SCHEDULE F – PROJECT COMPLETION REPORT

VERY IMPORTANT:

Timing: You need to email a report, to your GMF project officer (contact info is in Schedule C), on the dates indicated in Schedule C or whenever FCM asks for such a report.

Copyright: Before you submit a report to FCM, make sure you hold the copyright for the report. If you're hiring a consultant to prepare the report, please make sure to get the copyright (see FCM's copyright tips document), or else FCM will not be able to disburse the Grant Amount.

Accessibility for people with disabilities: Please do not change the format, font, layout, etc. of this report. This template has been specially designed, following FCM's Accessibility Guidelines, in order to be accessible to people with disabilities.

Confidentiality: If your report contains any Confidential Information that you would prefer not be made available to the public (e.g. through a case study or other materials produced by FCM that relate to your Project), please submit two versions of the report:

1. **Complete report including Confidential Information:** Please clearly label this report with the word "**Confidential**" or similar wording and FCM will treat it as confidential.

2. **Abridged report excluding Confidential Information:** This report may be posted on the FCM website and otherwise made available to interested third parties, to help FCM meet its knowledge sharing objectives.

Please contact your project officer to receive an electronic copy of the Completion Report Template.

Upon completion of the project, a copy of the Final Deliverable must be submitted along with this Completion Report.

FCM will post your report on the Green Municipal Fund™ (GMF) website. This is because one of FCM's mandates is to help municipal governments share their knowledge and expertise regarding municipal environmental projects, plans and studies.

How to complete the Completion Report

The purpose of the Completion Report is to share the story of your community's experience in undertaking your project with others seeking to address similar issues in their own communities.

Please write the report in plain language that can be understood by people who are not specialists on the subject. A Completion Report is typically in the range of 5–10 pages, but may be longer or shorter, depending on the complexity of the project.

GMF grant recipients must enclose **final** copies of the Completion Report and the Final Deliverable with their final Request for Contribution. The reports, including all attachments and appendices, must be submitted in PDF format with searchable text functionality. Reports that are not clearly identifiable as final reports, such as those displaying headers, footers, titles or watermarks containing terms like "draft" or "for internal use only," will not be accepted by GMF. Additionally, reports must be dated. If you have questions about completing this report, please consult GMF staff.

GMF number	17057
Name of the lead applicant (municipality or other partner)	City of Port Moody
Name, title, full address, phone, fax, e-mail of lead technical contact for this Pilot Project	Julie Pavey-Tomlinson Director of Environment and Parks 3250 Murray Street Port Moody, BC V3H 1X8 Ph: 604-469-4570 jpavey-tomlinson@portmoody.ca
Date of the Report	November 10, 2022

1. Introduction

a) Who was involved in doing the Pilot Project, and what are their affiliations? Please include name, title and contact information. Those involved could include municipal staff, engineering and other consultants, a representative from a nongovernmental organization, and others.

Robbie Nall (no longer with the City of Port Moody), Superintendent of Parks
Kelly McMillan, Fleet Supervisor kmcmillan@portmoody.ca
Tyler Wahl, Horticulture Supervisor (Acting) twahl@portmoody.ca
Paul Leblanc, Manager of Solid Waste, Fleet and Shared Services pleblanc@portmoody.ca
Laura Sampliner, Sustainability and Energy Coordinator lsampliner@portmoody.ca
Julie Pavey-Tomlinson, Director of Environment and Parks jpavey-tomlinson@portmoody.ca

2. The Pilot Project

a) Please describe the project objectives and the approach used to meet these objectives. Include details on what technology or solution was tested during the Pilot Project. (Indicate relevant sections/pages of the Final Pilot Project Report)

Under its Climate Action Plan and Vehicle and Equipment Corporate Policy, the city has direction to work towards greening its fleet, including new technologies (electric, hybrid, alternative fuel) that take into consideration functional and economic constraints and environmental impact. Adoption of electric vehicles is one option that is also integrated with other direction to "right-size the fleet" (i.e., ensuring the correct-sized vehicle is used for suitable tasks, to reduce emissions and address other environmental concerns). Electric vehicle use is also supported by the city's draft "End of Life Electric Vehicle Battery Guide", demonstrating the holistic and long-term systems approach that the city is adopting towards zero-emissions vehicles.

The city needed to evaluate and demonstrate the feasibility of using zero-emission vehicles in the operational fleet. Parks operations was considered a good entry point for a pilot project, since some of their duties require less heavy-duty vehicles. The overall goal was to evaluate performance and benefits of using an off-road electric vehicle for parks operations. This pilot project was intended to further inform decision making around the city's adoption of alternative technologies. The primary objectives of the pilot project were to:

- Validate potential greenhouse gas emission reductions from introducing the electric vehicle to the municipal operations fleet
- Evaluate the vehicle's ability to perform a variety of parks operations by assessing its driving performance, safety, storage and transportation capacities, range, and economic viability
- Make recommendations on the scale-up of this initiative and the inclusion of additional electric vehicles to the municipal operations fleet.

Key milestones to implement the project included developing project objectives; seeking corporate approval and engaging internal and external team members; assessing fleet and staff needs; purchasing and operationalizing a zero-emission vehicle (Might-E Truck); and monitoring and evaluating implementation over one year.

The Might-E Truck was chosen for this pilot project because it is a small size zero-emissions vehicle and appropriate for use on smaller trails and in natural areas, meeting multiple policy directives under the city policies. Staff responsible for fleet services and parks worked together to complete a needs assessment and analysis of available options. The Might-E Truck was chosen based on this assessment, with the added benefit of being locally made by a reputable supplier with a proven track record in park maintenance.

The Fleet Supervisor and Crew Supervisors implemented use of the Might-E Truck, and now have more experience with operation and maintenance of a 100% electric vehicle. The Fleet Supervisor and in-house mechanics have also gained skills in maintenance and problem solving for this type of vehicle. The vehicle was outfitted for use by the city's mechanics to suit the specific needs of the vehicle users and city services. Modifications included installing a tool rack and welding higher sides on the dump box to store debris and tools safely. This also enabled the vehicle to be more functional for each of the potential work groups. A fast charge adapter also needed to be installed for a new satellite works yard where the truck was stored. After initial outfitting and battery upgrades (see lessons learned below), maintenance needs were minimal.

The project team met regularly with staff using the vehicle to understand its use, challenges, limitations, etc. and make changes to the vehicle where possible. Approximately 10 staff were signed off on the operation of this vehicle, and now have experience using this type and size of electric vehicle. A sign-off procedure was developed for this purpose. Daily use of the truck was logged with pre and post-trip records. The Might-E Truck also tracks usage minutes that can be compared to fuel consumption and GHG emissions from a fleet truck used for similar purposes.

The Might-E Truck was assigned to work units responsible for parks maintenance, horticulture, urban forestry and trail management. It was used as any other vehicle in the parks operational fleet and was prioritized for tasks whenever its smaller size did not hinder crew work. It was also prioritized for tasks where a smaller electric vehicle was beneficial; for example, its smaller size was useful on trails and its decreased noise pollution was useful near sensitive wildlife habitat. The Might-E Truck was particularly successful with the following tasks:

- Traffic circle and walkway maintenance

- Restoration projects – invasive plant removal, particularly on smaller trails
- Trail improvements and maintenance
- Park maintenance – garbage removal, garden bed maintenance
- Tree inventory work for Urban Forest Management Strategy

(see Final Pilot Project Report – Objectives, Approach and Implementation)

b) Did the pilot project include a methodology or approach for verifying or testing the performance of the technology or solution? Please respond Yes or No.

Yes [ ] No [X]

If you answered yes to Question #3, which methodology did you use in this pilot project for testing the performance of the technology or solution?

- Environmental Technology Verification Program
- Engineering Consultant
- Other (please specify) _____

3. Pilot Project Results

a) What are the Pilot Project's recommendations? (You may point to the relevant sections/pages of the Final Pilot Project Report if relevant.)

- Choose appropriate vehicle and battery type for local needs
- Anticipate the needs and select the 'right size' of vehicle
- Provide appropriate storage
- Assign the vehicle to a single work unit
- Improve record keeping for scaling up
- Consider the results of the pilot project in future fleet assessments

(see Final Pilot Project Report – Lessons Learned and Next Steps)

b) Is the Pilot Project *technically feasible* for full-scale implementation? Please comment on why or why not.

The Might-E Truck is technically feasible for full-scale implementation of this type of zero-emissions vehicle, for certain work areas and tasks. It was suitable for many park and trail tasks but would not be suitable for many operations and maintenance tasks that require heavy-duty vehicles, as it is too small and cannot handle large loads. Piloting the use of the Might-E Truck as a smaller vehicle in the fleet supported directions around 'right sizing the fleet' and demonstrated the advantages of have a smaller type of vehicle included in the Parks operational fleet.

c) What were the financial results of the Pilot Project and is the Pilot Project *financially feasible* for full-scale implementation? Please comment on why or why not.

The Might-E Truck had positive financial results.

- Reduced fuel consumption:
  Might-E Truck: 0 fuel used (2021)
  Standard Truck for comparable uses: $2,369 fuel used (2021)
- Similar and decreasing maintenance costs:
  Might-E Truck: $1,384 (2021) – note that some of these costs were for upgrade to the battery; maintenance costs have decreased over time
  Standard Truck for comparable uses: $1,245 (2021)
- Once the Might-E Truck was outfitted and technical issues were addressed, costs were lower than a standard comparable truck.
- Full-scale implementation of the pilot project is financially feasible for the city, in large part because of the skills gained through this project and lessons learned.

d) Please complete the following table that was part of your pilot project application with the actual results from your pilot project. Please also provide the page numbers where the environmental results of the pilot project can be found in the final report.

Project Parameter	**Units**	**Baseline Performance before Project**	**Anticipated performance after project completion**
Greenhouse Gas Emissions	tonnes CO2e/ year	35.4	25.75
Fuel consumption	Litre/ year	14,535	10,790.80

e) Please describe all of the environmental results including any potential negative results or trade-offs that need to be considered.

- The Might-E Truck has potentially reduced fuel use of 3,743.49 L, resulting in a reduction of 8.8 tCO2e in 2021 as compared to 2019. This equates to a 25.6% reduction in parks fleet emissions based on a sampling of parks fleet vehicles that the Might-E Truck replaced. Please note that 2020 was not referenced in calculations as the pandemic resulted in abnormal use of fleet vehicles and schedules.
- The Might-E Truck reduced noise pollution in parks and trails. This noise reduction is advantageous in Port Moody's parks, as they are primarily natural areas with significant wildlife habitat. The quieter electric vehicle reduced the negative effects of noise on resident Great Blue Herons in Shoreline Park, that are listed under the Federal Species at Risk Act as species of special concern.
- Electric vehicle batteries are expected to be replaced and considered end-of-life every 7-10 years. The city has developed guidance for steps to take at the end of life for these batteries, and this draft process will be followed when the Might-E Truck battery reaches its end-of-life. The battery performance is being tracked over the vehicle's lifespan though maintenance records, and an assessment of the battery condition will be done at the time of replacement to determine the best option (reuse or recycle, aiming for 100% recovery of critical battery minerals and materials).

f) Based on the experience gained in the pilot, please update the anticipated social and economic outcomes (community benefits) of full scale implementation of the pilot project. Column B of the following tables shows the anticipated economic and social benefits you noted in your application.

Please complete the table below by describing in Column C the anticipated economic benefits of the pilot project at full scale implementation. Please complete for all that apply in the list below. If there are additional economic benefits, please describe these in the last row of the table.

Figure 1 – Economic benefits

A	B	C
Economic benefit	**As described in your GMF application**	**Anticipated economic benefits of the pilot project at full scale based on pilot experience.** If the result is different than what was expected in the application form, please indicate **why**.
Increased return on investment		
Deferred or avoided capital expenditures		
Decrease in facility operating or maintenance costs		Reduced fuel costs. Maintenance costs are decreasing over time.
Extended lifespan for facility		
Increased municipal revenue streams (e.g. property tax, user fees, etc.)		
Lower taxes		
Stimulus for local economy (use of local business, capacity for local business development)		
Increased employment options or job retention	Staff will learn skills associated with operating zero emission vehicles. These skills and experience will make them more employable moving forward in their careers.	The Fleet Supervisor and Crew Supervisors implemented use of the Might-E Truck, and now have more experience in this area. The Fleet Supervisor and in-house mechanic staff have also gained skills in maintenance and problem solving. Approximately 10 staff were signed off on the operation of this vehicle, and now have experience using this type and size of electric vehicle.
Increased transit ridership		
Attraction of new businesses		
Other (please specify)		

g) Please complete the table below by describing in Column C the anticipated social benefits of the pilot project at full scale implementation. Please complete for all that apply in the list below. If there are additional social benefits, please describe these in the last row of the table.

Figure 2- Social benefits

A	B	C
Social benefits	**As described in your GMF application**	**Anticipated social benefits of the pilot project at full scale implementation based on pilot experience** If the result is different than what was expected in the application form, please indicate **why.**
Improvements to public health	By implementing further zero emission vehicles, the City will lower tailpipe emissions from our fleet. These tailpipe emissions have been linked to multiple adverse health impacts.	If all smaller City vehicles were replaced with zero-emission models, improvements to public health from decreased tailpipe emissions would be expected. In some cases, larger trucks needed for city operations cannot be replaced by electric models. However, as fleet size grows, the city could ensure no additional increase to emissions and further detriments to public health by also scaling up the pilot project and ensuring additional vehicles added to the fleet were zero-emission models.
Improvements to public safety		
Improvements to community quality of life	By improving public health benefits by reducing tailpipe emissions we are directly improving the community's quality of life. Our initiative will improve morale of the public and how they view the city they live in.	Positive feedback was received from the public when the Might-E Truck was on the trails and at public events. The reduction in emissions and noise from the electric truck were noted. If all smaller City vehicles were replaced with electric models, improvements to community quality of life would be observed. If these vehicles were mostly used in park areas (i.e., smaller trucks), park experience would be improved.
Increased opportunities for community engagement	Our communications department will be enlisted to promote are initiative and engage the public. On an Operational level, the public are invited annually to our Operations Centre for Public Works Day. This opportunity will be used to engage the public.	Scaling-up of the pilot project would provide additional opportunities for community engagement. The purchase of more electric vehicles would be an opportunity for public outreach about the benefit of alternative technologies, for example through the City's seasonal newsletter or social media and truck signage. Additional press releases would also be done, and electric vehicles would be available for showcase at public events (e.g., Public Works Days and other community fairs).
Increased public education or awareness	Promotion of the Might-E truck and zero emission vehicles through use in our high-profile parks and premier trail system will inspire and influence the	If the pilot project was more widely implemented, it is anticipated that most of the fleet that could be switched to electric models are Parks vehicles, especially the trucks used in nearby

A	B	C
	public. Staff are regularly approached by park dwellers, and the presence of zero emission vehicles will be no exception. This presents a unique opportunity for staff to educate, and increase knowledge amongst the public.	Shoreline Park. This is the most high-profile park in Port Moody, located near the city Works Yard where trucks are stored. Expanding the use of small electric vehicles in and around this well-used park would increase awareness. Electric vehicles would also be showcased at public events involving the city.
Community revitalization		
New housing and infrastructure		
New or enhanced public space or public facilities		
Improved access to recreation and physical activities		
Reduced urban sprawl		
Increased civic pride, ownership and participation	Port Moody's residents are actively engaged in the community they live in. Climate change issues are no exception, with town hall meetings for the development of our Climate Action Plan attracting large crowds. Lowering greenhouse gas emissions and implementing green infrastructure, was a popular topic put forward by attendees. Our project builds upon, and follows the publics direction towards green initiatives.	Expansion of the pilot project would further demonstrate how the city is implementing its community-developed Climate Action Plan (CAP). The CAP was developed with significant input from the community and staff and seeing a tangible result from this work would show that civic participation can lead to action. The unique look of the Might-E Truck further adds to the visibility of this action.
Improved quality and efficiency of service provision to residents		
Reduced opportunities for crime		
Other (please specify)		

4. Lead Applicant's Next Steps

a) What next steps does your municipality plan to take based on the findings and recommendations of the Pilot Project?

Since the successful addition of the Might-E Truck to the fleet, the city's fleet department has decided to undertake a fleet assessment. The assessment will determine if there are opportunities to electrify and decarbonize other fleet vehicles and what infrastructure and policy supports are required to aid this transition. The fleet assessment is anticipated to be completed in early 2023.

(see Final Pilot Project Report – Next Steps)

5. Lessons Learned

In answering the questions in this section, please consider all aspects of the Pilot Project —from the initial planning through each of the essential task until the Final Report of the Pilot Project was prepared.

a) What would you recommend to other municipalities interested in doing a similar Pilot Project? What would you do differently if you were to do this again?

- Budget accordingly for the best type of vehicle for local conditions. For the Might-E Truck, the city initially purchased a cheaper option with a lead acid battery. This made the vehicle too slow for local terrain and roads and required more charging time and mechanic monitoring and maintenance. A lithium battery vehicle should have been purchased from the onset.
- The Might-E Truck does not record mileage in the same way and does not require regular visits to the garage for fuel. An alternative system of tracking usage of the zero-emission vehicle may be useful for comparison against other vehicles.
- Ensure adequate fast charging infrastructure or equipment is available at all possible storage locations of the zero-emission vehicle.

b) What barriers/challenges (if any) did you encounter in doing this Pilot Project? How did you overcome them?

- The slower speeds of the Might-E Truck required additional regulatory steps. A special road permit had to be requested from the Port Moody Police Department.
- The Might-E Truck had to be outfitted with additional gear and dump box features to make it useful for a variety of tasks. This challenge was overcome by retrofitting the truck by in-house staff.
- The size of vehicle proved most useful to crews working on trails and multi-use paths, where minimal gear was needed, so was not used as much at project onset. This challenge was overcome by providing most access to the vehicle to a single work unit instead of sharing across units.

(see Final Pilot Project Report – Lessons Learned)

6. Knowledge Sharing

a) Is there a website where more information about the Pilot Project can be found? If so, please provide the URL.

The following press release was communicated upon award of the FCM grant:
City receives Green Municipal Fund grant towards electric vehicle - City of Port Moody

b) In addition to the Pilot Project results, has your Pilot Project led to other activities that could be of interest to another municipality (for example, another pilot project, sharing of the results of this pilot project with other municipalities formally or informally, changes to existing policies and/or practices

etc.)? If so, please list these outcomes and include copies of the relevant documents (or website links).

City staff shared information on the Might-E Truck pilot project with Metro Vancouver municipalities through the Regional Engineers Advisory Committee – Climate Protection Subcommittee in the summer of 2021. This group is comprised of a representative from each Metro Vancouver municipality working on climate action. Port Moody staff provided an overview of the Might-E Truck pilot project, the vehicles features, the grant received from FCM and feedback from staff who operated the vehicle. The same information was also shared in 2021 with the city's Climate Action Committee, a civic committee chaired by two Councillors with membership from various residents.

The city produces an annual climate action implementation report, detailing progress on actions being implemented under the 2020 Climate Action Plan. The 2021 annual report included a count of electric vehicles, including the Might-E Truck. This report was received by City Council and published in early 2022. A Link to the report can be found here: https://www.portmoody.ca/en/recreation-parks-and-environment/resources/Documents/Climate%20Action/Climate_Action_Plan_Implementation_2021_Annual_Report_-_Phase_One.pdf

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