SCHEDULE G
PROJECT COMPLETION REPORT

Part 1 - Instructions

REQUIREMENT: You must submit a Project Completion Report as a condition of the Final Loan Disbursement.

PURPOSE: Your Project Completion Report has three purposes:

1. **Project tracking:** This report enables FCM to confirm that your project was completed as described in the Agreement.

2. **Reporting on the impacts and lessons learned during the construction of the project:** This report includes any environmental, social and economic results as well as lessons learned during the *planning, design and construction of the project*. Ensure that you include in the report any processes or techniques that were implemented at these stages to address triple bottom line impacts. This could include dust minimization measures or the onsite use of electric vehicles instead of gas powered. All environmental, social and economic results *from the operation* of the project will be reported under a separate Environmental Results Report in the form set out in one of the schedules to the Agreement.

3. **Knowledge sharing:** FCM shares the lessons and expertise gained through GMF-funded initiatives with other communities across Canada. The findings and lessons learned documented in your Project Completion Report could be valuable for other municipal governments that are seeking to address sustainability issues in their own communities. FCM will post your reports on its website at the approved projects database[1]. This is the part of the GMF website which is most frequently visited. Your report will assist FCM in producing other materials related to your project, including a GMF case study. In addition, other municipalities may view your project completion report to improve the success of their project.

COPYRIGHT: You must hold the copyright to the reports that you submit to us and provide FCM with rights to reproduce and distribute it as set out in the Agreement.

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**". 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.

CONTENT OUTLINE: Your Project Completion Report should be approximately **9 to 15 pages long;** some reports may be longer or shorter depending on the complexity of the Project. While there are no

[1] http://www.fcm.ca/home/programs/green-municipal-fund/funded-initiatives.htm

maximum word counts for each section, the most pertinent section of the report — Lessons Learned — should be given more weight.

Because your report may be read by non-technical municipal staff and similar readers, please assume a low to moderate level of technical knowledge and a preference for clear, direct and focused writing. Use simple language, and explain any highly technical terms or acronyms that are used.

REPORT FORMAT: Please request an electronic Form of Project Completion Report from the GMF Project Officer and submit your report in either .doc or .pdf (searchable) format. A scanned copy of the Project Completion Report will not be accepted. FCM endeavors to collect the most relevant project information and as such may amend the Form of Project Completion Report from time to time. If so, FCM will provide you with the latest Form of Project Completion Report.

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

Part 2 –Project Completion Report Form

Project information

GMF number: _15108_____
Name of funding recipient: _ City of Vancouver, BC _____
Project title: _Burrard Bridge Renewal and Transportation Improvement Project __
Date of Project Completion Report: _July 31, 2018__
Project Construction Start Date (MM/DD/YYYY):__02/16/16___
Project Substantial Completion Date (MM/DD/YYYY): __12/31/17__
Total Project Cost (Actual): _$35M_

QUESTIONS:

Project implementation

1. Was the Project implemented as outlined in the contract (or as amended)? Please identify any substantial changes , explaining why they happened (e.g. getting a new system to operate correctly, delays due bad weather, labour availability, etc.) and their impact on the project (e.g. higher overall costs, more staff training required, etc.).

   The project was constructed as outlined. The initial budget, scope, and schedule established in the project charter were achieved.

   However, there was a substantive change to the design delivery method for the project. During the planning phase of the project the design was changed from internal delivery to external delivery. In order to adhere to the tight design schedule the decision was made during planning to hire an engineering design consultant to complete the designs instead of using internal City of Vancouver (CoV) designers.

   One of the justifications for hiring a design consultant was that it would free up CoV staff time; this was found to be incorrect and was difficult to explain/justify to staff. There was a shift of staff time, from designers and drafters to design leads (engineers), but not a reduction of work for staff. Despite this change, the project was able to stay on schedule with no change to the construction budget or scope.

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

Lessons learned

INSTRUCTIONS:

Lessons learned refer to knowledge gained from the Project that can be applied to other situations. For this report, GMF is interested in the lessons learned from the **design, planning and construction phases** of the project.

Answers in this section may refer to **positive** experiences (i.e. what worked or went well, and could serve as a model for future projects) or **negative** experiences (i.e. what didn't work, or went poorly, and should be avoided in future projects).

2. Describe what worked well and what did not work well, and why, for the project elements below, include a description of any solutions implemented to address challenges?

    a. Design, procurement and contracting:

    What worked well / Successes:

    The City Planned Works from a Strategic Perspective through

    - *Modelling various construction scenarios and determining that staged partial closures of the Burrard Bridge provided a reasonable balance of construction efficiency with the impacts on the transportation network, residents and the business community*
    - *Planning and scheduling other road and utility upgrades in the Burrard Corridor to take advantage of the traffic reductions required by the Burrard Bridge rehabilitation.*

    What didn't work well / Challenges:

    Impact to Staff Morale due to Shifting Design from Internal to External:

    - *It was difficult to message shifting design from inside the City to an outside consultant; this impacted the City's staff morale.*
    - *Messaging from senior management explaining the justifications for the shift was unclear. Improving communication around justifying such actions would have decreased the risk of damaging staff morale.*

    Expectations of Work and Effort Required From Outside Consultant:

    - *Senior staff spent a significant amount of time checking, correcting and commenting on the consultant's work, which resulted in higher costs.*
    - *Communications between City staff and the consultants generally took more time to conduct than internal communication.*
    - *The City maintains in-house designers that continually work on similar projects, and are particularly experienced in designing cycling, pedestrian, multi-modal (active) transportation in the public realm. Consultant had to overcome a large learning curve in order to be able to complete the design to City standards.*
    - *Drawing standards and base survey formats vary from branch to branch within the City. When drawings needed to be merged, the consultant copied and pasted the City drawings together, which resulted in drafting issues such as drawing misalignments and inconsistencies, in addition to many other quality issues being found and design delivery being delayed.*

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

- *For future projects, it was advised that the City should avoid partially completing the design in-house and then sending the incomplete design to an external consultant for completion; rather, it would be preferred to complete the designs in-house, or allow for the consultant to create the design from start to finish.*

b. Consultation and community engagement (prior to and during construction):

What worked well / Successes:

The City Limited Construction Related Traffic Impacts by

- *Preparing a detailed construction plan that considered the bridge works (2 phases, west side first, then the east side) and the road and utility works (multiple stages), then developing a coordinated "stage by stage" construction traffic management plan that balanced the construction access needs with the access needs of pedestrians, cyclists, transit, commercial vehicles and private vehicles.*
- *Hiring a dedicated traffic monitor to observe the multiple construction traffic management plans (by the City crews, the bridge contractor, the trenchless contractor etc.). The City's Project Manager used the traffic monitor's feedback to take action when excessive traffic impacts occurred.*
- *Coordinating project construction with the construction of other groups like private developers, utility companies, and filming and special events to ensure impacts are managed and minimized.*
- *Making unique adjustments to traffic flow and operations, such as adjusting signal timing, removing parking or banning turns adjacent to construction sites to support the flow of traffic, for each construction phase.*
- *Working with Vancouver Police Department to control and direct traffic at critical times and locations during the construction work, maintaining traffic flow and ensuring a safe working environment.*
- *Providing advance notice to residents, businesses, and commuters so that they could prepare and anticipate the changed road conditions and make informed decisions to take alternate routes.*

The City Minimized Impacts to Businesses by

- *Facilitating collaborative dialogue in the planning stages with individual business and business improvement associations to understand the needs of local business, hours of operation, access, delivery schedule, and key dates for events.*
- *Providing advance notification to business operators and the general public on timing and implications of construction. This allowed each business to take steps to minimize impacts within their control (e.g. adjusting hours of operation, use it as an opportunity to do some renovations, reduce staffing levels or inventory levels, invest in on-line marketing and sales). The City offered businesses an online toolkit to help them implement business improvement strategies during construction.*
- *Installing 'businesses are open signage' in high visibility locations within and adjacent to the construction site, and providing a dedicated Community Liaison Officer as the key point of contact for providing timely information and responding to business needs.*
- *Including contractual requirements to maintain access to businesses at all times, and limiting construction traffic impacts and use of street space (parking, passenger loading, commercial loading).*

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

What didn't work well / Challenges:

- *In future the City should make direct contact with every building manager in the area of the work zone to inform them of upcoming work. Initially local residents didn't feel that they were adequately informed about the project because letters weren't being appropriately disseminated to residents. Using the building manger as a conduit so they can relay the information to all of the residents of their building proved to be effective.*

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

c. Construction of the project

What worked well / Successes:

The City Planned Works from a Strategic Perspective through

- *Modelling various construction scenarios and determining that staged partial closures of the Burrard Bridge provided a reasonable balance of construction efficiency with the impacts on the transportation network, residents and the business community*
- *Restricting construction works on the other False Creek Bridges (Granville Bridge and Cambie Bridge) to maintain overall system capacity and to provide effective detour routes.*
- *Completing other road and utility upgrades in the Burrard Corridor to take advantage of the traffic reductions required by the Burrard Bridge rehabilitation.*
- *Providing advanced notice to private developers, third party utilities (Telus, Fortis, and Hydro etc.) film companies and special event operators regarding Project scope and construction impacts.*

What didn't work well / Challenges:

- *Drawings produced and modelled from the external consultant were different from the City's drawings, for which the City's Operations were not (as) familiar with and resulted in confusion for City construction crews.*

d. Completing the project on time and on budget.

What worked well / Successes:

The City Addressed Unforeseen Conditions by

- *Including several months of "slack time" in the road and utility construction schedule to allow for potential delays. Three months of this "slack time" was utilised for the longer duration for the trenchless storm works.*
- *Including contingency in the final budget and iteratively progress project estimates to ensure the established project budget was accurate.*
- *Working closely with the trenchless contractor to approve/monitor efficient methods to remove the obstructions in the path of the new storm pipe.*

What didn't work well / Challenges:

Setting aggressive targets and introducing new documentation protocols:

- *There were many additional documentation requirements and frameworks to be followed for the project, such as new project management practices, PMF tools and templates, creating tender ready design packages, that made the design and planning process more time-consuming than what was required.*
- *Unrealistic deadlines and expectations were set, which impacted staff morale.*

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

3. Describe your experience (e.g. trade-offs, surprises) when choosing a particular approach, technology or solution for this project. What would you do differently?

For future consulted works the City would like to utilize consultants on smaller, less complex components of projects to start and then move to larger more complex components as they become more familiar with the City's protocols and design expectations.

Additionally, external consultants do not have the established relationships that City Staff have with Operations, who were responsible for constructing the project. These relationships prove to be quite important.

4. Has the business case associated with the project changed since the planning stage (e.g. change in the level of service delivered by the project, expected revenues, capital or operating costs or payback, etc.)? Could anything have been done to better understand the business case at the application stage?

The "business case" for this project has not changed. The project objective for the outset was to improve the safety of the Burrard and Pacific intersection, the Burrard Bridge, and adjacent blocks within the project area. Additionally, while improving the safety there was an opportunity to upgrade water, sewer, and road assets nearing or at the end of their useful lives.

In 2015, prior to the beginning of this project the Burrard and pacific intersection was the highest crash location in the City of Vancouver as ranked by the Insurance Corporation of British Columbia. The project has made significant improvements to the safety of this area foa all road users and is no longer the highest crash location in the City.

5. Did you use any approach(es), that are not business as usual over the course of the Project (e.g. decision making approach, consultation methodology, non-typical procurement, full-cost accounting)? Were there any benefits or drawbacks of this approach?

As a result of hiring external design consultants to complete the drawings and specifications for this project, it became apparent that the City did not have well-documented and fully up-to-date design standards, making it difficult for consultants to consistently design to the City's expectations. This has led to the creation of design standards package at the City; enabling clear consistent requirements on all future City of Vancouver consulted projects.

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

Sustainable Design and Construction:

6. In your GMF application, you noted that the project would have sustainable design and construction measures as set out in column B of the table below.

   Please complete the table below by inserting into column C the following information:
   - Did the project implement the measures as described?
   - Describe the effectiveness of the measures?
   - Please provide reasons for any changes to the measures?
   - Please include any measures that were taken beyond what you committed to in the application from.

A	B	C
Sustainable Design and Construction Element	As described in your GMF Application	Describe the Implementation of the Measure (one paragraph)
Sustainable Design and procurement		
Environmental considerations integrated at the design stage	*Not Applicable*	*Not Applicable*
Green procurement	*Not Applicable*	*Not Applicable*
Site Characteristics		
A remediated brownfield or underutilized site (i.e. is not a green field).	*Not Applicable*	*Not Applicable*
Existing buildings/ infrastructure / equipment is used	*Not Applicable*	*Not Applicable*
Avoids, protects or enhances sensitive environmental areas	*Not Applicable*	*Not Applicable*
Utilize natural systems to provide environmental benefits within the project (e.g. wetlands)	*Not Applicable*	*Not Applicable*
Does not contribute to urban sprawl	*Not Applicable*	*Not Applicable*
Part of the urban transport network and encourages the use of sustainable transportation	*Not Applicable*	*Not Applicable*
Construction activities:		
Reuse of available construction material on-site	*Not Applicable*	*Not Applicable*
Use of construction materials with recycled content	*Not Applicable*	*Not Applicable*
Construction Waste management including diverting construction waste from the landfill through recycling and re-use (off-site)	*Not Applicable*	*Not Applicable*
Minimize expected impacts of construction activities (e.g. dust minimization, minimise soil erosion)	*Not Applicable*	*Not Applicable*
Biodiversity and ecosystem protection	*Not Applicable*	*Not Applicable*

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

A	B	C
Sustainable Design and Construction Element	As described in your GMF Application	Describe the Implementation of the Measure (one paragraph)
Other (Please specify)	The City will increase the number of street trees at and near the intersection of Burrard and Pacific Street by 55 trees.	The City increased the number of street trees at and near the intersection of Burrard and Pacific Street to 55.
others	The City will use a "superpave" asphalt mix for the 10,000 square metres that will be repaved. This asphalt mix provides a more durable pavement, particularly under heavy vehicle loading conditions (Burrard Street is a transit route and a designated truck route). The use of this asphalt mix will extend the useful life of the pavement, which is a sound strategy from asset management and sustainability perspectives.	The City used a "superpave" asphalt mix for the 10,000 square metres or pavement. This asphalt mix provides a more durable pavement, particularly under heavy vehicle loading conditions (Burrard Street is a transit route and a designated truck route). The use of this asphalt mix will extend the useful life of the pavement, which is a sound strategy from asset management and sustainability perspectives.

Environmental, Social and Economic Outcomes:

7. Please describe any additional environmental, social and economic outcomes your Project has achieved during the design, procurement and construction phases.

   Now that the project is complete pedestrians have two dedicated sidewalks, cyclists have two dedicated bicycle lanes and vehicles have four traffic lanes. The project also included modifications at the north end of the bridge, including intersection improvements at Burrard and Pacific Streets and improvements one block north, west and east so that cyclists can connect more safely to/from the existing network of bike routes downtown.

   This has led to a modal shift from vehicular traffic to bicycle and pedestrian traffic.

Project Champion:

8. Do you have a Project champion who has been instrumental to the Project to date (design, procurement, construction)? If so, please include his or her name, title and contact information, and describe his or her role in the Project.

   There was no project champion for this project.

Next steps

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

9. Please describe any steps you have taken or plan to take to ensure that the people, internal groups or other key stakeholders that are important to the operation of the project adopt the necessary behaviours and other practices to ensure successful performance?

   Leaving the project website up and active during and after substantial completion of the project was important in educating all road users about the project and the changes to accessibility within the project site. The webpage included a map indicating how the new vehicle lanes would function as well as information about bike lane connectivity. This piece helped encourage people to head out and use the new area, equipped with the knowledge of how it would all work.

10. Have the systems and technologies been established for measuring and monitoring the performance of the project during operation

    Yes, the long term maintenance plan has been established and count information will be collected to inform the effectiveness of safety improvements.

Publicity

11. Briefly describe any recognition, media coverage, awards, or public support the Project has received to date.

    None that the project team is aware of.

Photos and materials

FCM includes project photos and links to project materials in GMF case studies, website content, and other communication vehicles.

1. Identify and attach any materials resulting from the Project that would be useful to share with other communities, such as checklists, toolkits, guidelines, bylaws, videos or information brochures. If the material is available on your website, simply include the link to it.

   For example, a water conservation project might result in a new municipal water use bylaw, or a series of householder information brochures or online video clips on ways to reduce water use.

   Project Website:
   https://vancouver.ca/streets-transportation/burrard-bridge-and-pacific-street intersection-upgrades.aspx

2. Attach five high-quality photographs of the Project. Where possible, include photos that feature people in action, illustrate the progress of the project, or feature "before" and "after" perspectives. The photos must be in jpeg or tiff format and at least 300 dpi (up to 10 MB/10,000 KB but no smaller than 1 MB/1,000 KB in file size).

   For each photo, please include:

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

SCHEDULE G: Project Completion Report

a) A caption describing what is featured in the photo.

b) A photo credit that indicates who owns the copyright to the photo and the photographer (e.g. © 2010, City of Ottawa/Madison Brown).

c) A written release signed by the individuals depicted in the photo granting FCM permission to use the images. **Please request an FCM Photo Consent Form from the GMF Project Officer.**

This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.