

City of London Carling Creek Stormwater Management Master Plan – Municipal Class Environmental Assessment Public Information Centre 2



Welcome

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Land Acknowledgement

We want to acknowledge that we are on lands traditionally occupied by Indigenous Peoples. They continue to care for this land, they continue to shape the City of London, and we want to show our respect. Hundreds of years after the first treaties were signed, they are still relevant today.



Presentation Format

- This meeting is being hosted as a pre-recorded video.
- If you have downloaded the slides independently of the video, please be sure to read the attached script.



Agenda

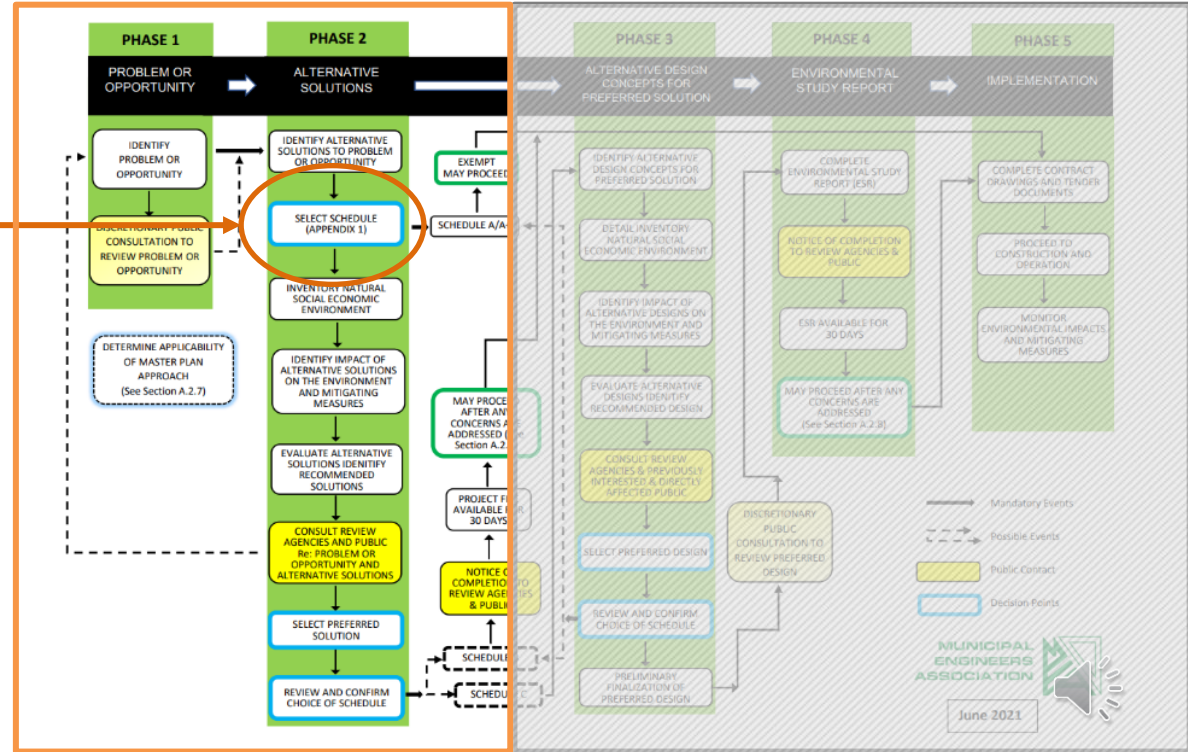
- Introduction
- Background Information
- Stormwater Management Alternatives
- Evaluation of Stormwater Management Alternatives
- Recommended Prioritization of Improvement Works
- Completion of the Environmental Assessment Process



Municipal Class EA Process

Master Plan
process
includes
Phases 1 and
2 only

We
are
here



Carling Creek Flooding Risk Assessment and Alternative Development Objects/Opportunities



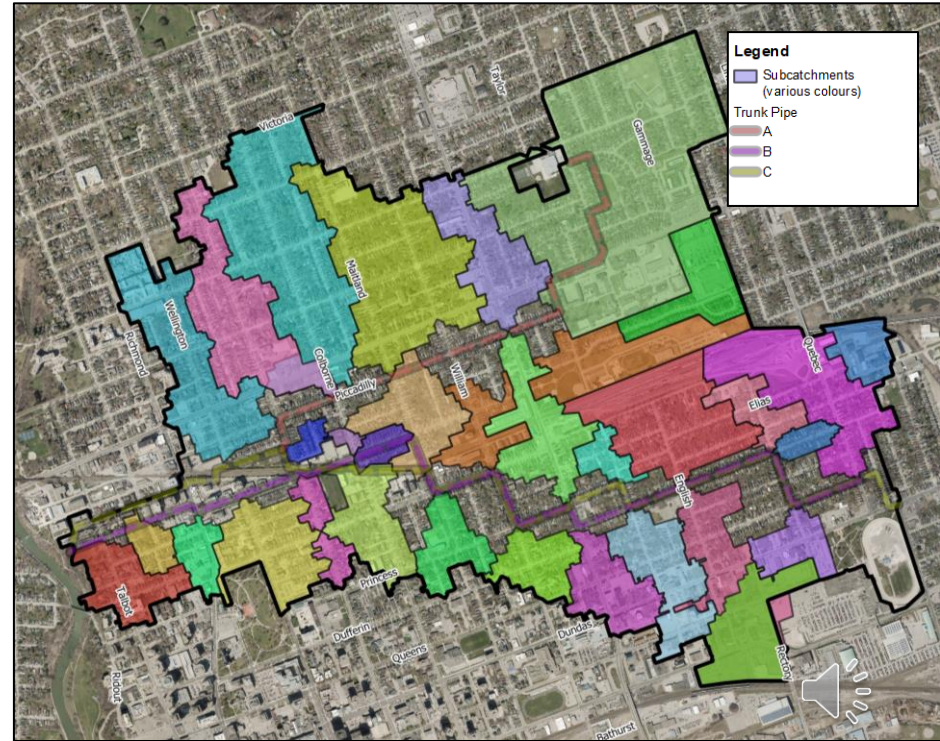
Assessing Flood Risk and Damages

- Updated hydrologic/hydraulic model (Infoworks ICM) used to simulate rainfall events and estimate flooding depths at critical locations throughout the Study area.
- Modeled flooding depths translated into flooding areas and mapped on local topography to assess potential impacts.
- Quantify flood impacts to residents, local businesses, and the public resulting from assessed flood damages.
- Determine a target Level of Service (LOS) to address critical flooding areas and reduce flood depths to allow safe access/egress from critical infrastructure and along arterial roadways.



Flooding Risk Assessment

- Flood risk assessment completed on individual subcatchment areas draining to the three main Carling Creek trunk storm sewers.
- Estimated peak flows for the 1:5-, 1:10-, 1:25-, 1:50-, 1:100-year Environment Canada Storms.
- Assessed flood risk on the basis of flooding area and flooding depth, noting potential impacts on private properties within each subcatchment area.

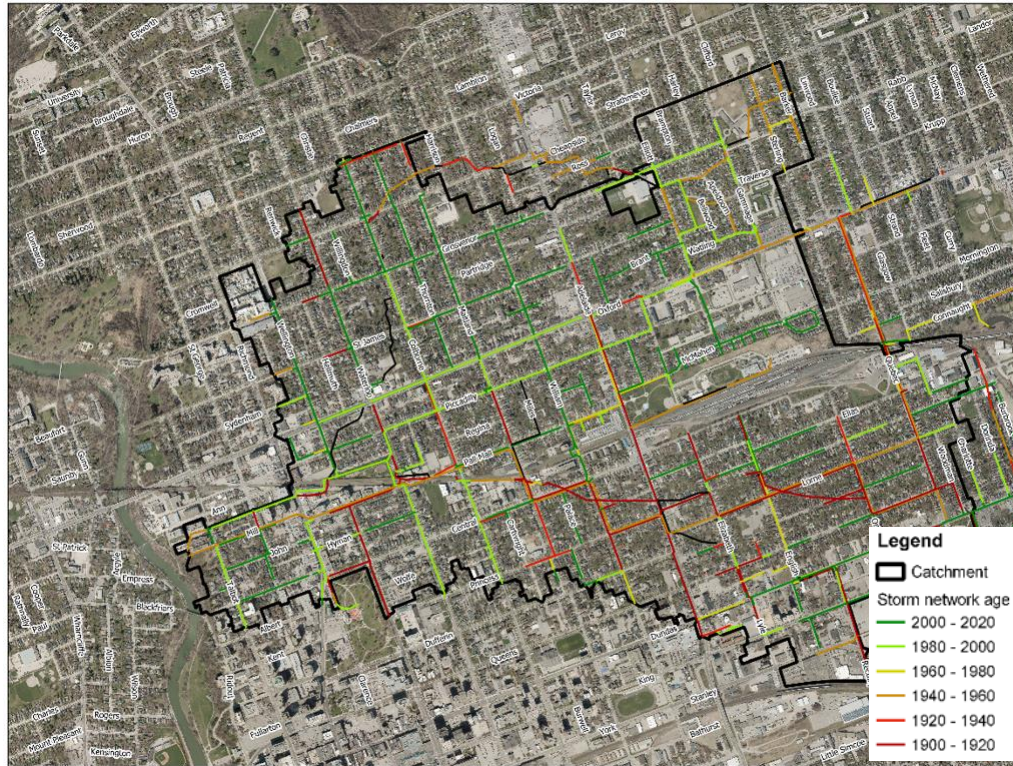


Refining the Alternative Development Objectives

- Integrates with the City's long-term storm servicing needs within the Downtown Core.
- Reduces flooding risk on public and private property.
- ***Makes use of existing municipal infrastructure and where feasible accept a lower Level of Service for storm servicing where flooding risk is minimal.***
- Considers the social, economic and environmental impact on the Thames River and surrounding lands.
- Facilitates infrastructure renewal and allows the City to assess stormwater servicing improvement priorities.
- Considers the total life cycle cost of the projects compared to modeled and potential flood risk and flood damages.



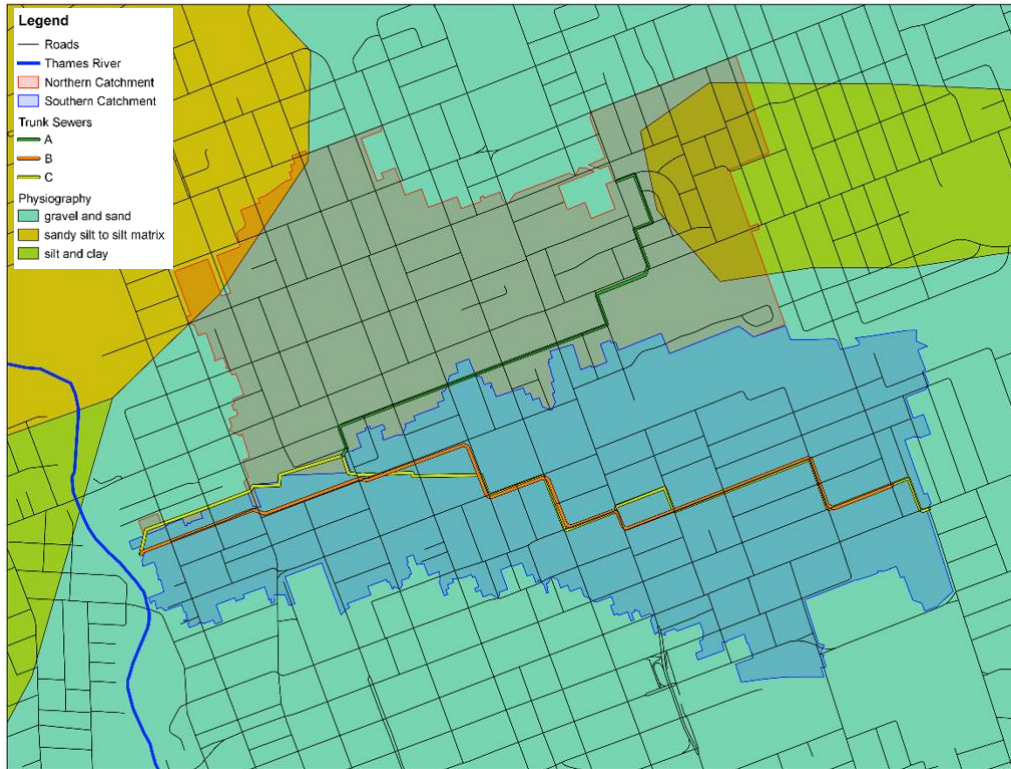
Renewal of Aging Stormwater Infrastructure



- Significant portion of the downtown core serviced with stormwater infrastructure that is a century old, particularly along Branch B.
- The physical condition of stormwater infrastructure warrants improvements and upgrades to attain City of London servicing design criteria.
- Master Plan to consider opportunities to address necessary infrastructure renewal while making improvements to the level of service of infrastructure to reduce potential impacts caused by surface flooding.



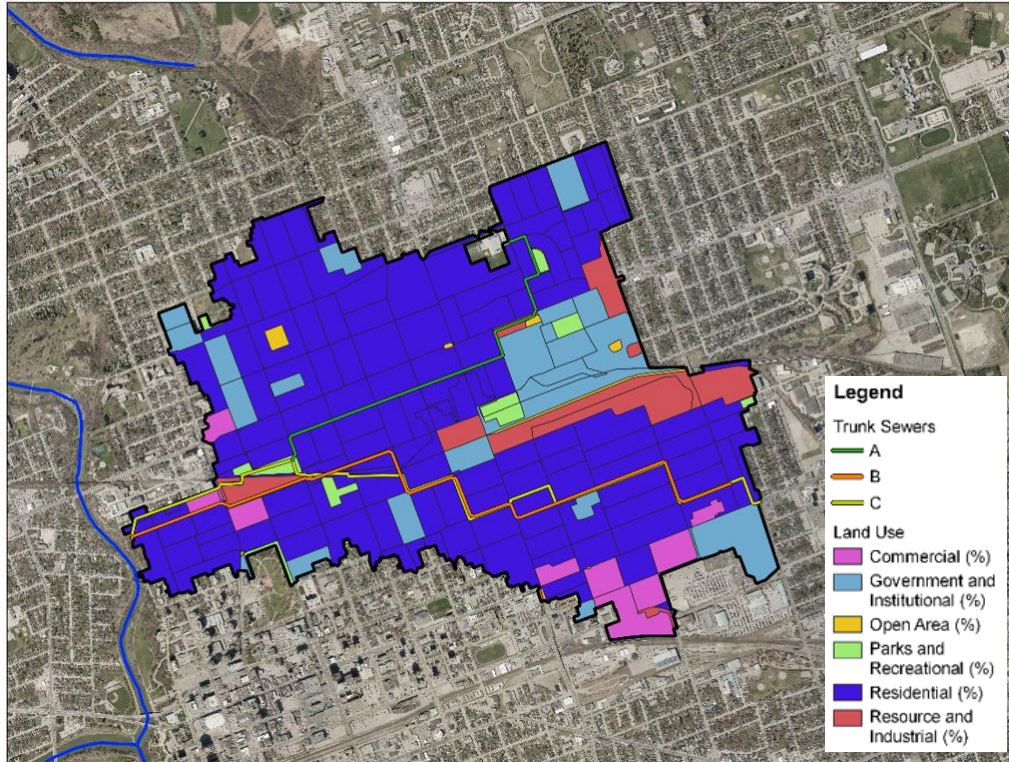
Physiography of the Downtown Core



- Significant portion of the downtown core has surficial soils consisting of gravel and sands with underlying loam indicative of the Thames River ‘spillway’.
- Surficial soils consisting of gravel and sand provide opportunities for the use of infiltration type stormwater management features such as bioswales and open-bottom underground storage chambers.
- Local topography and groundwater conditions impact implementation of certain types of stormwater management solutions.



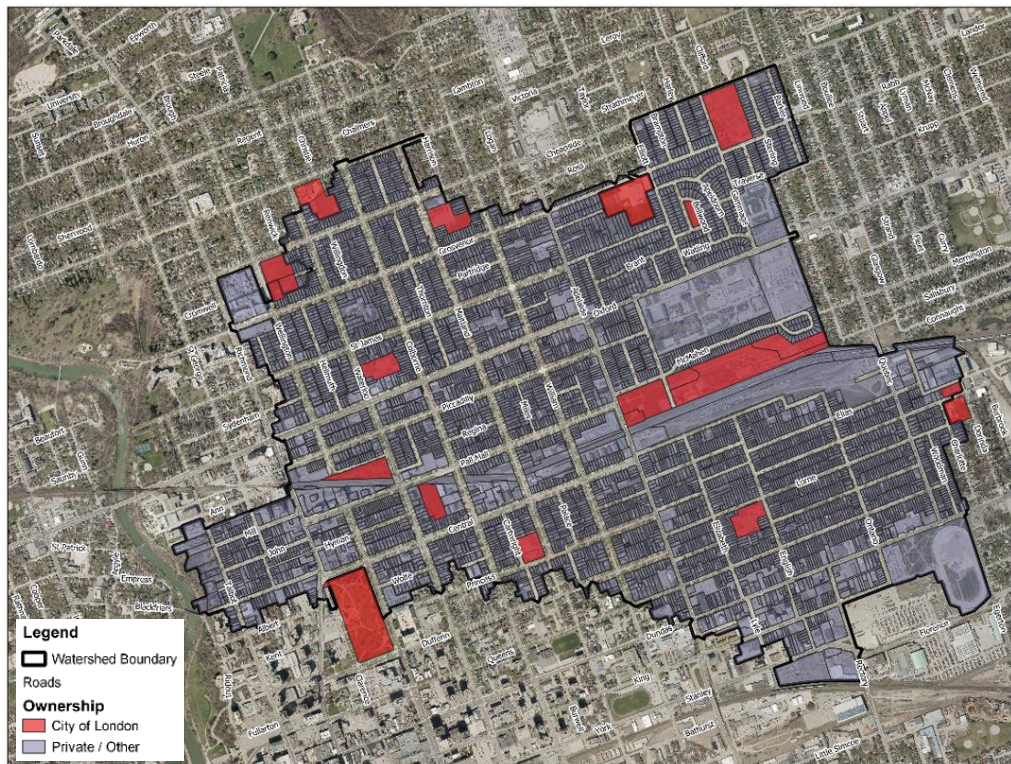
Land Use Constraints within the Downtown Core



- Significant portion of the Carling Creek Watershed is 100% developed with limited opportunities for implementing traditional stormwater management solutions such as ponds on greenfield sites.
- Location within the downtown core makes property purchase for implementing large-scale stormwater management solutions extremely costly with significant socio-economic impacts.
- Implementation of certain types of stormwater management solutions are not compatible with existing land use conditions.



Opportunities for Stormwater Management Measures on City owned Property Parcels



- Stormwater Management Master Plan measures will focus on using City owned property within the downtown core that will ultimately require completion of Schedule A/A+ Environmental Assessment process.
- Where feasible, LID and stormwater measures will be integrated into municipal road right-of-ways or greenspace to address potential climate change impacts.
- Storm sewer conveyance capacity improvement alternatives will be considered if stormwater management alternatives are not feasible or if improvements can be coordinated with planned infrastructure renewal.
- Stormwater management alternatives implemented on private property (requiring land purchase) will require completion of Schedule B/C Environmental Assessment process.



Proposed Stormwater Management Alternatives – Carling Creek



Stormwater Alternatives

For the majority of catchments, two solution strategies were considered: Source Control and Enhanced Conveyance.

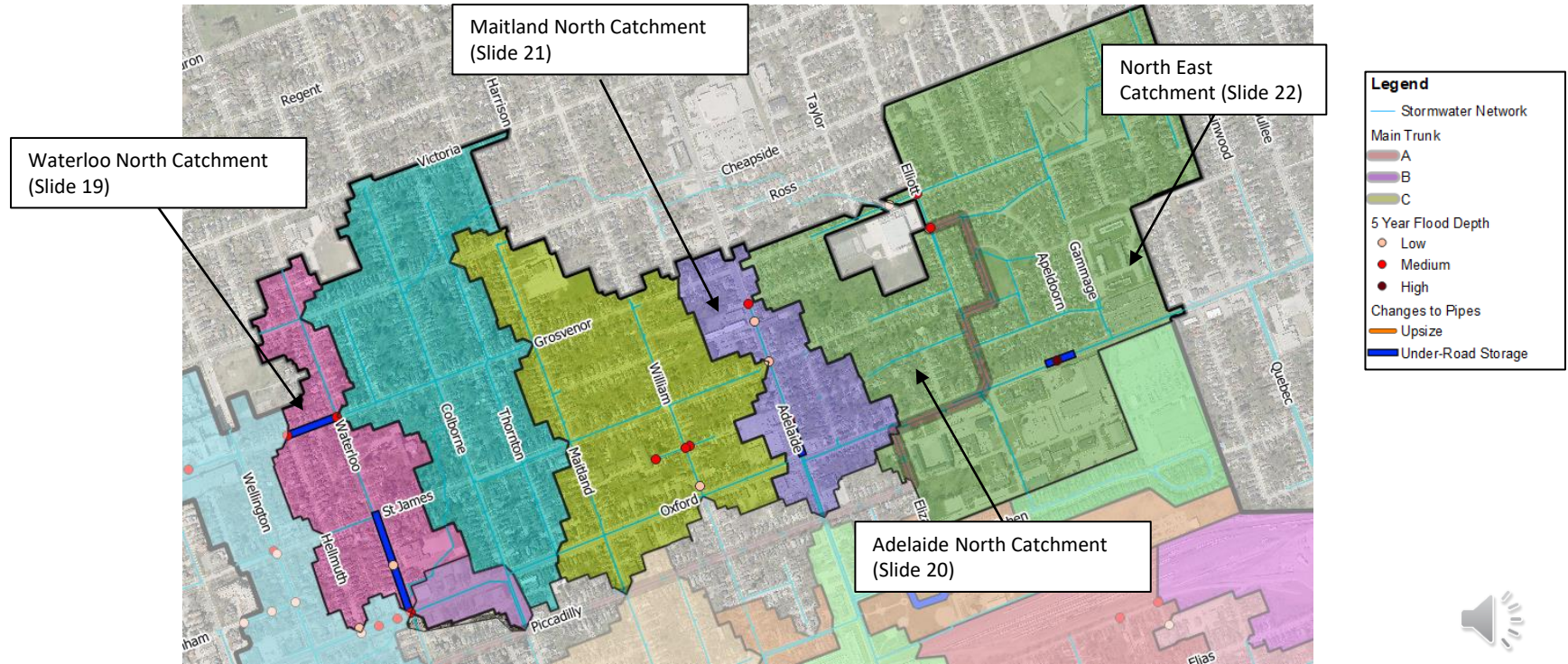
- **Source Control** solutions function through the storage and slow release of stormwater runoff. These solutions aim to capture and hold runoff within storage facilities, such as subsurface tanks, oversized pipes or ponds. Advantages to source control solutions include reducing the peak flow volume released to the trunk sewer system and limiting construction to localized areas.
- **Enhanced Conveyance** solutions function through increasing the conveyance capacity of the stormwater network, typically by upgrading the size of stormwater pipes and channels. These solutions allow for runoff to be evacuated more quickly and reduce surface accumulation of runoff. Advantages to enhance conveyance solutions include limiting construction to the city right-of-way and fewer spatial constraints as compared to a storage solution.
- **Hybrid Storage/Conveyance** solutions combine storage and conveyance capacity enhancements to achieve improvements to level-of-service and reduce potential flooding impacts. Although not explicitly evaluated for each subcatchment there are an unlimited number of combination of storage and conveyance combinations that could achieve improvements to the Carling Creek system. Future phases of design will explore and optimize the recommendations of this study.



Proposed Stormwater Management Alternatives – Northern Catchments



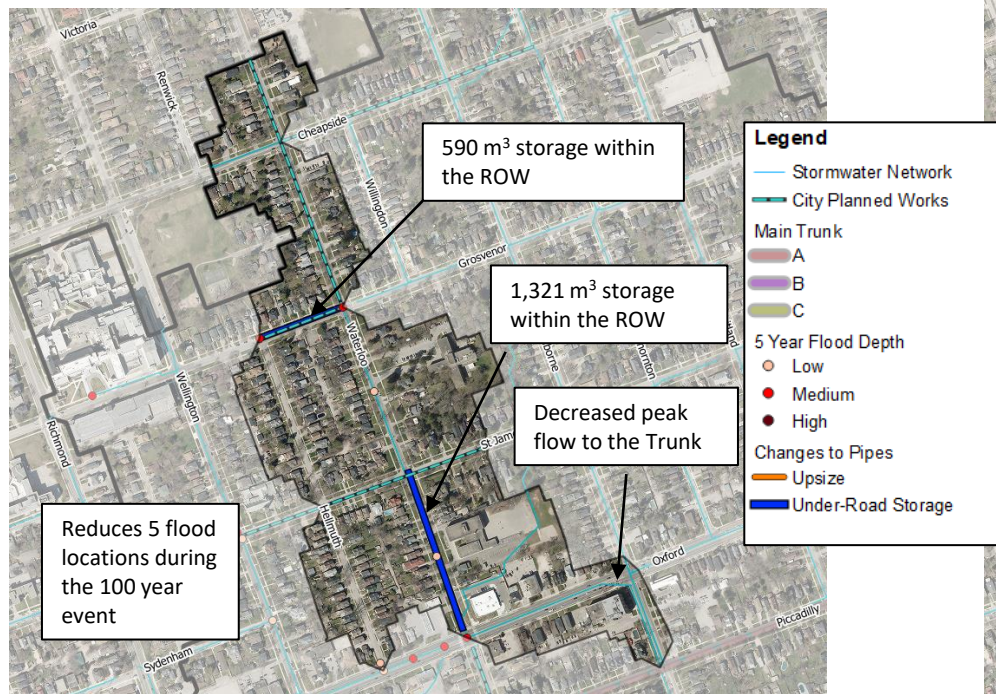
Northern Stormwater Catchment Areas



Waterloo North

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



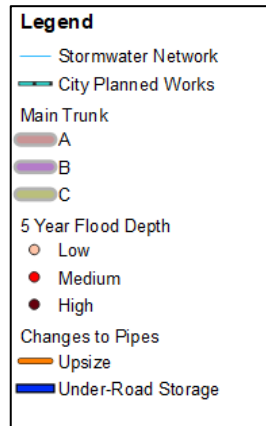
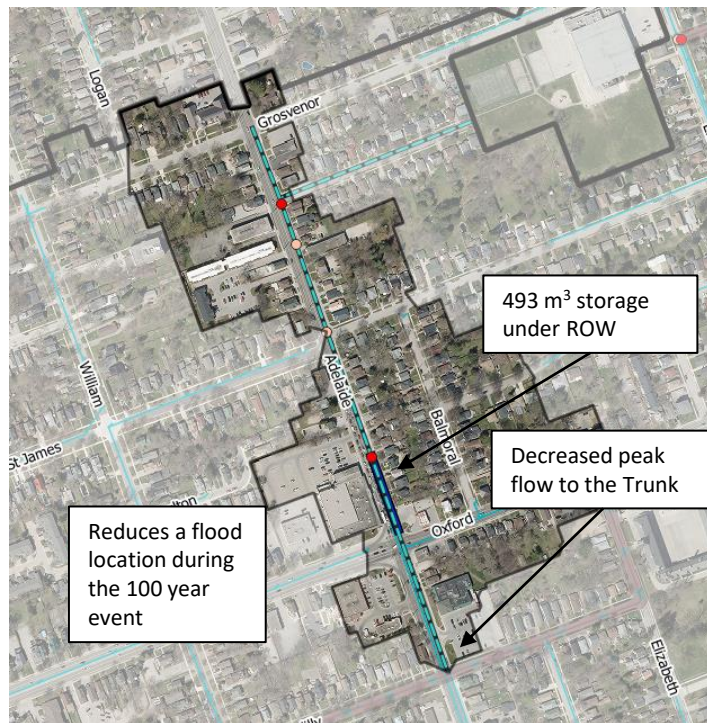
Conveyance Alternative



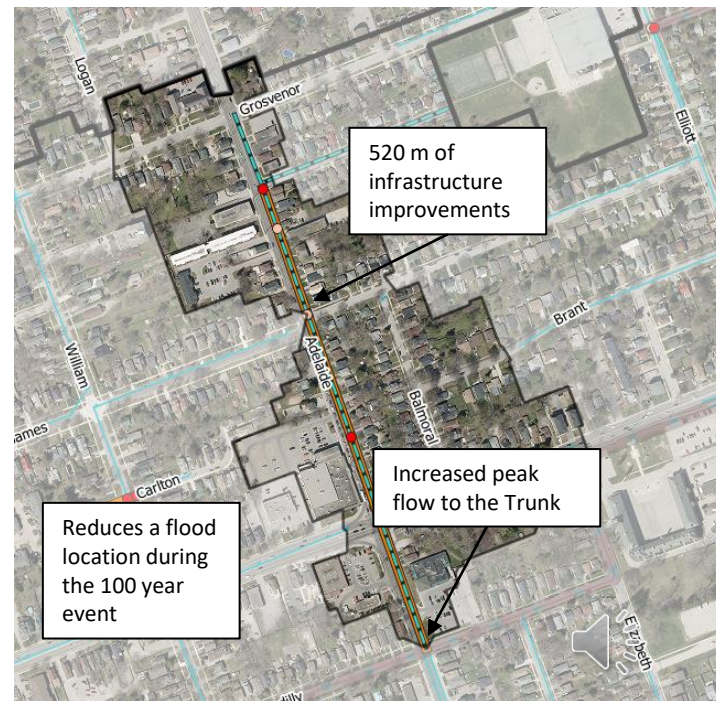
Adelaide North

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



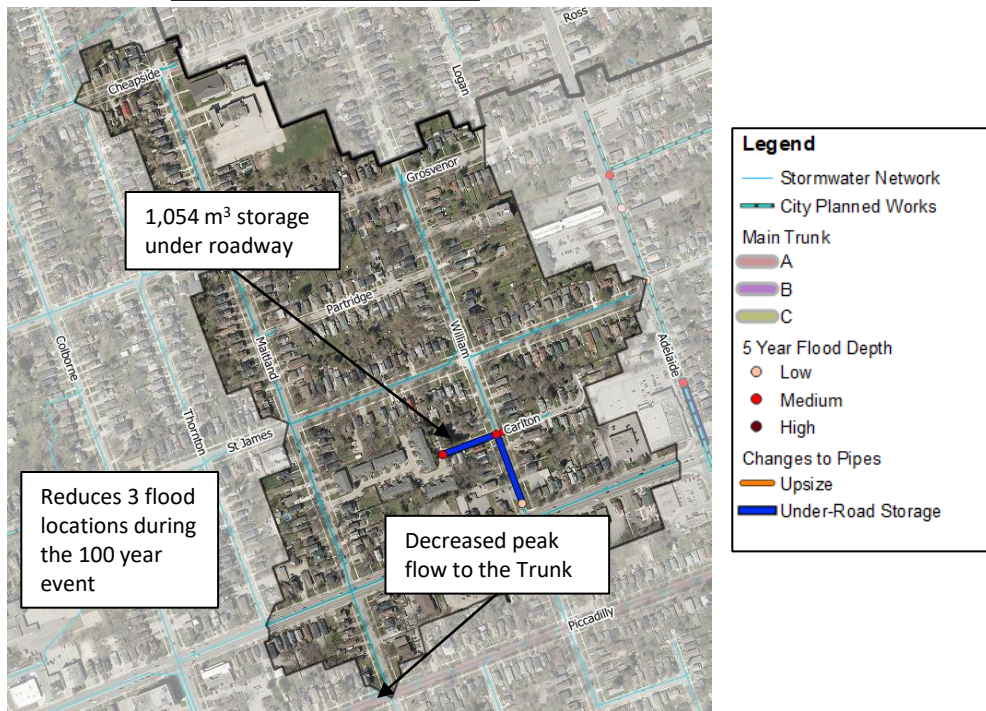
Conveyance Alternative



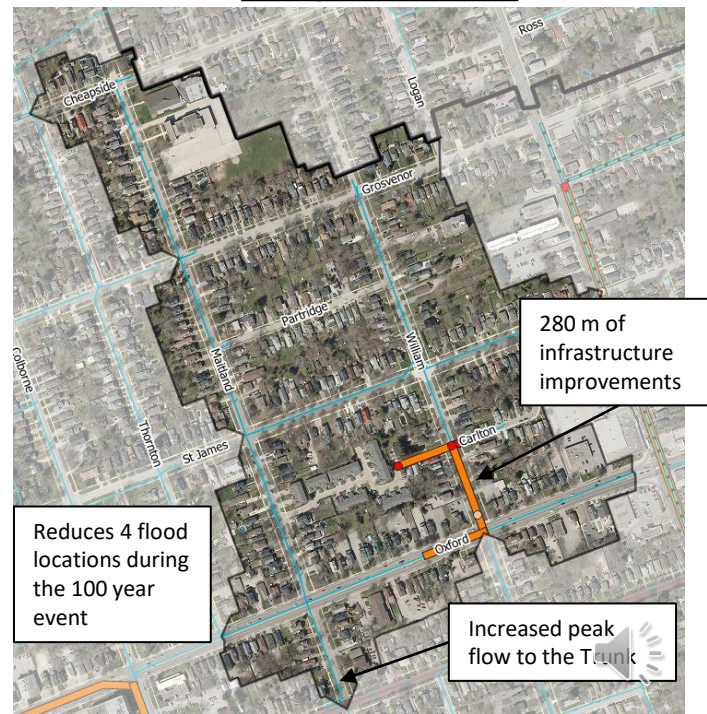
Maitland North

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



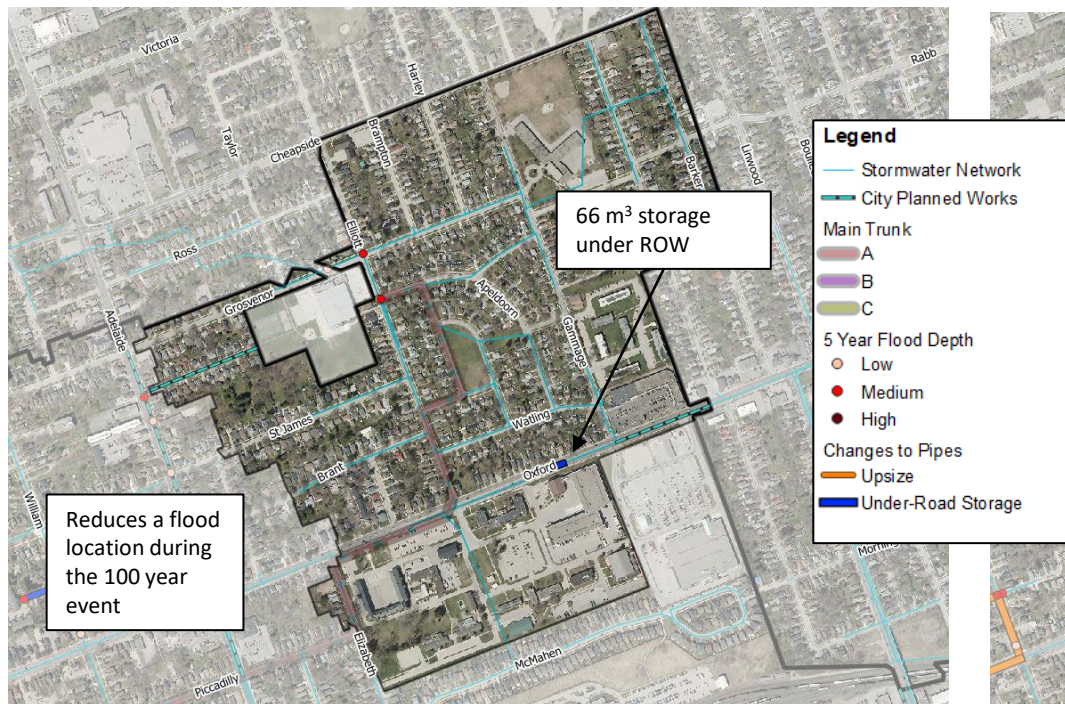
Conveyance Alternative



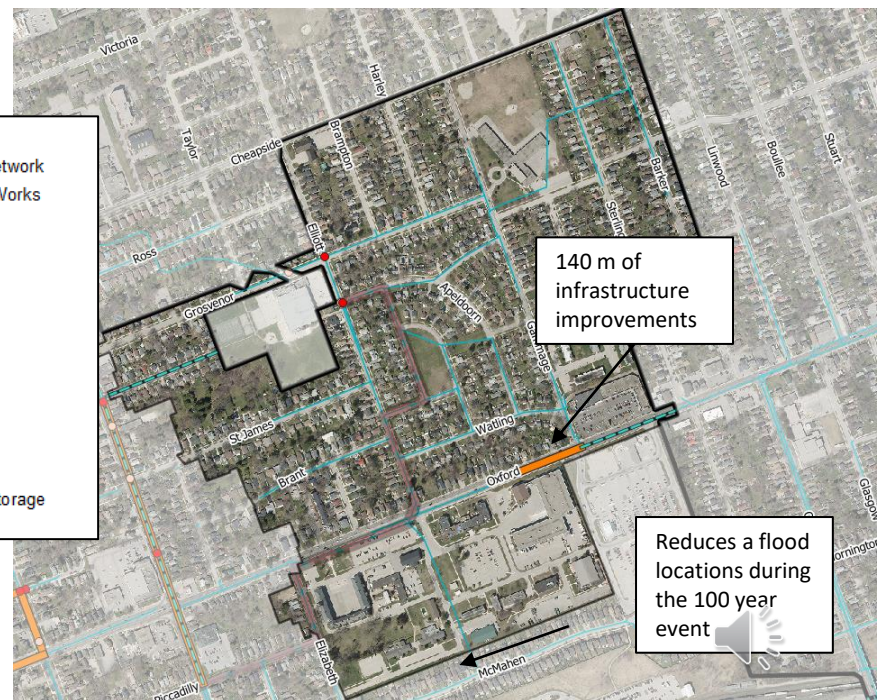
North East

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



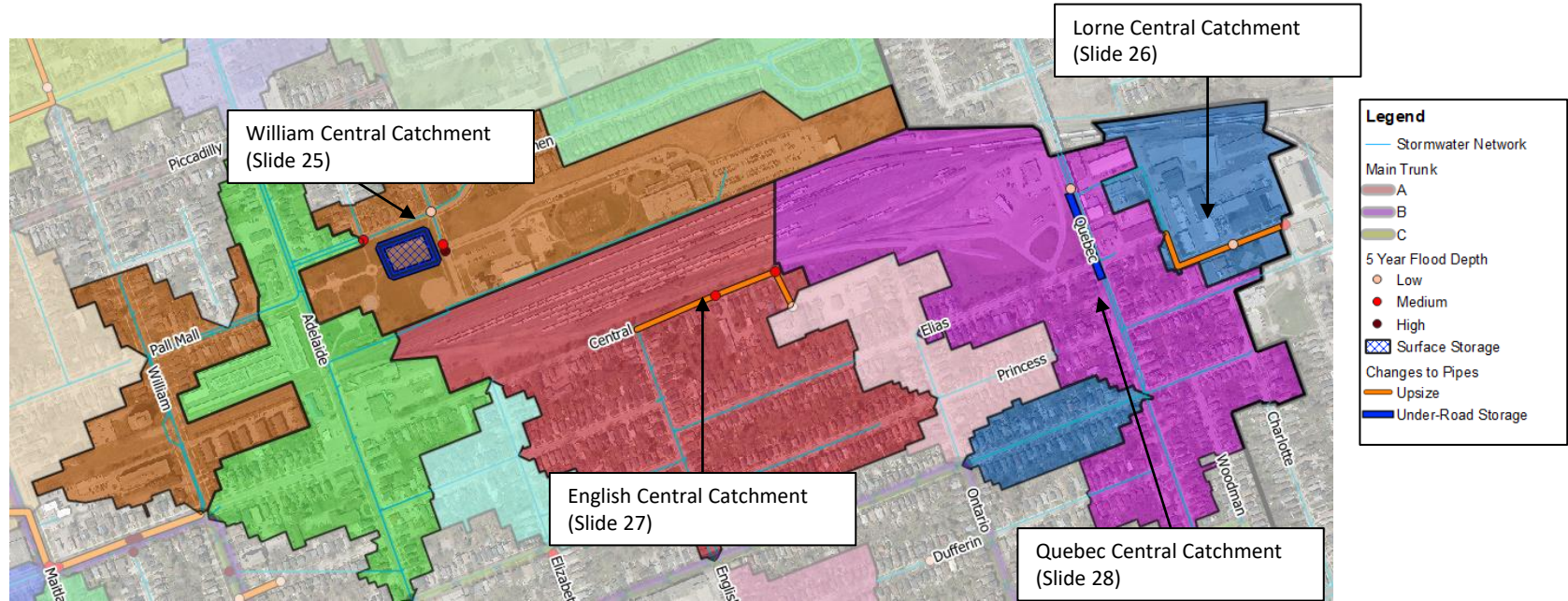
Conveyance Alternative



Proposed Stormwater Management Alternatives – Central Catchments



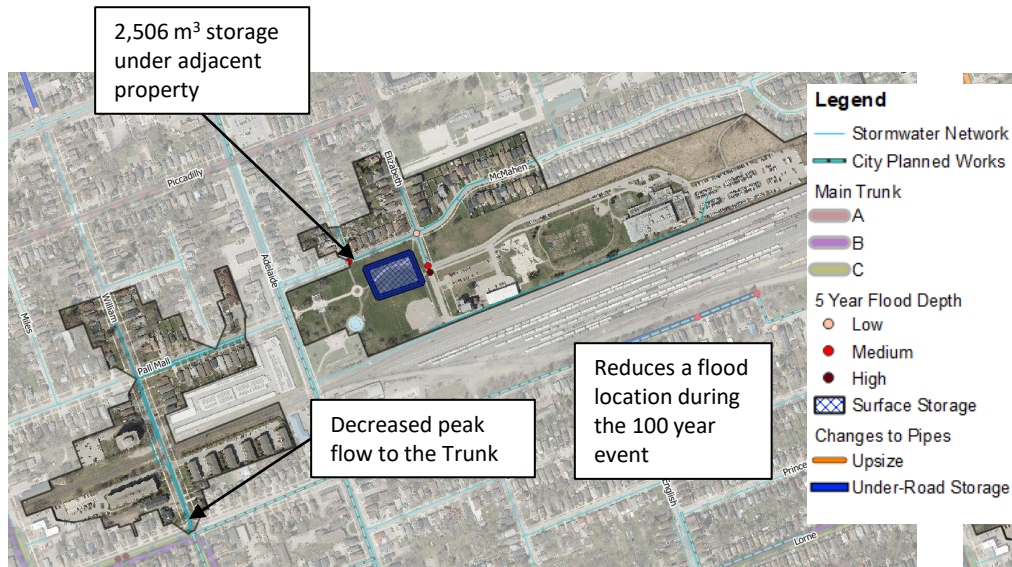
Central Stormwater Catchment Areas



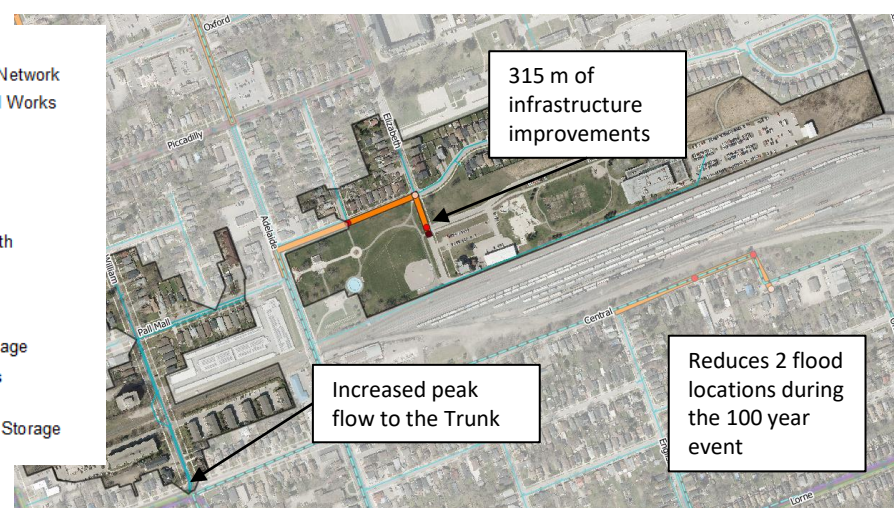
William Central

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



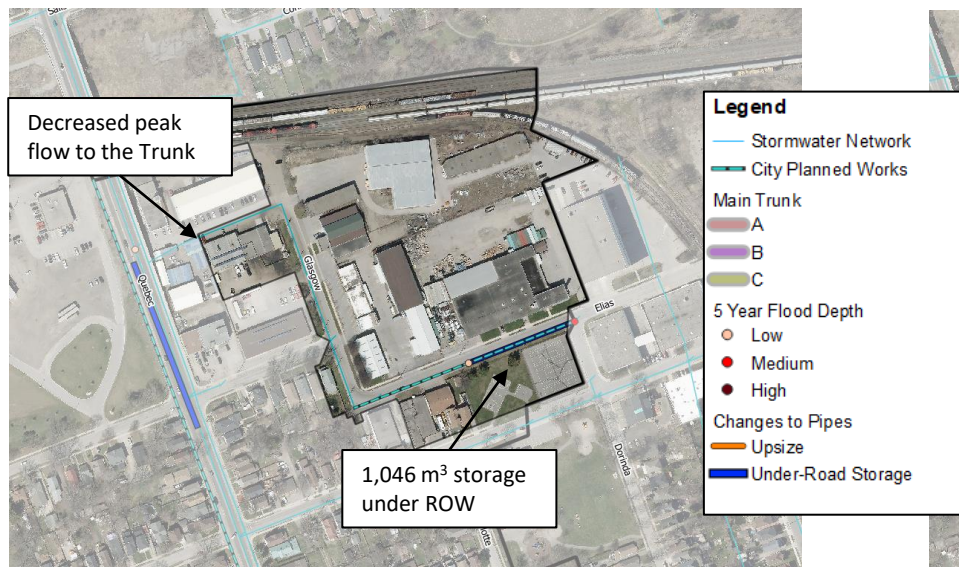
Conveyance Alternative



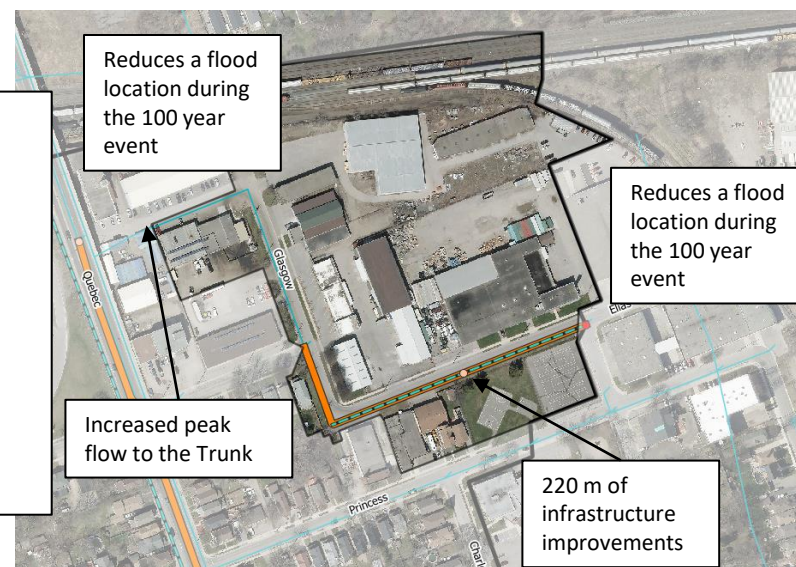
Lorne Central

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



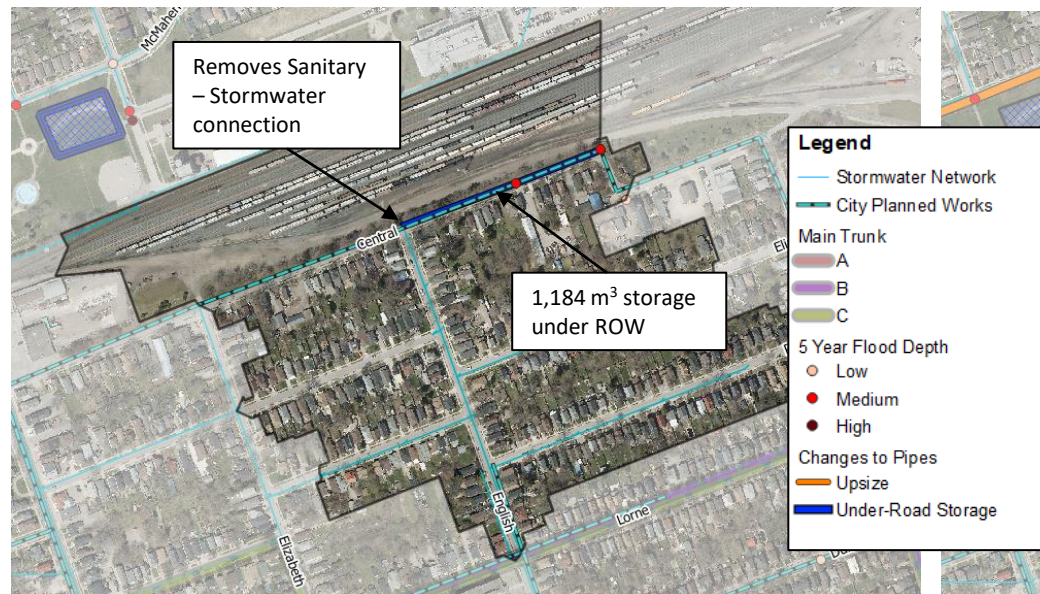
Conveyance Alternative



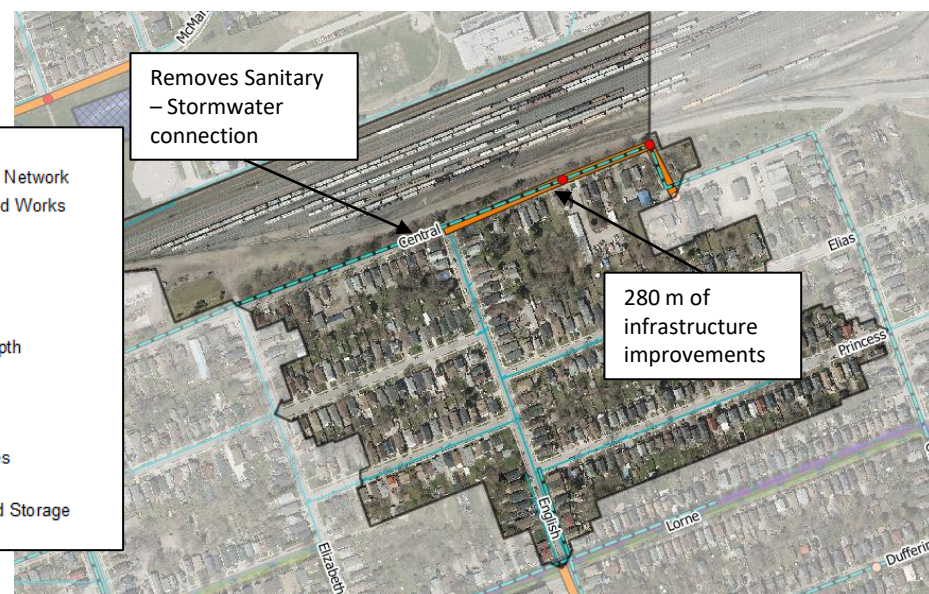
English Central

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



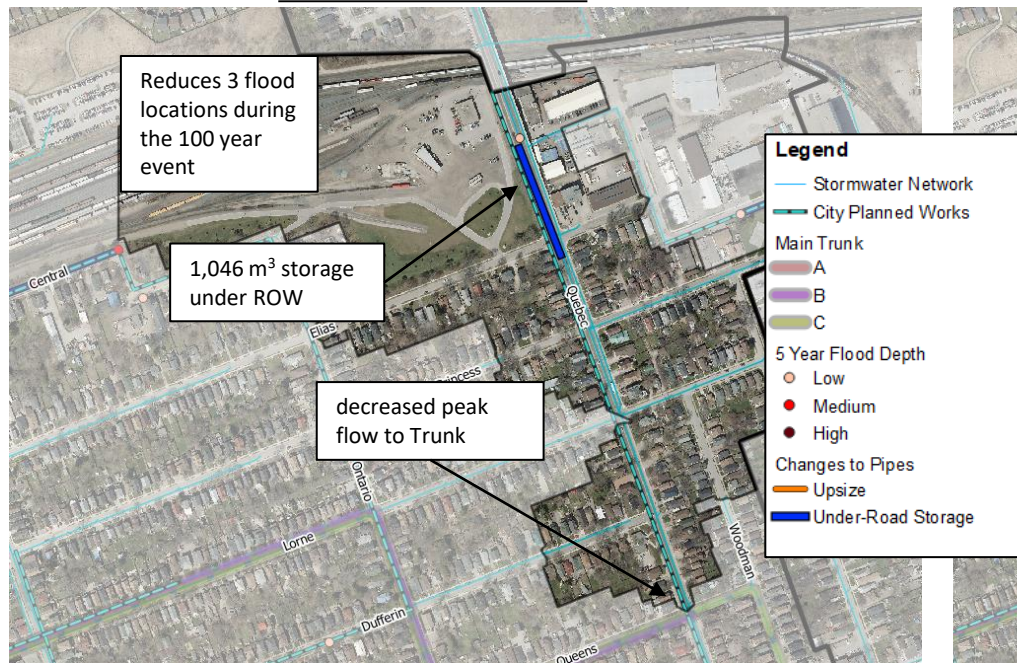
Conveyance Alternative



Quebec Central

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



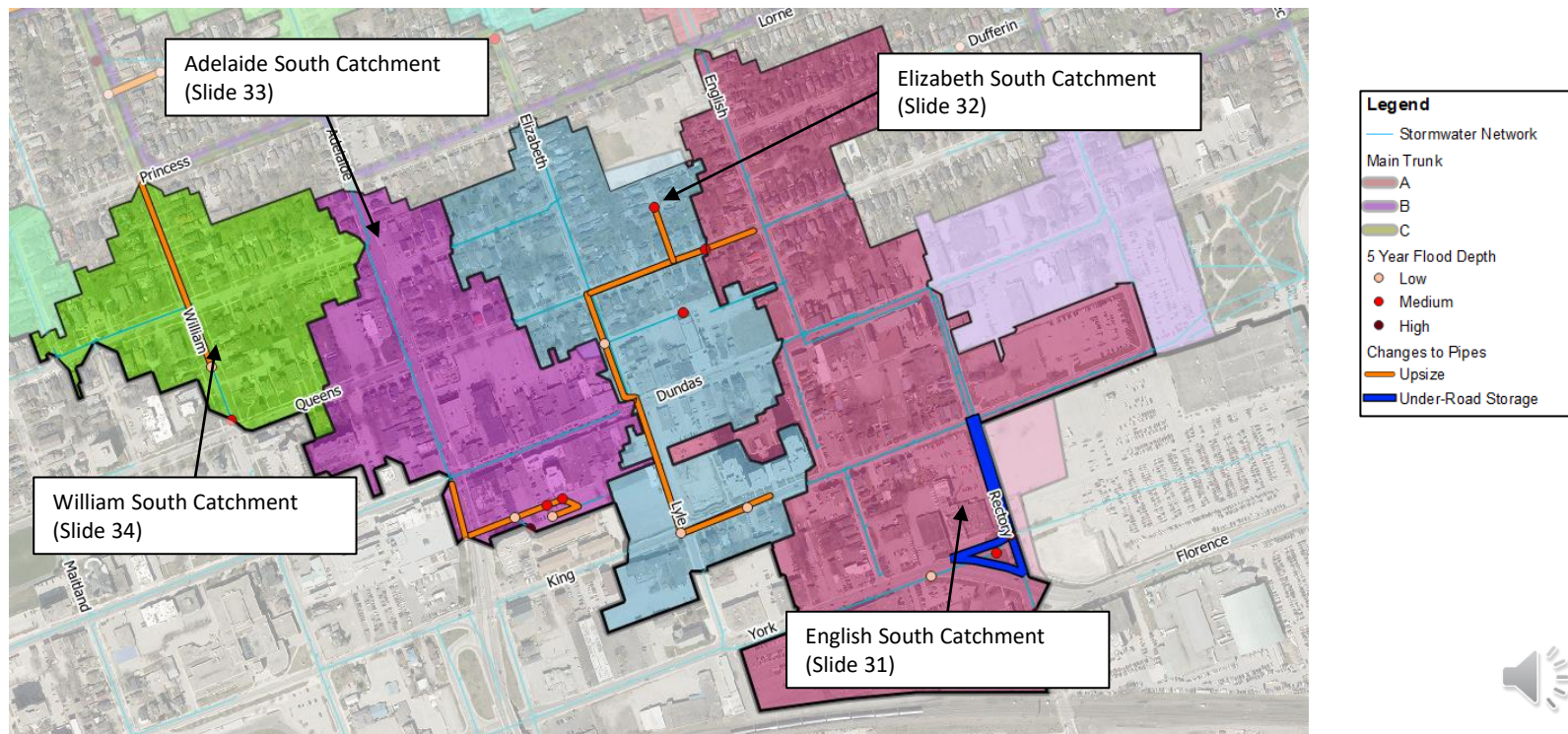
Conveyance Alternative



Proposed Stormwater Management Alternatives – South Catchments



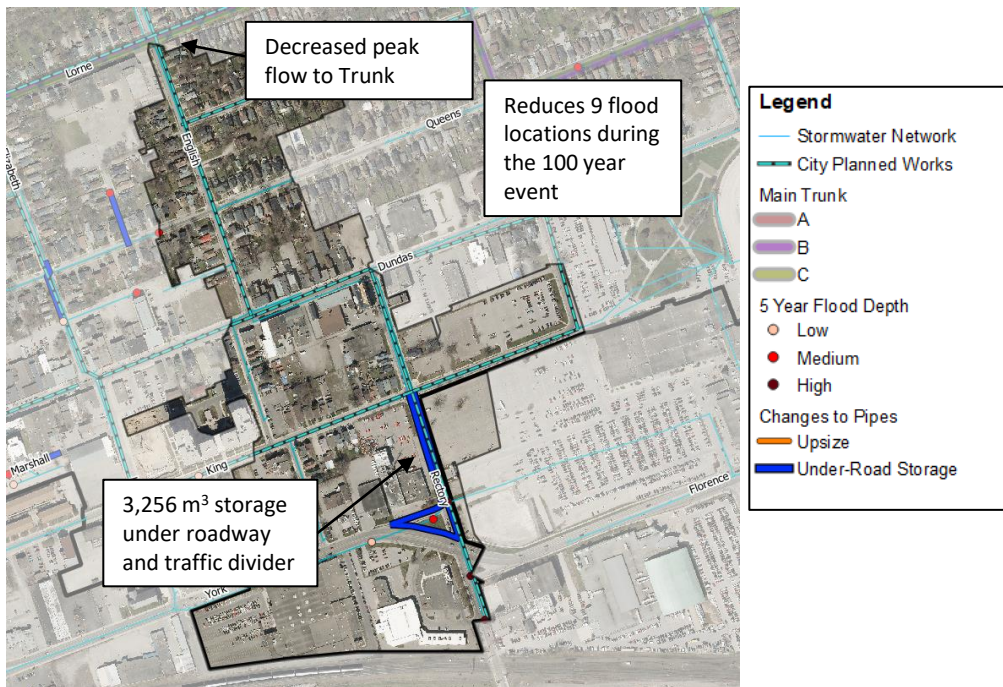
Southern Stormwater Catchment Areas



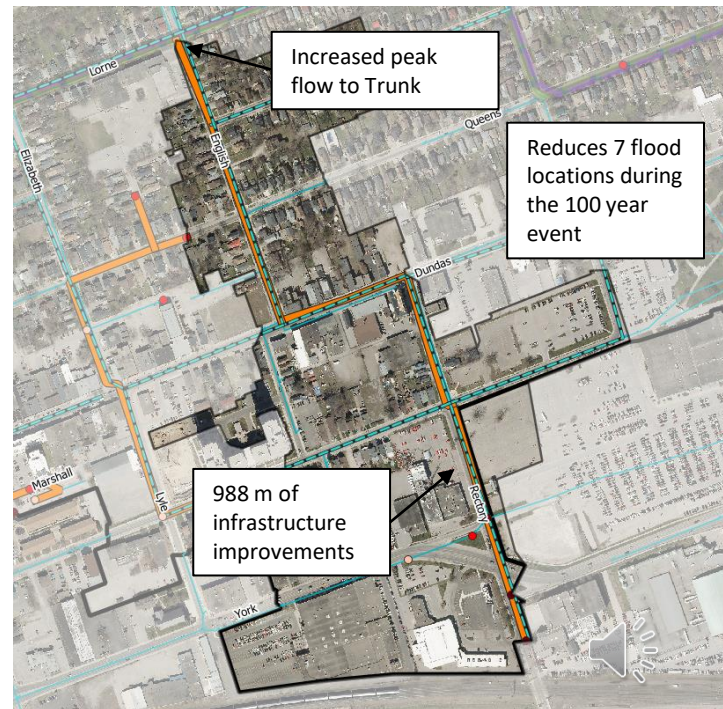
English South

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



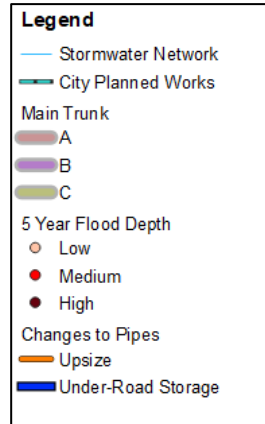
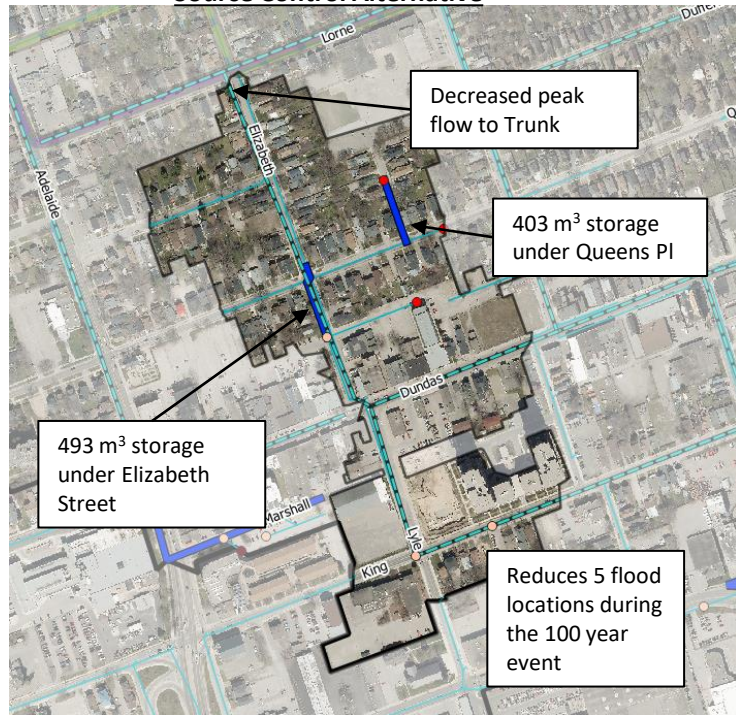
Conveyance Alternative



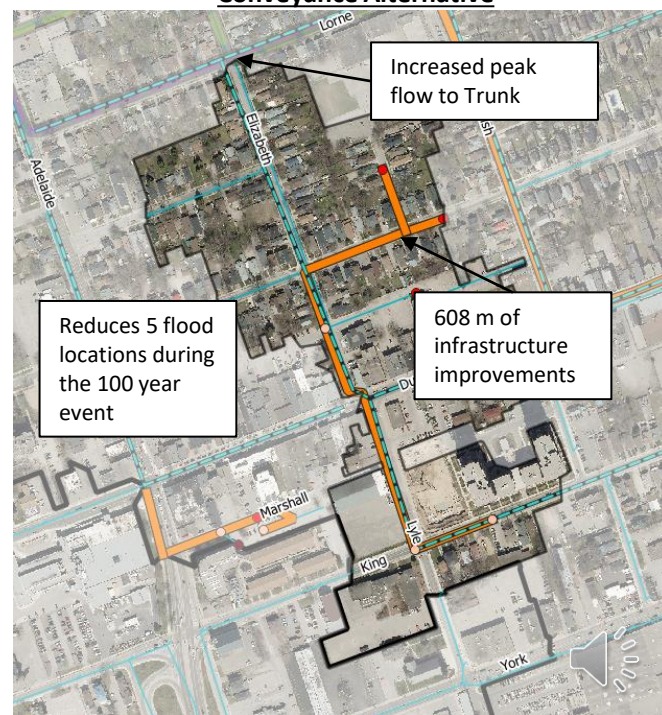
Elizabeth South

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



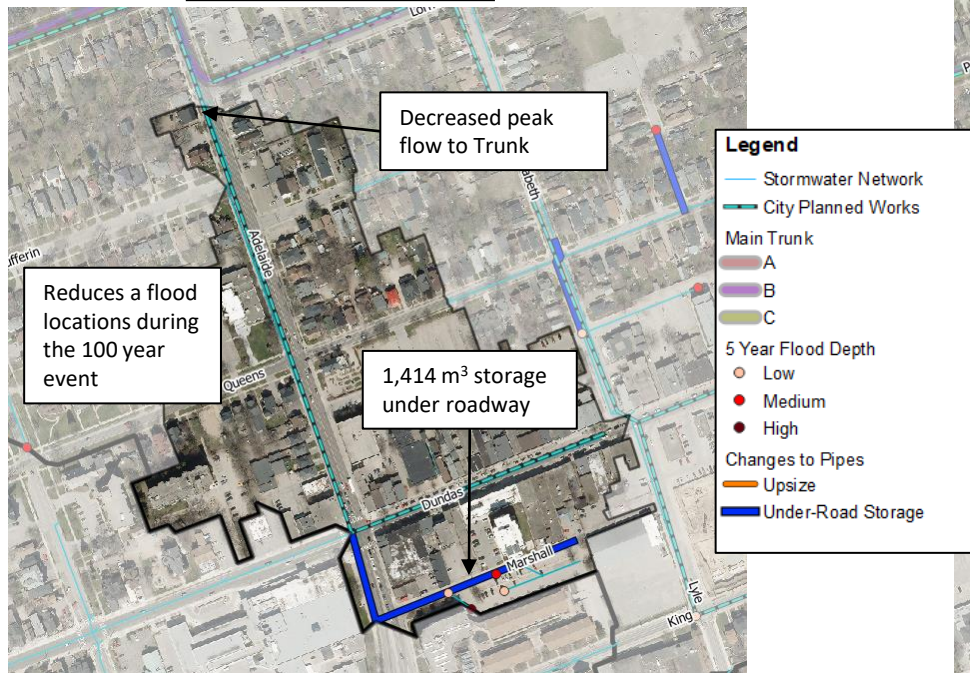
Conveyance Alternative



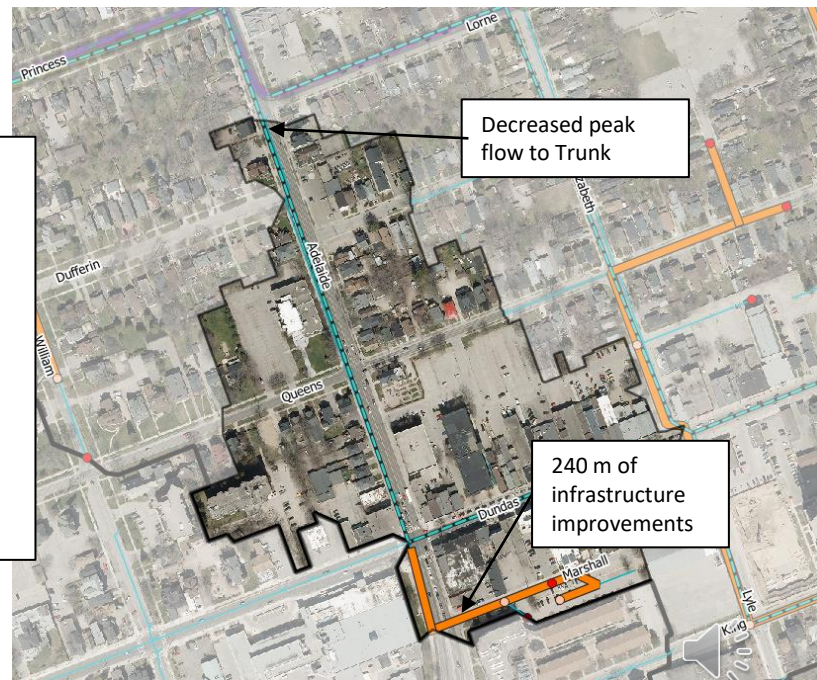
Adelaide South

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



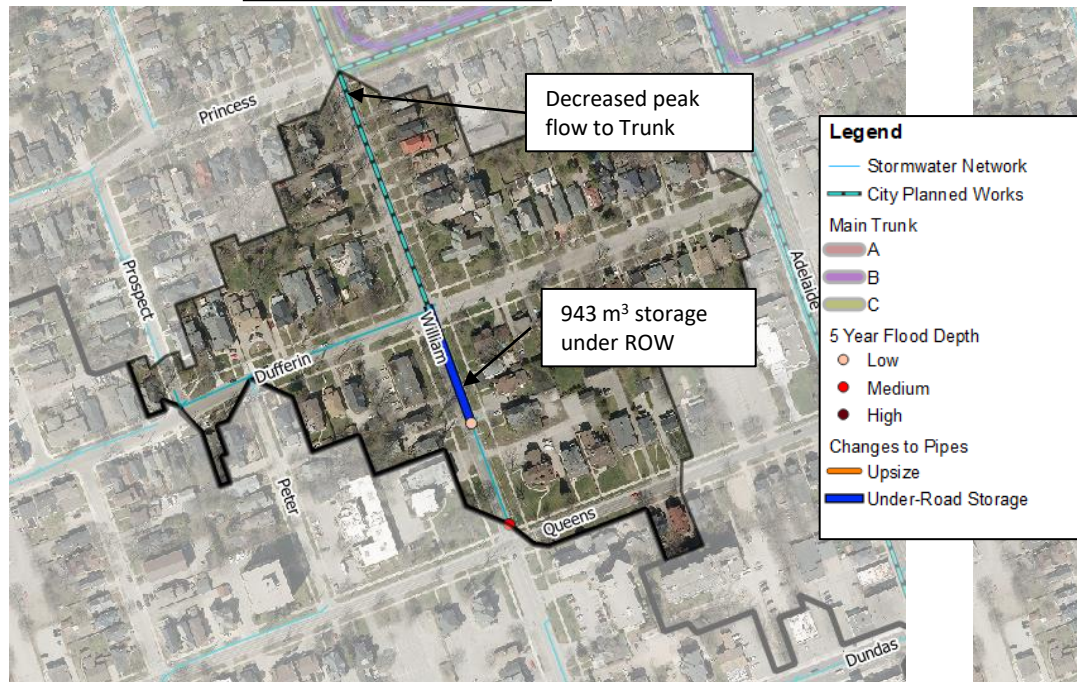
Conveyance Alternative



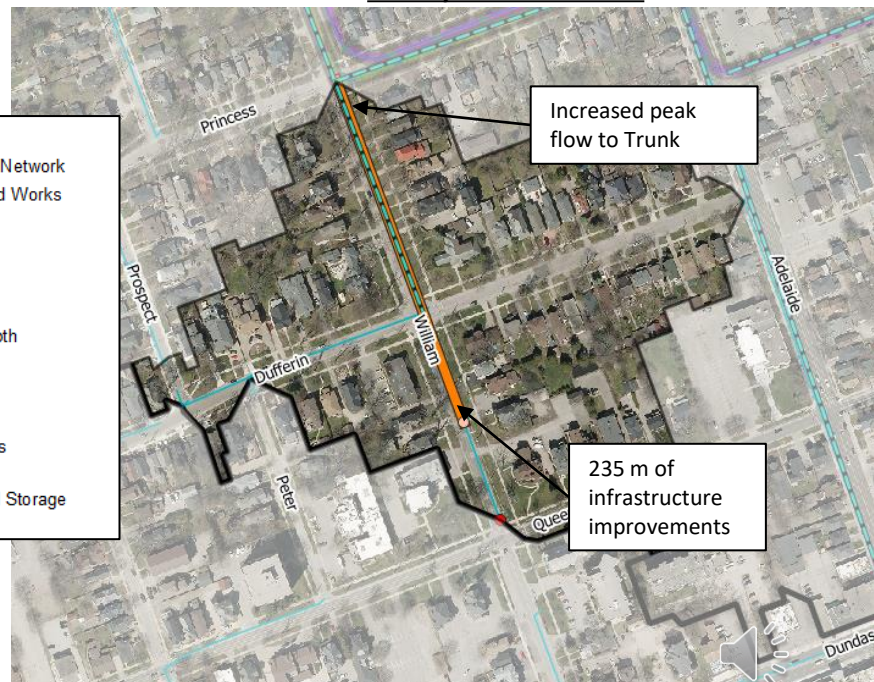
William South

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



Conveyance Alternative



Proposed Stormwater Management Alternatives – Carling Trunk



Potential Improvements along Trunk C

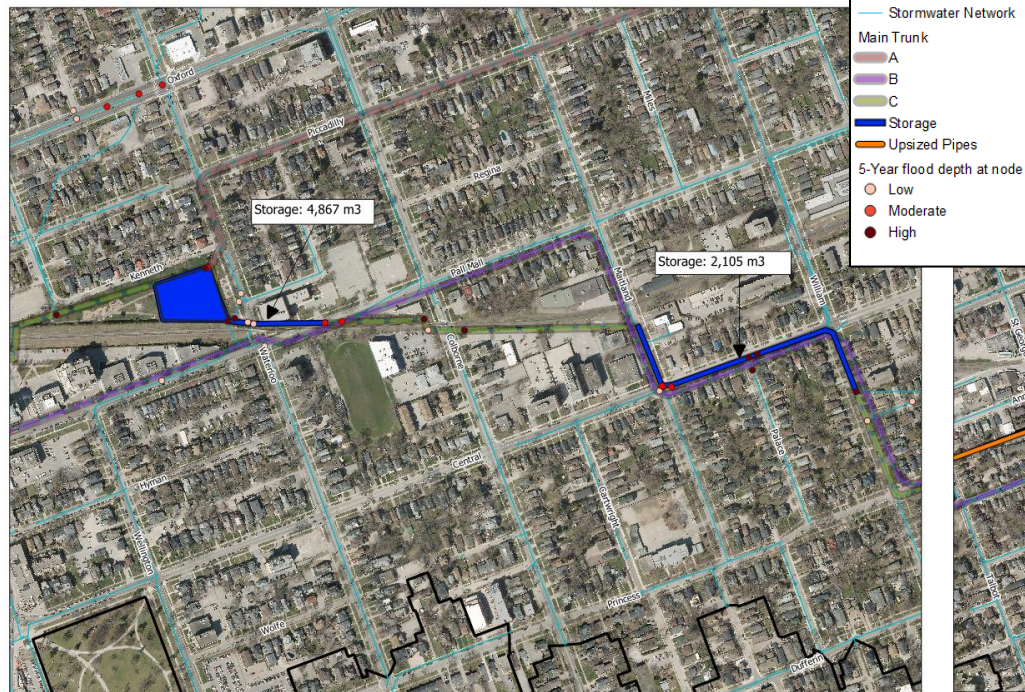
- Flooding occurs along Trunk C from Piccadilly Park to William Street. Subcatchment improvements (described in previous slides) reduce surcharging depths but does not eliminate flooding along the Trunk.
- Piccadilly Park adjacent to Kenneth Ave provides an opportunity for a large-scale stormwater storage system.
- 4,867 cubic meters of storage would be required to reduce flooding for the 1:5-year storm event.
- Additional storage could be integrated into the Maitland and Central Ave right-of-way in the future to provide an additional 2,105 cubic meters of storage and reduce surcharging at maintenance holes along Rosedale and William to less than 0.06m for the 1:5-year storm event.
- Historical flooding occurs along Dufferin Ave, Ann Street and Queens Ave in a topographical depressions and potentially impact several properties along the right-of-way. Flooding impacts in these areas will be significantly reduced when implementation of the watershed-wide storage and/or conveyance improvements are completed, ultimately providing a City standard 1:5-year level-of-service within the right-of-way area previously identified as being prone to flooding.
- Improvements to the profile of Queens Ave and Dufferin Ave could effectively improve major overland flow routing and reduce the flooding potential in this area.



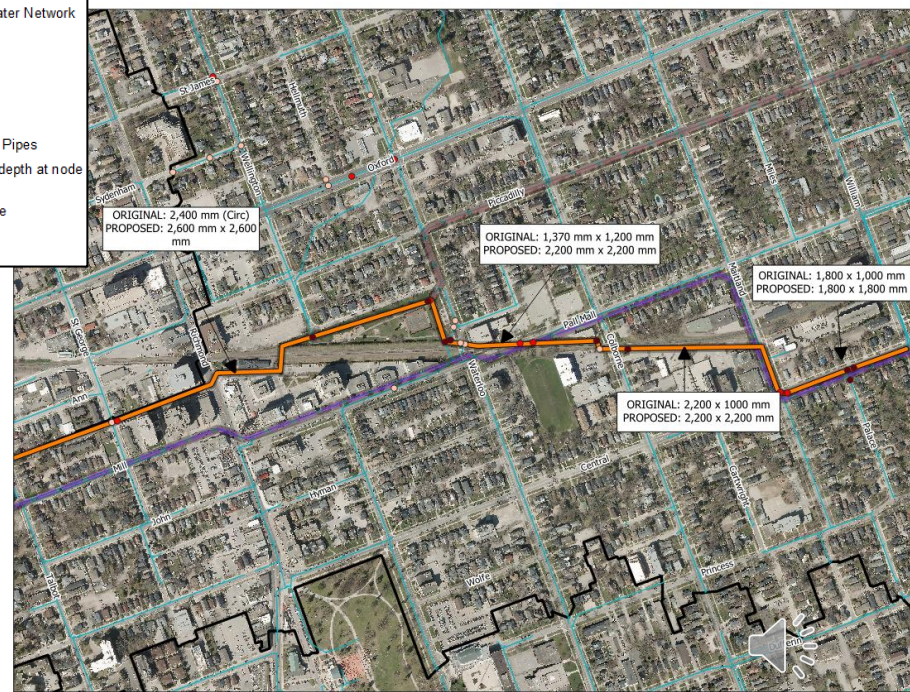
Trunk C Improvement Alternatives

Conveyance Capacity and Stormwater Storage Improvements Alternatives

Source Control Alternative



Enhanced Conveyance Alternative



Evaluation of the Stormwater Management Alternatives



Technical Evaluation Criteria

Environmental Factors:

- Protects environmental features, wildlife and species-at-risk.
- Integrates elements of climate change resilience with the intent of improving environmental/public health and safety.

Technical Factors:

- Solutions are technically feasible and constructable given site-specific constraints, taking into consideration broader City of London initiatives such as the IRP (infrastructure renewal program) and BRT (Bus-Rapid-Transit).
- Makes use of existing infrastructure and manages/minimizes construction risk.
- Aligns with the City's design and operational strategy for municipal infrastructure, meeting or exceeding City of London design criteria and level of service expectations.
- Provides an opportunity to enhance Level-of-Service (LOS) in areas identified for emergency services or potential flooding impacts.
- Provides an opportunity to enhance performance to accommodate Climate Changes (Sustainable Design).

Financial Costs:

- Achieves low/reasonable lifecycle costs, minimizes operational expenses and provides maximum value for capital expenditures.

Legal and Jurisdictional:

- Complies with applicable planning policies (Identified MCEA Schedule).
- Makes use of existing City own lands, thereby minimizing the potential for land acquisition requirements.



Evaluation of Master Plan Alternatives

Carling Creek Northern Catchment Areas

Evaluation Criteria	Waterloo North Catchment		Maitland North Catchment		Adelaide North Catchment	
Alternative Type	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System
Protects and/or Improves Environmental Features, Wildlife and Species-at-Risk Health and Safety	☒	☒	☒	☒	☒	☒
Solution integrates with City of London Infrastructure Initiatives and Makes Use of Existing Infrastructure	☐	☒	☐	☒	☒	☐
Meets City of London Flooding and Stormwater Management Design Criteria	☒	☒	☒	☒	☒	☒
Provides opportunity for Level-of-Service enhancement for Climate Change and Water Balance with LIDs	☐	☒	☐	☒	☐	☒
Achieves Low/Reasonable capital and lifecycle costs and makes use of existing City of Lands	☐	☒	☒	☐	☐	☒



Evaluation of Master Plan Alternatives

Carling Creek Central Catchment Areas

Evaluation Criteria	Quebec Central Catchment		English Central Catchment		Lorne Central Catchment		William Central Catchment	
Alternative Type	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System
Protects and/or Improves Environmental Features, Wildlife and Species-at-Risk Health and Safety	✓	✓	✓	✓	✓	✓	✓	✓
Solution integrates with City of London Infrastructure Initiatives and Makes Use of Existing Infrastructure	✓	✓	✓	✓	✓	✓	✓	✓
Meets City of London Flooding and Stormwater Management Design Criteria	✓	✓	✓	✓	✓	✓	✓	✓
Provides opportunity for Level-of-Service enhancement for Climate Change and Water Balance with LIDs	✓	✓	✓	✓	✓	✓	✓	✓
Achieves Low/Reasonable capital and lifecycle costs and makes use of existing City of Lands	✓	✓	✓	✓	✓	✓	✓	✓



Evaluation of Master Plan Alternatives

Carling Creek Southern Catchment Areas

Evaluation Criteria	Elizabeth South Catchment		English South Catchment		Adelaide South Catchment		William South Catchment	
Alternative Type	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System	Conveyance Improvements	Source/Storage System
Protects and/or Improves Environmental Features, Wildlife and Species-at-Risk Health and Safety	✓	✓	✓	✓	✓	✓	✓	✓
Solution integrates with City of London Infrastructure Initiatives and Makes Use of Existing Infrastructure	✓	✓	✓	✓	✓	✓	✓	✓
Meets City of London Flooding and Stormwater Management Design Criteria	✓	✓	✓	✓	✓	✓	✓	✓
Provides opportunity for Level-of-Service enhancement for Climate Change and Water Balance with LIDs	✓	✓	✓	✓	✓	✓	✓	✓
Achieves Low/Reasonable capital and lifecycle costs and makes use of existing City of Lands	✓	✓	✓	✓	✓	✓	✓	✓



Evaluation of Master Plan Alternatives

Carling Creek Trunk Storm Sewer

Evaluation Criteria	Carling Creek Trunk Sewer Improvements	
Alternative Type	Conveyance Improvements	Source/Storage System
Protects and/or Improves Environmental Features, Wildlife and Species-at-Risk Health and Safety	☒	☒
Solution integrates with City of London Infrastructure Initiatives and Makes Use of Existing Infrastructure	☐	☒
Meets City of London Flooding and Stormwater Management Design Criteria	☒	☒
Provides opportunity for Level-of-Service enhancement for Climate Change and Water Balance with LIDs	☐	☒
Achieves Low/Reasonable capital and lifecycle costs and makes use of existing City of Lands	☐	☒



Summary of Master Plan Recommendations and Priorities



Summary of Master Plan Recommendations

	STREET BREAKDOWN WITHIN CENTRAL CATCHMENTS					STREET BREAKDOWN WITHIN NORTHERN CATCHMENTS				
Catchment Area	Quebec Central	Lorne Central	Lorne Central	English Central	William Central	North East	Maitland North	Adelaide North	Maitland North	Maitland North
Street Location	Quebec Street	Elias Street	Glasgow Street	Central Avenue	McMahan Park	Oxford Street (east)	Oxford Street (Center)	Adelaide Street	William Street (North)	Carlton Avenue
Preferred Stormwater Management Alternative	Conveyance System Improvement – Within Road Right-of-Way	Conveyance System Improvement – Within Road Right-of-Way	Conveyance System Improvement – Within Road Right-of-Way	Conveyance System Improvement – Within Road Right-of-Way	Source/Storage System – McMahan Park Surface Storage Pond	Source/Storage System – Within Road Right-of-Way	Conveyance System Improvement – Within Road Right-of-Way	Source/Storage System – Within Road Right-of-Way	Source/Storage System Improvement – Within Road Right-of-Way	Source/Storage System Improvement – Within Road Right-of-Way
Length of Works within Right-of-Way	540 m	170 m	250 m	280 m	-	14 m	80 m	100 m	120 m	75 m
Construction Needs Aligns with City's IR Program	Yes	Yes	No	Yes	-	No	No	Yes	No	No
Approximate Area Required by Storage System	-	-	-	-	1,250 m ²	-	-	-	-	-
Existing Conditions Flooding Observation Summary	Nuisance flooding along roadway and into parking lot	Nuisance flooding along roadway	Nuisance flooding along roadway	Flooding above 0.3 m along roadway. Sanitary Connection	Nuisance flooding along roadway and within McMahan Park	Flooding due to a private drain connection. Does not impact adjacent property.	Flooding impacts up to 13 buildings	Flooding impacting 3 properties.	Flooding impacts up to 13 buildings	Flooding impacts up to 13 buildings
Priority	Low	Low	Low	High	Low	Low	Moderate - High	Moderate	Moderate - High	Moderate - High
Anticipated Municipal Class EA Schedule	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+



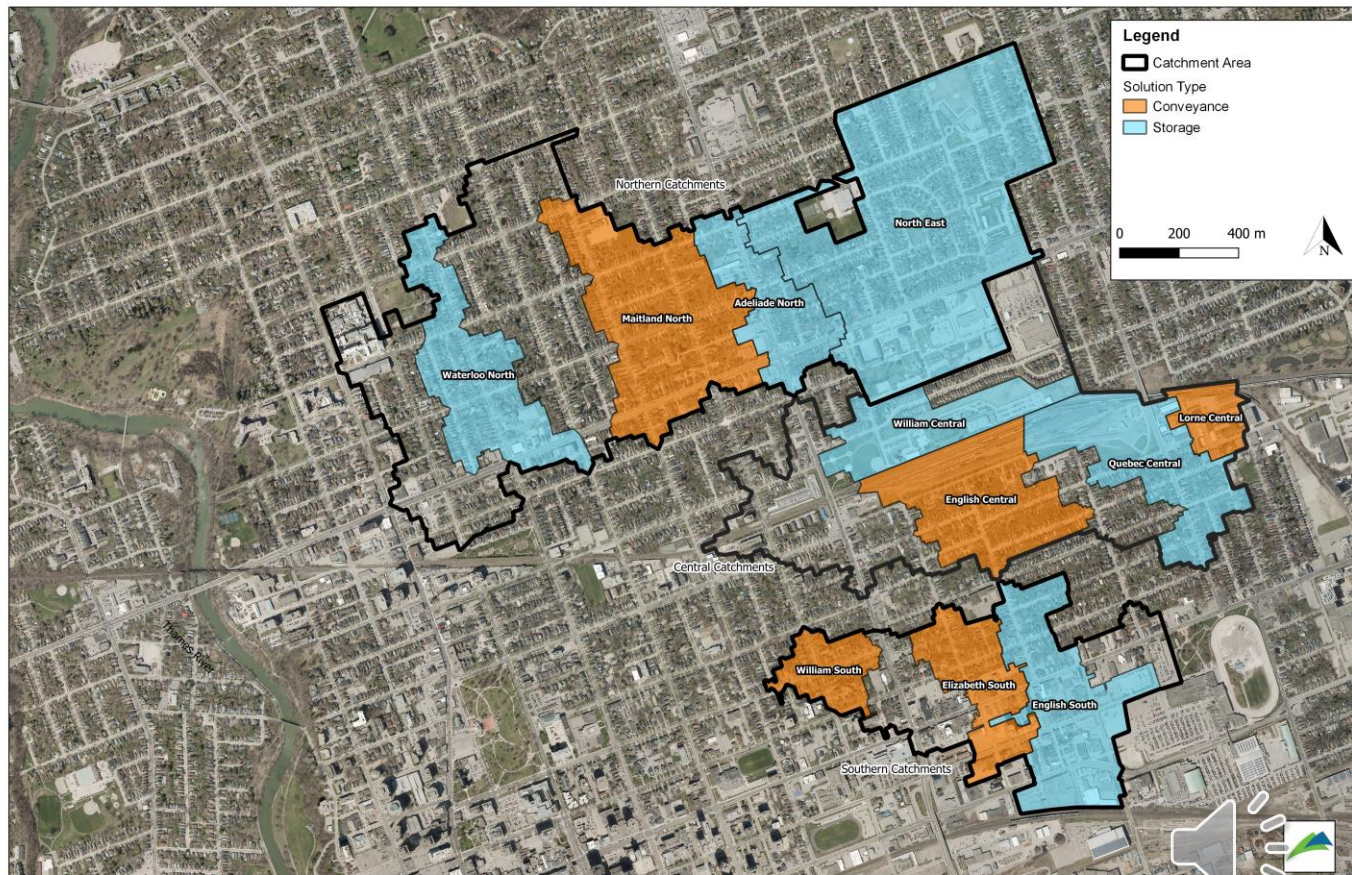
Summary of Master Plan Recommendations

	STREET BREAKDOWN WITHIN NORTHERN CATCHMENTS	STREET BREAKDOWN WITHIN SOUTHERN CATCHMENTS				STREET BREAKDOWN WITHIN CARLING CREEK TRUNK	
Catchment Area	Waterloo North	English South	Elizabeth South	Adelaide South	William South	Trunk	Trunk
Street Location	Waterloo Street	Rectory Street	Elizabeth Street	Marshal Street	William Street (South)	Piccadilly Park	Central Avenue Storage
Preferred Stormwater Management Alternative	Source/Storage System – Within Road Right-of-Way	Source/Storage System – Within Road Right-of-Way + Traffic Divider	Conveyance System Improvement – Within Road Right-of-Way	Conveyance System Improvement – Within Road Right-of-Way	Conveyance System Improvement – Within Road Right-of-Way	Source/Storage System – Under Piccadilly Park	Source/Storage System – Within Road Right-of-Way
Length of Works within Right-of-Way	400 m	680 m	606 m	240 m	235 m	-	480 m
Construction Needs Aligns with City's IR Program	No	No	Yes	No	Yes	No	No
Approximate Area Required by Storage System	-		-		-	2,433 m ²	-
Existing Conditions Flooding Observation Summary	Due to the topographic grading, flooding could impact 44 properties	High flood depths along arterial road impacting 2 large buildings	Flooding impacts 9 residential properties	Nuisance flooding within parking lot	Nuisance flooding along roadway	Flooding at major intersection, impacting a single commercial property	Flooding potentially impacting 14 residential properties
Priority	High	Moderate-High	Moderate - High	Low	Low	Moderate-High	High
Anticipated Municipal Class EA Schedule	Schedule A+	Schedule A	Schedule A+	Schedule A+	Schedule A+	Schedule A+	Schedule A+



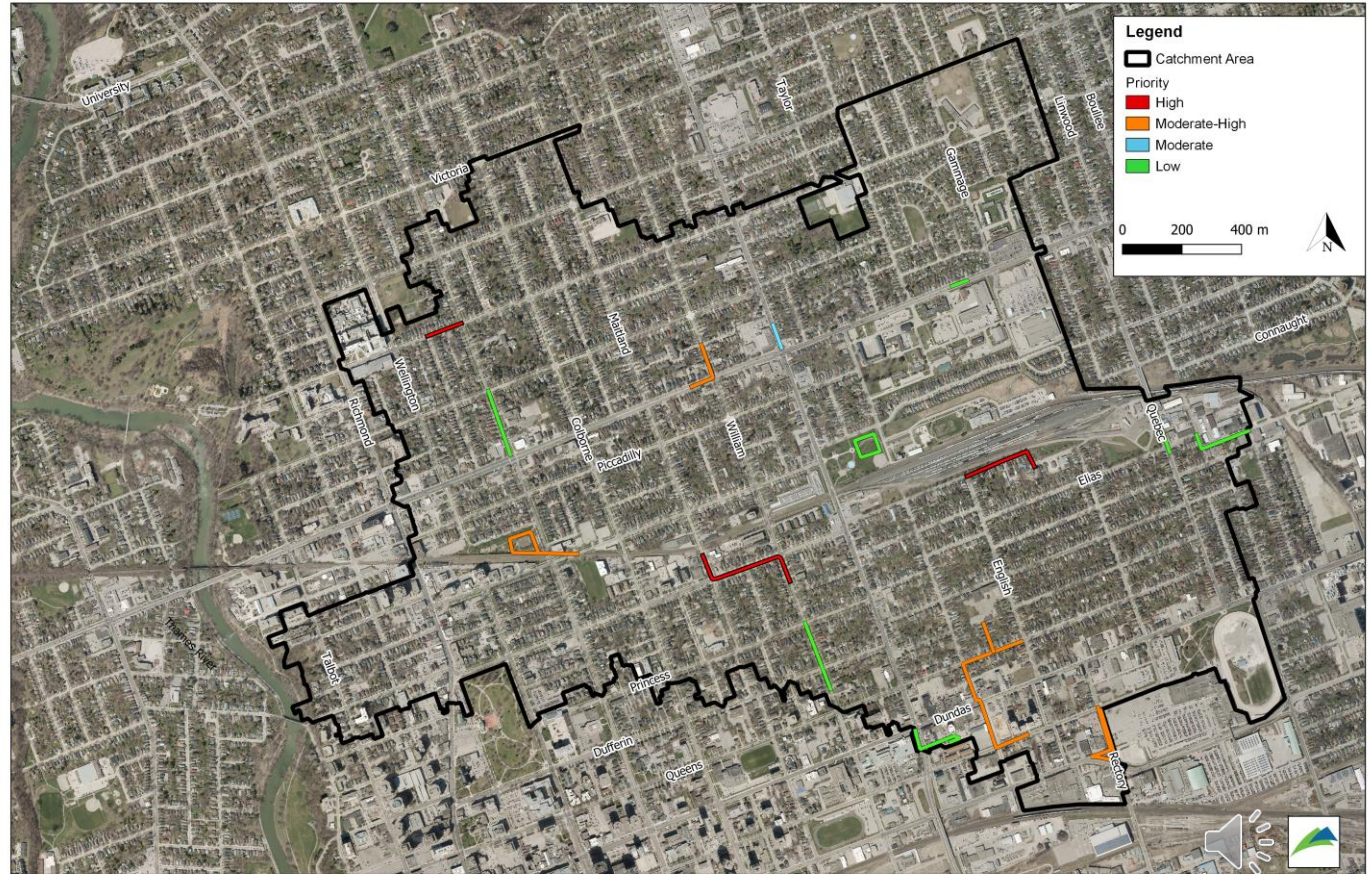
Summary of Master Plan Recommendations

Preferred Stormwater Management Alternatives



Summary of Master Plan Recommendations

Prioritization of Preferred Stormwater Management Alternatives



Next Steps

- Receive Comments through Consultation Process
- Confirm the Municipal Class EA 'Schedule' of each of the recommended Alternatives
- Complete Preparation of Master Plan Document
- File Master Plan and Complete Municipal Class EA Process



Contact Information

If you would like to be included on the project mailing list and/or provide input, please complete the project flooding survey form available at

[Carling Creek Master Plan | Get Involved London](#)

and submit by email to:

nkrygsman@matrix-solutions.com

Input from Public Information Centre No. 2 will be received until

January 5th, 2024

Thank you for participating!

Contact Information:

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Thank you!

