



Basement Flooding Study Area 52

South Scarborough – Highland Creek West

Public Drop-In Consultation

June 27, 2024

Study Overview

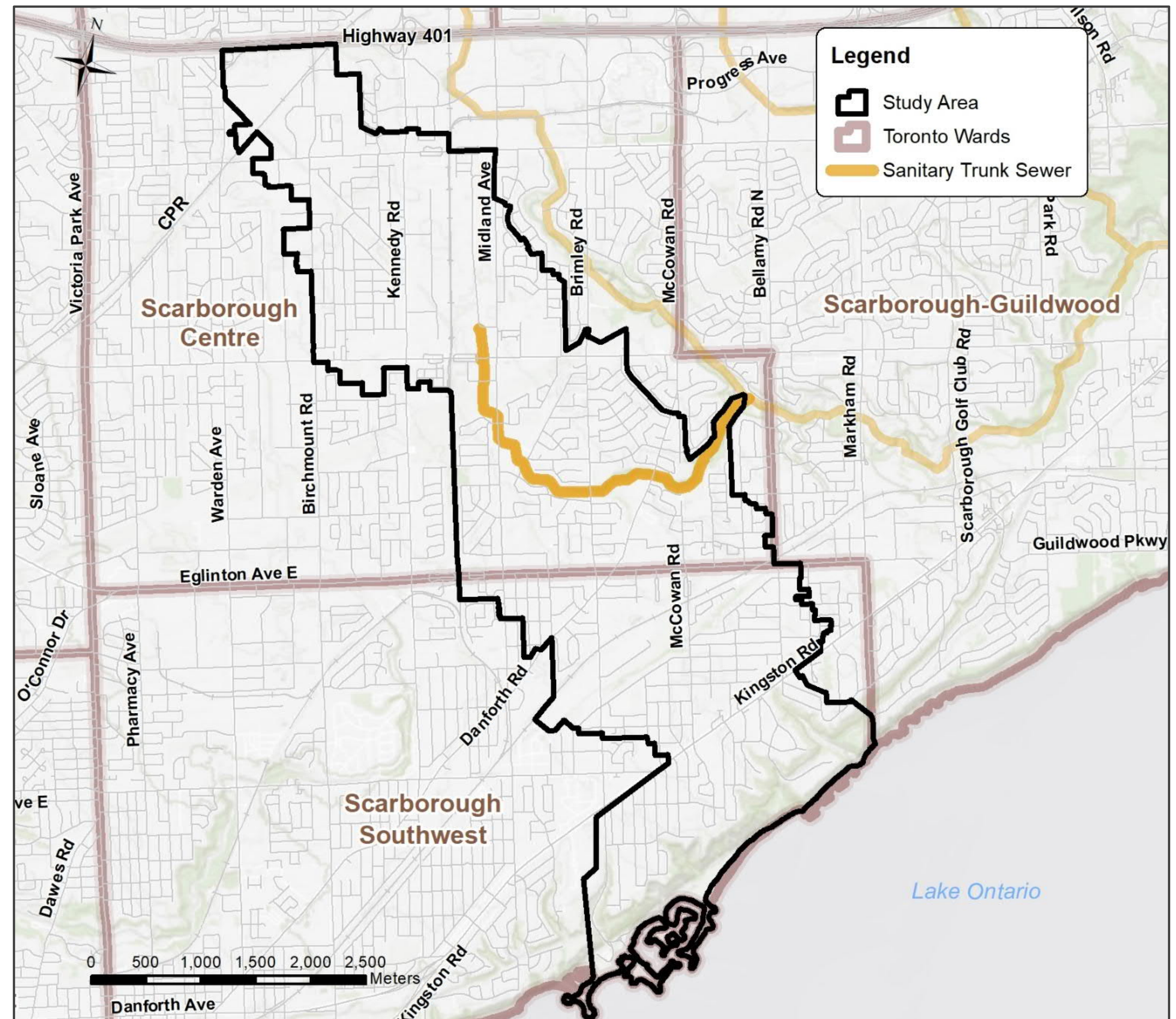
The City's sewer and drainage system was originally designed to handle average rainfall events and not extreme rainfall events (e.g. 100-year storm).

For Study Area 52, the City is creating a flood-risk reduction strategy that involves an:

- Examination of the City's sewer and drainage system.
- Identifying causes of basement and surface flooding.
- Identifying where the system does not meet the Basement Flooding Protection Program's Level-Of-Service targets.
- Evaluating options and recommending solutions to achieve the targets.

Study Area 52

- Approximately 1,700 ha
- Spans Ward 20 (Scarborough-Southwest) and Ward 21 (Scarborough Centre)
- Generally bounded by Highway 401 to the north and Lake Ontario to the south
- Study area is positioned based on existing storm and sanitary sewer system connections



City's Basement Flooding Protection Program

The City of Toronto has established “**Level Of Service**” (**L-O-S**) targets for the wastewater collection and storm drainage system it owns and operates. These targets are to ensure minimal risk of property and roadway flooding.

Combined sewers and storm sewers

- Ability to handle an extreme rainfall event of 90 mm rain within 6 hours, 40 mm of which falls in 10 minutes (100-year storm)

Sanitary sewers

- Ability to handle an extreme rainfall event similar to May 12, 2000

Municipal roadways target during 100-year storm:

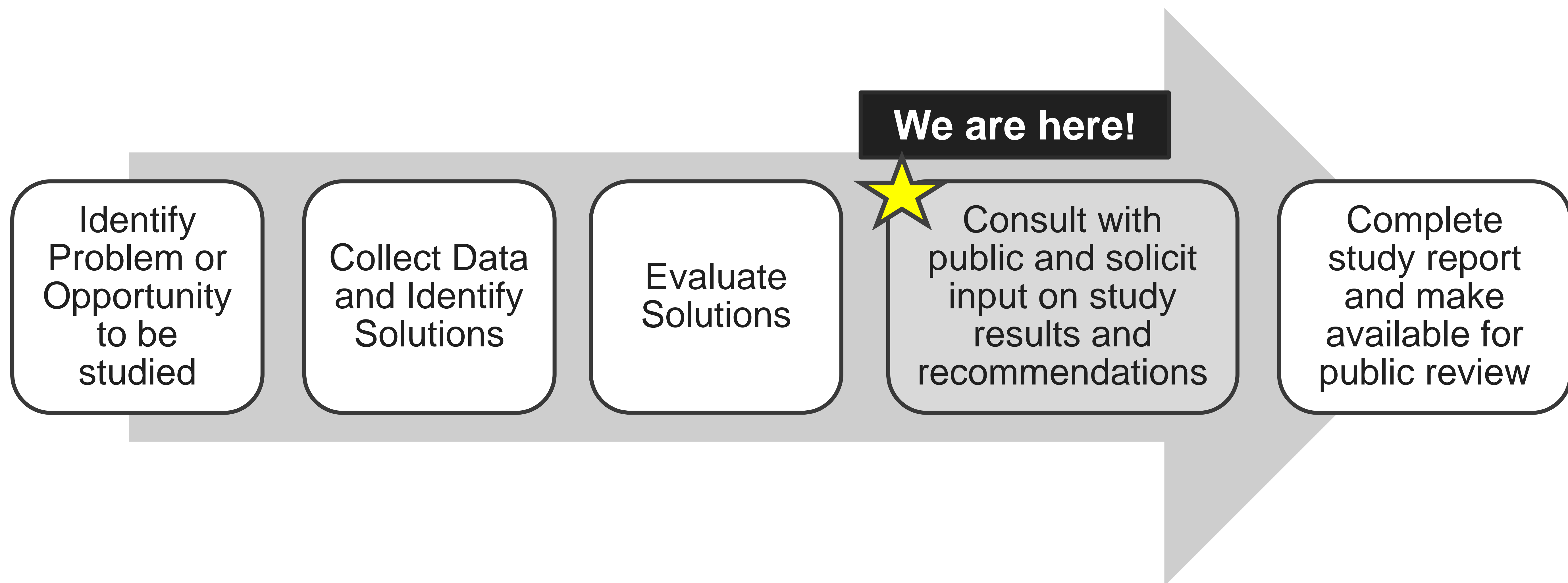
- Arterial roads: ponding permitted on outer lanes; however centre lanes must be open for travel in each direction
 - Collector/local roads: ponding permitted within the City's right-of-way (depending on road design)
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- Performance of the sewer system is evaluated using a detailed computer simulation of an extreme rainfall event, which identifies all locations where L-O-S targets are not met. The simulation is then used to examine solutions.

Level-Of-Service Exceptions

- While the City aims to achieve the Basement Flooding Protection Program's target Level-Of-Service (L-O-S) throughout the study area, this is not always possible due to technical limitations. In study areas 52, certain locations were exempted from meeting these targets based on the low level of flood risk to private property.
- Below are the types of areas with L-O-S target exceptions in Study Area 52:
 1. Areas with low risk of basement flooding or no sewer connections to houses.
 2. Areas where sewers discharge into Lake Ontario or Dorset Park Creek where the sewers cannot be lowered below the lake or creek level.
 3. Privately owned sewers, which are the responsibility of the property owner to manage.
 4. Sewers impacted by the sanitary trunk sewer (trunk sewer capacity to be assessed through a separate project).

Study Process

For each study area, the City is following the Municipal Class Environmental Assessment process, an approved planning process under the Ontario Environmental Assessment Act.



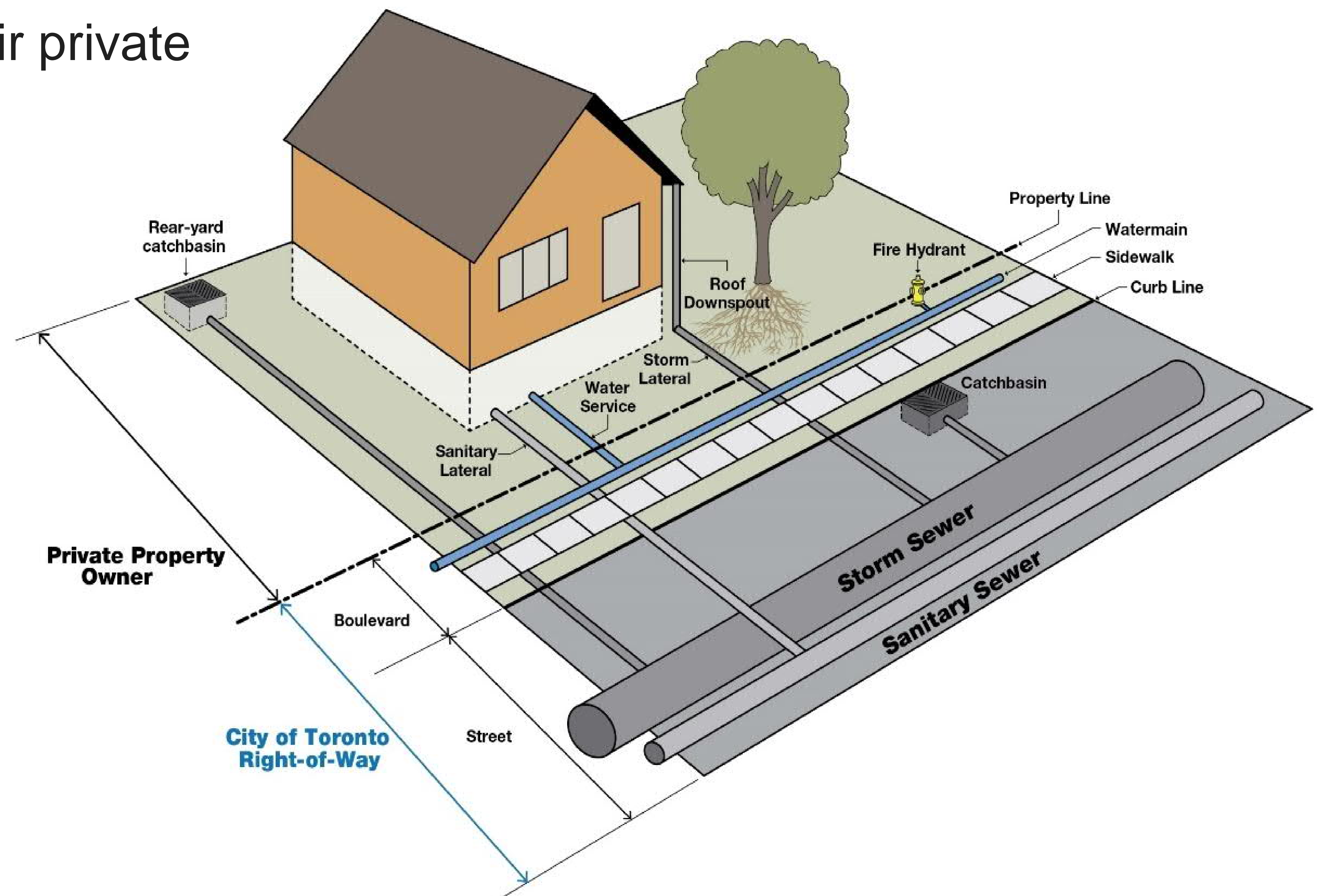
Understanding the Sewer System

Areas of Responsibility

The City is responsible for infrastructure within the public Right-of-Way.

Homeowners are responsible for the operation and maintenance of drainage systems on their private property, including:

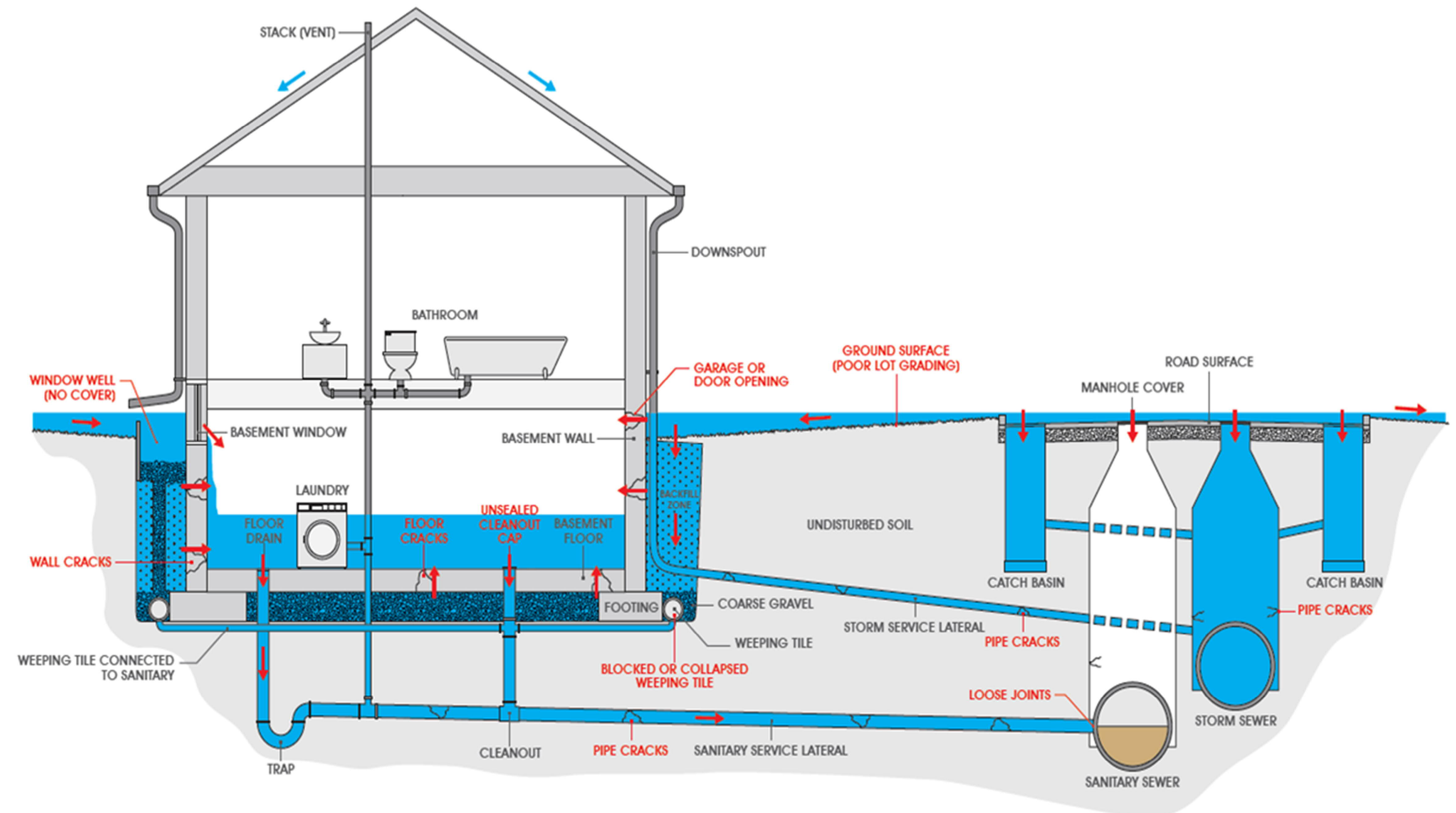
- Lot grading
- Front and rear-yard or driveway drainage catchbasins
- Foundation drains
- Sump pumps and backwater valves
- Private tree roots and what you put down the drain (fats, oils, grease, etc.)
- Disconnecting downspouts



Separated Sewer System Design

Storm Sewers capture rainwater or melted snow, mainly through catch basins, the square grates on the side of the road. This water flows directly into nearby waterways including streams, rivers and Lake Ontario.

Sanitary Sewers transport wastewater released from a drain, toilet, sink or appliance such as a clothes or dishwasher. This wastewater from residences and businesses flows to treatment plants where it is cleaned before being released into Lake Ontario.

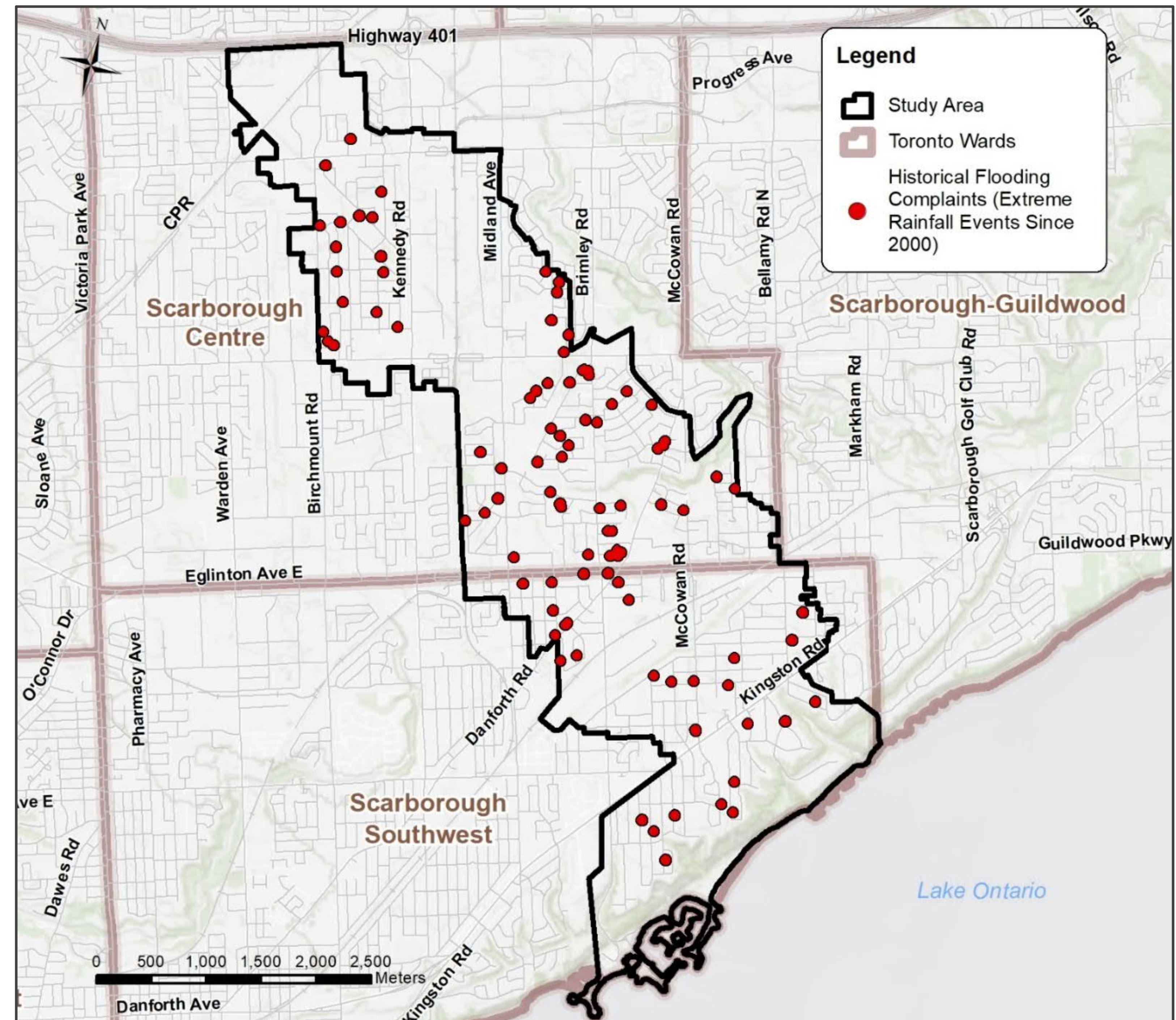


Separated sewer systems have two pipes:
sanitary sewers and storm sewers

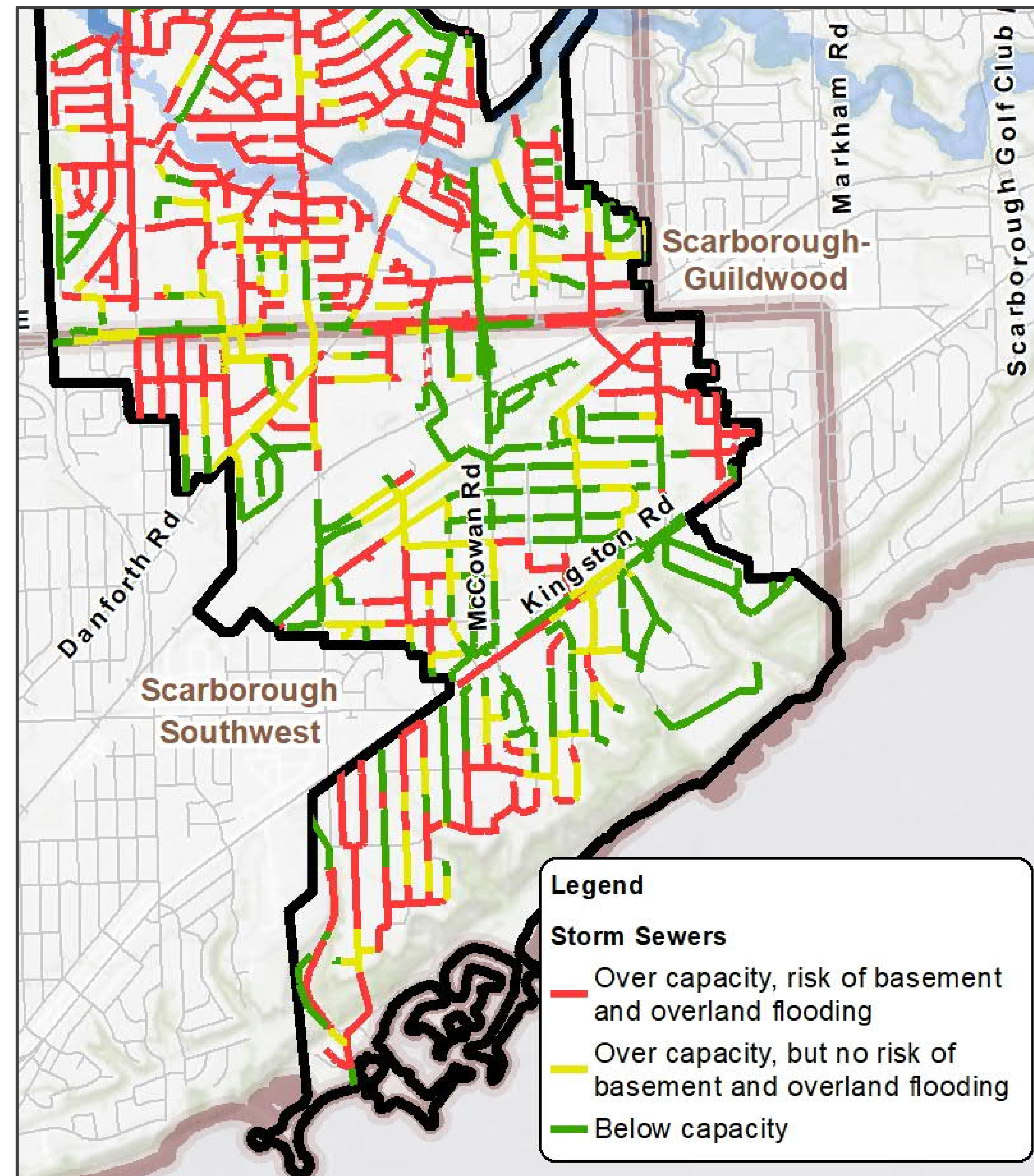
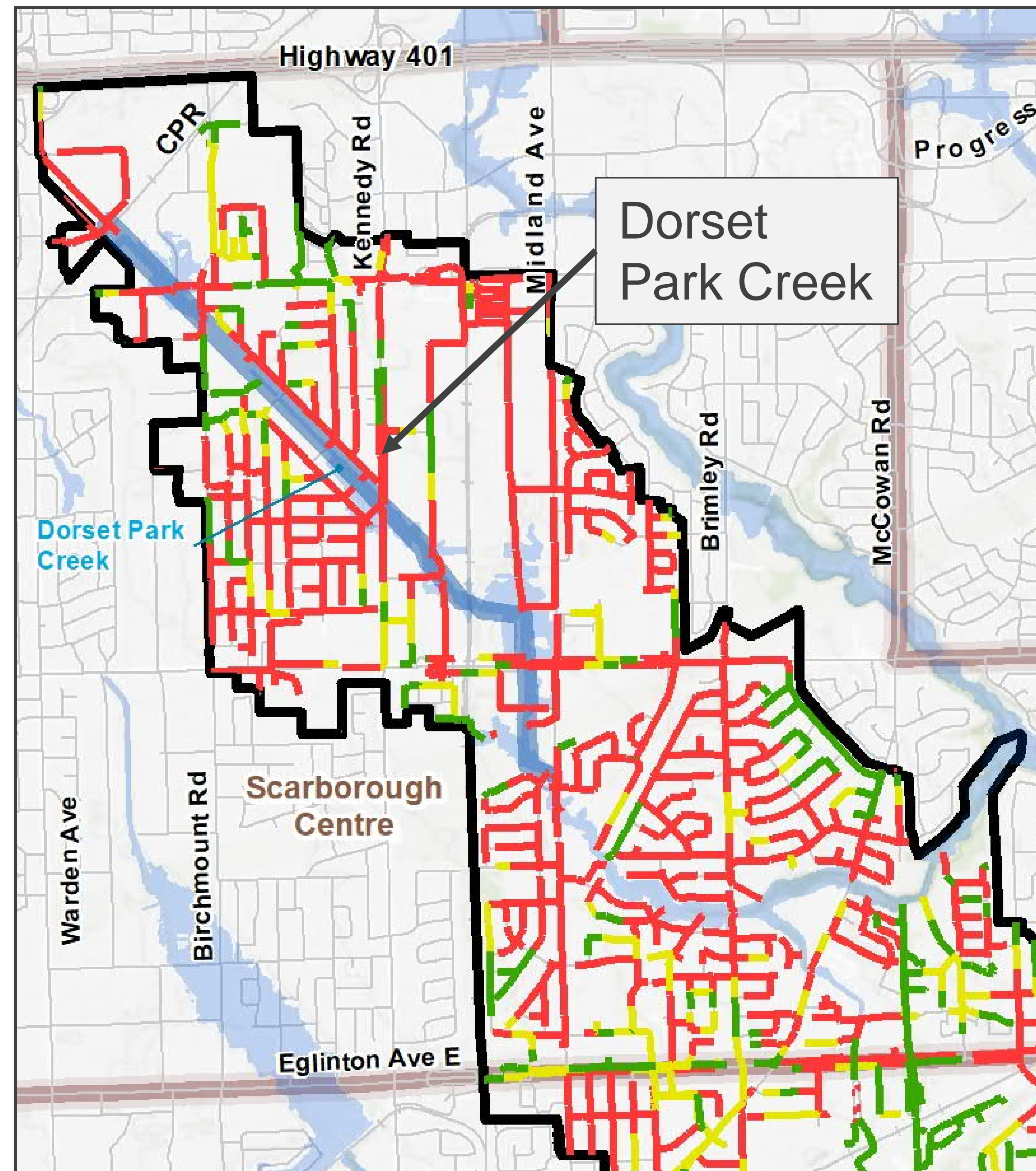
Reports of Basement Flooding

Property flooding has been reported to the City after extreme rainfall events such as August 7, 2018, and July 8, 2013.

The map shows locations of reported flooding in study area 52 after extreme rainfall events since 2000.



Assessment of Existing Storm Sewer System

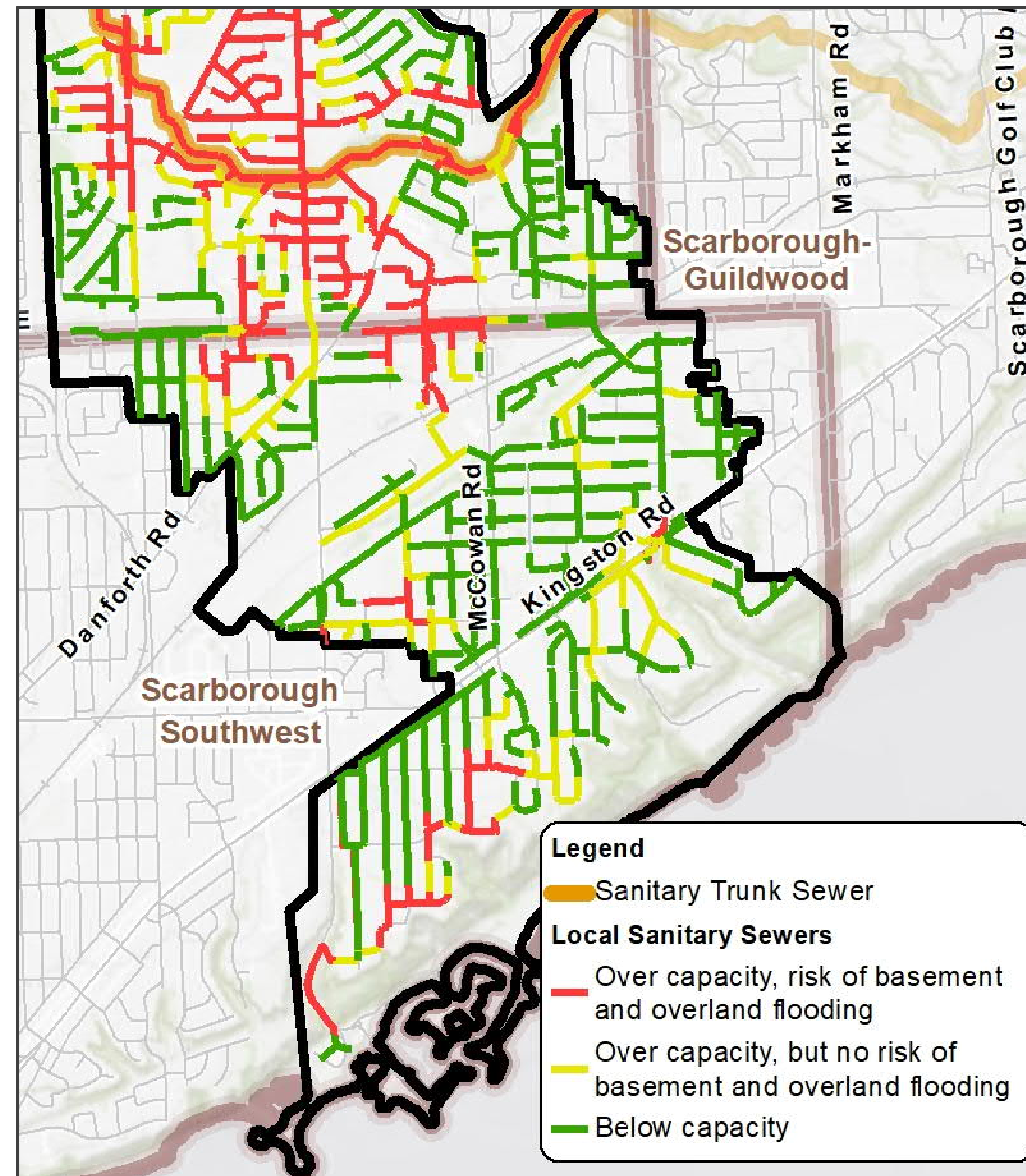
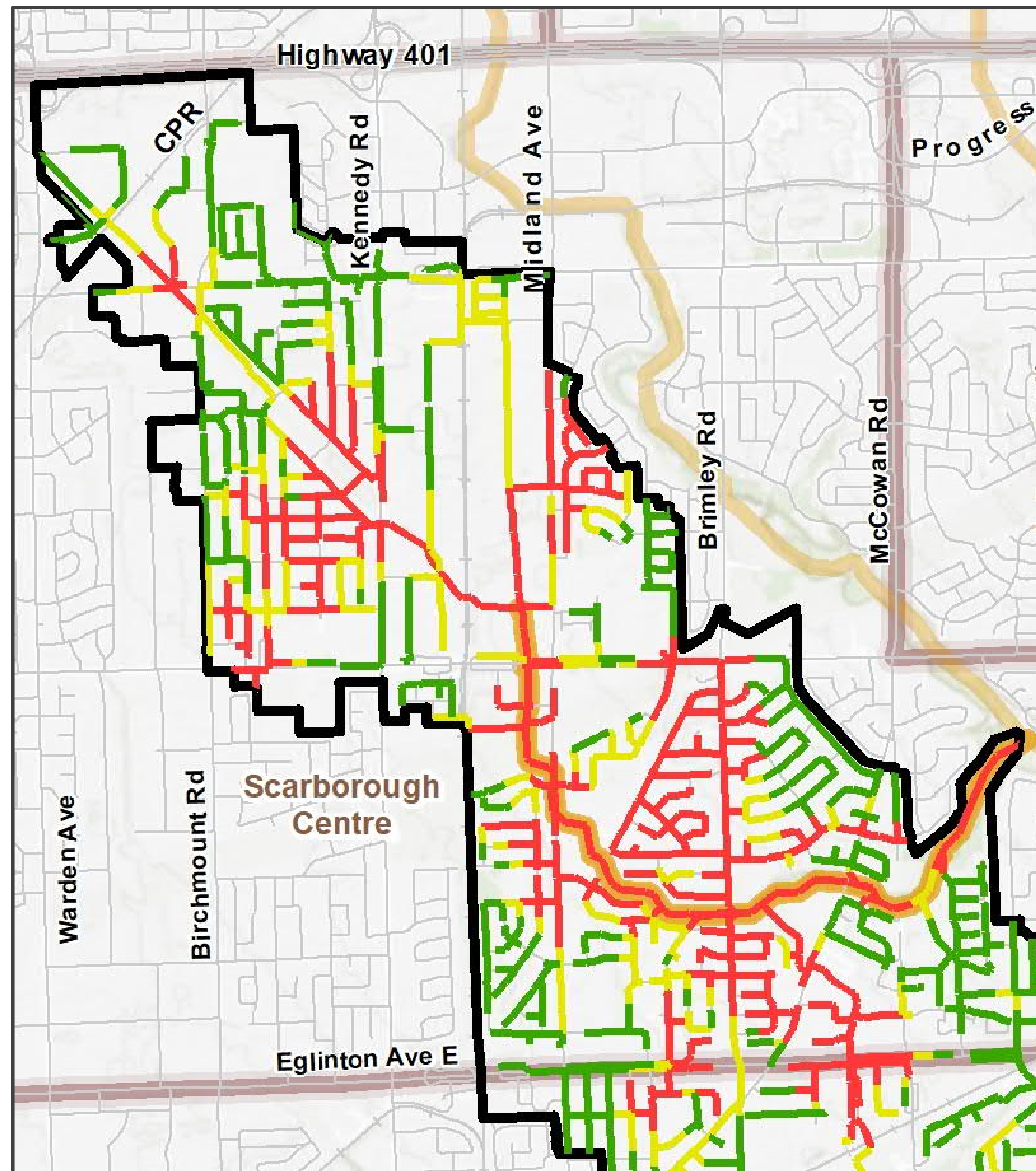


High water levels along Dorset Park Creek (left) after extreme rainfall events causes backup in the storm sewer system.

In the south half of the study area (right), there is a lack of overland flow routes in the streets to redirect water away from private properties.

Insufficient local storm sewer capacity also leads to ponding on the streets.

Assessment of Existing Sanitary Sewer System



The sanitary sewers within the study area experience capacity issues (red, yellow), and some are at risk of basement and overland flooding during extreme rainfall events.

Causes of Flooding in the Study Area

- Existing local storm and sanitary sewers have limited conveyance capacity, or ability to carry large amounts of water, during extreme rainfall.
- High river flows and water levels in Dorset Park Creek following extreme rainfall events back up into storm sewers upstream, reducing sewer conveyance capacity.
- There are insufficient catchbasins to capture water flow, resulting in surface flooding.
- Buildup of surface stormwater in low-lying areas with no suitable overland flow route.



Basement flooding
due to sewer overflow



Surface flooding



Riverine flooding caused
by high water levels in
the creek that back up
into storm sewers
upstream

Study Recommendations

Potential Solutions to Basement Flooding

Below are potential solutions to basement flooding in the study area, which can be combined:

More Conveyance Capacity

- New sewers on local roads
- New catchbasins
- Replace existing sewers with larger pipes

Storage Facilities

- Underground tanks or “in-line” storage pipes
- Large sewers with vertical storage shafts
- Stormwater management ponds

Creek Improvement

- Replace existing culverts with larger culverts at road crossings
- Widen the existing creek
- Replace the enclosed creek sections with open channel

Recommended Approach for Area 52

More Conveyance Capacity

Storage Facilities

Creek Improvements

- A “**hybrid**” approach is recommended, which would apply a combination of solutions to address flooding.
- **Conveyance improvement, supported by new underground storage, is the central and most important element to a system-wide solution.**
- Increased conveyance capacity in the sewer system is required to relieve local flooding issues and achieve the Basement Flooding Program’s Level-Of-Service targets, where feasible.
- Creek improvements are not recommended as they cannot fully eliminate overflow effects and would result in significant property impacts.

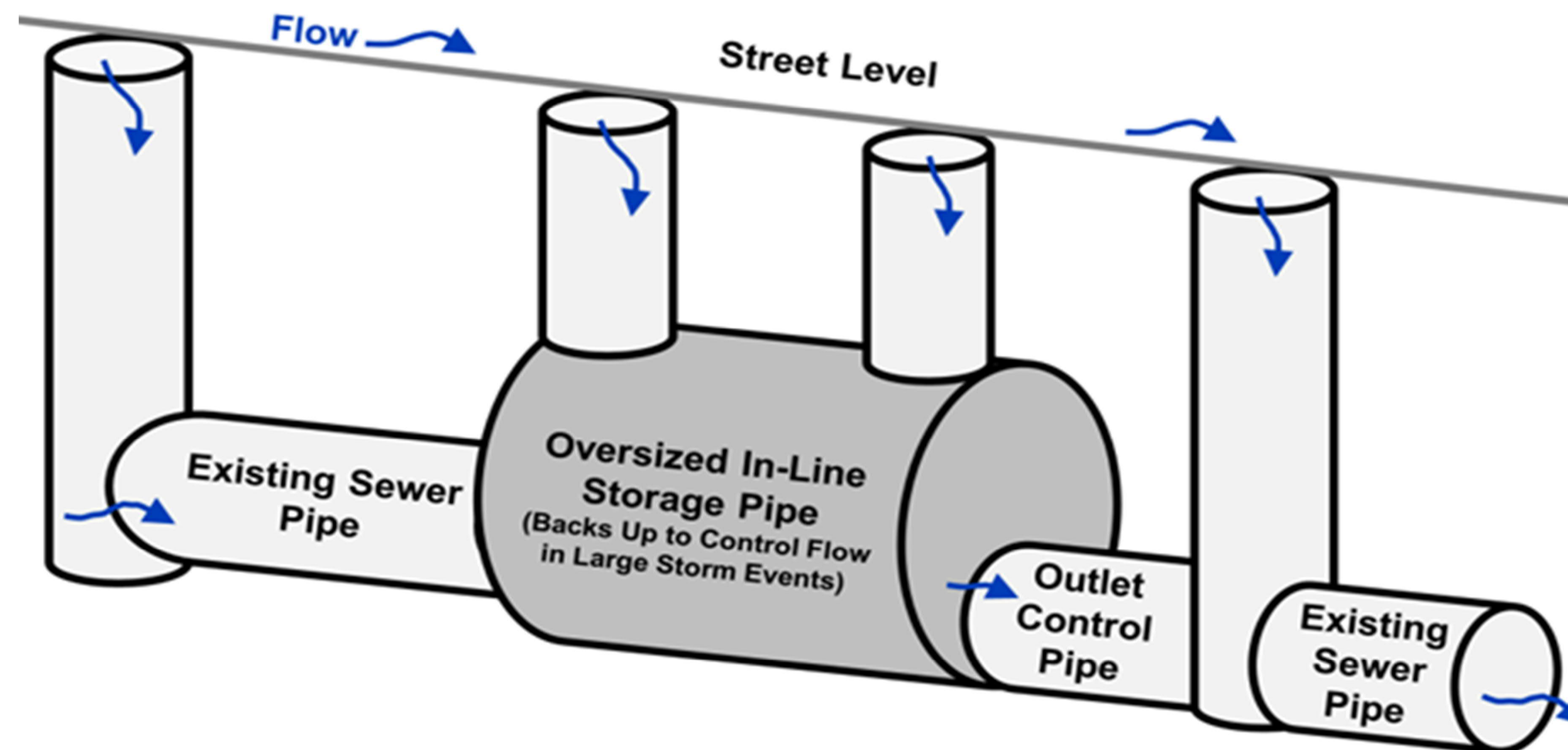
Replacement Storm and/or Sanitary Sewers

- Replacing existing sewers with larger sewers so the upgraded system can convey a greater volume of stormwater.
- Replacement requires excavation of the road to remove the old sewer, manhole and catchbasins, and disconnect the sewer service line(s).
- A new sewer is then installed and connected to the system, followed by restoration of the road and boulevard.



Storage Facilities

- New underground storage facilities would temporarily store water during storm events and relieve overloading of the sewer system.
- Construction of storage facilities requires excavation of the road or open space area to remove old sewers, manholes and disconnect the sewer service line(s).
- A new tank or sewer is then installed and connected to the system followed by restoration of the road or open space area.

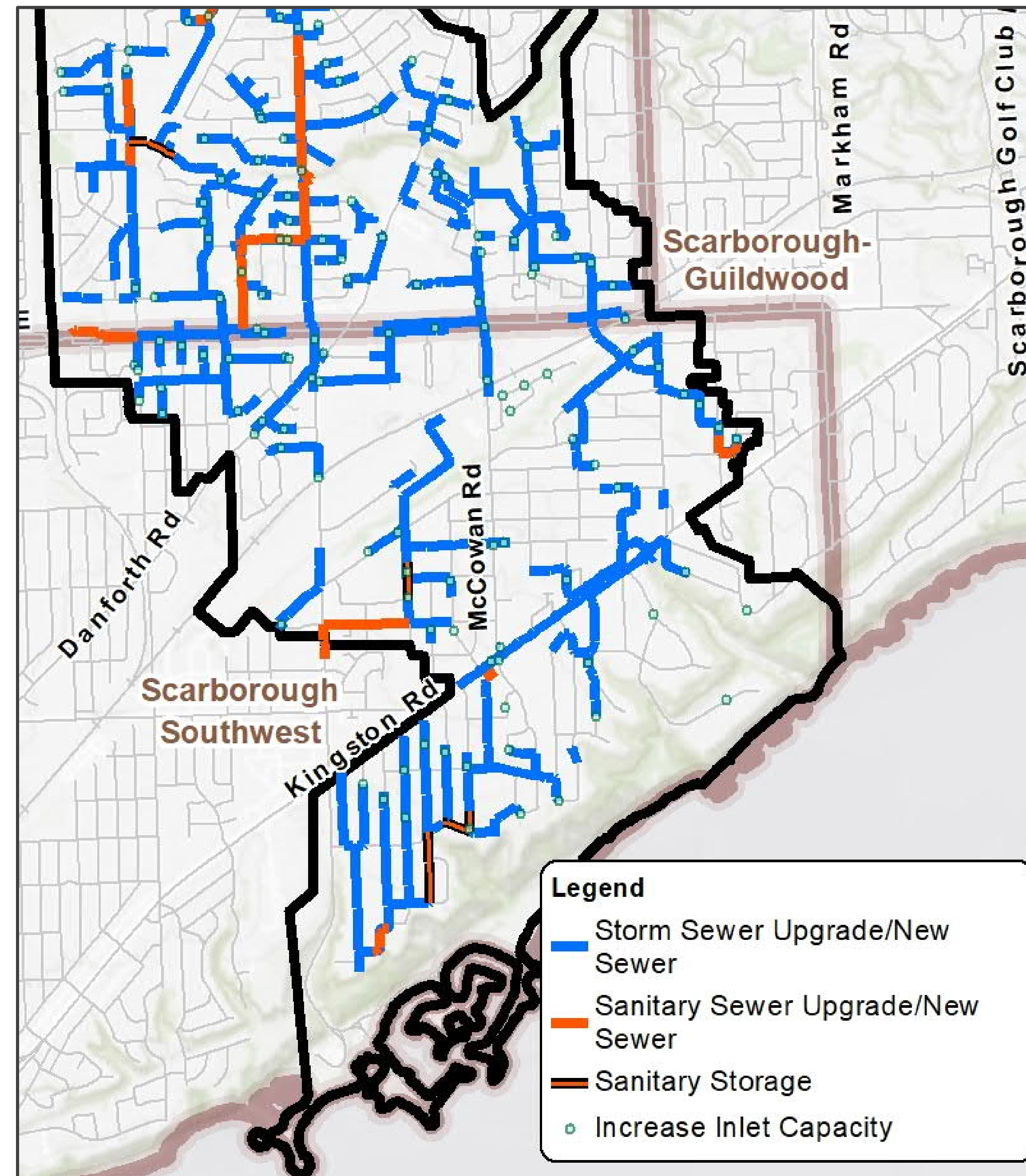
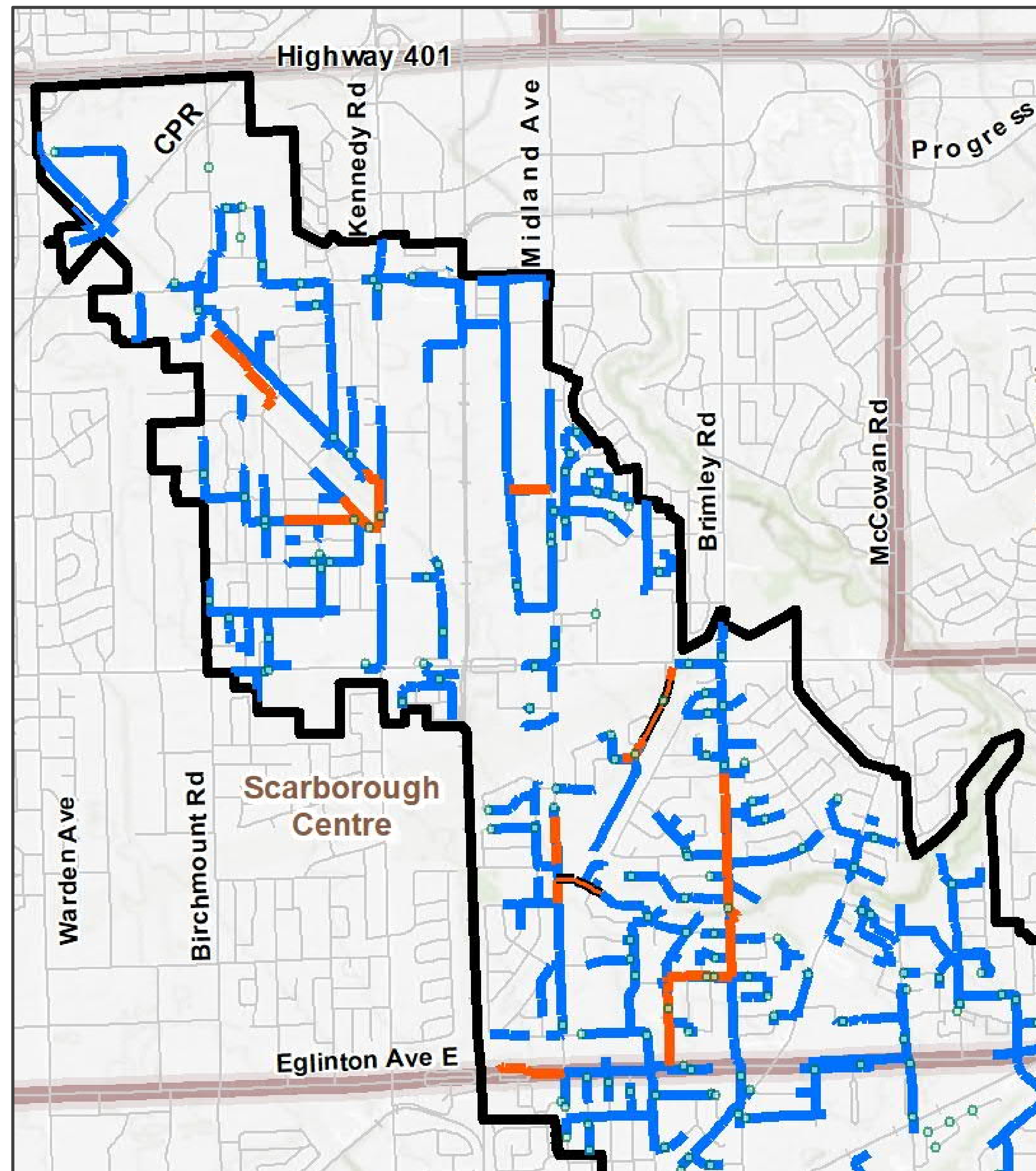


Catchbasins

- Increasing the number of catchbasins would improve capture flow from the surface.
- Minor excavation of the road is required to install the new catchbasin(s) and connect them to the storm sewer, along with restoration of the curb and road.



Recommended Solutions Overview



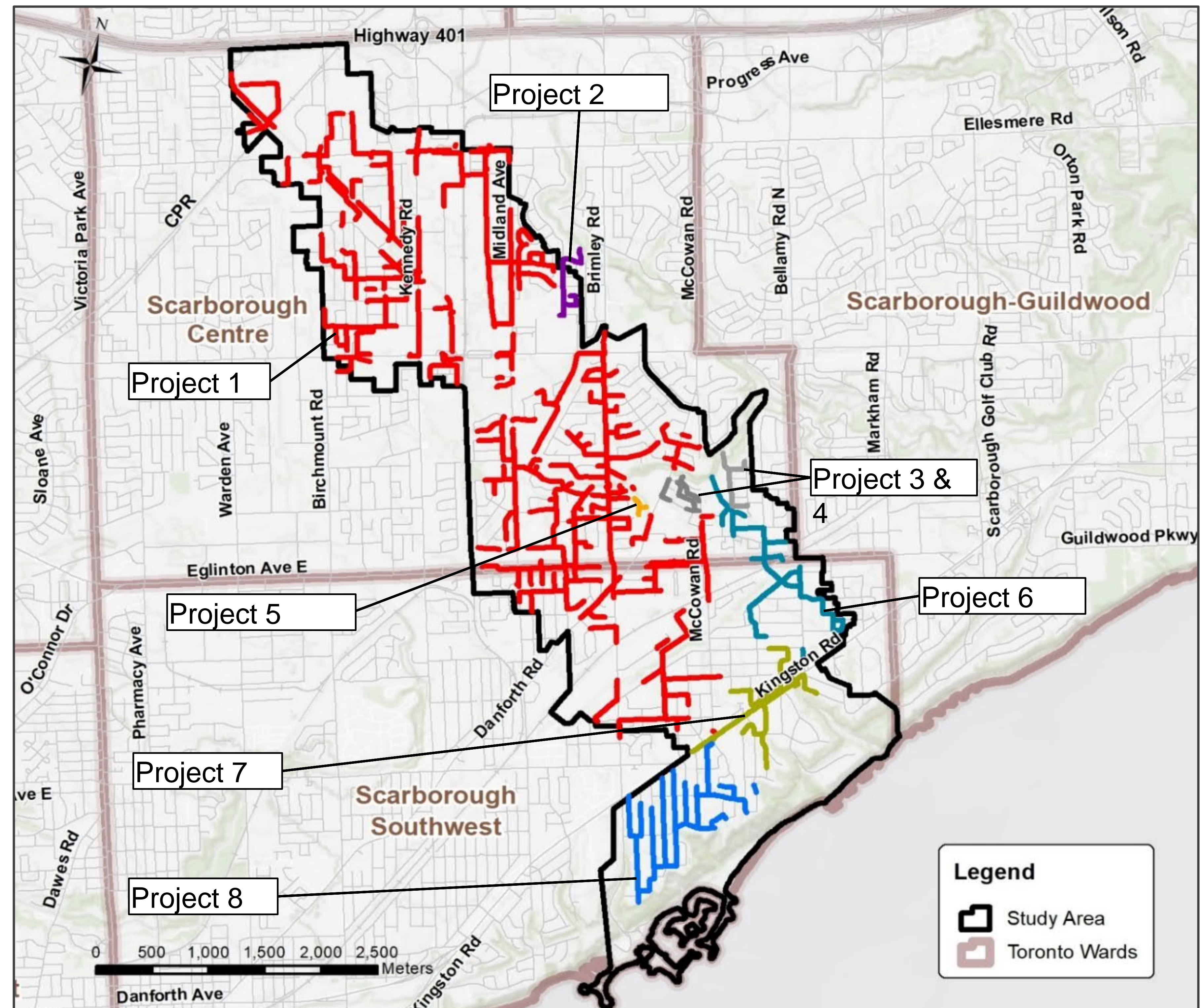
The recommended solutions involve a “hybrid” approach, which would apply a combination of solutions to address flooding, including sewer upgrades / new sewers, and storage pipes.

The majority (65 km) of proposed sewer upgrades are small diameter sewers, with 8.9 km of storage pipes recommended.

Recommended Projects

The recommended solutions were grouped into eight projects based on their alignment to the sewer system:

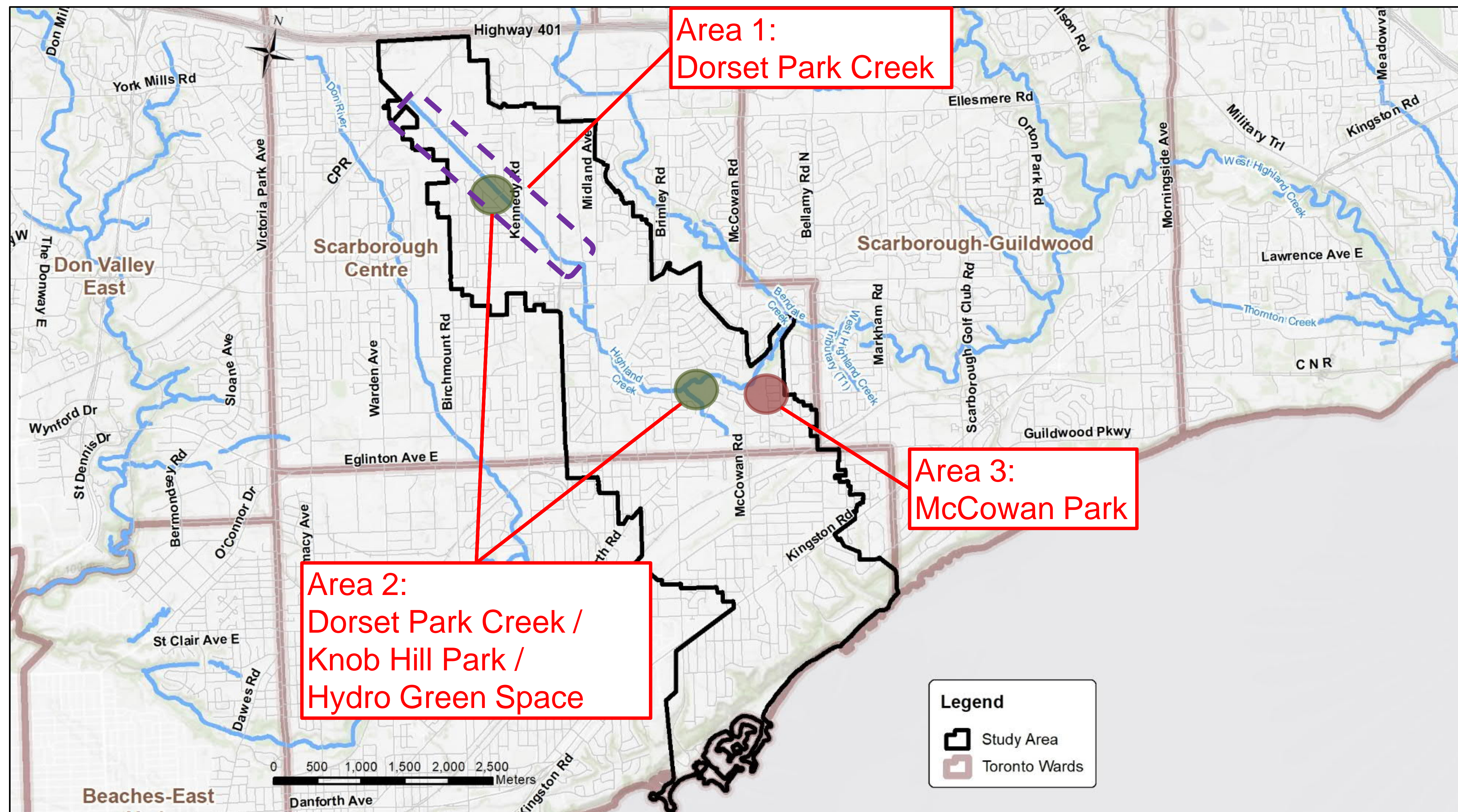
- Two Schedule A projects, which are within the City's right of way. These projects are pre-approved/exempt under the Municipal Class EA process.
- Five Schedule B projects, which are within new or existing easements, impacting private property.
- One Schedule C project which may involve property and easement impacts, channel modifications and installations with environment impacts, and/or greater cost. This project would involve additional consultation in the future.



Alternative Solutions

Alternatives Solutions

Alternative solutions were assessed in three areas due to potential property or environmental impacts and/or greater technical or cost complexities. A recommended solution was chosen in each area.



Criteria to Assess Alternative Solutions

Alternative solutions were assessed based on their ability to address the Study's purpose and the criteria below:

Natural Environment

Effectiveness in reducing potential impacts on:

- Terrestrial systems (vegetation, trees, wildlife)
- Aquatic systems (aquatic life and vegetation)
- Surface and groundwater
- Soil and geology
- Receiving water quality
- Stream erosion

Socio-Cultural

Effectiveness in reducing:

- Land use impacts (parks, ravines, open spaces)
- Community disruption during construction (traffic, noise, construction in easements)
- Community disruption after construction (visual impact, odour, safety)
- Potential impacts to archaeological and cultural resources
- Impacts to First Nations

Technical

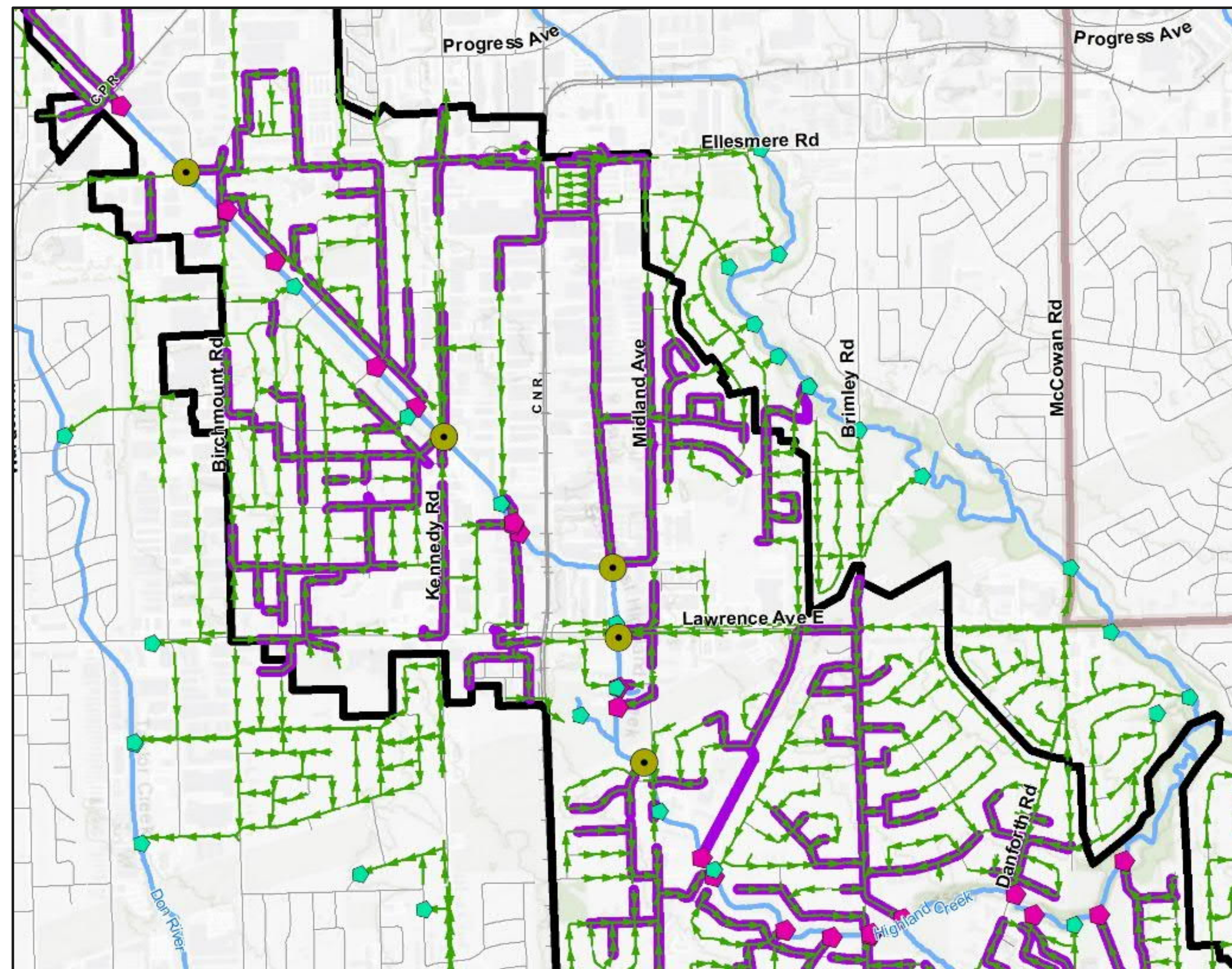
- Effectiveness in reducing surface and basement flooding
- Improvement to runoff quality
- Feasibility of implementation (available space, accessibility, constructability, easement requirements, approvals)
- Reducing potential impacts on upstream/downstream and surrounding area infrastructure
- Reducing potential impacts to operating and maintenance requirements

Economics

- Limiting capital, operating and maintenance costs

Alternatives for Area 1: Dorset Park Creek

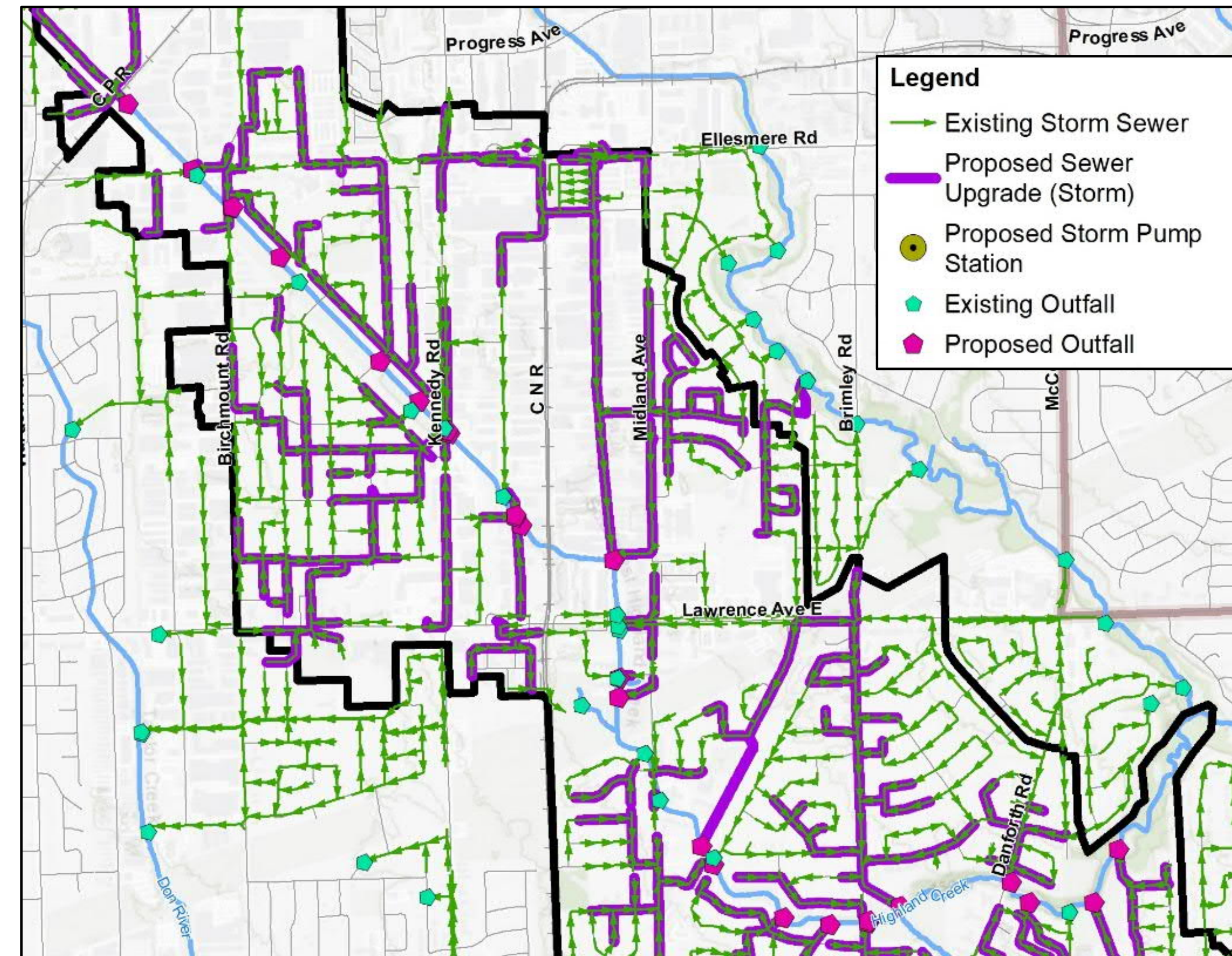
Four alternate solutions were identified to address surface and basement flooding upstream due to water levels in Dorset Park Creek.



Alternative 1

Increase pipe sizes and add storm pump stations at five locations along Dorset Park Creek.

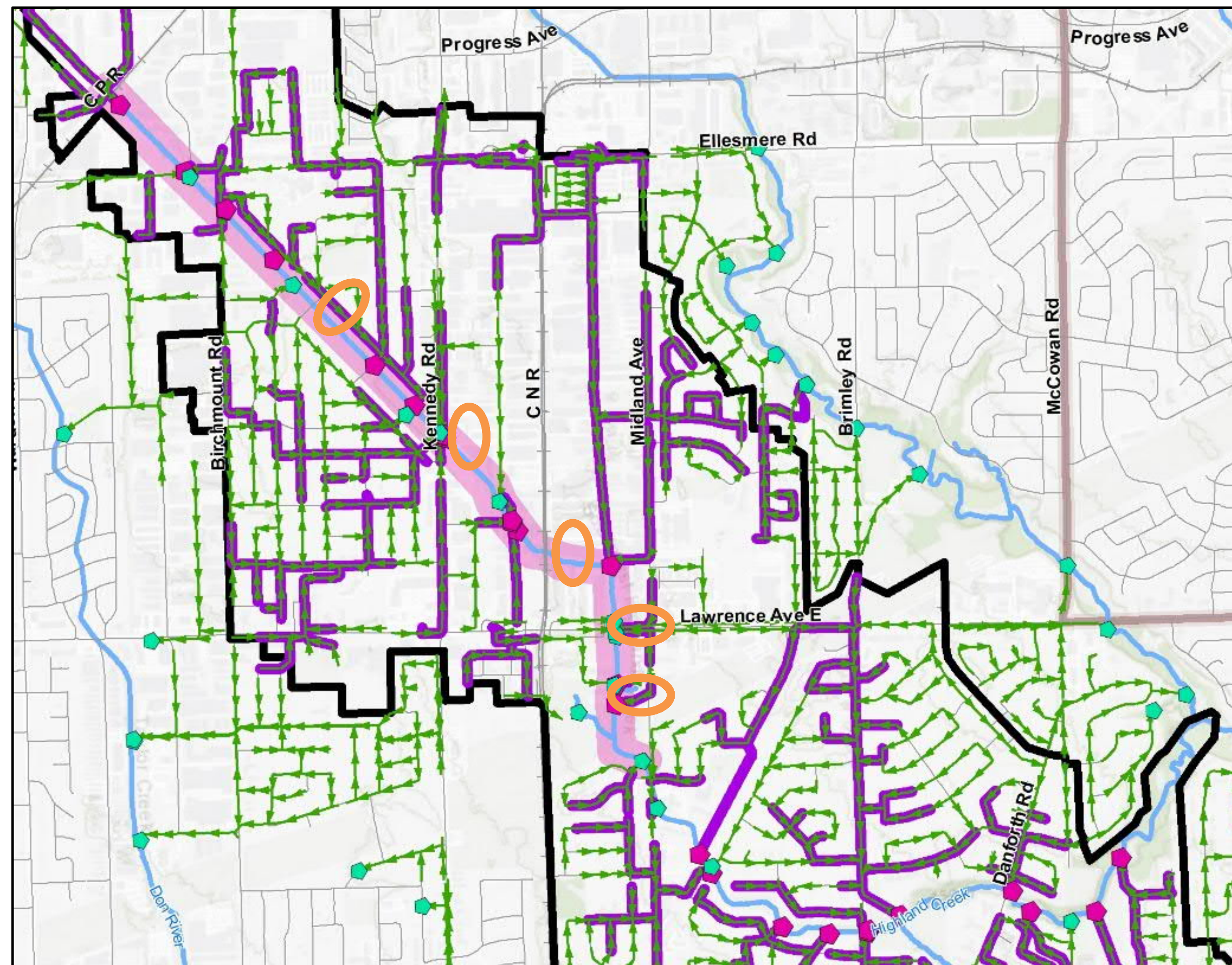
- Extensive property impacts to build pump stations.



Alternative 2 - Recommended Solution

Increase pipe sizes without the need for pump stations.

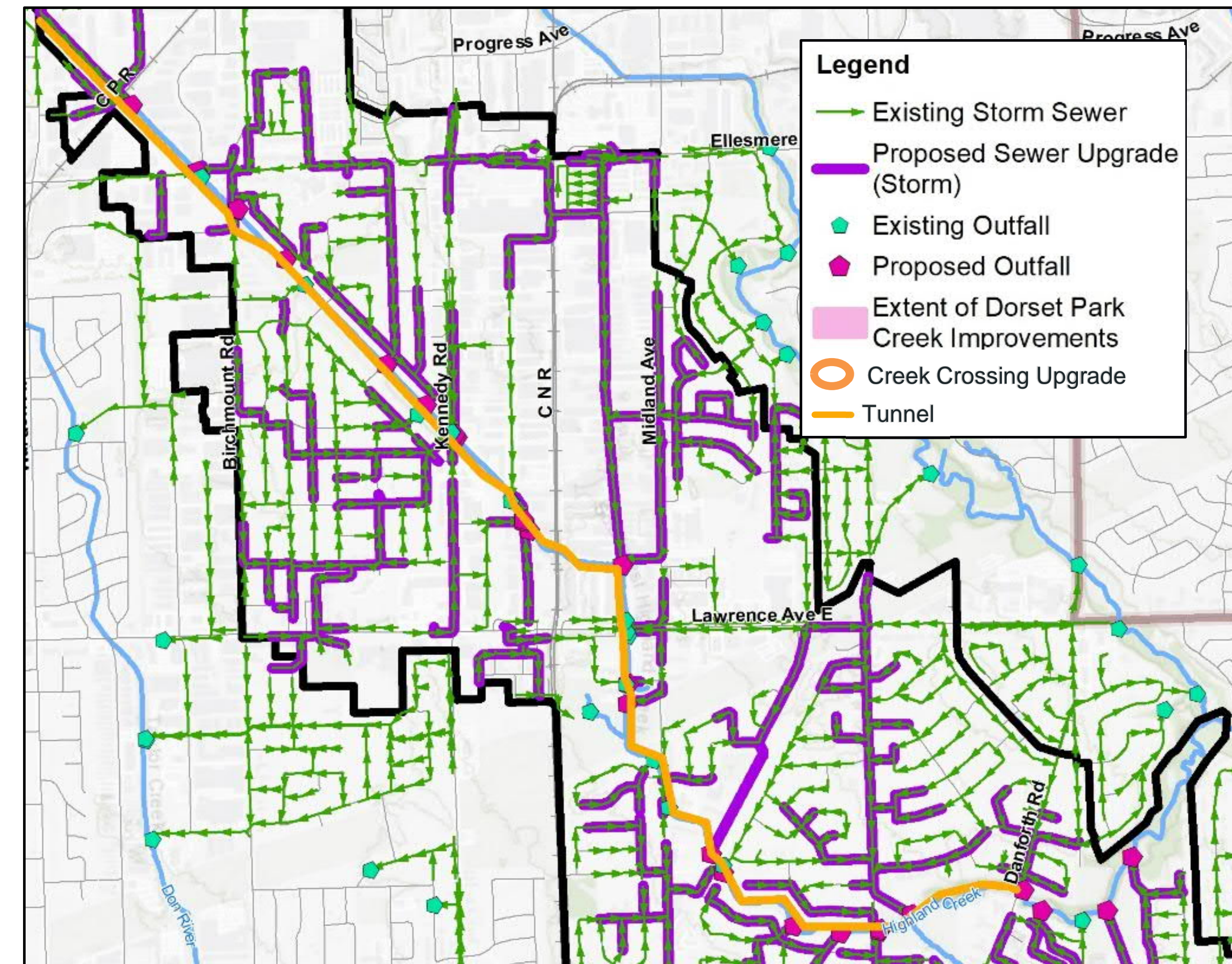
Alternatives for Area 1: Dorset Park Creek



Alternative 3

Increase pipe sizes and carry out creek improvements to lower creek water level (including upsizing existing culverts at road crossings, widening the existing creek, and/or replacing the enclosed creek sections with open channel).

- Does not eliminate backwater into sewers.
- Would result in property impacts and extensive watercourse improvements on private property and at transit locations.



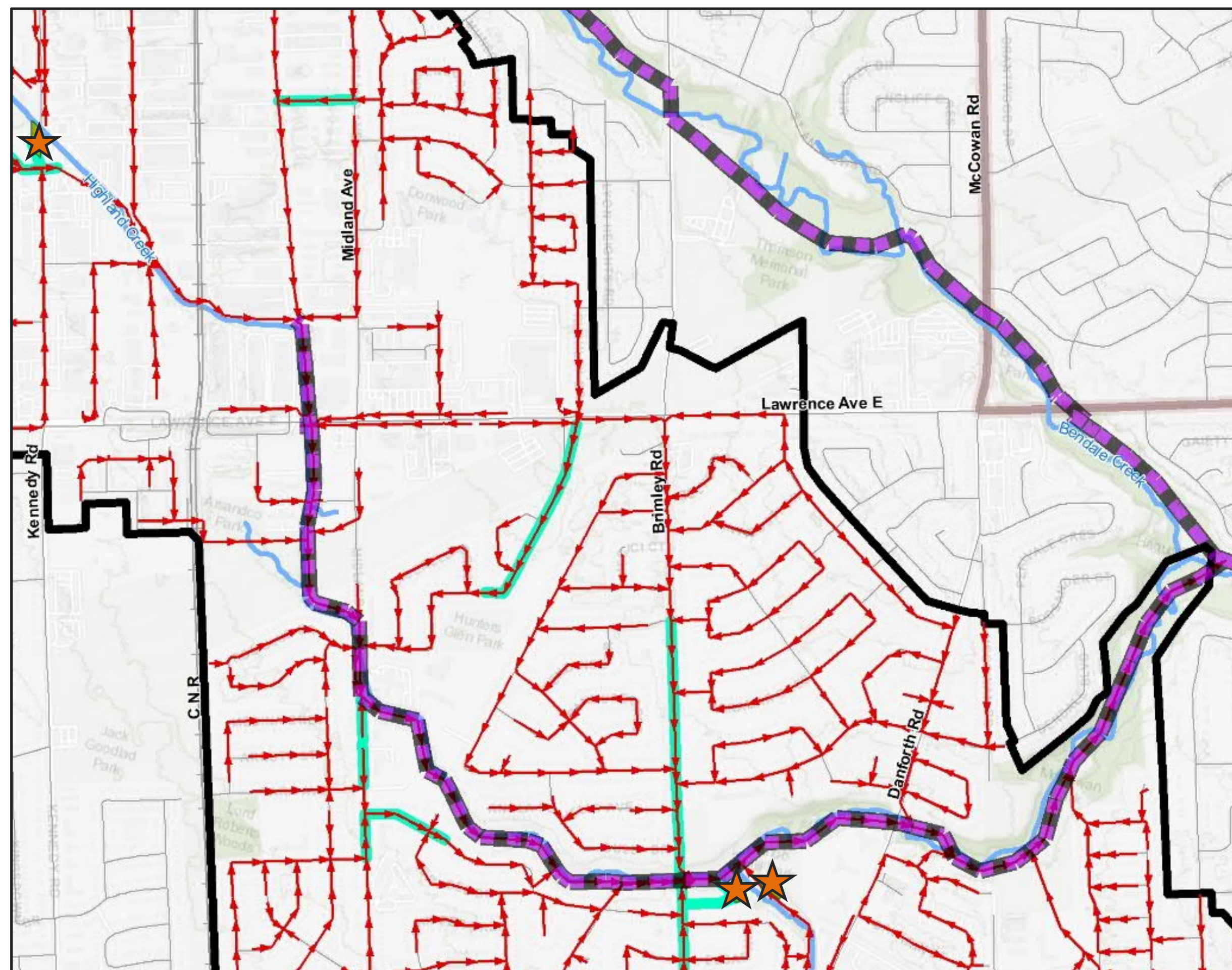
Alternative 4

Increase pipe sizes and construct a large, deep tunnel to capture flows from five outfalls submerged by creek water levels.

- Reduced flow would reduce water levels in the creek.
- Does not fully eliminate backwater effects.
- Tunnel would be constructed in Dorset Park Creek Valley, resulting in costly and complex infrastructure improvements.

Alternatives for Area 2: Dorset Park Creek / Knob Hill Park / Hydro Green Space

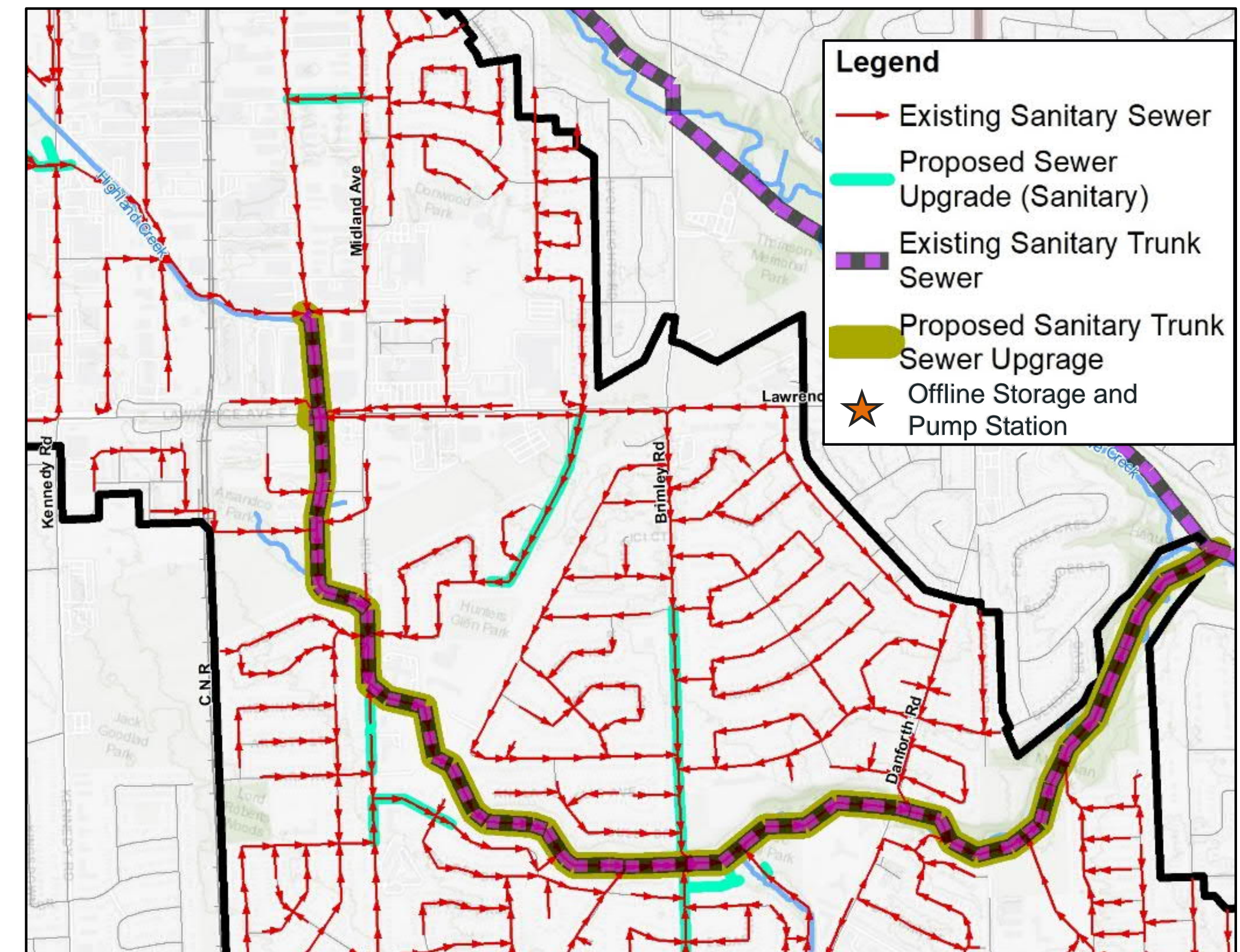
Two alternate solutions were identified to address surface and basement flooding upstream due to water levels in this area.



Alternative 1

Increase pipe sizes and construct a sanitary pump station and storage tank at three separate locations. Each location is situated upstream of a sanitary outlet along the Dorset Park Sanitary Trunk Sewer.

- Reduces risk of surface and basement flooding for upstream catchment area.



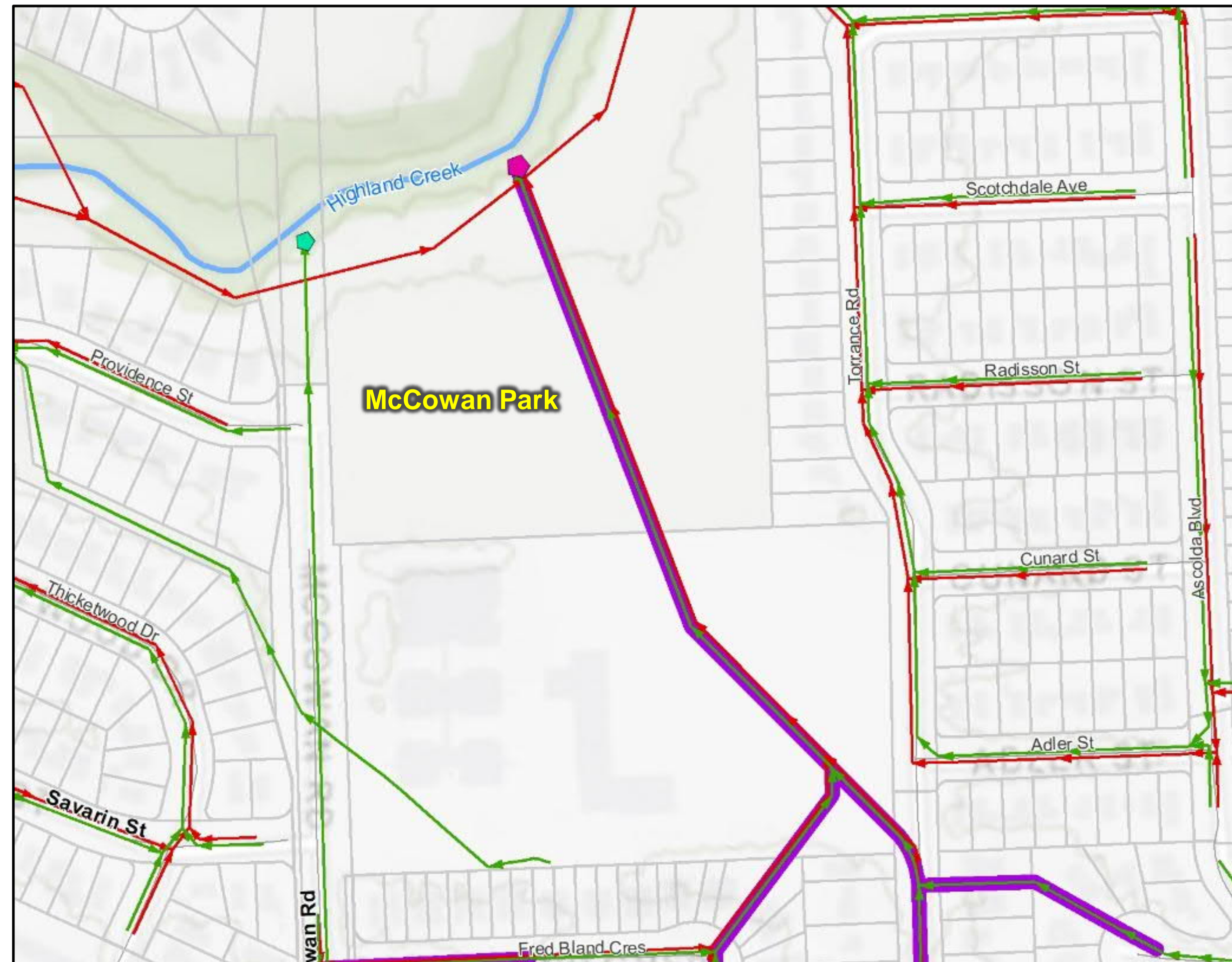
Alternative 2 - Recommended Solution

Upsize sanitary sewers without pump stations, and upgrade Dorset Park Sanitary Trunk Sewer along valley.

- Reduces the need for sanitary pump stations and storage facilities.

Alternatives for Area 3: McCowan Park

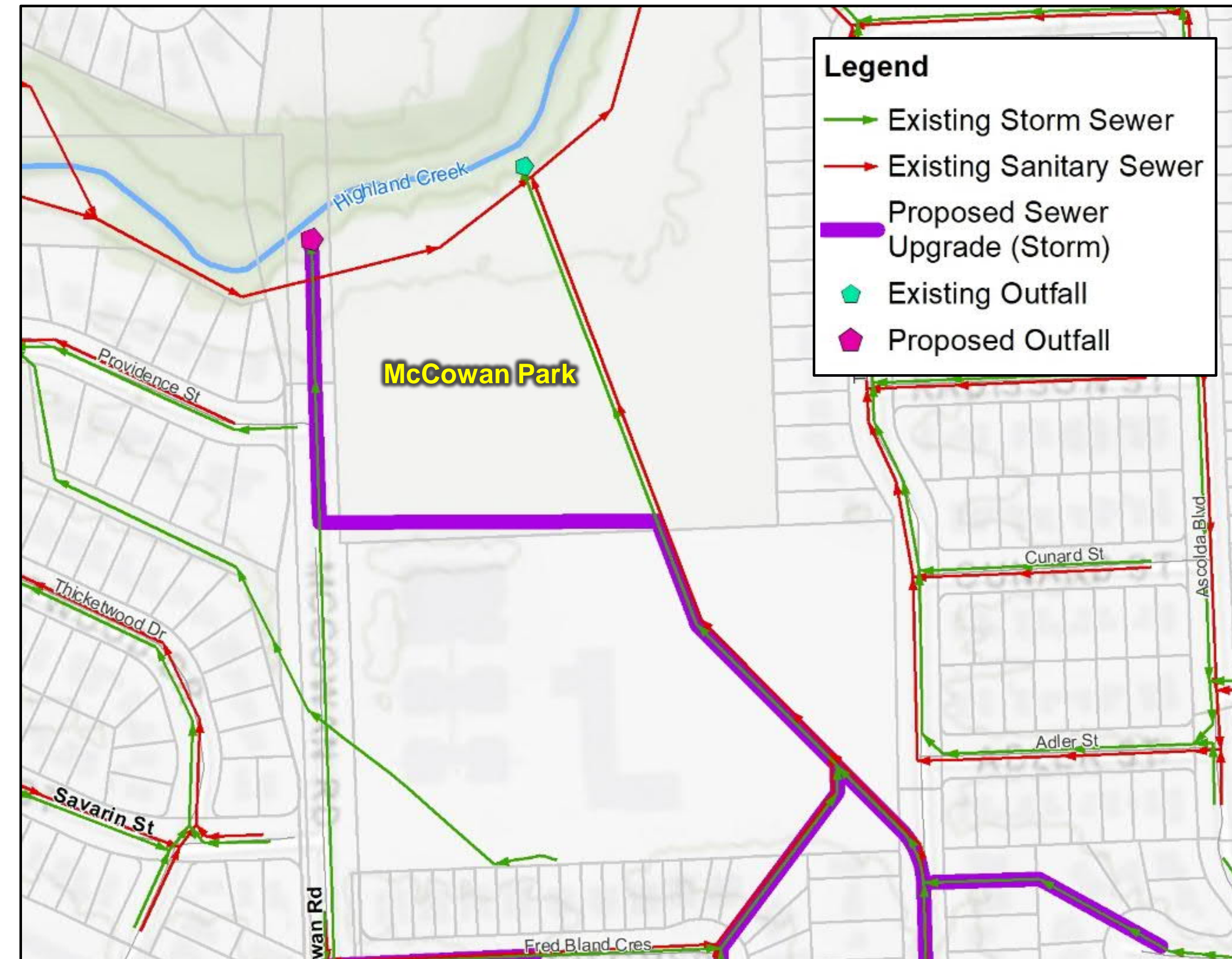
Two alternate solutions were identified to address surface and basement flooding upstream due to water levels in McCowan Park.



Alternative 1

Upsize existing storm sewers through McCowan Park and playground and discharge via existing outfall.

- Involves impacts to public green space and playground.



Alternative 2 - Recommended Solution

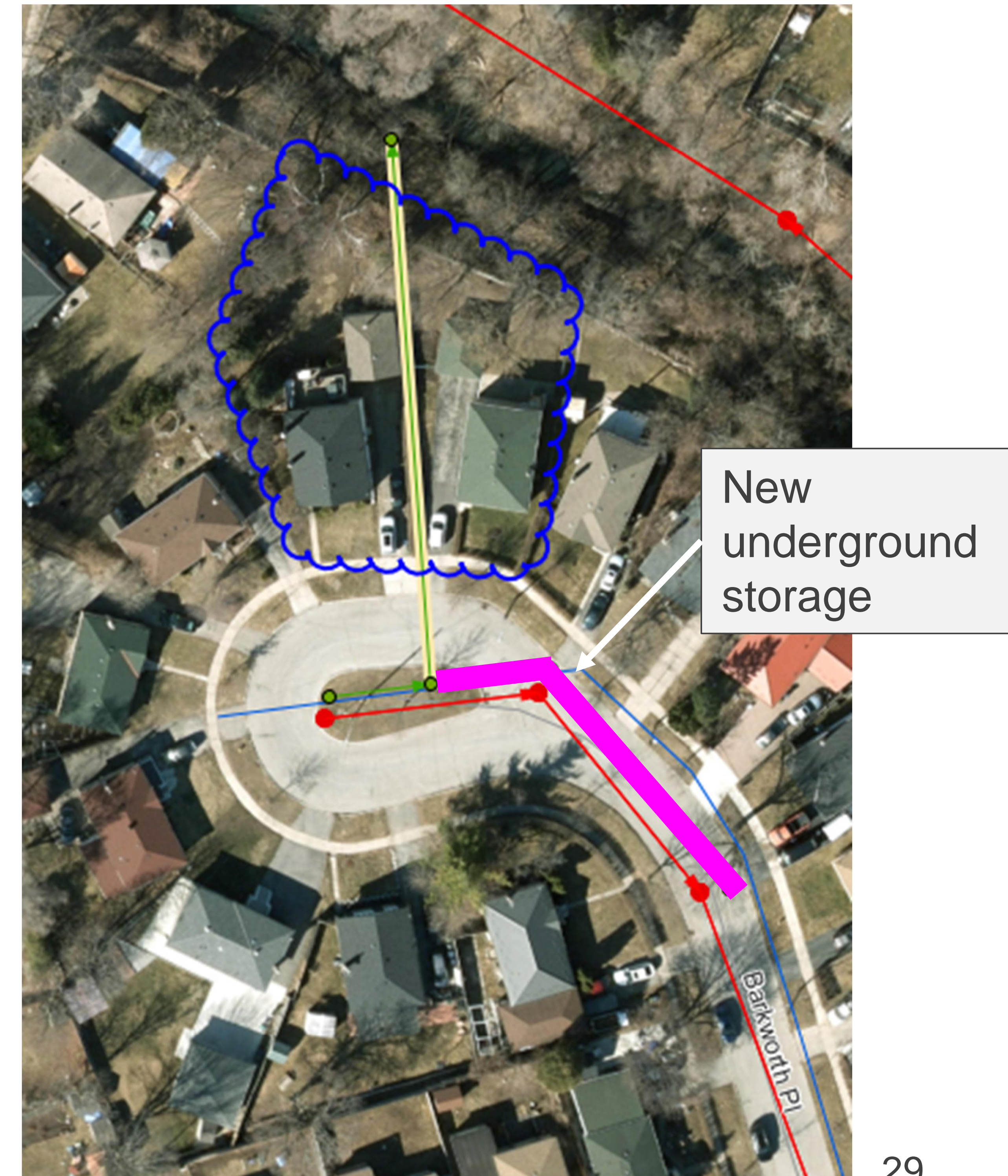
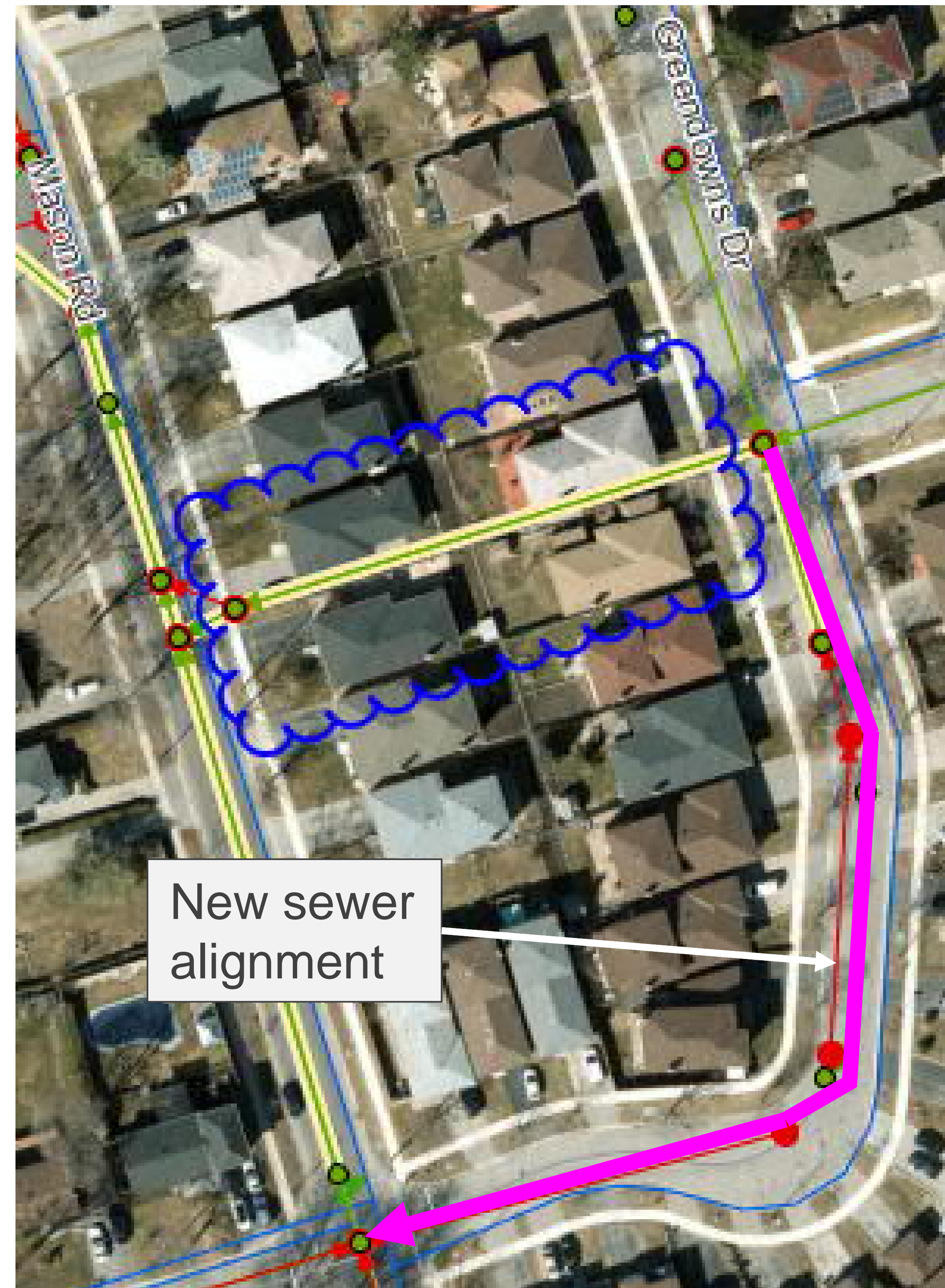
Direct flow with new storm sewer along the south edge of McCowan Park to the storm sewers within McCowan Rd right-of-way, and discharge to a different existing outfall.

- Reduces impact to public green space, as this sewer alignment avoids the playground area and mature trees.

Limiting Impacts to Private Property

Several properties in Area 52 have an existing sewer passing underneath the property (examples shown in blue areas).

Where possible, solutions involving new local sewer alignment (left) or underground storage (right), were considered to increase sewer capacity without requiring construction on private property or changes to existing property easements.

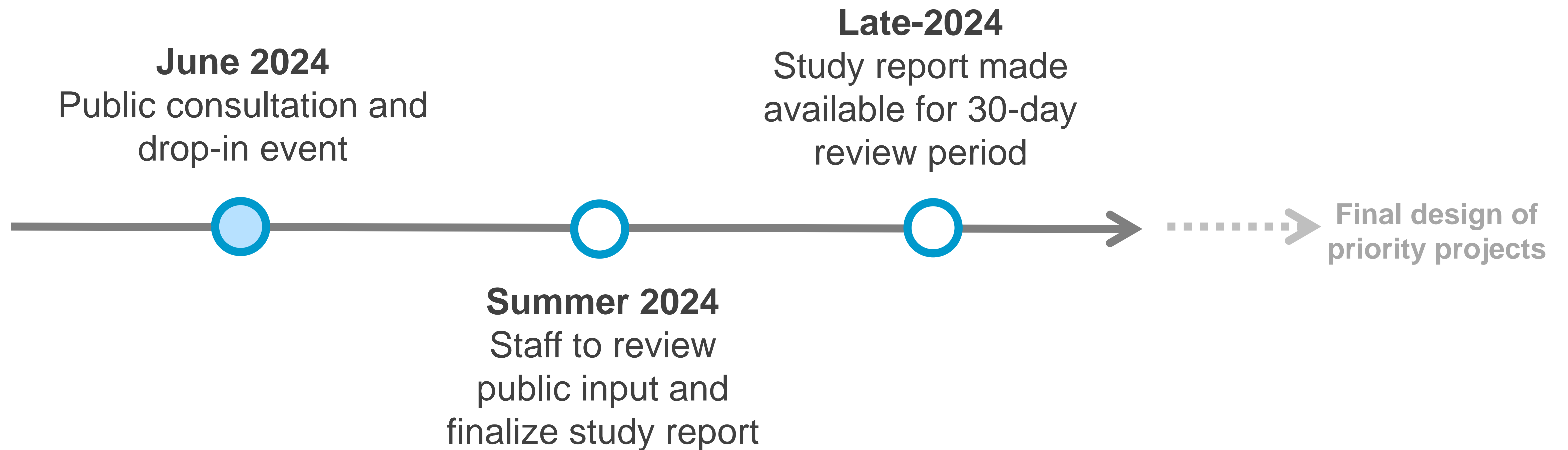


After Study Completion

- After the completion of the study, funding for the recommended projects must be arranged and approved.
- All City basement flooding projects must be prioritized to benefit the greatest number of properties and coordinated with other construction work. Projects are prioritized based on a Council-adopted \$68,000 cost-per-benefitting-property threshold.
- Projects meeting the threshold at the completion of preliminary design may proceed to construction. Projects that exceed the threshold are moved into the deferred project list for future consideration, when projects under \$68,000 have been advanced.
- During detailed design, solutions would be refined and property impacts would be confirmed.



Next Steps



What You Can Do To Reduce Flooding

At-Source Measures



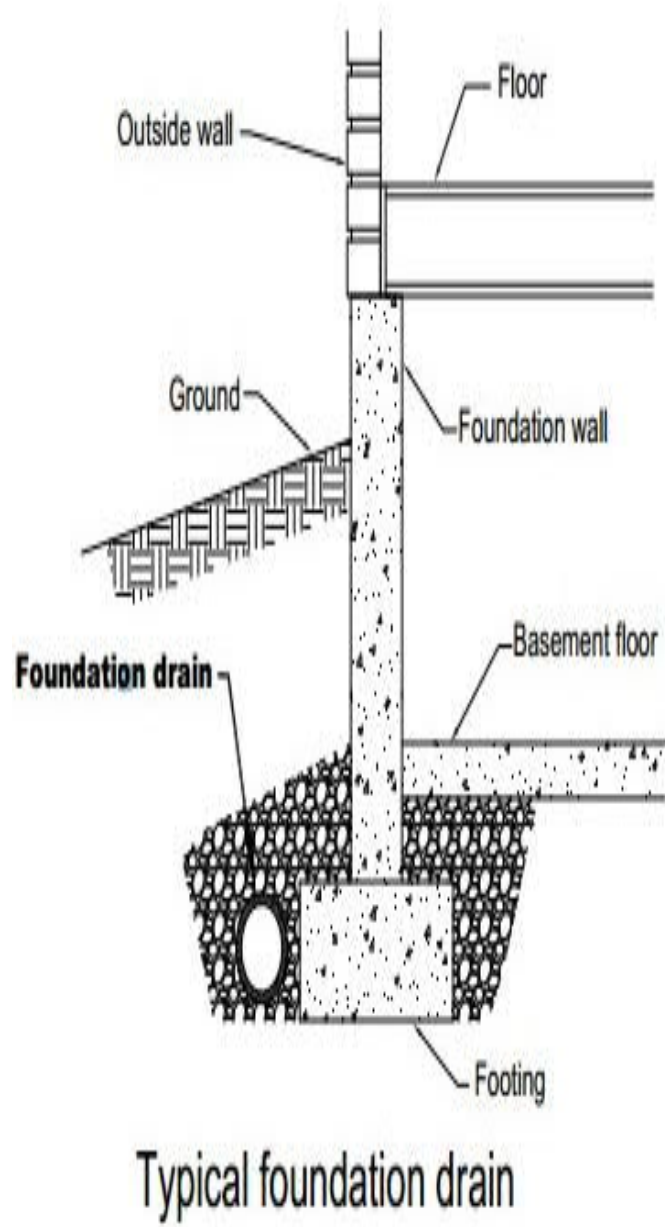
**Clean out
leaves, debris
in front and
rear-yard
drainage or
driveway
catchbasins**



**Install
backwater
valve**



**Install
permeable
surfaces**



**Disconnect
foundation
drains from
sanitary
sewer and
install/
maintain
sump
pumps**



**Improve
lot
grading**



**Disconnect
downspouts**



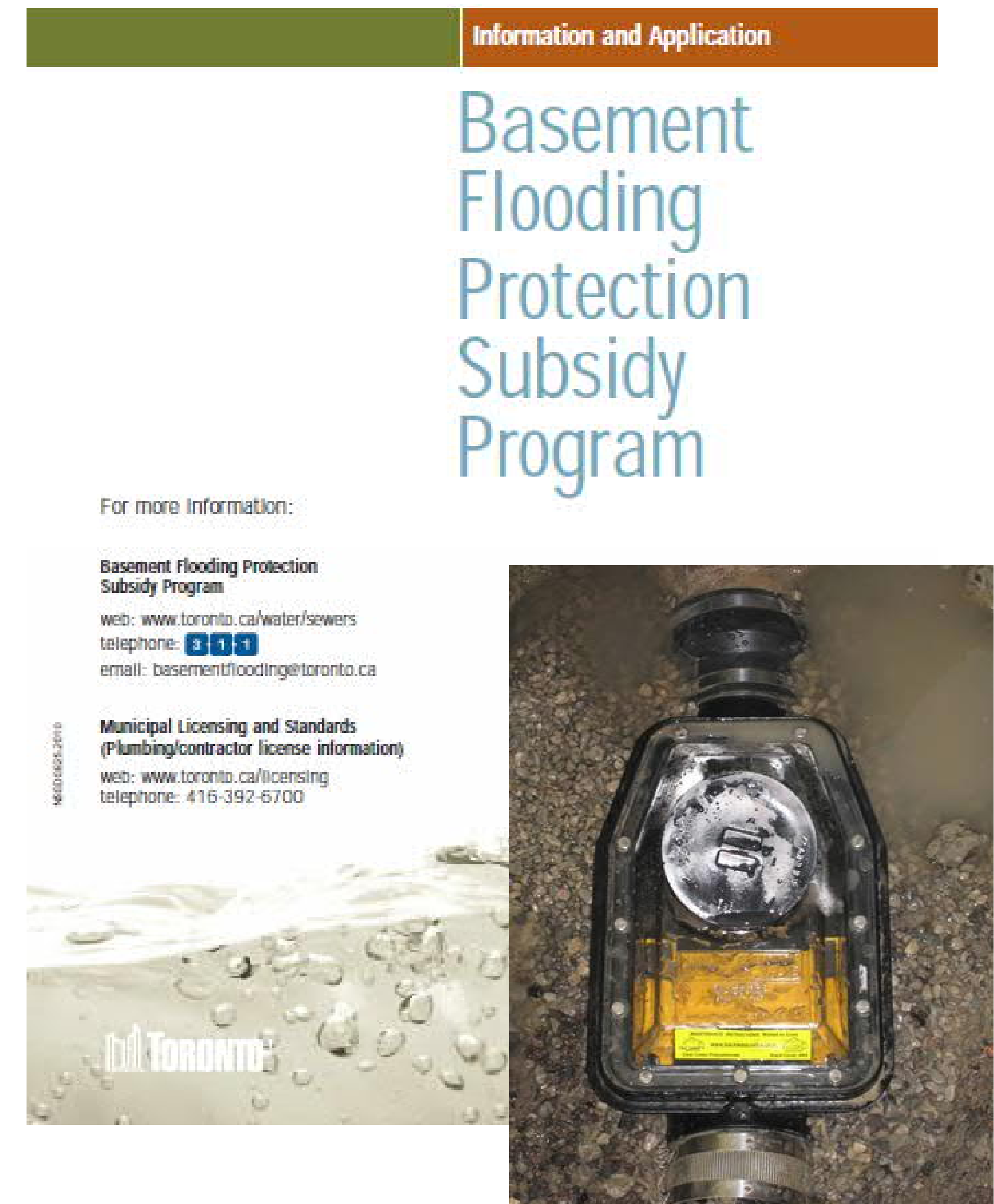
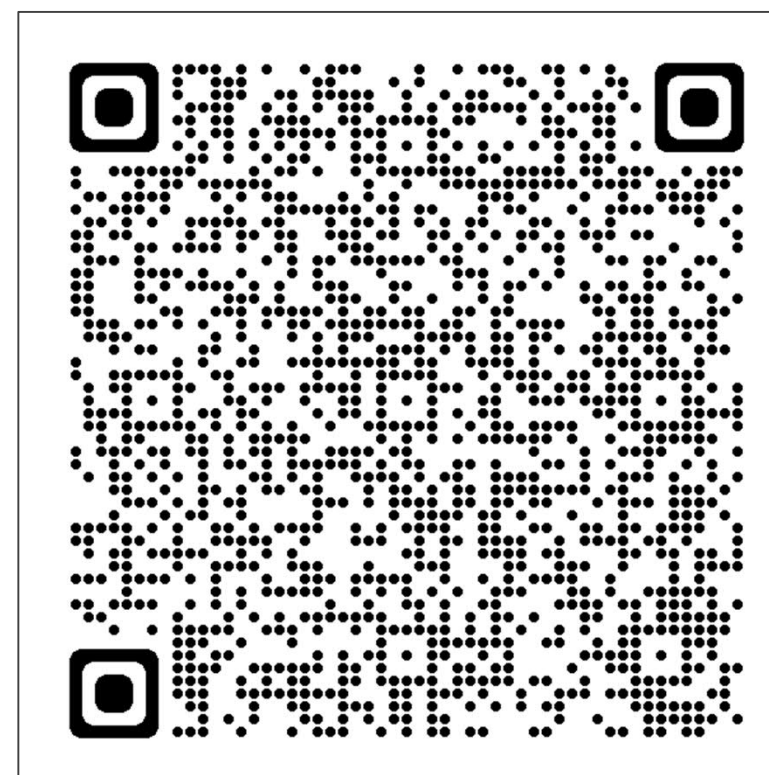
**Use rain
barrels**

Subsidy Program

To assist homeowners, the City offers owners of single-family, duplex, triplex, and fourplex residential homes a financial subsidy of up to \$3,400 per property to install flood protection devices including:

- a backwater valve
- a sump pump
- disconnection of a home's foundation drains (weeping tile) from the sewer system

For more information on the City of Toronto Basement Flooding Protection Subsidy Program, please scan the QR code:



Backwater valve

Contact Us

Visit our webpage at toronto.ca/bf52 to view information and submit written comments before July 11 to:

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