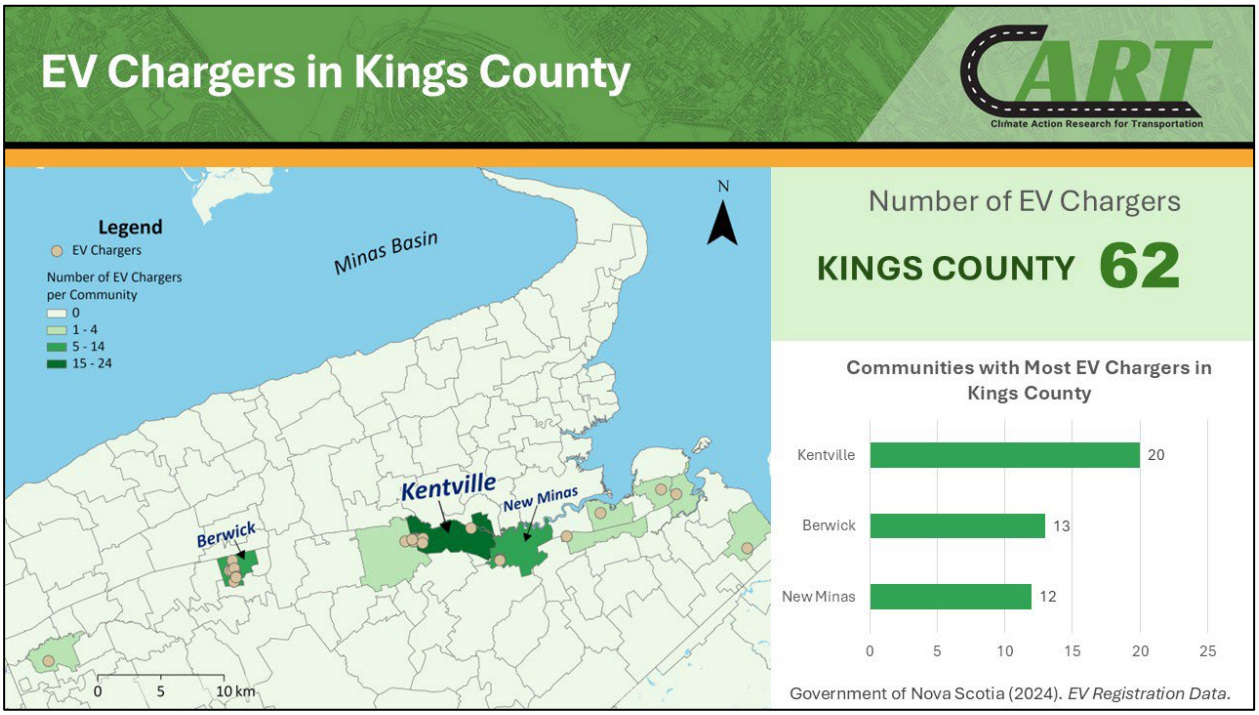
Sydney, Nova Scotia, November 15, 2023 — Transit Cape Breton will have new electric buses and an upgraded bus maintenance facility thanks to the combined investment of $54 million from the Governments of Canada, Nova Scotia and Cape Breton Regional Municipality.

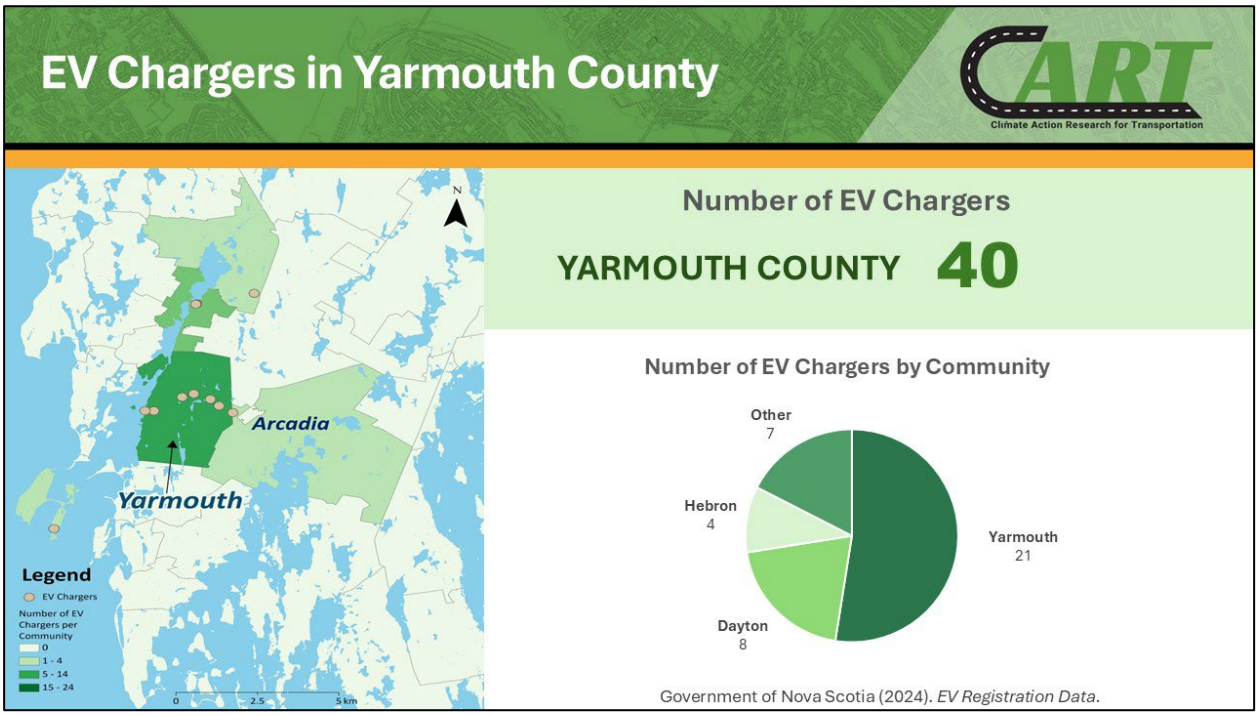
Cape Breton has purchased 6 electric buses (Government of Canada, 2023)

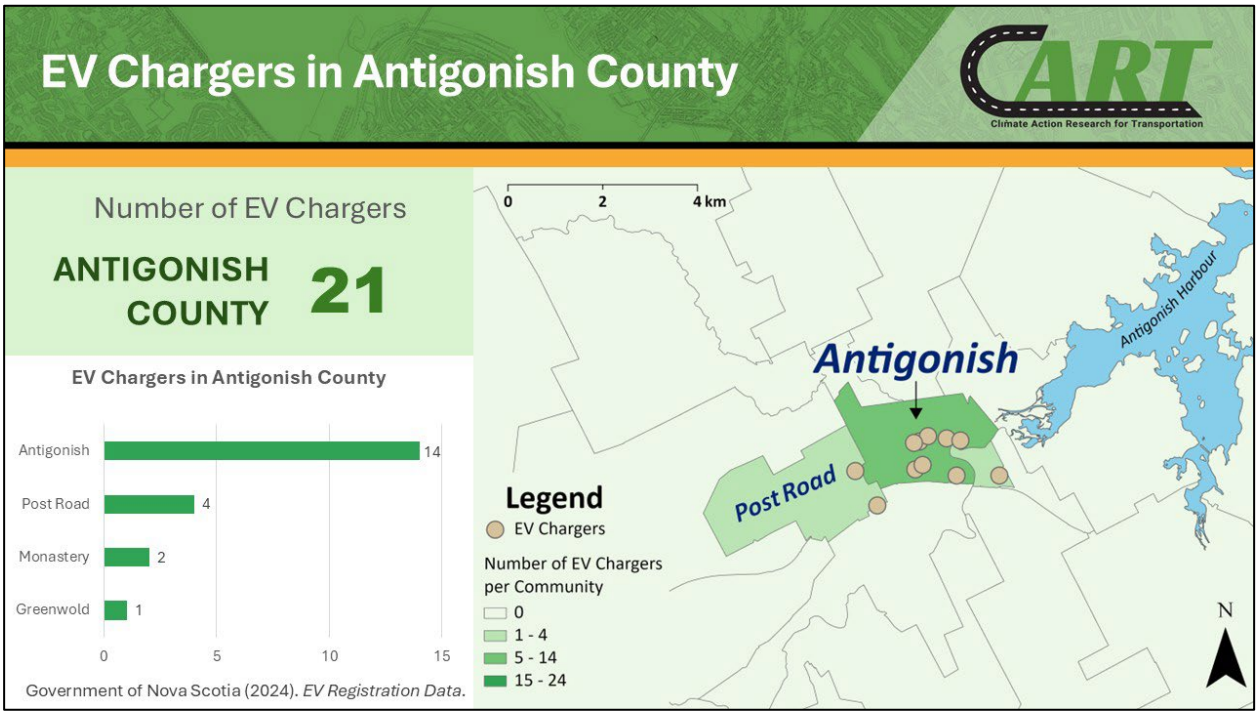

State of EVs in NS: Registered EVs
CART
Climate Action Research for Transportation
14,303
Registered EVs
Number of Electric Vehicles per County
Other
2528
Colchester
600
Lunenburg
755
Kings
954
Halifax
9466
Government of Nova Scotia (2024). EV Registration Data.
N
Legend
Number of EVs per County
25 - 99
100 - 399
400 - 999
1000 - 9500
0 25 50 100 km


NS EV Charging Stations
CART
Climate Action Research for Transportation
N
Legend
Number of EV Chargers per County
3 - 9
10 - 19
20 - 69
70 - 195
Density of EV Chargers
Sparse
Dense
0 50 100 200 km
243
EV Charging Stations
523
EV Charging Ports
Counties with Most EV Chargers
Halifax
195
Kings
62
Yarmouth
40
0 50 100 150 200 250
Government of Nova Scotia (2024). EV Registration Data.


EV Chargers in Halifax Region
CART
Climate Action Research for Transportation
Number of EV Chargers
HRM 195
Number of EV Chargers per Community
Other 3
Enfield 11
Bedford 14
Dartmouth 20
Halifax 147
Government of Nova Scotia (2024). EV Registration Data.
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
25 - 140
N
0 2.5 5 km


EV Chargers in Kings County
CART
Climate Action Research for Transportation
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
Minas Basin
Kentville
New Minas
Berwick
N
0 5 10 km
Number of EV Chargers
KINGS COUNTY 62
Communities with Most EV Chargers in Kings County
Kentville 20
Berwick 13
New Minas 12
0 5 10 15 20 25
Government of Nova Scotia (2024). EV Registration Data.


EV Chargers in Yarmouth County
CART
Climate Action Research for Transportation
Arcadia
Yarmouth
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
0
2.5
5 km
N
Number of EV Chargers
YARMOUTH COUNTY 40
Number of EV Chargers by Community
Other
7
Hebron
4
Yarmouth
21
Dayton
8
Government of Nova Scotia (2024). EV Registration Data.


EV Chargers in Antigonish County
CART
Climate Action Research for Transportation
Number of EV Chargers
ANTIGONISH COUNTY 21
EV Chargers in Antigonish County
Antigonish
14
Post Road
4
Monastery
2
Greenwold
1
0
5
10
15
Government of Nova Scotia (2024). EV Registration Data.
0
2
4 km
Antigonish
Antigonish Harbour
Post Road
Legend
EV Chargers
Number of EV Chargers per Community
0
1 - 4
5 - 14
15 - 24
N

Workshop Plan

1. **Session #1:**

   How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

   - 2 Individual Activities; 1 Group Activity

   Break with Refreshments (20 min)

2. **Session #2:**

   Laying the Foundation for Community-Based Electrification Strategies (50 minutes)

   - 2 Group Activities; Report back
   - Building the RESAlliance; Workshop Evaluation

Session #1

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

ACTIVITY #1

[INDIVIDUAL] **Draw a picture of yourself driving, charging, or watching an electric vehicle in your community.** (10 minutes)

Session #1

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

ACTIVITY #2

[GROUP] **What are the benefits of electrification of transport systems in rural municipalities?** (20-minute discussion)

Session #1

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities? (45 minutes)

ACTIVITY #3

[INDIVIUDAL] **In your opinion, what are the principles that should guide rural electrification strategies in your community?** (10 minutes)

Break with Refreshments

CART Climate Action Research for Transportation

COMMUNITY-BASED PLANNING & DESIGN FOR THE ELECTRIFICATION OF TRANSPORT SYSTEMS IN RURAL MUNICIPALITIES

Low Carbon Communities Program, Nova Scotia Dept. Energy

Community Transportation Network Connecting Nova Scotians · Ecology Action Centre · Municipality of the County of Antigonish · Foundation Clean · JRTA Joint Regional Transportation Agency · Town of Amherst Nova Scotia · Yarmouth On the Edge of Everywhere Partout, à partir d'ici

Session #2

CART Climate Action Research for Transportation

Laying the Foundation for Community-Based Electrification Strategies
(50 minutes)

ACTIVITY #1

[GROUP] **What short term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?** (10-minute discussion)

Session #2

Laying the Foundation for Community-Based Electrification Strategies
(50 minutes)

ACTIVITY
#2

[GROUP] **What long term strategies in rural municipalities are necessary to achieve net-zero emissions by 2050?** (10-minute discussion, 10-minute reporting of short- and long-term strategies as a group)

Session #2

Laying the Foundation for Community-Based Electrification Strategies
(50 minutes)

ACTIVITY
#3

[INDIVIUDAL] **Building the RESAlliance?** (10 minutes)

THANK YOU

[INDIVIDUALLY] **Please complete the workshop evaluation survey**
(5 minutes)

2. Session Sheet

Workshop #2: Western NS Perspective on Electrification Strategies

SESSION 1:

How Can We Develop Electrification Strategies for Rural Nova Scotia Municipalities?

(40 Minutes)

This session focuses on advancing rural transport electrification strategies by exploring the benefits, guiding principles, and big ideas for Nova Scotia's rural municipalities.

ACTIVITIES:

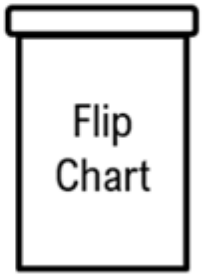
1

[Individual] Draw a picture of yourself driving, charging, riding or watching an electric vehicle in your community.

Use the stick notes provided.

10 minutes

2



[Group] What are the benefits of electrification of transport systems in rural municipalities?

Within your group, discuss and document a summary with bullet points on the provided flip chart sheet.

20-minute discussion

3

[Individual] In your opinion, what are the principles that should guide a Rural Electrification Strategy in your community?

Write keywords on the provided sticky notes and post them under the correct heading on the wall to help build a collective word cloud.

10 minutes

Break with Refreshments
20 minutes

Project funded by Low Carbon Communities, Nova Scotia Department of Energy

Workshop #2: Western NS Perspective on Electrification Strategies

SESSION 2:

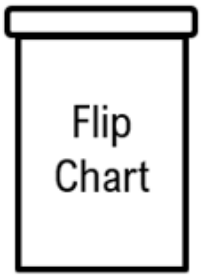
Laying the Foundation for a Community-Based Rural Electrification Strategy (RES)

(55 Minutes)

This session develops short—and long-term strategies rural municipalities can adopt to reach net-zero by 2050.

ACTIVITIES:

1

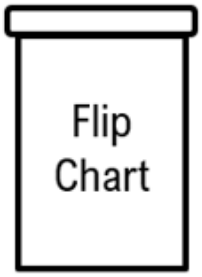


[Group] What short-term/long -term strategies in rural municipalities are necessary to achieve net-zero emissions in transport by 2050?

In your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion
10-minute reporting of strategies to the group

2



[Group] What are the major strategies to electrify bus services and install charging stations in your community?

In your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion
10-minute reporting of strategies to the group

3

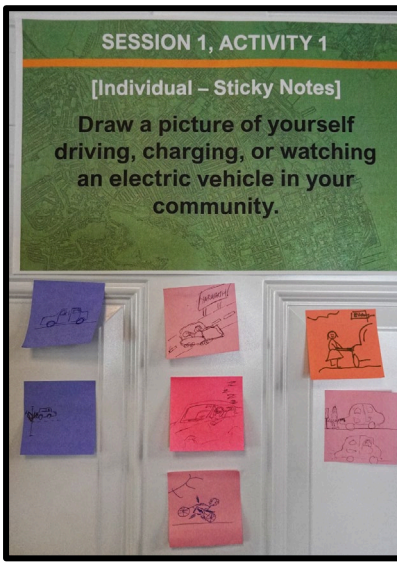
[Group] Building the RESAlliance

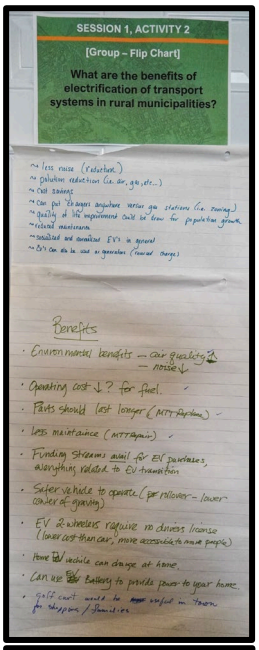
If you would like to join the RESAlliance and participate in this project, please place your name and email address in the correct section of the circle of support.

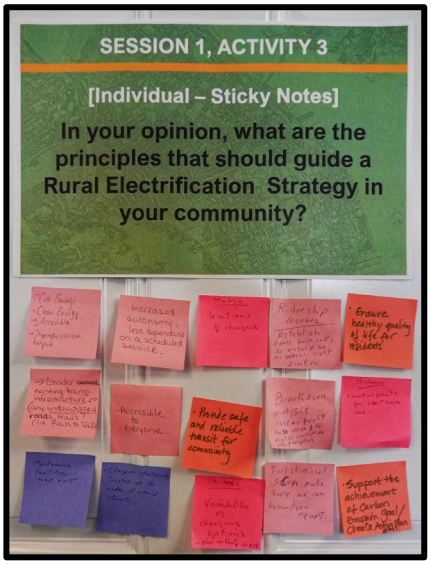
10-minutes

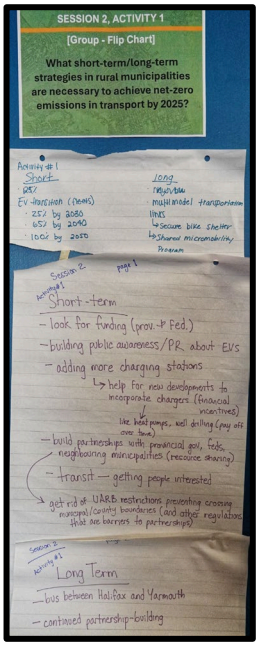
[Individually] Please complete the workshop evaluation survey
5-minutes

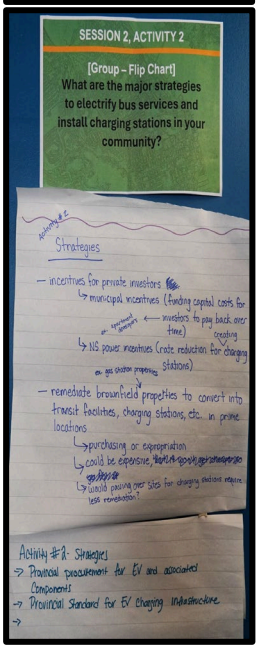
3. Photo Gallery


SESSION 1, ACTIVITY 1
[Individual – Sticky Notes]
Draw a picture of yourself driving, charging, or watching an electric vehicle in your community.


SESSION 1, ACTIVITY 2
[Group – Flip Chart]
What are the benefits of electrification of transport systems in rural municipalities?
Benefits


SESSION 1, ACTIVITY 3
[Individual – Sticky Notes]
In your opinion, what are the principles that should guide a Rural Electrification Strategy in your community?


SESSION 2, ACTIVITY 1
[Group - Flip Chart]
What short-term/long-term strategies in rural municipalities are necessary to achieve net-zero emissions in transport by 2025?
Short-term
Long Term


SESSION 2, ACTIVITY 2
[Group – Flip Chart]
What are the major strategies to electrify bus services and install charging stations in your community?
Strategies

APPENDIX E - COLCHESTER WORKSHOP, NOVEMBER 2025

1. Summary of Findings

Rural Municipal Fleet Electrification Roadmap

Vision Statement

To support a practical, equitable, and phased transition toward transportation electrification in Colchester by improving fleet efficiency, expanding charging infrastructure, and strengthening community resilience. This strategy aims to reduce emissions, lower long-term operational costs, and ensure that electrified mobility solutions enhance service delivery while aligning with Nova Scotia's 2050 net zero goals.

Benefits Identified for the Community

Environmental

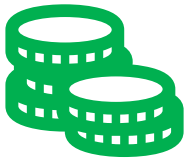
- Reduces greenhouse gas emissions from municipal operations, supporting community and provincial climate goals
- Improves local air quality by lowering tailpipe emissions, benefiting residents and staff
- Decreases noise pollution from municipal vehicles, improving comfort in residential and downtown areas

Institutional & Regional

- Supports right sizing of the municipal fleet and more efficient use of resources.
- Improves fleet management through stronger data tracking and lifecycle planning.
- Helps maintain reliable service delivery by reducing downtime and simplifying maintenance
- Enables collaboration with neighbouring municipalities on shared infrastructure and procurement

Economic

- Lowers long term operating costs through reduced fuel consumption and fewer mechanical repairs
- Provides more predictable budgeting as electricity prices are generally more stable than gasoline and diesel
- Expands eligibility for external funding programs that prioritize low carbon municipal projects
- Creates opportunities for local trades and service providers to develop skills in EV charging and fleet maintenance



Social & Community

- Demonstrates municipal leadership and signals commitment to sustainability
- Improves safety with smoother, quieter vehicles and reduced emissions exposure
- Helps build awareness and public interest in EVs through visible municipal use

Action Items

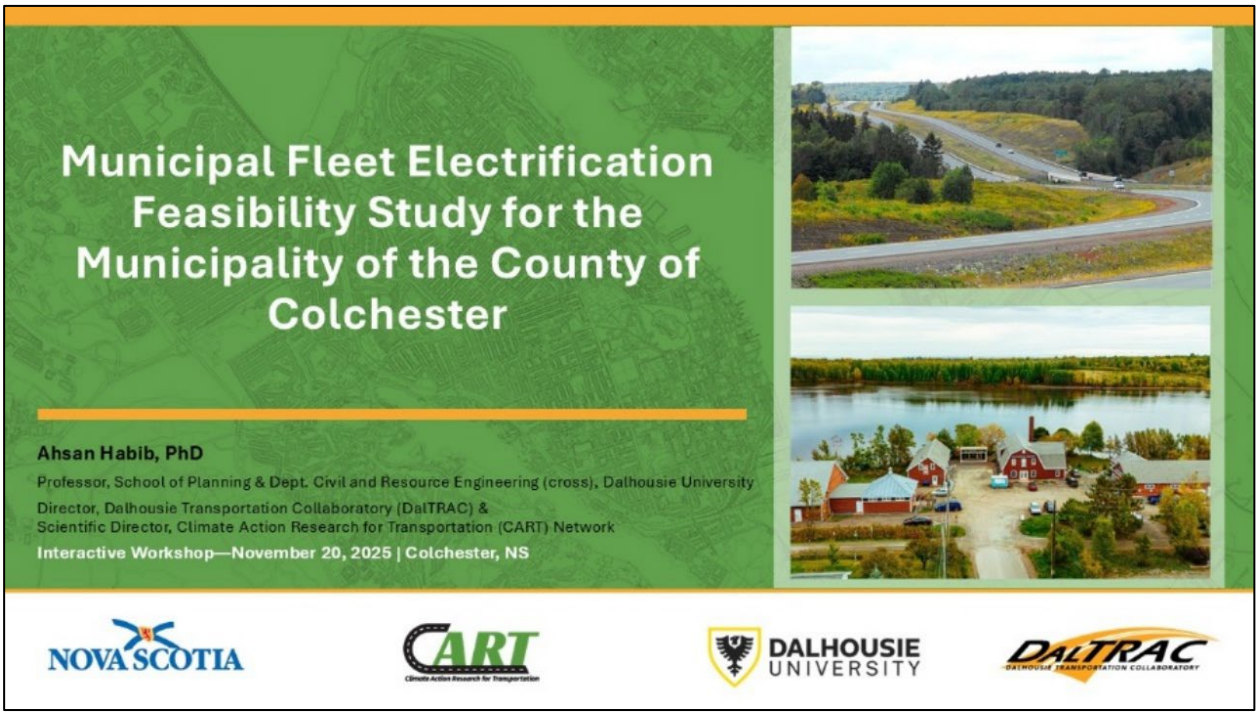
Short-Term Strategies (0-5 Years)

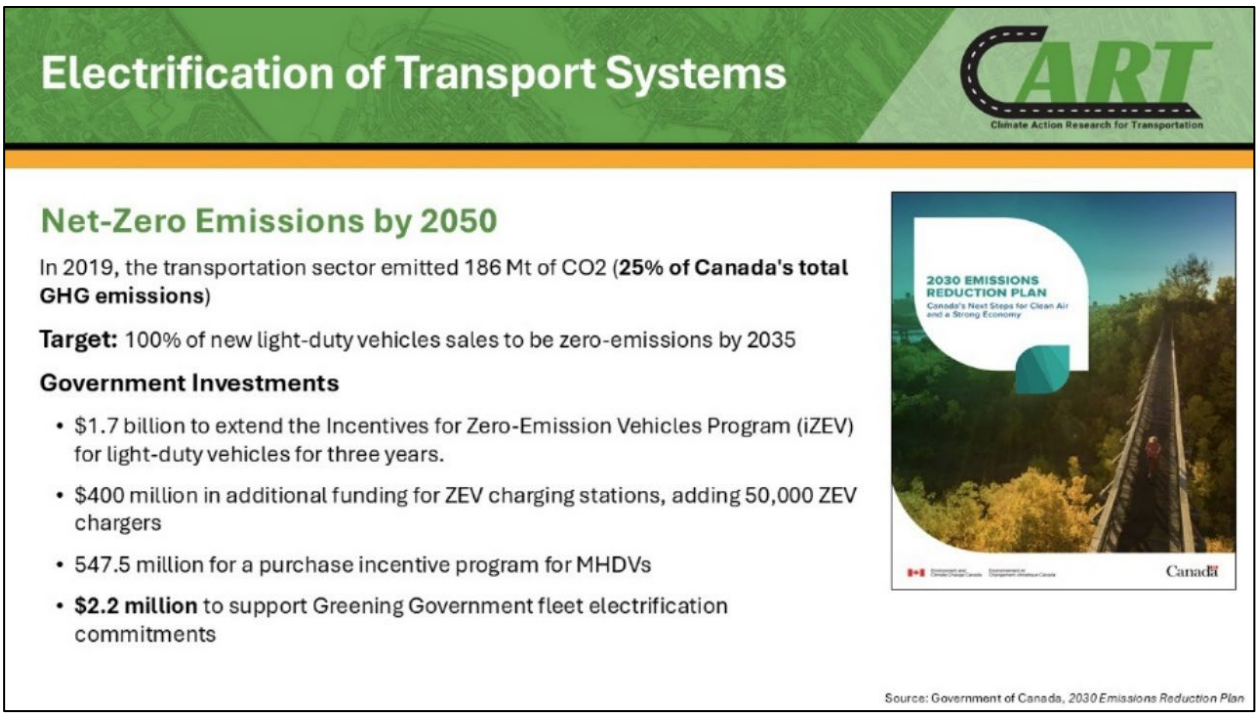
- Conduct an assessment of fleet composition, duty cycles, fuel use, and priority charging locations
- Complete feasibility and cost studies to evaluate total cost of ownership for early fleet transitions
- Install initial Level 2 chargers to build baseline charging capacity and support pilot vehicle deployments
- Repurpose municipal or underused properties, such as brownfield sites, for charging or fleet facilities
- Pilot early fleet transitions by introducing one or two electric models in high-visibility or low-mileage roles, collecting data to inform larger procurement decisions
- Provide EV training and information sessions for municipal staff
- Launch public awareness efforts to share information on EV incentives, operational benefits, and reliability
- Strengthen collaboration through the RESAlliance by coordinating procurement, sharing fleet data, and jointly pursuing funding opportunities
- Work with Nova Scotia Power to evaluate grid capacity at priority sites and begin planning for any required upgrades to support future charging needs

Long-Term Strategies (5-15 Years)

- Transition medium and heavy-duty municipal vehicles as models become available and financially feasible
- Develop a long-term fleet replacement schedule that prioritizes electrification and lifecycle cost efficiency
- Expand the municipal charging network across multiple sites to support broader fleet adoption
- Integrate renewable energy systems, such as solar generation, into municipal charging infrastructure
- Partner with neighbouring municipalities to explore shared charging hubs and regional fleet solutions
- Embed fleet electrification goals into municipal transportation, climate action, and asset management plans
- Expand workforce development opportunities by supporting ongoing training for local electricians, mechanics, planners, and fleet managers in EV technologies and infrastructure
- Track key indicators such as emissions reductions, charger usage, operational savings, and fleet conversion rates
- Maintain transparent communication with council, staff, and residents by publishing regular updates and celebrating key milestones that reflect community progress

2. Workshop Slide Deck





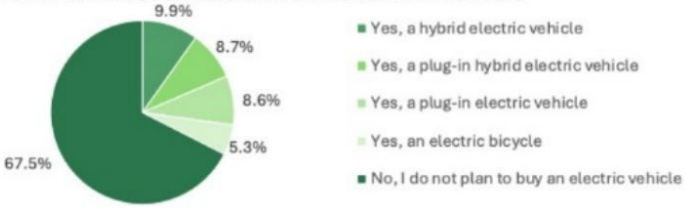
Nova Scotia Travel Activity Survey, 2023

CART
Climate Action Research for Transportation

8.6%

are interested in purchasing a plug-in electric vehicle within the next 5 years

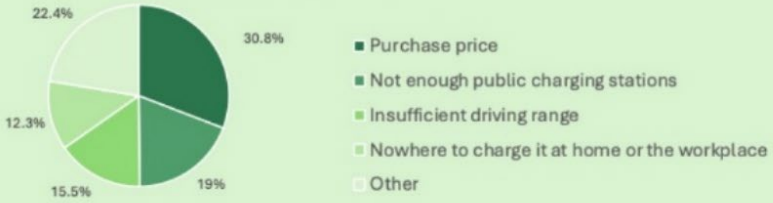
Intention to Purchase an Electric Vehicle within Five Years



19%

identified 'not enough public charging stations' as a barrier for EV ownership

Reasons for Not Owning an Electric Vehicle

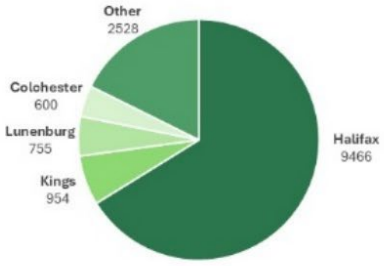


Registered EV in NS

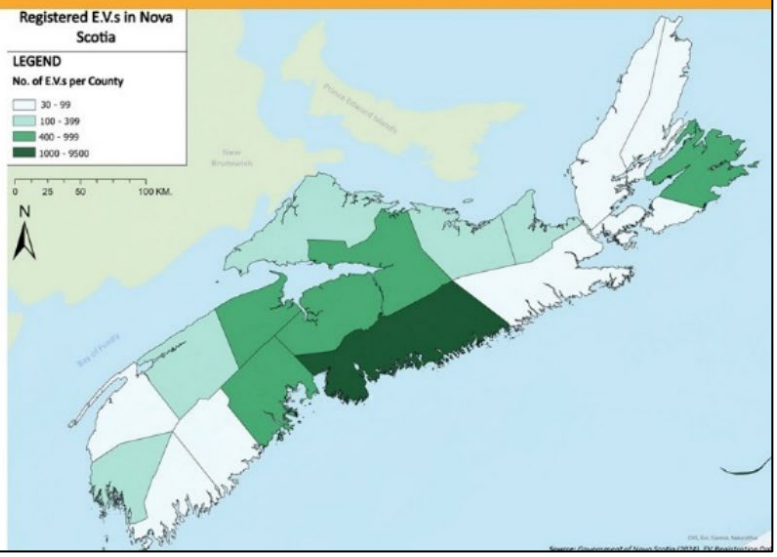
CART
Climate Action Research for Transportation

14,303 *Registered EVs*

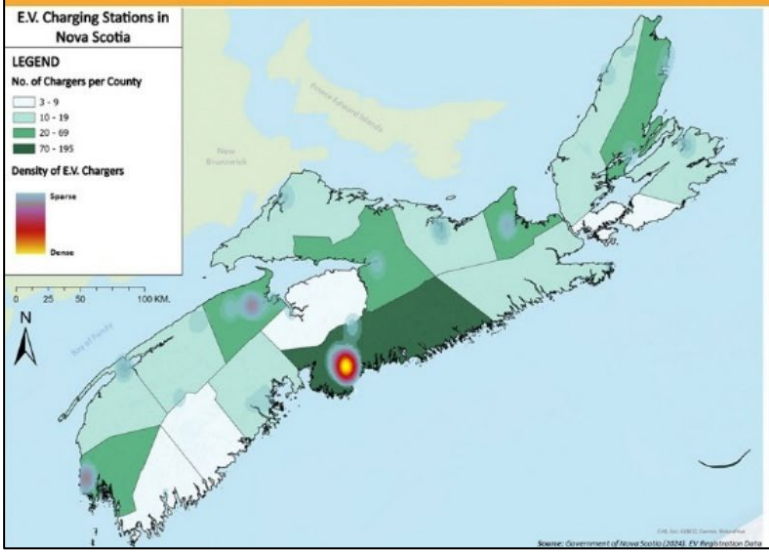
Number of Electric Vehicles per County



Government of Nova Scotia (2024). *EV Registration Data.*



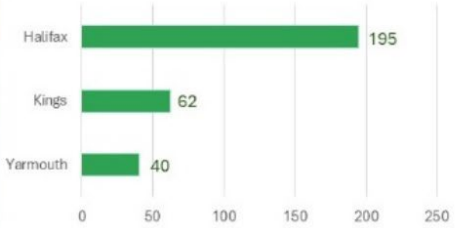
NS EV Charging Stations



243 *EV Charging Stations*

523 *EV Charging Ports*

Counties with Most EV Chargers



Government of Nova Scotia (2024). *EV Registration Data.*

Community Consultation:
Stakeholder Workshop in Halifax (June 2024)

EV Challenges

- Lack of 'electrification strategies' and guidelines thereof
- Reliability of charging stations; Responsibility – Who should own chargers and maintain them? Location – Where should chargers be located? Communication with public– Where they are located and how to use them?
- Availability between rural communities

Interesting/Key Ideas

- What are the critical strategies to promote EV in rural municipalities? How do we integrate newer transport infrastructure with surrounding built environment in rural communities?
- How to design EV charging infrastructure to promote local economy, tourism?

Community Consultation:
Stakeholder Workshop in Yarmouth (July 2025)

CART
Climate Action Research for Transportation

EV Challenges

- Financial constraints in smaller municipalities. Local governments with limited budgets often lack the capital to fund large-scale EV infrastructure
- Access to reliable and widespread charging networks to ensure long-distance travel and rural adoption
- High upfront costs and extended return-on-investment timelines discourage adoption, particularly among low-income households

Interesting/Key Ideas

- Strengthen programs that reduce upfront costs of greener vehicles through subsidies, tax breaks, and government assistance
- Foster partnerships with neighbouring municipalities to coordinate electrification efforts and support long-term community-wide improvements

Municipal Fleet Electrification

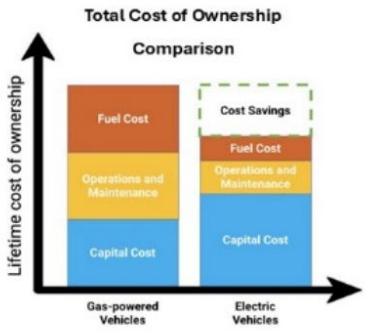
CART
Climate Action Research for Transportation

Technology Improvement

- Advancing technology and lower costs
  - **Battery improvements** have significantly increased travel range, with EVs now capable of over 400km on a single charge (**3 times more** from 2011)
  - Automakers are rapidly expanding EV offerings, introducing new light-, medium-, and heavy-duty models each year to meet diverse fleet needs

Financial Savings

- While upfront costs remain higher, EVs deliver substantial **long-term savings**, with fueling and maintenance costs up to **50% lower** than gas-powered vehicles.
  - Up to **68%** reduction in fuel costs
  - Up to **37%** reduction in maintenance costs



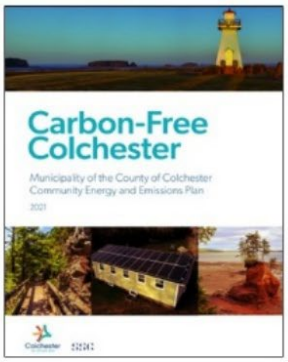
mayorsinnovation.org

Carbon-Free Colchester

Path to Net-Zero Emission by 2050

Goal: Transition to renewable energy and reduce municipal greenhouse gas emissions

Why: Transportation is Colchester's **2nd largest emitter (22%)**



Transportation Actions

- Through improved vehicle efficiency and electrification
- Municipal fleet 100% electric by 2035
- All on-road vehicles electric/zero-emissions by 2040
- 70% of off-road vehicles electric by 2040

By 2040, cumulative savings will significantly outweigh the cost – delivering over $2.23 billion in net benefits.

Colchester Feasibility Study – Work Plan

Project Goals & Objectives

Objective: To conduct a feasibility study for electrifying the municipal fleet of Colchester

1. Jurisdictional Scan
Conduct a jurisdictional scan and best practice analysis for municipal fleet electrification projects across North America

2. Stakeholder Workshop
Engage with stakeholders to identify benefits, challenges and opportunities for municipal fleet electrification in the Municipality of the County of Colchester.

3. Municipal Fleet Inventory Assessment
Establish baseline conditions and assess Colchester's current municipal fleet inventory, including the type and number of vehicles, vehicle conditions, usage, fuel consumption, and GHG emissions.

4. Technical & Financial Feasibility Assessment
Assess the technical and financial feasibility, as well as the environmental, social and economic impacts of fleet electrification in the Municipality of the County of Colchester.

5. Municipal Fleet Conversion Recommendations
Recommend a possible fleet conversion strategy, including downsizing/rightsizing and electrified fleet and charging infrastructure to support the needs of the Municipality of the County of Colchester.

Fleet Electrification – Technical Considerations

Criteria	Questions to Consider	Rules of Thumb
Daily driving needs (range, size)	Are viable electric models available?	Vehicles driving less than ~250 km per day are easier to electrify given commonly available battery sizes.
Duty cycle/charging windows	Will AC charging suffice? Can vehicles share chargers?	Windows of 8-plus hours help enable lower-power charging feasibility, sharing of chargers, and cost savings.
Parking location and charging access	Is it easy to charge during off hours?	Vehicles parked in dedicated garage or lot are much easier to provide with charging.
Special requirements	Is the vehicle used for pursuit or medical response?	Operational requirements for these vehicles generally make them a lower priority for electrification.
Replacement schedule	How many years until retirement of existing vehicles?	Vehicles at or near retirement age can be replaced with lower sunk costs and/or limited resale concerns.
Fuel and Maintenance	Is there an opportunity to replace the biggest gas guzzlers?	Electrifying the least efficient ICE vehicles provides the largest fuel savings.

mayorsinnovation.org

Case Studies – Fleet Electrification

Tucson, AZ

Population: 542,630

Targets

- Transition 100% of the city light-duty vehicle fleet to electric by 2030
- Increase stock of zero emissions battery powered transit to 90% by 2030

Actions

- 5 electric buses, 44 hybrid fleet vehicles, 2 electric fleet vehicles
- Expanding charging network, with more stations along highways
- Rebates for residential EV chargers through Tucson Electric Power

Savings

- Estimated $44 million in savings in Arizona by transitioning to EVs

gillig.com

kvoa.com

Case Studies – Fleet Electrification

Easthampton, MA

Population: 17,508

Target: Net-zero emissions by 2040

Action: Municipal partnership with MoveEV to electrify municipal fleet (122 vehicles). Provide municipal employees with resources to understand EV adoption.

Anticipated Savings

- $360,000 annual savings in municipal fuel spend
- $346,000 annual savings in employee fuel spend
- $13,000,000 annual savings in residential fuel spend

Anticipated GHG Reduced: 600 metric tons of Co2 removed annually

Timeline: 5-10 years

moveEV

Case Studies – Fleet Electrification

Kawartha Lakes, ON

Population: 79,247

Target: Fully electric municipal fleet by 2033

Actions: Replace 116 passenger vehicles, 17 EV (12 electric SUVs and 5 electric vans) 17 EV charging ports

Challenges: Geographical size of municipality and the existing charging station network. Obtaining funding for new EV charging infrastructure and network

Anticipated Savings: $24,781 in annual fuel savings from the Fleet Greening Hydrogen Project

GHG Reduced: 54.78 tonnes of CO_2 emissions removed annually

peterboroughexaminer.com

destinationontario.com

Case Studies – Fleet Electrification

CART
Climate Action Research for Transportation

Saskatoon, SK

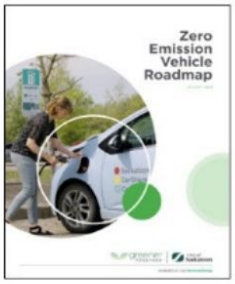
Population: 266,141

Targets:

- 100% electric municipal and transit fleet by 2030
- 30% of all new vehicle sales are electric by 2030 and 90% by 2050
- 50% of all new heavy trucks are zero emissions by 2030, 100% by 2040

Actions: 328 vehicles to be transitioned and replaced from 2026 to 2039

Challenges: Public interest in investment with concerns on cost and limited range. Cold winter climate and battery performance and range.



saskatoon.ca

Case Studies – Fleet Electrification

CART
Climate Action Research for Transportation

County of Kings, NS

Population: 62,914

Target: Reduce GHG emissions of municipal fleet (24 vehicles) by 50%

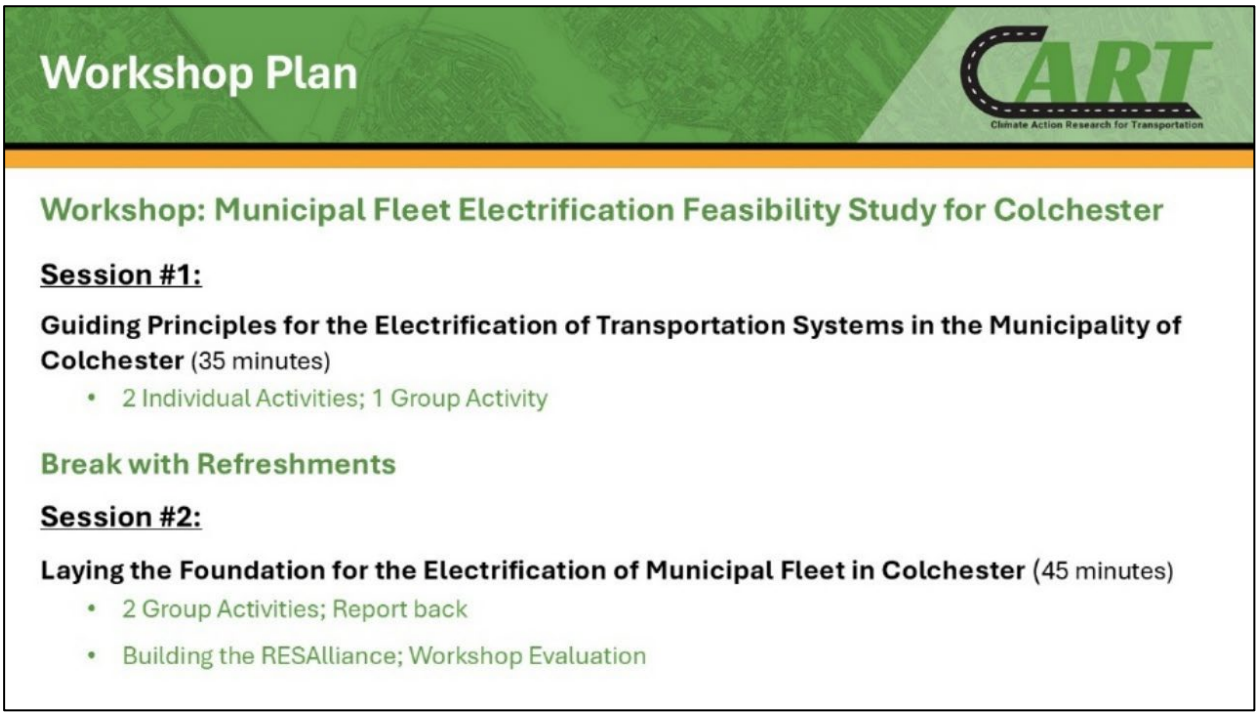
Actions: Six new EV charging stations for municipal and public use implemented in April 2025

Funding: Received funding through the Sustainable Communities Challenge Fund

MUNICIPALITY of the COUNTY of KINGS

countyofkings.ca

news.novascotia.ca


Workshop Plan
CART
Climate Action Research for Transportation
Workshop: Municipal Fleet Electrification Feasibility Study for Colchester
Session #1:
Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester (35 minutes)
• 2 Individual Activities; 1 Group Activity
Break with Refreshments
Session #2:
Laying the Foundation for the Electrification of Municipal Fleet in Colchester (45 minutes)
• 2 Group Activities; Report back
• Building the RESAlliance; Workshop Evaluation


Questions?
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Workshop Plan

Workshop: Municipal Fleet Electrification Feasibility Study for Colchester

Session #1:

Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester (35 minutes)

- 2 Individual Activities; 1 Group Activity

Break with Refreshments

Session #2:

Laying the Foundation for the Electrification of Municipal Fleet in Colchester (45 minutes)

- 2 Group Activities; Report back
- Building the RESAlliance; Workshop Evaluation

Session #1:
Municipal Fleet Electrification Feasibility Study for Colchester

Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester (35 Minutes)

Activity #1:

[Individual] Draw a picture of yourself driving, charging, riding or watching an electric vehicle in your community.

(10 minutes)

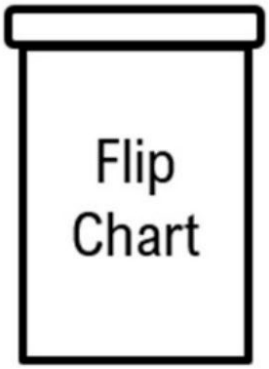
Session #1:
Municipal Fleet Electrification Feasibility Study for Colchester

Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester (35 Minutes)

Activity #2:

[Group] What are the benefits of electrification of the municipal fleet in your community?

(10-minute discussion, 10-minute summary writing)



Session #1:
Municipal Fleet Electrification Feasibility Study for Colchester

Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester (35 Minutes)

Activity #3:

[Individual] In your opinion, what are the guiding principles for the electrification of municipal fleet in your community?

(5 minutes)

Break with Refreshments

Municipal Fleet Electrification Feasibility Study for the Municipality of the County of Colchester

(10 minutes)

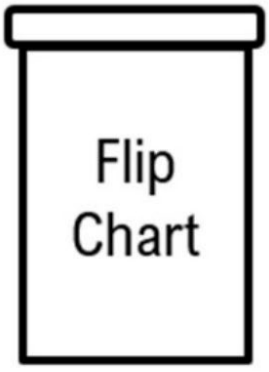
Session #2:
Municipal Fleet Electrification Feasibility Study for Colchester

Laying the Foundation for the Electrification of the Municipal Fleet in Colchester (45 Minutes)

Activity #1:

[Group] What are the challenges of municipal fleet electrification in Colchester?

(10-minute discussion, 10-minute reporting)



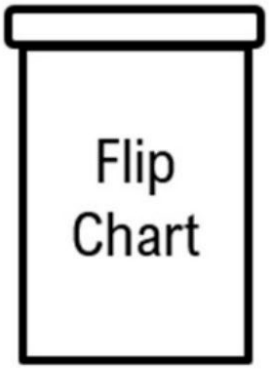
Session #2:
Municipal Fleet Electrification Feasibility Study for Colchester

Laying the Foundation for the Electrification of the Municipal Fleet in Colchester (45 Minutes)

Activity #2:

[Group] How would you plan to electrify your municipal fleet?

(10-minute discussion, 10-minute reporting)



Session #2:
Municipal Fleet Electrification Feasibility Study for Colchester

Laying the Foundation for the Electrification of the Municipal Fleet in Colchester (45 Minutes)

Activity #3:

[Individual] Please complete the workshop evaluation survey

[Group] Building the *RESAlliance*

(5 minutes)


THANK YOU
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2. Session Sheet

Workshop: Municipal Fleet Electrification Feasibility Study for Colchester

SESSION 1:

Guiding Principles for the Electrification of Transportation Systems in the Municipality of Colchester

(35 Minutes)

This session focuses on advancing rural transport electrification strategies by exploring the benefits, guiding principles, and big ideas for Nova Scotia's rural municipalities.

ACTIVITIES:

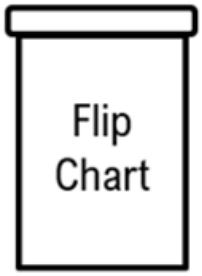
1

[Individual] Draw a picture of yourself driving, charging, riding or watching an electric vehicle in your community.

Use the sticky notes provided.

10 minutes

2



[Group] What are the benefits of electrification of the municipal fleet in your community?

Within your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion
10-minute summary writing

3

[Individual] In your opinion, what are the guiding principles for the electrification of municipal fleet in your community?

Write keywords on the provided sticky notes and post them under the correct heading on the wall to help build a collective word cloud.

5 minutes

Break with Refreshments
10 minutes

1

SESSION 2:

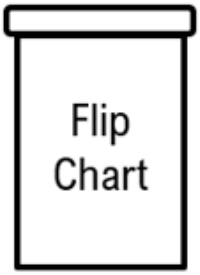
Laying the Foundation for the Electrification of Municipal Fleet in Colchester

(45 Minutes)

This session develops short- and long-term strategies rural municipalities can adopt to reach net-zero by 2050.

ACTIVITIES:

1

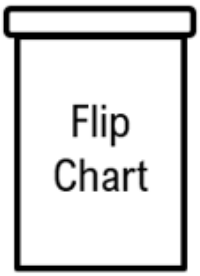


[Group] What are the challenges of municipal fleet electrification in Colchester?

In your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion
10-minute reporting of strategies to the group

2



[Group] How would you plan to electrify your municipal fleet?

In your group, discuss and document a summary with bullet points on the provided flip chart sheet.

10-minute discussion
10-minute reporting of strategies to the group

3

[Individual] Workshop evaluation survey

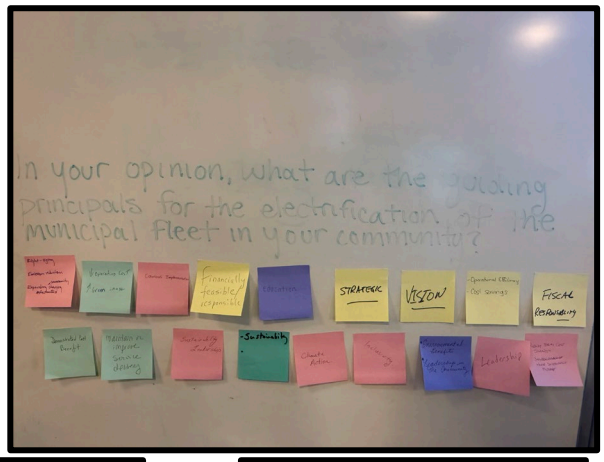
[Group] Building the RESAlliance

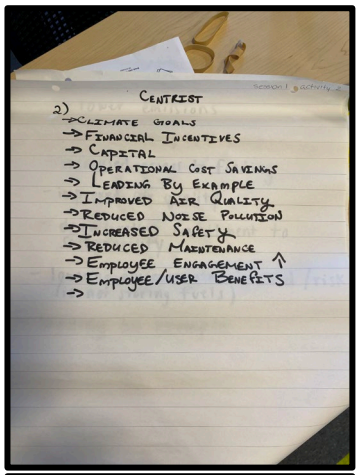
If you would like to join the RESAlliance and participate in this project, please place your name and email address in the correct section of the circle of support.

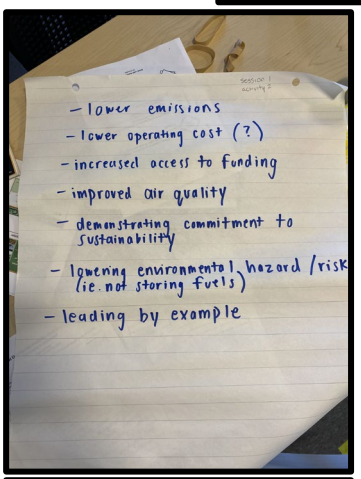
5 minutes

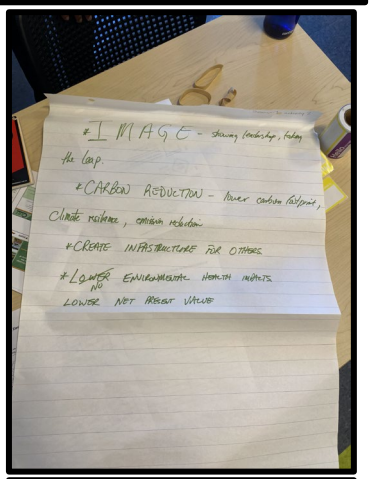
2

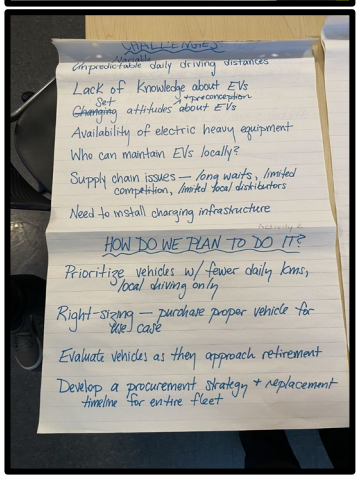
3. Photo Gallery

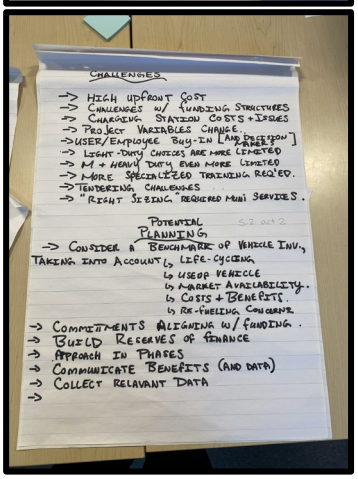

In your opinion, what are the guiding principals for the electrification of the municipal fleet in your community?
STRATEGY
VISION
FISCAL

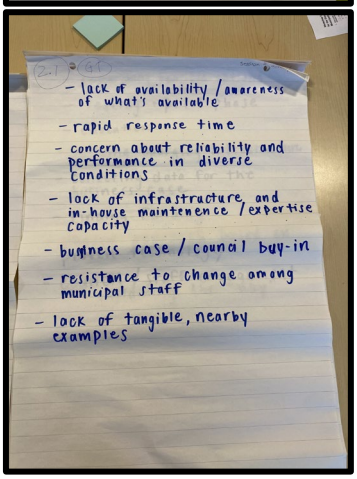

CENTRIST
2)
CLIMATE GOALS
FINANCIAL INCENTIVES
CAPITAL
OPERATIONAL COST SAVINGS
LEADING BY EXAMPLE
IMPROVED AIR QUALITY
REDUCED NOISE POLLUTION
INCREASED SAFETY
REDUCED MAINTENANCE
EMPLOYEE ENGAGEMENT
EMPLOYEE/USER BENEFITS


- lower emissions
- lower operating cost (?)
- increased access to funding
- improved air quality
- demonstrating commitment to sustainability
- lowering environmental hazard/risk (ie. not storing fuels)
- leading by example


#IMAGE - showing leadership, taking the lead.
#CARBON REDUCTION - lower carbon footprint, climate resilience, emission reduction
#CREATE INFRASTRUCTURE FOR OTHERS
#LOWER ENVIRONMENTAL HEALTH IMPACTS
LOWER NET PRESENT VALUE


CHALLENGES
Unpredictable daily driving distances
Lack of knowledge about EVs
Set/preconception
Changing attitudes about EVs
Availability of electric heavy equipment
Who can maintain EVs locally?
Supply chain issues — long waits, limited competition, limited local distributors
Need to install charging infrastructure
HOW DO WE PLAN TO DO IT?
Prioritize vehicles w/ fewer daily kms, local driving only
Right-sizing — purchase proper vehicle for use case
Evaluate vehicles as they approach retirement
Develop a procurement strategy + replacement timeline for entire fleet


CHALLENGES
-> HIGH UPFRONT COST
-> CHALLENGES W/ FUNDING STRUCTURES
-> CHARGING STATION COSTS + ISSUES
-> PROJECT VARIABLES CHANGE.
-> USER/EMPLOYEE BUY-IN [AND PERCEPTION]
-> LIGHT-DUTY CHOICES ARE MORE LIMITED
-> M + HEAVY DUTY EVEN MORE LIMITED
-> MORE SPECIALIZED TRAINING REQ'ED.
-> TENDERING CHALLENGES
-> "RIGHT SIZING" REQUIRED MULTI SERVICES.
POTENTIAL PLANNING
-> CONSIDER A BENCHMARK OF VEHICLE INV., TAKING INTO ACCOUNT,
↳ LIFE-CYCLING
↳ USE OF VEHICLE
↳ MARKET AVAILABILITY.
↳ COSTS + BENEFITS.
↳ RE-FUELING CONCERNS
-> COMMITMENTS ALIGNING W/ FUNDING.
-> BUILD RESERVES OF FINANCE
-> APPROACH IN PHASES
-> COMMUNICATE BENEFITS (AND DATA)
-> COLLECT RELAVANT DATA


- lack of availability / awareness of what's available
- rapid response time
- concern about reliability and performance in diverse conditions
- lack of infrastructure and in-house maintenence / expertise capacity
- business case / council buy-in
- resistance to change among municipal staff
- lack of tangible, nearby examples

APPENDIX F – WORKSHOP EVALUATIONS

1. Summary of Findings

All three workshops concluded with an anonymous evaluation form to gather participant feedback. Across all workshops, 23 participants completed the evaluations.

Question 1 (Halifax and Yarmouth only): Were you aware of the CART (Climate Action Research for Transportation) Network prior to this workshop?

The purpose of this question was to gauge participants' familiarity with the (CART Network), a university-government collaboration established by DalTRAC in partnership with multiple universities and municipalities across the country. Participants were provided with the following response options:

A. Yes, I was aware of this.
B. No, I was not aware of this.

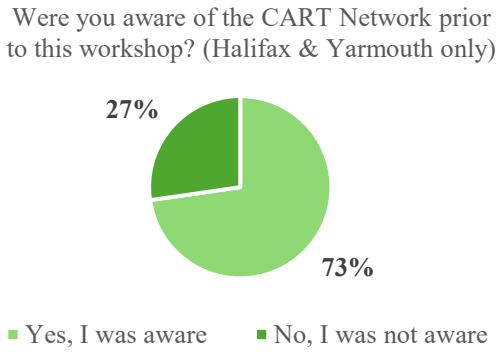


Figure 1. Question 1 Survey Response

73% of participants had heard of the CART Network prior to attending the workshop, while 27% had not.

Question 1 (Colchester) + Question 2 (Halifax and Yarmouth): Prior to this workshop, were you aware of the challenges and opportunities related to transport electrification in rural communities?

The purpose of this question was to gain a clearer understanding of participants knowledge regarding the impacts of transportation electrification. Participants were provided with the following options:

A. Yes, and I have considered strategies to support electrification.
B. Yes, but I have not considered strategies to support electrification.
C. No, I was not aware of these issues.
D. Not applicable.

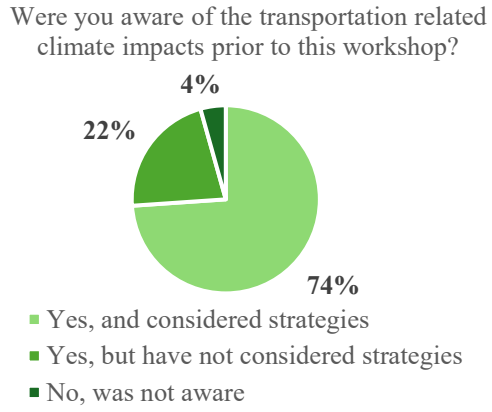


Figure 2. Question 1 & 2 Survey Response

Results indicate strong awareness and engagement among participants. Overall, 96% of participants reported being aware of transportation electrification challenges and opportunities in rural communities prior to the workshop. Of these, 74% had already considered strategies to support electrification, while 22% were aware

but had not yet explored strategies. Only 4% of participants was not aware of these issues before attending the workshop.

Question 2 (Colchester only): In your opinion, what should be the vehicle fleet composition in your municipality by 2030?

This question aimed to capture participants' views on the most appropriate mix of vehicle types for their municipality by 2030, helping to identify expectations and priorities for fleet planning. Participants were asked to choose one of the following:

A. Electric vehicles only.
B. A mix of electric and hybrid vehicles.
C. A mix of electric/hybrid and conventional/gas vehicles.
D. Gas/diesel vehicles only.

Most participants (67%) indicated a preference for a mix of electric/hybrid and conventional/gas vehicles. Another 25% preferred a fleet composed of only electric and hybrid vehicles, while 8% believed the fleet should consist exclusively of electric vehicles.

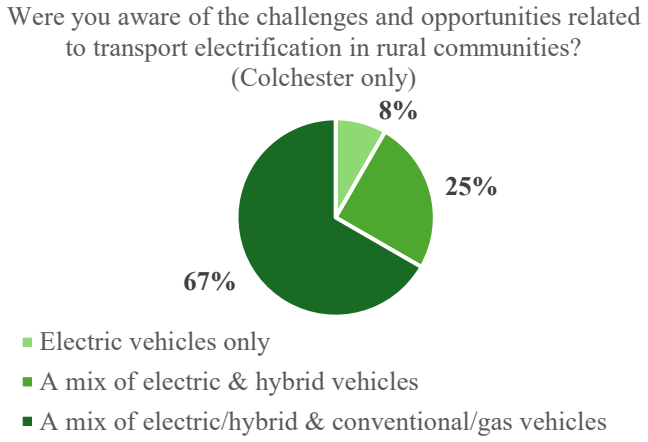


Figure 3. Question 2 Survey Response

Questions 3-7 asked participants to rank their level of agreement on a scale from 1-5, where 1 is strongly disagree and 5 is strongly agree:

Question 3: The workshop content was relevant, comprehensive, and easy to understand.

Overall, participant responses were positive. 57% of participants responded with "strongly agree," 39% responded with "agree," and 4% responded with "neutral." No one disagreed or strongly disagreed.

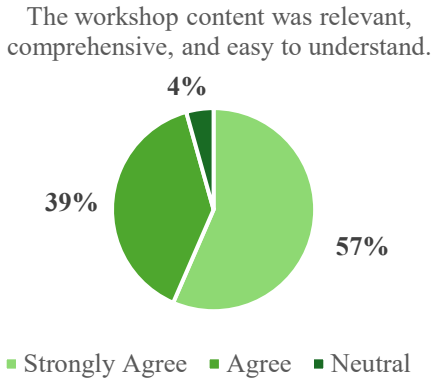


Figure 4. Question 3 Survey Response

Question 4: The activities were useful learning experiences.

Majority of participants found the activities valuable, with 65% responding “strongly agree” and 31% responding “agree.” Only 4% selected “neutral,” and no participants disagreed or strongly disagreed.

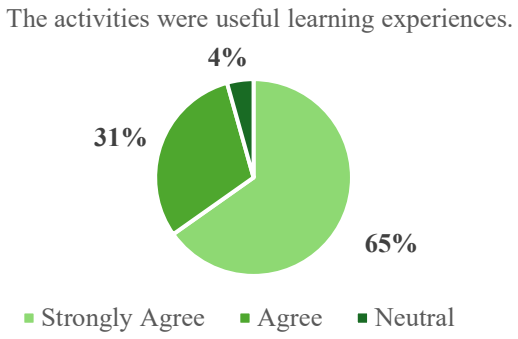


Figure 5. Question 4 Survey Response

Question 5: I plan to share what I learned at this workshop with colleagues or peers in my organization.

All participants agreed to this statement. 57% selected “strongly agree,” while 43% selected “agree.” No one was neutral, disagreed, or strongly disagreed.

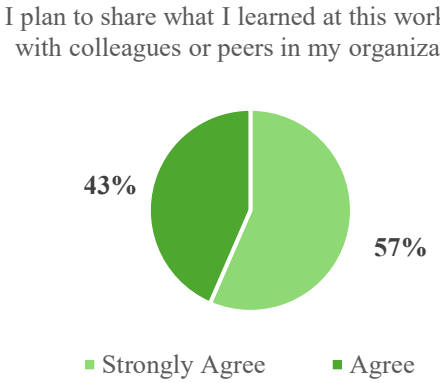


Figure 6. Question 5 Survey Response

Question 6: The workshop met my expectations.

Similar to Question 5, all participants agreed with this statement, with 57% selecting “strongly agree” and 43% selecting “agree.” No one was neutral, disagreed, or strongly disagreed.

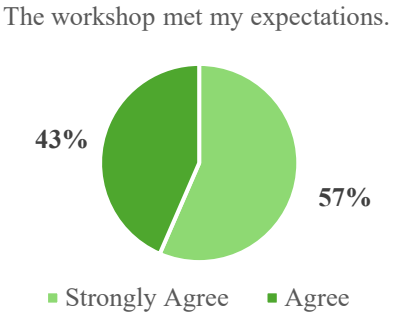


Figure 7. Question 6 Survey Response

Question 7: I am excited to participate in or follow the progress of the RESAlliance.

52% of participants responded with “strongly agree,” 9% responded with “agree,” and 9% responded with “neutral.” No one disagreed or strongly disagreed.

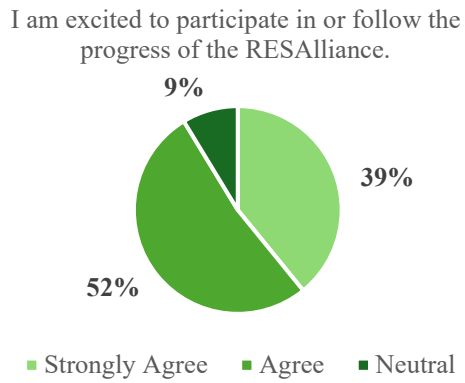


Figure 8. Question 7 Survey Response

Two opened-ended questions (Question 8 and 9) were included to allow participants to share more detailed ideas and perspectives.

Question 8: What did you like best about the workshop?

To analyze participants responses, answers were categorized into the following themes:

Structure: Small group sessions provided opportunities to share ideas and collaborate.

Discussion: Group work expanded on individual activities, encouraging engaging conversations, collaborative learning, and strategy brainstorming based on the activity prompts.

Activities: Interactive activities and questions effectively engaged participants, addressed various challenges, and generated new ideas.

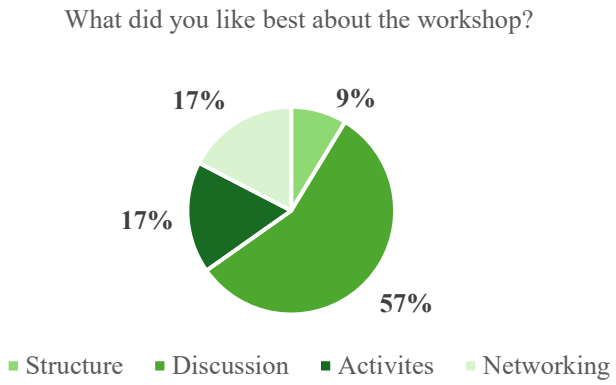


Figure 9. Question 8 Survey Response

Networking: The workshop brought together a variety of stakeholders, allowing participants to hear diverse perspectives and collaborate with municipal staff.

Question 9: What did you like lease about this workshop?

To analyze participants responses, answers were categorized into the following themes:

Nothing: Participants did not identify any feedback for improvement.

Timing: The time of day the workshop was held could be reconsidered.

Groups: Smaller groups remained the same throughout the workshop; mixing groups could allow for more diverse collaboration.

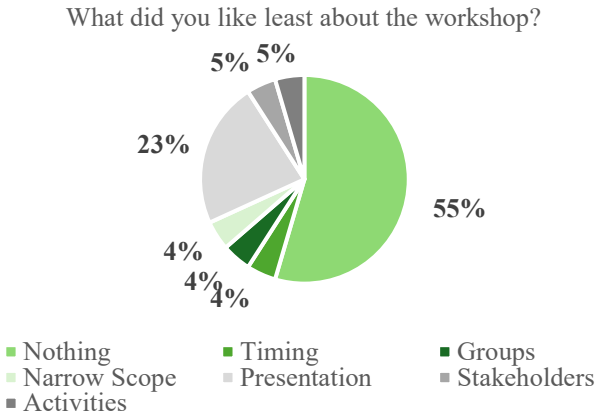


Figure 10. Question 8 Survey Response

Narrow Scope: Suggested for participants to think more broadly about transportation electrification planning.

Presentation: Requests for more local context in the preamble, additional background information on other core initiatives, information on DalTRAC's expertise, more educational context on electrification, and clarification on the distinction between net-zero and transportation-focused topics.

Activities: Participants did not find the picture drawing activity at the beginning helpful.

Stakeholders: Lack of participation from other municipalities and transit organizations.

2. Workshop Evaluation for Halifax and Yarmouth Workshops

Workshop Evaluation: Community-Based Planning & Design for the Electrification of Transport Systems in Rural Municipalities

1. **Were you aware of the CART (Climate Action Research for Transportation) Network prior to this workshop?**
   a. Yes, I was aware of this.
   b. No, I was not aware of this.
2. **Prior to this workshop, were you aware of the challenges and opportunities related to transport electrification in rural communities?**
   a. Yes, and I have considered strategies to support electrification.
   b. Yes, but I have not considered strategies to support electrification.
   c. No, I was not aware of these issues.
   d. Not applicable.

On a scale of 1–5 where, *1 = Strongly Disagree* and *5 = Strongly Agree*, please circle the number that best reflects your opinion:

3.	The workshop content was relevant, comprehensive, and easy to understand.	1 2 3 4 5
4.	The activities were useful learning experiences.	1 2 3 4 5
5.	I plan to share what I learned at this workshop with colleagues or peers in my organization.	1 2 3 4 5
6.	The workshop met my expectations.	1 2 3 4 5
7.	I am excited to participate in or follow the progress of the **RESAlliance**.	N/A 1 2 3 4 5

8. What did you *like best* about this workshop? _____

_____

9. What did you *like least* about this workshop? _____

_____

10. Additional comments or suggestions: _____

_____

_____

3. Workshop Evaluation for the Colchester Workshop

Workshop Evaluation: Community-Based Planning & Design for the Electrification of Transport Systems in Rural Municipalities

1. **Prior to this workshop, were you aware of the challenges and opportunities related to transport electrification in rural communities?**

   a. Yes, and I have considered strategies to support electrification.
   b. Yes, but I have not considered strategies to support electrification.
   c. No, I was not aware of these issues.
   d. Not applicable.

2. In your opinion, what should be the vehicle fleet composition in your municipality by 2030?

   a. Electric vehicles only
   b. A mix of electric and hybrid vehicles
   c. A mix of electric/hybrid and conventional gas/diesel vehicles
   d. Gas/diesel vehicles only

On a scale of 1–5 where, *1 = Strongly Disagree* and *5 = Strongly Agree*, please circle the number that best reflects your opinion:

3.	The workshop content was relevant, comprehensive, and easy to understand.	1 2 3 4 5
4.	The activities were useful learning experiences.	1 2 3 4 5
5.	I plan to share what I learned at this workshop with colleagues or peers in my organization.	1 2 3 4 5
6.	The workshop met my expectations.	1 2 3 4 5
7.	I am excited to participate in or follow the progress of the **RESAlliance**.	N/A 1 2 3 4 5

8. **What did you like best about this workshop?** _____

_____

9. **What did you *like least* about this workshop?** _____

_____

10. **Additional comments or suggestions:** _____

_____