



SOURCE
2STREAM

2025
Conference

Canada's Premier
Stormwater and Erosion
and Sediment Control
Conference

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Presented by:



In association with:



Watercourse Collector App

Results from a multi-year watercourse deficiency monitoring program

Presented by:

Hector Quintero, City of Hamilton

Meghan Sauro, AECOM

Agenda

1. Project Purpose
2. Building the App
3. Field Example
4. Results with Case Studies
5. Project Outcomes
6. Q&A



Hamilton Water Storm O&M Team



Project Purpose



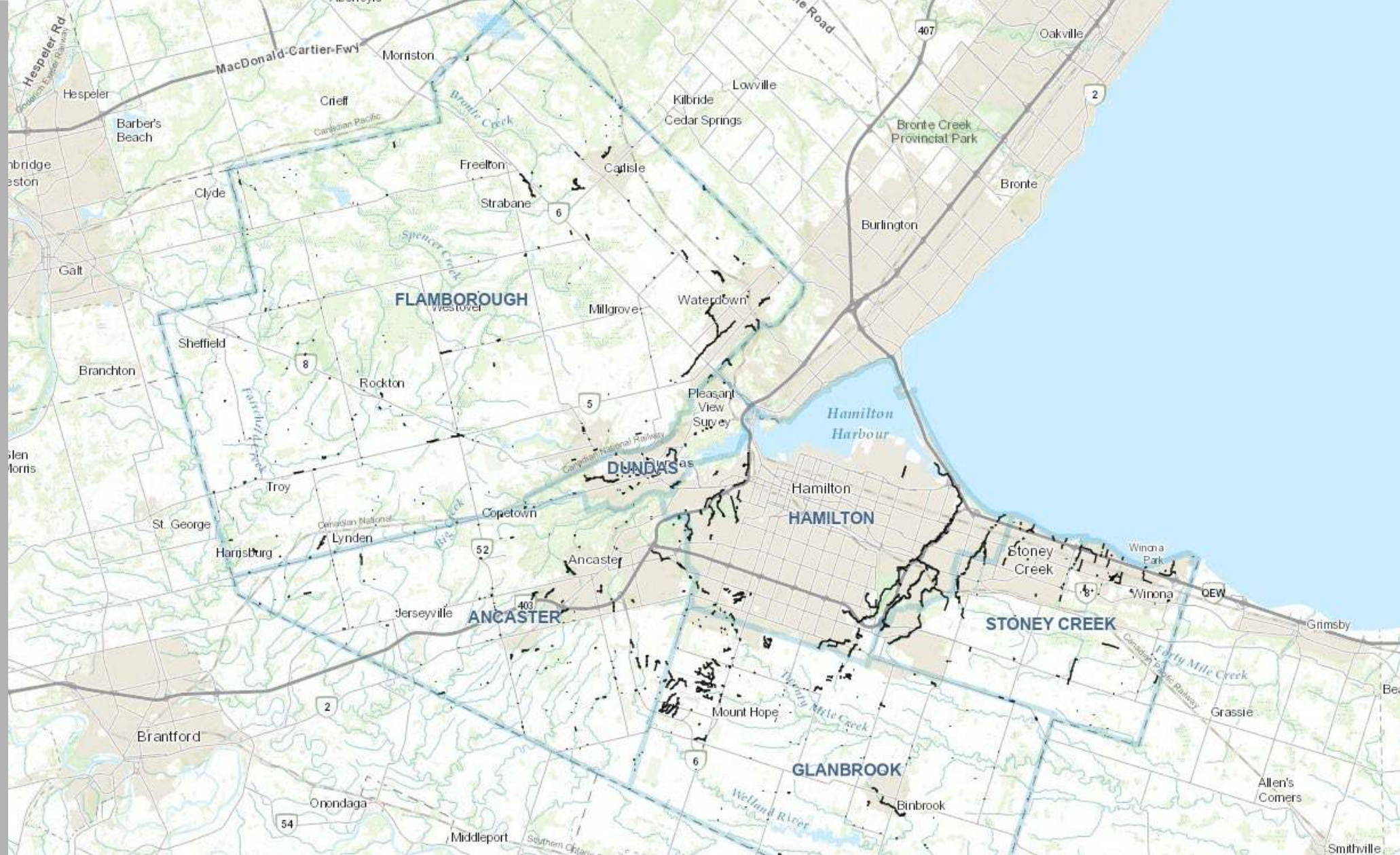
Collector App Development

- Erosion scars
- Embankment failures
- At risk infrastructure
- Beaver activity
- Vegetation
- Major obstructions

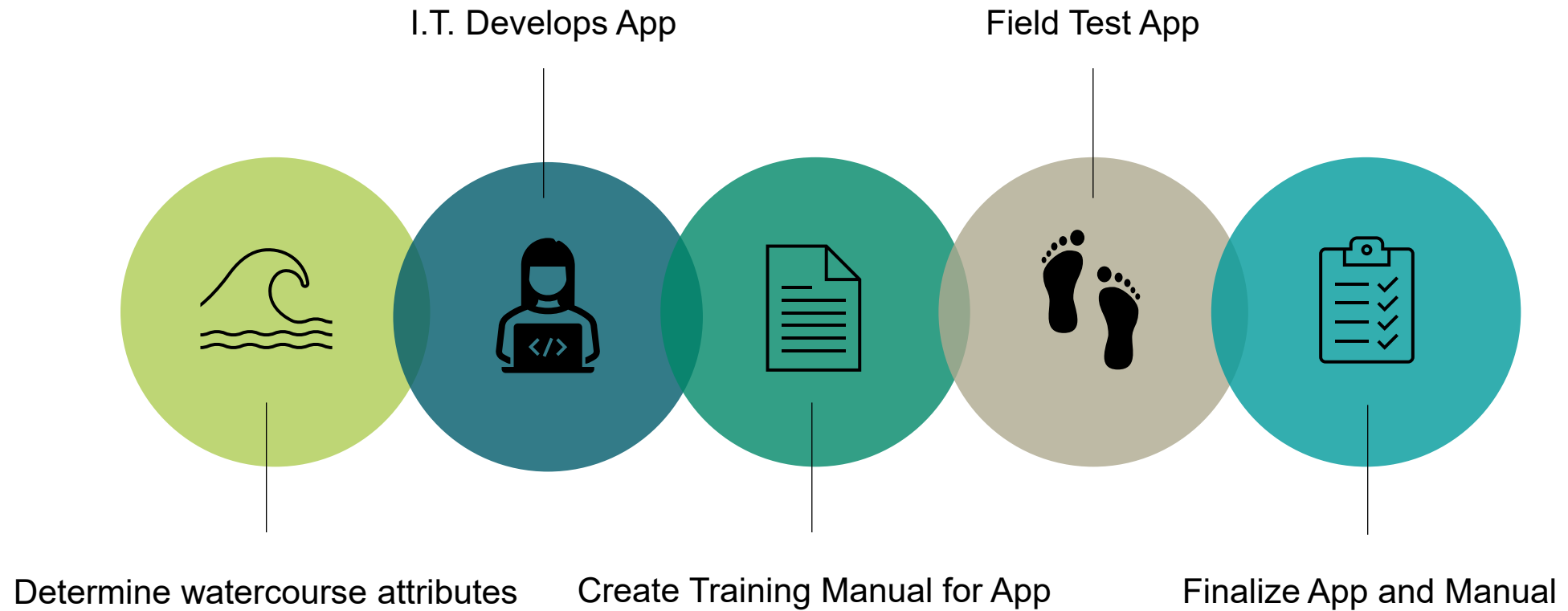
Deployment

- Field testing
- Training
- City-wide inspection
- Reporting

Study Area



Building the App



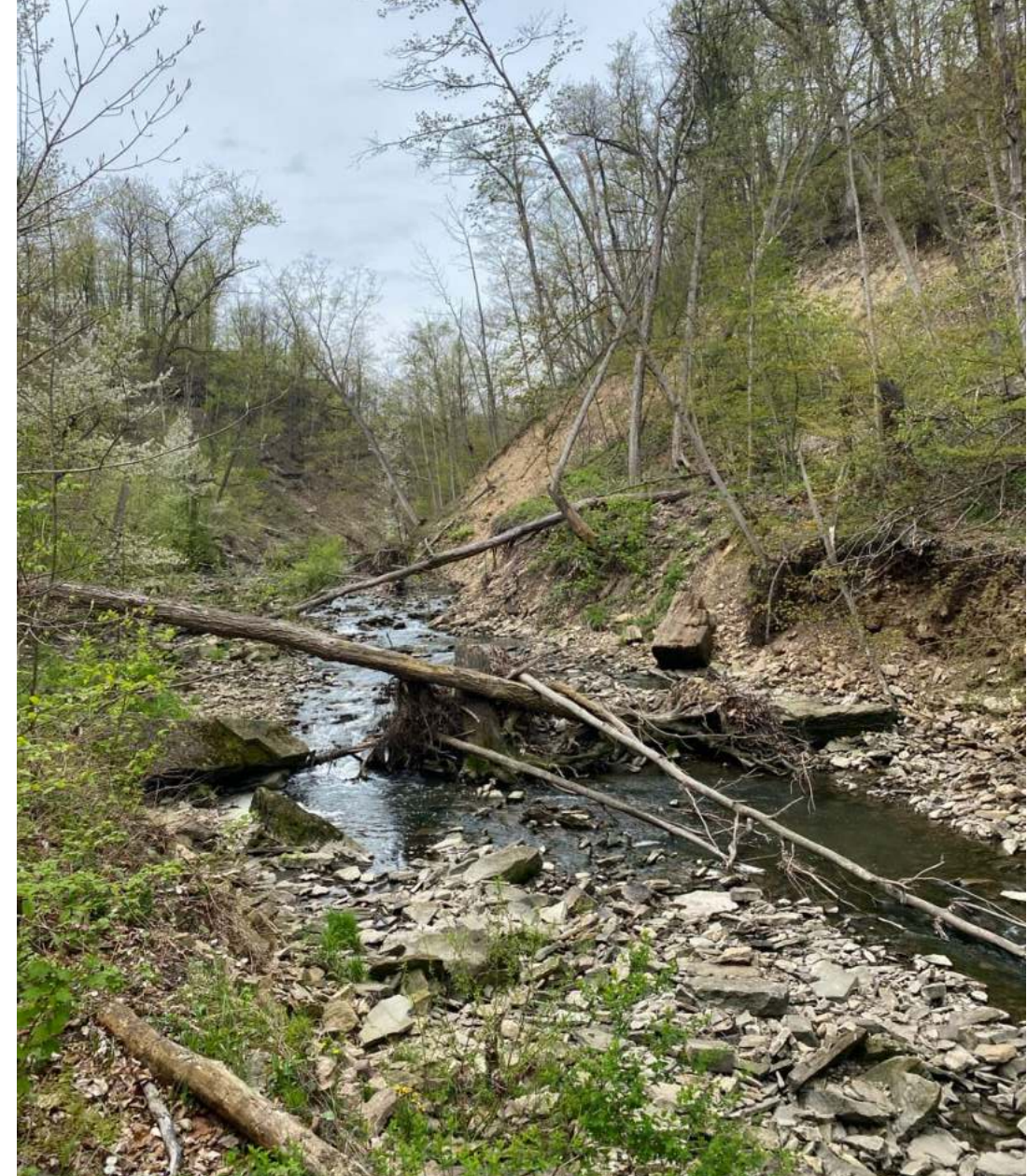
Building the App

Base Layer Attributes

- Property lines
- Servicing network
- ArcGIS basemap
- Recent aerial imagery
- Elevation contours

Field Attributes

- Deficiencies (type/rating)
- General notes and photos
- Proximity to private property
- Channel characteristics (w/d)
- Online structures and reach characteristics



Building the App – Training Manual

Purpose

- Standardized method

Content

- Deficiency and rating examples
- Photograph guidelines
- Measurements
- Field equipment
- App functions

Watercourse Collector Application
Inspection, Rating and Guidance
Manual

City of Hamilton
Project number: 6060840

5.2.10.1 Sediment Accumulation Maintenance Rating

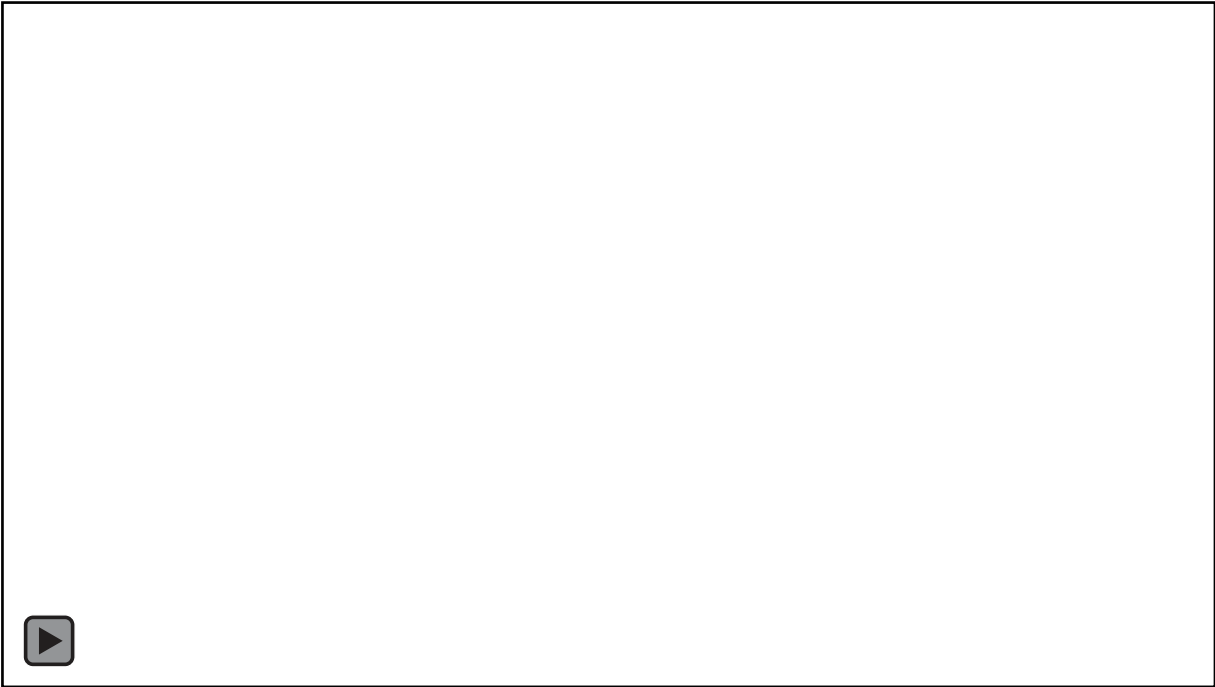
Maintenance Rating	Representative Examples	
Fair Sediment depositing within a structure as part of a natural process, not affecting any stream processes or causing backwatering.		

Watercourse Collector Application
Inspection, Rating and Guidance
Manual

City of Hamilton
Project number: 6060840

Maintenance Rating	Representative Examples	
Immediate Concern Culverts are geomorphically undersized and consist of sediment build up. Undersized culverts or culverts that have been blocked with sediment may contribute to flooding upstream.		

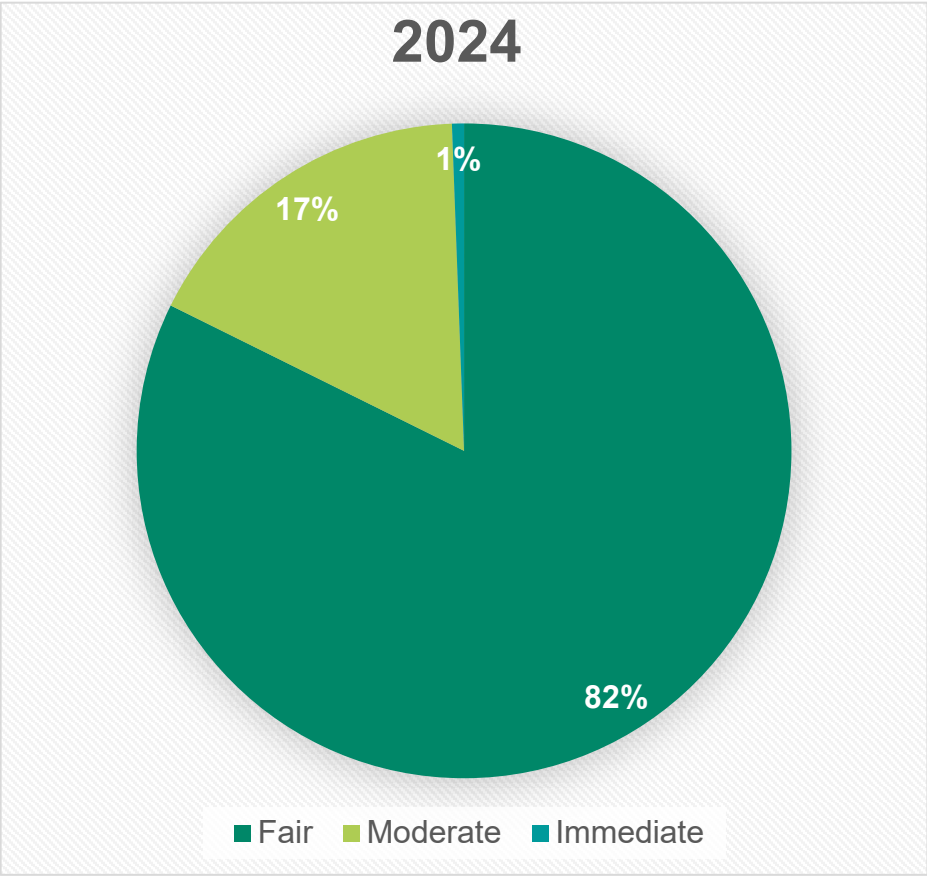
Field Example



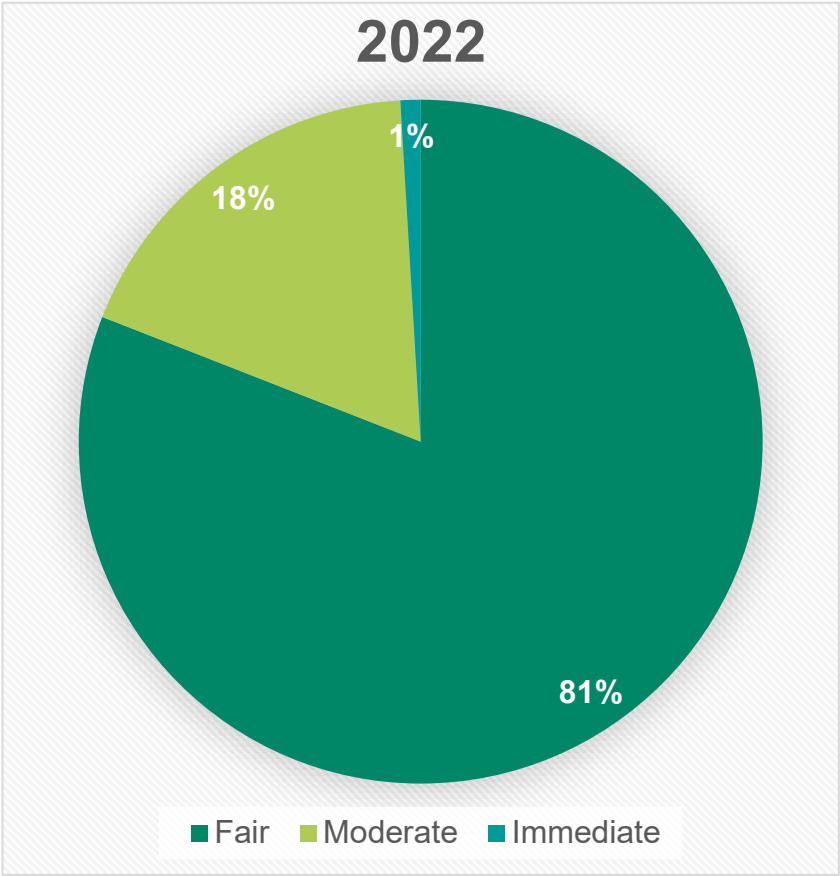
WC_Deficiency2024: trail	
Access Distance	5.00
Access Name	trail
Accessibility To Site	yes
CreationDate	6/4/2024, 11:49 a.m.
Creator	Aecom
Deficiency Height / Depth (m)	2.00
Deficiency Length (m)	10.00
Deficiency Width (m)	3.00
EditDate	
Editor	
Maintenance Rating	1 - Fair
Nearest Asset ID	
Notes	large csp pipe displaced and buried in channel, parallel, woody debris at inlet, disrupting flow
ReachID	SULSCH3217T11
Type of Deficiency	Major Obstruction/Debris Jam
Watercourse ID	Sulphur creek
Wetted Depth (m)	0.10
Wetted Width (m)	2.00
Attachments:	
Photo 1.jpg	
Photo 1.jpg	
Photo 2.jpg	
Photo 3.jpg	
Photo 4.jpg	
Edited by hw128839 on 10/7/24 at	



Monitoring Results – Deficiency Rankings

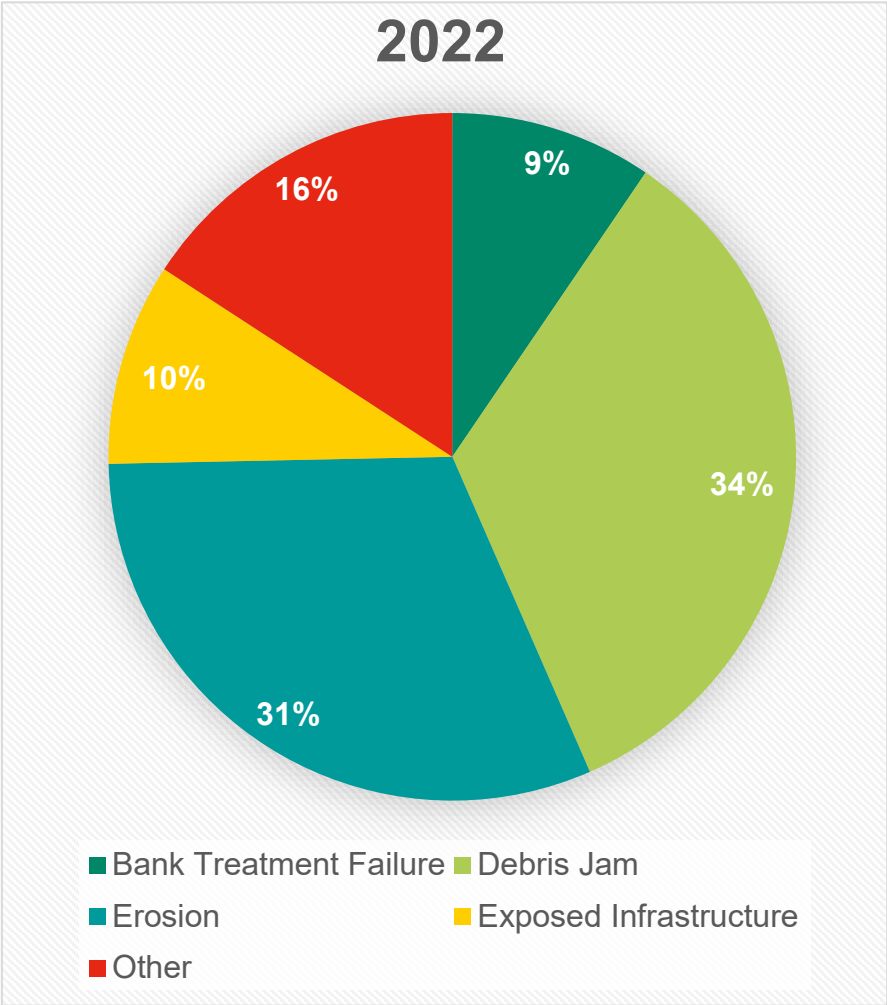
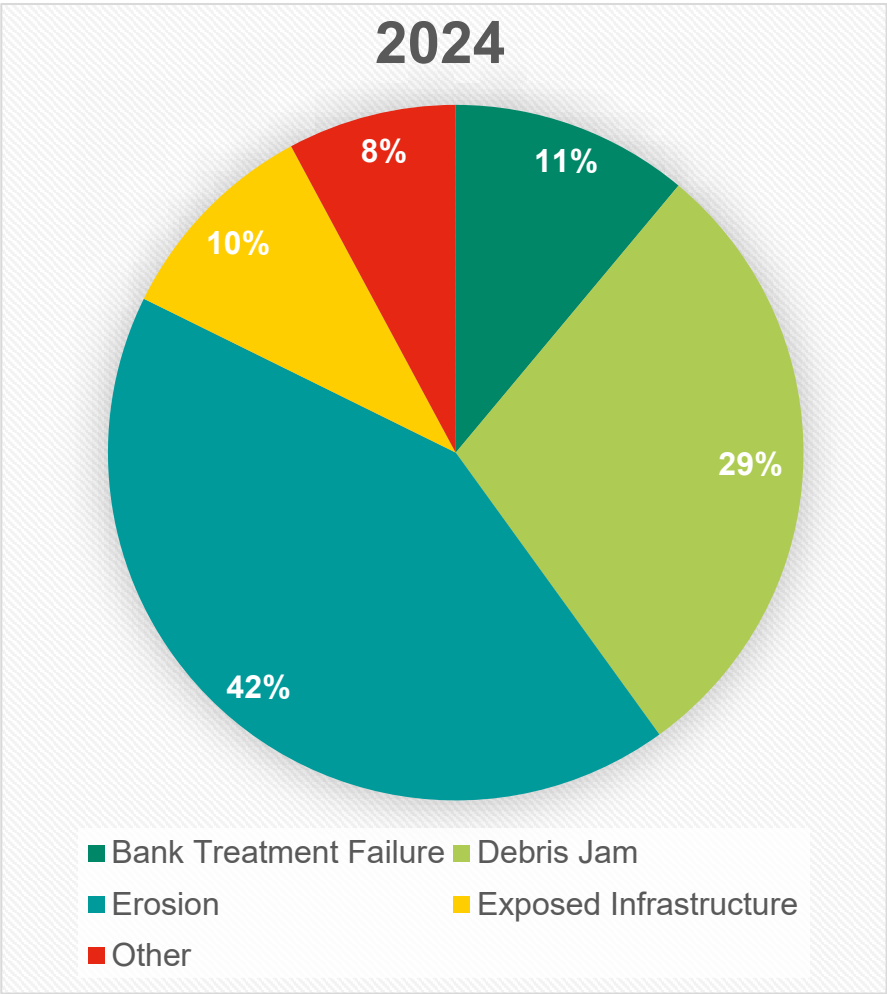


490 Deficiencies



209 Deficiencies

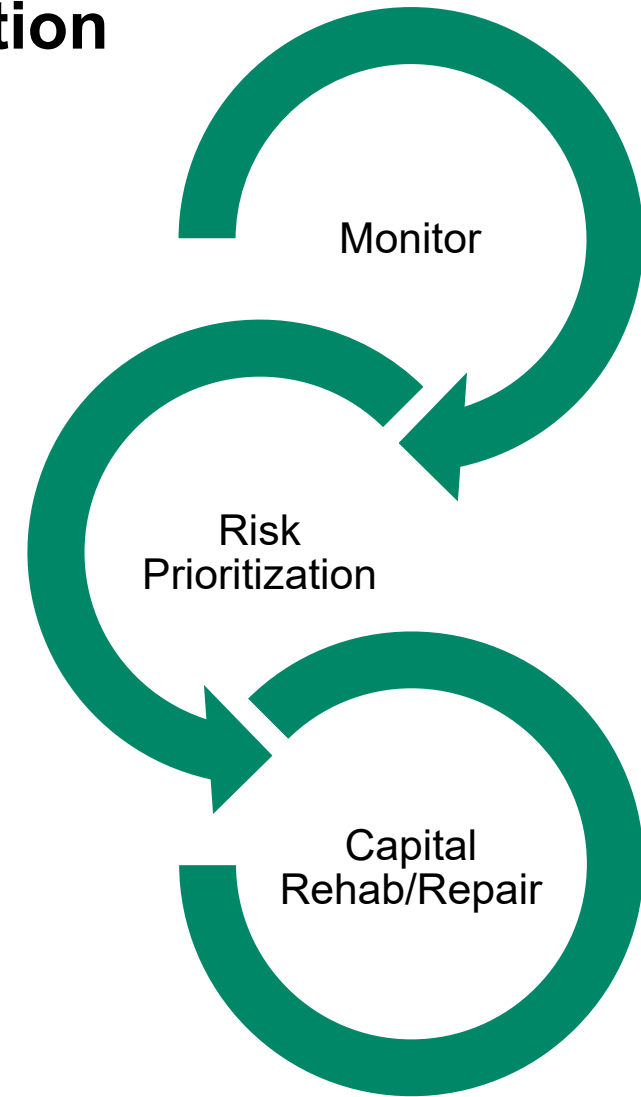
Monitoring Results – Deficiency Types



Other: Excess vegetation, beaver activity, sedimentation...

Capital Rehabilitation and Maintenance Prioritization

- Senior Team Review
- Risk Assessment
 - Danger to public, property/infrastructure, or overall safety
- Permitting, Design, and Public Engagement LOE
- Client Feedback



Case Study 1: Low (10 + Years)

- Adjacent to pedestrian trail and park
- Bank erosion with structures displaced
- Minimal change since previous inspection (2022)
- Recommended bank rehabilitation and structure replacement



2022



2024



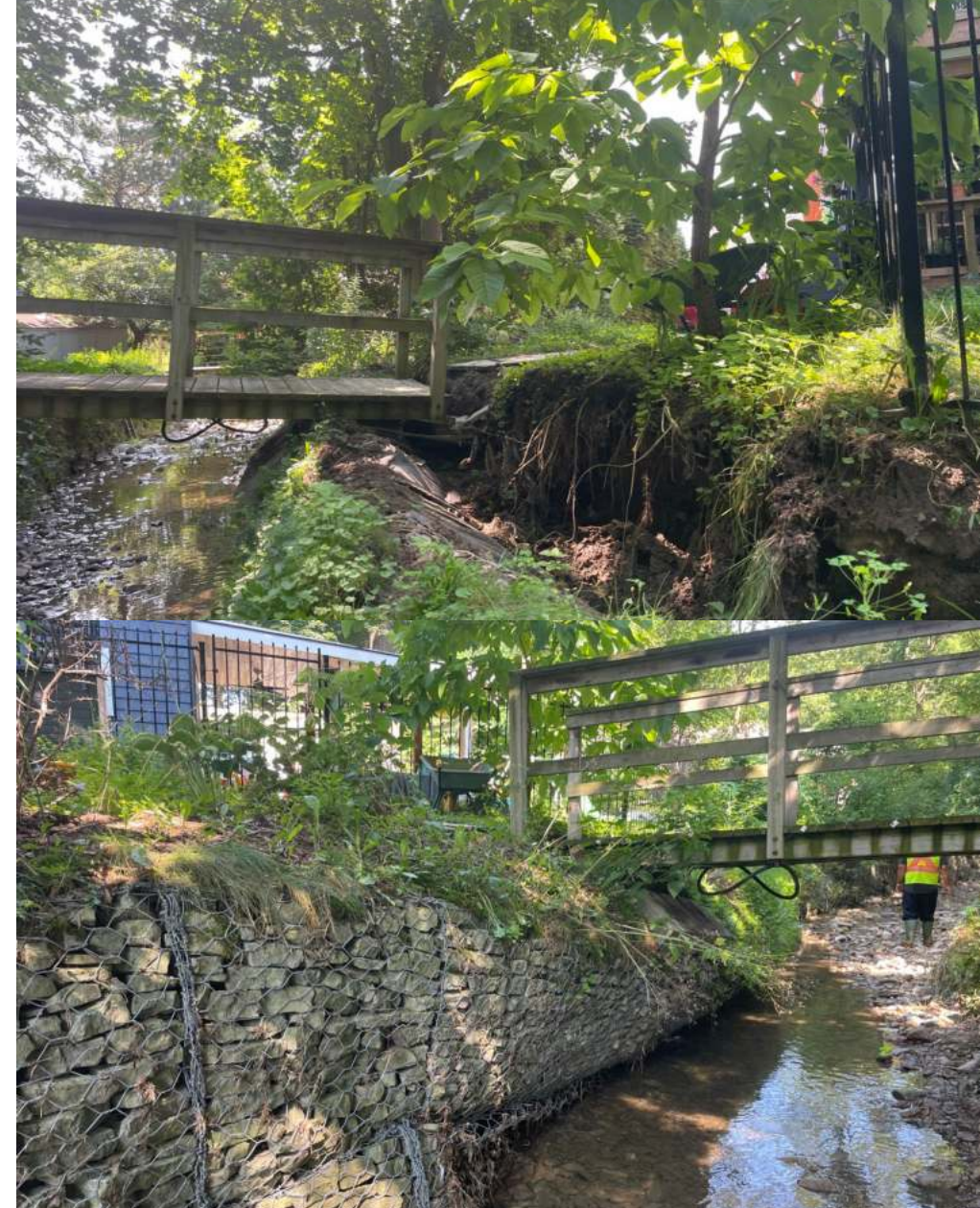
Case Study 2: Medium (3 - 5 Years)

- Sewer pipe exposed across creek
- Significant downcutting and widening through reach
- Consequent LWD jams
- Recommended debris jam maintenance and creek reconstruction



Case Study 3: High (~ 1 Year)

- Gabion wall collapse 1 m away from private property
- Potential failure of upstream Gabion walls that are currently sloped
- Residents voiced concern
- Recommended rehab of slopes and gabion walls



Building the App - Lessons Learned

1. Understand Client Needs

- Gathering the right team
- Level of effort at planning stage

2. Communication is Key

- Milestone conversations
- Prompt feedback
- Training documents

3. A Photo is Worth a Thousand Words



Project Outcome

Inventory Management

- Watercourses & Natural Assets
- Inspection (2 yr)
- Failure progression
- Online structures

Risk Profile

- Capital Rehabilitation Needs
- Minor Maintenance

Communication

- Senior Leadership
- Council
- Community





2025 Water, Wastewater and Stormwater Rate Supported Budget

New Capital Program - Ravines and Watercourses

1 Senior Project Manager (Engineering Services)

1 Project Manager (Engineering Services)

- Creating a team responsible for asset management of naturalized stormwater assets including stormwater management facilities, ravines, watercourses, municipal drains, and shorelines
- Responsive to program gaps identified in Report PW21074, December 6, 2021

Thank you!

Acknowledgements

AECOM: Kosta Paliouras, Rhonneke Van Riezen, Bayan Costas, Connor Hamilton, Cody Candassie, Mikayla Reid, Pippy Warburton.

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