CASE STUDY | CS-02

Fall River Stormwater Assessment

NOVA SCOTIA FEDERATION OF MUNICIPALITIES

Context

Fall River is a rural-suburban community in Halifax Regional Municipality with an identity and history tied to its waterways. The primary drainage artery through this area is a 5 km stretch of Highway 2, with a steep natural ridge running parallel to the roadway. Stormwater runoff flows toward Fletcher Lake and Lake Thomas while Highway 2 acts as a drainage collector via a network of roadside ditches, underground pipes, catch basins, and cross-culverts.

The Challenge

During periods of high-intensity rainfall, Fall River has experienced significant localized flooding, including along the Highway 2 corridor. This natural challenge is worsened by maintenance gaps. Physical field inspections revealed that many cross-culverts and lake outfalls are broken down or blocked with dirt, sediment, and thick vegetation, reducing their active drainage capacity.

The Response

The municipality undertook an assessment of grey-green infrastructure solutions to manage runoff in problem areas. To provide the municipality with a road map for long-term upgrades, engineers developed a drainage restoration strategy which included:

- Field Mapping and Inspections
- Flow Modeling
- Targeted Pipe Upgrades (Grey Infrastructure)
- Low-Impact Development Testing
- Capital Cost Estimating

Key Insights

1 Green Infrastructure Limits

In areas where public property boundaries are narrow, there may not be enough land to build rain gardens or swales large enough to significantly influence downstream impacts. In these space-constrained zones, widening traditional underground grey pipes is necessary.

2 Deferred Maintenance Costs

Digital models often assume clean storm pipe networks, masking the reality that debris and mud can severely restrict pipe capacity. Ground-truthing and routine maintenance is essential to keep systems functional and defer costly upgrades.

3 The Downstream Advantage

When engineering upgrades accelerate stormwater flow, the final exit point is critical. Upstream drainage network can better pass water at higher volumes and speeds if they discharge into receiving basins (like large local lakes) that can accommodate the sudden volume within their normal water levels.

Guiding Municipal Decisions

Municipalities can consider matching infrastructure choices to available land space, keeping regular maintenance schedules to clear ditches and culverts, and confirming that outfalls discharge safely into receiving water bodies.

Consider Your Municipality

If not currently in place, are there opportunities for municipalities to establish regular roadside ditch and culvert maintenance before heavy storm seasons?

LEARN MORE: View the full Guidance Document at FloodAdaptNS.ca

Acknowledgement : *Financial support for this project was provided in part by Natural Resources Canada through the Flood Hazard Identification and Mapping Program (FHIMP). We also acknowledge funding and support from the Government of Nova Scotia's Municipal Flood Line Mapping Program (MFLMP).*

Canada NOVA SCOTIA