Agile
INFRASTRUCTURE

CITY OF PORT COLBORNE

WATER AND STORMWATER MASTER PLAN

Public Information Centre

December 3, 2025 | 3 – 7 PM

Vale Health & Wellness Centre
550 Elizabeth Street, Port Colborne, ON

Welcome to the Public Information Centre

Public Information Centre Objectives

- Present the study objectives and Problem and Opportunity Statement
- Present the Master Plan Class Environmental Assessment (EA) process
- Present an overview of the City's existing water and stormwater systems
- Present planned future growth and the associated opportunities and challenges to the water and stormwater systems
- Present the proposed alternatives, water and stormwater evaluation, and preliminary preferred long-term management strategies.
- Receive feedback on all the presented materials and incorporate it into the project moving forward

- Please sign in and take a comment sheet
- Review the information on the display boards and talk to the Project Team
- Submit comments in person or online

Project Objectives

The 2025 Water and Stormwater Master Plan will identify and develop a **long-term water and stormwater servicing strategy** and capital forecast to achieve the desired infrastructure performance objectives for **existing and future residents and businesses**, with consideration for expanding services to support critical employment opportunities. This will support projected **future growth in the community to 2051** and consider **potential impacts beyond 2051**.

- Detailed Inventory and Characterization of Existing Systems
- Update and Calibrate the Water Hydraulic Model & Develop New Stormwater Hydraulic Model
- Confirm Desired Water and Stormwater System Performance Targets
- Quantify How the System is Performing Now and, in the Future, (with Growth)
- Identify the Long-Term Management Strategy
- Develop Capital Program (Budget) and Implementation Plan (Schedule)

Master Plan and Class EA Process

Through the Water and Stormwater Master Plan, we will complete Phases 1 and 2 of the Municipal Engineers Association (MEA) Class EA process.

Environmental Assessment Process – Phases 1 and 2

Problem and Opportunity

- What is the state of the existing infrastructure?
- How does the system work?
- Where is the system working well and where are there issues?
- Problem and opportunity statement

Identify Alternative Solutions

- How do we meet existing and future needs?
- What are potential concepts and strategies that would achieve our needs?
- What type of infrastructure upgrades and modifications are required for each potential solution?

Evaluate Alternative Solutions

- How well does each potential solution perform against various criteria?
- Are there opportunities to merge potential solutions to optimize outcomes?
- What is the best solution and why?
- **Public Information Centre**

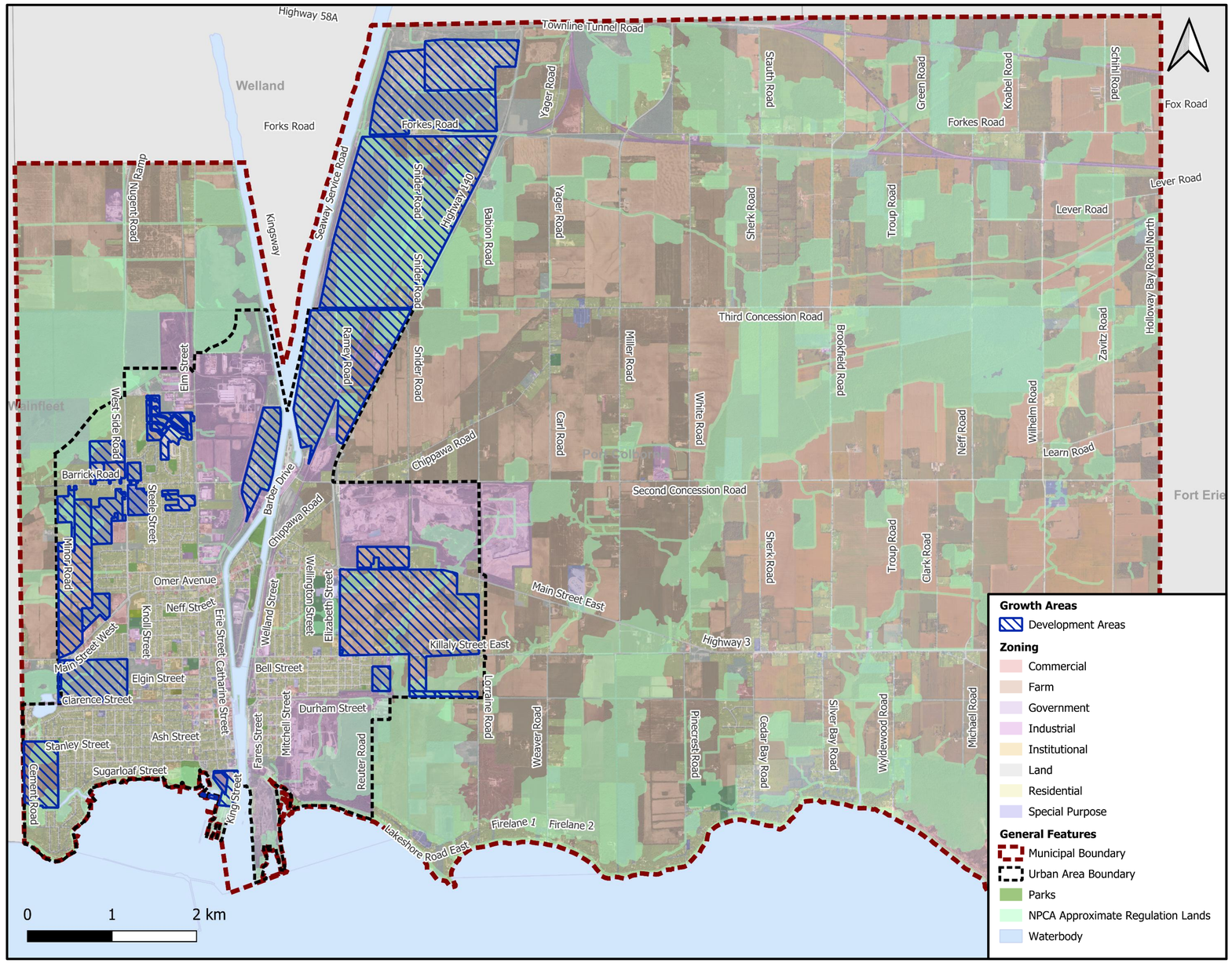
We are here

Select Preferred Solution

- What are the next steps required to implement the preferred solution?
- Project file reports – documentation of the Master Plan
- Project Notice of Completion
- 30-Day Public Review
- Finalization of Project File

The Master Plan process is outlined in Section A.2.7 of the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (Oct 2000, as amended in 2007, 2011, 2015, 2023, 2024)

Growth Scenario



Growth Planning:

- **Water and Stormwater Infrastructure have 50 to 100 + year life span –** Need to build a resilient network that supports reliable service as the City grows
- **Plan for the long-term** using a 2051 planning horizon while considering full build-out
- Growth includes several larger water users to support industrial processes

	2051 Growth Scenario	Buildout Growth Scenario
Residential Growth (people)	11,447	19,167
Employment Growth (people)	10,271	10,271
Additional High Water Use Employment Area (ha)	191	191
Additional High Water Use Employment Area (MLD)	14.9	14.9

Alternatives Development and Evaluation Process

How do we know that we need to upgrade the water or stormwater infrastructure?

What thresholds do we use to identify infrastructure upgrades?

How do we balance minimizing project costs while maintaining a sufficient capacity buffer?

Identify Long List of Servicing Concepts

→

Screen Long List of Servicing Concepts based on their ability to meet the Problem/ Opportunity Statement

→

Evaluate Short List of Servicing Alternatives based on Detailed Evaluation Criteria

→

Identify Preferred Water and Stormwater Servicing Strategies

Detailed Evaluation Criteria

Technical

- Meets existing and future servicing objectives
- Supports growth servicing and phasing
- Minimizes operational complexity and implementation risk
- Provides system operational reliability and resilience to climate change

Environmental

- Minimizes impacts to natural heritage systems, wildlife and species at risk
- Minimize contributions to climate change.

Social and Cultural

- Minimizes short- and long-term impacts on residents, businesses, and the community
- Minimizes impacts to local cultural heritage and archeological features

Financial

- Capital cost
- Operational and maintenance cost

Water System Management Objectives

Two Tier System

Water servicing is operated under a two-tier system; Niagara Region and the City of Port Colborne

Niagara Region

- Responsible for water treatment, transmission mains, storage facilities, pumping stations
- Long-term planning is guided by the Region's Master Servicing Plan, which identifies system needs and future upgrades

City of Port Colborne

Manages the local water distribution system, including all distribution watermains

City Master Servicing Plan

- Focuses on local water distribution
- Ensures adequate pressures and fire protection
- Maintains high water quality

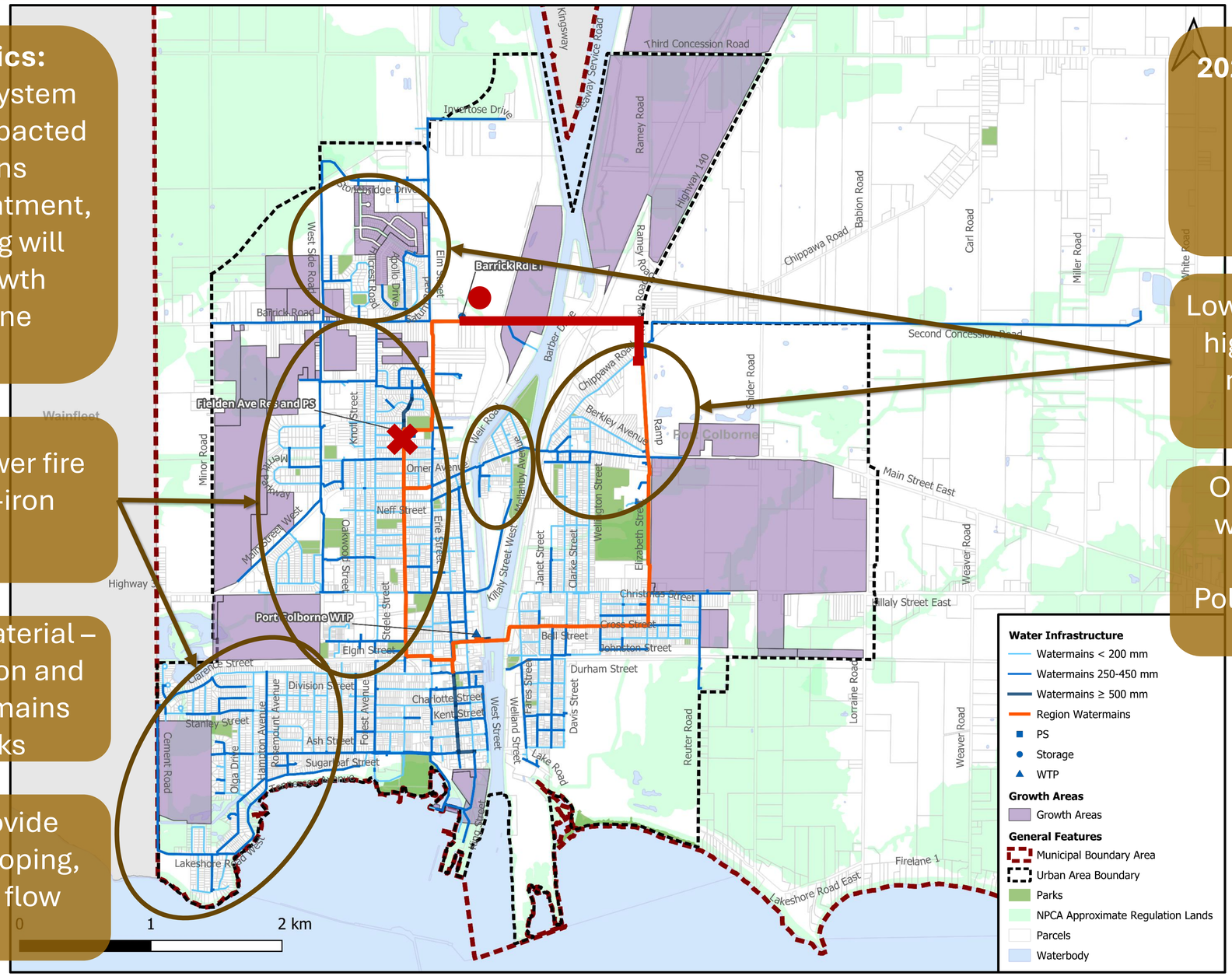
Water System Opportunities and Constraints

System Characteristics:
- Supplied by Region; system pressure and flows impacted Regional operations
- Assumed Regional treatment, storage, and pumping will expand to meet growth
- Single pressure zone maintained

High concentration of lower fire flow in areas with cast-iron watermains

Watermain condition & material – signification aging cast-iron and asbestos cement watermains with a history of breaks

Future growth areas provide opportunity for system looping, leading to improved fire flow capacity

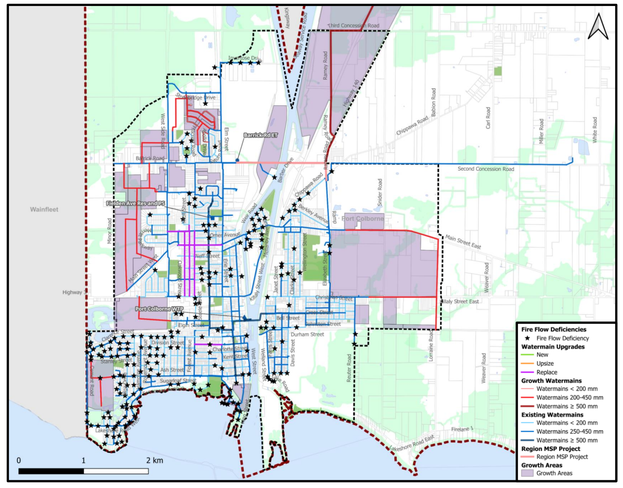


2021 Region MSP Projects:
- New canal crossing
- New Elevated Tank
- Fielden Reservoir decommissioning

Lower pressures in areas with higher elevation; pressures remain above minimum pressure targets.

Opportunity to coordinate with wastewater projects identified through the Pollution Prevention Control Plan (PPCP)

Water System Servicing Concepts & Evaluation

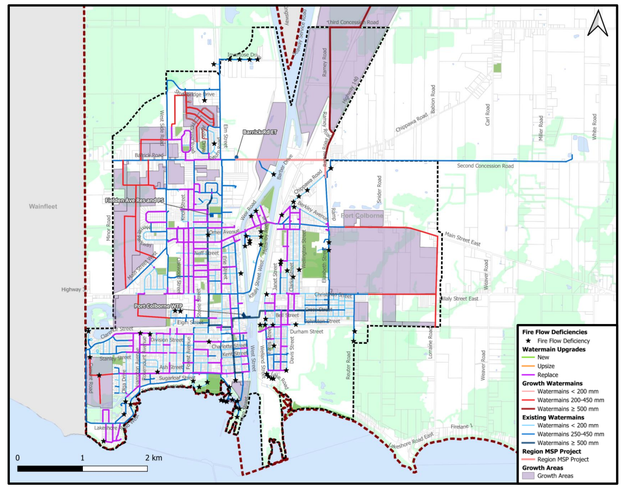


A: Buildout Capital Program

- City's planned watermain replacements
- Targets watermains with frequent breaks or ongoing issues
- Coordinates upgrades with planned municipal construction

Length Replaced**: 4.5 km**

Total System Deficiencies: **31%**

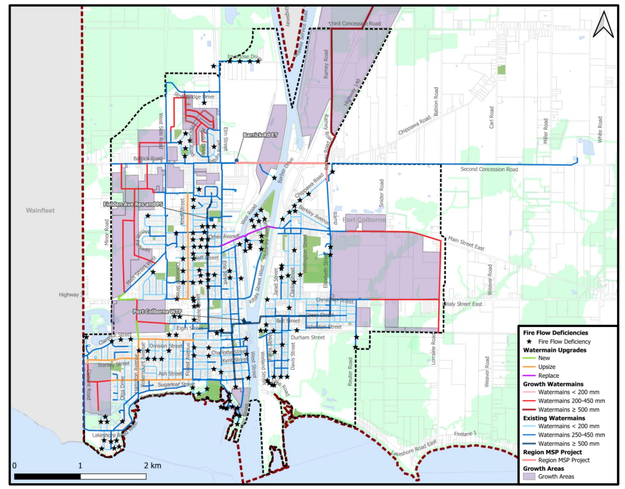


B: Cast Iron Replacement

- Including City's Capital Program
- Replaces all Cast Iron watermains in system
- Focused on localized renewal in areas with frequent watermain breaks
- Limited impact on overall system hydraulics

Length Replaced**: 30.9 km**

Total System Deficiencies: **11%**

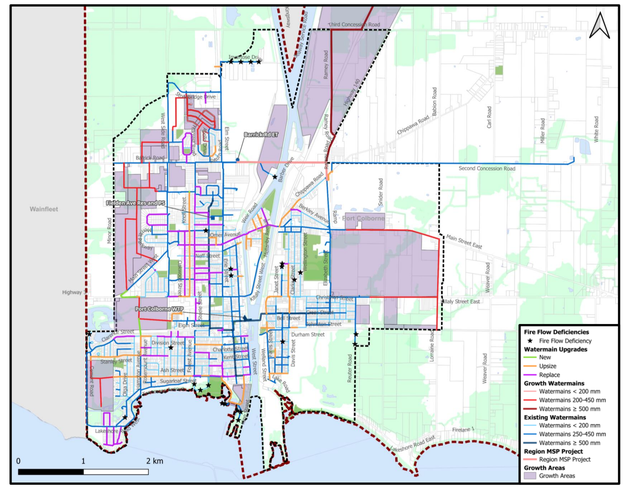


C: Sub-Trunk Loops

- Adds new sub-trunk watermains to enhance fire flow capacity with minimal watermain replacement
- Focused on system performance rather than watermain replacement
- Does not focus on Cast Iron watermains or City problem areas

Length Replaced**: 6.9 km**

Total System Deficiencies: **23%**



C+B: Sub-Trunk Loops & Target Upgrades

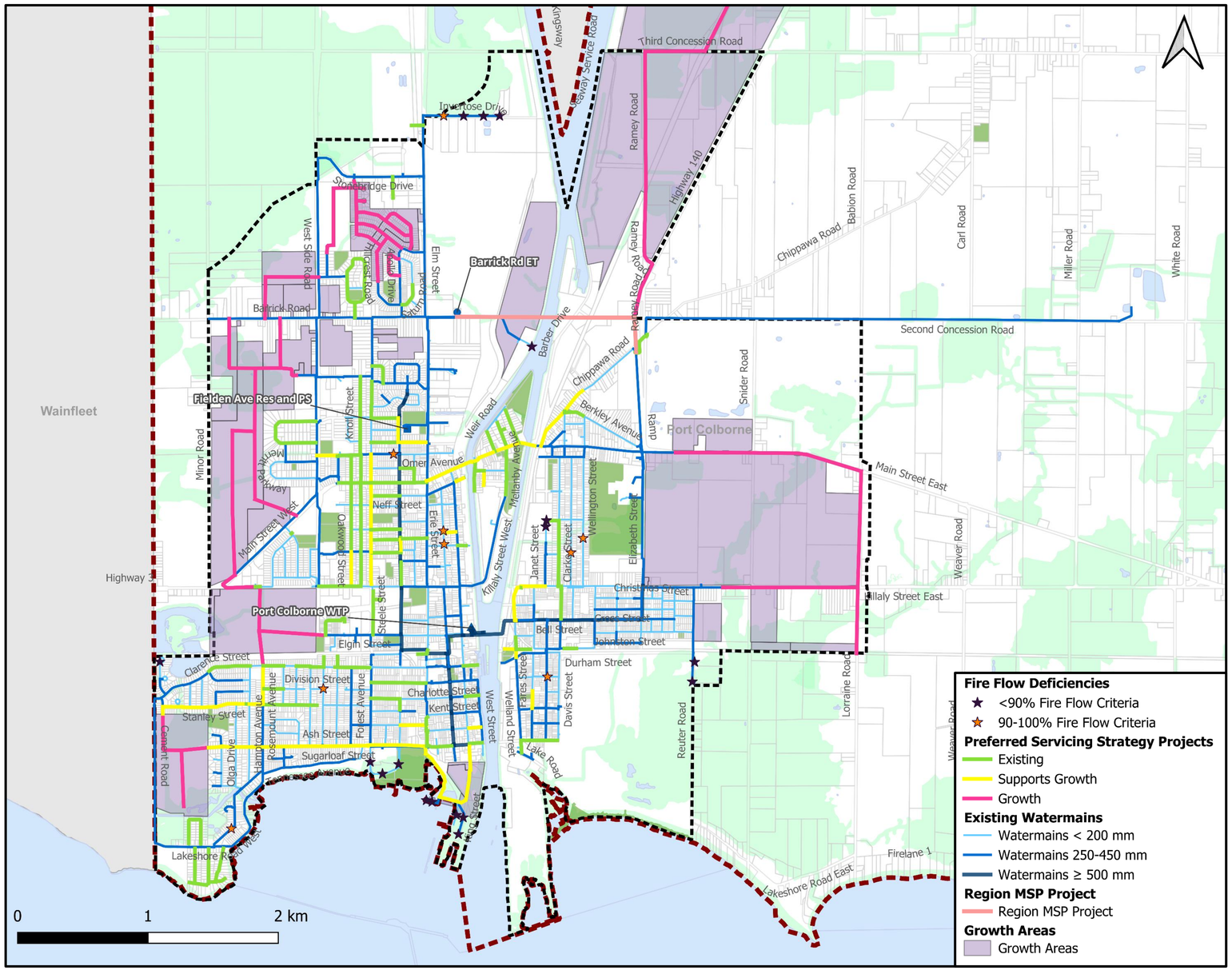
- Combines new looping with replacement of undersized watermains
- Aligned with Cast Iron watermains and watermain breaks
- Focuses on system reliability and addressing fire flow deficiencies

Length Replaced**: 26.1 km**

Total System Deficiencies: **4%**

	Financial	Technical	Environmental	Social & Cultural	Recommended Alternative
A: Buildout Capital Program	Medium	Medium	High	High	Not Recommended: Does not address large portion of fire flow deficiencies. To be included as part of overall upgrade plan.
B: Cast Iron Replacement	High	Low	High	Medium	Not Recommended: Provides no additional system resiliency and does not address all fire flow deficiencies
C: Sub-Trunk Loops	Medium	Medium	High	Medium	Not Recommended: Fails to address most fire flow deficiencies or watermain breaks; to be included as part of overall upgrade plan
C+B: Sub-Trunk Loops & Target Upgrades	High	High	High	Medium	**Recommended:** Looping provides additional system resiliency and target upgrades address watermain break issues and fire flow deficiencies

Preliminary Preferred Servicing Strategy



Balanced Approach

- **Alternative C+B (Sub-Trunk Loops and Target Upgrades)** provides the best mix of system resiliency with the looping and meeting fire flow requirements
- Trunk looping to support greenfield growth – 300 mm watermains to accommodate medium-density residential and industrial development

Targeted Investment

- Addressing both deficient areas and loop connectivity
- CI watermain lining and replacement to improve local fire flow
- Prioritize lining where feasible; replace where lining is not viable

Flexibility in Implementation

- Supports a phased approach – Capital Program upgrades can proceed first, followed by looping and local upgrades

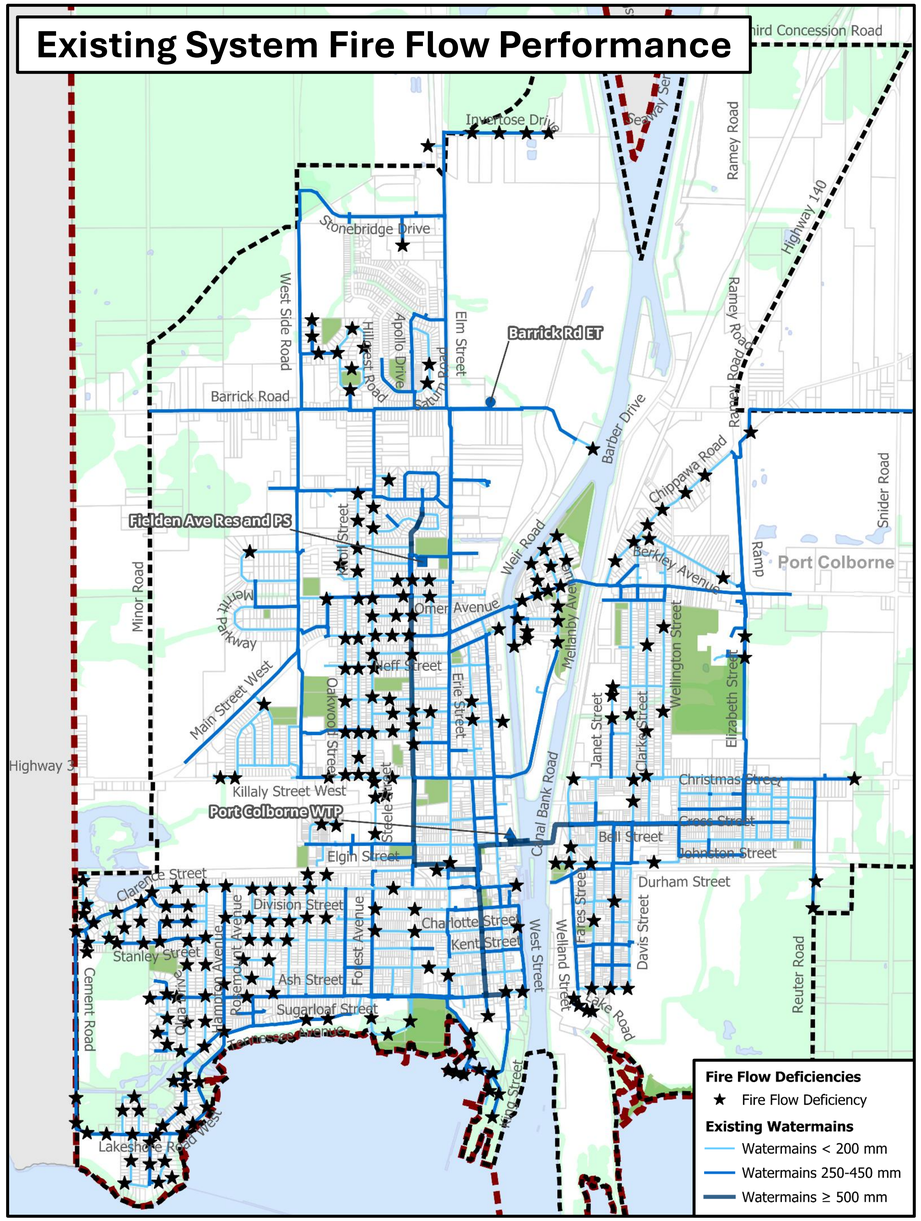
Meets Requirements

- Pressures within allowable range
- Meets fire flow requirements for >95% of system

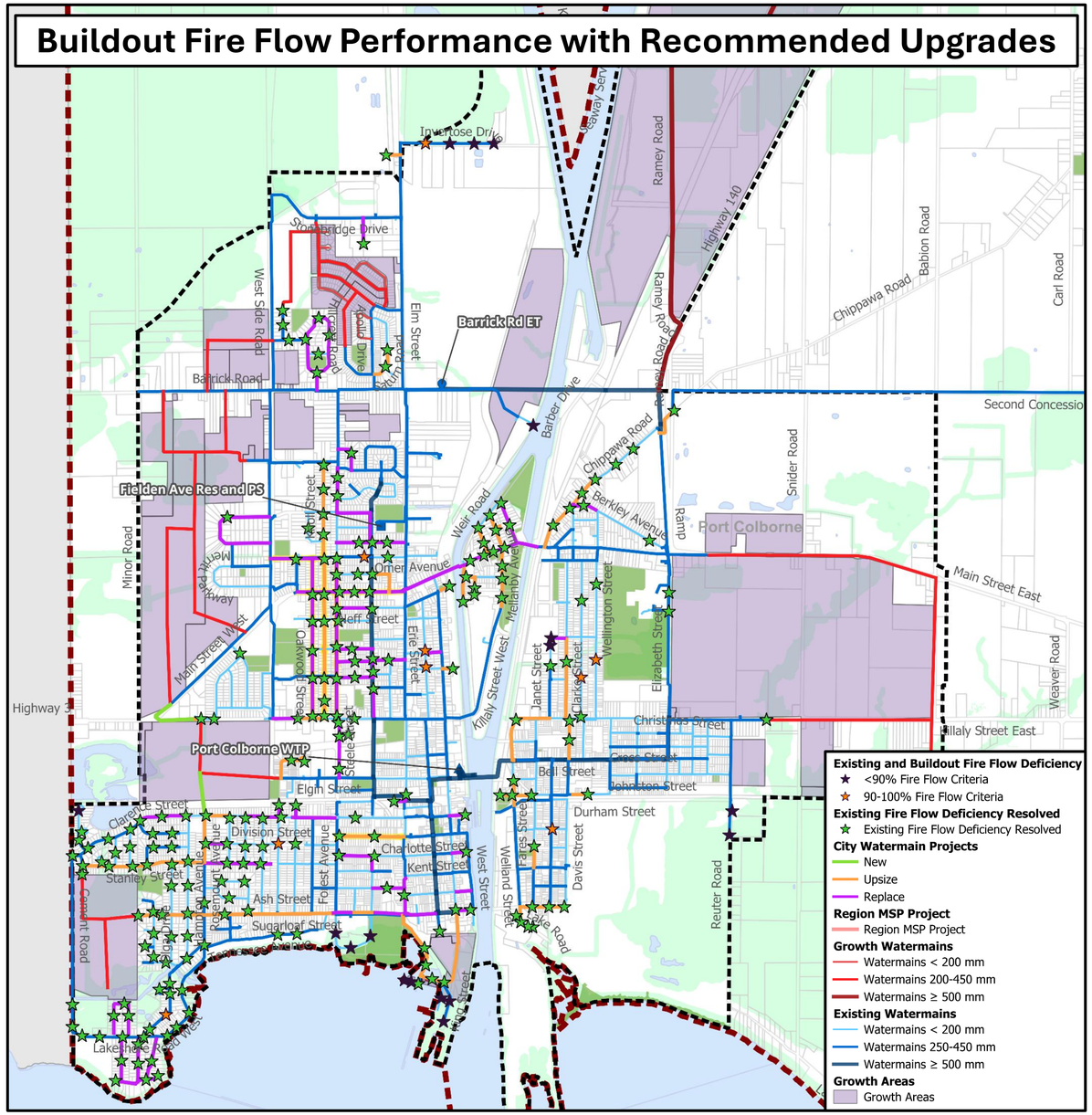
	Length (km)
New Watermains including Growth Areas	20.0
Line Existing Watermains	5.9
Upsize Existing Watermains	11.7
Watermain Replacements (potential lining based on condition)	8.5
Total	**46.1**

Water System Performance

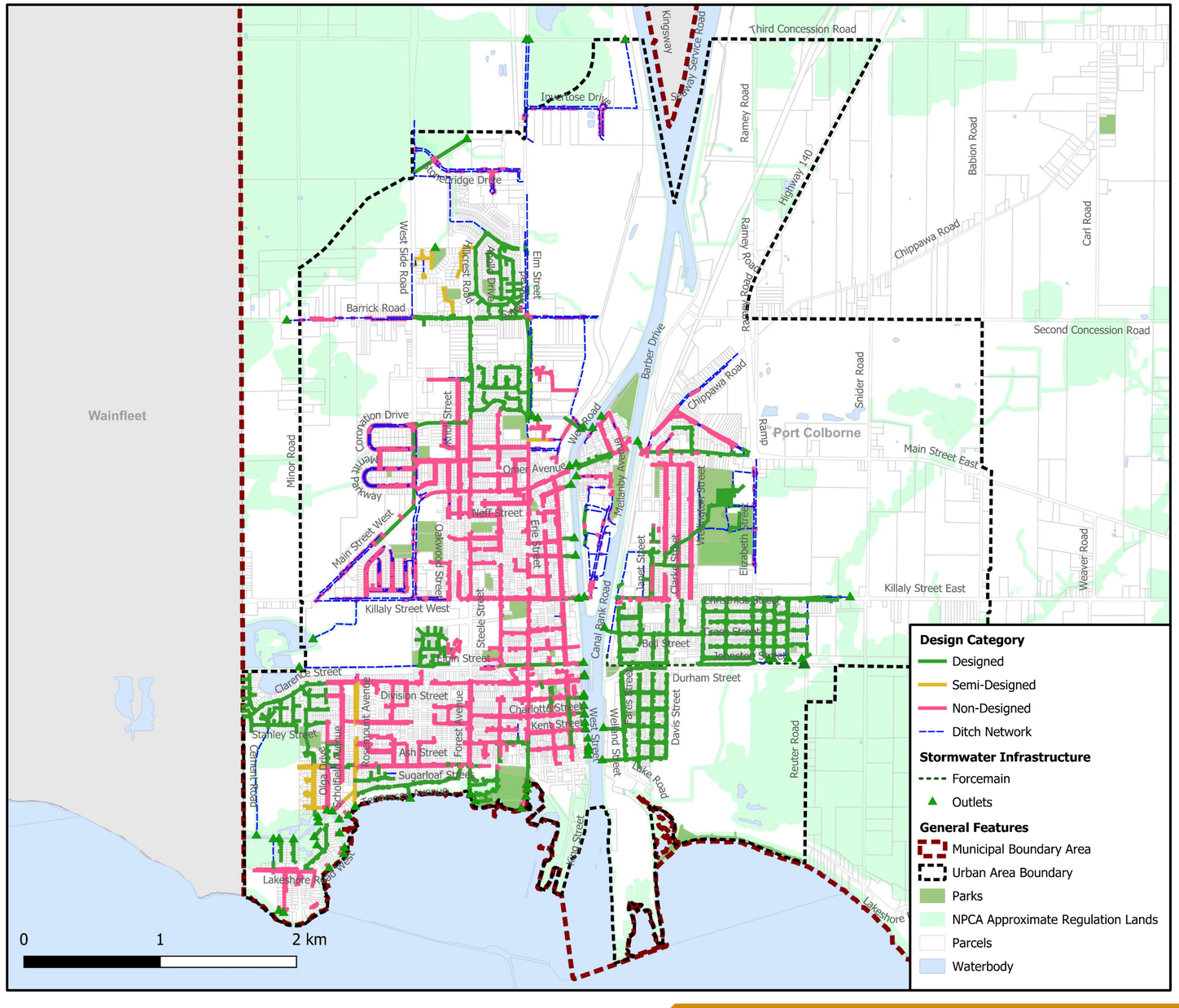
Existing System Fire Flow Performance



Buildout Fire Flow Performance with Recommended Upgrades



Stormwater System Overview



Designed Areas

- Newer stormwater system and trunk sewers
- Built to be consistent with engineering standards
- Generally meets intended design performance

Semi-Designed Areas

- Combination of designed and non-designed sections
- Portions added or modified over time
- Inconsistent design approaches across neighbourhoods

Non-Designed Areas

- System developed ad hoc over many years
- No clear underlying design standards
- Often characterized by parallel pipes and informal routing

Stormwater System Management Objectives

Designed Systems

- To meet the City's design criteria
- Identify localized upgrades and targeted investigations

Semi-Designed / Non-Designed Systems

- Risk and cost-based review
- Review both minor and major systems
- Identify areas needing major upgrades and develop a trunk servicing strategy

City Master Servicing Plan

Focuses on trunk conveyance to the outlets

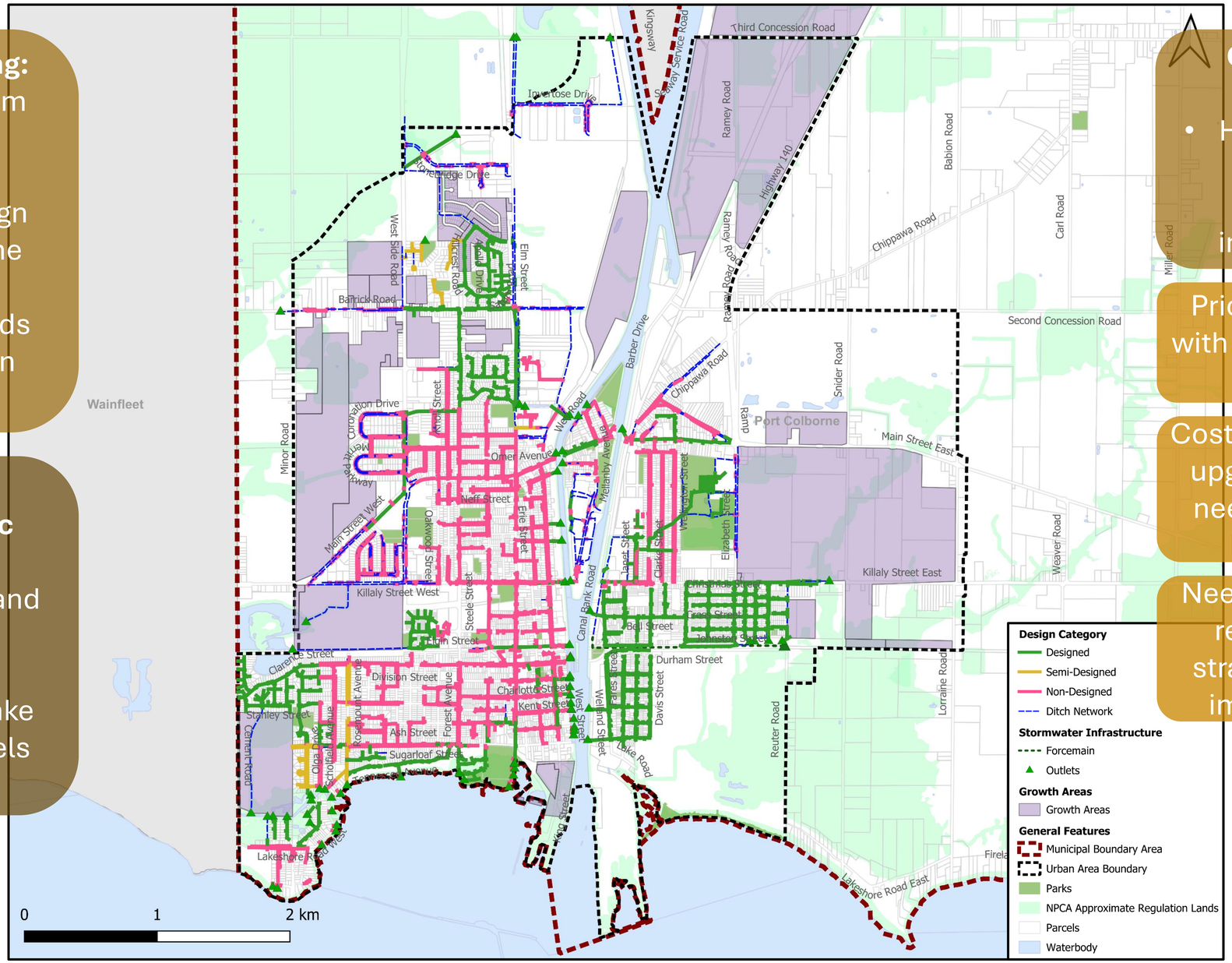
Major Deficiencies: Rebuild and redesign; requirement for major studies and investigation to confirm design

Moderate Deficiencies: Trunk upgrades prioritized; identify key investigation areas

Stormwater System Opportunities and Constraints

System Understanding:
- Uncertainty in system configuration and condition
- Mix of different design standards across the network
- Many neighbourhoods lack a formal design basis

Overland & Hydraulic Constraints
- Limited formal overland flow routes
- Outlet capacity restrictions due to lake and canal water levels



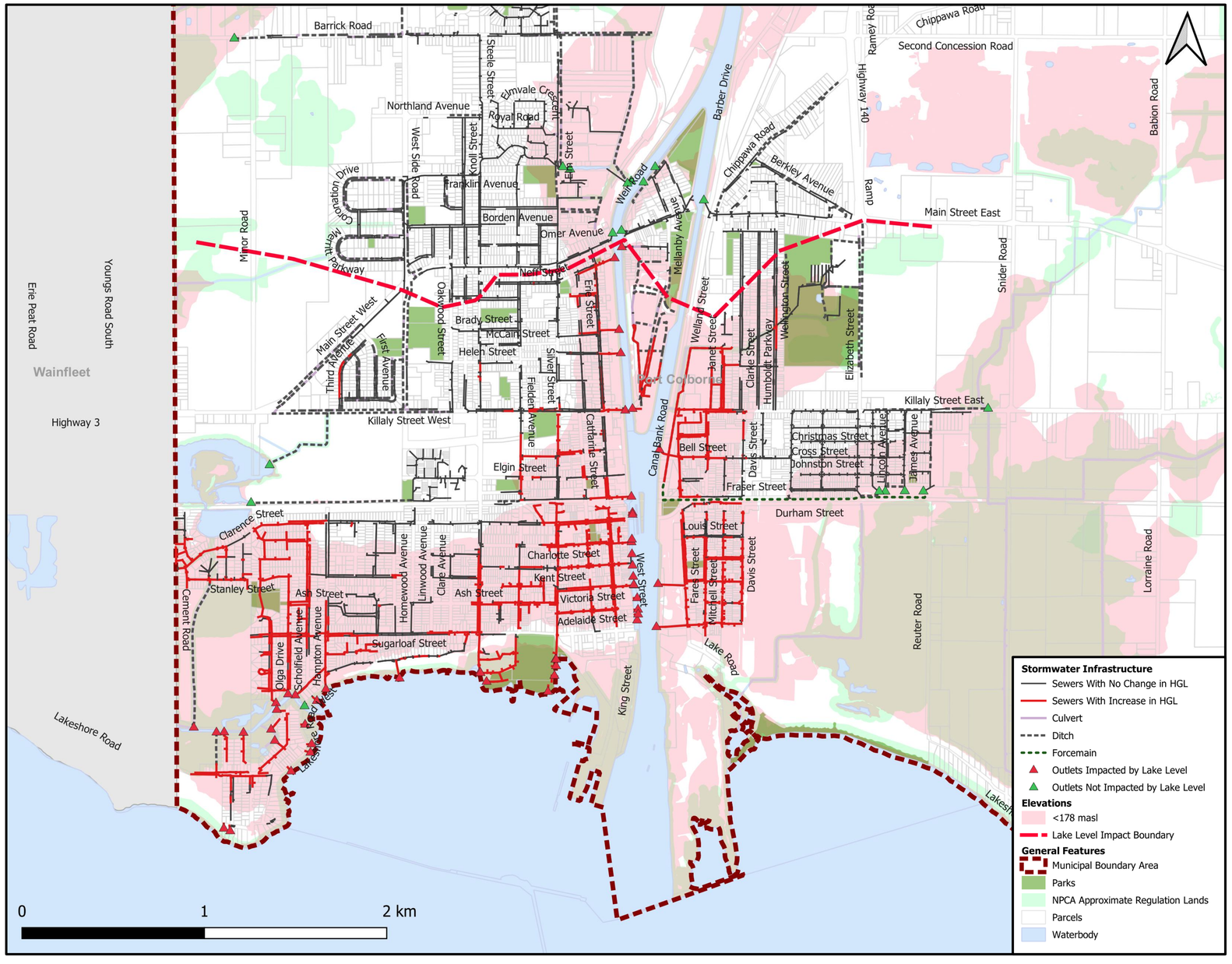
Construction & Cost Considerations
- High cost and complexity of upgrades
- Need to balance investment with priorities

Prioritize solutions in areas with known history of flooding issues

Cost to implement full system upgrades not feasible – will need to prioritize upgrades based on system risk

Need to develop a long-term rehab and replacement strategy to manage system improvements over time

Lake and Canal Level Impacts



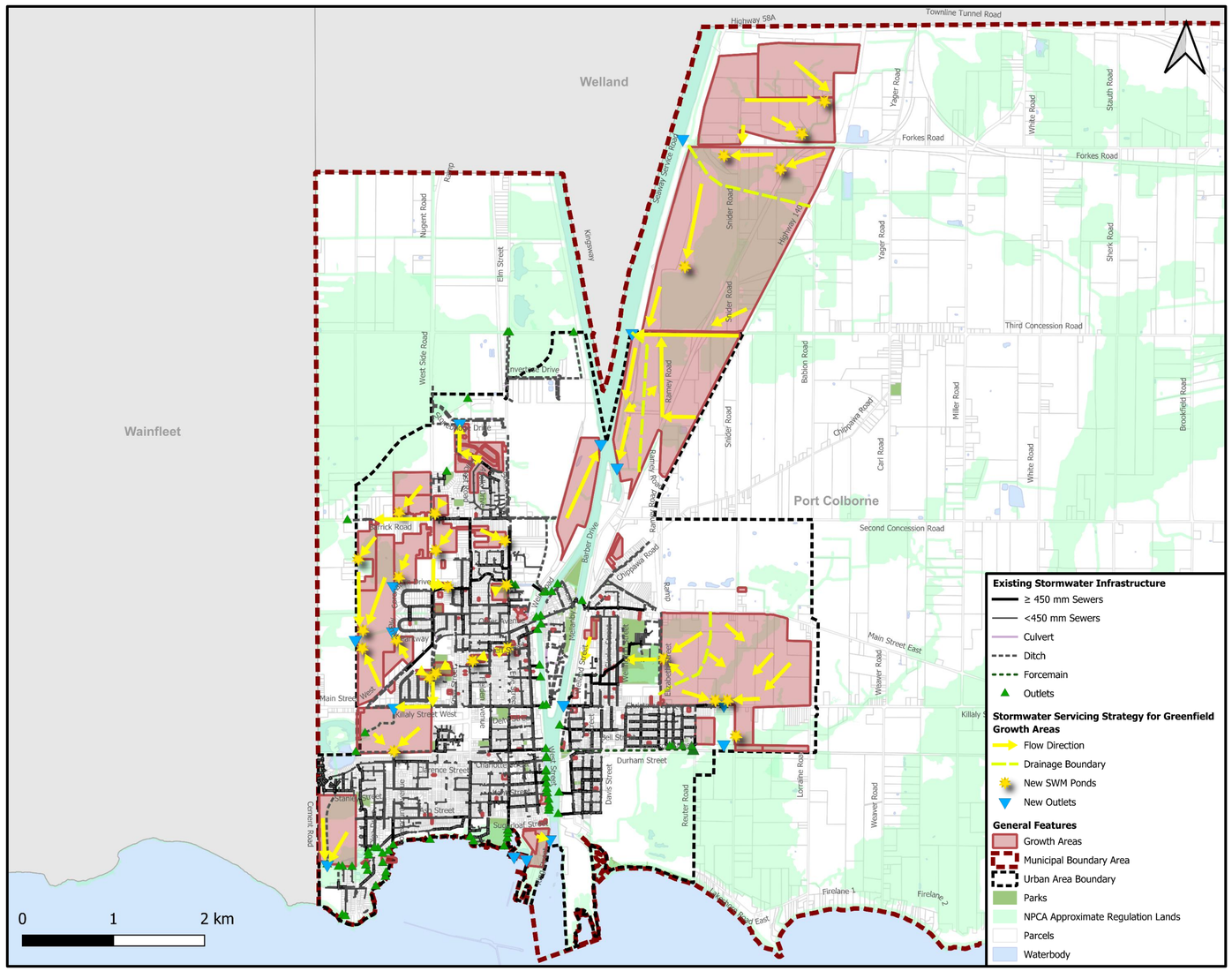
Lake Level Considerations

- Influenced by long-term seasonal trends
- Additional impacts from seiche (storm) events

Welland Canal Levels

- Water levels regulated by the Seaway
- Analysis based on reported operational levels

Growth Servicing Needs



Increasing Impervious Areas

- Growth adds more hard surfaces (roads, rooftops, driveways), which increases stormwater runoff and reduces natural infiltration

On-Site Stormwater Management

- New developments are generally required to manage runoff on-site so that post-development peak flows match pre-development conditions

Existing Built-Up Areas

- In established neighbourhoods, future growth is assumed not to increase peak flows, but may require targeted improvements or controls

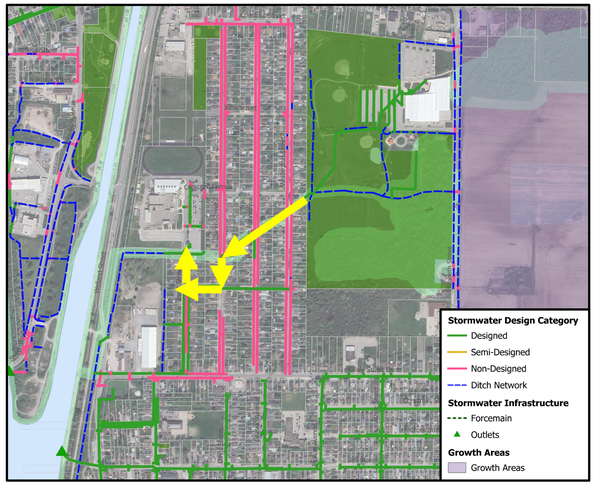
Provisional Planning for Upgrades

- Growth planning identifies:
  - General system needs
  - Potential improvement areas
  - Suitable outlets to tie into the existing stormwater network

Need for Site Specific Designs

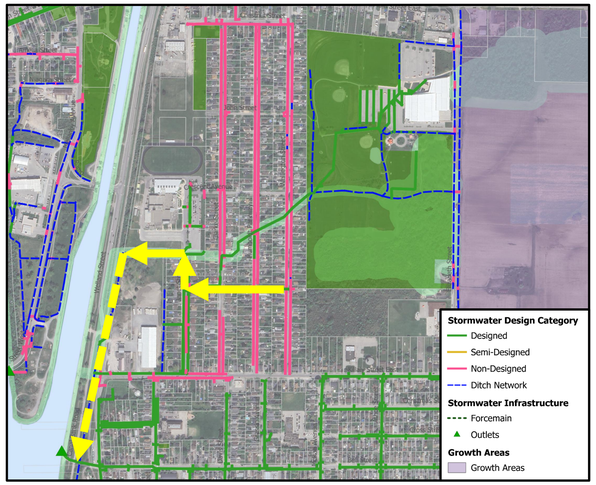
- Individual developments must complete detailed stormwater management (SWM) studies to confirm appropriate solutions to ensure compatibility with the local system

Clarke Street Drainage Servicing Concepts & Evaluation



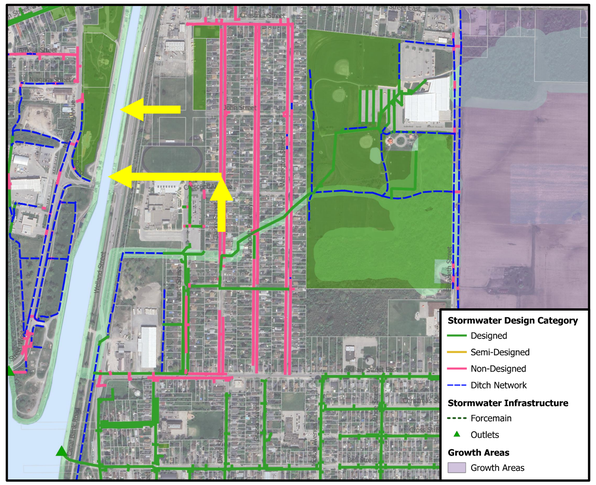
Sewer Upgrades Existing Alignment

- Utilizes the existing sewer network
- Faces access and encroachment issues
- Local sewers remain undersized for future development
- Trunk sewer still requires rehabilitation or replacement



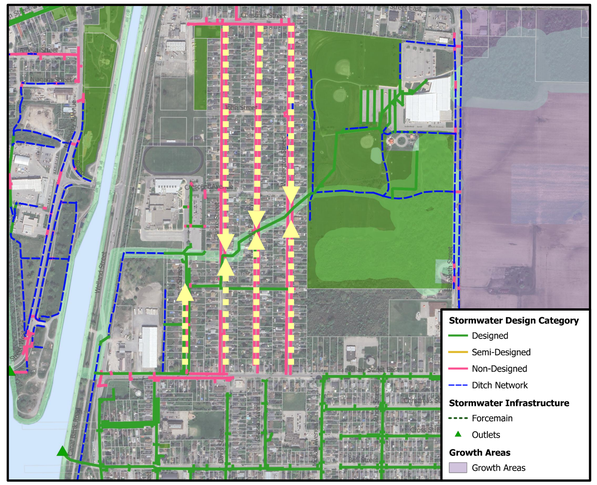
Trunk Sewer Realignment

- Shifts the trunk sewer into road rights-of-way for better access and long-term maintenance
- Enables system optimization and flow diversion opportunities
- Requires reconstruction of local sewers and may involve routing through parklands



Diversion to New Outfalls

- Potential to reduce the amount of upstream sewer upgrading and relieve downstream capacity issues
- Outfall placement options are limited by canal/lock infrastructure
- Would likely require land acquisition, further EA processes, and still does not address trunk sewer rehab needs

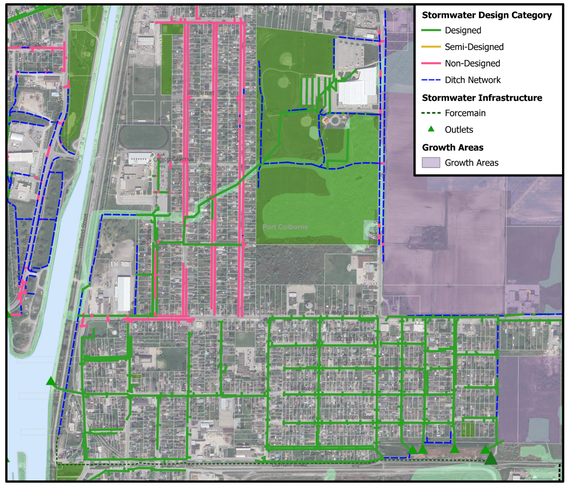


Localized Sewer Upgrades

- Addresses localized capacity issues at lower cost
- Does not address broader system wide issues

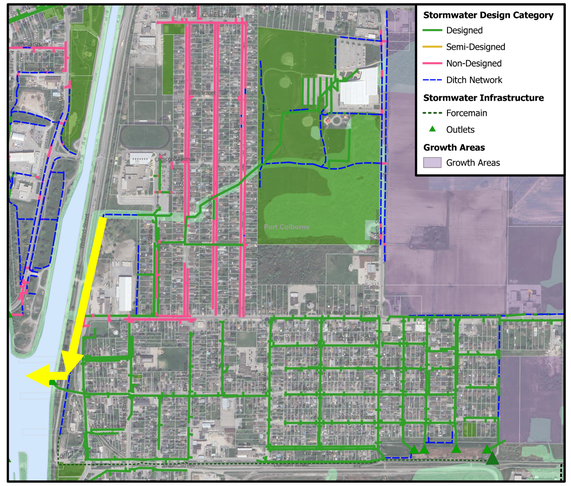
	Financial	Technical	Environmental	Social & Cultural	Recommended Alternative
Sewer Upgrades Existing Alignment	Medium	Medium	High	Medium	Not Recommended: Does not address long-term O&M issues of the existing trunk sewer and provides limited opportunity to address existing local system deficiencies
Trunk Sewer Realignment	High	High	High	High	**Recommended:** Addresses the long-term O&M issues for the existing trunk sewer and provides opportunity to reconfigure local system
Diversion to New Outfalls	Medium	Low	Medium	Medium	Not Recommended: Due to technical challenges related to securing and constructing a new outlet; does not address long-term O&M issues of existing trunk sewer
Localized Sewer Upgrades	Low	Low	High	High	**Recommended:** To address localized issues

Clarke Street Outlet Servicing Concepts & Evaluation



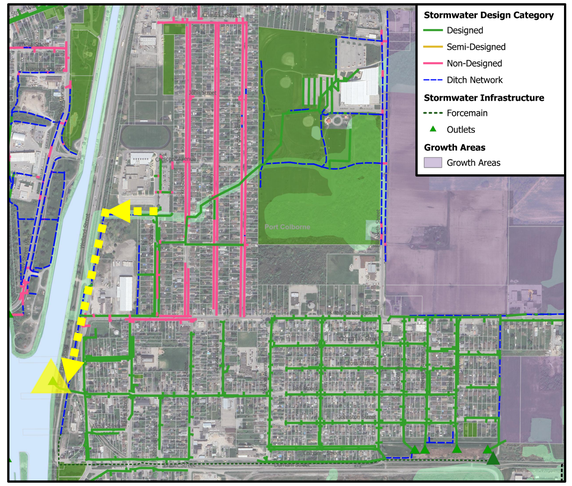
Status Quo

- Maintains the existing system with minimal disruption
- Relies on current storage to manage peak flows
- Does not provide protection against high lake levels



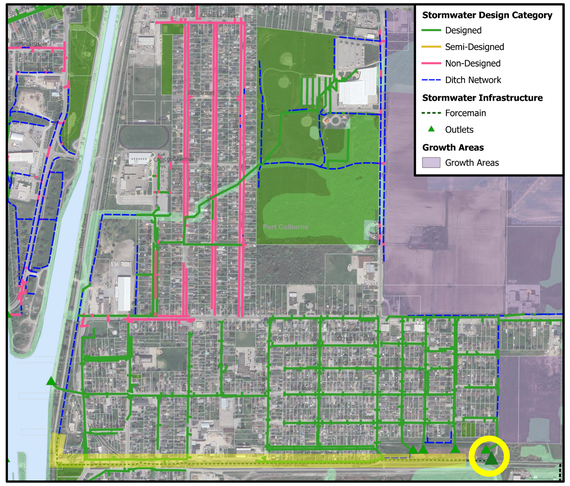
Capacity Upgrades

- Increases conveyance to reduce flooding risk
- Does not protect against high lake levels
- Requires coordination of works in the canal



Flood Protection & Storage Improvements

- Provides protection against high lake levels
- Increases storage to manage peak flows and/or flows during high lake levels
- May involve environmental impacts from canal bank/ditch work and requires coordinated construction in the canal

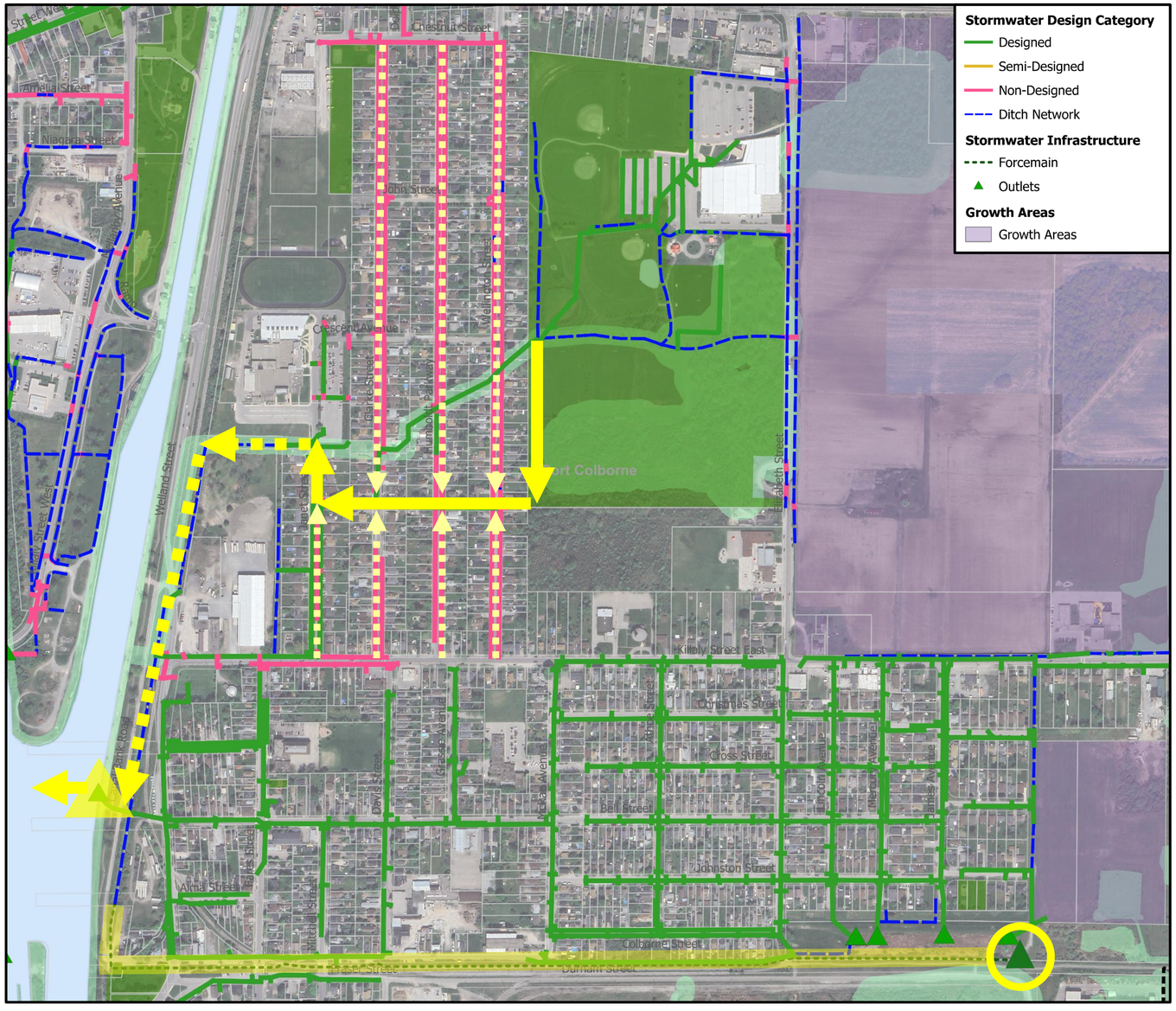


Real-time Control

- Uses operational controls to optimize existing infrastructure at relatively low cost
- Minor increase in flooding risk in the Elizabeth Street Area

	Financial	Technical	Environmental	Social & Cultural	Recommended Alternative
Status Quo	Low	Low	High	Low	Not Recommended: Does not address flooding issues
Capacity Upgrades	Medium	Medium	Medium	Medium	**Recommended as part of Hybrid Solution:** Minimizes risk of flooding, and ensures storage is available during high lake levels
Flood Protection & Storage Improvements	Medium	High	Low	High	**Recommended as part of Hybrid Solution:** Best protection against high lake levels
Real-time Control	Medium	Medium	High	High	**Recommended as part of Hybrid Solution:** Low-cost solution and provides additional benefit.

Clarke Street Preliminary Preferred Servicing Strategy



Trunk Sewer Realignment & System Reconstruction

- Realign the trunk sewer along **Russell Avenue**
- Fully reconstruct the local sewer network north of **Killaly Street** to support future growth and reliability.

Sewer Investigation & Inspection

- Conduct detailed inspection and condition assessments of existing sewer infrastructure to target rehabilitation needs and validate design assumptions

Localized Capacity Enhancements

- Implement targeted sewer upgrades in the **Bell Street Area** to resolve localized capacity bottlenecks

Hybrid Outlet Improvements

- Increase outlet capacity to better manage system flows
- Integrate flood-protection measures to guard against high lake levels

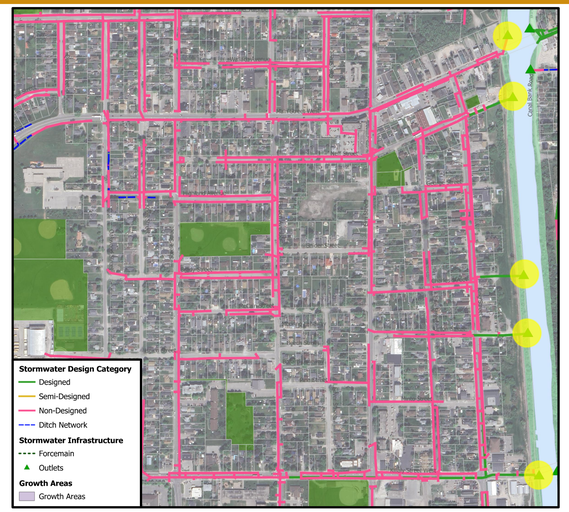
Canal Bank Channel Rehabilitation

- Rehabilitate and strengthen the drainage channel along **Canal Bank Road**
- Where feasible, expand storage capacity through in-ditch improvements or retention features

Real-Time Control Strategy

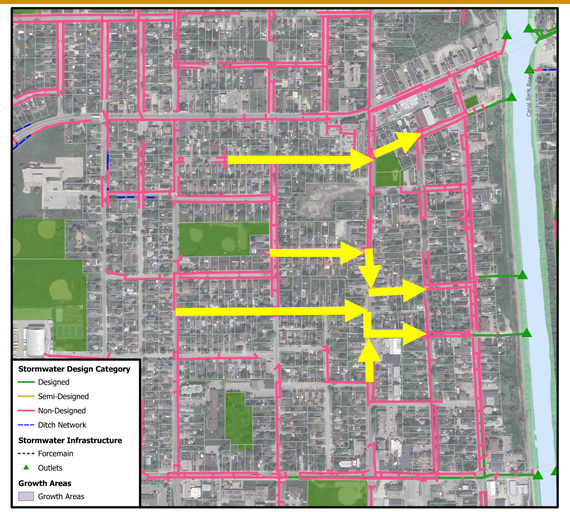
- Install real-time control mechanisms at **Johnston Pump Station** to delay pumping when canal storage in use

Elm Street & King Street North Servicing Concepts & Evaluation



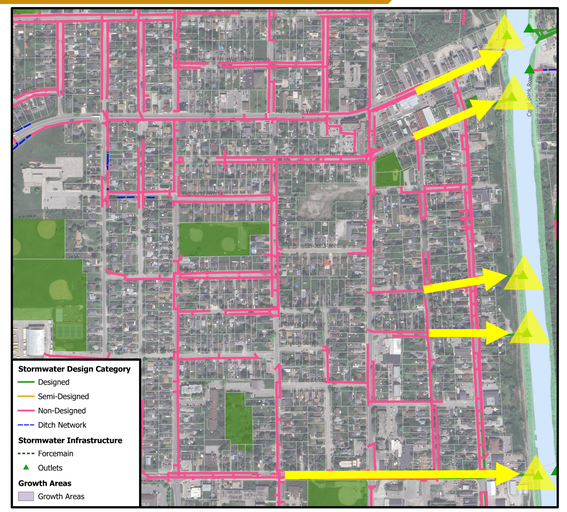
Outlet Flood Protection

- Inspect and rehab outlets
- Partial protection from high lake levels
- Reduces backwater effects at the outlet
- No increase in system capacity
- Still vulnerable during extreme lake conditions
- Requires canal-side construction



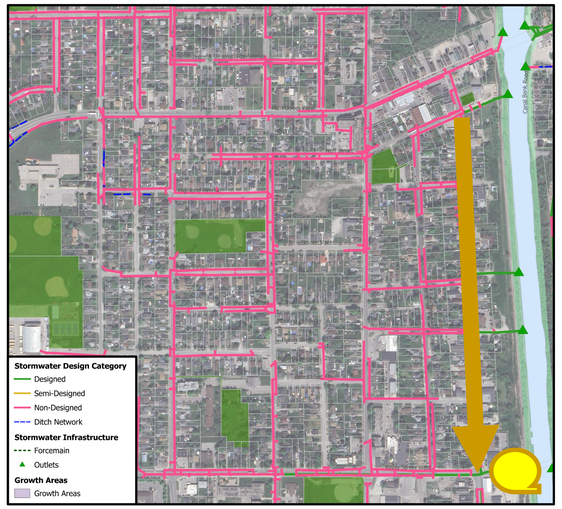
Localized Sewer Upgrades

- Leverage existing outlets and capacity
- Improve conveyance and capacity
- Addresses localized capacity issues
- Limited by existing outlet capacity
- No protection from high lake levels



Outlet Capacity Upgrades

- Increase outlet capacity
- Paired with local network improvements
- Can add storage benefits with flood protection measures
- Outlet options constrained by canal lock locations
- Still susceptible to high lake levels
- Requires coordinated work in the canal

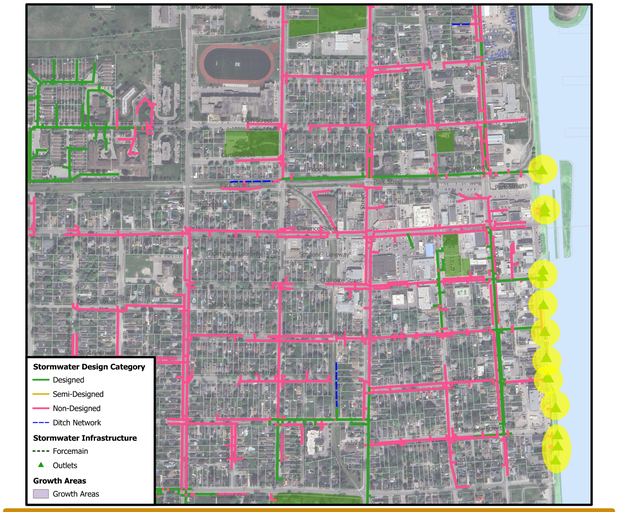


Diversion and Pumping

- New trunk sewer and pump station
- Pump operates during high lake levels
- Protection from high lake levels
- Substantial improvement to overall system performance
- Requires significant new infrastructure
- Higher long-term operating costs due to pumping

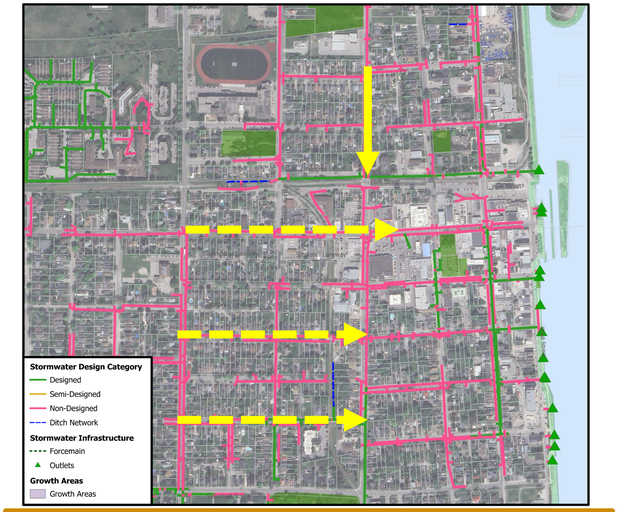
	Financial	Technical	Environmental	Social & Cultural	Recommended Alternative
Outlet Flood Protection	Low	High	Medium	High	**Recommended as part of Hybrid Solution:** Provides partial protection against high lake levels
Localized Sewer Upgrades	Low	High	High	High	**Recommended as part of Hybrid Solution:** Targeted upgrades to address highest flood risk areas
Outlet Capacity Upgrades	Medium	Medium	Medium	Medium	Not Recommended: Outlets sufficiently sized to support existing design objectives. Upsizing provides marginal benefit
Diversion and Pumping	High	Low	Low	Low	Not Recommended: High implementation and operational cost.

Elm Street & King Street South Servicing Concepts & Evaluation



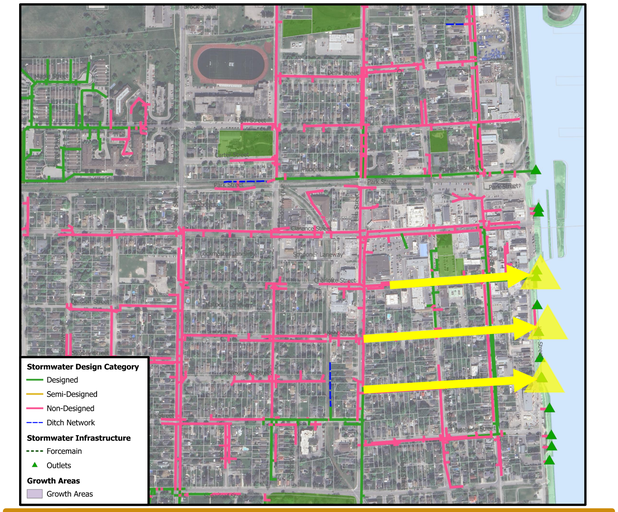
Outlet Flood Protection

- Inspect and rehab outlets
- Partial protection from high lake levels
- Reduces backwater effects at the outlet
- No increase in system capacity
- Still vulnerable during extreme lake conditions
- Requires canal-side construction



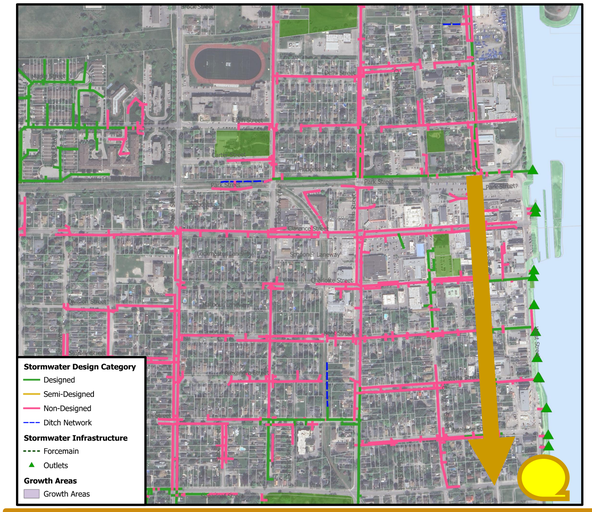
Redirection of Drainage Areas

- Leverage existing outlets and capacity
- Improve conveyance and capacity
- Addresses localized capacity issues
- Limited by existing outlet capacity
- No protection from high lake levels



Outlet Capacity Upgrades

- Increase outlet capacity
- Paired with local network improvements
- Can add storage benefits with flood protection measures
- Outlet options constrained by canal lock locations
- Still susceptible to high lake levels
- Requires coordinated work in the canal



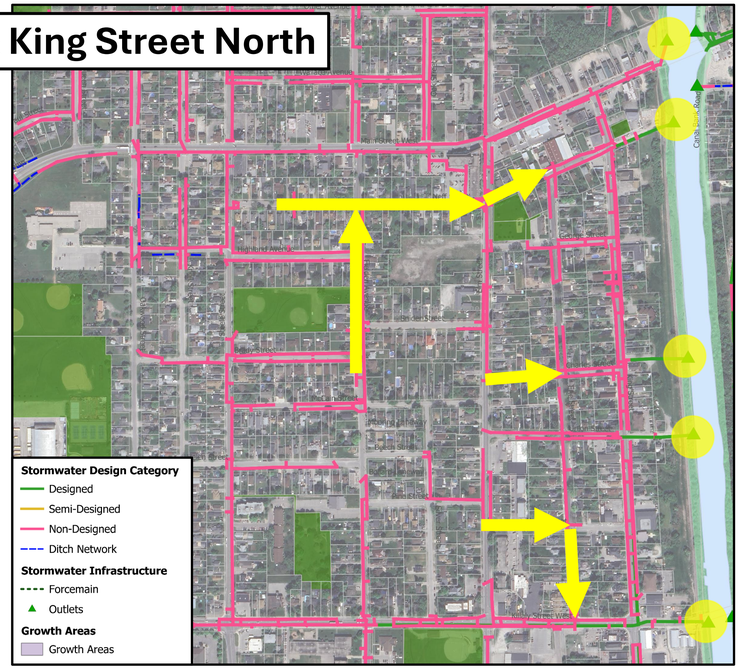
Diversion and Pumping

- New trunk sewer and pump station
- Pump operates during high lake levels
- Protection from high lake levels
- Substantial improvement to overall system performance
- Requires significant new infrastructure
- Higher long-term operating costs due to pumping

	Financial	Technical	Environmental	Social & Cultural	Recommended Alternative
Outlet Flood Protection	Low	High	Medium	High	**Recommended:** Provides partial protection against high lake levels
Redirection of Drainage Areas	Medium	Medium	High	High	Not Recommended: Limited by capacity of existing drainage network
Outlet Capacity Upgrades	Medium	Medium	Medium	Medium	Not Recommended: Outlets sufficiently sized to support existing design objectives. Upsizing provides marginal benefit
Diversion and Pumping	High	Low	Low	Low	Not Recommended: High implementation and operational cost.

Elm Street and King Street Preliminary Preferred Strategy

Elm Street & King Street North



Sub-Trunk Improvements

- Construct a new trunk sewer along **Neff Street** to enhance system capacity and connectivity
- Build a new trunk sewer along **Field Avenue** to support future growth and reliability

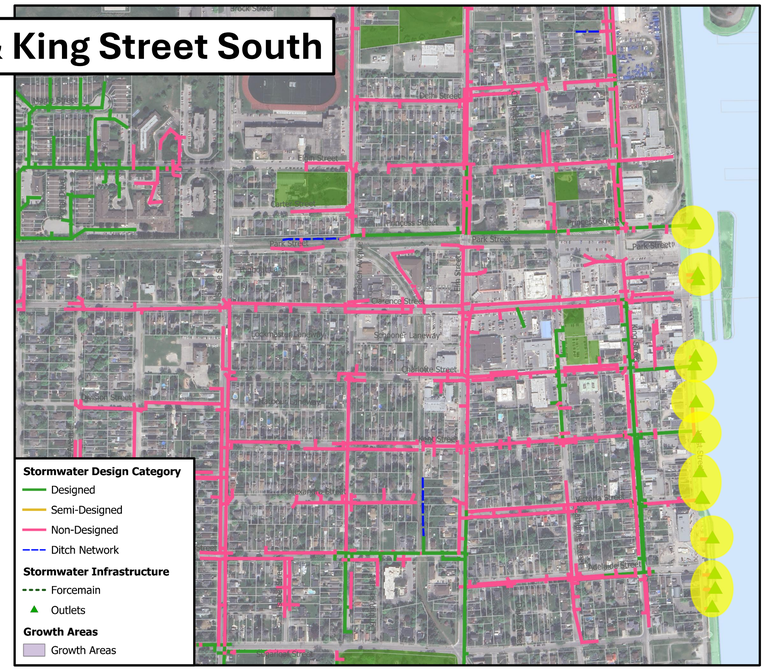
Local Sewer Improvements

- Implement local sewer improvements on **Charles Street** to address existing deficiencies
- Upgrade local sewers on **Minto** and **Erie Streets** to improve flow and service reliability

Outlet Improvements

- Enhance outlet performance through inspection, rehabilitation, and flow protection measures

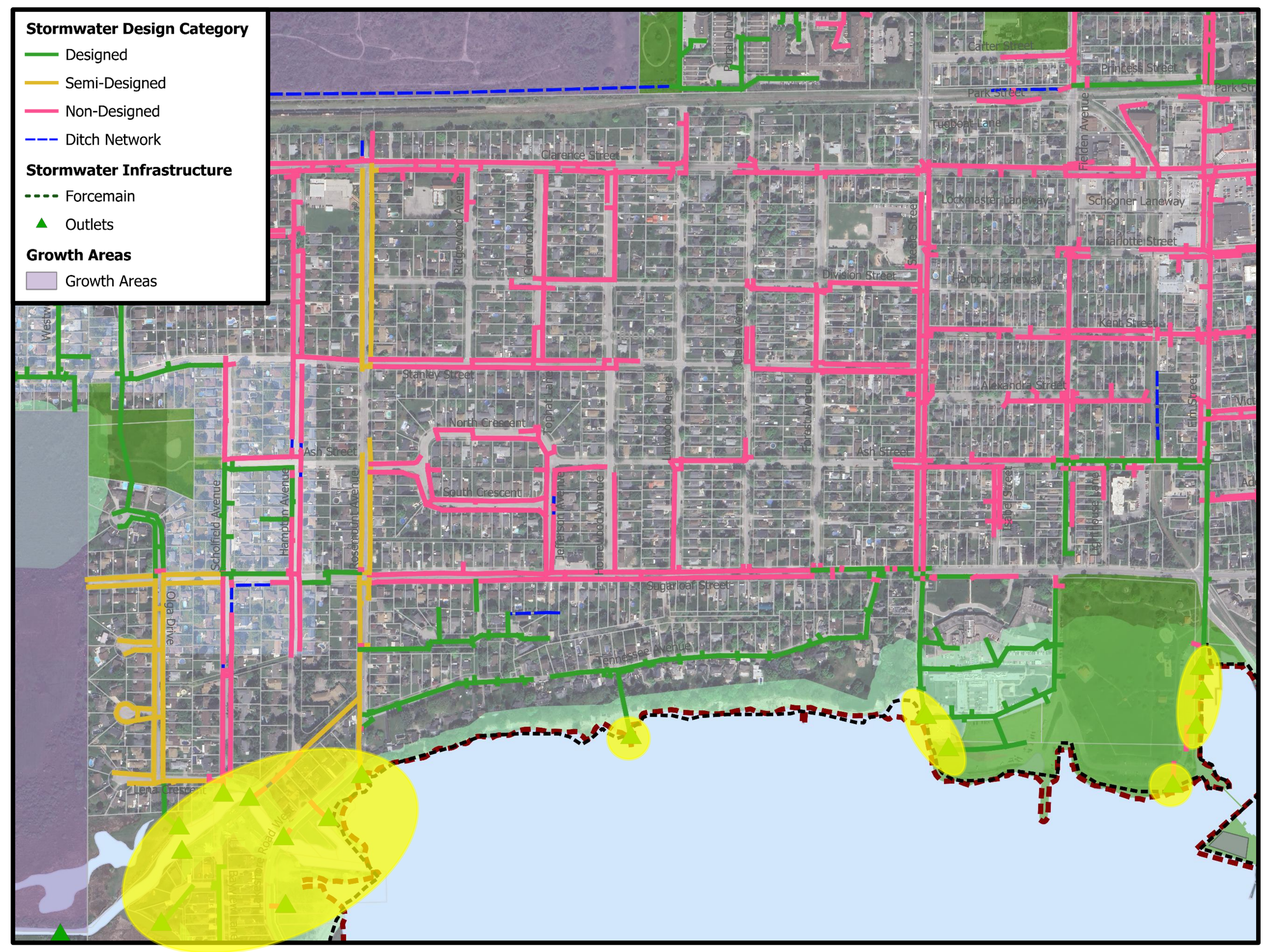
Elm Street & King Street South



Outlet Improvements

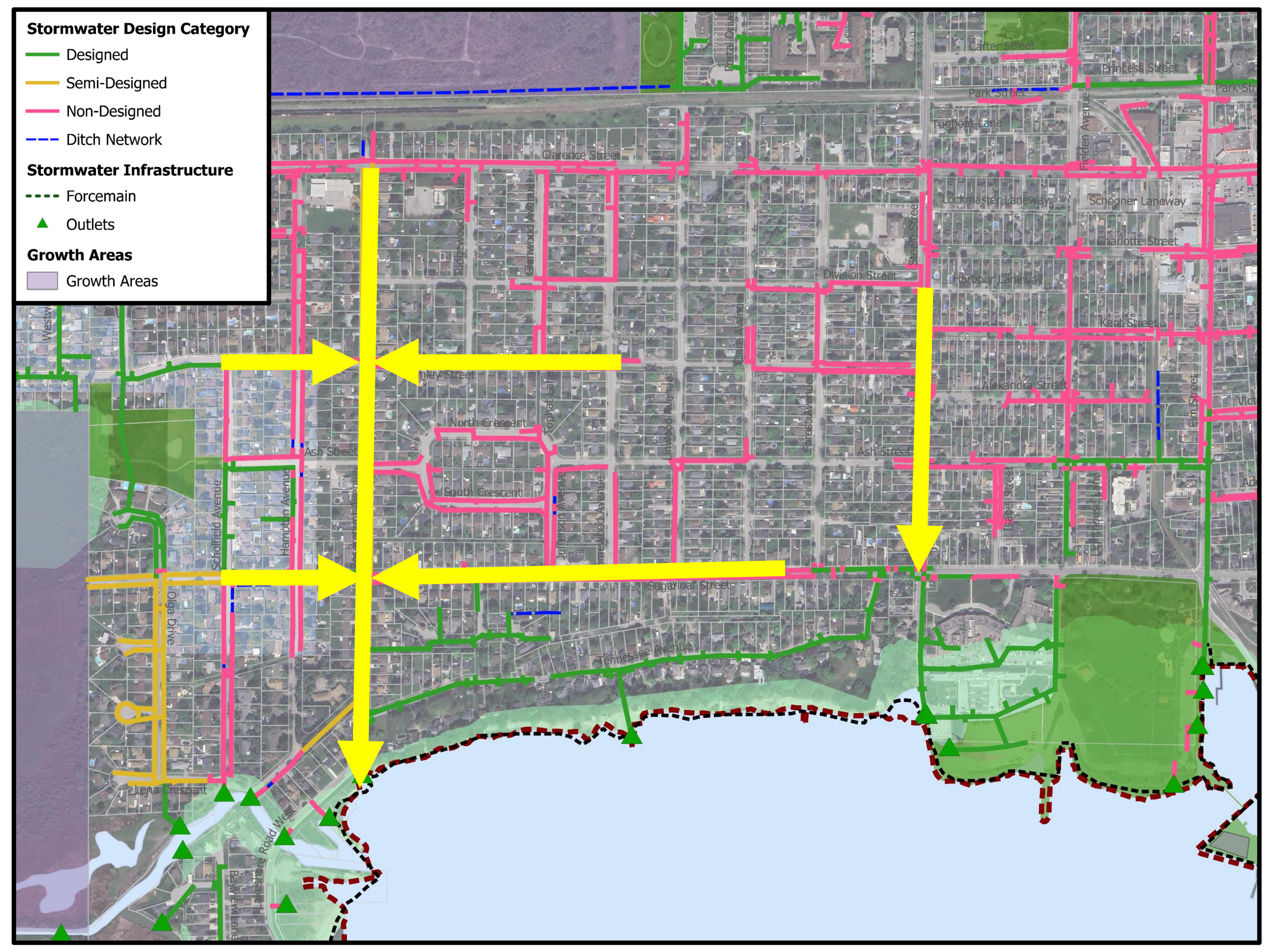
- Inspect and rehabilitate outlets to maintain structural integrity and hydraulic performance
- Implement flow protection measures to reduce erosion and enhance system reliability

Sugarloaf Area Servicing Concepts & Evaluation



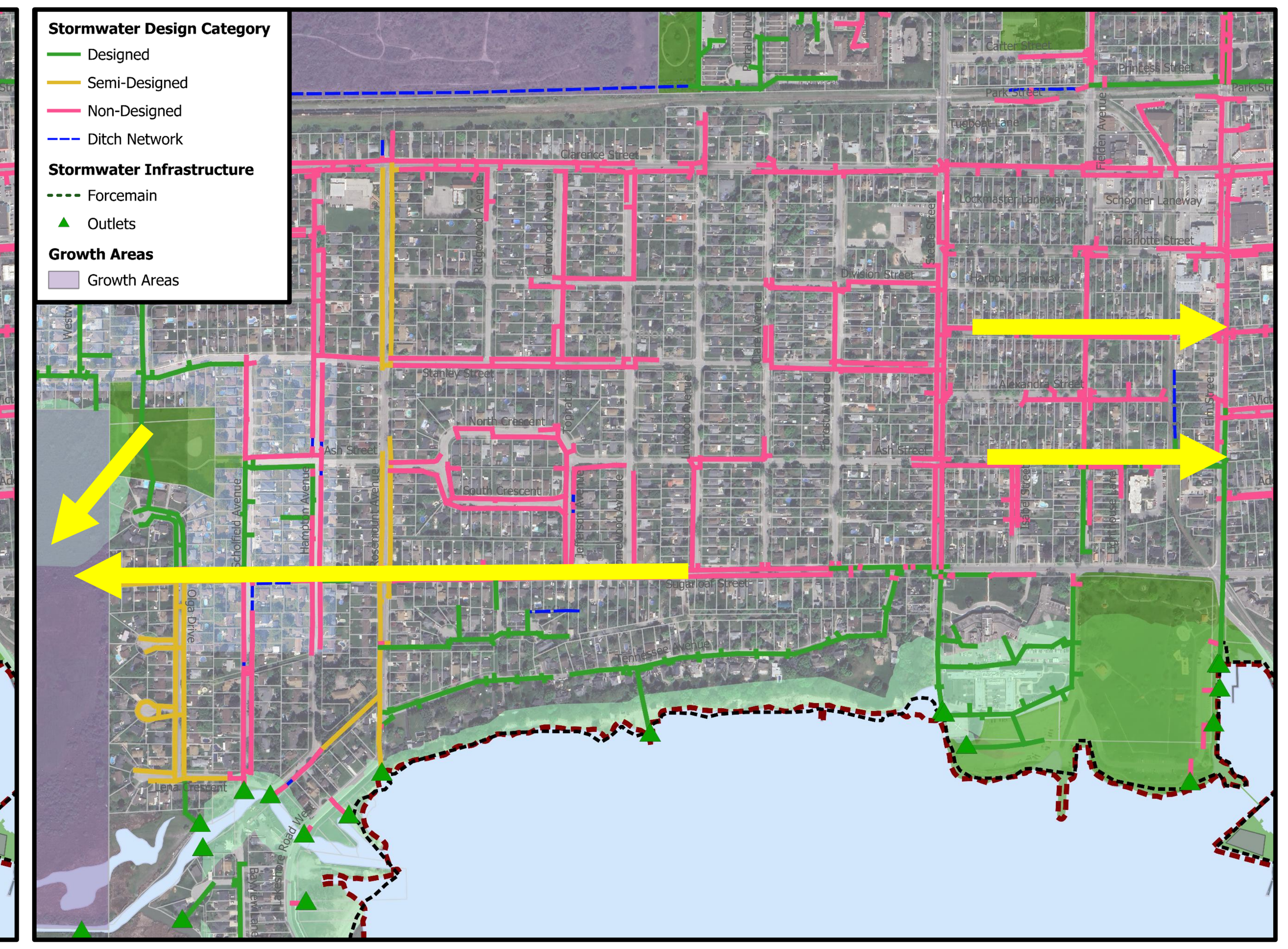
Outlet Flood Protection

- Flood protection at outlets to reduce high lake level impacts
- Inspect and rehabilitate outlets to maintain performance
- Requires lakeshore work
- Does not increase system capacity for growth areas



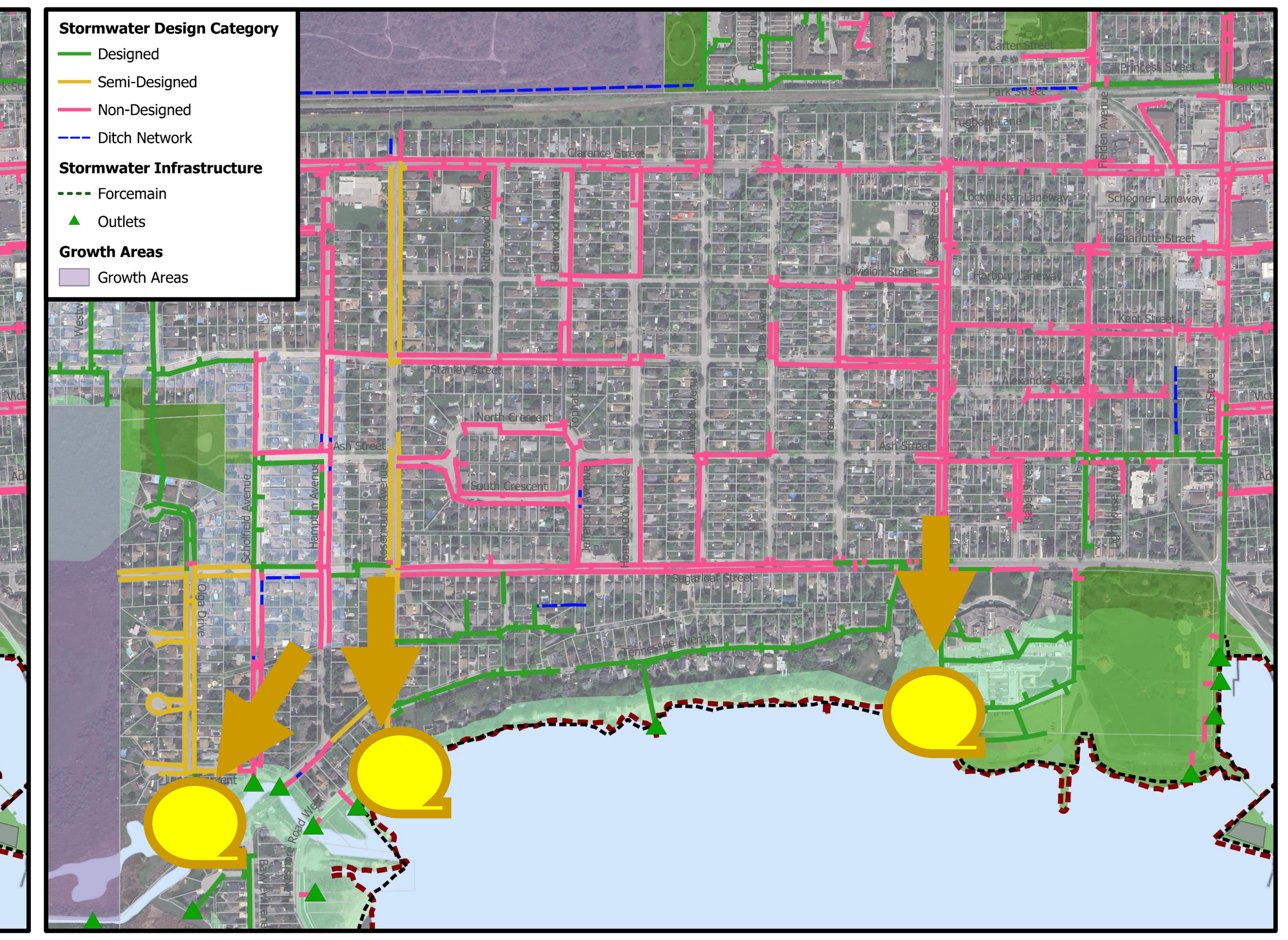
Improve Conveyance to Existing Outlets

- Construct new trunk sewers and improve outfalls to increase capacity
- Address existing system condition and align with planned road improvements
- Supports future growth areas
- May require substantial upgrades and lakeshore work



Divert Flows to Other Catchments

- Enhance capacity in undesigned systems to better serve local areas
- Divert minor flows to East and West catchments to reduce trunk demand
- Limited effect on overall system capacity
- Timing and downstream development may constrain effectiveness

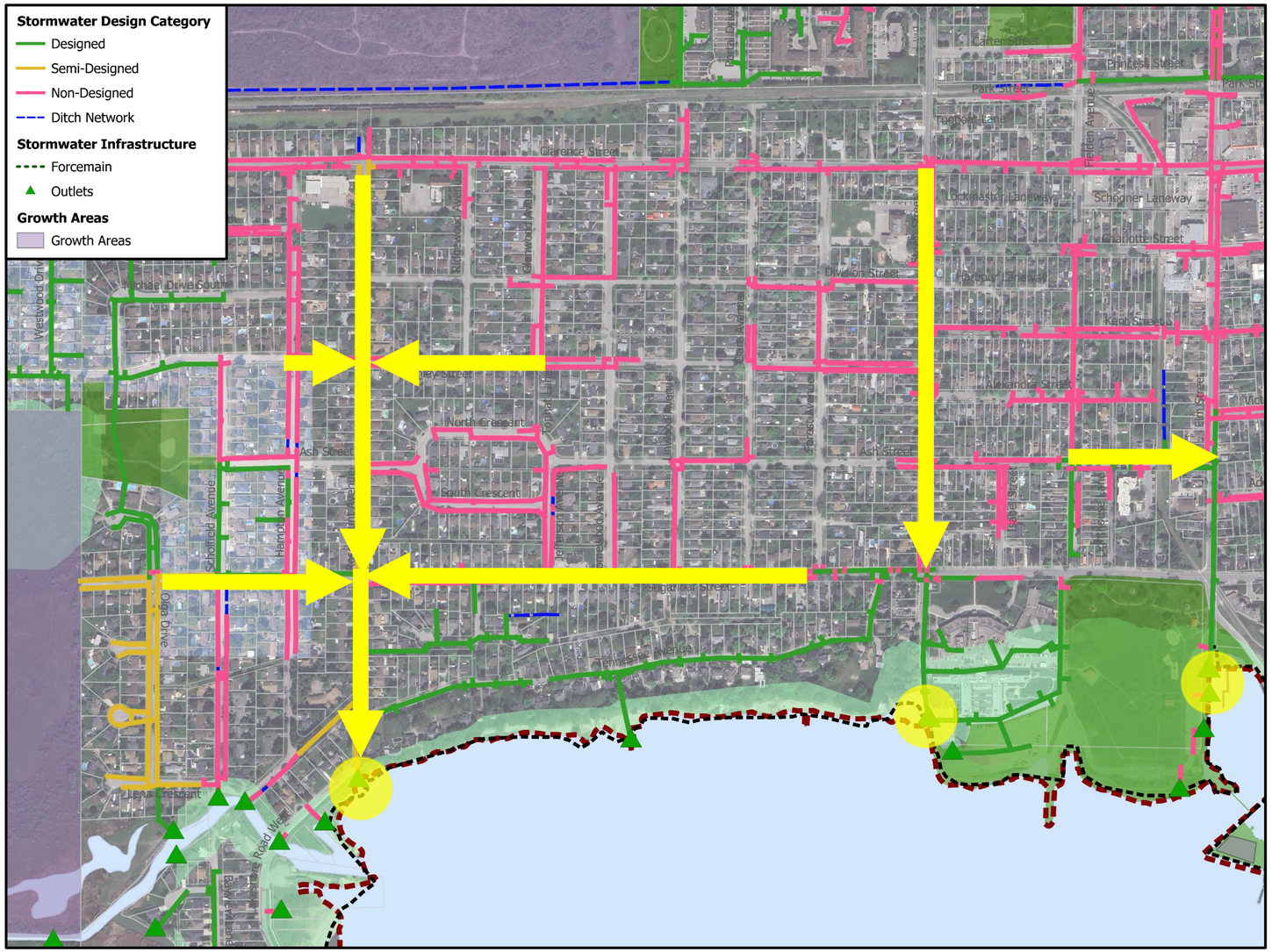


Diversion and Pumping

- Intercept and divert flows along Sugarloaf to the west into new development areas
- Install pump stations to outfalls to operate during high lake levels
- Can be combined with conveyance upgrades to improve overall system performance
- Requires significant infrastructure investment and increases operational costs

	Financial	Technical	Environmental	Social & Cultural	Recommended Alternative
Outlet Flood Protection	Low	Medium	Medium	High	**Recommended as part of Hybrid Solution:** Provides partial protection against high lake levels
Improve Conveyance to Existing Outlets	Medium	High	Medium	Medium	**Recommended as part of Hybrid Solution:** Address existing system capacity issues and provides capacity for growth areas
Divert Flows to Other Catchments	Low	Medium	Medium	Medium	Not Recommended: Trunk upgrades still required and triggers additional downstream upgrades. Limited by the timing of the development
Diversion and Pumping	High	Low	Low	Low	Not Recommended: High implementation and operational cost

Sugarloaf Area Preliminary Preferred Servicing Strategy



Greenfield Growth Servicing

- Provide an outlet to the development area north of **Clarence Street**
- Provide capacity to allow partial diversion of flow away from Quarry Ponds

New Trunk Network and Outlets

- Construct new trunk sewers along **Rosemount Avenue**, **Sugarloaf Street**, and **Stanley Street** to improve system capacity and reliability
- Provide upgraded outlets to support existing and future drainage areas

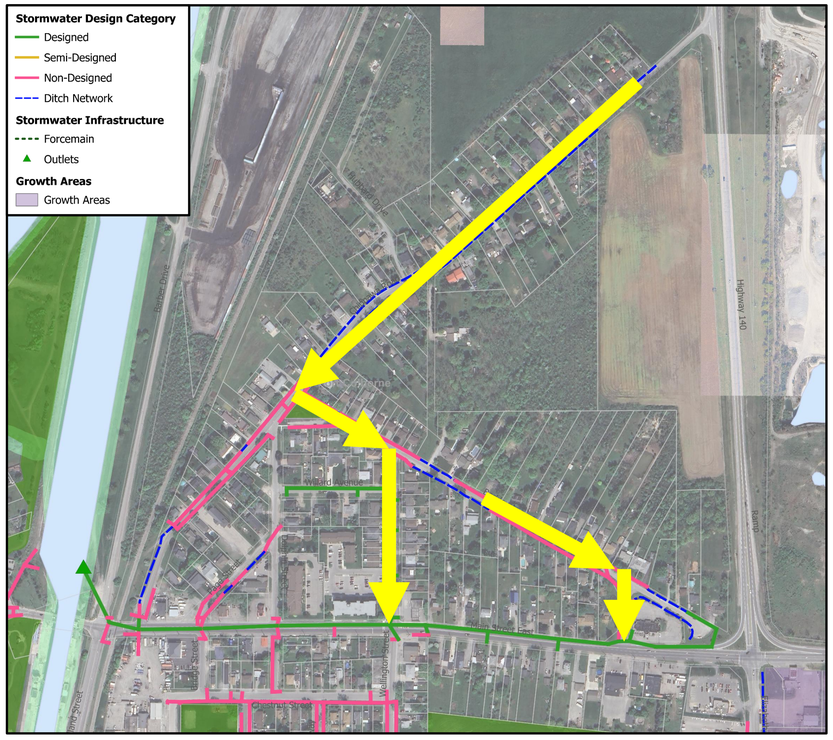
Local Trunk Upgrades

- Upgrade local trunk sewers on **Steele Street** and **Ash Street** to address current deficiencies and improve flow performance

Outlet Improvements

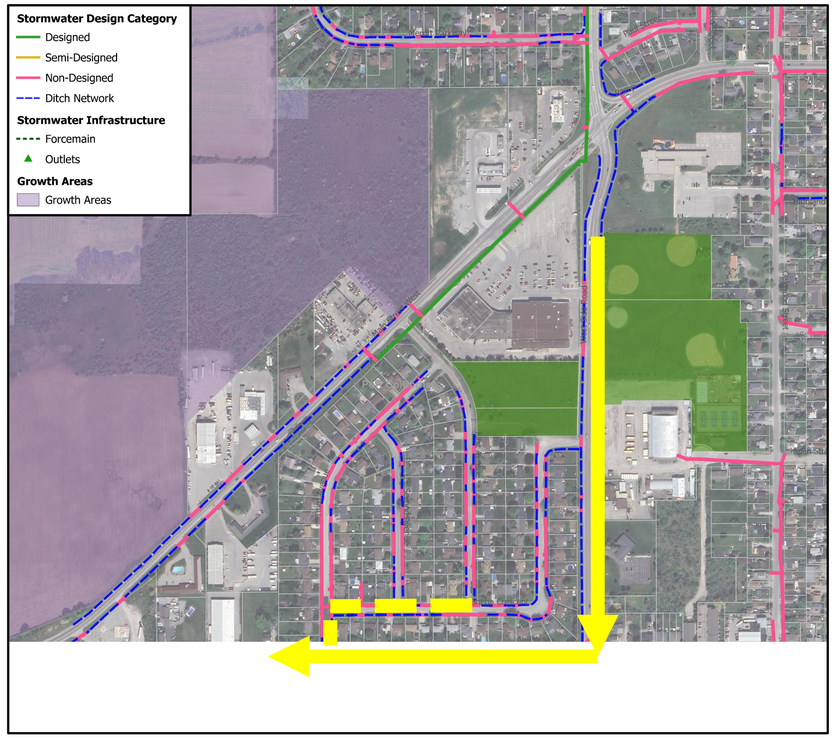
- Inspect and rehabilitate existing outlets to maintain structural integrity
- Implement flow protection measures to reduce erosion and improve system reliability

Local Stormwater System Upgrade Needs



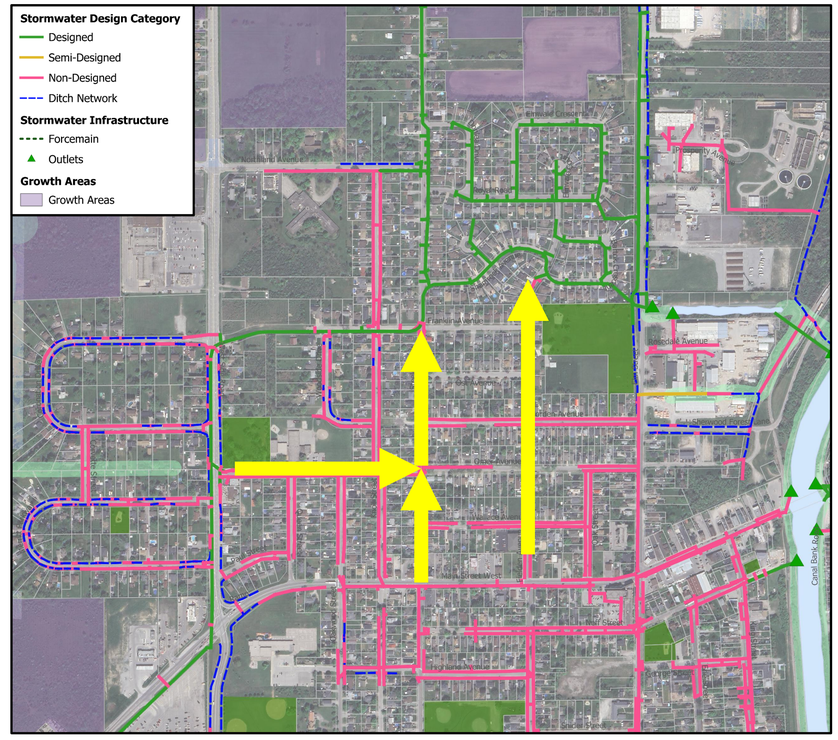
Chippawa Road Area

- Redirect flows from Chippawa Road to the Wellington Street trunk sewer
- Upgrade the Wellington Street sewer to provide adequate conveyance
- Implement drainage improvements along Chippawa Road and Berkley Avenue



Third Avenue Area

- Investigate and confirm sizing requirements for local culverts and roadside ditches
- Upgrade sewers and ditch drainage along Killaly Street and West Side Road to improve conveyance
- Implement targeted drainage improvements on Third Avenue and Sheba Crescent
- Coordinate upgrades with planned growth to ensure long-term system performance



Omer Avenue Area

- Construct new sub-trunk sewers on Fielden Avenue and Omer Avenue/Steele Street to expand conveyance capacity
- Implement partial flow re-direction to relieve constraints and improve performance along Main Street
- Coordinate timing with planned wastewater upgrades to maximize corridor efficiency

Thank you for your participation!

Project Next Steps

- Confirm Preferred Servicing Strategies
- Develop Capital Program and Costing
- Coordination of Water, Wastewater and Stormwater Programs
- Develop Project Implementation Plan
- Council Presentation
- Project Notice of Completion

If you have questions, comments, or want to hear more about this project, let us know!

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