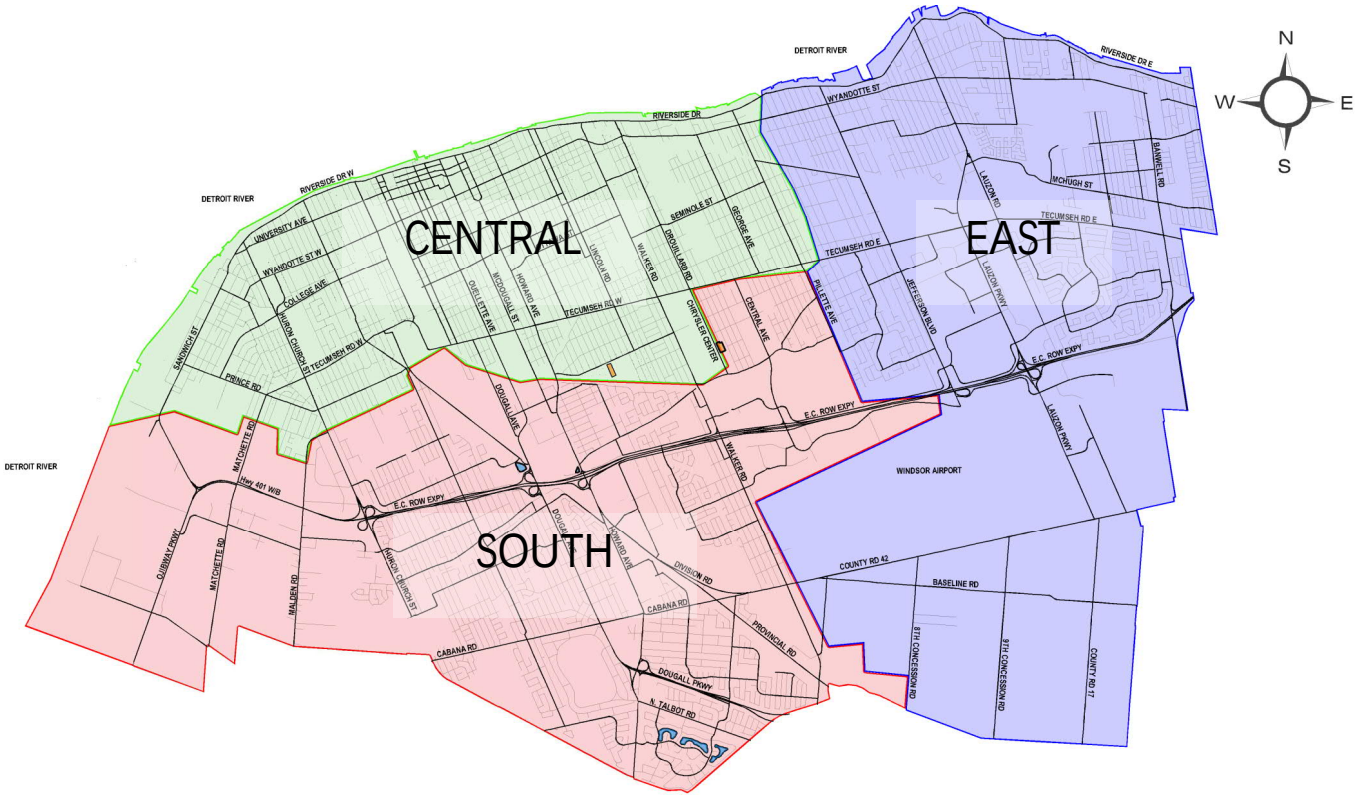
Sewer and Coastal Flood Protection Master Plan

The City of Windsor has experienced several significant storm events in recent years that have resulted in widespread basement and surface flooding throughout the City. In addition to these events, current high Lake St. Clair and Detroit River Water Levels are putting strain on the municipal sewer system and posing risks to property owners in coastal and low lying areas. The City has undertaken this master plan to understand the causes of flooding, identify and evaluate solutions, complete high level design and cost estimates for proposed infrastructure improvements, and to provide an implementation strategy for the recommended solutions.

This Sewer and Coastal Flood Protection master plan follows the Municipal Class Environmental Assessment process which provides the framework for the public to have an active role in the development of the solutions.

This executive summary document is intended to provide a summary of the findings and final recommendations of the City's master plan. Further details will be available in the Master Plan Environmental Assessment report and appendices.



Report Overview

Book 1	• Master Plan Report • Acronyms, Abbreviations, Definitions • Appendix A - Background Literature Review
Book 2	• Appendix B – Stakeholder Consultation Summary Report and Consultation Documentation
Book 3	• Appendix C – Short Term Solution Recommendation Report • Appendix D – Technical Volume 1: Sewer Model Development and Existing Conditions • Appendix E – Technical Volume 2: Flood Reduction Solutions Alternative Development
Book 4	• Appendix F – Technical Volume 3: Functional Design, Estimated Cost and Implementation • Appendix G – Environmental Assessment Comparative Evaluation Matrices
Book 5	• Appendix H – Natural Environment Assessment • Appendix I – Archaeological Assessment Stage 1 Report • Appendix J – Geotechnical Desktop Review • Appendix K– Sewer Model Results (Available Upon Request)

Master Plan Objectives

Master Plan Section 1.0

- Understand the causes of basement, surface, and coastal flooding.
- Identify areas vulnerable to basement, surface, and coastal flooding.
- Identify and evaluate short-term and long-term solutions to reduce the risks and impacts of this flooding.
- Identify improvements to City infrastructure.
- Identify actions homeowners can take to reduce their risk of flooding and reduce strain on the City's system.
- Develop preliminary designs and cost estimates for the recommended infrastructure improvements.
- Recommend an implementation strategy.

Community Engagement

Appendix B

To keep the community informed of this study and to obtain valuable feedback regarding the study's recommendations, an enhanced level public engagement was implemented. The master plan's engagement plan included;

- Several popup events
- Public information centres
- Flooding Survey for residents
- Project website (weatheringthestorm.ca)
- A Stakeholder Advisory Committee (SAC)
- Engagement with regulative agencies, first nations and adjacent municipalities.

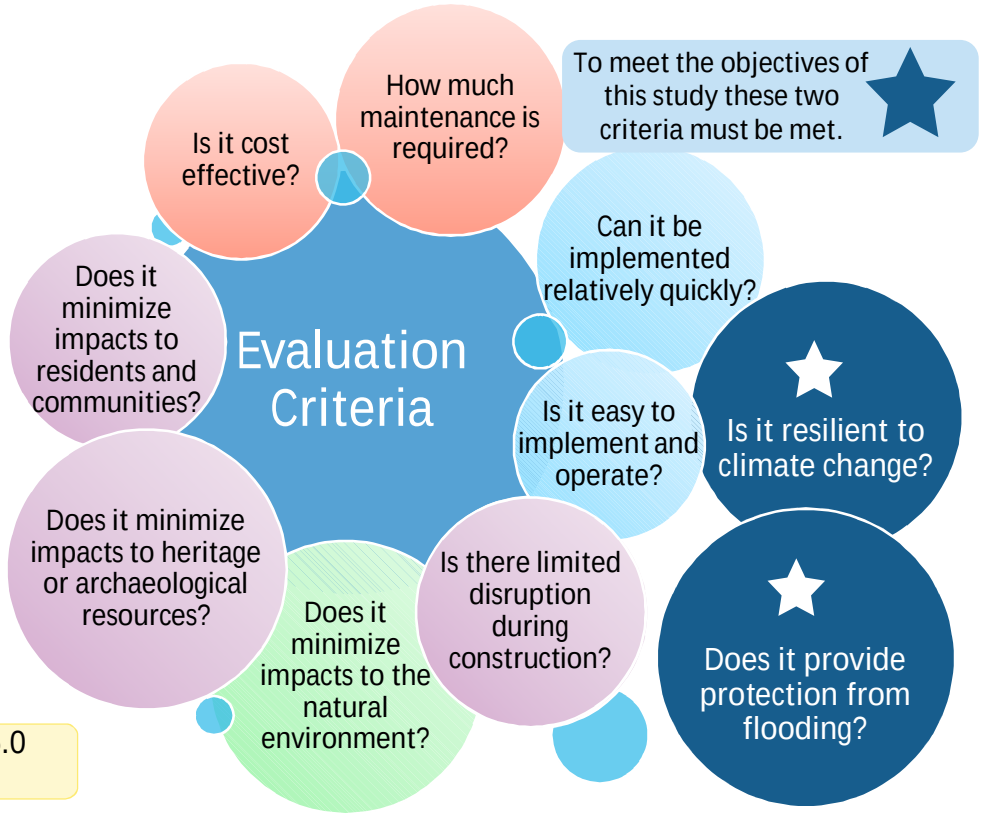
Evaluation of Alternative Solutions

Using the City-Wide Sewer Computational Model, various alternative solutions were developed to meet the established level of service.

Alternative solutions were evaluated following the Municipal Class Environmental Assessment process, comparing each solution based on a number of evaluation criteria.

The recommended solutions summarized in this document represent the preferred solution determined through this process.

Master Plan Section 6.0
And Appendix G



Problem Identification

Appendix E

A number of key principles were considered in the identification of problem areas and mitigation of flood risk:

- More stringent design criteria should be used to mitigate flooding for vulnerable areas;
- Solutions recognize that residents and property owners play an integral part in achieving the goals of this initiative, and
- Solutions cannot rely on only one level of intervention and need to include all components of the drainage system.

Level of Service is a benchmark used to determine where problem areas exist and determine where improvements are needed to mitigate the risks of flooding.

Level of Service

Level of Service: 1:100 Year Storm (85 mm over 4 hours):

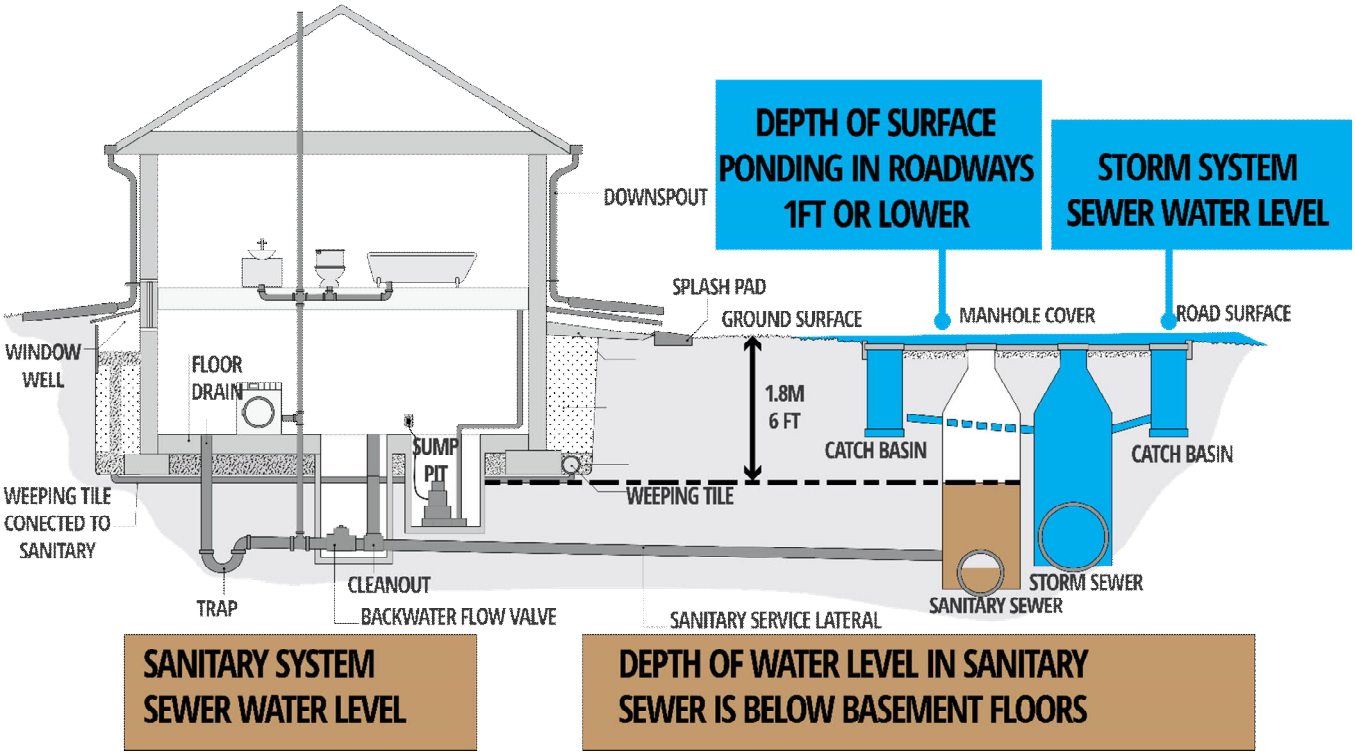
Sanitary System: Sewer surcharge below typical basement floor level (1.8 m (6.0 ft) below ground).

Storm System: Limit surface (roadway) ponding to less than 30 cm (1 ft).

Coastal Flood Protection Infrastructure: Protect lower-lying inland areas from impacts of high lake levels based on projected high lake level elevation (176.50 m).

Enhanced Level of Service: "Climate Change" Storm (120 mm over 4 hours):

More severe storm criteria were used for major roadways and vulnerable areas.
Vulnerable areas include schools, hospitals, long term care centres, emergency services, evacuation centres.



Recommended Solutions

Appendix E

Flooding solutions are made up of a combination of various levels of improvement. Each level represents a part of the City's drainage system, these include:

Increase Downstream Outlet Capacity (Increased treatment capacity or larger outlets to receiving water bodies)

Source Control and Private Property Measures

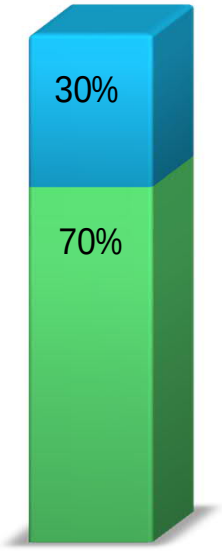
Coastal Flood Protection (Overland flood barriers and backflow prevention)

Improve Sewer System Conveyance and Storage Capacity (Large sewer pipes and storage facilities)

Key Assumptions:

1. The effectiveness of solutions rely on a partnering approach between private property owners and the City. Integration of private property measures and public infrastructure upgrades are required to reduce the risk and impacts of flooding.
2. Solutions will reduce, but not completely eliminate flooding risks.
3. The infrastructure improvements are expected to require an extended period of time to implement due to the scope and costs. The City will incorporate these improvements into their asset management plan and implement projects in conjunction with other initiatives.
4. The City will need to enhance their current operation and maintenance programs for a new and larger infrastructure.
5. Recommended solutions do not eliminate the need for property owners to implement property protection measures and plumbing improvements.

Sources of Inflow and Infiltration into the Sanitary System



PUBLIC RIGHT OF WAY
- Manhole covers
- Sewer system leaks
- Improper storm connections

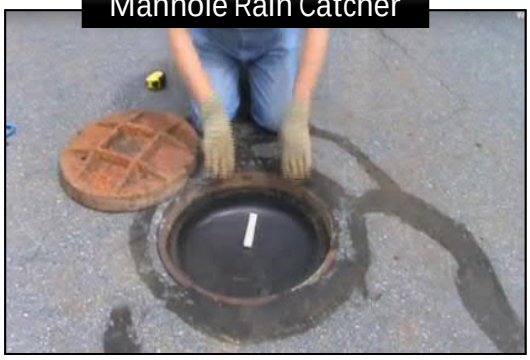
PRIVATE PROPERTIES
- Connected foundation drains
- Improper plumbing connections
- Leaks in private drain pipes

Source Control: City Projects

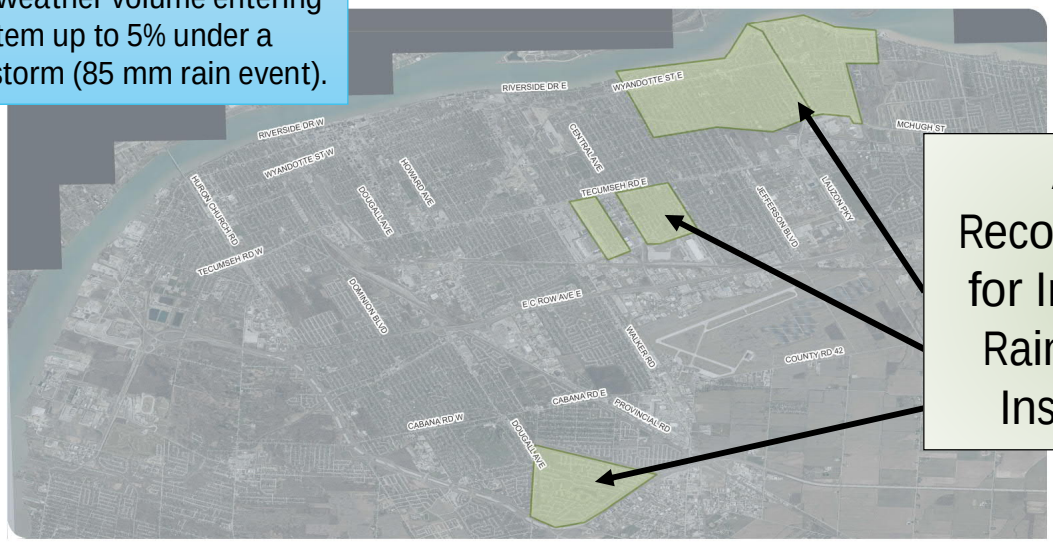
- ✓ Pilot Projects to measure the benefit of Downspout Disconnection, Foundation Disconnection and Low Impact Development (LID) Measures.
  - ✓ Confirm the criteria and assumptions used in the development of these solutions are valid and that measurable reductions in inflow are observed.
- ✓ Updating and implementing new City by-laws:
  - ✓ City-Wide Downspout Disconnection By-Law (By-law 26-2008)
  - ✓ Foundation Drain Disconnection By-Law
- ✓ Updating the City's Development Standards to reflect a new flood mitigation criteria.
  - ✓ Revise a new sewer design criteria and mechanisms to control excess inflow.
  - ✓ Developers must demonstrate that new builds will not impact downstream areas.
  - ✓ Mandatory sewage ejector pumps for new development.
  - ✓ Develop Standards for the implementation of LIDs.
- ✓ Enhanced Educational Program
  - ✓ Homeowner and Contractor Information Sessions.
  - ✓ Develop and Distribute Education Materials and Guidelines.
  - ✓ Continue Project Website: Weatheringthestorm.ca.
- ✓ Implementing Low Impact Development (LIDs) measures, such as:
  - ✓ Exfiltration trenches (Example: Matthew Brady Construction).
  - ✓ Bioswales, Rain Gardens and Stormwater Retention Features.
  - ✓ Permeable Pavements (Example: Tranby Park Parking Lot).
- ✓ Installing rain catchers on manholes in high priority areas and eventually all manholes.
- ✓ Placement of Backflow Prevention Devices, to:
  - ✓ Protect the City's Sewer System from high river levels.
  - ✓ Place at storm and sanitary sewer system interconnections.

Appendix C

Manhole Rain Catcher



Installing rain catchers city-wide will reduce wet weather volume entering sanitary system up to 5% under a 1:100 year storm (85 mm rain event).



Source Control: Private Property Improvements

In order to meet the level of service and to mitigate the risks of flooding property owners will need to take an active role to mitigate their property's strain on the municipal system.

Basement Flooding Solution

- ✓ Foundation Drain Disconnection
- ✓ Correct Improper Connections
- ✓ Backflow Prevention Valves

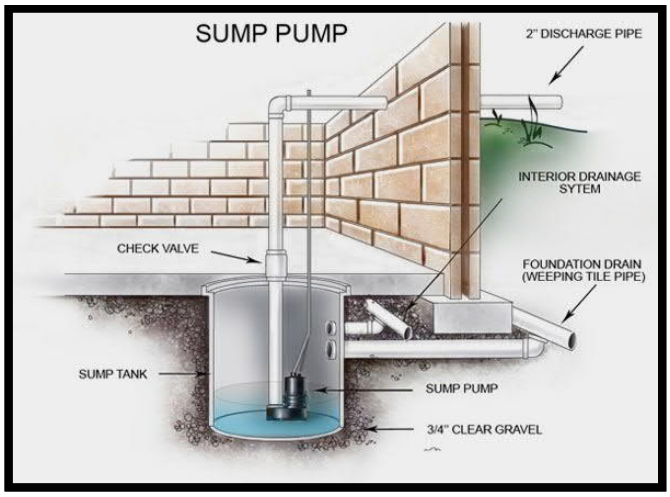
Surface Flooding Solution

- ✓ Downspout Disconnection
- ✓ Improve Lot Grading
- ✓ Low Impact Development (LID) measures, such as:
  - ✓ Rain Barrels and Rain Gardens
  - ✓ Seal window wells
  - ✓ Permeable pavements

These measures are key components of the overall recommended solution strategy. The City will need to partner with property owners to meet flood reduction goals.

Appendix E

Private property measures and property owner cooperation are an integral part of the comprehensive recommended solutions. Foundation drain disconnection and downspout disconnection will have a benefit to the City's system if implemented City-wide.



Is it recommended that the City move forward with the following:

- Implement necessary By-Law to provide the framework for a City Wide policy.
- Coordinate with neighbouring municipalities to implement source control measures (Town of Tecumseh and Town of LaSalle).
- Complete Pilot Projects, whereby the City shall implement this bylaw in an isolated area, which will be monitored and assessed to confirm the benefit of these measures.
- Implement a subsidy program.
- Develop a program to inspect and enforce compliance with the new by-law.
- Develop an Approved Contractor List for residents.

Sewer System Conveyance and Storage Improvements

Basement Flooding Solutions

- ✓ Enhanced sewer separation strategy for combined sewer areas (Downtown/Central Area and Fontainebleu Area).
- ✓ Construction of large sanitary trunk sewers to provide underground storage and improve flow conveyance:
  - 47 km of sanitary sewer upgrades in East Windsor area.
  - 8 km of sanitary sewer upgrades in South Windsor area.

Appendix E and F

Surface Flooding Solutions

- ✓ Large storm trunk sewers to provide underground storage and improve flow conveyance:
  - 40 km in East Windsor area and 9 km in South Windsor area.
  - 17 km of trunk storm sewer in Central Windsor area.
- ✓ 3 New and 4 Upgraded stormwater management (SWM) ponds:
  - Little River Golf Course New SWM Pond.
  - Dougall Ave. and Howard Ave. SWM Ponds.
  - Modifications to ponds serving Southwood Lakes
  - Increase size of the Central Ave. SWM Pond.
- ✓ Underground storage systems under parks, parking lots, and commercial properties.
- ✓ Construction of Low impact development (LID) measures:
  - Tranby Park Permeable Parking Lot, Matthew Brady Exfiltration Trenches.

Downstream Outlet Capacity Improvements

Basement Flooding Solutions

- ✓ Little River Pollution Control Plant:
  - Future plant expansion to provide service for population growth and to provide some wet weather treatment capacity.
  - In the interim, improve the existing bypass outlet at the treatment plant (Pontiac Pumping Station improvements).
- ✓ Lou Romano Water Reclamation Plant:
  - Construct a Retention Treatment Basin Facility and Sandwich Street Combined Relief Trunk Sewer.
    (Combined Sewer Overflow Control in the Riverfront Area, West of Caron Avenue, Class EA).

Surface Flooding Solutions

Appendix E and F

- ✓ Improved or construct a new storm sewer outlets to the Detroit River.
  - Detroit St., Bruce Ave., Cameron St., Albert Rd., Marentette Ave.
- ✓ New or improved stormwater pumping station (PS) capacities including emergency back-up power.
  - New St. Rose Ave. PS (St. Rose Park) –Improved outlet capacity and provide flood relief to drainage area.
  - Improve St. Paul PS – Pumping Station Expansion to provide relief to drainage area.
  - East Marsh PS – Maintain current capacity for a reduced drainage area.
  - Improve Ford Blvd. PS (Reaume Park) – Upsize pumps to improve resiliency of the drainage area.
  - Improve Drouillard PS (Cadillac Park) – Replace existing pumping station with a new pumping station to improve flooding along Drouillard Rd.
  - Improve Lakeview PS (South Rendezvous Park) - Replace existing pumping station with a new pumping station to improve the Blue Heron Pond outlet.
  - New Pump Station at Chappell Ave. – Required to drain the storm system after rain events.

Coastal Flood Protection

The purpose of Coastal Flood Protection:

- ✓ Protect in-land areas from high lake/river levels.
- ✓ Protect low lying residents, who live North of Riverside Dr., from overland surface flooding on Riverside Dr.
- ✓ Mitigate inflow of lake/river water into the municipal storm sewer system.
- ✓ Utilize existing private property grades to meet minimum protection levels.
- ✓ Prevent backflow of high lake levels into the sanitary and storm sewers systems.

Appendix E and F

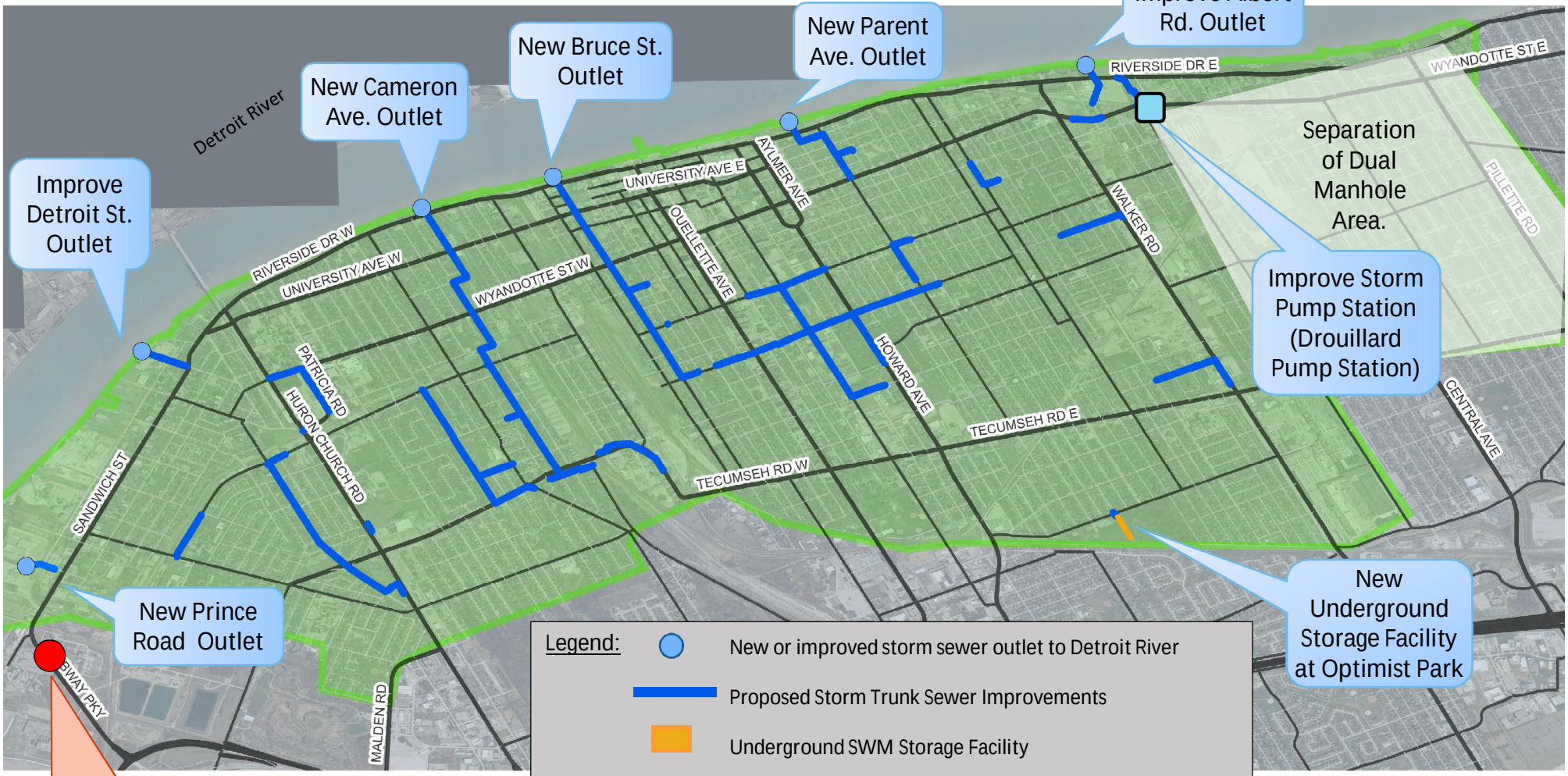
The recommended landform barrier will be an earth berm built to an elevation of 176.50, located along the North or South boulevard of Riverside Drive East. Construction of the berm will require:

- Acquisition of property or an easement along the Riverside Drive East right of way.
- Where properties are above the established protection elevation, the earth berm will not be required. The City will work with these property owners to incorporate lot elevation as part of the property's legal status.
- Maintenance of acceptable driveway grades for vehicle and barrier free access.
- Storm sewers and catch basins to capture local drainage north of the berm.
- In Area 1: Riverside Drive East, Ford Blvd. to St. Rose. Ave., berm construction will be integrated into the reconstruction of Riverside Drive (Vista Phase 2A Construction Limits).
- In Area 2: Riverside Drive East, St. Rose Ave. to Riverdale Ave., much of the berm construction has been completed as part of the recent Riverside Vista Phase 1 construction.
- In Area 3: East Riverside Area, Riverdale Ave. to East City limits (Ganatchio Trail), construction will require infill where the existing berm or intersection streets do not meet minimum protection grades.

Two flood protection elevation scenarios have been elevated based on the existing regulatory flood protection levels and recent climate change projections.

Based on the environmental assessment, the barrier elevation of 176.50 was found to be preferred. The landform barrier elevation of 176.80 would have significant impacts on private property would require extensive surface area to construct.

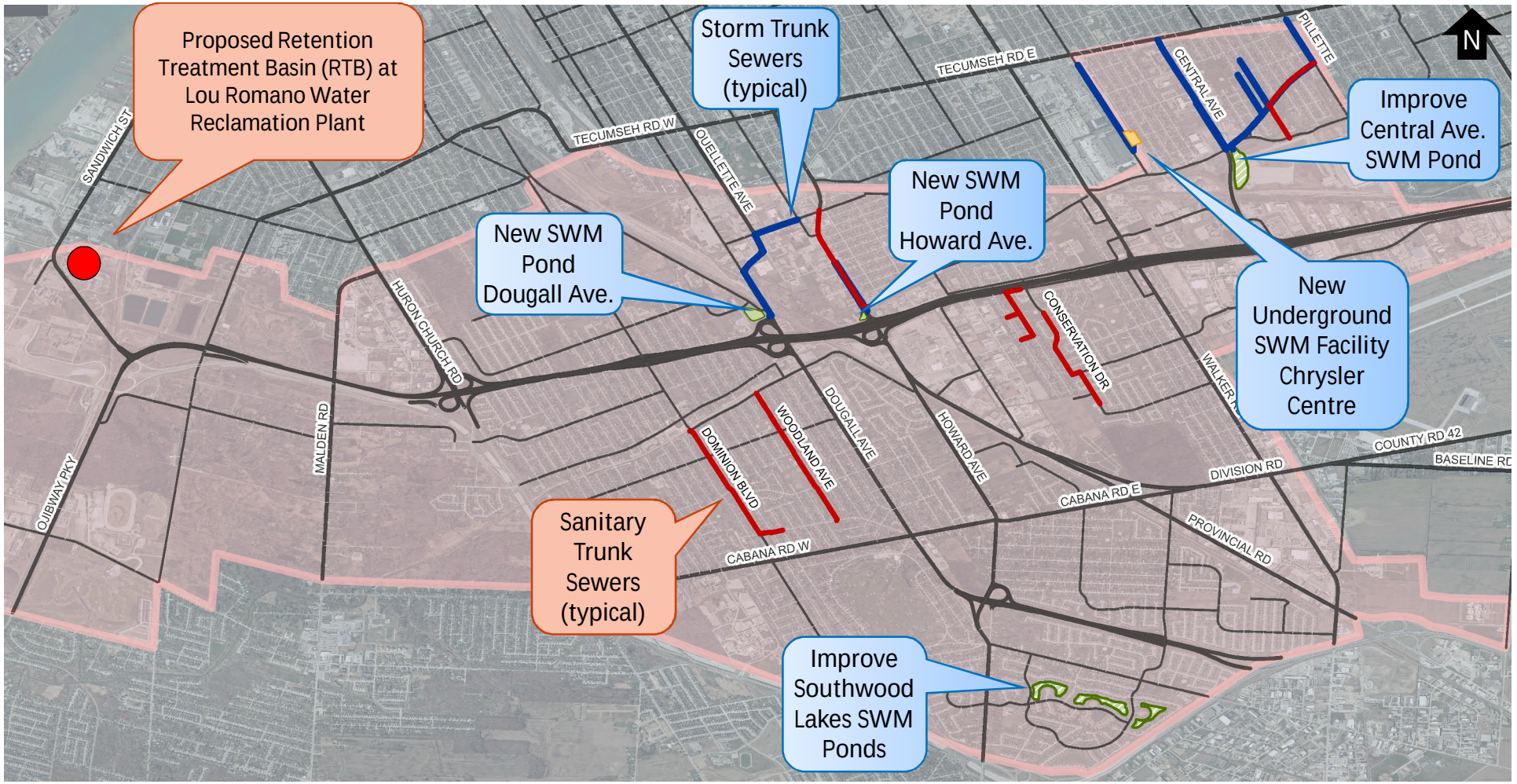
Recommended Infrastructure Projects
Central Windsor Area – Sewer Separation Program



These improvements include the construction of 4 new storm sewer outlets and improvement to 2 existing outlets. This solution requires the direction of both municipal and private property drainage, such as drainage from roofs, front and rear yards and alleys, to the storm sewer system and out of the combined sewage system.

In addition, a Retention Treatment Basin (RTB) is proposed at the Lou Romano water reclamation plant, which will reduce the frequency of CSOs and better manage wet weather inflow at the treatment plant.

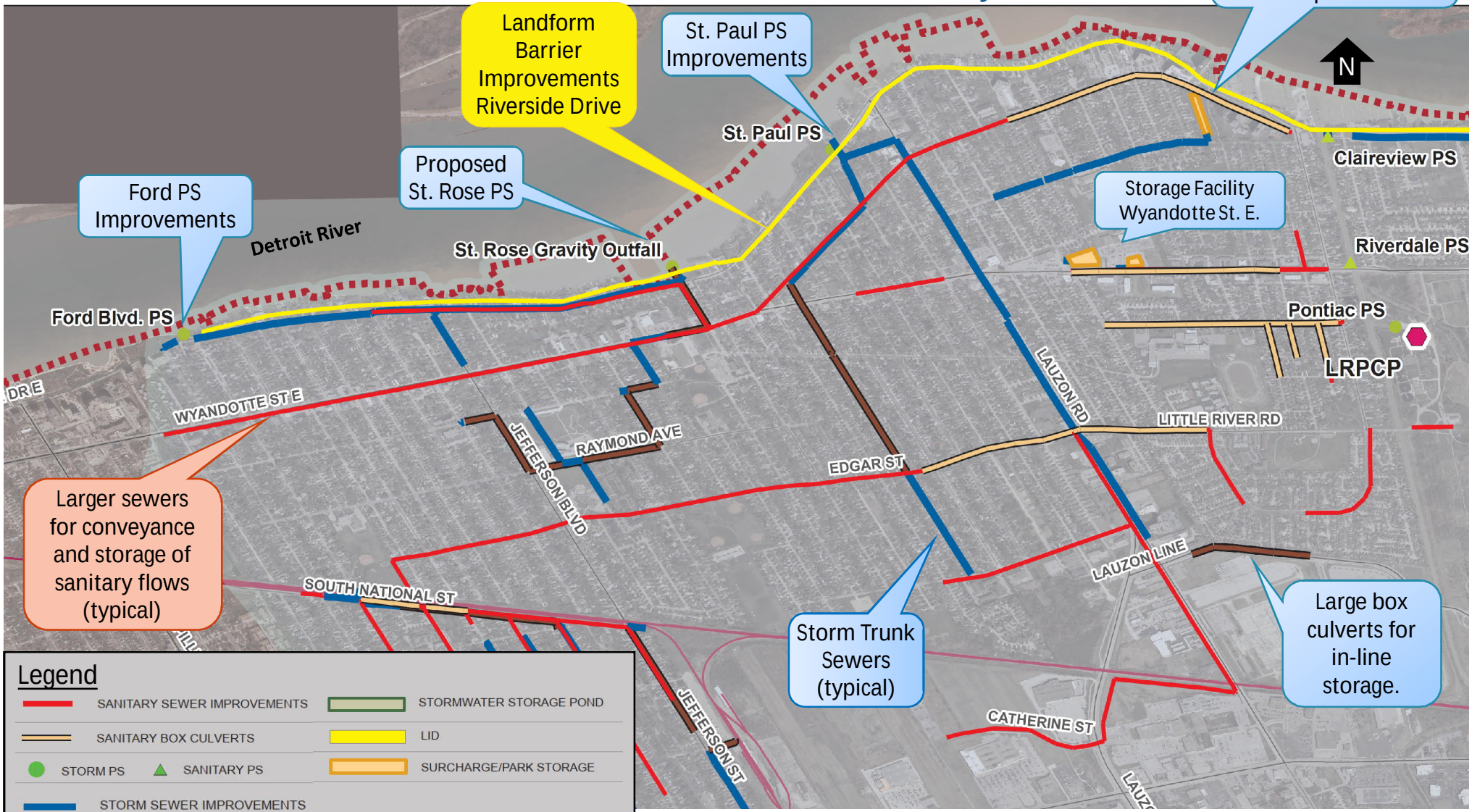
Recommended Infrastructure Projects
South Windsor Area



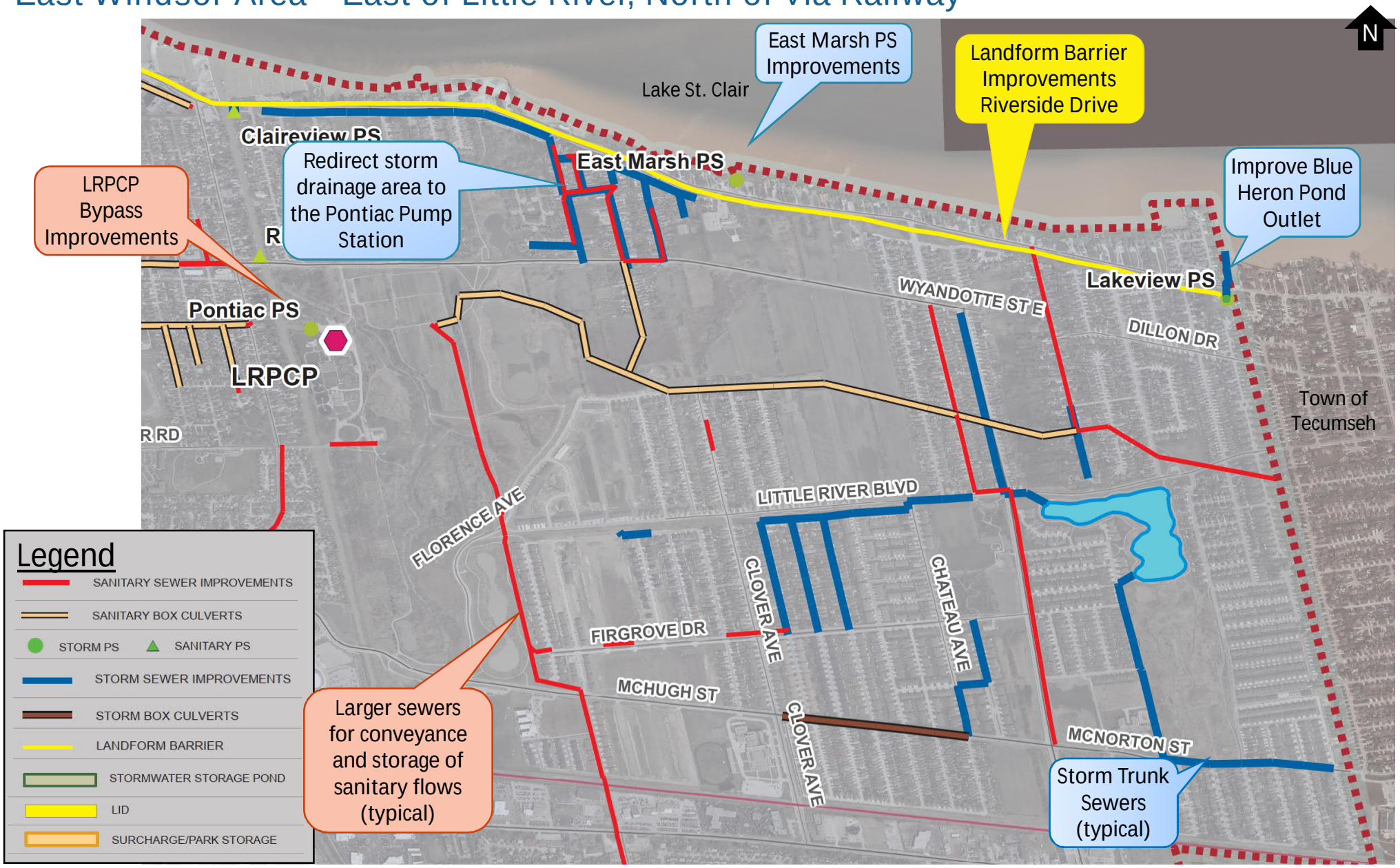
Legend:

- New or Upgraded SWM Ponds
- Underground SWM Storage Facility
- Storm Trunk Sewer Improvements
- Sanitary Trunk Sewer Improvements
- South Sanitary Drainage Area

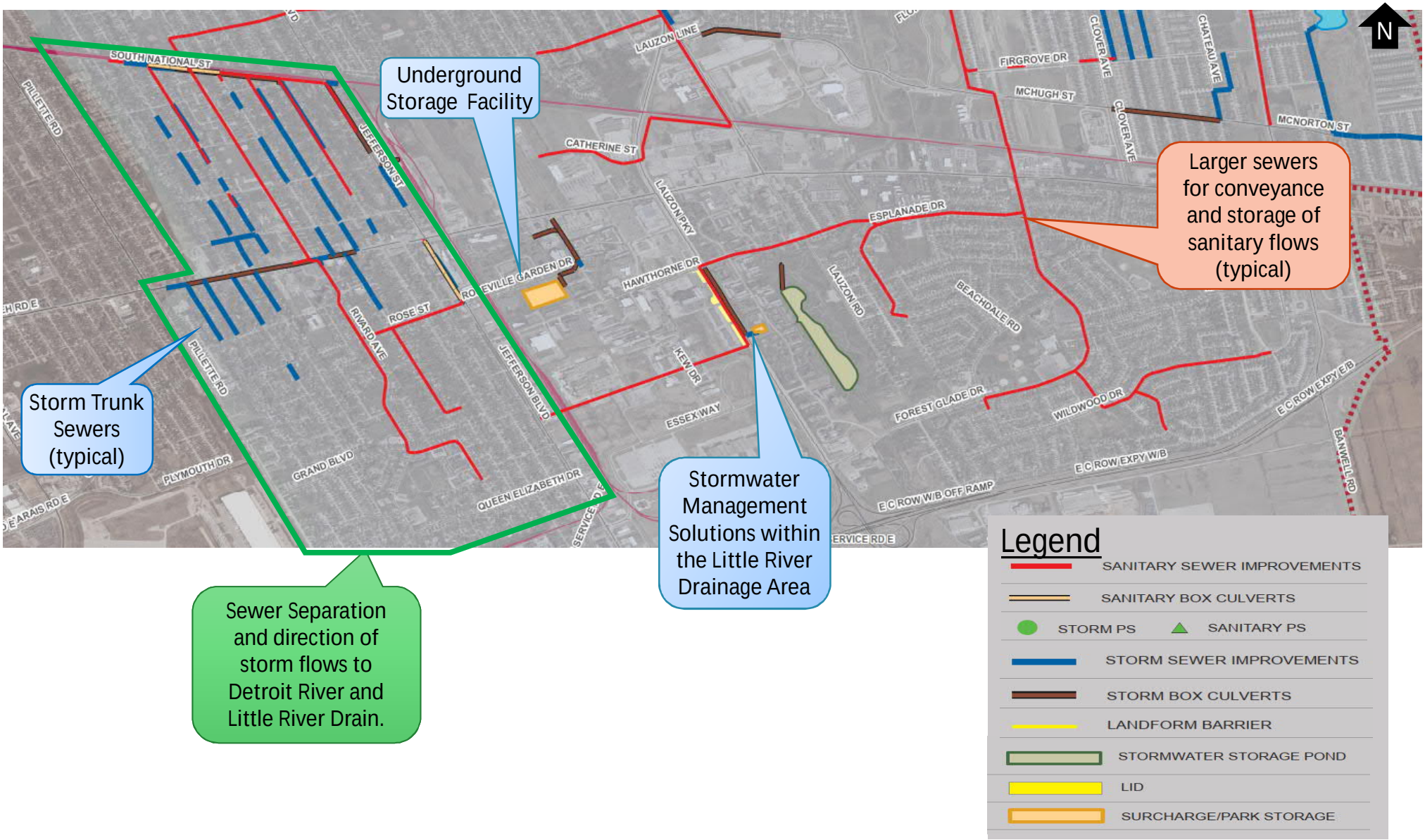
Recommended Infrastructure Projects
East Windsor Area, West of Little River, North of VIA Railway



Recommended Infrastructure Projects
East Windsor Area – East of Little River, North of Via Railway



Recommended Infrastructure Projects
East Windsor Area - South of VIA RAIL



Estimated Construction Costs

Source Control Measures and Private and Public Improvements

Solution Component	Sub-Total Costs
Private Property Programs:	
City-wide Foundation Drain Program	$950M
City-wide Downspout Disconnection Program	$50M
Public Infrastructure Improvements	
Sanitary Manhole Sealing Program	$0.5M
Sewer Backflow Prevention Device Program Allowance	$8M
Sub-Total	$1,009M

Sewer System and Downstream Improvements

Solution Component	Sub-Total Costs
Conveyance and Storage	
Sanitary System Improvements	$3,040M
Storm System Improvements	$883M
Coastal Flood Protection	
Barrier Landform and Sewer Backflow Protection	$9M
Outlet Capacity	
LRWRP - Retention Treatment Basin	$70M
LRPCP - Improved Bypass	$5M
New or Upgraded Stormwater Pumping Stations	$40M
Grand Total	$4,047M

Appendix F

Costs Are in Million of Dollars.

Total Summary of Construction Costs

Recommended Solutions	Central Windsor	South Windsor	East Windsor	Total Costs
Grand Total	$3,475M	$429M	$1,158M2	$5,056M

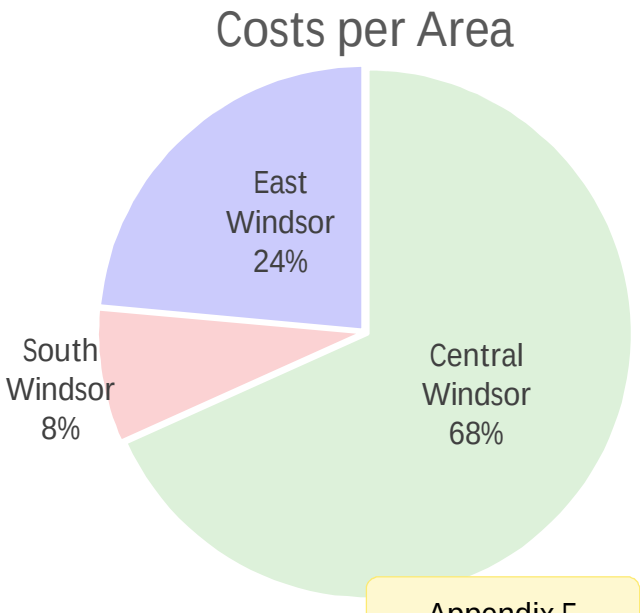
Improvements require significant investment however it is important to recognize these improvements are meant to be implemented over the next 50+ years.

Improvements will be integrated into the City's Capital Works program and asset management plan.

As new infrastructure is implemented necessary operation and maintenance costs should be incorporated into the City's Annual Capital Works budget.

Estimated Construction Cost Assumptions

- These high level budgetary costs shall be used for capital works planning however they are not based on detailed design of proposed infrastructure.
- Cost estimates are based on 2020 construction prices and exclude applicable taxes.
- Construction cost estimates are Class D Estimates and a +30% contingency has been added.
- An allowance of 20% has been included for engineering including design and site construction observation.
- Landform barrier estimates assume that the flood protection will be provided with an earth berm only. Flood protection measure estimates do not include costs for walls, partial walls or mechanical gate structures.
- Construction costs includes full road reconstruction of ensure City.
- Storm sewer improvements includes an allowance to implement Low Impact Development (LID) measures. The type of LID suitable for each project will need to be evaluated on a site by site basis.
- Construction costs exclude
  - Utility relocation.
  - Land acquisition, land appraisal, legal costs, and expropriation costs.
  - Additional studies or additional site environmental assessments.
  - Demolition of existing buildings.
  - Fees associated with agency reviews, permits, and approvals.
  - Costs for annualized maintenance of identified improvements has not been included in the construction cost estimates.
  - Phasing and staging works have not been included.



Appendix F

Implementation

To assist City administration in planning and scheduling recommended solutions, projects have been assigned a priority level based on various criteria. Projects that are already funded or are required to facilitate source control or private property improvements are considered immediate. The remaining projects were ranked (High, Medium and Low), using a ranking system developed to score projects based on the below criteria.

- Condition of Existing Sewers
- Flood Reduction Effectiveness
- Emergency Access
- Cost Efficiency
- Reduction of Combined Sewer Overflows (CSOs)
- Access to Vulnerable Areas

It is recommended that the City continuously review and re-evaluate the prioritization list, especially as it relates to future climate change projections, and how the list overlaps with other road/capital projects or maintenance programs.

It is important to note that public infrastructure improvements are only one part of the comprehensive solution to mitigate flooding and that the implementation of private property source control and protection measures are critical in achieving the established level of service. Continuous sewer system monitoring and modelling analysis will be required to confirm that the anticipated the benefit is achieved.

As projects and source control measures are implemented, the risk of flooding will be reduced.

Upcoming Programs and Construction Projects (0-8 years)

- ✓ Completion of various ongoing programs (Inflow and Infiltration reduction program, basement subsidy programs, etc.).
- ✓ Sealing manhole covers in low lying areas.
- ✓ Determining how to fund stormwater projects (Stormwater Financing Study).
- ✓ Prepare and facilitate an Enhanced Educational Program to educate the community on measures residents can do in their home.
- ✓ Updating the City's Development Standards Manual.
- ✓ Implementing Pilot Projects, Sewer Monitoring and Evaluation of Solutions to test the benefit of recommended source control measures.
- ✓ Storm Sewer System Improvement in Riverside Area funded by Disaster Mitigation and Adaptation Fund (DMAF), see below.

Disaster Mitigation and Adaptation Fund - Round 1

- Little River Pollution Control Plant Overflow Improvements.
- St. Paul and East Marsh Pumping Station Improvements.
- Brumpton Park Stormwater Management Improvements.
- Riverside Vista Reconstruction -Phase 2A: Large storm trunk sewer and landform barrier (2020-2024).
- Storm sewer improvements along Belleperche Place, Cedarview St., Matthew Brady Blvd., Belle Isle View Blvd., Eastlawn Ave. and within the East Marsh Drainage Areas.

The following projects have also been identified as 'immediate' because they must be constructed in conjunction with the DMAF funded projects listed above.

- St. Rose Ave. and Ford Blvd. Pumping Station Improvements.
- St. Rose Ave. Storm and Sanitary Trunk Sewers.
- Sanitary Trunk Sewer along Riverside Vista Phase 2A project limits.

Appendix F

Basement Flooding – Project Prioritization Central/Combined Area

Priority	Trunk Storm Sewer Improvement and Enhanced Sewer Separation	
Immediate Priority (0 – 10 Years)	Lou Romano Water Reclamation Plant Retention Treatment Basin and Sandwich St. Sanitary Sewer	
	Prince Road Storm Trunk Sewer Outlet and Pump Station at Chappelle Ave.	
High	Cameron Ave. Trunk Sewers	Wellington Ave. Trunk Sewers
Medium	McDougall Ave. Trunk Sewers	Bruce St. Outlet and Trunk Sewers
	Lincoln Ave. Trunk Sewers	Detroit St. Outlet and Trunk Sewers
	Parent Ave. Outlet and Trunk Sewers	
Low	Huron Church Trunk Sewers Trunk Sewers	Askin Ave. Sewer Separation
	Albert Rd. Outlet and Trunk Sewers	Felix Ave. Trunk Sewers
	Dual Manhole Area Separation	Prince Road Sewer Separation

East and South Area

Priority	Basement Flooding Solutions
Immediate Priority Projects (0 – 10 Years)	• Little River Pollution Control Plant Overflow Improvements Riverside Drive Sanitary Trunk Sewer - Ford Blvd. To St. Rose Blvd. • Sanitary Sewer Improvements along Riverside Drive E. and St. Rose Ave.
High	East Windsor Area 1: Martinique Inlet Sanitary Sewer Infrastructure Riverside Dr. E., St. Rose Ave., Ganatchio Trail, Clairview Ave.
Medium	South Windsor Area: Sanitary Sewer Infrastructure (Howard Ave., Dominion Blvd., Roselawn Dr., Woodland Ave., Parkwood Ave., Sydney Ave., Malcolm Ave., Foster Ave., Calderwood Ave., EC Row Ave. E, Conservation Dr., Grand Marais Rd. E., Tourangeau Rd.) East Windsor Area 2: Wyandotte Inlet Sanitary Sewer Infrastructure (Wyandotte St. E., Carling Cres.) East Windsor Area 4: Edgar Inlet Sanitary Sewer Infrastructure (Edgar St., Tranby Ave., Little River Rd., Little River Acres Dr., Catherine St., Lauzon Pkwy., Lauzon Rd., South National St., Jefferson St., Balfour Blvd., Glendale Ave., Ferndale Ave., Ford Blvd., Tecumseh Rd. E., Rivard Ave., Grandview St., Courtland Cres., Coronation School Yard/Pikes Park/WECHC, Rose St., Jos St. Louis Ave.) East Windsor Area 3: Jerome Inlet Sanitary Sewer Infrastructure (Jerome St., Westchester Dr., Rholaine Dr., Greendale Dr., Thompson Park)
Low	Sanitary Sewer Infrastructure East Area 5: East/South Inlet via Aspenshore and Beverly Glen (East Riverside, Forest Glade and Sandwich South)

Appendix F

Surface Flooding - Project Prioritization

Priority	Road Surface Flooding Solutions		
Immediate Projects (0-10 Years)	Dorchester Rd.	Ellis St. and Giles Blvd. -McDougall Ave. to Howard Ave.	
	Totten St.	Prince Rd. Storm Outlet at Chappell Ave.	
	Felix Ave.	Lauzon Parkway	
High	Dougall Ave. at the CN Rail Crossing and Eugenie St. E.	Howard Ave. at EC Row Expressway	
		Tecumseh Rd. W. at Crawford Ave.	
Medium	McNorton St., East of Banwell Ave.	Banwell Ave.	Lauzon Rd.
	Roseville School and Rose-Ville Garden Dr.	Jefferson Blvd. and Raymond Ave.	Jefferson Blvd. and South National St.
	Giles Blvd./McDougall Ave./Erie St.	Huron Church Rd.	Ypres Ave.
	Mc Hugh St., East of Lauzon Rd.	Parent Ave.	
Low	Chrysler Centre	College Ave.	Patricia Rd.
	Mc Hugh St., West of Banwell Ave.	Drouillard Rd.	Lincoln Rd.
	Wyandotte St. East at Watson Ave.	Walker Rd.	Ontario St.

Priority	Regional Surface Flooding Solutions
Immediate	DMAF Round 1 Projects and related projects (St. Rose Pump Station, St. Rose Sewer, etc.)
High	Storm Problem Areas 1 and 2 – Riverside - Ford Blvd to Lauzon Road
	Storm Problem Area 3 and 4 - Fontainebleau and Lauzon Parkway
Medium	Storm Problem Area 7 - Central/Pillette/Grand Marais
	Storm Problem Area 8 - Southwood Lakes
Low	Storm Problem Area 5 - Blue Heron Pond
	Storm Problem Area 6 - Pontiac and East Marsh Drainage Area

Priority	Coastal Flood Protection (Landform Barrier/Backflow Prevention Solutions
Immediate	Area 1: Riverside Dr. E., Ford Blvd. to St. Rose. Ave. (Riverside Vista Ph. 2A).
High	Area 2: Riverside Dr. E., St. Rose Ave. to Riverdale Ave. Area 3: East Riverside Area, Riverdale Ave. - East City limits (Ganatchio Trail)

Appendix F

Class EA Project Schedules

This master plan will satisfy the EA requirements for Schedule B projects. The following is a general description of Schedule B and C projects that have been identified among the preferred solutions:

Schedule B Projects:

- New and Improved Stormwater Pumping Stations;
- New Stormwater Management Ponds and Underground Storage Facilities on Private Property;
- New Low Impact Development (LID) Measures on Private Property;
- New Sanitary/Storm Trunk Sewers and Box Culverts Requiring Additional Property;
- New Storm Sewers including Upgrades to Existing Outlets to the Detroit River; and
- Barrier Landform Improvements on Riverside Drive that Require Additional Property.

Schedule C Projects:

- New Stormwater Pumping Stations;
- New Trunk Storm Sewers that require new outlets to the Detroit River;
- Improvements to the Little River Pollution Control Plant wastewater treatment facility, including:
    - Improvements to the existing bypass at the Pontiac pumping station;
    - Interim measures to optimize the operation of the Little River Pollution Control Plant for existing wet weather flows; and
    - Future treatment plant expansion to meet the ultimate development needs.

The project schedules for each recommended solution are noted in the Master Plan and will be identified in the Notice of Completion. Prior to implementing any Schedule C project, additional consultation and investigation, which will fulfill Phases 3 and 4 of the Municipal Class EA, will need to be completed and provided for public review.

During the Review Period (45 Days), any person who has significant concerns about the project may provide written comments to our project team or the Ministry of Environment Conservation and Parks (MECP). Requests should specify what kind of order is being requested, how an order may prevent, mitigate or remedy potential adverse impacts, and any information in support of the statements in the request.

Conclusions

- ✓ Recommendations to mitigate risk of basement, surface and coastal flooding have been developed based on the established level of service.
- ✓ The total cost of recommendation solutions will be $5.0 Billion Dollars, which will be integrated into the City's capitals works program.
- ✓ The ultimate solution recommendations will need to be integrated into the City's asset management program.
- ✓ City will need to enhance their current operation and maintenance programs for new and larger infrastructure. Flooding solutions are based on a partnering approach between private property owners and the City.
- ✓ Flooding solutions will require an extended period of time to be fully implemented due to their scope and costs.
- ✓ Flooding solutions will reduce, but not completely eliminate flooding risks.

Master Plan Section 8.0