Canadian Brownfields Case Study

Mission Waterfront Revitalization Master Plan

Source: Mission.ca

Figure 1: Redevelopment of Mission's waterfront into neighbourhoods, open spaces, and employment areas.

PROJECT SUMMARY

The Mission Waterfront Revitalization Master Plan was a 2023 Brownie Awards finalist, recognized for its renewal of the community. The project sets out a long term plan for the redevelopment of the City of Mission's waterfront over the next 40 years. The waterfront is currently used for industrial purposes, commercial uses, the Mission Raceway, a dike to protect the city from the Fraser River flood risk, as well as vacant lands. The redevelopment will create several new neighbourhoods, introducing new residential areas, employment areas, commercial uses, and open spaces. The revitalization will involve infrastructure improvements to resist flooding, including the raising of lands, construction of a super dike, and use of native riparian vegetation to stabilize the river banks. The City is working with O2 Planning + Design, Pinchin, and Aplin & Martin Consultants to design and implement the plan.

Site Characteristics and History

Mission's waterfront is on S'ólh Téméxwm, the unceded territories of the Matsqui, Kwantlen, Sema:th, Katzie, Sq'ewlets, and Leq'á:mel First Nations. Historically, the site was a significant trading and fishing area along the Fraser River.

Over time, the city's waterfront has been highly industrialized. The current land uses are industrial, railway, highway, and commercial (figure 2). The subject lands are owned by private entities, such as the BC Custom Car Association, which owns the Mission Raceway in the west of the lands, smaller private landowners, and the province.[2] Though the site is largely industrial, there are some significant ecological features. The Fraser River has two tributary streams on the site, Lane Creek and Windebank Creek, both being Class A red-coded watercourses with a significant fish presence.[3] These watercourses provide habitats

QUICK FACTS

Location
Mission, British Columbia

Project type
Neighbourhood Master Plan and Revitalization

Site size
296 acres along 3.5 km of the Fraser River[1]

Land uses
Residential, open space, employment, commercial

Keywords/special features
Flood mitigation, redevelopment, open space, waterfront

Website
https://www.mission.ca/council-government/plans-strategies/waterfront-revitalization-master-plan

Project address
7101 Horne Street, Mission, British Columbia

Author
Safa Abou-Hussein

Editors
Christopher De Sousa
Rami Hilan

Please Note:
Case studies were prepared as a course assignment by students enrolled in PL8319/PLE845: Brownfields & Sustainable Development, School of Urban and Regional Planning, Toronto Metropolitan University (Winter 2025). Information for the case studies was obtained from online sources, available reports, and, in some cases, site visits and direct communication with stakeholders.

If you are aware of any errors or updates to the case studies, please contact chris.desousa@torontomu.ca.

for species of salmon, trout, anadromous fish, and white sturgeon, as well as bird and amphibian species, and nine different at-risk species.[4] The site is located on a floodplain which poses development challenges. The flood risk is currently mitigated to some extent by existing dike structures along Highway 11, Dyke Road, and Harbour Avenue, but these measures have been disruptive to the ecological health of the site, being rigid forms of flood protection that do not accommodate the natural states of rivers.[5] With the geography and ecology of the site, the Master Plan aims to incorporate flood protection measures, naturalization and restoration of the site, and new infrastructure to accommodate residential uses.

Conceptualization

Redevelopment plans for Mission's waterfront were first considered in 2006 with the Mission Landing Concept Plan, which examined the possibility of developing a mixed-use neighbourhood along the waterfront. In 2009, the Waterfront & Brownfield Redevelopment Study was carried out to further understand the limitations of any development, followed by the Market Analysis & Feasibility Study in 2010. Throughout 2018 and 2019, the City carried out engineering, soil contamination, and geotechnical studies to examine the conditions of the site.[6]

The current Master Plan process was initiated in 2020 with the incorporation of the Waterfront Comprehensive Planning Area in the 2020 Official Community Plan update, and the plan being finalized in 2022. Since its finalization, the City has started to raise lands around the Mission Bridge above the flood level to prepare for redevelopment and has begun the design process for the Lane Creek Pump Station replacement and new dikes.[7] The provincial government has undergone the South Mission Integrated Planning Study to support transportation infrastructure improvements[8]. The City has been working with O2 Planning + Design Inc., Pinchin Ltd., Aplin & Martin Consultants Ltd., and GeoPacific Consultants Ltd. to further the waterfront plan and studies[9].

Precincts and Key Characteristics

The Mission Waterfront Revitalization Plan divides the site into 5 precincts; Mission Raceway, Bridge West, Bridge East, Station Lands, and River's Edge (figure 3). The Mission Raceway precinct maintains the raceway as a landmark entertainment district and maintains the existing wetland area. The Bridge West precinct transforms what is currently vacant land split by the existing dike into an innovation employment area with new flood protection infrastructure, and opportunities for marinas and casinos. The Bridge East precinct is similarly vacant and split by the existing dike, and set to be the site of the Waterfront Central Park and institutional uses. The Station Lands precinct is currently used by commercial and industrial uses, and planned to be a mixed use district linked to Downtown Mission through a bridge and urban plaza, and heights up to 25 storeys. River's Edge is planned to be the main residential area of the revitalized waterfront, featuring a Destination Playground, beaches, and natural areas. The Master Plan emphasizes the mix of uses intended to provide new residences and employment opportunities.[10]

A challenge for the City in achieving the master plan will be acquiring the necessary lands. Some of the precincts, particularly Bridge East, are made up of many small, privately owned parcels of land which will need to be acquired over a long period of time. Development is currently being focused on publicly owned areas that do not have the complexities of consolidating ownership.[11]

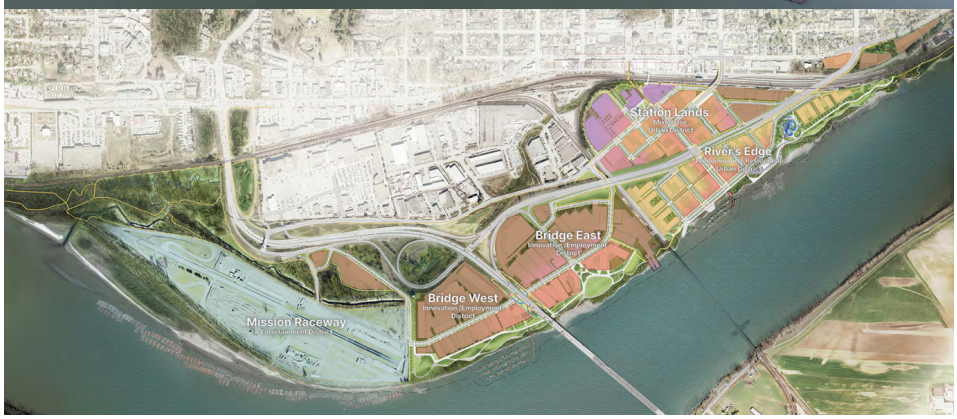
Open Space Zones

These precincts are paired with detailed

Figure 2: Mission's waterfront is currently made up of industrial, commercial, and vacant lots.

Source: Google.com/Maps

Figure 3: Planned precincts in the waterfront master plan.



Source: Mission.ca

Figure 4: Dedicated open space zones in the waterfront.

Source: Mission.ca

plans for open space zones, serving various ecological and public realm functions (figure 4). These include Ecological Areas, Fallow Open Spaces, Waterfront - Riparian Zone, Waterfront - Upper, Inland Parks, and Partnered Open Spaces.

The Ecological Areas are intended for more sensitive natural areas with opportunities to renaturalize parts of the environment and provide connections for fish passage. Fallow Open Spaces are areas with less public access but potential low intensity uses, such as off-leash dog zones, where feasible.

The Waterfront - Riparian zone will play a significant role in flood and erosion mitigation with its location below the 7.0 metre flood elevation, being part of a low slope dike and incorporating Green Shores bioengineering. This zone will also include naturalized beaches and fish habitats. The Waterfront - Upper zone comprises areas above the 7.0 metre flood elevation, primarily intended for park use, incorporating the upper portions of the new dike structures and transitioning from the Riparian zone.

Inland Parks are intended for the Waterfront Centrepiece Hub, Waterfront Central Park area, and Urban Plaza, while Partnered Open Spaces will include areas where the City collaborates with third parties to provide open spaces.[12]

Engineering Considerations

Both Bridge East and Bridge West are currently being raised to Flood Construction Level, with River's Edge to be raised in the future, while Mission Raceway and Station Lands will be under the Flood Construction Level (figure 5). The Station Lands will instead be protected by the future dike and have no residential uses at grade.

The revitalization plan will require land to be raised above the Flood Construction Level of 9.7 metres to allow for residential development, forming a super dike system with the areas south of Highway 11. The lands that will not be raised to this level are not planned to have residential development on the ground level and will be protected by their positioning behind the raised lands.[13] The lands will be raised using engineered fill, such as dredged sand, sand, and gravel. The banks will be constructed of sand and fine gravel. Along the super dike structures, riprap will be used for bank stabilization with a filter layer of traditional gravel or crushed rock to further stabilize the banks. Important infrastructure, such as the new pump station, will be constructed above the Flood Construction Level to protect them from damage during flooding events.[14]

Mission's waterfront has a significant risk of flooding due to the large floodplain. Though the waterfront has an existing dike structure, these result in unnatural river edges that limit the ecological function of the dikes and cannot easily be used as public spaces. Hardened banks of traditional riprap are less flexible with the changing flows of rivers, narrowing the channel and causing the river to flow faster, subsequently harming aquatic species.[15] The Green Shore design of the new flood infrastructure will be more responsive to flooding while also creating more useful habitats. Green Shore designs will incorporate native plants, vegetated riprap rather than traditional riprap to stabilize sediments, logs, and boulders, which will stabilize the river banks to prevent erosion, filter pollutants, and resist flooding.[16] Mission's waterfront has been divided into five planting zones, which take into consideration the level of flooding each elevation of the banks receives. This will result in planting specific, suitable, and resilient species into riprap in each zone to resist erosion. Green Shores design helps restore natural sedimentation cycles and to prevent scouring of sediments.[17]

To support the redevelopment, the City will be replacing aging infrastructure. This will include new water and sewer mains along Harbour Avenue and Mershon Street, a new Harbour Avenue Sanitary, and Lane Creek Drainage Pump Station.[18, 19] The City has undergone an environmental assessment carried out by Pinchin Ltd., which included a desktop assessment and field assessment to examine the ecological health of various locations throughout the site, producing recommendations for the development.[20]

The environmental assessment conducted on the site found that half of the 20 locations that were studied were considered to have 'poor' ecological health. The prominent concerns on the site were poor passage for wildlife, pollution, and disturbed habitats. These will require mitigation through habitat restoration, improved connections such as bridges and wildlife tunnels, and riparian vegetation, with bridges being preferred to culverts for fish passage.[21] Fish passage is already being considered in the design of the upgraded Lane Creek Pump Station which will incorporate three fish friendly pumps.[22] Wildlife crossings along roads will also be considered to allow for safer conditions for animals.[23]

With the industrial history of the site, there is risk of soil and groundwater contamination. There are two aquifers underneath the site, Aquifer 17 and Aquifer 18, which are both highly vulnerable to contamination due to their shallow water levels and being unconfined.[24] There is also documentation of pulp mill and industrial effluent being in Windebank Creek, as well as nutrients from agricultural uses, which

Source: Mission.ca

Figure 5: Lands to be raised to the Flood Construction Level.

affect water quality. The long term construction on the site could lead to contamination of the watercourses by increasing sediment input, which can harm the development of sensitive fish eggs and young, as well as aquatic plants. The site will require contaminated soils to be disposed of properly, and sediment and erosion control will be needed to prevent contaminated soils from spreading.[25] While there are areas that will require future investigation, many of the lands on the site are minimally contaminated and can be managed through capping rather than excavating the soil.[26]

The site's location along multiple watercourses also increases the risk of stormwater runoff carrying contaminants into the rivers as the redevelopment increases the amount of impervious surfaces. Runoff carries pollutants such as suspended solids, hydrocarbons, hard metals, nutrients, copper, lead, oil, and insecticides.[27, 28] With the redevelopment and construction of storm sewer systems, there is a greater chance of peak flows to the Fraser River increasing as the water travels faster, which can cause erosion and flooding in the site's streams.[29] Pollutants in runoff can impact the health of various fish species and result in bioaccumulation. Much of this impact can be mitigated through developing a healthy riparian zone in conjunction with using green stormwater infrastructure to filter stormwater and improve water quality. Riparian vegetation provides wildlife with a habitat and food source, stabilizing river banks to prevent erosion.[30] The revitalization plan will also include improving water drainage throughout the site by installing mechanical water quality treatment units at outfalls to treat stormwater before its release into the creeks.[31] The City also plans to use bioswales and rain gardens along roadways to reduce the impact of contamination from roads.[32]

Phasing and Financing

The revitalization of the waterfront is planned as a long term redevelopment, expected to take up to 40 years, being divided into 10 year phases. The first phase will develop the employment lands and food protection and begin developing the Waterfront Central Hub and Under the Bridge Park, with lands around the bridge having already started to be raised. The redevelopment will generally begin in the west of the site, then continue east.[33]

The engineering cost for the development is estimated to be over $253 million over 40 years.[34] With the flood protection measures that are required to facilitate the development of the waterfront, the City will have the opportunity to use Federal and Provincial funding programs for flood resilience, offering a source of funding for the development. The City will also acquire and raise properties to the Flood Construction Level, rezone, then sell these lands at a higher value to help fund the redevelopment in addition to Development Cost Charges and Community Amenity Contributions.[35] The City is working with developers through the Mission Bridgehead Investment Corporation, which presented the plan to developers at a real estate investment conference in France in 2024.[36]

Benefits and Key Challenges

The revitalization will be a challenge given the flood mitigation efforts involving the raising of land and use of Green Shore design. Other challenges will include the clean up of contamination, prevention of runoff, protection of wildlife, and consolidation of land. However, the waterfront revitalization will bring new investments into the area. The master plan taps into underutilized land to create a mixed use neighbourhood that will serve generations to come. The introduction of innovation employment uses into the waterfront will cement the presence of jobs and small business opportunities, bringing in funding to the city and economic benefits to residents. The redevelopment will also increase property values for current residents as the city attracts investment. Lots throughout the waterfront are already increasing in value, with a 35 hectare site comprising a third of the waterfront being valued at $100 million, and lands in the eastern side doubling in value to $175 million.[37, 38]

The revitalization of the waterfront will create thousands of new residences. This will provide more housing in Mission, while introducing mixed use development to the city. This housing will be located in close proximity to retail, open spaces, and employment uses, creating a complete community.

The master plan embeds public and open spaces throughout the redevelopment. This utilizes the city's waterfront for public enjoyment, introducing beach and marina spaces, as well as trails throughout. This was a key request from community engagement. This is done in conjunction with the restoration of the land and naturalization of portions of the site. While naturalization will help the neighbourhood be more resilient in the face of flooding, pollution, and erosion, it also serves to increase the green space in the area, combining resilience with open spaces.

Lessons Learned

The revitalization of Mission's waterfront requires sensitive approaches to minimize harms to the river ecosystem while improving existing conditions. This will involve significant efforts to manage the flood risk in untraditional manners that are more ecologically beneficial. The project is finding innovative ways to manage flood risk while naturalizing the waterfront and remediating brownfields. The work to restore Mission's riparian zone will be an interesting case study in balancing between engineered and natural flood mitigation methods. The project will require coordination of both public and private actors to treat and raise lands for development, and likely lead to new ways of managing these large scale projects. The preservation of the Mission Raceway as an important community landmark, as emphasized in engagement findings, reflects the need to work with partners to ensure large scale developments result in the best outcome for all.

Source: Mission.ca

Figure 6: Walkway concept with a naturalized waterfront.

Endnotes

1. City of Mission. "Mission Waterfront Implementation | City of Mission." City of Mission, February 23, 2024. https://www.mission.ca/business-building/economic-development/mission-waterfront-implementation.
2. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
3. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
4. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
5. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
6. City of Mission. Bylaw 6095-2022-5670(33) (2022). https://pub-mission.escribemeetings.com/filestream.ashx?DocumentId=5573.
7. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
8. City of Mission. "Mission Waterfront Implementation | City of Mission." City of Mission, February 23, 2024. https://www.mission.ca/business-building/economic-development/mission-waterfront-implementation.
9. Pinchin Ltd. "Green Shores Environmental Considerations," December 20, 2022. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppCIV-GreenShores.pdf.
10. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
11. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
12. Ibid.
13. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
14. Aplin & Martin Consultants Ltd. "Mission Waterfront Engineering Plan," September 2023.
15. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
16. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
17. Pinchin Ltd. "Green Shores Environmental Considerations," December 20, 2022. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppCIV-GreenShores.pdf.
18. Ibid.
19. Aplin & Martin Consultants Ltd. "Mission Waterfront Engineering Plan," September 2023.
20. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
21. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
22. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
23. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
24. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
25. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
26. Patrick Penner, "The Chilliwack Progress," The Chilliwack Progress (My Local News, August 21, 2021), https://www.theprogress.com/news/building-in-missions-waterfront-financially-viable-for-developers-planners-say-1919871.
27. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
28. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
29. Aplin & Martin Consultants Ltd. "Integrated Rainwater Management Plan," September 2023. https://www.mission.ca/media/file/wrmp-irmp.
30. Pinchin Ltd. "Biophysical Inventory and Environmental Assessment," July 9, 2023. https://www.mission.ca/sites/default/files/2024-03/WRMP_IRMP_AppC-BiophysicalEnviro.pdf.
31. Aplin & Martin Consultants Ltd. "Mission Waterfront Engineering Plan," September 2023.
32. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
33. City of Mission, and O2. "Waterfront Revitalization Master Plan," June 2022. https://www.mission.ca/sites/default/files/2024-01/Waterfront-Revitalization-Master-Plan_0.pdf.
34. Aplin & Martin Consultants Ltd, "Engineering Cost Estimate," September 18, 2023, https://www.mission.ca/sites/default/files/2024-03/WRMP_Engineering_AppK-Cost.pdf.
35. Ibid.
36. Mission City Record Staff, "Housing Legislation Brings New Interest to Mission Waterfront," Mission City Record, March 5, 2025, https://www.missioncityrecord.com/local-news/housing-legislation-brings-new-interest-to-mission-waterfront-7831652.
37. Mission City Record Staff, "Housing Legislation Brings New Interest to Mission Waterfront," Mission City Record, March 5, 2025, https://www.missioncityrecord.com/local-news/housing-legislation-brings-new-interest-to-mission-waterfront-7831652.
38. Chris Campbell, "Sparks Fly over Mission Waterfront Plans at All-Candidates' Meeting," Mission City Record, September 28, 2022, https://www.missioncityrecord.com/news/sparks-fly-over-mission-waterfront-plans-at-all-candidates-meeting-2172147.