Recommended Solutions Overview

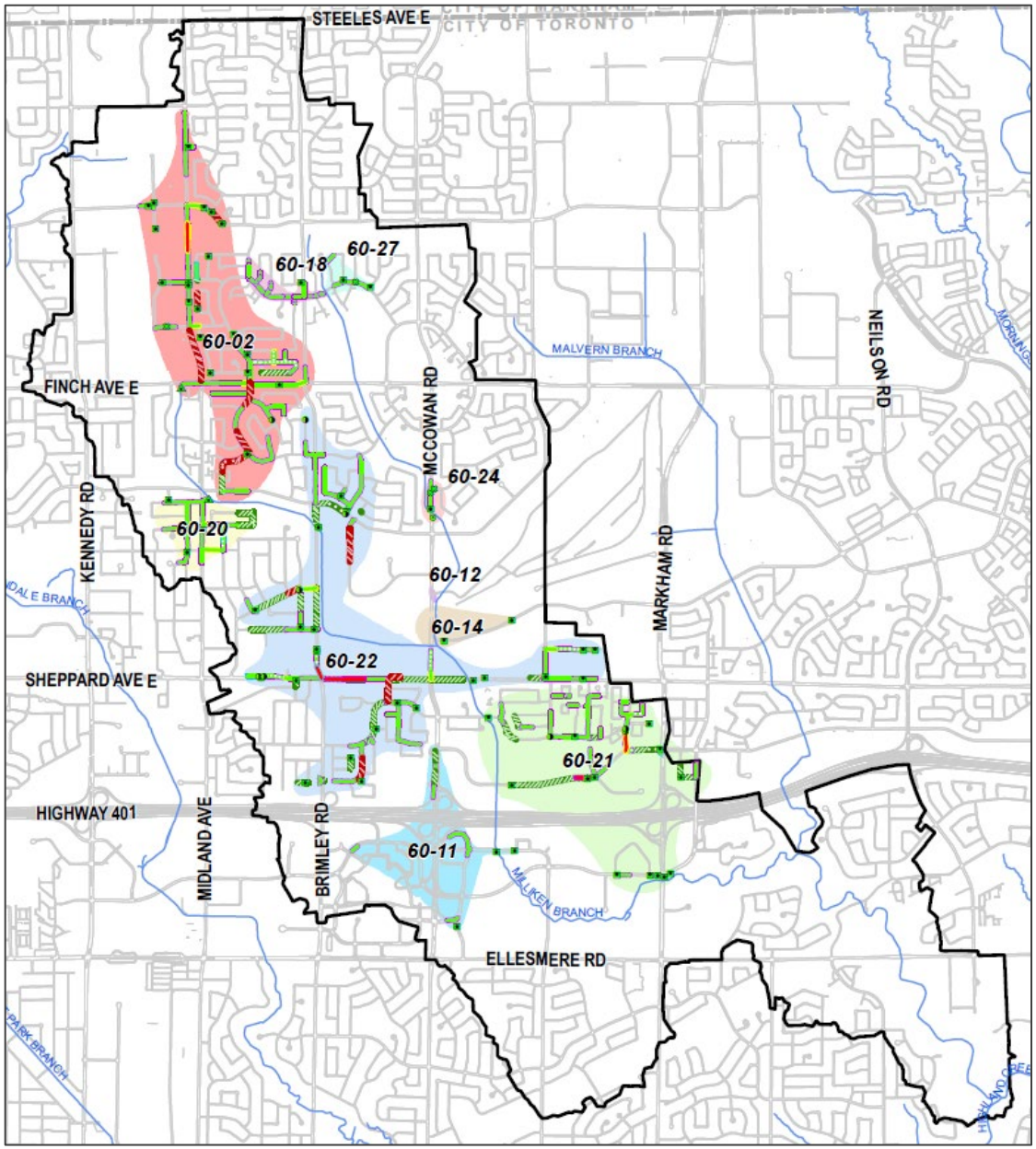
Legend

Proposed Storm Solution

- Upgrade Outfall
- Remove Catchbasins
- Increase Inlet Capacity
- Isolate Manhole
- Increase Inlet Capacity, Isolate Manhole
- Remove Catchbasins, Depress Curb
- New
- Realign
- Replace
- Upgrade
- Realign and Upgrade
- Inline Storage
- Realign and Inline Storage

Proposed Sanitary Solution

- New
- Replace
- Upgrade
- Inline Storage
- Realign and Inline Storage

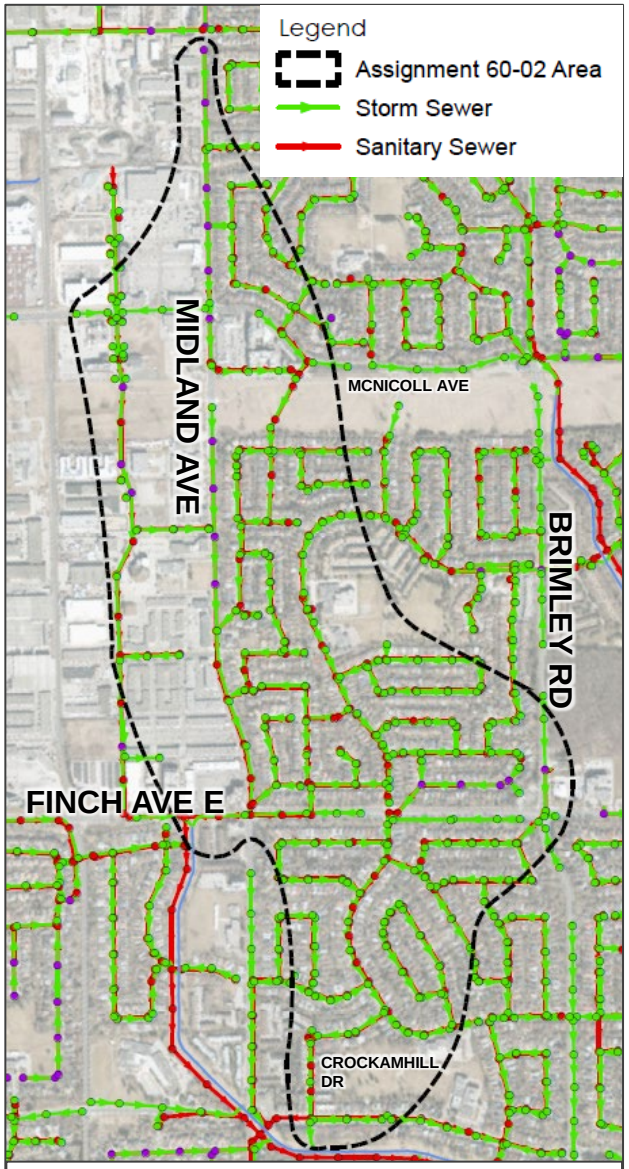


The following maps illustrate the differences between alternatives considered for each solution and the recommended solution

TORONTO

Assignment 60-02 Overview

- Assignment solutions include sewers north of Milliken Branch of Highland Creek (including Midland Ave, Finch Ave, McNicoll Ave, Crockamhill Dr)



Map showing the Assignment 60-02 area

TORONTO

Assignment 60-02 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve pipe improvements, with the following main differences:

Alternative 1

- Conveyance Upgrades
- In-line Storage
- Relief/Diversion Sewers
- Outfall upgrade on City Property
- Cost: $104M

Alternative 2

- Conveyance Upgrades
- Cascading In-line Storage
- Relief/Diversion Sewers
- Easement Upgrades
- Cost: $133M

Alternative 3

- Conveyance Upgrades
- Reduced In-line Storage
- Relief/Diversion Sewers
- Outfall Upgrade
- Chartland Park Storage Tank
- Cost: $110M

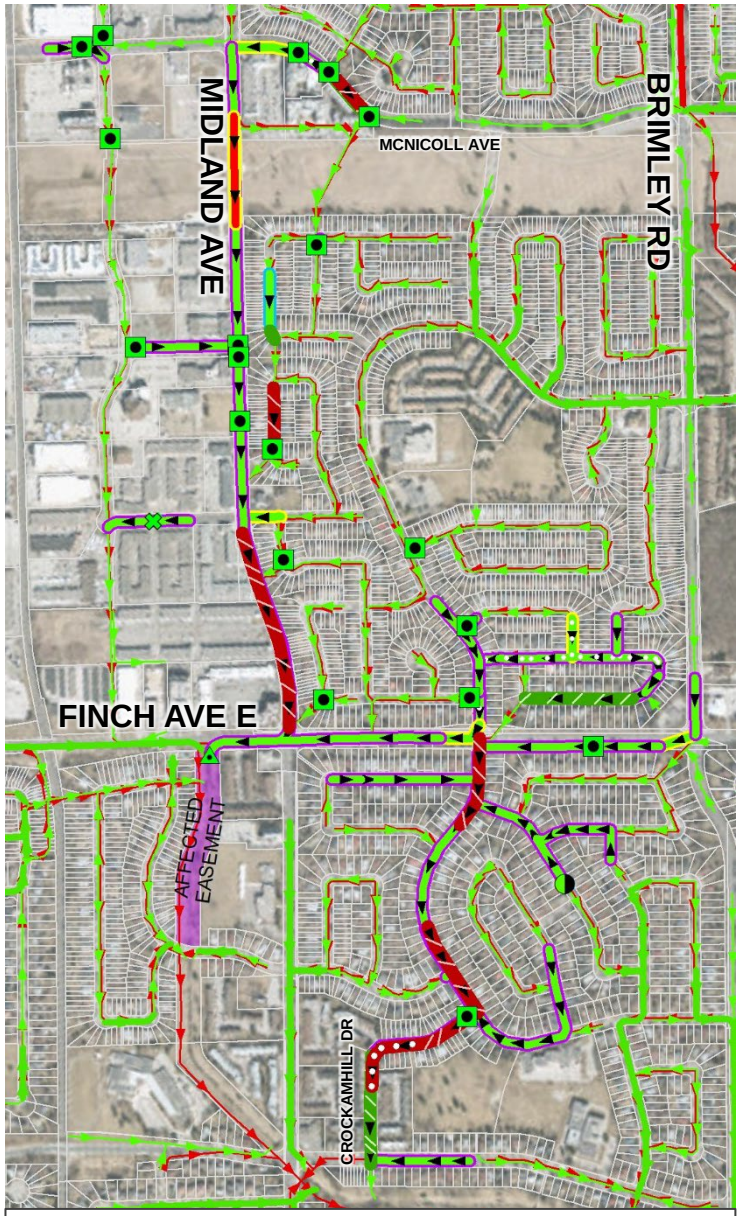
TORONTO

Assignment 60-02 Alternative 1

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Remove Catchbasin
- Upgrade Outfall
- New Storm
- Realign Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storage Tank
- New Sanitary
- Sanitary Inline Storage
- Realign Sanitary Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- In-line Storage
- Outfall Upgrade



Map showing Alternative 1 of Assignment 60-02

TORONTO

Assignment 60-02 Alternative 2

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Remove Catchbasin
- Upgrade Outfall
- New Storm
- Realign Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storage Tank
- New Sanitary
- Sanitary Inline Storage
- Realign Sanitary Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Cascading In-line Storage
- Sewer Upgrades within Easement

Map showing Alternative 2 of Assignment 60-02

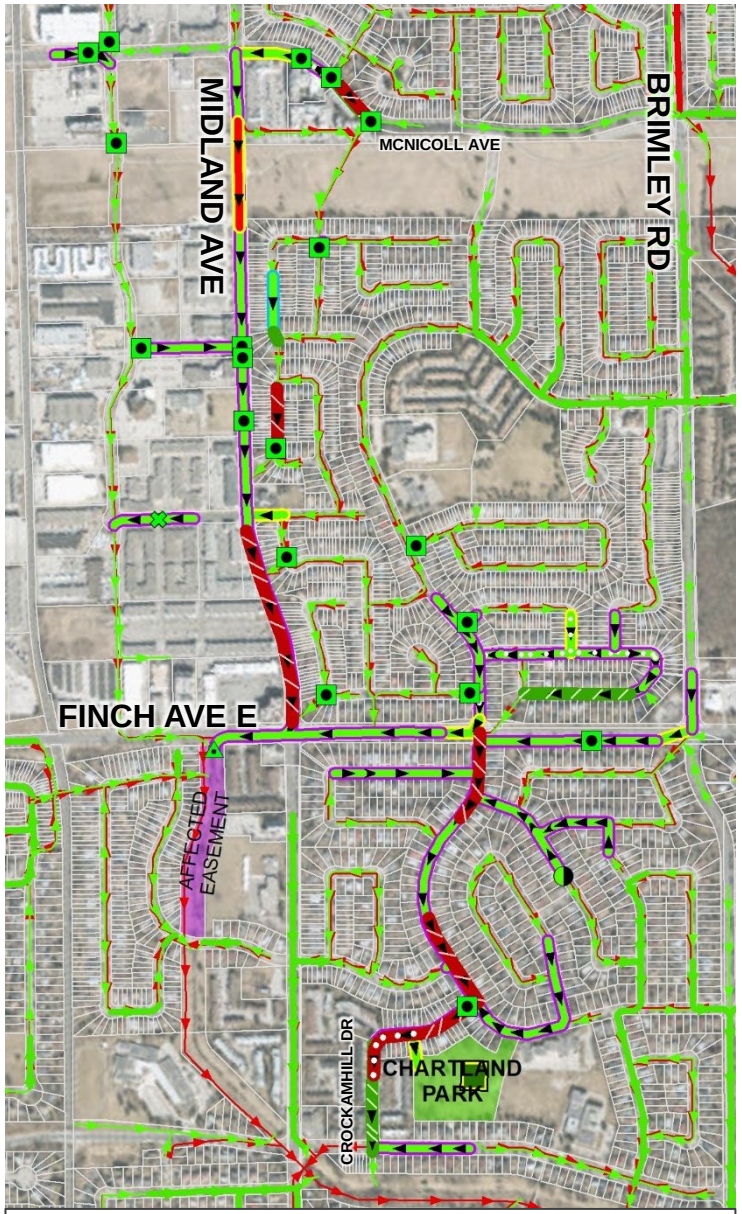
TORONTO

Assignment 60-02 Alternative 3

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Remove Catchbasin
- Upgrade Outfall
- New Storm
- Realign Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storage Tank
- New Sanitary
- Sanitary Inline Storage
- Realign Sanitary Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Reduced In-line Storage
- Outfall Upgrade
- Chartland Park Storage Tank



Map showing Alternative 3 of Assignment 60-02

TORONTO

Assignment 60-02 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 1**

- Alternative 2 requires construction within the private Hydro Electric Power Corridor as well as cascading in-line storage.
- Alternative 3 requires construction within Chartland Park for an off-line storage tank. Both alternatives would require significant maintenance and operation. Alternatives 1 avoids this work.
- Alternative 1 has a lower capital cost compared to Alternatives 2 and 3.

Assignment 60-02 Recommended Improvements

Legend

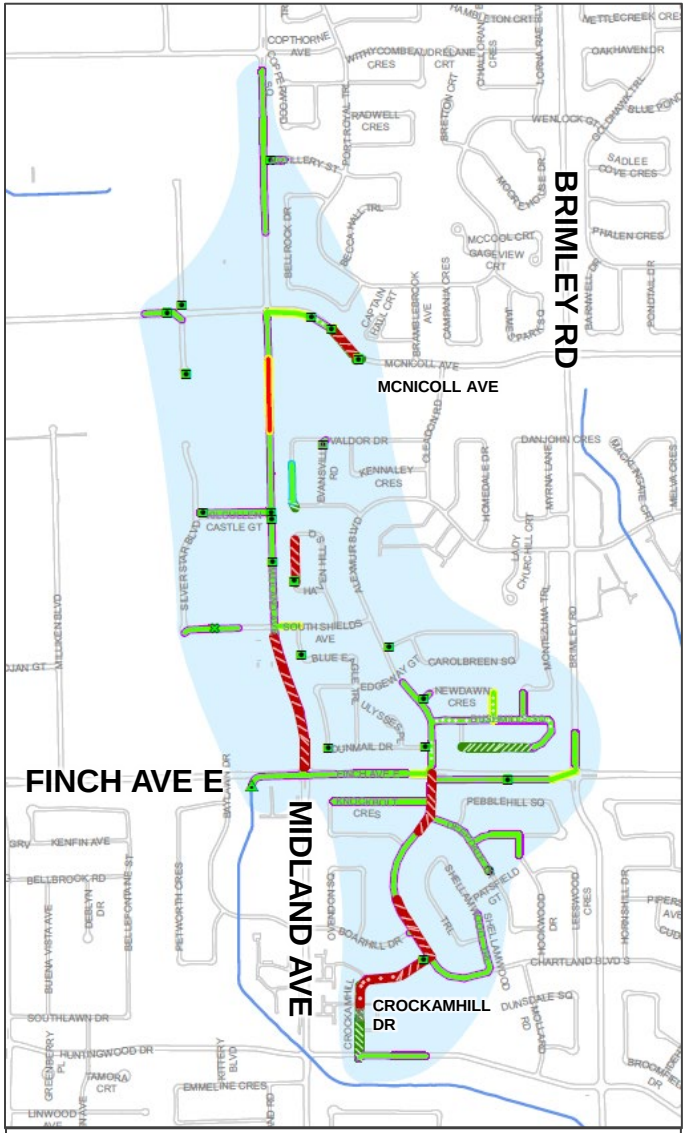
- Assignment 60-02 Area

Proposed Storm Solution

- Upgrade Outfall
- Remove CBs
- Increase Inlet Capacity
- Isolate MH
- New
- Realign
- Replace
- Upgrade
- Realign and Upgrade
- Inline Storage

Proposed Sanitary Solution

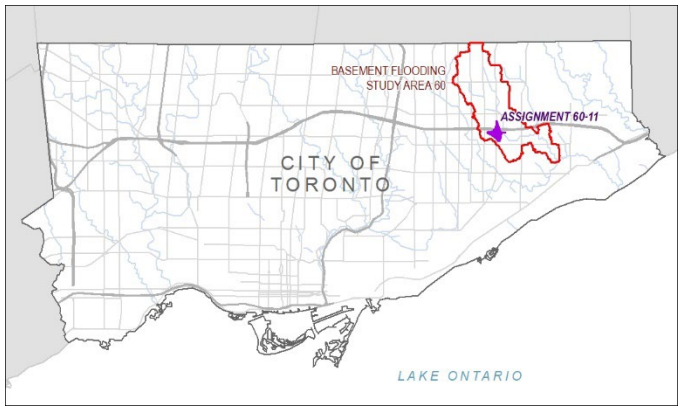
- New
- Inline Storage
- Realign and Inline Storage

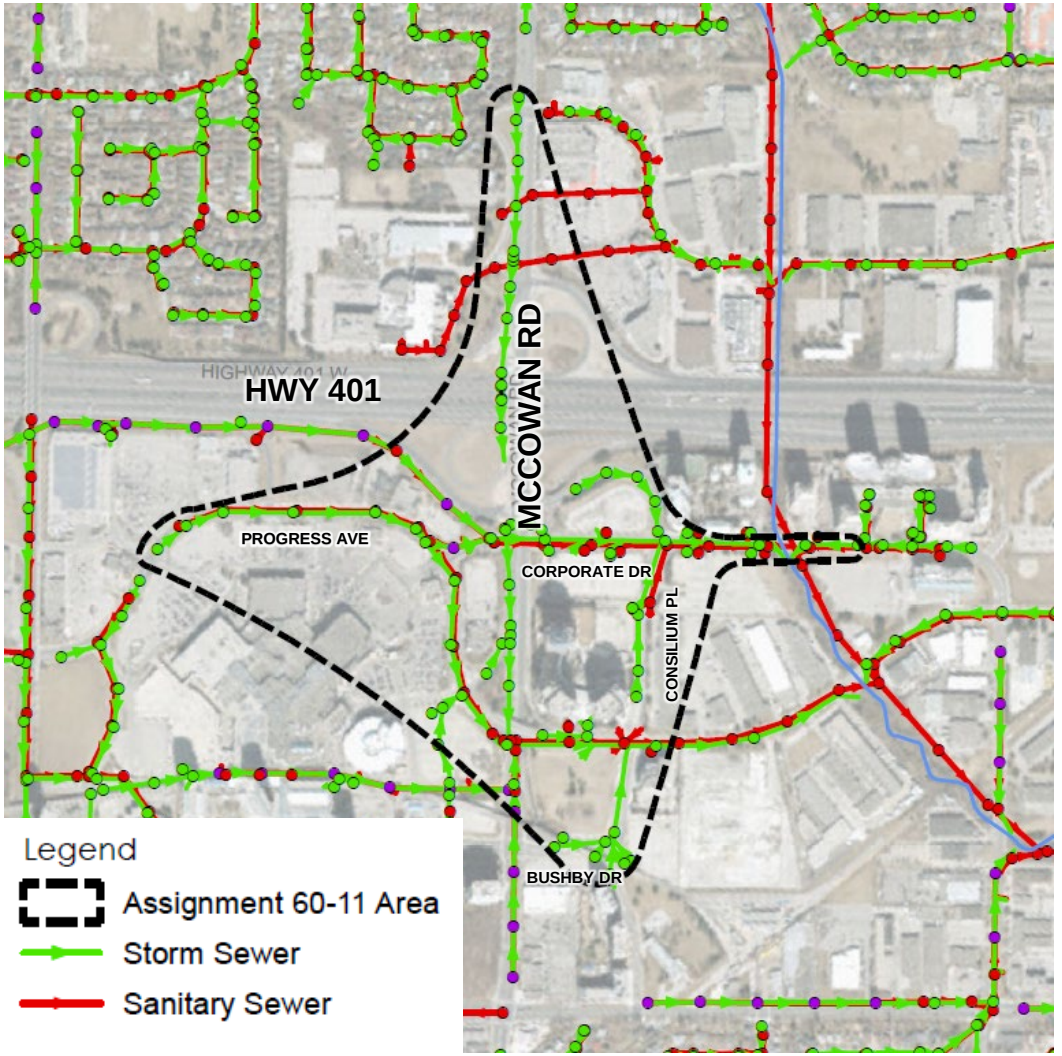


Map showing the Recommended Improvements for Assignment 60-02

Assignment 60-11 Overview

- Assignment solutions include sewers along McCowan Rd, Progress Ave, Consilium Pl, Corporate Dr, and Bushby Dr





Map showing the Assignment 60-11 area

TORONTO

Assignment 60-11 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve pipe improvements, with the following main differences:

Alternative 1

- Increased Inlet Capacity
- Conveyance Upgrades
- Includes Upgrades Under Highway 401
- Cost: $9.79M

Alternative 2

- Increased Inlet Capacity
- Conveyance Upgrades
- Inline Storage to Avoid Upgrades Under Highway 401
- Cost: $4.99M

Alternative 3

- Increased Inlet Capacity
- Conveyance Upgrades,
- Do Nothing on McCowan Rd
- Cost: $2.73M

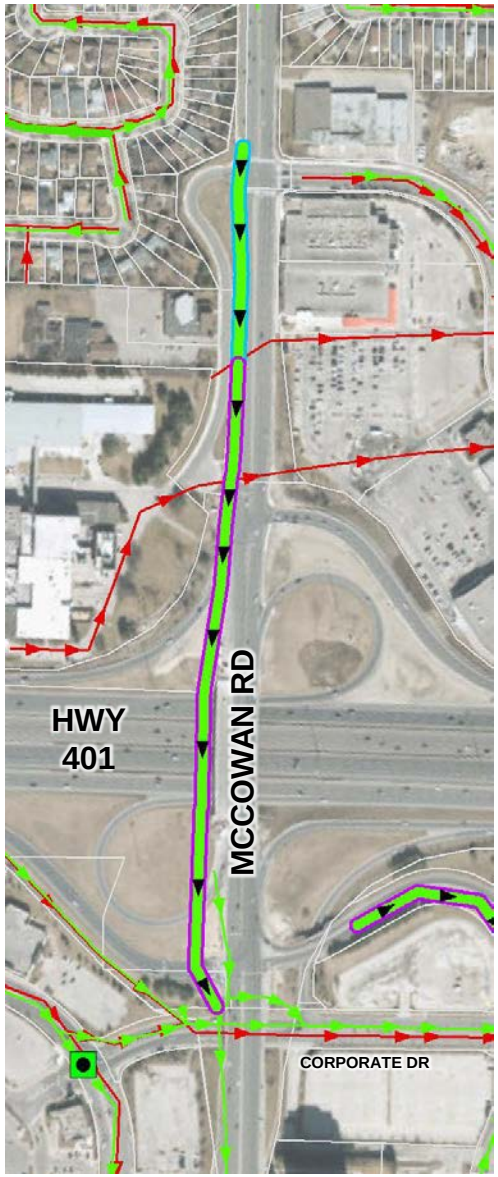
TORONTO

Assignment 60-11 Alternative 1

Legend

- Increase Inlet Capacity
- Replace Storm
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Includes Upgrades Under Highway 401



Map showing Alternative 1 of Assignment 60-11

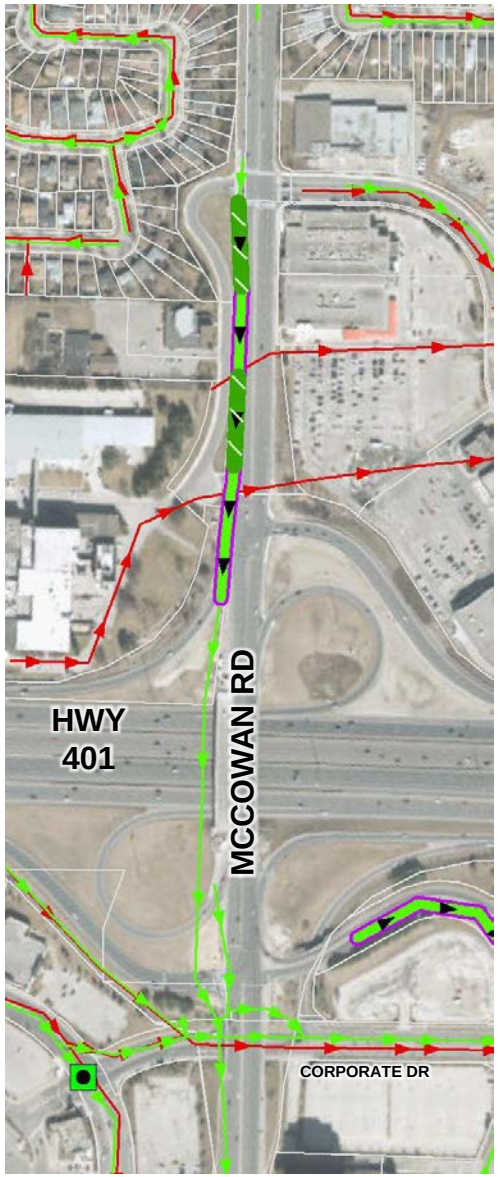
TORONTO

Assignment 60-11 Alternative 2

Legend

- Increase Inlet Capacity
- Replace Storm
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Inline Storage to Avoid Upgrades Under Highway 401



Map showing Alternative 2 of Assignment 60-11

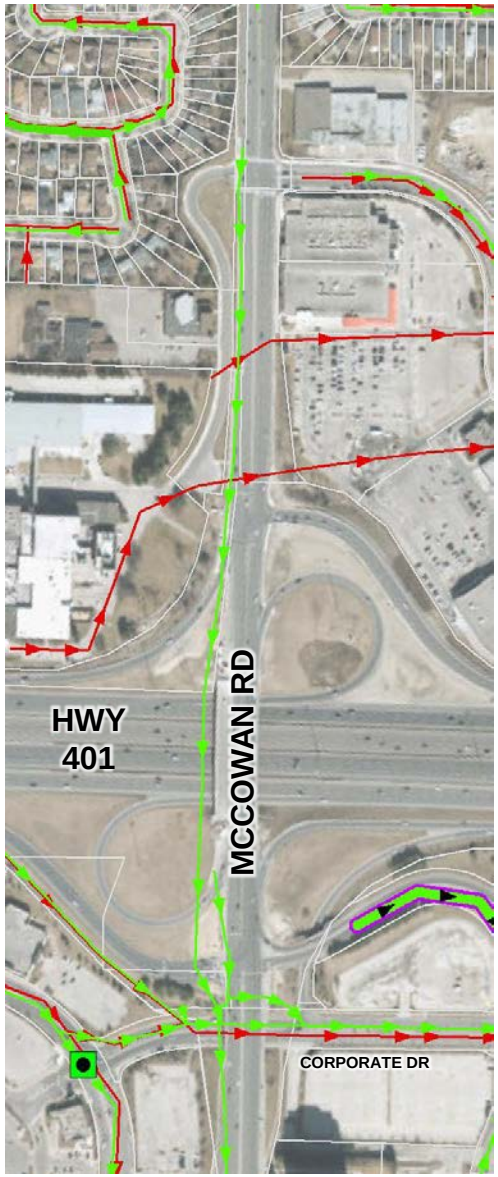
TORONTO

Assignment 60-11 Alternative 3

Legend

- Increase Inlet Capacity
- Replace Storm
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Do Nothing on McCowan Rd



Map showing Alternative 3 of Assignment 60-11

TORONTO

Assignment 60-11 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 2**

- Alternative 1 has significant constructability challenges and higher cost due to proposed upgrades under Highway 401, which are not required under Alternative 2

- Low-risk hydraulic issues remain present under Alternative 3 which are addressed with Alternative 2

TORONTO

Assignment 60-11 Recommended Improvements

Legend

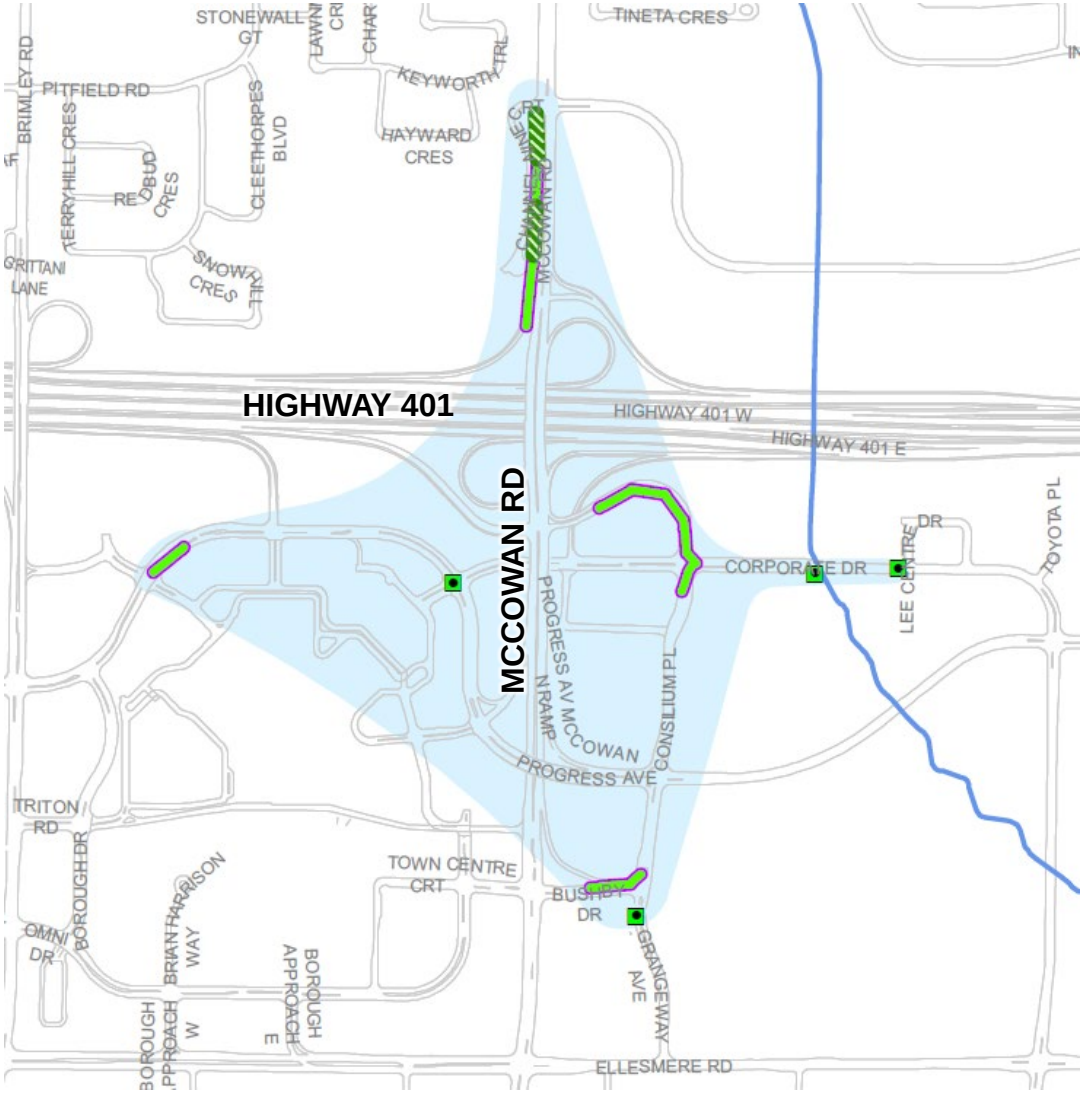
Assignment 60-11 Area

Proposed Storm Solution

Increase Inlet Capacity

Upgrade

Inline Storage

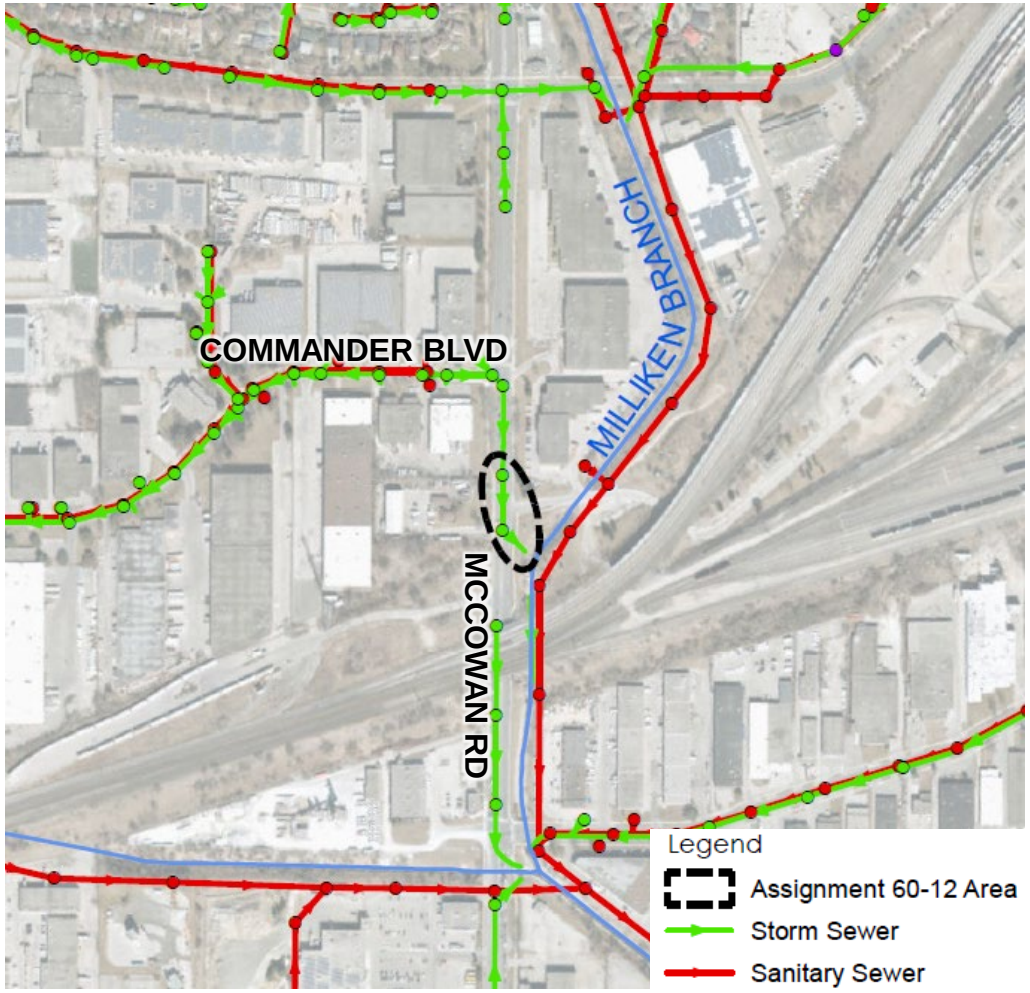


Map showing the Recommended Improvements for Assignment 60-11

TORONTO

Assignment 60-12 Overview

- Assignment solutions include sewers along McCowan Rd south of Commander Blvd



Map showing the Assignment 60-12 area

Assignment 60-12 Alternative Solutions

Two alternative solutions have been identified to mitigate surface and basement flood risk within the assignment, with the following main differences:

Alternative 1

- Reprofiling the existing sewer with an Outfall Upgrade
- Cost: $0.5M

Alternative 2

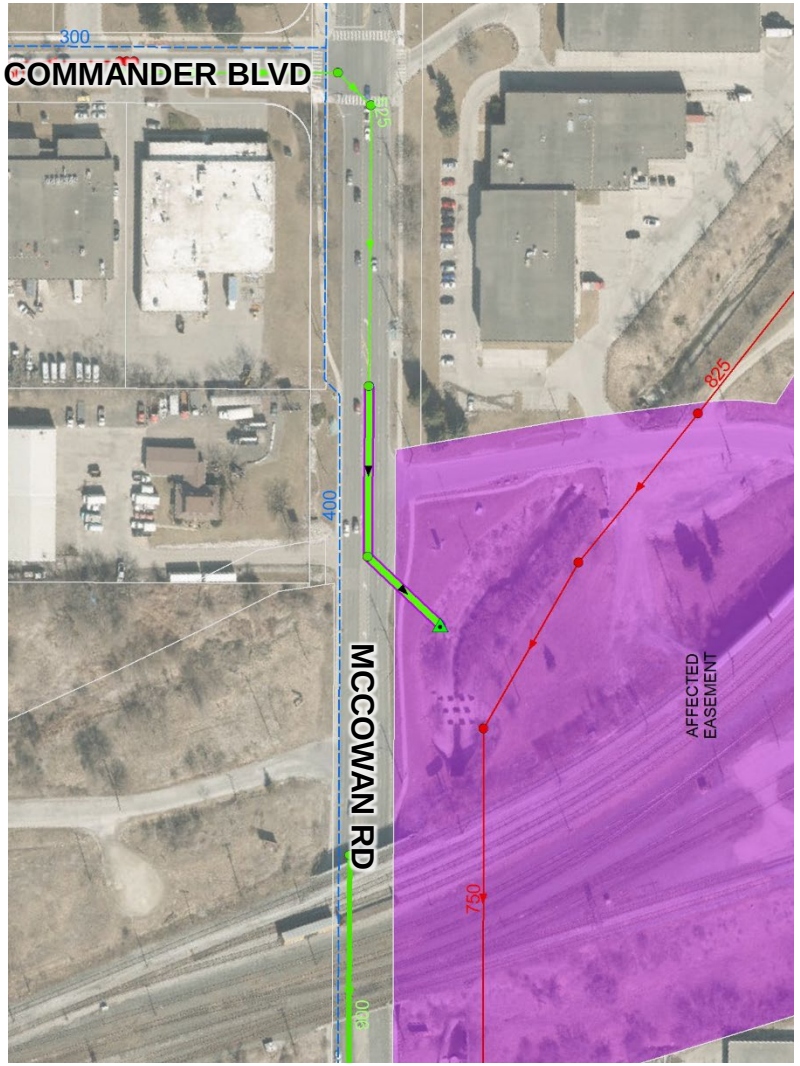
- Do Nothing due to low flood risk
- Cost: $0M

Assignment 60-12 Alternative 1

Legend

- Upgrade Outfall
- Upgrade Storm
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Reprofiling the Sewer with an Outfall Upgrade



Map showing Alternative 1 of Assignment 60-12

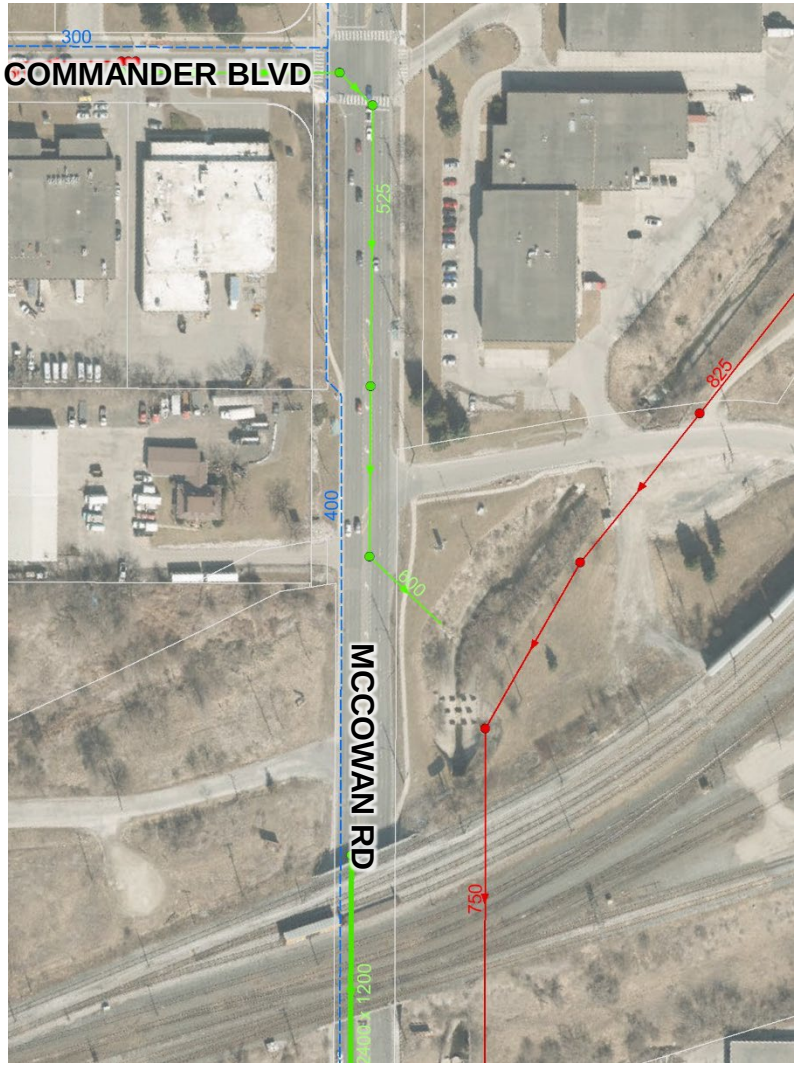
TORONTO

Assignment 60-12 Alternative 2

Legend

- Upgrade Outfall
- Upgrade Storm
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Do Nothing due to low flood risk



Map showing Alternative 2 of Assignment 60-12

TORONTO

Assignment 60-12 Recommended Improvements

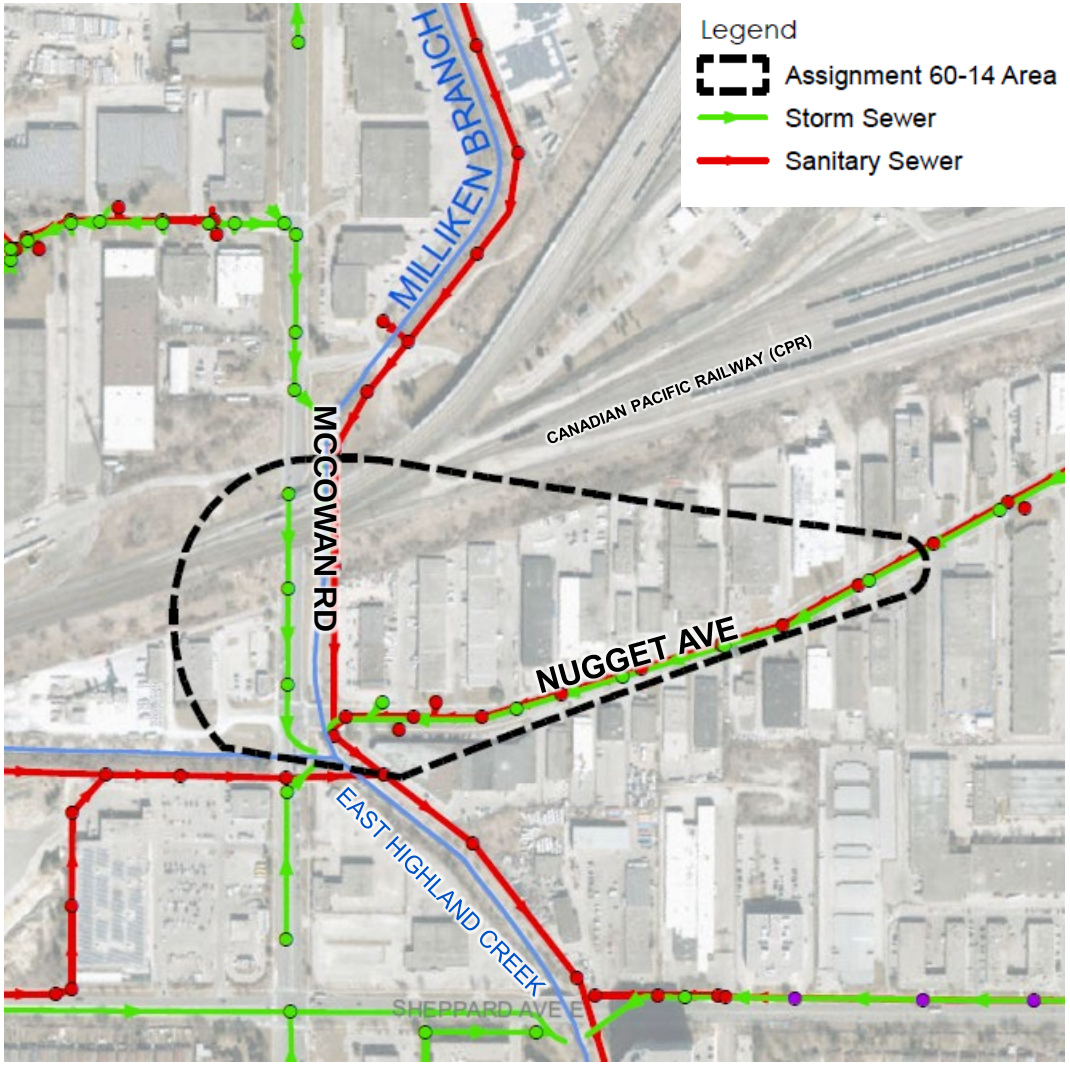
Based on the evaluation of alternative solutions, the preferred solution is **Alternative 2**

- Given that the location with a risk of flooding is a single area at the bottom of a steep slope near the outfall, there is a very low flood risk for the assignment and area.

- The Alternative 2 option to “Do Nothing” is preferred.

Assignment 60-14 Overview

- Assignment solutions include sewers along McCowan Rd and Nugget Ave between Canadian Pacific Railway (CPR) and East Highland Creek



Map showing the Assignment 60-14 area

TORONTO

Assignment 60-14 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve sewer improvements, with the following main differences:

Alternative 1

- Increased Inlet Capacity
- Conveyance Upgrades
- Outfall Upgrade
- Cost: $2.83M

Alternative 2

- Increased Inlet Capacity
- Conveyance Upgrades
- Inline Storage to Avoid Outfall Upgrades
- Cost: $7.41M

Alternative 3

- Increased Inlet Capacity
- Do Nothing on McCowan Rd
- Cost: $113K

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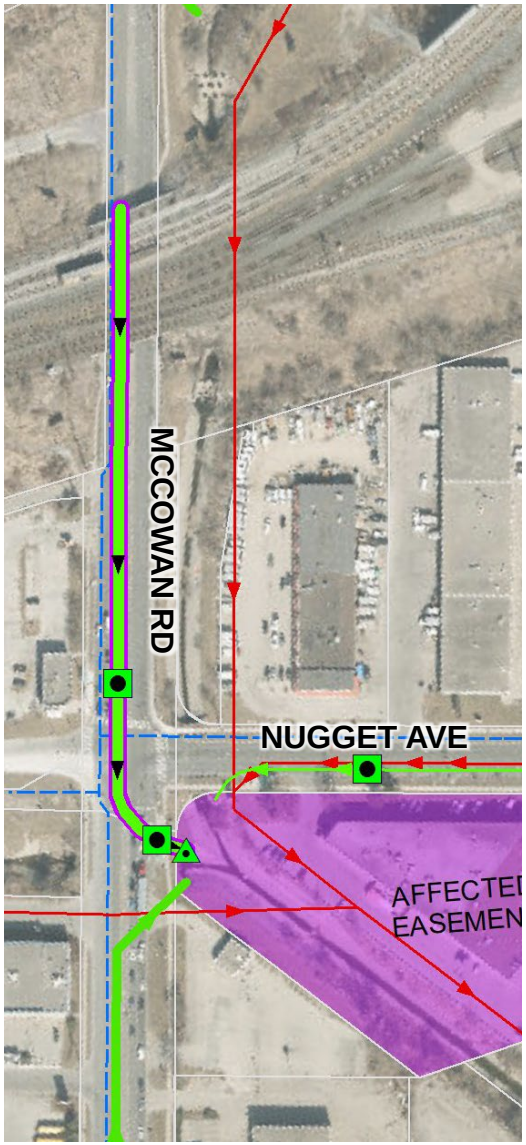
Assignment 60-14 Alternative 1

Legend

- Increase Inlet Capacity
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Outfall Upgrade



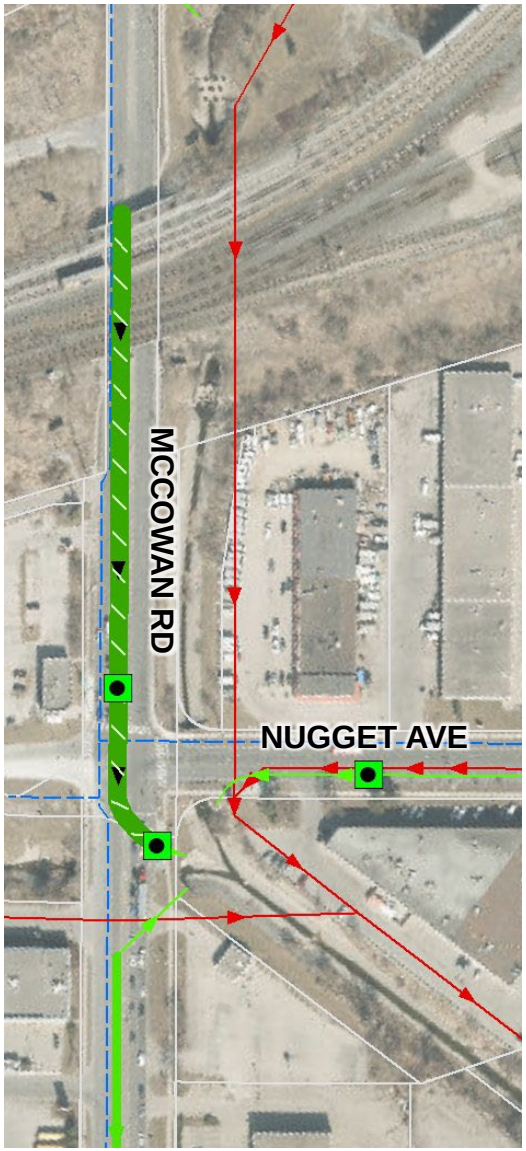
Map showing Alternative 1 of Assignment 60-14

Assignment 60-14 Alternative 2

Legend

- Increase Inlet Capacity
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Inline Storage to Avoid Outfall Upgrades



Map showing Alternative 2 of Assignment 60-14

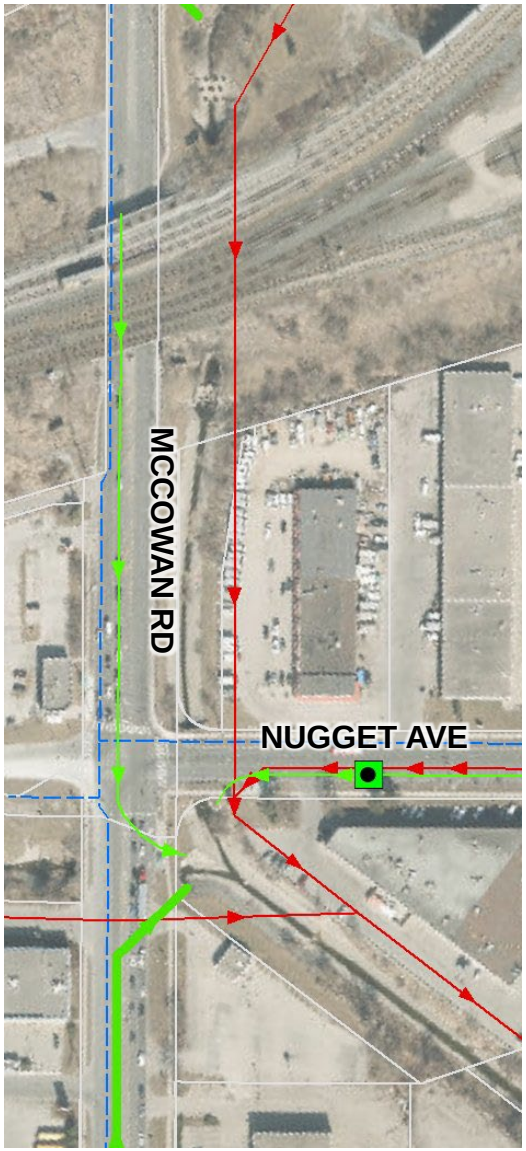
TORONTO

Assignment 60-14 Alternative 3

Legend

- Increase Inlet Capacity
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Do Nothing on McCowan Rd



Map showing Alternative 3 of Assignment 60-14

Assignment 60-14 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 3**

- Alternative 1 requires an outfall upgrade in private property, which poses significant constructability challenges and coordination.
- Alternative 3 includes a Do Nothing component on McCowen Rd, due to the low flooding risk.
- Alternative 3 has a significantly lower capital cost compared to Alternatives 1 and 2.

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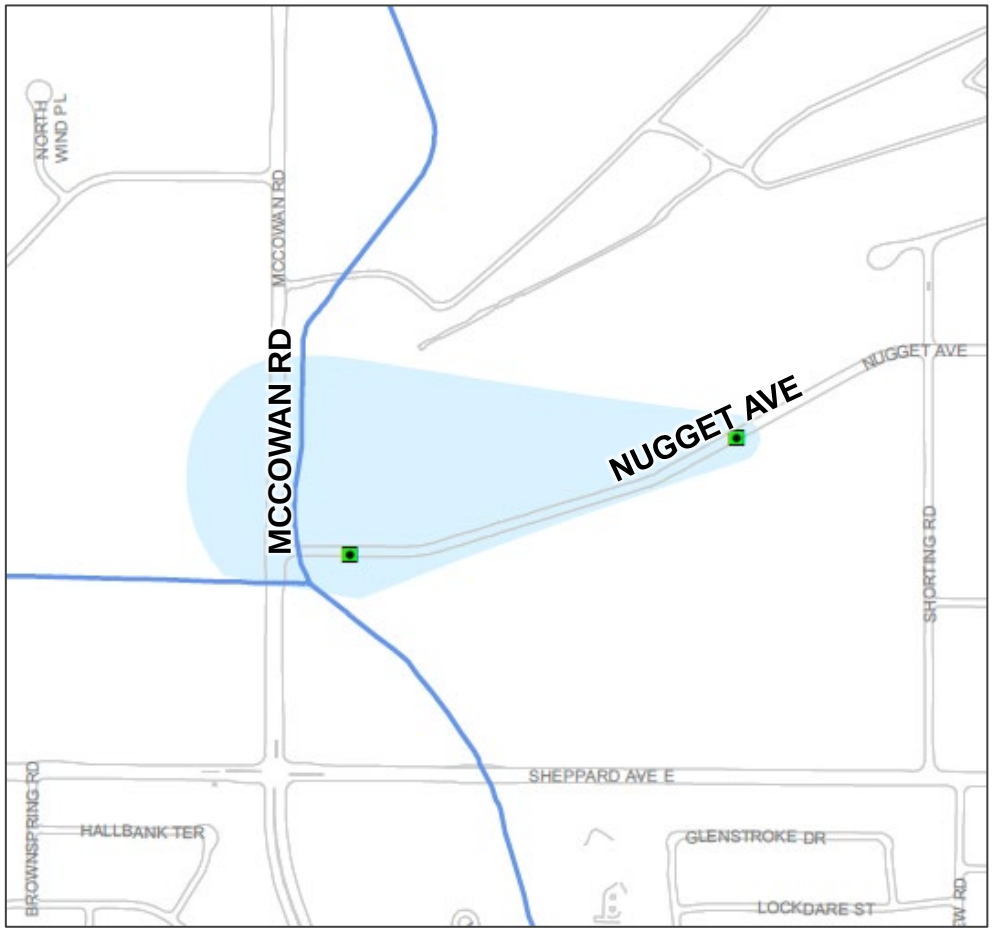
Assignment 60-14 Recommended Improvements

Legend

Assignment 60-14 Area

Proposed Storm Solution

Increase Inlet Capacity

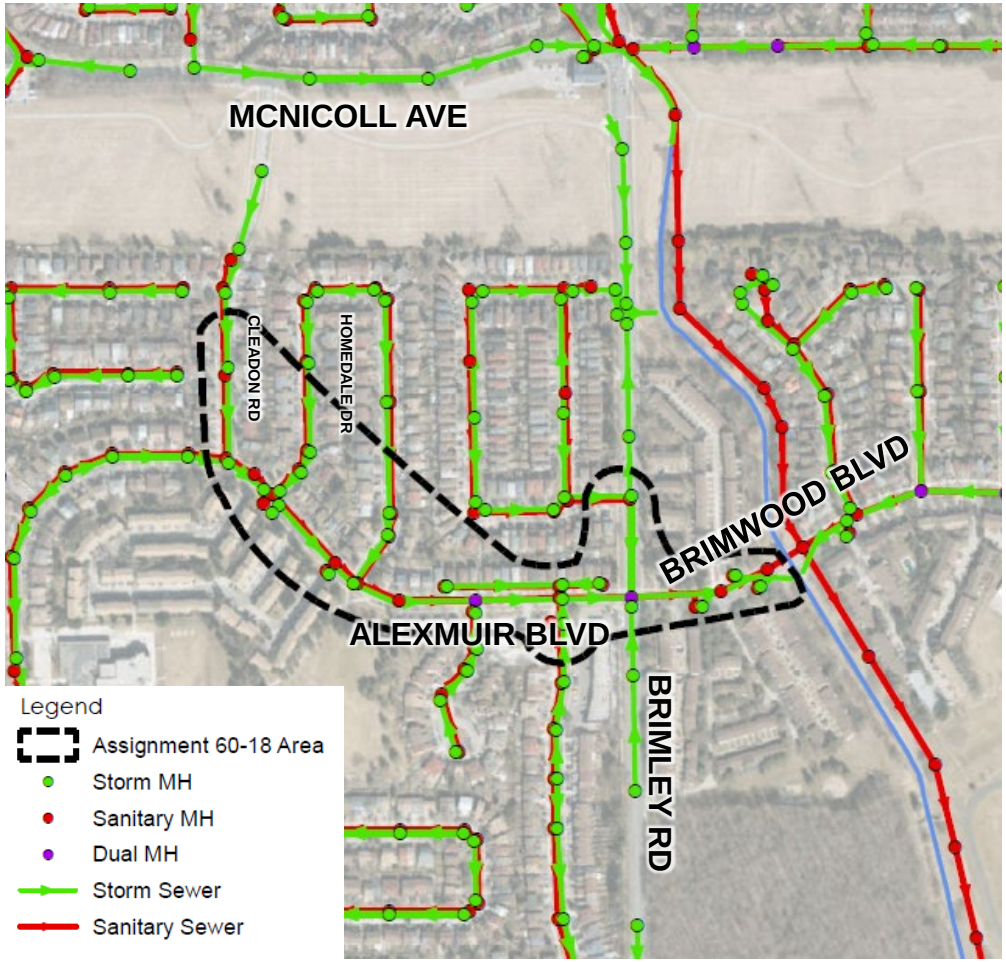


Map showing the Recommended Improvements for Assignment 60-14

TORONTO

Assignment 60-18 Overview

- Assignment solutions include sewers south of McNicoll Ave discharging into East Highland Creek (including Alexmuir Blvd, Brimley Rd, Cleadon Rd, Homedale Dr)



Map showing the Assignment 60-18 area

Assignment 60-18 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve pipe improvements, with the following main differences:

Alternative 1

- Conveyance Upgrades
- Outfall Upgrade on City Property
- Cost: $13M

Alternative 2

- Conveyance Upgrades
- Inline Storage to Avoid Outfall Upgrade
- Cost: $21M

Alternative 3

- Conveyance Upgrades
- No Outfall Upgrade
- Cost: $11M

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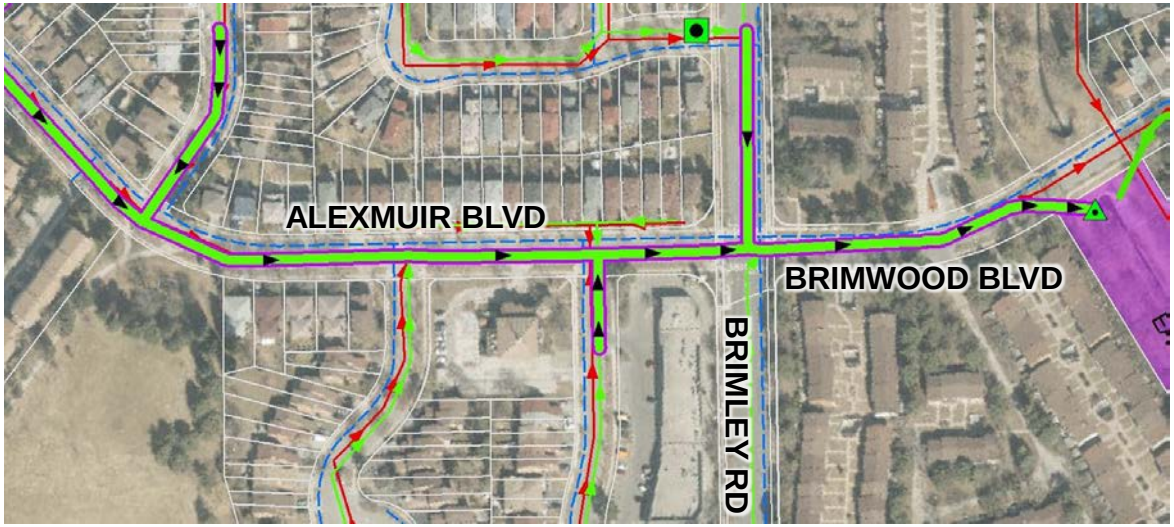
Assignment 60-18 Alternative 1

Legend

- Increase Inlet Capacity
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Outfall Upgrade



Map showing Alternative 1 of Assignment 60-18

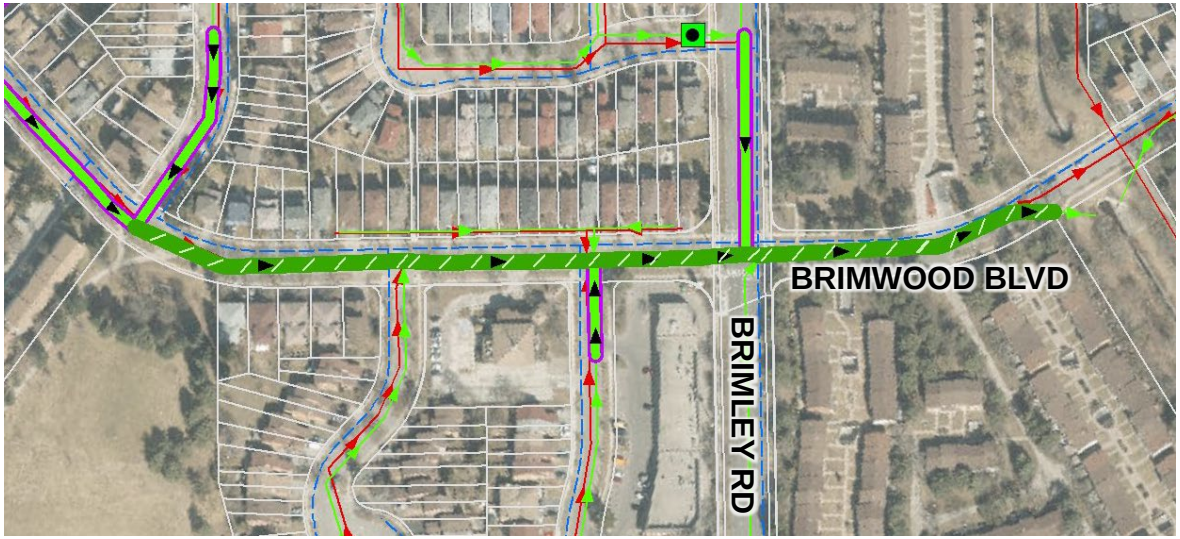
TORONTO

Assignment 60-18 Alternative 2

Legend

- Increase Inlet Capacity
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Inline Storage to Avoid Outfall Upgrade

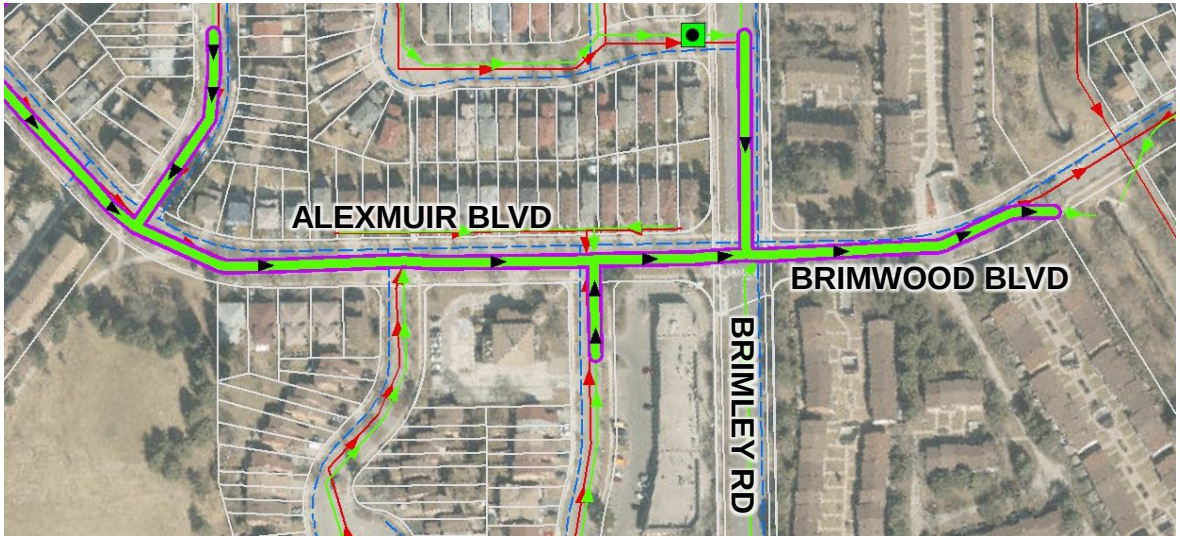


Map showing Alternative 2 of Assignment 60-18

Assignment 60-18 Alternative 3

Legend

- Conveyance Upgrades without Outfall Upgrade or Inline Storage



Map showing Alternative 3 of Assignment 60-18

Assignment 60-18 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 3**

- Alternative 1 includes an outfall upgrade which would affect the East Highland Creek easement and result in greater environmental disturbances.
- Alternative 2 includes extensive road construction/disturbance along Alexmuir Blvd and Brimwood Blvd due to inline storage
- Alternative 3 has a significantly lower capital cost compared to Alternatives 1 and 2.

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Assignment 60-18 Recommended Improvements

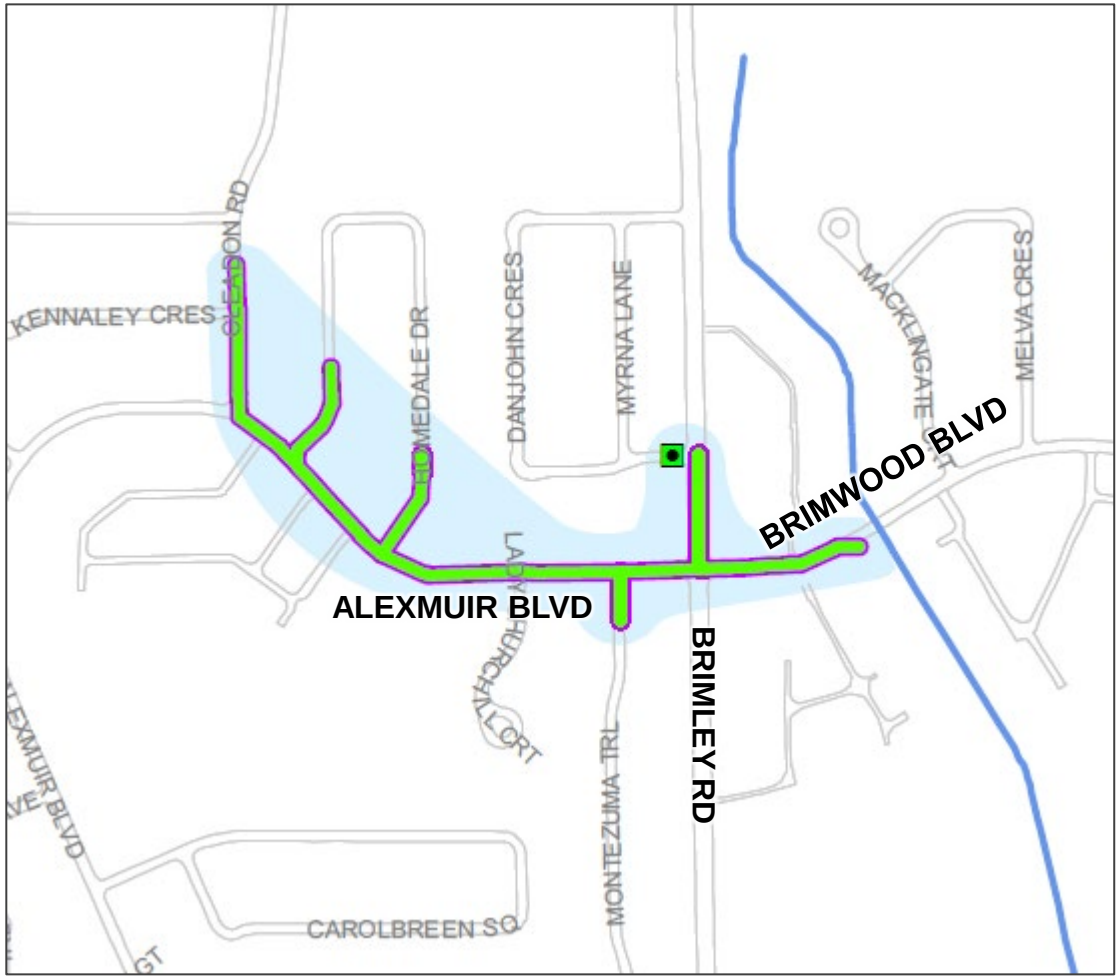
Legend

Assignment 60-18 Area

Proposed Storm Solution

Increase Inlet Capacity

Upgrade

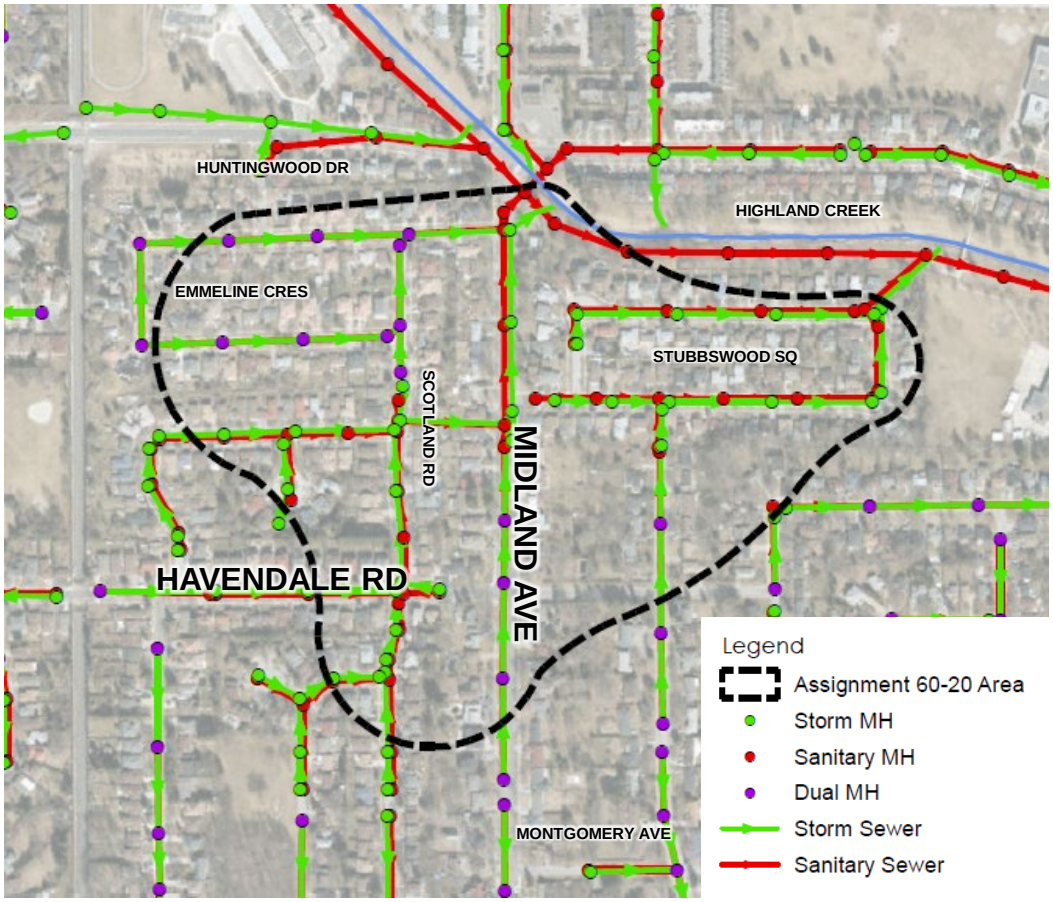


Map showing the Recommended Improvements for Assignment 60-18

TORONTO

Assignment 60-20 Overview

- Assignment solutions include sewers south of Huntingwood Dr, north of Montgomery Ave discharging into Highland Creek (including Midland Ave, Havendale Rd, Scotland Rd, Emmeline Cres and Stubbswood Sq)



Map showing the Assignment 60-20 area

Assignment 60-20 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve sewer improvements, with the following main differences:

Alternative 1

- Conveyance Upgrades
- Sewer/Flow Redirection
- In-line Storage
- Outfall Upgrade
- Cost: $25M

Alternative 2

- Conveyance Upgrades
- Sewer/Flow Redirection
- Additional In-line Storage
- Cost: $54M

Alternative 3

- Conveyance Upgrades
- Catchbasin Reduction
- Reduced In-Line Storage without Outfall Upgrade
- Cost: $48M

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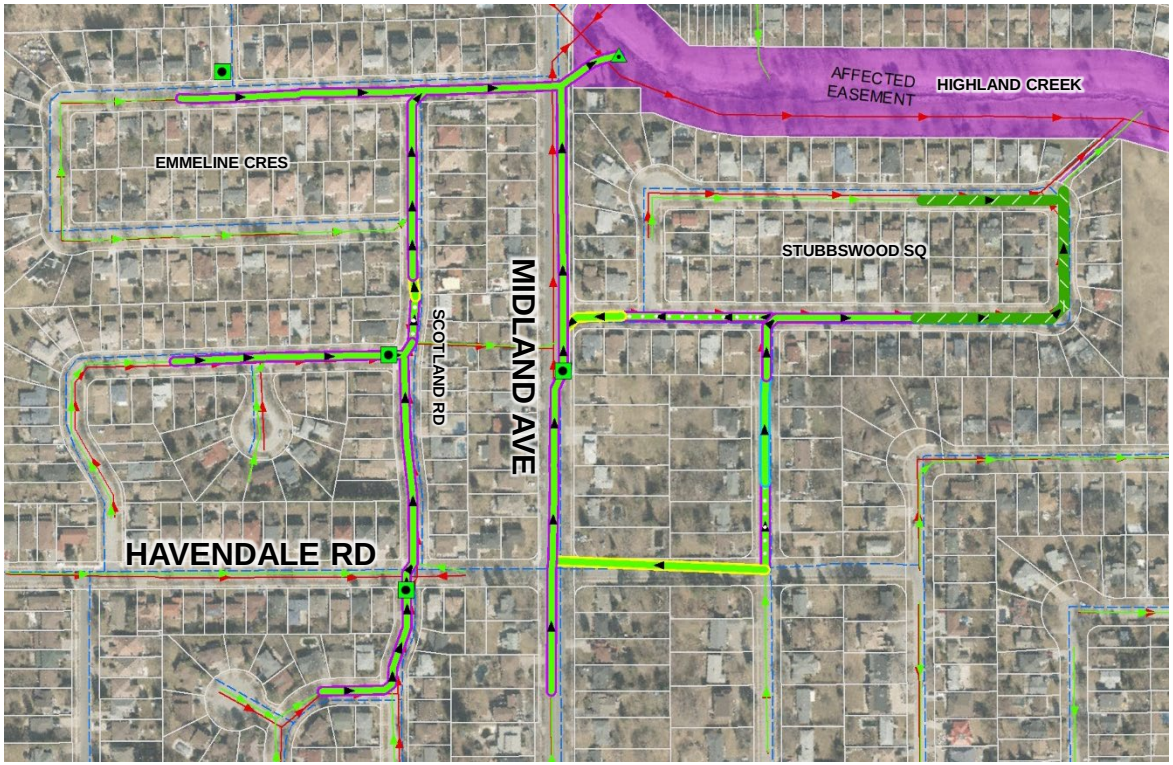
Assignment 60-20 Alternative 1

Legend

- Increase Inlet Capacity
- Remove Catchbasin
- Upgrade Outfall
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Sewer/Flow Redirection
- In-line Storage
- Outfall Upgrade



Map showing Alternative 1 of Assignment 60-20

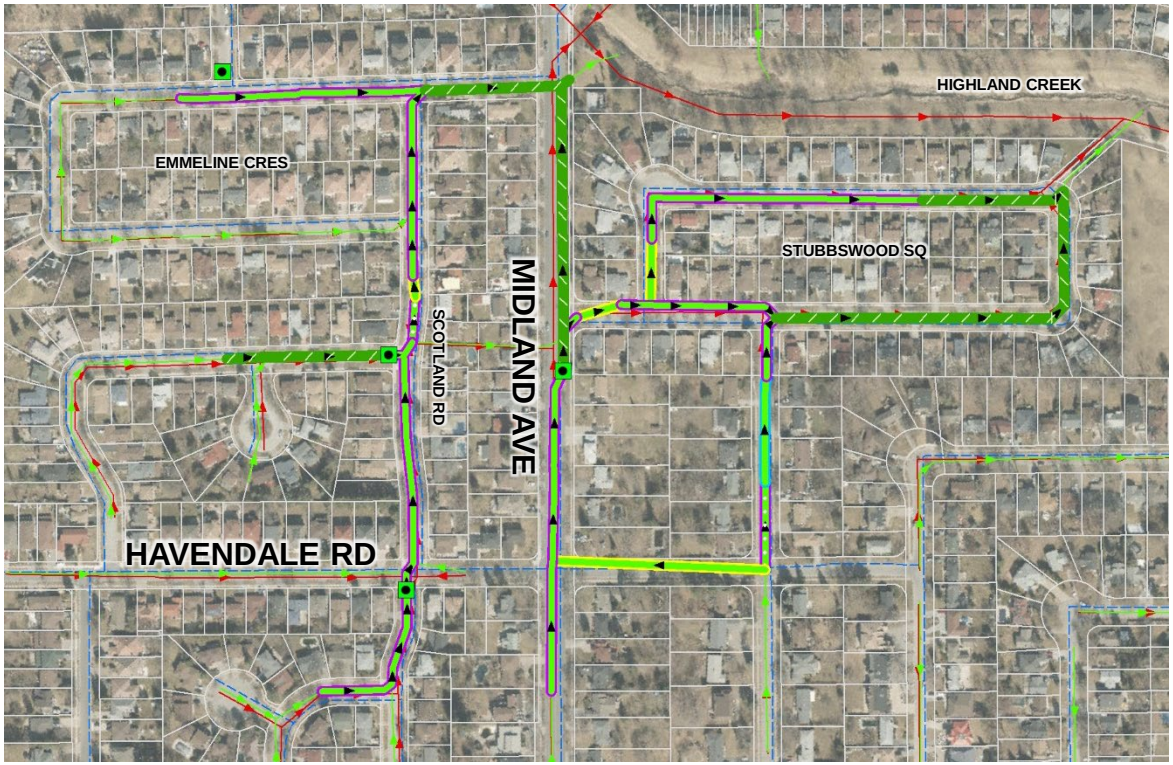
TORONTO

Assignment 60-20 Alternative 2

Legend

- Increase Inlet Capacity
- Remove Catchbasin
- Upgrade Outfall
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Sewer/Flow Redirection
- Additional In-line Storage
- No Outfall Upgrade



Map showing Alternative 2 of Assignment 60-20

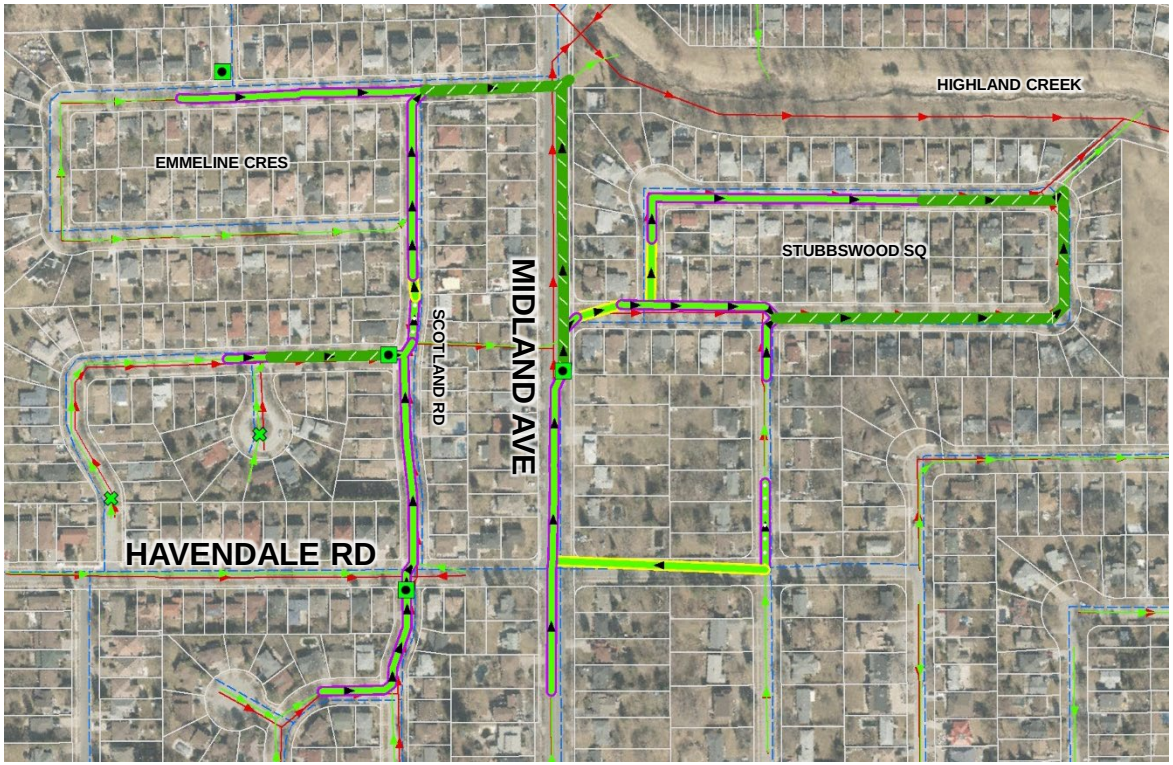
TORONTO

Assignment 60-20 Alternative 3

Legend

- Increase Inlet Capacity
- Remove Catchbasin
- Upgrade Outfall
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Catchbasin Reduction
- Reduced In-Line Storage without Outfall Upgrade



Map showing Alternative 3 of Assignment 60-20

TORONTO

Assignment 60-20 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 1**

- Alternatives 2 and 3 include extensive road construction/disturbance along Midland Ave and Stubbswood Sq due to in-line storage and conveyance upgrades.
- Alternative 1 includes an outfall upgrade which would affect the East Highland Creek easement and result in greater environmental disturbances.
- Alternative 1 has a significantly lower capital cost compared to Alternative 2 and 3.

TORONTO

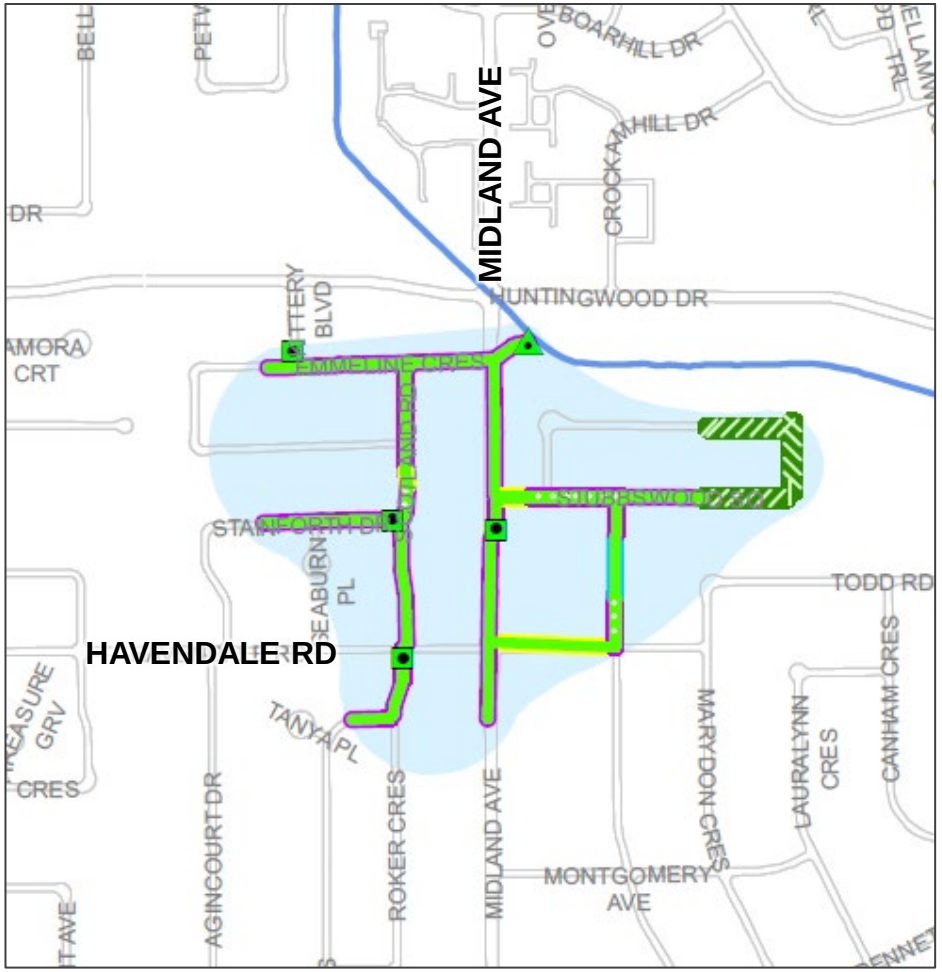
Assignment 60-20 Recommended Improvements

Legend

- Assignment 60-20 Area

Proposed Storm Solution

- Upgrade Outfall
- Increase Inlet Capacity
- New
- Replace
- Upgrade
- Realign and Upgrade
- Inline Storage
- Realign and Inline Storage



Map showing the Recommended Improvements for Assignment 60-20

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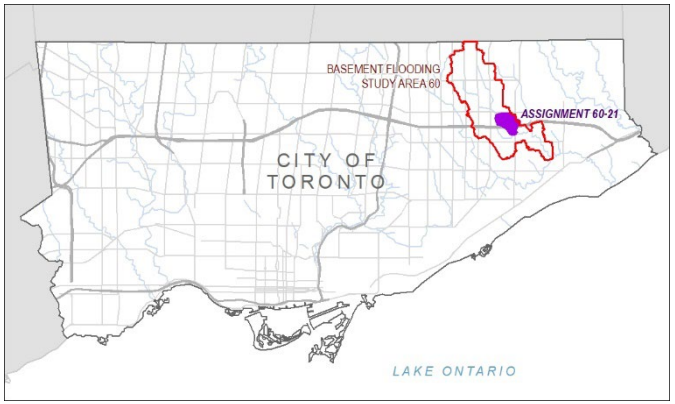
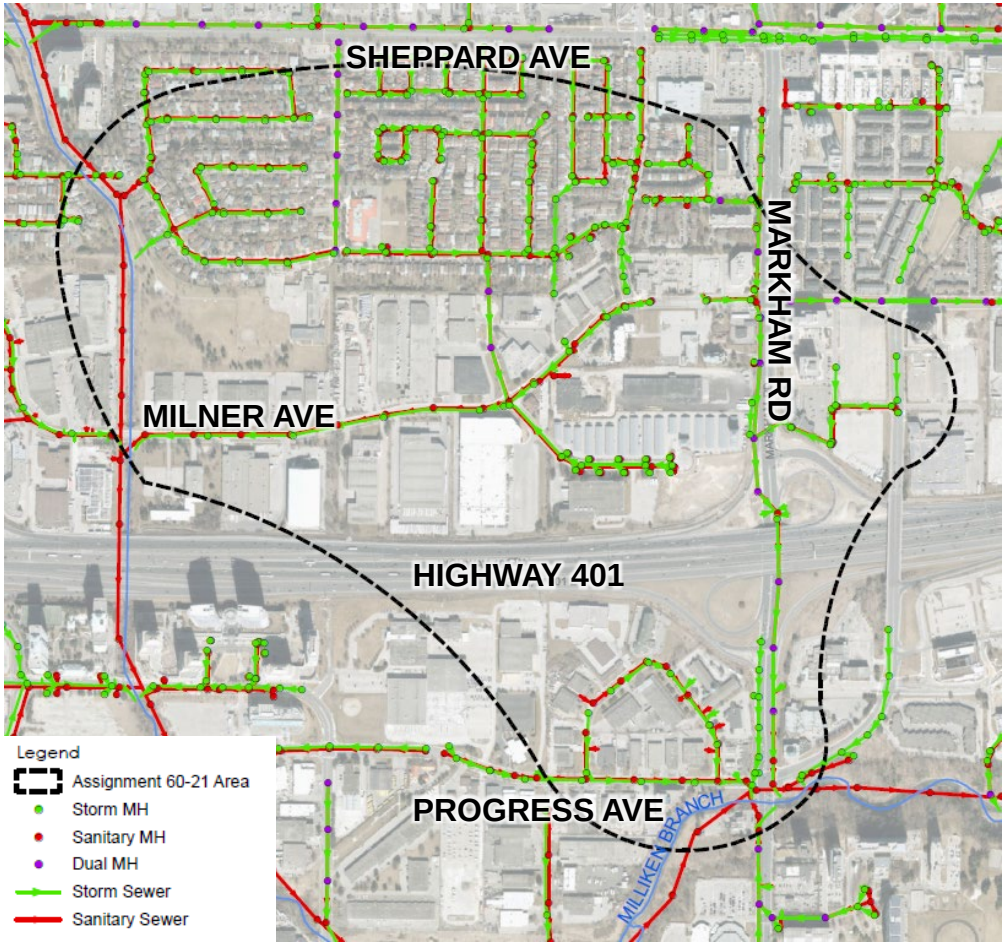
Assignment 60-21 Overview

- Assignment solutions include sewers in the area bounded by Sheppard Ave E to the north, Markham Rd to the east, Milner Ave to the south, and East Highland Creek (Markham Branch) to the west; as well as sewers along Progress Ave





Map showing the Assignment 60-21 area

Assignment 60-21 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve sewer improvements, with the following main differences:

Alternative 1

- Increased Inlet Capacity
- Conveyance Upgrades
- Flow Redirection
- Inline Storage
- Outfall Upgrade
- Cost: $64.5M

Alternative 2

- Increased Inlet Capacity
- Conveyance Upgrades
- Flow Redirection
- Inline Storage to Avoid Outfall Upgrade
- Cost: $73M

Alternative 3

- Increased Inlet Capacity
- Conveyance Upgrades
- Inline Storage
- Flow Redirection from Invergordon Ave to White Haven Park Tank Storage
- Outfall Upgrade
- Cost: $92.4M

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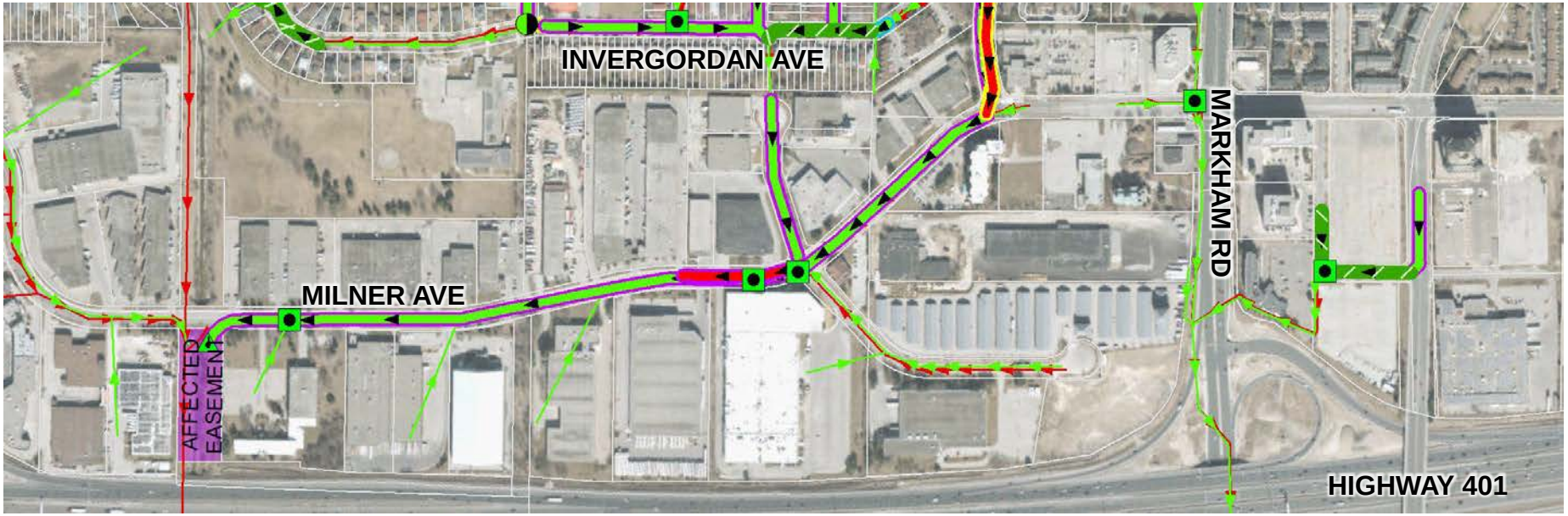
Assignment 60-21 Alternative 1



Map showing Alternative 1 of Assignment 60-21

- Outfall Upgrade

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Upgrade Outfall
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storm, Realign and Inline Storage
- Storage Tank
- New Sanitary
- Upgrade Sanitary
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

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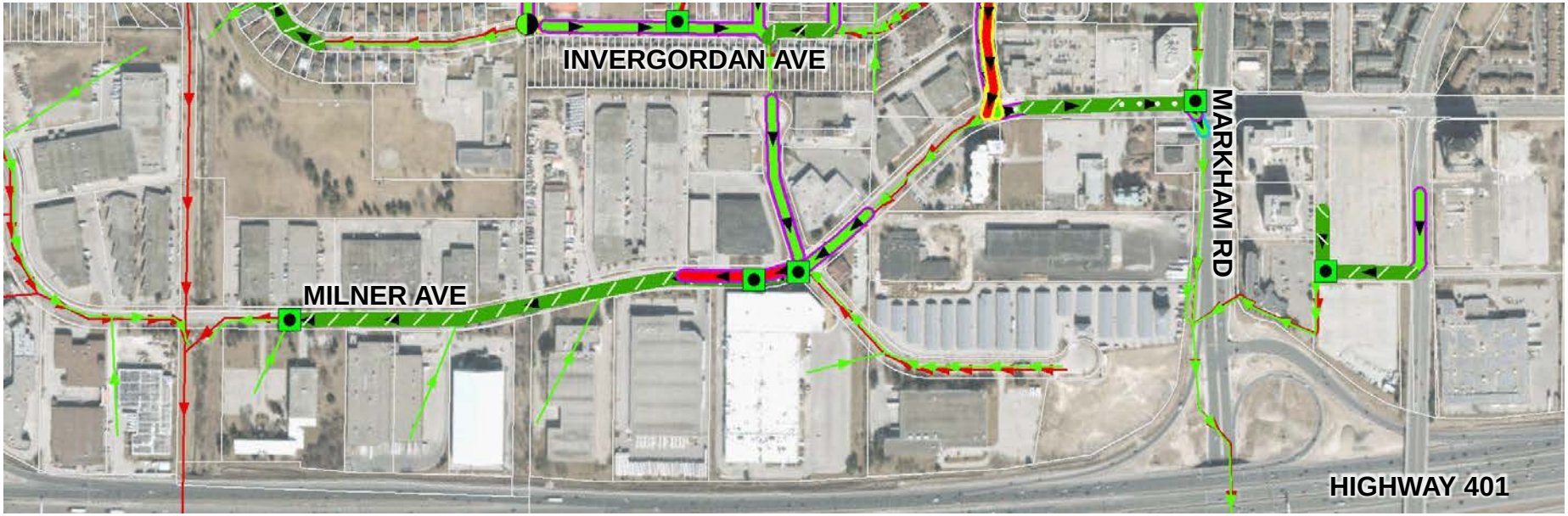
Assignment 60-21 Alternative 2



Map showing Alternative 2 of Assignment 60-21

- Inline Storage to Avoid Outfall Upgrade

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Upgrade Outfall
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storm, Realign and Inline Storage
- Storage Tank
- New Sanitary
- Upgrade Sanitary
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

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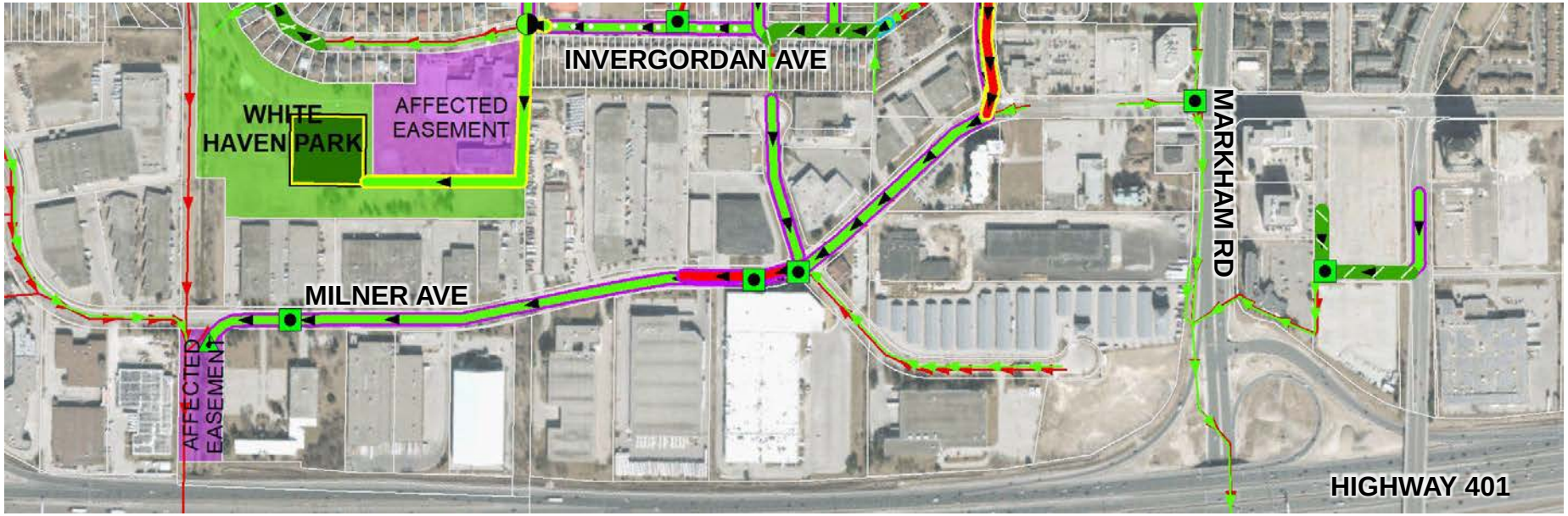
Assignment 60-21 Alternative 3



Map showing Alternative 3 of Assignment 60-21

- Flow Redirection from Invergordon Ave to White Haven Park Tank Storage (6,400 m^3)
- Outfall Upgrade

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Upgrade Outfall
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storm, Realign and Inline Storage
- Storage Tank
- New Sanitary
- Upgrade Sanitary
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

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Assignment 60-21 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 2**

- Alternative 1 and 3 have constructability challenges regarding the outfall upgrade. Alternative 3 also includes tank storage in White Haven Park and new sewers on White Haven Public School property.

- Alternative 2 includes Inline Storage to avoid outfall upgrades and has a higher capital cost compared to Alternative 1, but a lower capital cost compared to Alternative 3.

Assignment 60-21 Recommended Improvements

Legend

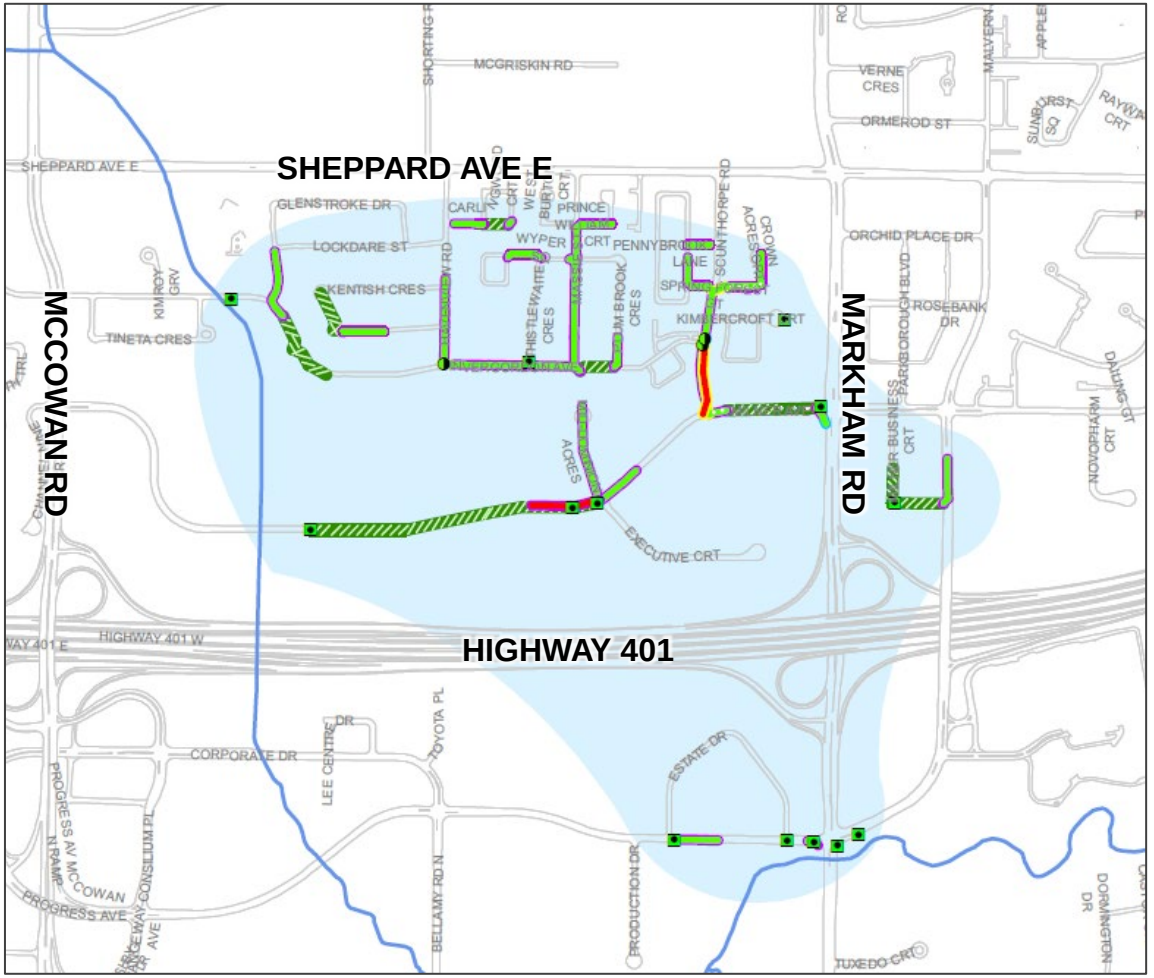
- Assignment 60-21 Area

Proposed Storm Solution

- Increase Inlet Capacity
- Isolate MH
- New
- Replace
- Upgrade
- Realign and Upgrade
- Inline Storage
- Realign and Inline Storage

Proposed Sanitary Solution

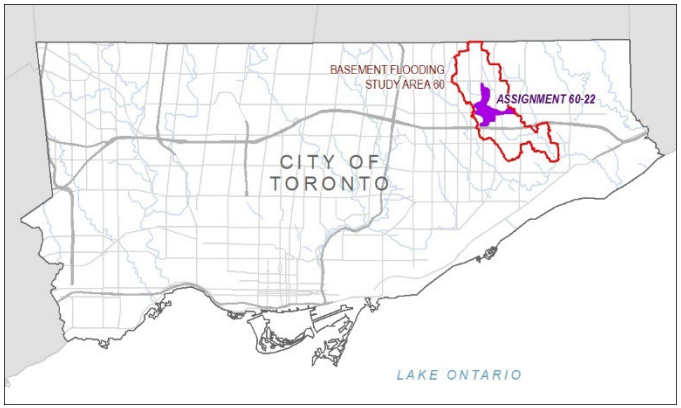
- New
- Upgrade

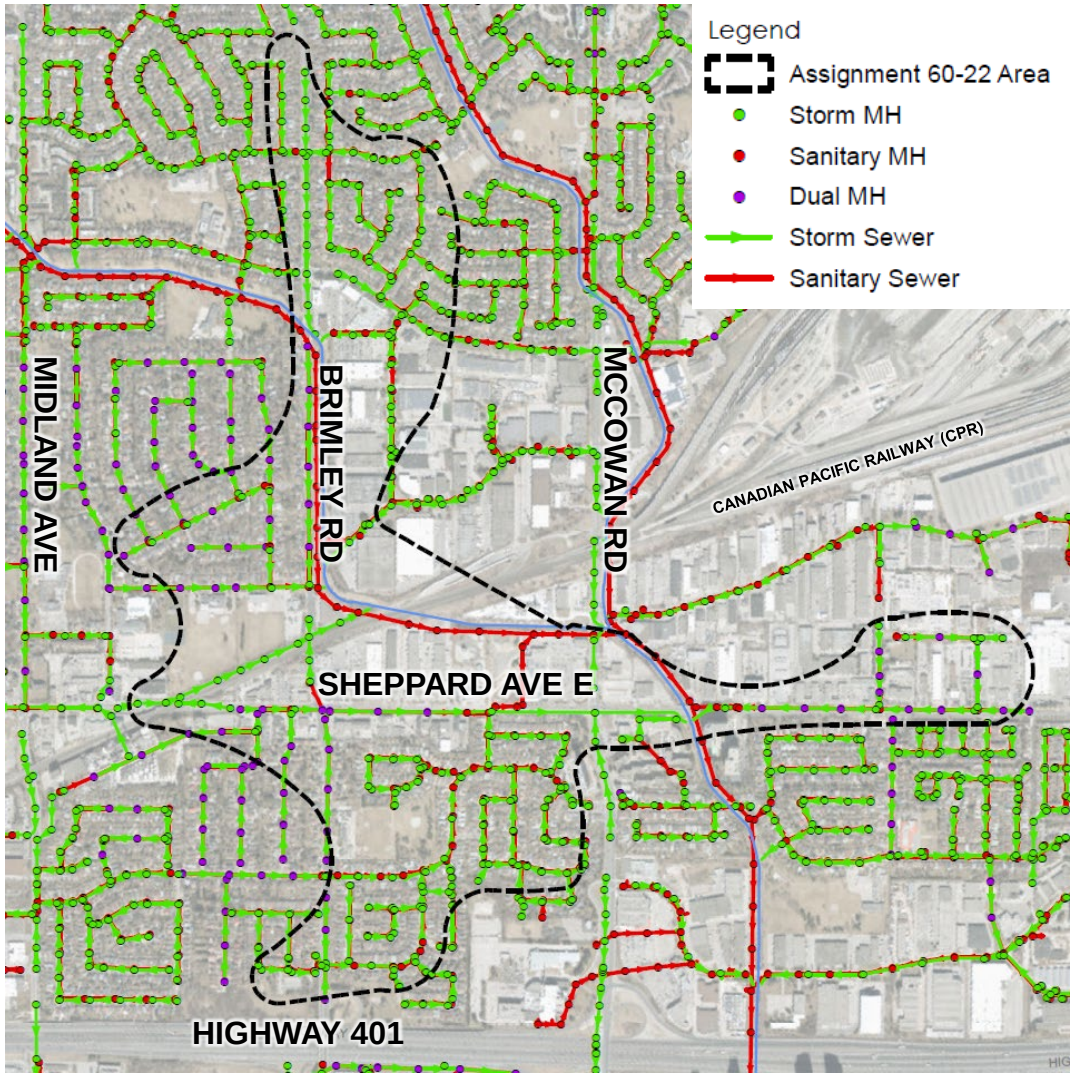


Map showing the Recommended Improvements for Assignment 60-21

Assignment 60-22 Overview

- Assignment solutions include sewers in area bounded by Finch Ave E to the north, the Canadian Pacific Railway (CPR) property to the east, Highway 401 to the south, and Midland Ave to the west





Map showing the Assignment 60-22 area

Assignment 60-22 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve sewer improvements, with the following main differences:

Alternative 1

- Increased Inlet Capacity
- Conveyance Upgrades
- Flow Redirection
- Inline Storage
- Outfall Upgrades
- Cost: $142.1M

Alternative 2

- Increased Inlet Capacity
- Conveyance Upgrades
- Flow Redirection
- Additional Inline Storage to Avoid Outfall Upgrades
- Cost: $206.4M

Alternative 3

- Increased Inlet Capacity
- Areas of Decreased Inlet Capacity
- Conveyance Upgrades
- Flow Redirection
- Additional Inline Storage to Avoid Most Outfall Upgrades
- Cost: $156.3M

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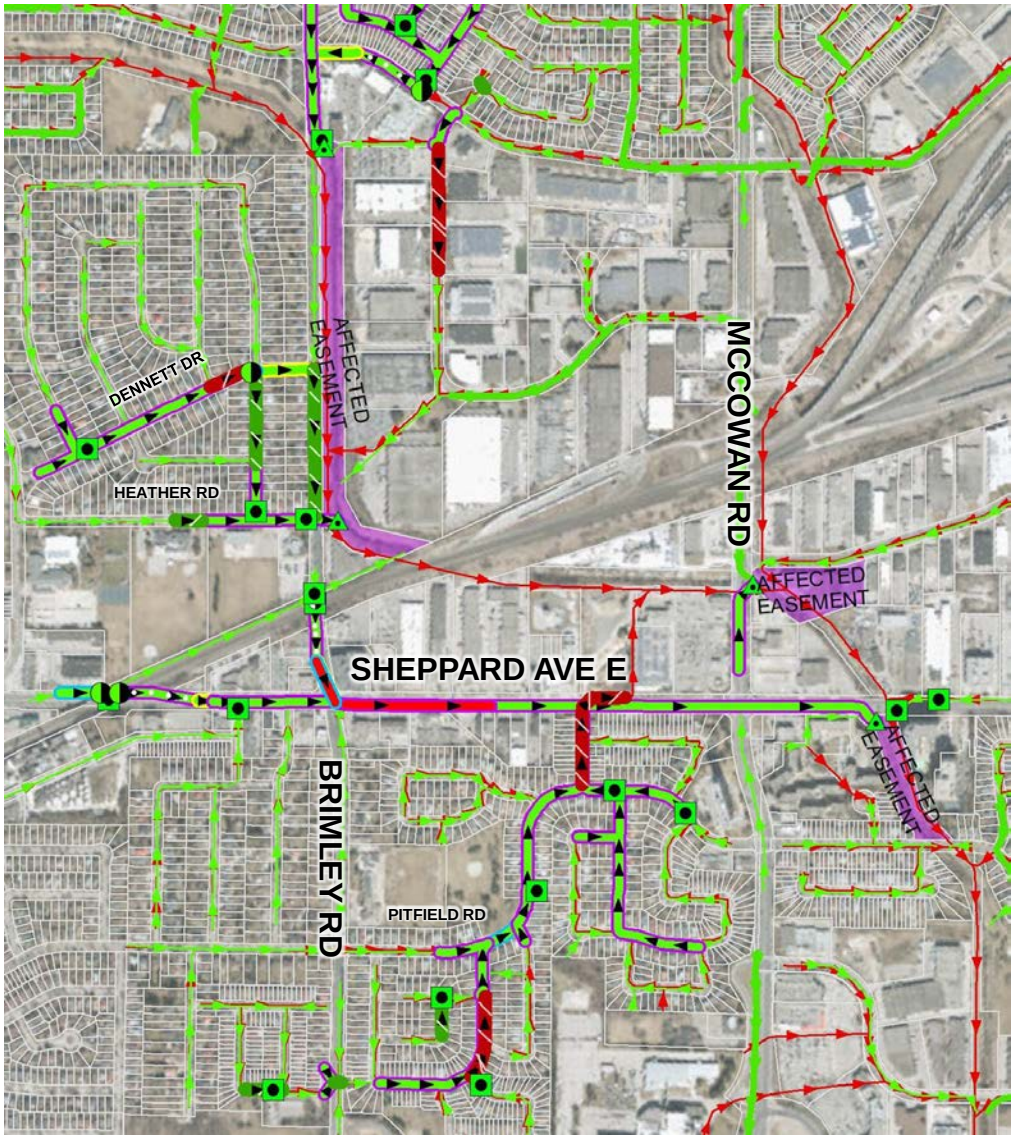
Assignment 60-22 Alternative 1

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Increase Inlet Capacity, Isolate MH
- Upgrade Outfall
- Remove Catchbasin
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storm, Realign and Inline Storage
- Replace Sanitary
- Upgrade Sanitary
- Sanitary Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Inline Storage
- Outfall Upgrades



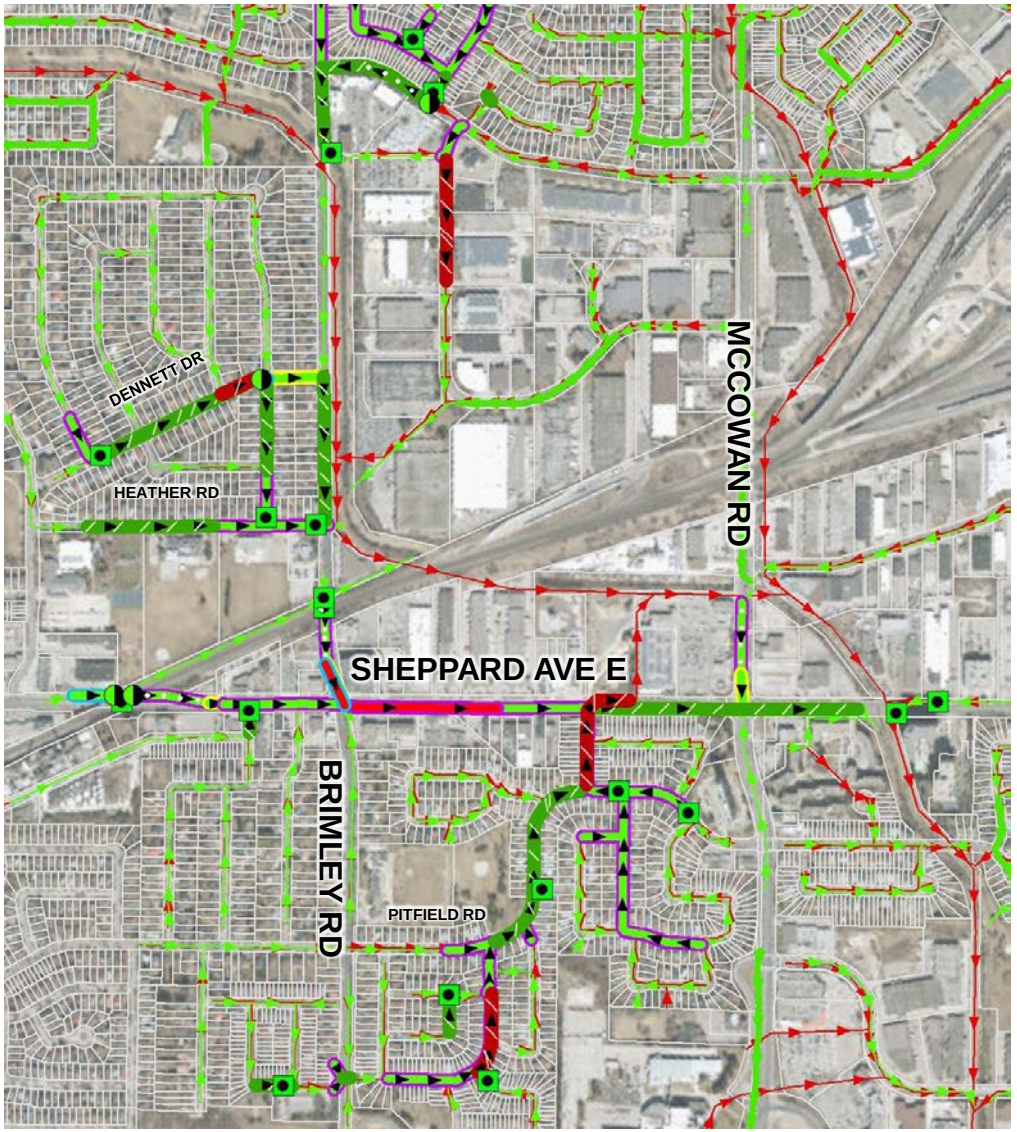
Map showing Alternative 1 of Assignment 60-22

Assignment 60-22 Alternative 2

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Increase Inlet Capacity, Isolate MH
- Upgrade Outfall
- Remove Catchbasin
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storm, Realign and Inline Storage
- Replace Sanitary
- Upgrade Sanitary
- Sanitary Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Additional Inline Storage to Avoid Outfall Upgrades



Map showing Alternative 2 of Assignment 60-22

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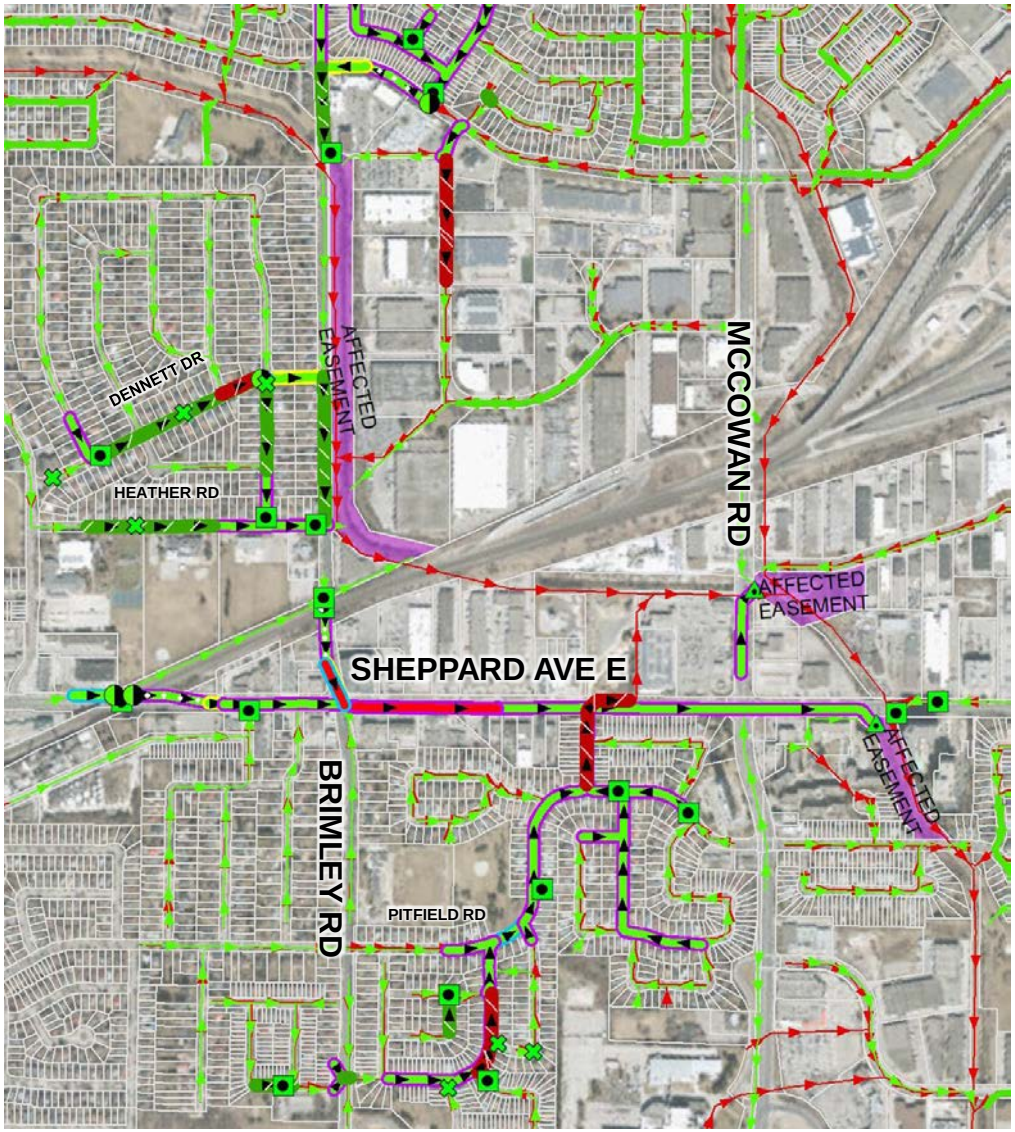
Assignment 60-22 Alternative 3

Legend

- Increase Inlet Capacity
- Isolate Manhole
- Increase Inlet Capacity, Isolate MH
- Upgrade Outfall
- Remove Catchbasin
- New Storm
- Replace Storm
- Upgrade Storm
- Realign & Upgrade Storm
- Storm Inline Storage
- Storm, Realign and Inline Storage
- Replace Sanitary
- Upgrade Sanitary
- Sanitary Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Areas of Decreased Inlet Capacity
- Additional Inline Storage to Avoid Most Outfall Upgrades



Map showing Alternative 3 of Assignment 60-22

Assignment 60-22 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 2**

- Alternative 1 and 3 require outfall upgrades, requiring additional consultation and increased peak outflows to East Highland Creek.
- Alternative 2 has the greatest capital cost, but includes additional inline storage to avoid outfall upgrades.

Assignment 60-22 Recommended Improvements

Legend

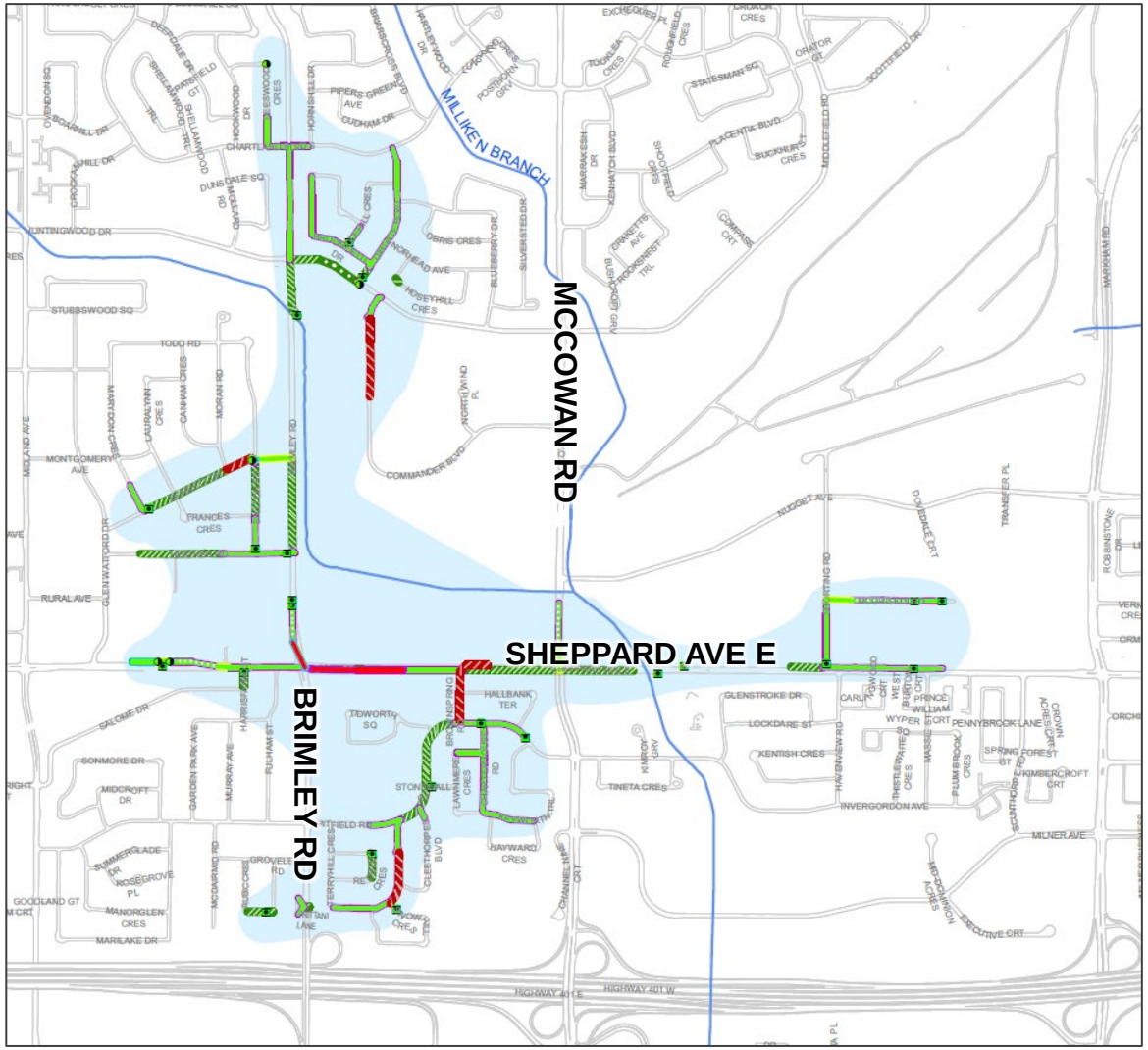
- Assignment 60-22 Area

Proposed Storm Solution

- Increase Inlet Capacity
- Isolate MH
- Increase Inlet Capacity, Isolate MH
- New
- Replace
- Upgrade
- Realign and Upgrade
- Inline Storage
- Realign and Inline Storage

Proposed Sanitary Solution

- Replace
- Upgrade
- Inline Storage



Map showing the Recommended Improvements for Assignment 60-22

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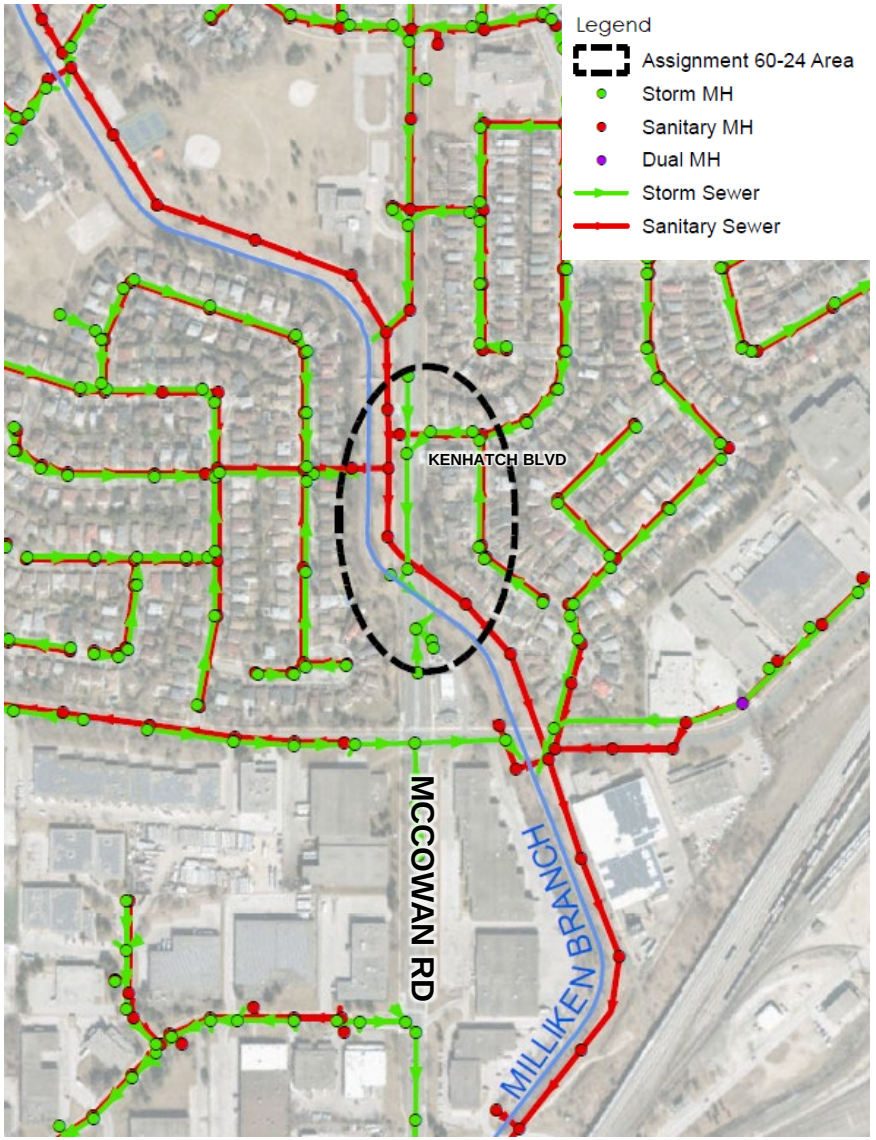
Assignment 60-24 Overview

- Assignment solutions include sewers on McCowan Rd discharging into East Highland Creek



Map showing the Assignment 60-24 area

Assignment 60-24 Alternative Solutions

Four alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve sewer improvements, with the following main differences:

Alternative 1

- Conveyance Upgrades
- Two Outfall Upgrades
- Cost: $2.3M

Alternative 2

- Conveyance Upgrades
- Inline Storage
- Inlet Restriction with Inlet Controls
- Overland Flow Re-Routing
- Cost: $3.8M

Hybrid Alt 1 & 2

- Conveyance Upgrades
- Outfall Upgrade
- Inlet Restriction with Inlet Controls
- Overland Flow Re-Routing
- Cost: $1.7M

Alternative 3

- Conveyance Upgrades
- Inlet Restriction by Catchbasin Removal
- Overland Flow Re-Routing
- No Outfall Upgrades
- Cost: $1.7M

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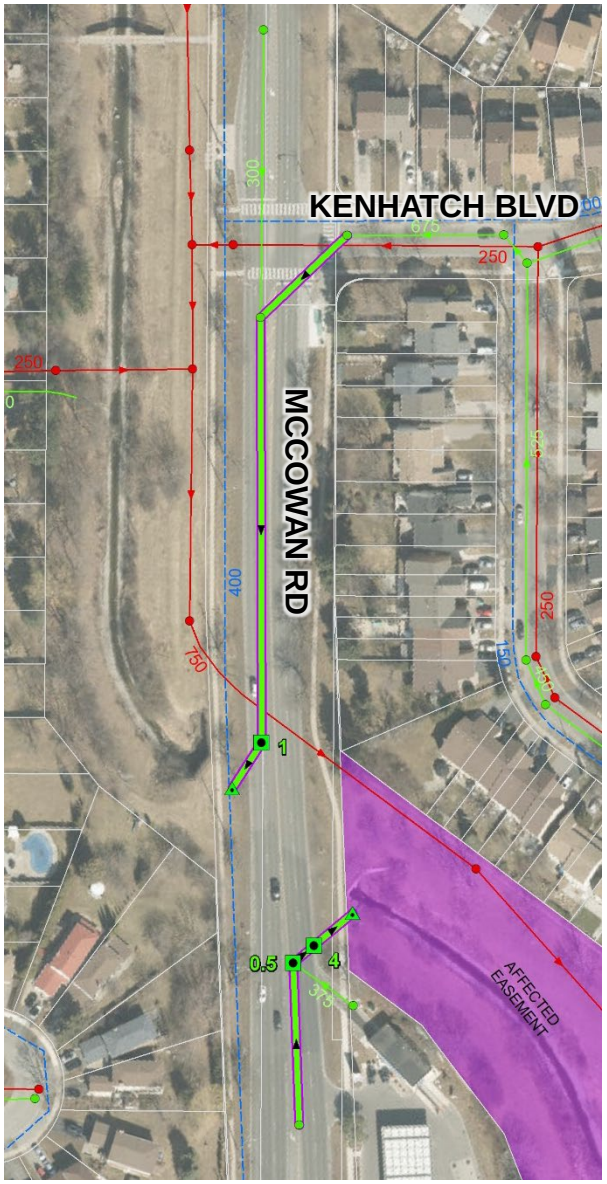
Assignment 60-24 Alternative 1

Legend

- Increase Inlet Capacity
- Inlet Control Device, Depress Curb
- Remove Catchbasin
- Remove CB, Depress Curb
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Two Outfall Upgrades within City Roadway and within City Property



Map showing Alternative 1 of Assignment 60-24

Assignment 60-24 Alternative 2

Legend

- Increase Inlet Capacity
- Inlet Control Device, Depress Curb
- Remove Catchbasin
- Remove CB, Depress Curb
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Inline Storage
- Inlet Restriction with Inlet Controls
- Overland Flow Re-Routing

Map showing Alternative 2 of Assignment 60-24

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Assignment 60-24 Hybrid

Legend

- Increase Inlet Capacity
- Inlet Control Device, Depress Curb
- Remove Catchbasin
- Remove CB, Depress Curb
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Outfall Upgrade within City ROW
- Inlet Restriction with Inlet Controls
- Overland Flow Re-Routing

Map showing the Hybrid Alternative of Assignment 60-24

Assignment 60-24 Alternative 3

Legend

- Increase Inlet Capacity
- Inlet Control Device, Depress Curb
- Remove Catchbasin
- Remove CB, Depress Curb
- Upgrade Outfall
- Upgrade Storm
- Storm Inline Storage
- Other Storm Solution
- Other Sanitary Solution
- Existing Storm
- Existing Sanitary
- Affected Easement
- Affected Park

- Inlet Restriction by Catchbasin Removal
- Overland Flow Re-Routing
- No Outfall Upgrades

Map showing Alternative 3 of Assignment 60-24

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Assignment 60-24 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 3**

- Alternative 1 requires further approval and coordination for outfall upgrades, which would increase outflows to East Highland Creek. Construction would also require tree removals.
- Alternative 2 includes inline storage and inlet restriction, resulting in additional maintenance requirements.
- Alternative 3 does not require outfall upgrades or inline storage, has greater hydraulic performance within the pipe, and a lower capital cost compared to Alternatives 1 and 2.

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Assignment 60-24 Recommended Improvements

Legend

Assignment 60-24 Area

Proposed Storm Solution

- Remove CBs
- Increase Inlet Capacity
- Remove CBs, Depress Curb
- Upgrade

Map showing the Recommended Improvements for Assignment 60-24

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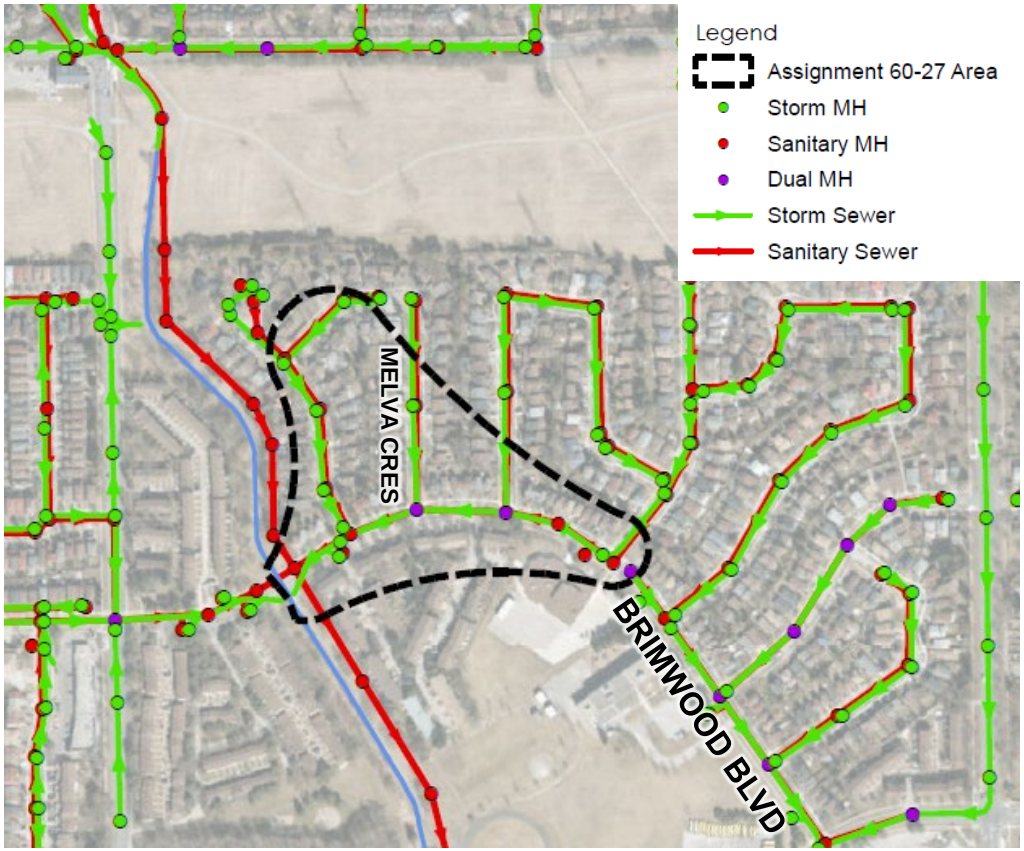
Assignment 60-27 Overview

- Assignment solutions include sewers along Brimwood Blvd and Melva Cres



Map showing the Assignment 60-27 area

Assignment 60-27 Alternative Solutions

Three alternative solutions have been identified to mitigate surface and basement flood risk within the assignment.

Each involve sewer improvements, with the following main differences:

Alternative 1

- Increased Inlet Capacity
- Conveyance Upgrades
- Outfall Upgrade
- Cost: $3.9M

Alternative 2

- Increased Inlet Capacity
- Conveyance Upgrades
- Inline Storage to Avoid Outfall Upgrade
- Cost: $6.4M

Alternative 3

- Increased Inlet Capacity
- Inlet Restriction by Catchbasin Removal
- Conveyance Upgrades
- Cost: $3.1M

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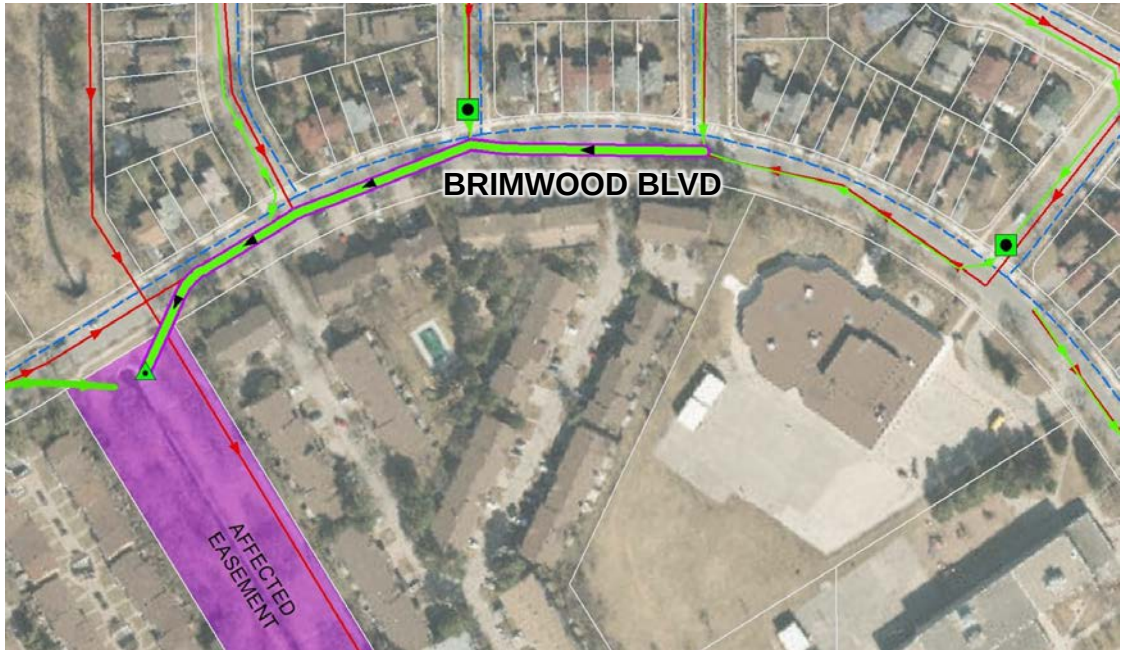
Assignment 60-27 Alternative 1

Legend

- Increased Inlet Capacity
- Outfall Upgrade



Map showing Alternative 1 of Assignment 60-27

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Assignment 60-27 Alternative 2

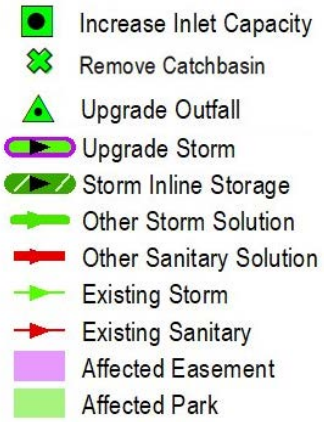
Legend

- Increased Inlet Capacity
- Inline Storage to Avoid Outfall Upgrade

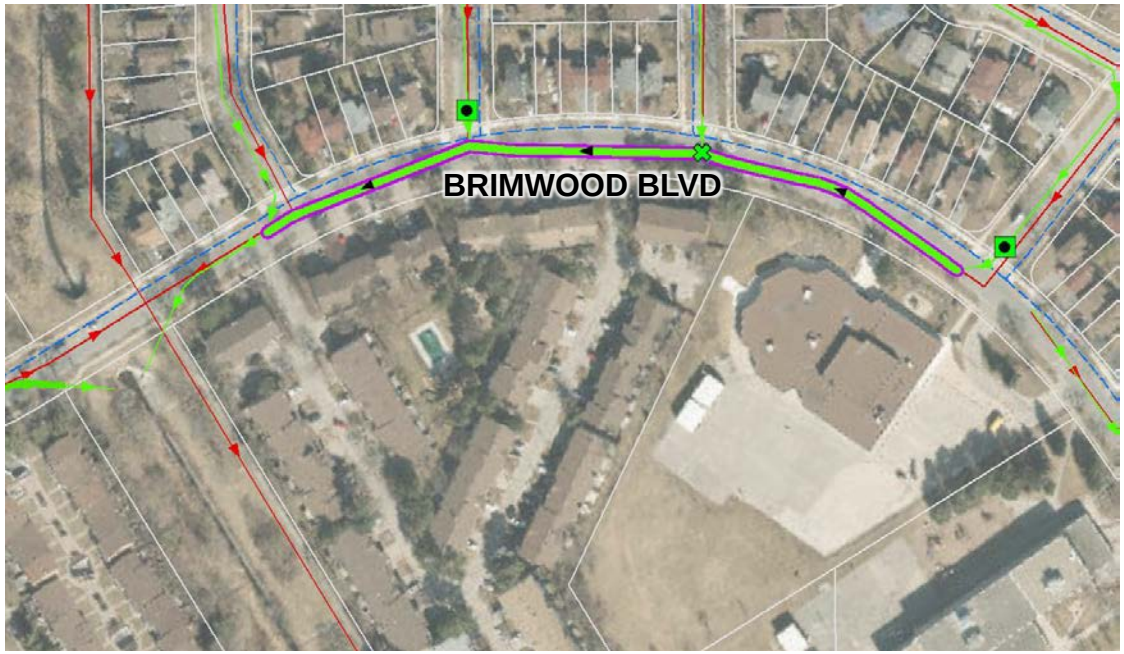
Map showing Alternative 2 of Assignment 60-27

Assignment 60-27 Alternative 3

Legend



- Increased Inlet Capacity
- Inlet Restriction by Catchbasin Removal



Map showing Alternative 3 of Assignment 60-27

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Assignment 60-27 Recommended Improvements

Based on the evaluation of alternative solutions, the preferred solution is **Alternative 3**

- The evaluation of all alternatives is similar, with Alternative 3 having the lowest capital cost and least construction risks.

Assignment 60-27 Recommended Improvements

Legend

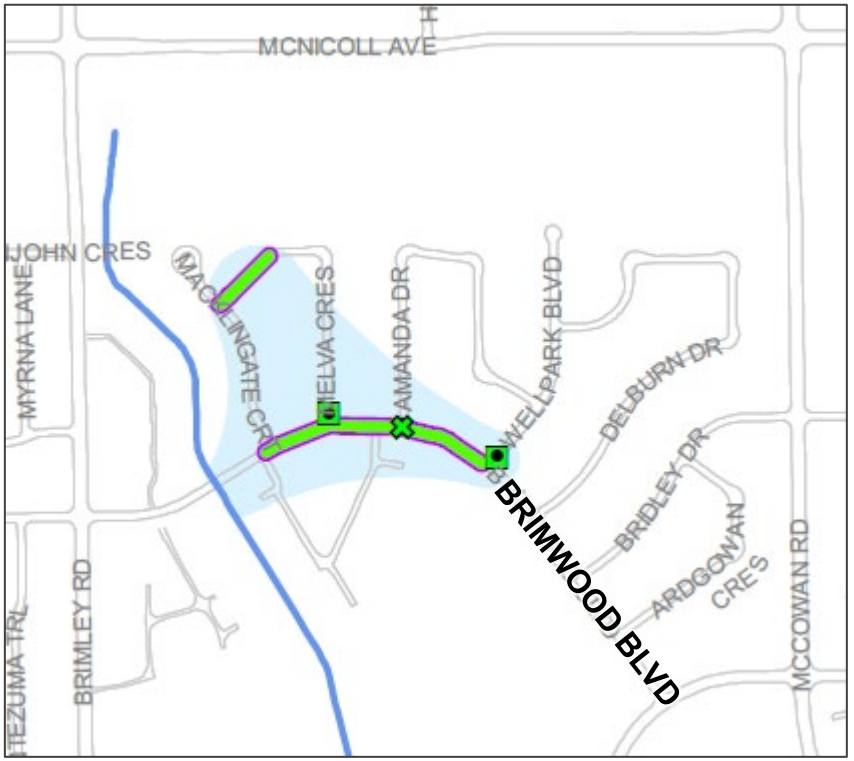
Assignment 60-27 Area

Proposed Storm Solution

Remove CBs

Increase Inlet Capacity

Upgrade



Map showing the Recommended Improvements for Assignment 60-27