West Humber River
Restoration and Infrastructure Protection Study

Geomorphic System Master Plan

Virtual Public Meeting: March 19, 2025

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West Humber River Geomorphic Systems Master Plan

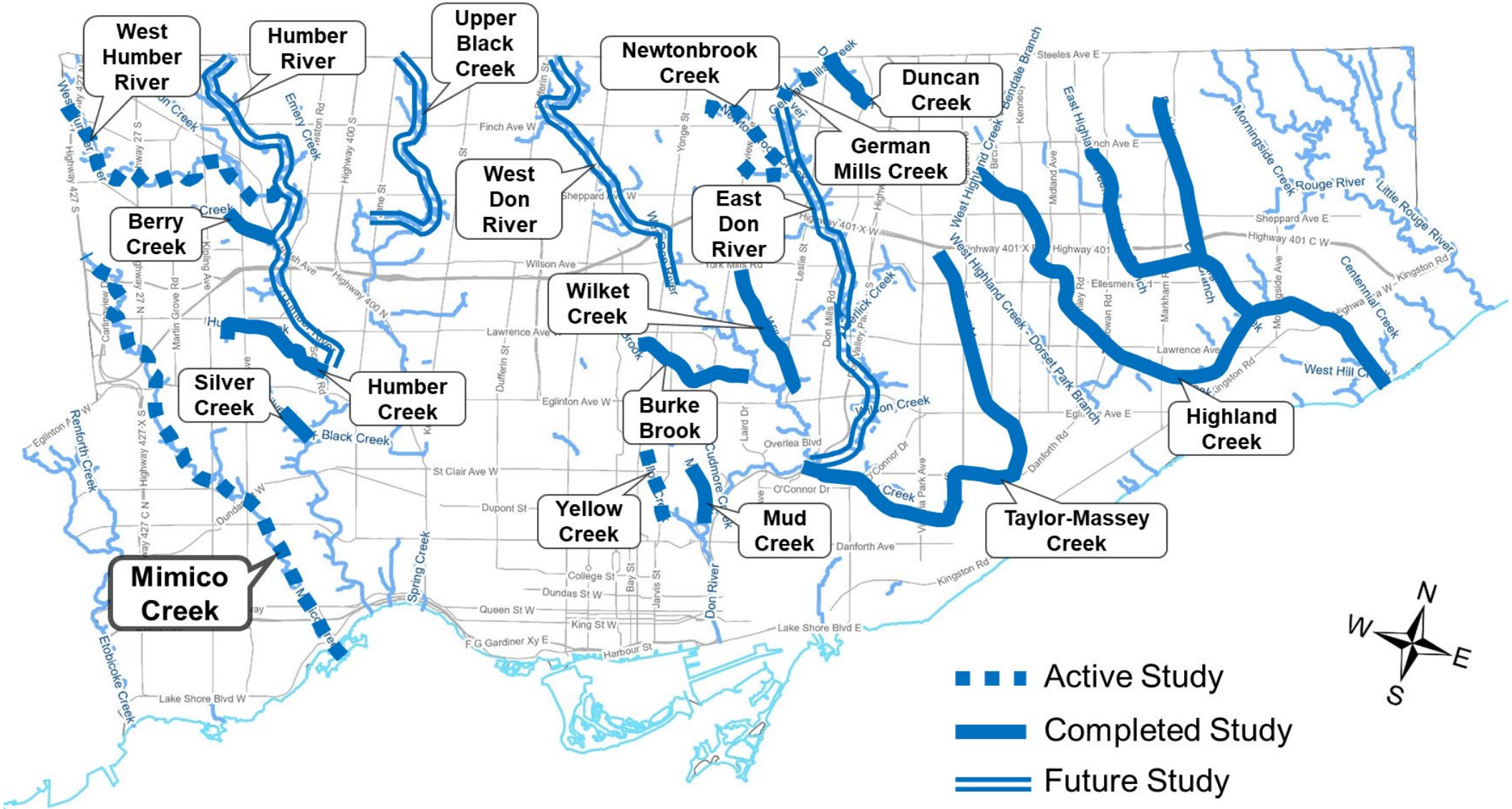
In late 2020 the City of Toronto initiated the West Humber River Geomorphic Systems Master Plan (GSMP) Environmental Assessment (EA), as one of five ongoing GSMP studies across the city to identify, assess and protect water, sewer and stormwater infrastructure that is at risk of erosion from high flows due to storms and snow melt runoff.

Study Purpose:

- To identify concerns related to erosion that may damage the City's water and stormwater infrastructure
- To develop solutions that protect the City's water and stormwater infrastructure from excessive erosion processes within the stream
- To improve stream functions, such as increasing stream bank stability, reducing erosion, enhancing stormwater conveyance, and improving habitats

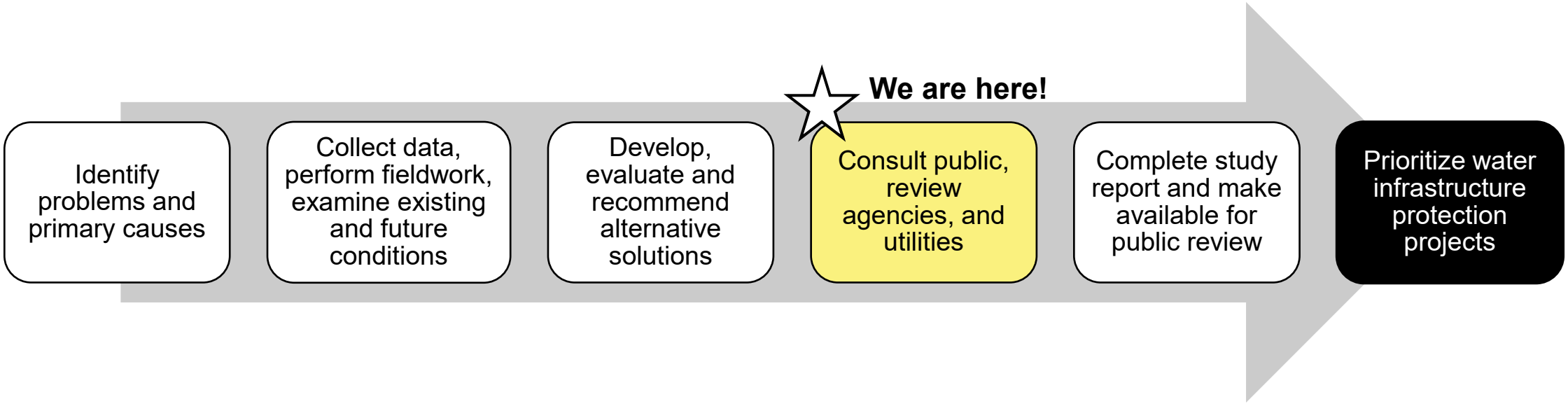
The objective is to maintain the City's water and sewer infrastructure in a state of good repair to ensure ongoing, optimal function of Toronto Water services.

Watercourse studies across the City



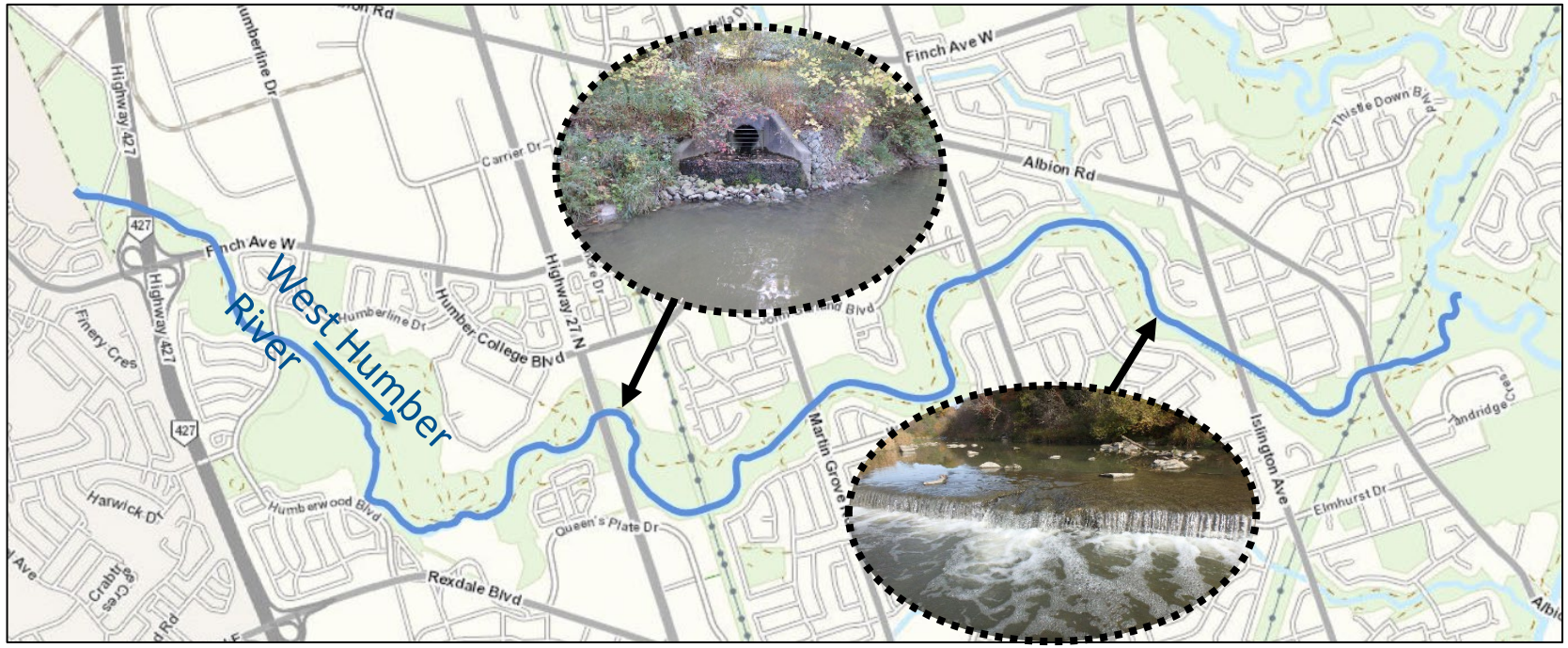
Study Process

This study is being undertaken as a Master Plan which is a long-range plan that examines the needs within a geographic area and provides a framework and vision for recommended improvements. The study will follow the Municipal Class Environmental Assessment study process, an approved planning process under the Ontario Environmental Assessment Act, which includes providing opportunities for public input.



Study Area

The study area includes the 10 km length of the West Humber River from west of Hwy 427 and Disco Road to where it meets the Humber River.



There are **83** water and sewer infrastructure sites and over 11 km of sanitary sewer lines including:

- **21** sanitary sewer sites and **19** sewer crossings, which carry wastewater to treatment plants
- **9** watermain sites, all of which are watermain crossings, which carry drinking water
- **34** storm sewer outfalls where stormwater runoff enters the river

Level of Erosion Risk

The level of erosion risk to the City's sewer and water infrastructure was assessed for 59 water, stormwater and sanitary sewer infrastructure sites close to the river. The assessment evaluated the likelihood of exposure and/or failure at each of the sites.

Very Low – Low-risk Sites

- Infrastructure and site conditions are stable
- Limited monitoring is required

Medium-risk Sites

- Infrastructure and site conditions are relatively stable
- Limited/some monitoring may be required

High-risk Sites

- Infrastructure is not exposed; exposure anticipated due to minimal depth of cover and/or high downcutting rates
- Regular monitoring may be required

Imminent-risk Sites

- Infrastructure is exposed and at risk of failure; requires immediate attention
- Regular monitoring and improvements to the infrastructure are required

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Alternative Solutions

Based on the risk assessment, alternative solutions for stabilizing the riverbed and banks were evaluated for the 15 sites most at risk.

Alternative 1: Do Nothing

- No improvements

Alternative 2: Local Works

- Single phase construction over a short section of channel subject to city-wide priority and budget availability
- Project sites generally less than 100 m
- Local bed and/or bank work in the stream to protect Toronto Water infrastructure

Alternative 3: Sub-Reach Scale Works (An extended segment of the river)

- Single or multiple phase construction over a long section of channel subject to city-wide priority and budget availability
- Project sites generally greater than 100 m
- Engineered channel design consisting of bed and bank work in the stream and floodplain to protect Toronto Water infrastructure
- Channel will be regraded or locally realigned to improve creek flow by reducing water velocities and erosion

Alternative 2 –
Example of Local Works

Alternative 3 –
Example of Sub-Reach Scale Works

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Examples of Alternative 2 and Alternative 3

Alternative 2 Local works: Sanitary sewer maintenance hole within the creek channel
The creek has been realigned away from the maintenance hole with armourstone walls built as bank protection.

Taylor-Massey Creek exposed maintenance hole (during construction)

Taylor-Massey Creek maintenance hole stabilized and protected behind armourstone

Alternative 3 Sub-reach works: Rehabilitated creek corridor to protect multiple infrastructure sites.
The creek was in poor condition and restored to a more natural channel.

Duncan Creek – erosion accelerated by large storms and exposure of water infrastructure

Duncan Creek – Rehabilitated creek corridor

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Evaluation of Alternative Solutions

Alternative solutions were evaluated against five criteria.

Physical & Natural Environment

Improves stability of stream and valley walls, flood conveyance, groundwater quality, vegetation, aquatic and terrestrial habitats including habitat for at-risk species, and minimised tree removals.

Economic Considerations

Evaluate total capital costs against recurring costs for maximum improvements and outcomes over a span of 30 years.

Infrastructure Risk

Addresses erosion and risk to City's water and sewer infrastructure.

Social & Cultural Environments

Protects built and cultural heritage as well as landscape and archaeological resources and assesses long term benefits for the community, minimum or short-term negative impacts, and consideration for impacts on private property.

Technical & Engineering Considerations

Evaluate regulatory agency standards, availability of staff and technical resources, maximum improvement for ecosystem and infrastructure.

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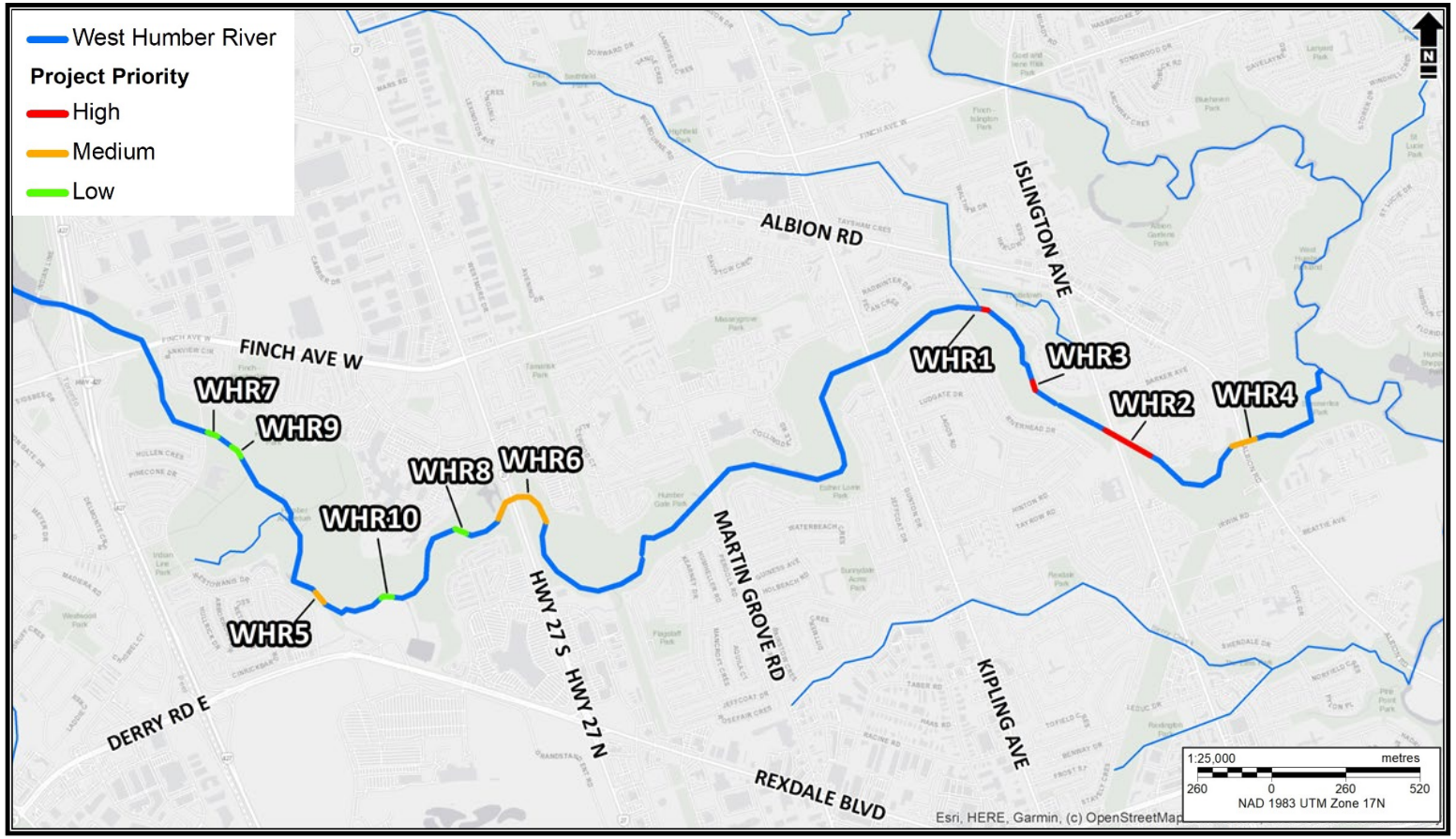
Recommended Solutions

Based on the outcome of the evaluation of alternatives for each of the 15 most at-risk infrastructure sites, the study recommends 10 river restoration projects.

- The projects consist of seven local works (Alternative 2) and three sub-reach works (Alternative 3) solutions.
- The 10 projects were assigned priority levels for implementation.
  - Projects 1-3 are high priority
  - Projects 4-6 are medium-priority
  - Projects 7-10 are low-priority
- Exposed sanitary sewers rank as the highest priority projects as they pose greater negative impacts if broken as compared to broken storm sewer outfalls or watermains.

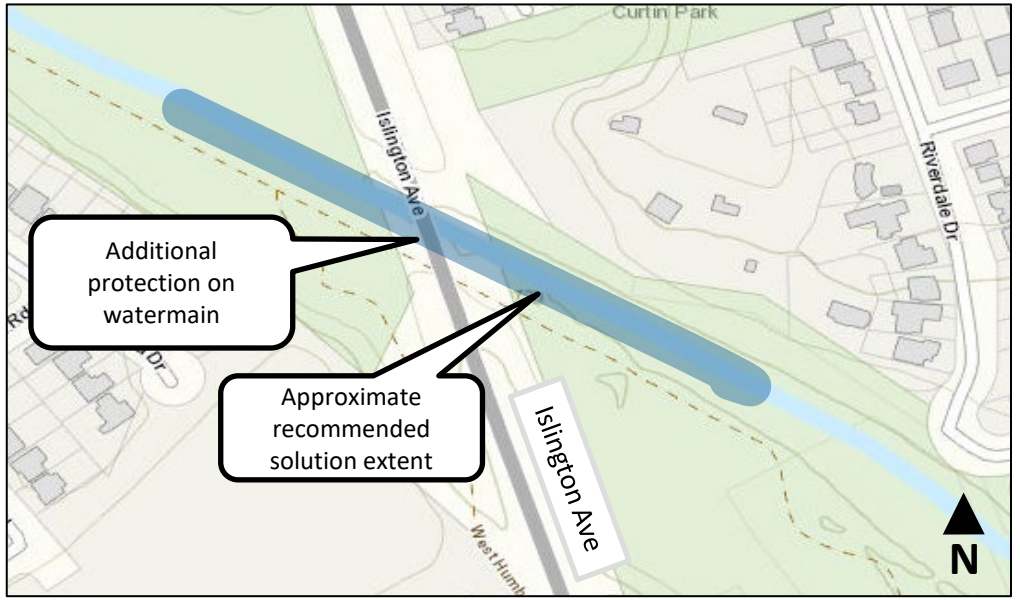


Recommended Solution: Project #1

Project No 1	High Priority (short to medium term)
Infrastructure at Risk	• Sanitary sewer crossing
Current Conditions	• Sewer is exposed • Large pool in the riverbed downstream
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 80 m. • In-channel bed protection, such as stone added to the riverbed and banks to protect the sanitary sewer crossings in place. • This project may be combined with Project #3 during detailed design.

Recommended Solution: Project #2

WHR Project No 2	High Priority (short to medium term)
Infrastructure at Risk	• Sanitary sewer crossing • Two watermain crossings
Current Conditions	• Sanitary sewer is exposed • Watermains remain covered (> 0.75 m of cover)
Recommended solution	<u>Alternative 3 - Subreach Based Works</u> • Engineered natural channel design works for approximately 250 m. • Includes adjusting the channel bed and banks and installing stone to reinstate protection over the sewer crossing and create a more stable channel form.



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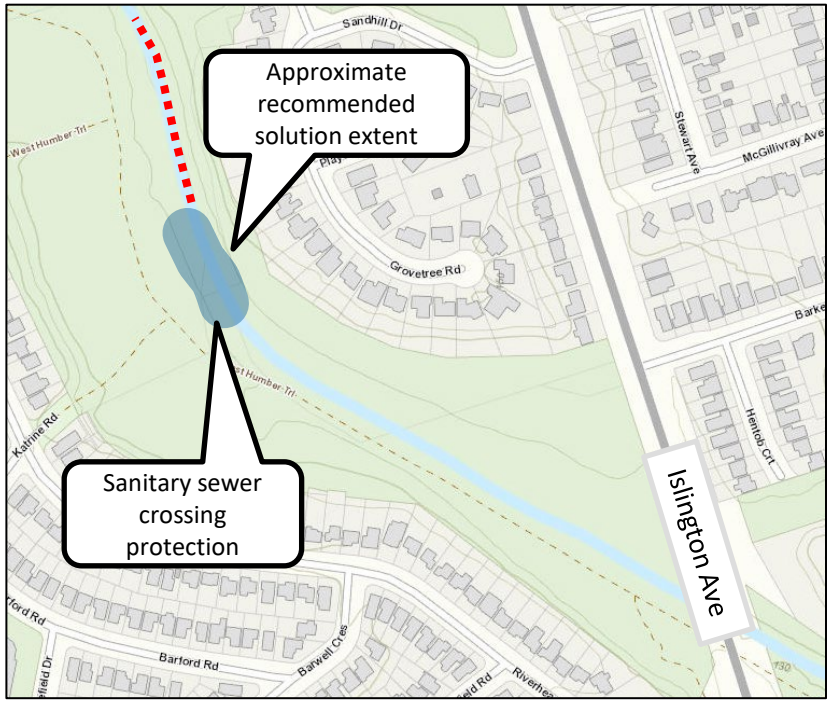
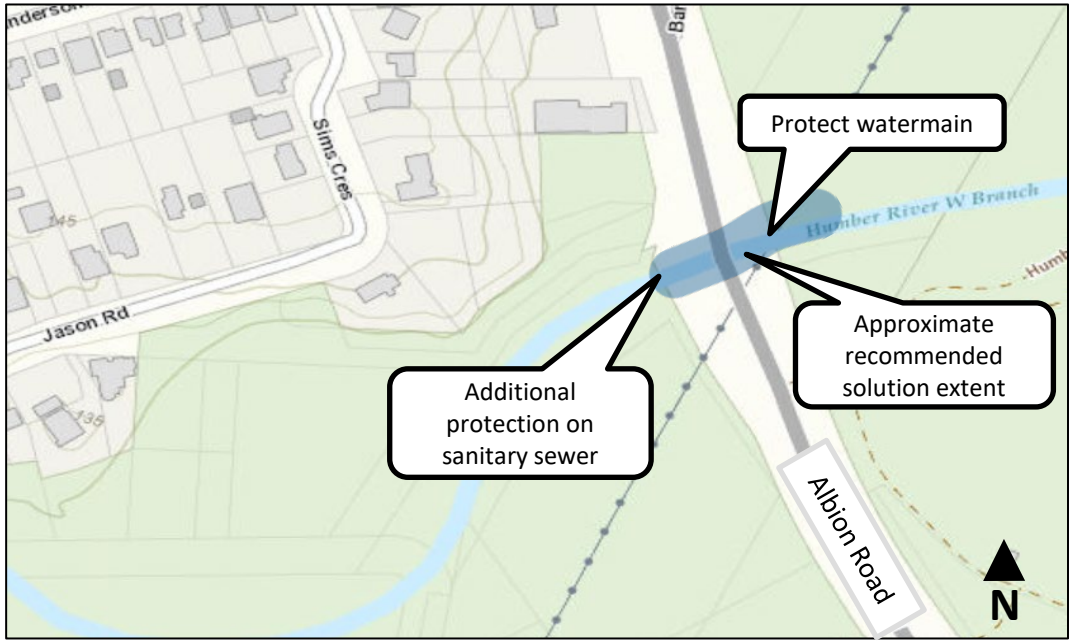
Recommended Solution: Project #3

WHR Project No 3	High Priority (short to medium term)
Infrastructure at Risk	• Sanitary sewer crossing
Current Conditions	• Sewer is exposed • Sewer currently acts as fish barrier
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 130 m. • In-channel bed protection, such as stone added to the riverbed and banks to protect the sanitary sewer crossings in place. • Addresses erosion risk within existing footprint of the river. • This project may be combined into with Project #1 during detailed design.



Recommended Solution: Project #4

WHR Project No 4	**Medium Priority**
Infrastructure at Risk	• Watermain crossing • Sanitary sewer crossing
Current Conditions	• Watermain close to being exposed (0.09 m of cover) • Sewer crossing remains covered (0.42 m)
Recommended solution	<u>Alternative 3 - Subreach Scale Works</u> • Engineered natural channel design works for approximately 300 m. • Includes adjusting the channel bed and banks, and installing stone, to reinstate protection over the sewer crossing and create a more stable channel form.

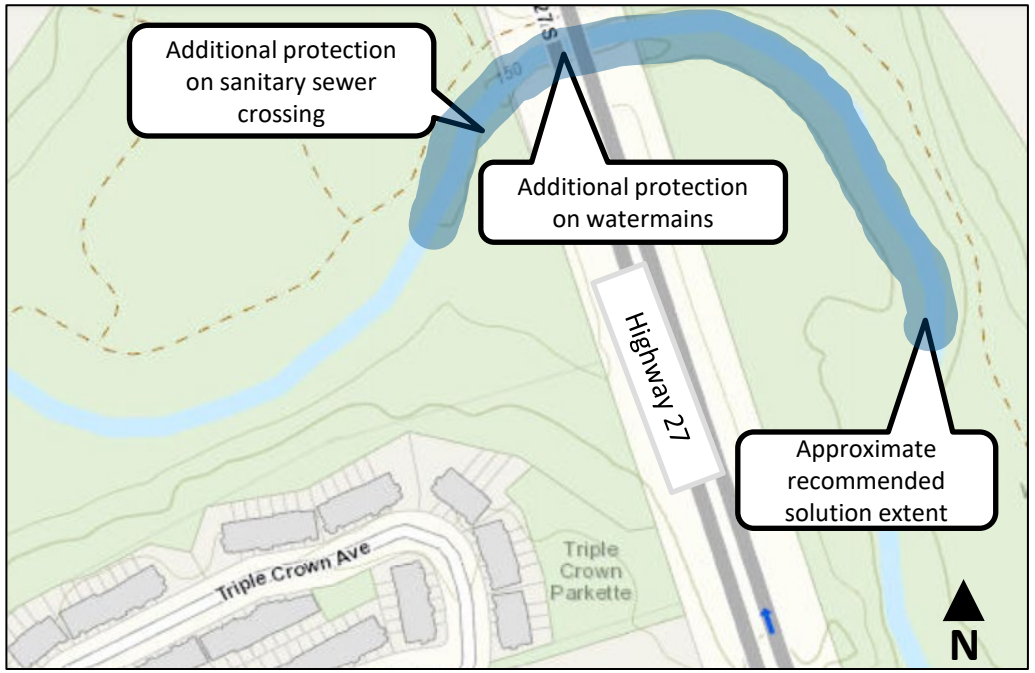


Recommended Solution: Project #5

WHR Project No 5	**Medium Priority**
Infrastructure at Risk	• Sanitary sewer crossing • Storm sewer outfall
Current Conditions	• Sanitary sewer close to being exposed (0.05 m of cover) • Erosion around outfall
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 100 m. • In-channel bed protection; to protect the sanitary sewer crossings in place.

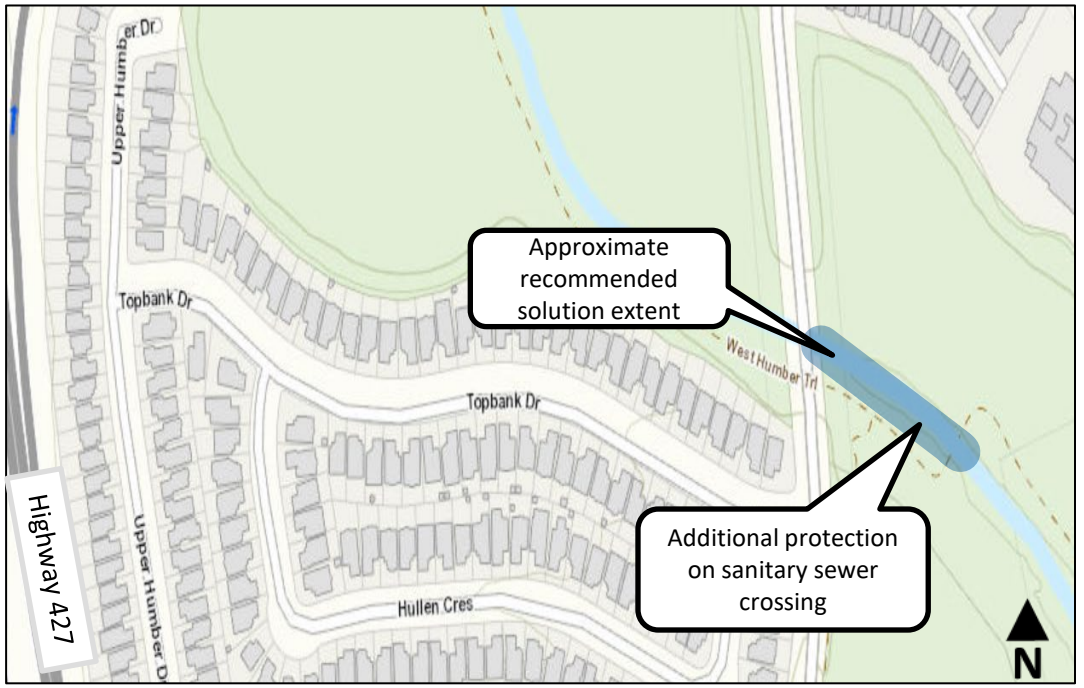
Recommended Solution: Project #6

WHR Project No 6	**Medium Priority**
Infrastructure at Risk	• Sanitary sewer crossing • Two watermain crossings
Current Conditions	• Sewer and watermains remain with > 1.0 m of cover
Recommended solution	<u>Alternative 3 - Subreach Scale Works:</u> • Engineered natural channel design works for approximately 300 m. • Includes adjusting the channel bed and banks, and installing stone, to reinstate protection over the sewer crossing and create a more stable channel form.



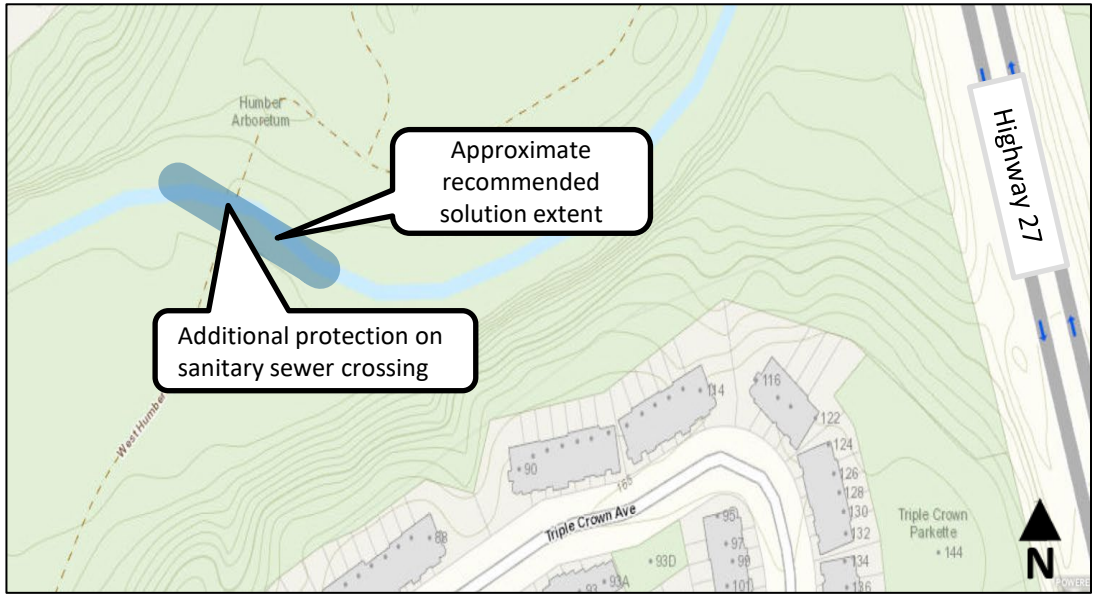
Recommended Solution: Project #7

WHR Project No 7	**Low Priority**
Infrastructure at Risk	• Sanitary sewer crossing
Current Conditions	• Sewer remains protected with 0.81 m of cover
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 121 m. • In-channel bed protection, such as stone added to the riverbed and banks to protect the sanitary sewer crossings in place. • Addresses erosion risk within existing footprint.



Recommended Solution: Project #8

WHR Project No 8	Low Priority
Infrastructure at Risk	• Sanitary sewer crossing
Current Conditions	• Sewer remains protected with 0.74 m of cover
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 62 m. • In-channel bed protection, such as stone added to the riverbed and banks to protect the sanitary sewer crossings in place. • Located directly downstream of pedestrian bridge.



Recommended Solution: Project #9

WHR Project No 9	**Low Priority**
Infrastructure at Risk	• Sanitary sewer in riverbank
Current Conditions	• Sewer remains covered. • Bank is migrating towards sewer at 0.09 m/year.
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 80 m. • In-channel bed protection, such as stone added to the riverbed and banks to protect the sanitary sewer crossings in place. • Addresses erosion risk within existing footprint.

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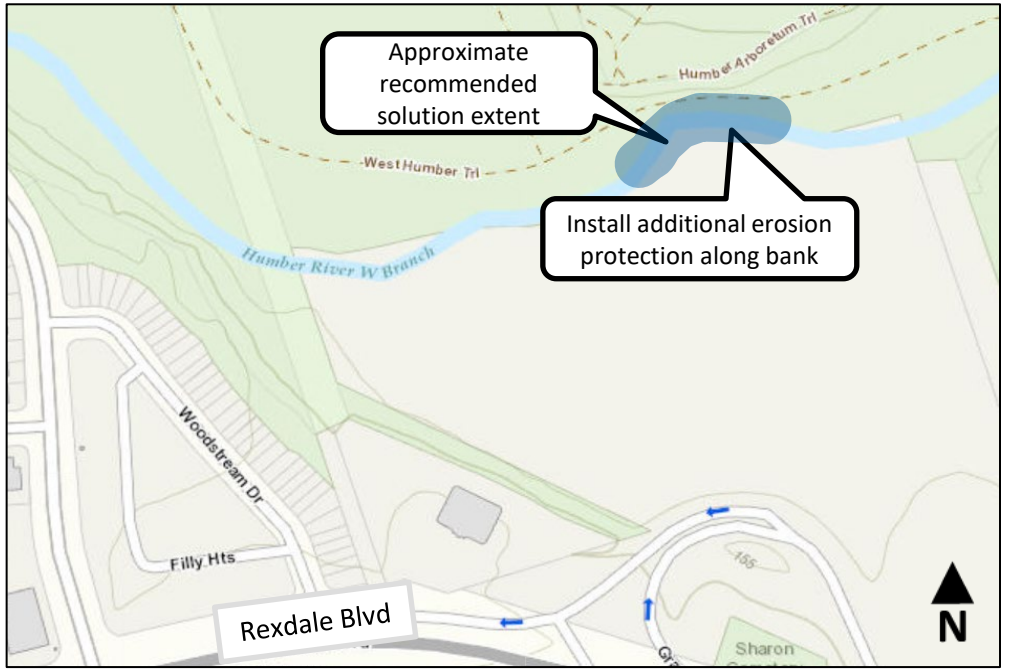
Recommended Solution: Project #10

WHR Project No 10	Low Priority
Infrastructure at Risk	• Sanitary sewer in riverbank
Current Conditions	• Sewer remains covered • Bank is migrating towards sewer at 0.04 m/year
Recommended solution	<u>Alternative 2 - Local Works and Protection</u> • Engineered natural channel design works for approximately 90 m. • In-channel bed protection, such as stone added to the riverbed and banks to protect the sanitary sewer crossings in place.



River Restoration and Protection Work Requirements

Future implementation of the recommended projects requires:

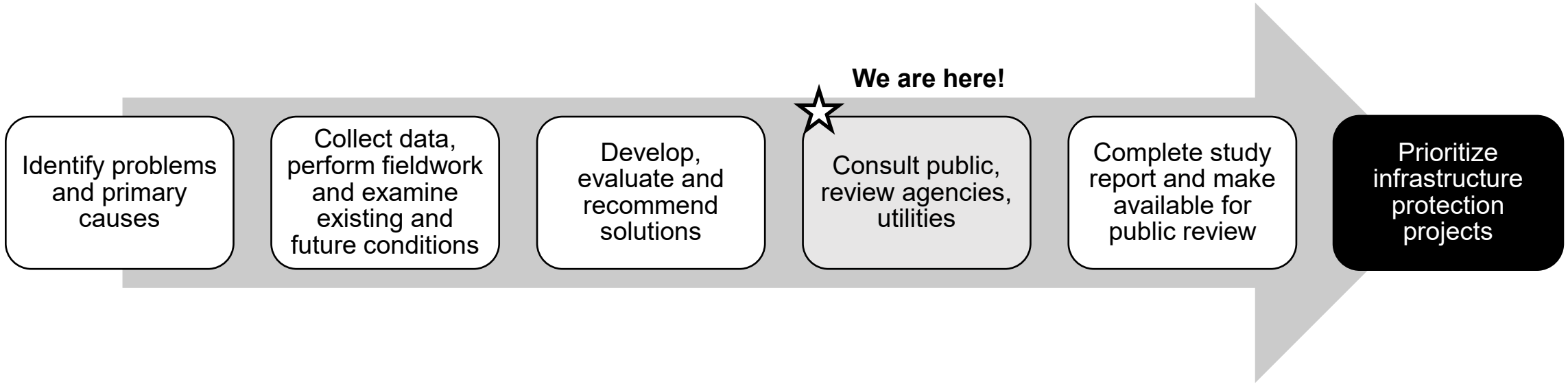
- Tree and vegetation removal followed by native species replanting. Many of the tree removals include non-native species
- Re-naturalisation areas will be densely planted with a diversity of species to promote a variety of layers in vegetation (ground cover, understory, canopy) and a mixture of fast and slower growing trees
- A restoration plan will be developed prior to construction as part of a future design phase after the study

Construction Impacts

- Possible park trail closures may be required to accommodate construction activities.
- Construction notices will be distributed to residents prior to any future construction

Next Steps in Study Process

- Complete the study and make the master plan report available for a 30-day public review period.
- Following a successful review period, the recommended solutions will be included in the City's stream restoration and erosion control program.
- Implementation will be prioritized across all GSMPs, city-wide.



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