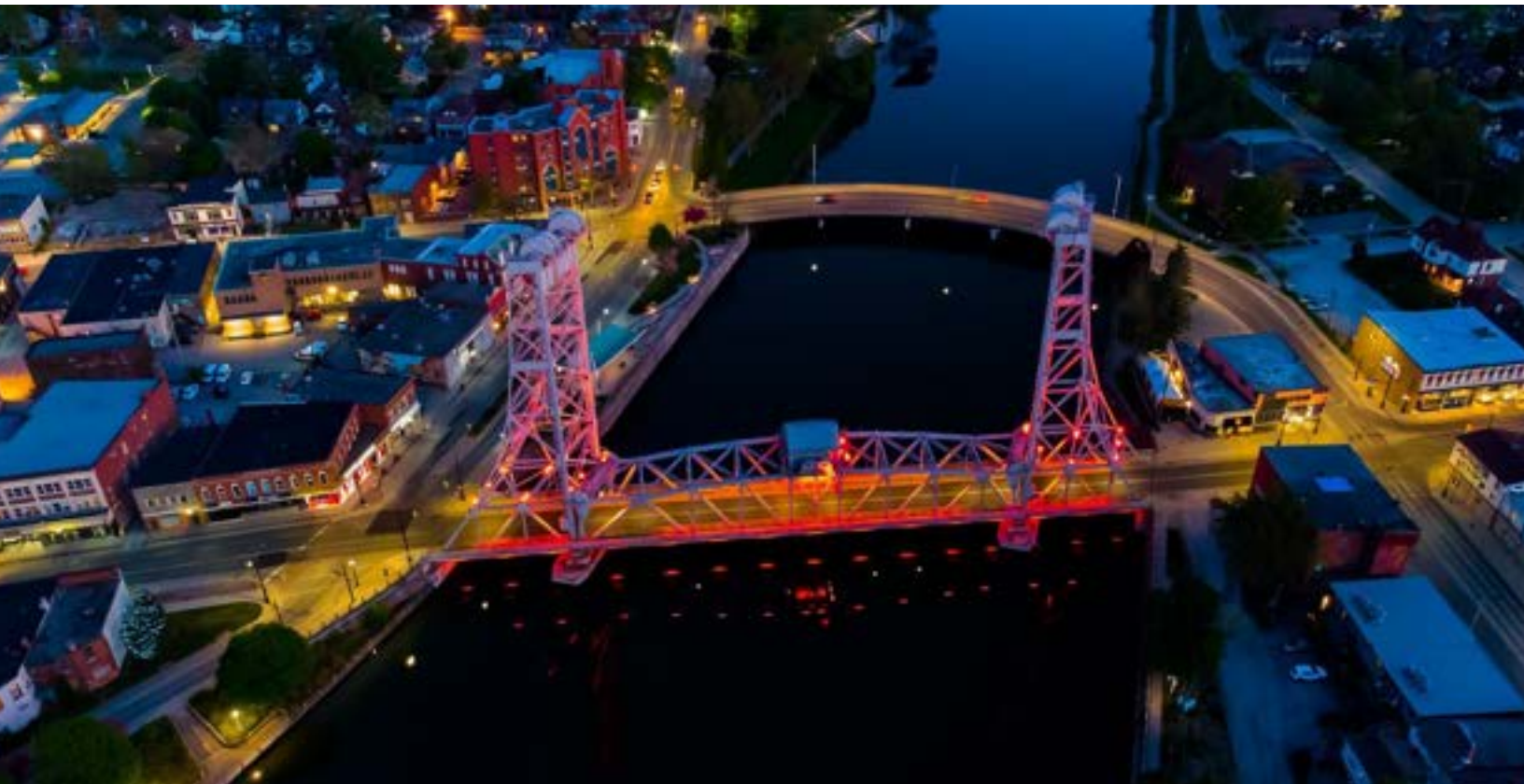


November 10, 2025

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update



Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield
Community Improvement Plan Update

Table of Contents

1.0	Introduction	1
1.1	DHWC CIP	1
1.2	Brownfield CIP	1
1.3	Urban Design	2
2.0	Key Findings of Background Report	2
2.1	DHWC CIP	2
2.2	Brownfield CIP	3
3.0	Public Engagement and Survey Analysis	4
3.1	Open Houses	4
3.1.1	Brownfield CIP Open House	5
3.1.2	DHWC CIP Open House	6
3.2	Survey	6
3.3	Written Comments	9
4.0	Downtown and Health and Wellness Cluster CIP	11
4.1	New Name!	11
4.2	New Vision and Objectives.....	11
4.3	Expanded Community Improvement Project Area.....	12
4.4	Financial Incentives.....	14
4.5	Administration and Monitoring.....	18
4.5.1	Application Form and Program Guide	18
4.5.2	Process	19
4.5.3	Marketing	19
4.6	Other Recommendations	21
4.7	Infrastructure Assessment.....	22
4.7.1	Existing Conditions and Previous Recommendations	22
4.7.2	Growth Forecast and Updated Assessment of Future Needs	25
4.8	Public Realm and Streetscape Plans	37
4.8.1	Current Conditions	37
4.8.2	Streetscape Recommendations	38
4.8.2.7	Segment 7: West Main Street between the bridge over the Welland Recreational Canal and Prince Charles Drive	50
4.9	Urban Design	57
4.9.1	Vision and Guiding Principles.....	57
4.9.2	Vision	57
4.9.3	Guiding Principles	58
4.9.4	Urban Design Guidelines	59
5.0	Brownfield CIP.....	61
5.1	Vision and Objectives.....	61
5.2	Community Improvement Project Area	62
5.3	Financial Incentives	63
5.4	Administration and Monitoring.....	68
6.0	Conclusions.....	69

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

6.1	Downtown and Health and Wellness Cluster CIP	69
6.2	Brownfield CIP	70
6.3	Next Steps.....	70

List of Appendices

Appendix A	Consultation Summary
Appendix B	Infrastructure Assessment

List of Figures

Figure 1	Downtown CIP Open House	5
Figure 2	Proposed Downtown and Surrounding Area Expansion.....	8
Figure 3	Proposed New CIP Areas.....	13
Figure 4	Example Pop-Up Shop.....	15
Figure 5	Example of Upgraded Alleyway From Ice Cream Alley in Ridgeway, ON (photo credit: Wheree).....	16
Figure 6	Example CIP Works Covered Under Façade Improvement Grant	19
Figure 7	CIP Infrastructure Review Areas	24
Figure 8	Distribution System Minimum Pressures – Maximum Day Demand (AE, 2025)	28
Figure 9	Distribution System Residual Pressure – Maximum Day Demand + Fire Flow (AE, 2025).....	29
Figure 10	Distribution System Available Fire Flow Under Maximum Day Demand (AE, 2025)	30
Figure 11	. Buildout Wastewater System Constraints: 10-Year Design Storm.....	33
Figure 12	Streetscape Locations.....	37
Figure 13	Segment 1 – 26m ROW Width (Ross Street to Golden Boulevard)	40
Figure 14	Segment 1B- 26 m ROW width (Golden Blvd to Wellington St.)	41
Figure 15	Segment 2 – 20m ROW Width (2-way portion)	43
Figure 16	Segment 2 – 20m ROW Width (1-way portion)	44
Figure 17	Segment 3 - 20 m ROW	46
Figure 18	Segment 4 - 20m ROW	47
Figure 19	Segment 5 - 20m ROW	48
Figure 20	Segment 6 - 20m ROW	50
Figure 21	Segment 7: 20m ROW	51
Figure 22	Segment 8 - 20 m ROW	53
Figure 23	Segment 9: 20m ROW	55
Figure 24	Segment 10 - 20m ROW	56
Figure 25	Tall Buildings Sketch	61
Figure 26	Brownfield Redevelopment Success Story: Canals Development	62

Policy Options, Directions and Recommendations Report City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

1.0 Introduction

The City of Welland is currently reviewing two of its Community Improvement Plans (CIPs): the Downtown and Health and Wellness Cluster (DHWC) CIP and the Brownfield CIP. Both CIPs are designed to encourage economic investment and support redevelopment and revitalization in key areas of the City.

Phase 1 of the project involved a comprehensive analysis of the existing CIPs in the context of the existing legislative and policy framework and best practices from other municipalities. This phase also reviewed monitoring data and feedback from key stakeholders to identify strengths and opportunities for improvement.

Phase 2 builds off these findings, using community engagement and an assessment of existing infrastructure conditions to develop policy options, directions and recommendations for both CIPs. These recommendations reflect the community vision for Welland and align with the City's Strategic Plan priorities to foster economic growth, promote health and well-being, enhance environmental stewardship and improve livability.

1.1 DHWC CIP

Recommendations for the DHWC CIP aim to incentivize development which facilitates a vibrant, attractive, safe and mixed use downtown and surrounding area. They focus on how to reduce vacancies, increase safety and pedestrian connectivity, support local businesses and promote pride in the upkeep and development of the Downtown. The report also considers the visitor experience along East Main Street exiting Highway 406 and entering Downtown and proposes to expand the Community Improvement Project Area (CIPA) to encourage investment along this corridor.

1.2 Brownfield CIP

Recommendations for the Brownfield CIP address the financial and legal challenges associated with brownfield redevelopment. Proposed updates aim to expand the programs to better assist property owners and increase program participation. Recommendations recognize that brownfields may exist beyond the boundaries of the urban areas, including on agricultural lands and, and propose to expand the boundaries of the Brownfield CIPA to cover the entire City.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

1.3 Urban Design

This report's urban design recommendations include new built form considerations with increased building heights proposed in key locations of the City, including the Downtown. These updates are intended to inspire pride in site design across the downtown area, enhance perceived safety through thoughtful design, and strengthen connectivity throughout the City.

Overall, this report focuses on developing innovative and forward-thinking recommendations aimed at facilitating the creation of a lively, inclusive and well-connected community. One that supports civic pride and sustainable growth.

The following sections provide an overview of the proposed updates to each CIP. These recommendations are grounded in community input, technical analysis and alignment with the City's broader strategic goals.

2.0 Key Findings of Background Report

The background report for the DHWC and Brownfield CIP update provides a comprehensive review of key legislative and policy documents, a critical review of the existing Community Improvement Plans, a summary of engagement with key stakeholders and staff, best practices and funding opportunities to determine successes and areas for improvement in both CIPs. The background report provided the basis for the work completed in Phase 2 of this project.

The City is well-positioned to support growth and development within the DHWC and Brownfield CIP areas. Over the last five years, the City allocated over \$45 million in funding through both the DHWC and Brownfield CIPs leading to the **creation of over 1,300 new housing units and over 10,000 square feet of new commercial space**. This project is strategically timed alongside the Official Plan Review, providing the perfect opportunity to consider whether additional policies are required to support the City's vision for these areas.

2.1 DWHC CIP

The existing DWHC CIP has been successful in encouraging building improvements and residential development through its incentive programs. Societal shifts following the COVID-19 pandemic and the rise of online shopping have exacerbated challenges in realizing the vibrancy for the Downtown, including high-turnover, building vacancies, a lack of residential development and a rising number of people living in homelessness.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

These challenges are not unique to Welland and are experienced in many communities across Ontario.

To support businesses and encourage pedestrian activity, more residential density is needed Downtown. While the Downtown has rich heritage, growing vacancies combined with a variety of different architectural styles and streetscape treatments, has resulted in a lack of a clear sense of place. Stakeholders consulted as part of this project expressed a desire to see incentives which address the growing vacancies and encourage commercial building occupancy and improvement. A demand-generator like a post-secondary institution or business incubator could help to generate increased desirability and activity within the Downtown. Incentives that bring people downtown like a purpose-built student housing grant could assist with increasing the Downtown's desirability to post-secondary educational uses and other businesses.

From a pedestrian and active transportation perspective, the one-way traffic along East Main Street and Division Street deters pedestrian activity due to safety concerns with the higher speeds along this stretch. However, as this is a Regional Road, the City is limited in the improvements which can be made along the East Main Street as it requires Regional support.

2.2 Brownfield CIP

The Brownfield CIP has been successful in promoting brownfield remediation and redevelopment throughout the City's entire urban area, not just the downtown, by offsetting study costs and tax increases resulting from redevelopment on properties located across the broader urban region. However, uncertainty regarding the level of contamination of a brownfield site and increased costs for studies and remediation work pose major barriers to redevelopment. Opportunities exist to enhance the Brownfield CIP incentives by offering more cost flexibility, reducing eligible fees rather than providing a grant and prioritizing specific redevelopment areas. Opportunities that could be expanded to the DHWC CIP as well.

For both CIPs, there are opportunities to provide a more simplified and coordinated application process with the Region. Reducing timelines, costs and red tape by providing a standardized grant process between both levels of government.

3.0 Public Engagement and Survey Analysis

Phase 2 of the project built on the focus group and stakeholder interviews conducted in Phase 1 to gather a broad range of feedback from the general public, stakeholders, property and business owners through in-person and written public consultation opportunities. It included:



3.1 Open Houses

Two open houses were held for each the DHWC and Brownfield CIPs, on March 24 and 26, 2025 from 6 to 8 pm. It is estimated that a total of 40 to 50 people attended the open houses, with the majority of attendees present at the DHWC CIP open house. Both open house sessions were designed to be informative and interactive, providing context regarding the current programs and inviting participants to mark up and interact with the boards. The set up was intended to get conversations started between attendees to generate new ideas and further discussions.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update



Figure 1 Downtown CIP Open House

3.1.1 Brownfield CIP Open House

During the open house, participants emphasized the importance of enhancing financial support at all phases of the redevelopment process. In particular, grants or incentives that assist with upfront costs, such as feasibility studies, environmental due diligence, archeological assessments, land use compatibility work, and pre-construction studies, were highlighted as critical tools to de-risk early investment. The high cost of development charges (DCs) was frequently cited as a major financial barrier, especially at the onset of redevelopment.

A key theme that emerged was the unique financial pressure faced by brownfield sites compared to greenfield developments. These projects often require costly upgrades to infrastructure or services, such as sewer, water, or road connections, and frequently encounter more complex approval pathways. Attendees were asked how the Brownfield CIP could better respond to these realities. Attendees suggested both offering targeted incentives for site servicing and by helping developers navigate a simplified, more transparent approvals process. Some also suggested support for mid-process funding, as projects often stall due to cash flow limitations before reaching shovel-ready status.

Given market volatility and the ongoing shift toward purpose-built rental development, attendees emphasized the need for flexibility within the CIP to reflect evolving economic and housing priorities. It was also acknowledged that not all brownfield sites are contaminated, and the CIP should recognize and accommodate that variability when applying incentives. Lastly, it was noted that many developers are unfamiliar with the application process and would benefit from clearer guidance.

Please see **Appendix A** for images of the open house boards with public feedback.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

3.1.2 DHWC CIP Open House

Attendees at the DHWC CIP Open House were asked “What is your vision for Downtown Welland in 5 to 10 Years?”. Key themes from the feedback received included:

1. A safer downtown
2. More housing
3. Better walkability and gathering spaces
4. Demand generating uses to bring people downtown
5. Consistent branding and signage
6. Better store fronts
7. Increased public art and streetscaping (i.e. signage, lighting)
8. Less on-street parking, more dedicated parking areas
9. Protected streets in the summer months or bike lanes
10. Small business support

When asked to provide feedback on the existing CIP incentives, attendees highlighted that they wanted a simplified and streamlined application process that was coordinated with the Region. Attendees also identified that they wanted incentives for affordable or supportive housing and protecting cultural heritage resources. Attendees also highlighted the desire to address boarded up or vacant buildings in the DHWC CIPA.

When asked whether new areas should be added to the DHWC CIPA, attendees identified the desire to expand the West Main Street and East Main Street areas to cover more lands in their vicinity.

As it relates to streetscapes, attendees wanted to see more traffic calming, more input in the design of regional roads and more parking around the hospital.

Please see **Appendix A** for images of the open house boards with public feedback.

3.2 Survey

Given the significance of the DHWC CIP and the interest of the public in its implementation, a survey was launched on June 18, 2025 and ran for five weeks to gather feedback on the draft vision, objectives, expansion and potential incentives for the DHWC Area CIP which were developed based on feedback received to date from members of the public and key stakeholders. A total of 85 responses were received, the majority from responses from residents of the City of Welland.

The draft vision presented in the survey spoke to creating a vibrant, attractive, safe and inclusive downtown area with a range of different uses. It spoke about creating a supportive business environment which leverages the City’s unique qualities and location. It focused on creating a unique environment that draws people downtown, celebrates the City’s rich history and promotes a range of different modes of

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

transportation. The majority of respondents (68) agreed or somewhat agreed with the proposed draft vision. When asked whether they would like to see anything added to the vision, some respondents highlighted the need for events and businesses to work together, the need to create an improved tourism draw, the need to focus on cultural institutions to anchor implementation, the importance of arts and culture as a cornerstone of community development and better utilization of spaces downtown for community events.

When asked about objectives to implement the draft vision, most respondents agreed with need to have more people downtown, to increase the range of housing options, to have vibrant and well-designed buildings and storefronts, to support infrastructure improvements (i.e. better sidewalks), to encourage amenities which encourage walking and cycling, to support local businesses first, to celebrate the City's heritage and showcase the recreational waterway with more amenities. There was more variability in responses related to incentivizing affordable and attainable housing and encouraging post-secondary institutions, student housing and startups. However, it appears that most people liked the idea of encouraging start-ups but were more concerned regarding affordability implications that may result through student housing and the development of post-secondary institutions. Respondents were most aligned with objectives that focused on improving the look of downtown and increased amenities. Respondents also highlighted the need to include safety and creating a cultural hub around City Hall as specific objectives.

Respondents were asked whether three areas adjacent to the existing Downtown (Figure 2) and Health and Wellness Cluster CIP should be included in its boundaries. Most respondents agreed that these areas should be added to the Downtown and Health and Wellness Cluster CIP to allow property owners to benefit from incentives offered that would aid in the achievement of a vibrant and attractive area.

Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement
Plan Update

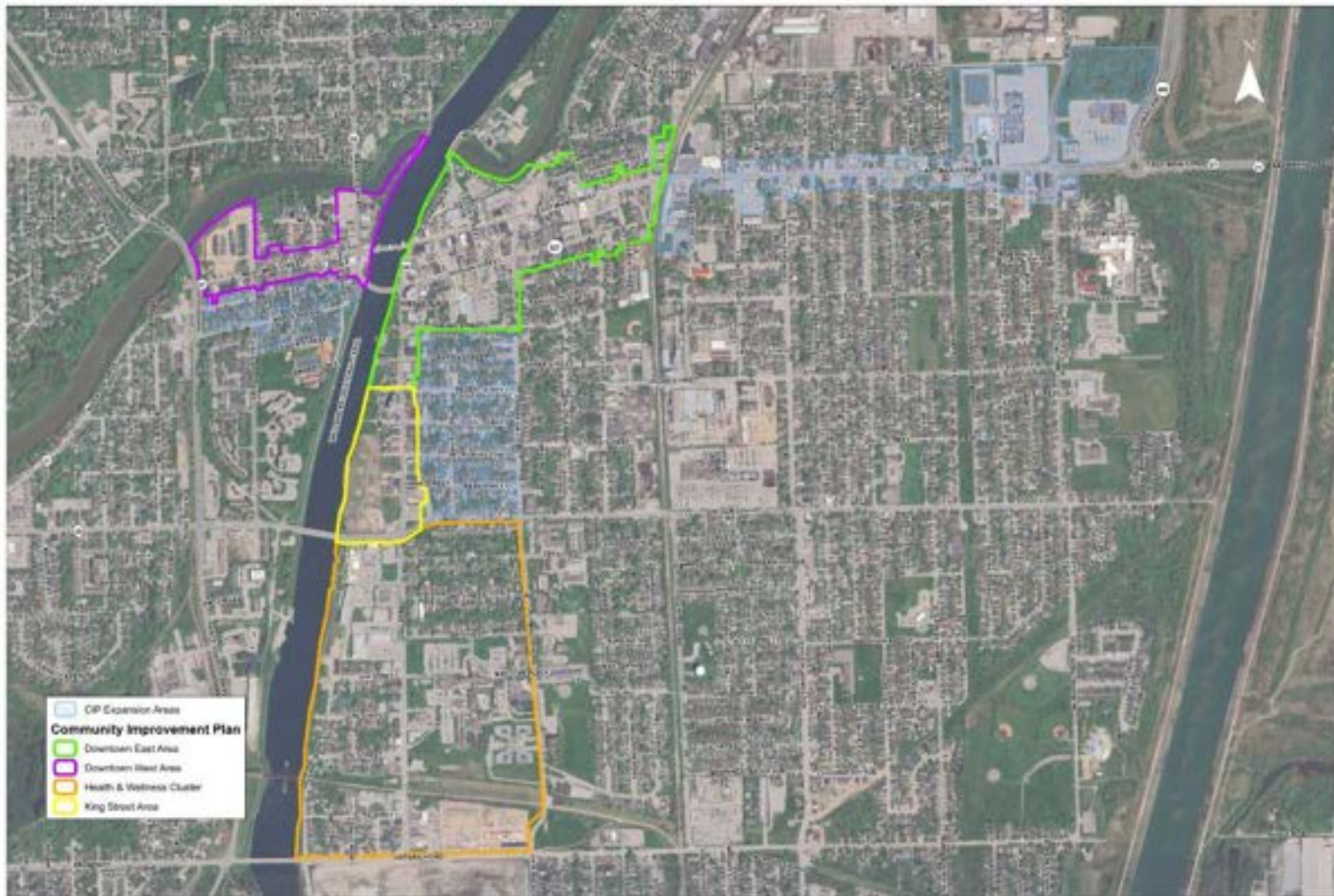


Figure 2 Proposed Downtown and Connected Districts Area Expansion

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

3.3 Written Comments

Throughout Phase 1 and 2, members of the public and key stakeholders were invited to submit written feedback on the CIP project through the dedicated project email and in-person at the open houses. Overall, responses highlighted the desire for a revitalized downtown, with coordinated landscaping, wayfinding and signage. As expressed through both the open house and survey, safety concerns were highlighted as hinderances to development and activity within the downtown. Some respondents wanted to see increased lighting in specific areas (i.e., alleyways, commercial blocks south of east main, east of King street), more security and targeted strategies to address homelessness in the downtown (i.e., new shelters, drug/addiction treatment programming). Another key theme in the responses is the need to establish Downtown Welland's identity, market unique amenities and identify unique selling points (i.e., arts and culture, specific cuisines, history). This helps to strengthen local identity, attract visitors and tourists, guide strategic planning, build community engagement and enhance competitiveness. One respondent identified the desire to rename Downtown Welland to the "Welland Downtown Bridge District" to establish a distinct identity, honour local heritage, enhance placemaking and wayfinding and support marketing. Respondents indicated a desire to see more community events and activity which activates the downtown both during business hours and into the evening.

The desire to turn East Main Street and Division Street into a two-way street was echoed in the written responses reviewed. Traffic calming and the need to increase connectivity within and to the Downtown was identified. The City can leverage existing assets such as the trail system along the recreational canal and offer incentives for buildings which back onto existing or planned trail systems to activate them and promote Crime Prevention through Environmental Design (CPTED) measures. Additional measures such as increased seating areas, food trucks and lighting can further increase pedestrian activity.

Respondents also indicated a desire for more housing within the Downtown. However, constraints such as parking were identified. As it relates to heritage, some respondents wanted to ensure that infill development respected designated heritage buildings and where a potential heritage building exists, wanted to see those buildings incorporated into the design. The area surrounding the Welland Canal Bridge 13 contains some of the oldest and most historic buildings in Downtown Welland. Some respondents wanted infill development to be directed outside of that area.

As it relates to incentives and programs offered by both CIPs, respondents provided the following feedback:

1. Increase budget allocations for grants, specifically the façade improvement grant.
2. Expand façade improvement grant to be available to each commercial tenant of a building, not just one property.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

3. Establish a reset period (i.e. 5 years) to allow applicants to reapply for the building improvement grant.
4. Expand incentives for designated heritage buildings to apply to all designated heritage buildings in the City.
5. Waive application fees as opposed to refunding the fees after the work is complete.
6. Difficult to get grants within the 30-day quote reality. Projects often get delayed resulting in increased fees that were not accounted for in the original quote.

Workshops that would assist applicants through the CIP process and better marketing of the CIP programs were identified as tools which can assist with program uptake.

A few respondents identified the desire to expand the CIP to include their properties. One respondent identified the desire to include a residential property north of the East Main Street focus area within the CIPA boundary; however, this area is primarily residential. One respondent identified the desire to include a property on the south side of Ontario Road; however this property is also located in a primarily residential neighbourhood that is distant from the central Health and Wellness Cluster Area, and is in proximity to an existing industrial area. Consequently, any decision to incorporate these properties within the boundaries should align with the overall vision and objectives of the DHWC CIP. Extending the DHWC CIP to include these areas may diminish its capacity to effectively address enhancements in the Downtown and Health and Wellness Areas by dispersing available resources.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

4.0 Downtown and Health and Wellness Cluster CIP

Based on our review and consultation completed to date we are recommending the following changes:

4.1 New Name!

Based on feedback received and marketing completed to date, we are recommending that the title be simplified to the:

“Downtown & Connected Districts CIP”

4.2 New Vision and Objectives

As a result of the feedback received to date, the proposed new vision for DHWC CIP is as follows:

“Our vision for Downtown and its Connected Districts is to foster a vibrant, attractive, and inclusive community with diverse commercial spaces, housing, services, and amenities for residents, workers, and visitors. We aim to support local businesses, post-secondary institutions, healthcare, and innovative enterprises by leveraging Welland’s unique strengths. The Welland Hospital will continue to contribute to the employment and health services in Welland and this Plan will support its evolving nature over time. We will promote diverse retail and cultural activities that are coordinated to generate demand, investment and invigorate our business landscape throughout the day and into the evening.

We will invest in lighting, signage, public art, and wayfinding to make the area welcoming and walkable. Enhancing open spaces, infrastructure, and connections for pedestrians and cyclists, along with improved parking, will encourage exploration and safe travel. We will celebrate the City’s history by proudly displaying and preserving heritage/historical buildings and continuing to encourage events in proximity to cultural institutions.

Together we will build a unique, thriving and inclusive community for all.”

Objectives should be updated to connect how the CIP will work with other municipally initiated projects to contribute to the achievement of the overall vision. This includes referencing the City’s existing redevelopment projects such as the Welland Market Square and community building such as the Welcoming Streets initiative.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

4.3 Expanded Community Improvement Project Area

As illustrated on Figure 3, we are proposing to expand the CIPA to include additional lands within the Downtown West, King Street and Downtown East areas. These lands were added as a result of public and council feedback to encourage improvements and proposals to increase residential density in proximity to the Downtown and encourage improvements along Hellems Avenue.

We propose to add a new area to the Downtown and Connected Districts CIPA, east of the railway intersecting with East Main Street, to recognize this area's role as a gateway into Downtown Welland from Highway 406 and to encourage building improvements within this area. Given that the area has a different function from the other sub-areas, we are recommending that this be a new sub-area titled "Downtown Gateway"

Based on community feedback, we are recommending that the "East Main Street Area" be renamed the "Downtown Bridge District" to differentiate between the section of East Main Street in the "Connected Districts" and further encourage community pride and assist with marketing initiatives.

Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement
Plan Update

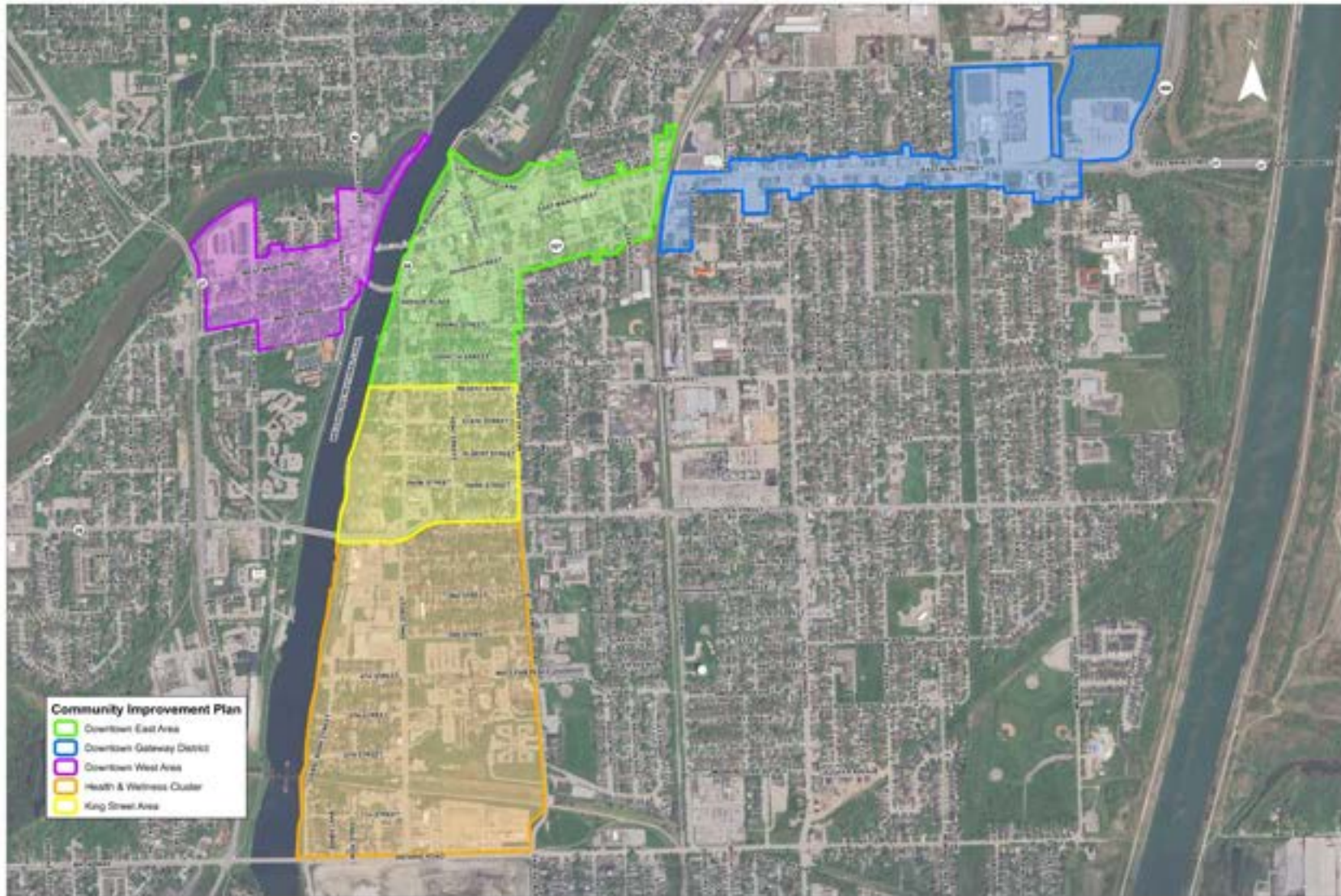


Figure 3 Proposed New CIP Areas

4.4 Financial Incentives

The existing CIP has seven (7) financial incentive programs:

1. Urban Design Study Grant Program
2. Façade Improvement Grant Program
3. Building Improvement Grant/Loan Program
4. Residential Grant/Loan Program
5. Tax Increment Grant Program
6. Planning and Building Fees Grant
7. Development Charge Reduction Program

Based on our review and consultation completed to date we are recommending the following changes:

1. Revise the Development Charge Reduction Program

As stated in the Background report, no applications were received for this program between 2019 and 2023, likely due to duplicated efforts in the City's Development Charges(DC) By-law which automatically reduces Development Charges by 75%. The program should be revised to state that it is administered through the City's DC By-law and the DC By-law should be updated to include the new CIP sub areas.

2. Introduce a Building Vacancy Assistance Stream under the Building Improvement Grant and Update Eligible Costs

To improve safety and activation around vacant commercial spaces, it is recommended that a new stream be added to the Building Improvement Grant for Vacant Commercial Units. This would fund publicly accessible uses in empty commercial units, offering up to \$5,000 for six-month leases and up to \$10,000 for longer leases, on top of the existing grant. Eligible uses could be specified to support active streetscapes. The City of Hamilton currently offers a similar grant.

To encourage more pop-up cafes and summer patios, the City could add outdoor patios as an eligible cost under the Building Improvement Grant.

Overall it is recommended that funding for the Building Improvement Grant be increased to \$15,000, to align with increases to the Façade Improvement Grant, with the possibility to receive up to \$25,000 in grant assistance to assist with upgrades to vacant publicly accessible commercial units.



Figure 4 Example Pop-Up Shop

3. Increase funding for the Residential Grant Program

Based on feedback received through public engagement and a review of best practices, it is recommended that the funding for the Residential Grant Program be increased to support the development of a maximum of six (6) units at \$15 per square foot of habitable floor space rehabilitated or constructed, to a maximum of \$15,000 per unit. Resulting in a total maximum grant of \$90,000. Further, we recommend that the CIP specify that this program applies to the creation of any dwelling within the CIPA provided it facilitates the development of more than three (3) dwelling units and does not need to be limited to a mixed use building.

4. Increase Planning and Building Fees Grant

Although the general public has expressed interest in converting this program to a fee waiver, such a change may present challenges for the City if these projects do not proceed or fail to obtain the required approvals. Therefore, we are not recommending that a fee waiver be introduced, but rather we are recommending that the overall funding amount be increased to \$25,000.

8. Increase scope and funding for Façade Improvement Grant to cover exterior safety improvements and include facades fronting pedestrian connections

It is recommended that funding for the Façade Improvement Grant be increased to \$15,000 for the front façade and \$10,000 for the side or rear building façade. The scope of the grant should be expanded to cover safety improvements such as pedestrian connectivity improvements into the site and surveillance cameras affixed to the exterior of the property, and uses that increase pedestrian traffic such as public murals, landscaping and art. Further, it is recommended that the grant can be used to be utilized for building facades which front publicly owned pedestrian

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

connections like alleyways and trails. To ensure better alignment with the City's Urban Design Guidelines, it is recommended that there is a checklist component to the application form where the applicant will be required to demonstrate how the design has regard for the Urban Design Guidelines.



Figure 5 Example of Upgraded Alleyway From Ice Cream Alley in Ridgeway, ON (photo credit: Wheree)

5. Include all designated residential heritage buildings as eligible buildings for two (2) different programs

It is recommended that all designated residential heritage buildings in the City should be eligible for two (2) programs. This would include the Façade Improvement Grant and Building Improvement Grant including the Building Vacancy Assistance Stream to assist property owners with costly improvements to maintain or restore heritage properties. The proposed Building Vacancy Assistance Stream could allow heritage properties to be temporarily repurposed, which may provide additional passive income to the property owner to fund building renovations or improvements. This would require a revision to the CIPA which expands it to all designated buildings in the City. This would not apply to listed Heritage Buildings. For clarity, the Building Vacancy Assistance Stream will only apply to heritage buildings within the Bridge District, Downtown West Area, Downtown Gateway District, King Street Area, and Health and Wellness Cluster.

6. Expand general program requirements to permit different businesses within a multi-unit building to access grant funding instead of limiting the grant to one (1) application per property.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

For the Façade Improvement Grant and Building Improvement Grant, it is recommended that where there is an existing multi-unit building, one application per unit be permitted, provided they are associated with a specific street facing business.

7. Establish a five (5) year ‘reset’ period to allow applicants to reapply for grants after a specific period.

Currently the CIP limits property owners/tenants to one application per program per property. It is recommended that the general program requirements be revised to allow applicants to reapply for grants after five (5) years, provided they are associated with a new improvement and are not repeating the same type work. For example, a property owner would not be able to apply to replace its windows twice.

8. Reduce the number of quotes required for the Residential Grant Program and Tax Increment Grant

It is recommended that the Residential Grant Program and Tax Increment Grant program be revised to require only 1 quote for both grant programs, as these quotes are time intensive and costly to prepare for larger development proposals.

9. Increase eligibility requirement to four (4) new dwelling units to receive funding under the Tax Increment Grant for residential buildings

Due to permissions which allow residential property owners to build two additional residential units for properties which contain single detached, semi-detached and townhouse development for a total of 3 dwelling units, there may be an increase in property owners within the CIPA boundary adding additional residential units to their properties and being eligible to receive funding under this grant. To prevent these funds from being used for lower density residential projects, the Tax Increment Grant should be structured to require that solely residential buildings result in a net increase of at least four (4) new dwelling units. This will ensure that the overall vision for the CIP by strategically allocating funding to ensure that funding is used for a variety of different projects.

10. Create a Reserve Fund which would fund the CIP or a land acquisition and placemaking initiatives

It is recommended that the City create a Reserve Fund that could be used to fund CIP programs, strategic placemaking or strategic land acquisitions. This could be funded by land sales.

11. Add a 5% inflation/cost increase coverage to grants

Contractor quotes are valid for 30 days and reflect rising construction material costs. The agreement should allow the total grant value to increase by 5% if the final cost of eligible works exceeds the initial quote, provided it is still below the maximum total grant for the program.

12. Remove Reference to Regional Matching Contributions for the Tax Increment Grant

Moving forward, the Niagara Region will no longer be contributing a matching percentage for the Tax Increment Grant and therefore reference to their contributions will need to be removed and ability to waive their taxes should be removed.

4.5 Administration and Monitoring

4.5.1 Application Form and Program Guide

Based on our review of the application forms and public consultation to date, it is recommended that:

1. Update application form to include a check box and key success metrics

The application form would benefit from the addition of a check box which identifies whether the applicant is applying for incentives under a different municipal CIP program or the Regional program. Further, it is recommended that a checklist be added to demonstrate how the applications have regard to the CIP Urban Design Guidelines. This could include outlining specific urban design measures that could be taken per the guidelines.

To measure the success of the program, it is important that the City continue to monitor the amount of commercial space added/renovated and the number of residential units added to the project area. The application form should include space for the applicant to provide this information to make it easier for staff to monitor the program outcomes.

2. Include example works under each program guide

To assist applicants to understand which program they should apply for to facilitate an improvement, it is recommended that the program guides include example projects that would be covered under each grant.



Figure 6 Example CIP Works Covered Under Façade Improvement Grant

4.5.2 Process

Once an application is approved, to avoid delays associated with the execution of an agreement, it is recommended that the applicant be permitted to begin work with the understanding that the approval is not final until the agreement is executed

4.5.3 Marketing

Staff have been successful in personally marketing the program through individualized site visits to businesses within the downtown and surrounding area. The 'MadeinWelland' website is a user-friendly and impactful marketing tool which reduces technical jargon to and uses visuals to explain specific programs. Staff have implemented program guides, brochures and have dedicated staff administering the program, in accordance with the original marketing strategy.

However, there are components of the original marketing strategy that have not been implemented or have been discontinued. These were more resource intensive items like a regular newsletter, periodic presentations/workshops and stories in the local media. Items like workshops and promotion in the local media will increase program outreach but will require additional staff members to successfully implement in order to produce the content required and run workshop sessions. In addition, targeted outreach should be provided to post-secondary institutions to raise awareness that the CIP incentives are available to them and to encourage the development of student housing projects.

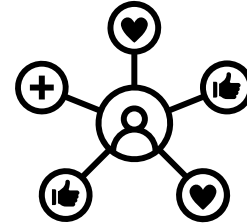
Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

There are other tools the City may consider that are less resource intensive and which leverage social media tools and user generated content. These would include:

1. Use hashtags on social media to market the CIP through user generated content.

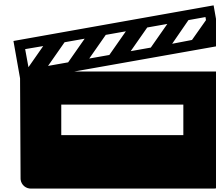
It is recommended that the City encourage applicants to post pictures of their CIP funded improvements on social media with a specific hashtag such as #RevitalizeDowntownWelland, #InvestinDowntownWelland or #WellandCIPinAction.



To successfully implement this tool, the City could collaborate with local influencers or business owners to use the hashtag, include posters or window decals with the hashtag and leverage the use of social media campaigns such as a photo-contest or story-sharing campaign.

2. Develop short, informative videos which explain the CIP application process and highlight its benefits.

Videos offer a cost-effective alternative to periodic presentations while achieving a similar impact and improving accessibility.



3. Showcase success stories/example projects on the MadelnWelland website which can be promoted periodically on the City's social media platform.

By featuring real-life examples, potential applicants can better visualize the impact of these grants and understand how they contribute to meaningful property improvements.



4. Promote the CIP at City booths at local events

Through the use of posters, brochures or stickers, the City can promote the CIP at existing City booths at different events such as the farmers market.



5. Maintain a Land Inventory of Vacant Properties within the Downtown and District Areas

The City may make this inventory accessible online, allowing prospective business owners and investors to review potential investment opportunities.



4.6 Other Recommendations

In addition to the recommendations related to financial incentives, monitoring and administration, it is recommended the City:

1. Develop Municipal Land Acquisition Strategy and Property/Business Directory

Separate from the CIP, the City should develop a Land Acquisition Strategy to allow it to strategically acquire land or repair/rehabilitate municipally owned land for placemaking initiatives, economic development, housing or growth related infrastructure, such as parking garages. As part of this program, the City should develop an internal list of strategic properties it would like to acquire. Through this strategy, the City could develop options for strategic partnerships with private developers to develop affordable housing and/or other desired growth supporting uses such as co-working spaces or commercial space. This could facilitate redevelopment of underutilized City property by providing land at a discounted rate to facilitate necessary development. The City could also pursue other development partnership models such as a land sale with development agreement (RFP), long term leaseholds, joint venture and public-private partnerships.

To support the Land Acquisition Strategy, it is also recommended that the City maintain an inventory of properties and businesses within the CIPA. Maintaining a comprehensive land and business directory better enables the City to make data-driven decisions about land use and economic development. It supports accurate property assessment and helps monitor vacancies or underutilized sites. With clear insight into ownership and business activity, the City can better plan services, foster investment, and identify where it should strategically acquire land to support redevelopment.

The directory should serve as an accessible and regularly updated tool that allows users to easily navigate real estate opportunities and understand the downtown property landscape. It should include key details such as ownership and contact information, brokerage and leasing data, tenancy and occupancy status, business type, employment numbers, building square footage, and overall marketability. By maintaining current and accurate information, the directory will strengthen the City's ability to engage with investors, support local businesses, and make informed, proactive land management decisions.

2. Enact a Cash-in-Lieu of Parking Strategy

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

Separate from the CIP, the City could develop a cash-in-lieu of parking strategy which allows property owners to provide cash to the City in lieu of parking in areas where there is street/municipal parking available. This extra funding could be used to facilitate the development municipal parking lots or garages.

3. Create a CIP Coordinator Role

To assist with the implementation of the CIP, the expeditious review of development applications and marketing initiatives, the City should consider creating a new standalone CIP Coordinator Role. This role is essential to effectively coordinate and oversee the implementation of CIP initiatives, ensuring that projects are managed efficiently and that the City maximizes the benefits of its investment in community improvements.

4.7 Infrastructure Assessment

4.7.1 Existing Conditions and Previous Recommendations

As part of the review for the DHWC CIP Area, an assessment of existing infrastructure in the DHWC CIP area including new expansion areas was undertaken to provide an understanding of the existing system under current conditions and the available capacity to support projected growth. These areas are described as (see map in Figure 7 CIP Infrastructure Review Areas).

1. **Area 1:** West of the Welland Canal, bound by the Welland River to the north and Prince Charles Drive N to the west, extending south to Maple Avenue/Hooker Street.
2. **Area 2:** East of the Welland Canal, bound by the Welland River to the north, extending eastward along East Main Street to Ross Street/Division Street, and southward along King Street and Hellems Avenue to Lincoln Street.
3. **Areas 3:** South of CIP Area 2. East of the Welland Canal extending further south down King Street, bound by Lincoln Street to the north, Ontario Road to the south, and Plymouth Road to the east.
4. **Area 4:** East of Area 2, extending further along East Main Street past Ross Street/Division Street to Highway 406.

The assessment included a desktop review of available data and reports, including GIS data, previous master plans developed by the Region of Niagara, annual infrastructure performance reports from the City and Region, and relevant studies completed by the City, including the 2024 Asset Management Plan and 2020 Pollution Prevention Control Plan (PPCP) Update. Moreover, the City's Director of Infrastructure Services was interviewed to provide insights on the constraints and opportunities in the City's existing water, wastewater, stormwater, and transportation infrastructure. A summary of infrastructure

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

availability, capacity and ownership in the study area is provided in **Appendix B**, along with any previously identified challenges and constraints in the systems.

Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement
Plan Update

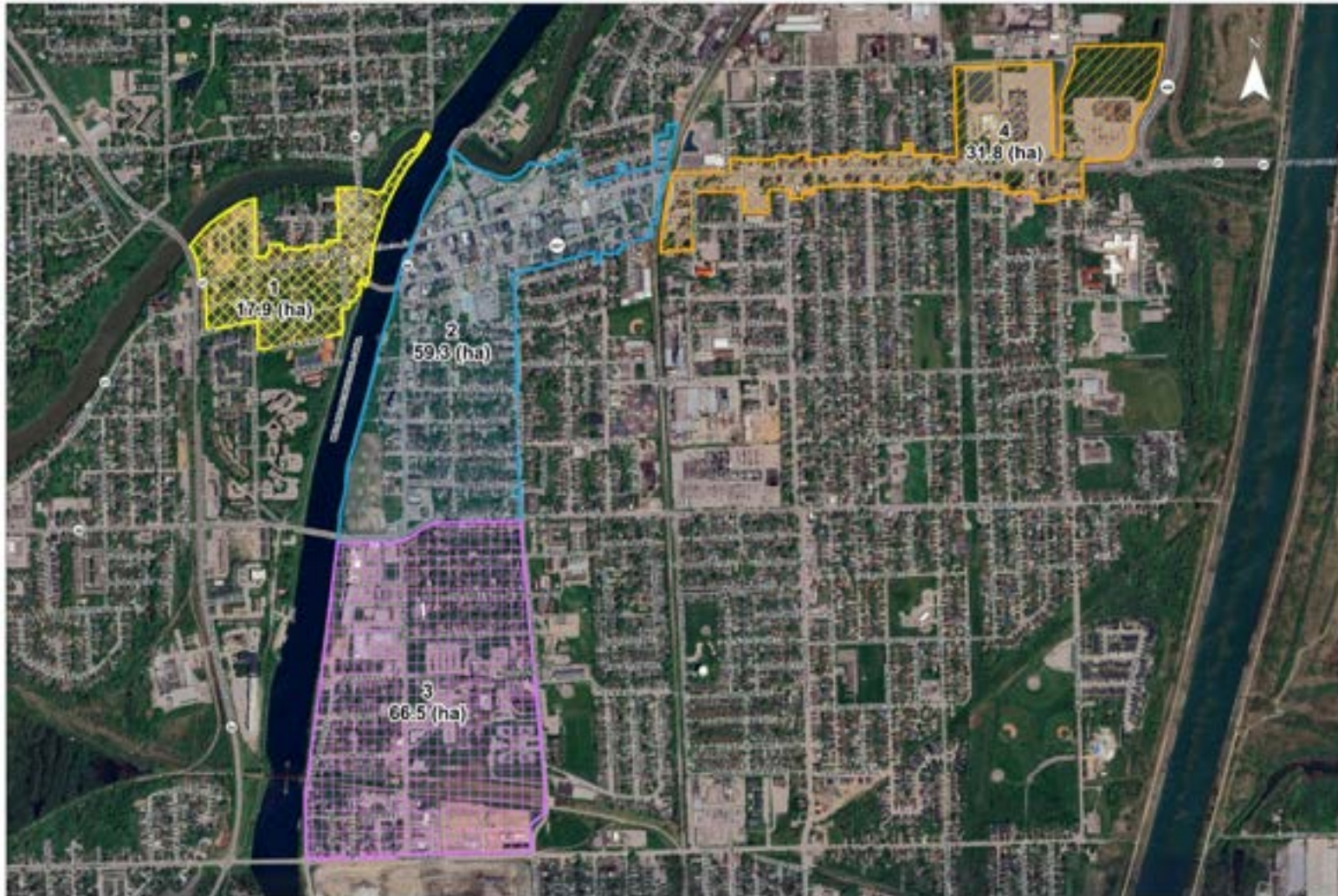


Figure 7 CIP Infrastructure Review Areas

Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield
Community Improvement Plan Update

4.7.2 Growth Forecast and Updated Assessment of Future Needs

4.7.2.1 Equivalent Population

To estimate future development potential within each CIP Area, population densities from the City's Official Plan were applied to the corresponding land use designations within each CIP Area. Conservative values were used to ensure sufficient capacity planning. Occupancy rates from the City's Development Charges Background Study (DFA, 2022) were then applied to convert these densities to equivalent units. The criteria applied in the analysis are summarized in Table 1.

Table 1: Development Density and Occupancy by Land Use

Official Plan Land Use Designation	Land Use Type	Density ¹	Occupancy Rate ²
Downtown	Mixed (Residential / Employment)	300 dwellings per hectare (assumed to be equivalent to high-density residential)	2.11 persons per unit (assumed to be equivalent to high-density residential)
Health & Wellness			
Commercial	Employment		
Industrial			
Institutional			
High Density Residential	Residential	Min 75 to max 300 dwellings per hectare – Maximum of 300 dwellings per hectare applied	2.26 persons per unit
Medium Density Residential		Min 15 to maximum of 60 dwellings per unit – Average of 37.5 dwellings per hectare applied	
Low Density Residential		Min 35 to a maximum of 125 dwellings per unit – Average of 80 dwellings per hectare	
Table Notes: 1. From City of Welland Official Plan 2. From Development Charges Background Study (DFA, 2022)			

Table 2 summarizes the total estimated developable land area and corresponding projected equivalent population within each CIP Area, based on existing and planned land use, applied densities, and occupancy assumptions. Per this criterion, the planned total population for the new DHWC CIP Area is estimated to be 74,315 people and jobs. This greatly exceeds the high growth scenario in the 2020 PPCP Buildout, which estimated a population estimate of 55,960 within the urban boundary of the entire city. The 2021 Region Water Master Servicing Plan Update (MSPU) was completed using an estimated buildout population of 93,114 within the City's urban boundary.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

It should be noted that the new DHWC CIP Area is only part of the study area considered in the 2020 PPCP and 2021 Region MSPU, which considered growth across the entire city. For the purposes of this assignment, only the CIP buildout growth was considered, and other additional growth trajectories were not included in this analysis.

Table 2: Total Projected Equivalent Populations: CIP Expansion Areas

CIP Expansion Area	Total Area (ha)	Developable Area (ha) ¹	Equivalent Residential Population ²	Equivalent Employment Population ²	Total Equivalent Population
1	17.9	13.2	4,150	1,395	5,546
2	59.3	41.0	8,567	8,088	16,656
3	66.5	58.2	18,359	18,446	36,806
4	31.8	26.3	524	14,784	15,308
Total	175.5	138.5	31,601	42,714	74,315
Table Notes: 1. Includes both vacant land and assumed re-development land. Excludes land area classified under Open Space & Recreation, Core Natural Heritage, etc. 2. Due to limited available data, areas designated as “mixed” land use (residential and employment) were assumed to be evenly distributed (50/50 split).					

4.7.2.2 Water

The 2021 Region MSPU determined that the existing and projected 2051 maximum day demands (MDD) at the Welland WTP are approximately 34,700 m³/day and 51,200 m³/day, representing 48% or 70% of the total rated capacity of the plant, respectively (based on the upgraded capacity of 73,000 m³/day a buildout population of 93,114).

As part of the servicing analysis for the current CIP Update, future water demands were estimated for each CIP Area based the projected equivalent population values. Per capita residential and employment demand rates and peaking factors from the 2021 Region MSPU were applied, as summarized in **Appendix B**.

As shown in Table 3, the future MDD would be approximately 28,484 m³/day for only the DHWC CIP Area, which represents only a portion of the demand at the Welland WTP. The 2021 Region MSPU considered a broader growth pattern across the entire City, while the current study applies much higher density targets specifically within the CIP study area alone. This results in a significantly greater concentration of people and servicing demand in the CIP study area compared to what was assumed in earlier studies. If the proposed development densities for this area are fully realized, the resulting City-wide growth could greatly exceed what was assumed in earlier studies. As a result, capacity constraints that were not previously identified may occur.

However, as growth applied in the previous studies was distributed more broadly across the City, the total community-wide population and servicing demand may remain generally consistent – meaning that increased growth in the CIP Area could be offset by lower growth elsewhere. It should also be recognized that the full buildout of this intensified growth

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

scenario is likely to occur over an extended timeframe. Therefore, as development progresses, it will be important to continue to monitor growth and reassess potential impacts on treatment infrastructure to ensure the upgraded capacity of 73,000 m³/day at the WTP remains adequate to service growth.

The WTP operates under a Permit to Take Water (PTTW), authorizing the withdrawal of up to 110,000 m³/day from the Old Welland Canal. With the current upgraded capacity of 73,000 m³/day, a margin of 37,000 m³/day remains available within the existing PTTW limit, indicating that future plant expansions could be undertaken without increasing the PTTW limit, to accommodate additional growth anticipated through this CIP update.

As it relates to future growth and water distribution and storage, there are some areas within the DHWC CIP Area where modelled pressures for water mains are outside of MECP guidelines. These results are shown in Figure 8 and Figure 9. There are also some areas where the City's fire flow requirements of 133L/s cannot be realized. This is shown in Figure 10 (Figure 1-3 of the AE report).

It is expected that ongoing and planned upgrades to nearby storage facilities (new Bemis ET within the Area 4) may mitigate or delay the onset of these issues by improving system capacity and resilience. However, if the higher-density development is realized, continued monitoring and re-assessment of system performance will be key to confirm the distribution system maintains an adequate level of service to support the projected growth. This includes assessing fire flow requirements and availability on a site-by-site basis as development progresses.

Please refer to **Appendix B** for more details and the water modelling results.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

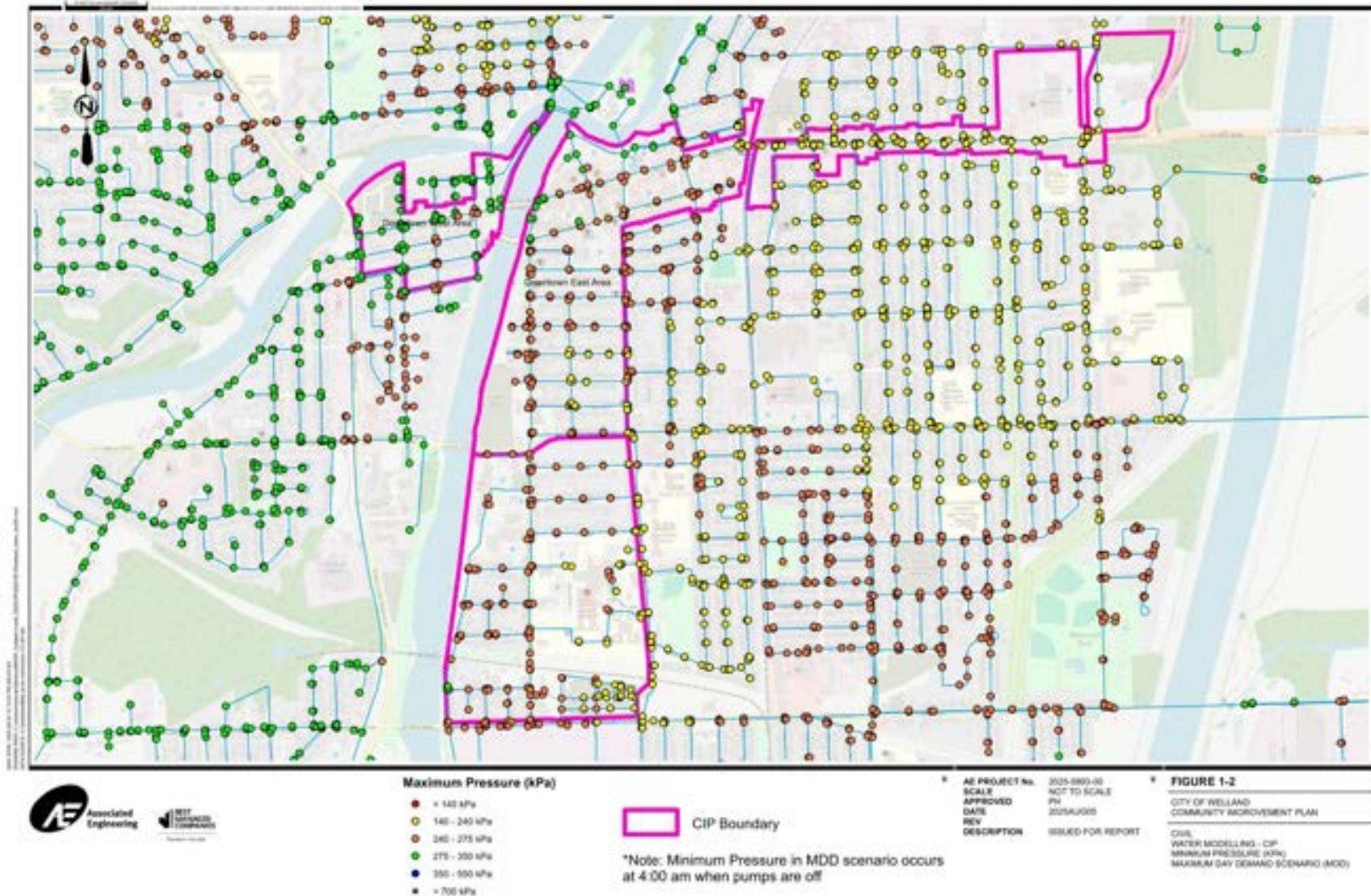


Figure 8 Distribution System Minimum Pressures – Maximum Day Demand (AE, 2025)

Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement
Plan Update

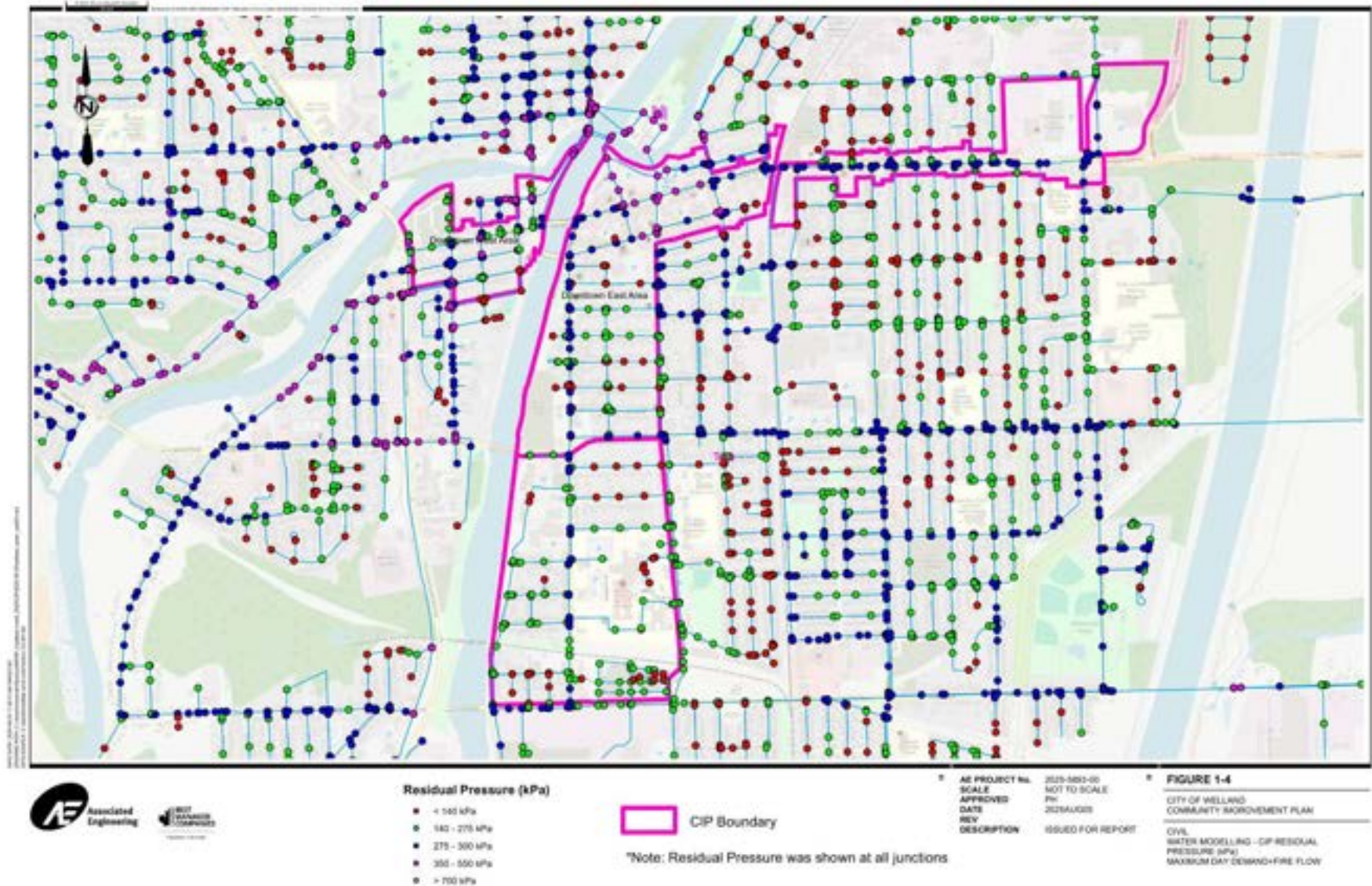


Figure 9 Distribution System Residual Pressure – Maximum Day Demand + Fire Flow (AE, 2025)

Policy Options, Directions and Recommendations Report
City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement
Plan Update

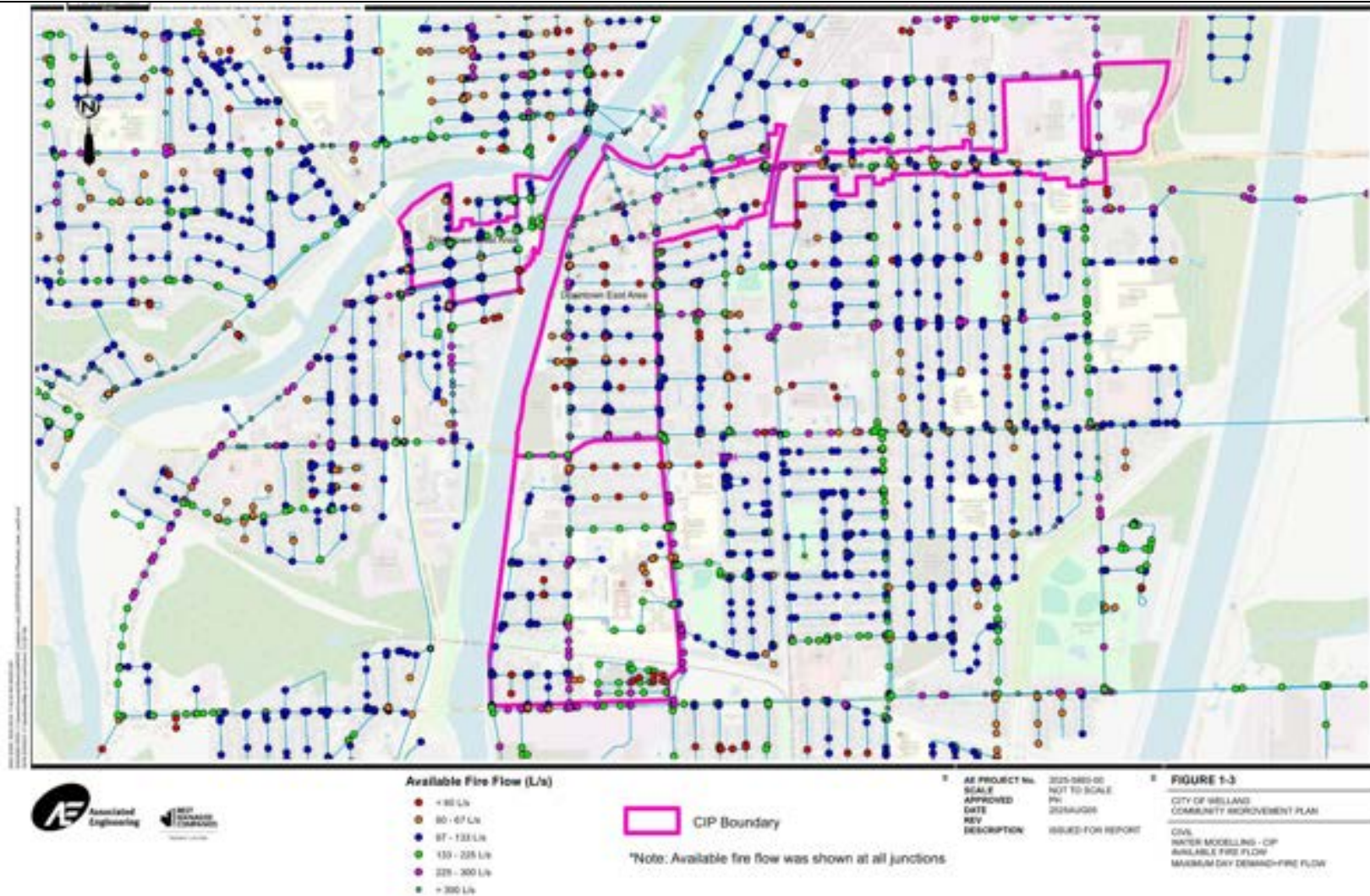


Figure 10 Distribution System Available Fire Flow Under Maximum Day Demand (AE, 2025)

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

4.7.2.3 Wastewater

4.7.2.3.1 Treatment

The 2021 Region MSPU determined that the existing and projected 2051 average day flows (ADF) at the Welland WWTP are approximately 34,200 m³/day and 48,900 m³/day, representing 63% or 90% of the total rated capacity of the plant, respectively (based a capacity of 54,600 m³/day and a buildout population of 93,114). Further, the study determined that that flows to the WWTP will reach the 80% study trigger capacity around 2041 and that the post-2051 flows are expected to exceed the plant capacity.

Projected average day flows generated under the CIP buildout scenario were estimated based on a projected population of 74,315 in the CIP study area and a per capita wastewater average day flow of 374 L/cap/day at the Welland WWTP (per Table 4.1 of the 2021 MSPU). As a result of the proposed CIP high-density growth, average day flows from the CIP area to the WWTP are projected to be 27,780 m³/day. This represents only a portion of the flows to be treated at the WWTP. Projected wastewater flows generated from the proposed CIP buildout growth, compared to previous estimates, are summarized in Table 5.

Table 3. Comparison of Estimated Average Day Flows at the WWTP

	2021 MSPU – Existing ¹	2021 MSPU- Buildout (to 2051) ¹	CIP Area – Buildout
Average Day Flow (m ³ /day)	34,200	48,900	27,780
Table Notes: 1. Wastewater flows within the City's urban boundary (2021 MSPU) 2. Wastewater flows within Health & Wellness CIP Area, only.			

Further to the discussions above, the 2020 PPCP and 2021 Region MSPU considered a broader growth pattern across the entire City, while the current study applies much higher density targets specifically within the CIP study area alone. This results in a significantly greater concentration of people and servicing demand in the CIP study area compared to what was assumed in earlier studies. If the proposed development densities for this area are fully realized, the resulting City-wide growth could exceed what was assumed in earlier studies. As a result, capacity constraints that were not previously identified may occur. However, increased growth in the CIP Areas could be offset by lower growth elsewhere. It should also be recognized that the full buildout of this intensified growth scenario is likely to occur over an extended timeframe. Therefore, as development progresses, it will be important to continue to monitor growth and reassess potential impacts on treatment infrastructure to ensure confirm the requirement and timing for capacity-related upgrades at the WWTP.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

As part of the servicing analysis for the current CIP Update, future wastewater flows were estimated for each CIP Area based the per capita residential and employment wastewater generation rates from the 2021 MSPU, presented in **Appendix B**.

These dry weather flows were applied to the City's wastewater model (from the 2021 MSPU) to complete a review of the system's future performance under future 2-, 5-, and 10-year design storms (see full report in **Appendix B**). Peaking factors were applied using the Harmon formula. In addition, rain-derived inflow and infiltration (I&I) allowances were based on recommended extraneous flow design allowances from the 2021 MSP. The results of the review are summarized in **Appendix B** and illustrated on Figure 11.

The calibrated model was used to estimate the existing DWF in these areas, as well as future projected DWFs per the 2021 Region MSPU. As presented in Table 4, the projected CIP buildout peak flows are significantly higher than the estimated existing and 2021 MSPU projected peak flows, by roughly 1.5 and 1.3 orders of magnitude, respectively.

Table 4. Comparison of Peaked Dry Weather Wastewater Flows

CIP Area	Existing Peaked DWF (L/s)	2021 MSPU Future Peaked DWF (L/s)	2025 CIP Update Peaked DWF (L/s)
1	1.86	5.9	56.26
2	3.49	9.86	150.45
3	3.97	6.32	292.09
4	2.50	2.89	153.45
Total	19.27	36.66	652.25

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

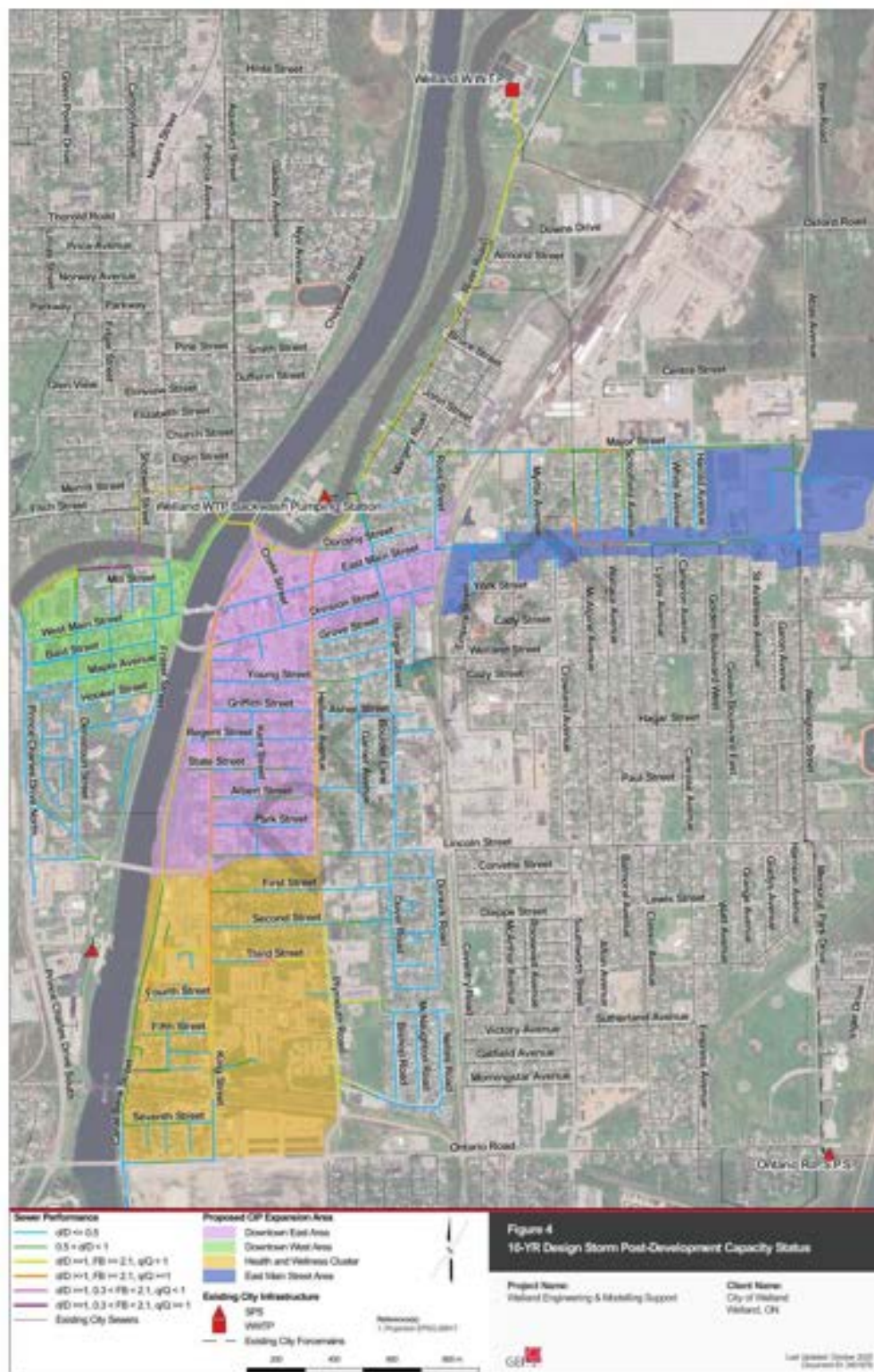


Figure 11 . Buildout Wastewater System Constraints: 10-Year Design Storm

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

Moreover, the evaluation determined that additional CIP buildout flows have an impact on the existing surcharging and basement flooding risks, in addition to the existing constraints identified in **Appendix B**. Additional City-Owned sewers experience surcharging under the buildout 2, 5, and 10-year design storm conditions due to downstream Region sewer capacities and in some instances, rely on downstream overflows to provide basement flooding protection. This includes sections along King Street/west of King Street, Plymouth Road/Hellems Ave, Major Street, and East Main Street as well as short sections along Third, Fourth, Fifth and Sixth Street. GEI also noted that with CIP buildout flows, there is a risk of overflows occurring under dry weather flows, which is noncompliant to F-5-5 requirements. Additionally, overflow volumes increase in 6 of the 13 overflows downstream of the CIP Expansion Areas under the 2, 5, and 10-year design storms.

Ongoing and planned upgrades to trunk sewers and continued efforts to reduce I&I are expected to help mitigate or delay the onset of these issues. Recommendations from the MSPU for upgrades along Plymouth Road remain a priority to provide additional online storage and basement flooding protection, with similar measures potentially required along Hellems Ave, King Street and East Main Street under the CIP growth conditions. As intensification progresses, continued monitoring and re-assessment of system performance will be key to confirm the collection system maintains an adequate level of service to support the projected growth.

4.7.2.4 Stormwater

The stormwater servicing for future municipal developments will be required to be in compliance with the City's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA), including the requirements for water balance, water quality, sediment and erosion control, water quantity and flood control outlined in Appendix A of the CLI ECA.

As development progresses within the CIP Area, stormwater management systems will be expanded to accommodate growth. While the CIP will accelerate development, it will not alter the regulatory requirements for new drainage infrastructure. New developments, including subdivisions, will be required to incorporate stormwater management facilities in line with current regulations, ensuring that post-development flows do not exceed pre-development levels. Although stormwater facilities are typically designed for individual developments, there are significant benefits to creating comprehensive stormwater management master plans. These plans would allow for shared facilities between subdivisions, optimizing land use and reducing costs, while ensuring long-term compliance with regulatory standards.

4.7.2.5 Transportation

The City has recently adopted a Transportation Master Plan (TMP) to assess road network and active transportation needs to accommodate existing and future projected population and employment growth to 2051. It is recommended the plan's findings and

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

strategies be incorporated into the development of the CIP. The TMP outlined key objectives to enhance network connectivity, promote active transportation, and improve safety and accessibility, which will be essential as the CIP Expansion Areas experience growth. Additionally, the TMP emphasizes the importance of regional integration and the need for updated transportation policies, all of which align with the density information provided in the Development Charges (DC) Background Study and the City's Official Plan. By integrating these strategies, the City can address potential transportation challenges, ensure consistency with the City's long-term goals, and support the development of a sustainable transportation system for future growth.

In terms of future constraints, particular attention should be given to potential capacity limitations on key streets and intersections, especially along East/West Main Street and Niagara Street, where increased density may lead to congestion. The TMP highlights these areas as requiring future upgrades to maintain efficient traffic flow and ensure pedestrian and cyclists' safety. Addressing these constraints proactively will be crucial to accommodating expected development while maintaining adequate transportation network performance. While the TMP identified these constraints and outlined corresponding improvements, its implementation plan did not fully align with the projected timeline of growth in the CIP Area. As a result, these items may need to be implemented sooner than originally anticipated.

4.7.2.6 Solid Waste

The Region of Niagara provides municipal curbside collection for garbage recycling to all residents living within the City of Welland. Regardless of the progress of the CIP, the City's growing population will require expanded collection services, such as more equipment (e.g., trucks) to continue the service at current levels. This need is projected to increase as growth continues in the CIP Areas. Collection services can typically be adjusted by optimizing collection routes, procuring more equipment (e.g., collection trucks), or by revising collection contracts to cater for population growth. As there is limited capital infrastructure involved in waste and recycling collection, the impacts on this municipal service are likely to be manageable.

Additionally, given the recent expansion and the resulting increase in capacity (see **Appendix B**), the landfill is expected to be sufficient to accommodate projected growth in waste volumes over the planning horizon. Its extended operating life provides a level of assurance that, despite anticipated development and intensification, the site will continue to support the community's needs without requiring additional investments in disposal infrastructure. The remaining undeveloped area within the site also offers flexibility for operational adjustments or future capacity enhancements, if needed.

As noted in the Niagara Region 2025 Corporate Asset Management Plan, the Region is currently developing a Waste Management Strategic Plan to guide the long-term delivery of waste services. Future infrastructure improvements and program planning

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

related to solid waste management should align with the direction and priorities established in this Strategic Plan.

4.7.2.7 Electrical Power

Hydro One is currently undertaking a Class EA to build a new double transmission line from the existing Hydro one corridor in Thorold into the Crowland TS. Given the high density growth targets being proposed in this CIP update are much higher than those estimated in previous master plans and other studies, it is important to consider potential constraints related to electrical servicing to support populations estimated in . Welland Hydro was contacted as part of this study to address the feasibility of supporting future development in the DHWC CIP. They advised that each CIP Area would require circuit expansion to accommodate the electrical loads associated with high-density residential development. However, available capacity exists on the adjacent 27.6 kV systems. At this time, no significant issues are anticipated in meeting future capacity requirements in these areas as development progresses. It is recommended that the City continue to engage Welland Hydro early in future project planning to confirm servicing needs and ensure that adequate hydro capacity is available to support proposed developments.

4.7.2.8 Natural Gas

While there are currently no available reports detailing the existing natural gas infrastructure in Welland, further information was obtained through direct consultation with Enbridge. A meeting was held to discuss their natural gas service, available capacity, and any existing limitations within the area. Enbridge confirmed that there are no known current constraints or limitations on the system supporting existing demands. However, to assess potential future constraints, detailed information would be required, including the type of development and associated gas demands – details that are not yet available or have not been confirmed. As the City expands, future development may require reinforcement of the natural gas network. It is therefore recommended that ongoing consultation with Enbridge be incorporated into the development process to ensure infrastructure planning aligns with growth.

4.7.2.9 Telecommunications

Given the likelihood that future high-speed internet expansion in the area will rely primarily on fixed wireless and satellite infrastructure, consideration must also be given to potential servicing constraints. Attempts were made to engage telecommunications service providers, including Cogeco and Bell, however responses were not received. As such, future development should include direct consultation with telecommunications providers to confirm service availability and identify any infrastructure needs early in the planning process.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

4.8 Public Realm and Streetscape Plans

As a result of public consultation and feedback at the workshops, the Study Area has been expanded to include the segment of East Main Street, between the rail corridor and Highway 406. Figure 12 outlines the various streets within the expanded Study Area that have been identified for review and potential widening, which are described in Table 8.

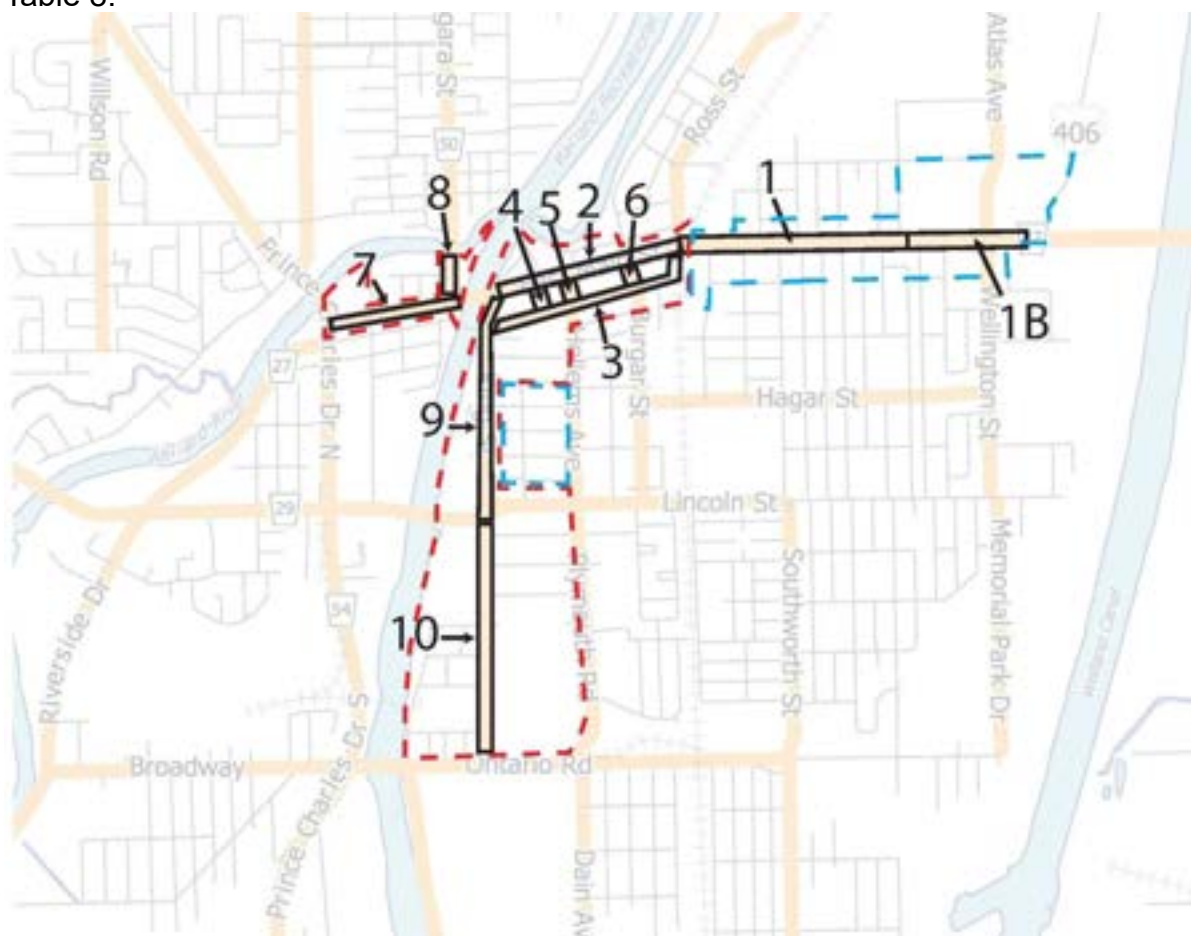


Figure 12 Streetscape Locations

In determining our urban design recommendation, we have taken direction from the Niagara Region Complete Streets Design Guidelines, 2017. This has also been weighed against the comments and feedback received at the Public Open House from local developers as well as local residents.

4.8.1 Current Conditions

Table 5 has been prepared to provide a summary of the existing status of all above noted road segments (Figure 12).

Policy Options, Directions and Recommendations Report
 City of Welland Downtown and Health and Wellness Cluster and Brownfield
 Community Improvement Plan Update

Table 5 Current Road Segment Conditions

Segment Number	Location	Current ROW Width
1	East Main Street between the Highway 406 Roundabout and the train tracks immediately east of Ross Street.	20-26m (varies across segment)
2	East Main Street between Ross Street and the bridge over the Welland Recreational Canal.	20m
3	Division Street between King Street and East Main Street.	20m
4	Cross Street between East Main Street and Division Street.	20m
5	Hellems Avenue between East Main Street and Division Street.	20m
6	Burgar Street between East Main Street and Division Street.	20m
7	West Main Street between the bridge over the Welland Recreational Canal and Prince Charles Drive.	18m
8	Niagara Street between West Main Street and the Welland River.	20m
9	King Street between East Main Street and Lincoln Street.	20m
10	King Street between Lincoln Street and Ontario Road.	20m

4.8.2 Streetscape Recommendations

Overall, in assessing the current status of the various important streets, a number of recurring themes have arisen, which form the basis of the recommendation:

1. Niagara Region contemplates three segments where a widening is required.
 - East Main Street, between the Highway 406 Roundabout and the train tracks immediately east of Ross Street, is planned for an ultimate ROW width of 26m (Segment 1).
 - A portion of King Street (between East Main Street and Division Street) is planned for an ultimate ROW width of 23m.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

- West Main Street (Segment 7) is planned for an ultimate ROW width of 20m.
- 2. The remaining streets are planned to remain at 20m. Notwithstanding the lack of any planned widening for those segments, there is notable opportunity to work within and improve the existing 20m ROW to support the overall revitalization of the Study Area.
 - In these examples, we note that vehicle/parking lanes in many instances are currently wider than the minimum requirements set out by Niagara Region. By reducing the width of the pavement in these areas, more of the ROW width can be re-allocated towards:
 - additional on-street parking areas
 - wider AODA compliant sidewalks (where feasible)
 - wider boulevards for tree planting, lighting and street furniture
 - inclusion of bike lanes and/or multi-use paths
- 3. the existing composition of any segment has been considered when recommending an improvement for a segment.
- 4. In the Bridge District, where the bike lanes have been removed, it is recommended that bike lock up facilities be provided to accommodate cyclists transitioning to pedestrian access. Recommendations on their design will be included in the urban design guidelines.
- 5. Where boulevard plantings are considered, planting methods should account for the challenges of the intense urban environment, including reflective heat, exposure to road salt, limited water and nutrients, potential root conflicts with underground utilities, and interference with overhead hydro lines. Smaller, more frequent tree planter boxes can help address these challenges. Once the trees reach a certain level of maturity, they can be transplanted, allowing the boxes to be reused for new plantings.

4.8.2.1 Segment 1: East Main Street between the Highway 406 Roundabout and the train tracks immediately east of Ross Street.

Segment 1 currently maintains a varied cross section. In some areas, the ROW width is as low as 20m, whereas in other areas the ultimate widening of 26m has already been achieved. We assume that widenings have been taken as part of the review and approval of specific land use planning applications, which has resulted in this variation along the segment.

While the corridor introduces turning lanes at intersections, and contains intermittent bike lanes, the segment is generally comprised of 2 lanes of 2-way traffic and one lane of on-street parking. Depending on where in the segment one is located, boulevards can range in width from 3-6m, again corresponding to any previous takings.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

Recommendation: We agree with Niagara Region in terms of protecting this corridor for the ultimate ROW width of 26m. As a means of creating the appropriate streetscape and public realm condition to support the revitalization of this corridor, we recommend the following:

1. Reduce right-of-way to two lanes of traffic until Golden Boulevard. One in each direction.
2. Add two lanes of on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking. On-street parking would terminate at Golden Boulevard.
3. Add a prominent planting/lighting zone for appropriate plantings..
4. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.
5. Add a potential for a “marketing zone” to support a safe pedestrian realm
6. Remove existing bike lanes east of St. Andrew, which due to the roundabout and Highway 406 result in hostile cycling conditions. Existing bike lanes west of St. Andrew should be optimized to remove gaps and provide clear indicators of ending lanes and where the bike lanes continue in the City.



Figure 13 Segment 1 – 26m ROW Width (Ross Street to Golden Boulevard)



Figure 14 Segment 1B- 26 m ROW width (Golden Blvd to Wellington St.)

4.8.2.2 Segment 2: East Main Street between Ross Street and the bridge over the Welland Recreational Canal

Segment 2 is consistently a 20m ROW for its entire length. This segment is unique as it maintains a 2-way portion between Ross Street and Bugar Street, which then switches to a 1-way road between Bugar Street and King Street.

The entire segment is fairly consistent with two lanes of traffic, and two corresponding lanes of parking. Where the segment switches to one way, it becomes two lanes of one-way traffic while still keeping two lanes of on-street parking. The direction of on-street parking changes as per the direction of travel of the road.

While some street trees and planter boxes are provided, they are inconsistent and often create conflicts with the sidewalk due to a lack of space.

Recommendation: We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. The City would like consideration for a 2-way traffic along East Main Street and it is recommended that the City continue to advocate for the Region to consider potential opportunities to provide two-way traffic along this road. As a means of creating the appropriate streetscape and public realm condition to support the revitalization of the downtown, we recommend the following:

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

1. Reduce lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.
3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings..
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.
6. Eliminate bike lane where applicable. The current arrangement has potential for significant vehicular / cyclist conflicts. While the loss of the bike lane is not ideal, the creation of a boulevards would be more of a benefit to the overall streetscape than the bike lane. It is recommended that bike parking or lock up facilities be provided in proximity to where the bike lanes terminate along a road.

Policy Options, Directions and Recommendations Report
 City of Welland Downtown and Health and Wellness Cluster and Brownfield
 Community Improvement Plan Update

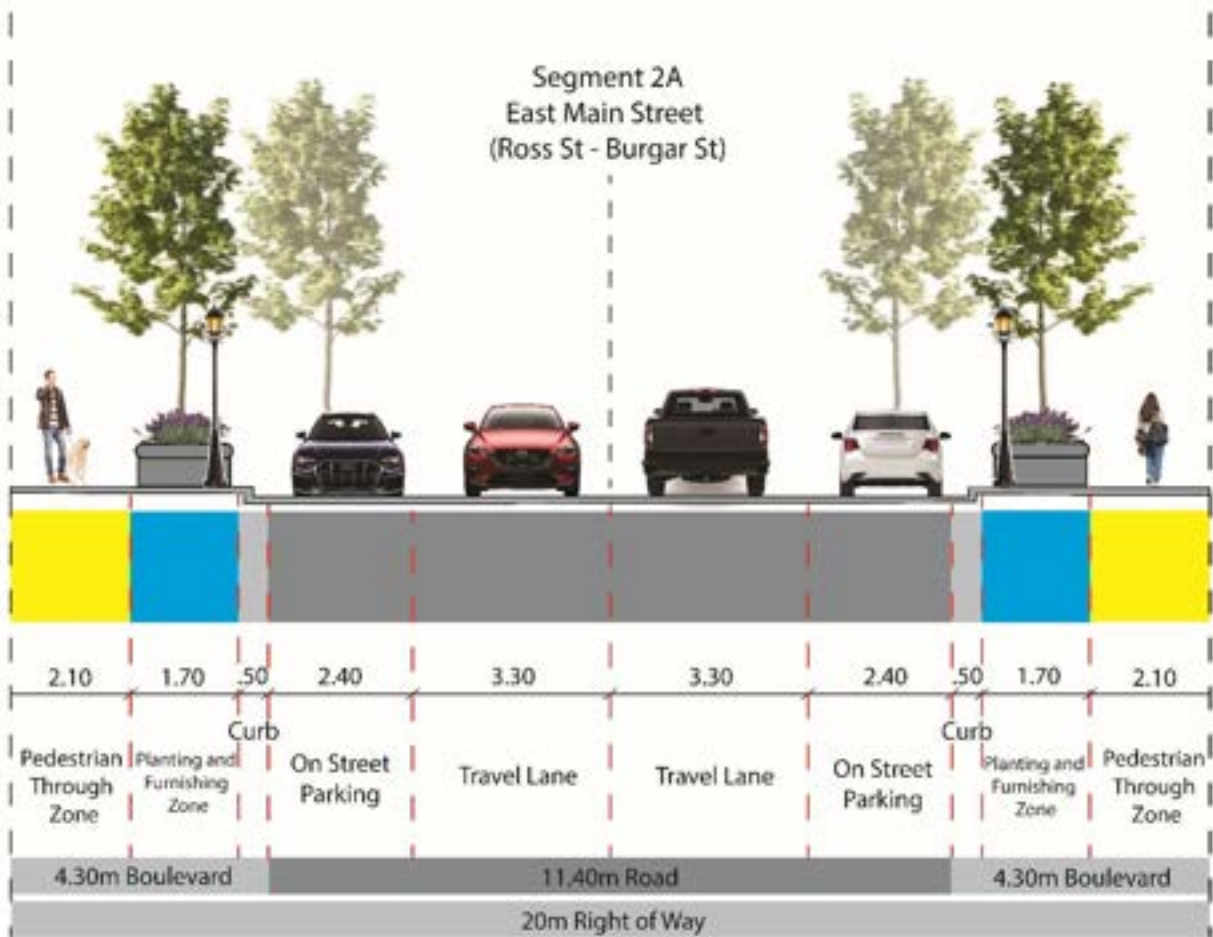


Figure 15 Segment 2 – 20m ROW Width (2-way portion)

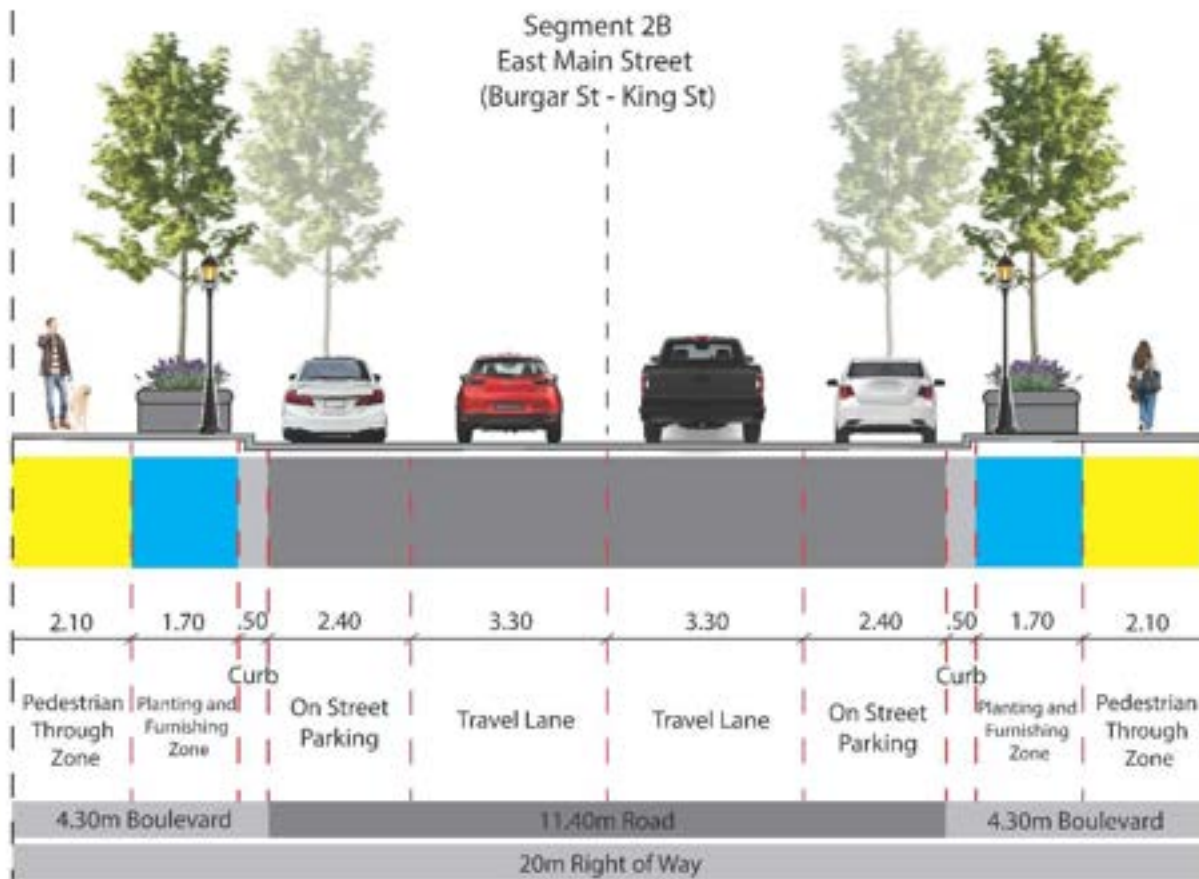


Figure 16 Segment 2 – 20m ROW Width (1-way portion)

4.8.2.3 Segment 3: Division Street between King Street and East Main Street

Segment 3 shares many similarities with Segment 2, including a change in two-way and one-way traffic. The main difference is related to the direction of travel, which is the opposite of East Main Street. In this instance, Division Street between King Street and Burgar Street is one-way traffic and Division Street between Burgar Street and Ross Street is two-way traffic. We note that a small segment of Division Street as it moves northward adjacent the rail corridor switches back to one-way traffic. This sub-segment has been left out of this assessment as it seems to be designed in that manner to provide access to a few select driveways.

Segment 3 is consistently a 20m ROW for its entire length. The entire segment is fairly consistent with two lanes of traffic, and two corresponding lanes of parking. It is noted that between Helles Avenue and Burgar Street, while maintaining the direction of travel, on-street parking is not provided. It is further noted that this is where the existing bike lane ends as well.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

Recommendation: We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. The City would like consideration for a 2-way traffic along Division Street and it is recommended that the City continue to advocate for the Region to consider potential opportunities to provide two-way traffic along this road. As a means of creating the appropriate streetscape and public realm condition to support the revitalization of the downtown, we recommend the following:

1. Reduce lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.
3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings.. Division Street is currently lacking street trees, particularly on the south side.
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility. The sidewalk location has been re-organized so there is space between the sidewalk and the property lines.
6. Eliminate bike lane where applicable. The current arrangement has potential for significant vehicular / cyclist conflicts. While the loss of the bike lane is not ideal, the creation of a boulevards would be more of a benefit to the overall streetscape than the bike lane. It is recommended that bike parking or lock up facilities be provided in proximity to where the bike lanes terminate along a road.

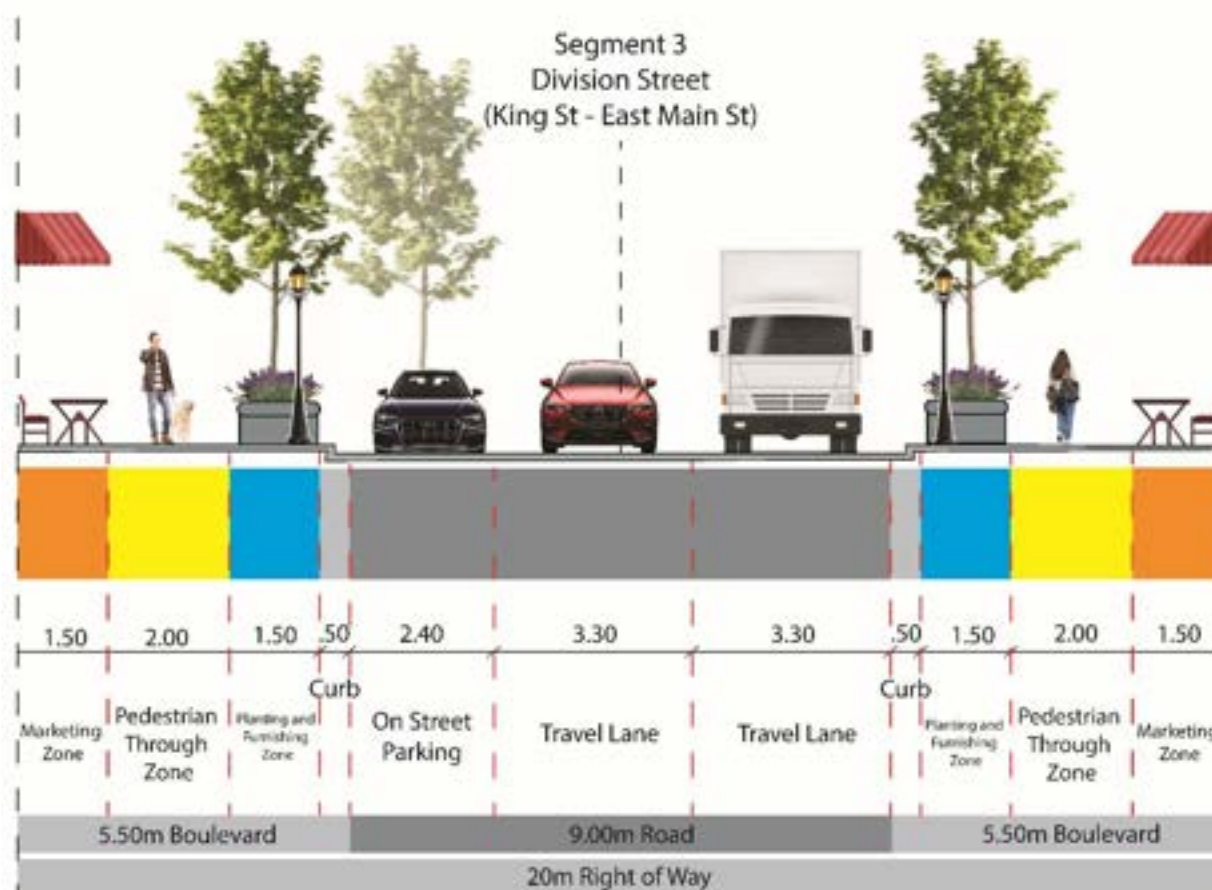


Figure 17 Segment 3 - 20 m ROW

4.8.2.4 Segment 4 - Cross Street between East Main Street and Division Street.

Segment 4 is consistently a 20m ROW for its entire length. This segment provides a two-way connection between Division Street and East Main Street. In addition to two lanes of two-way traffic, this segment includes two lanes of on-street parking for each direction of travel.

Recommendation: While this particular segment is not an identified Niagara Region road, nor has it been identified in the Welland Official Plan for a planned road widening, we believe that maintaining the current ROW width of 20m is appropriate. As a means of creating the appropriate streetscape and public realm condition to support the revitalization of the downtown, we recommend the following:

1. Reduce the width of the lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.

Policy Options, Directions and Recommendations Report
 City of Welland Downtown and Health and Wellness Cluster and Brownfield
 Community Improvement Plan Update

3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings..
5. Add a more pedestrian friendly wider sidewalk experience for increased safety and visibility.

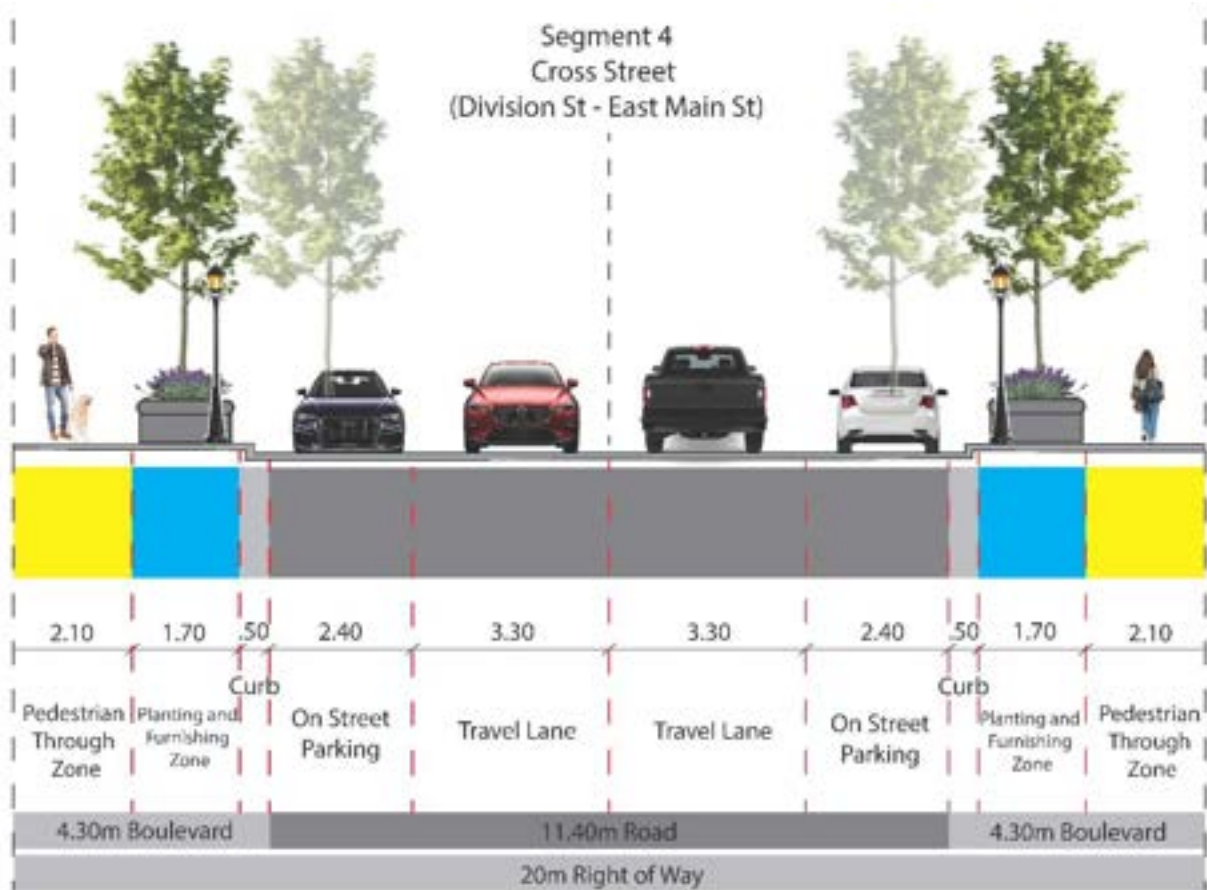


Figure 18 Segment 4 - 20m ROW

4.8.2.5 **Segment 5: Hellems Avenue between East Main Street and Division Street**

Segment 5 is consistently a 20m ROW for its entire length. Similar to segment 4, this segment provides a two-way connection between Division Street and East Main Street. While providing two lanes of two-way traffic, this segment includes one lane of on-street parking.

Recommendation: We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. As a means of creating the appropriate streetscape and

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

public realm condition to support the revitalization of the downtown, we recommend the following:

1. Reduce the width of the lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.
3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings.
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.

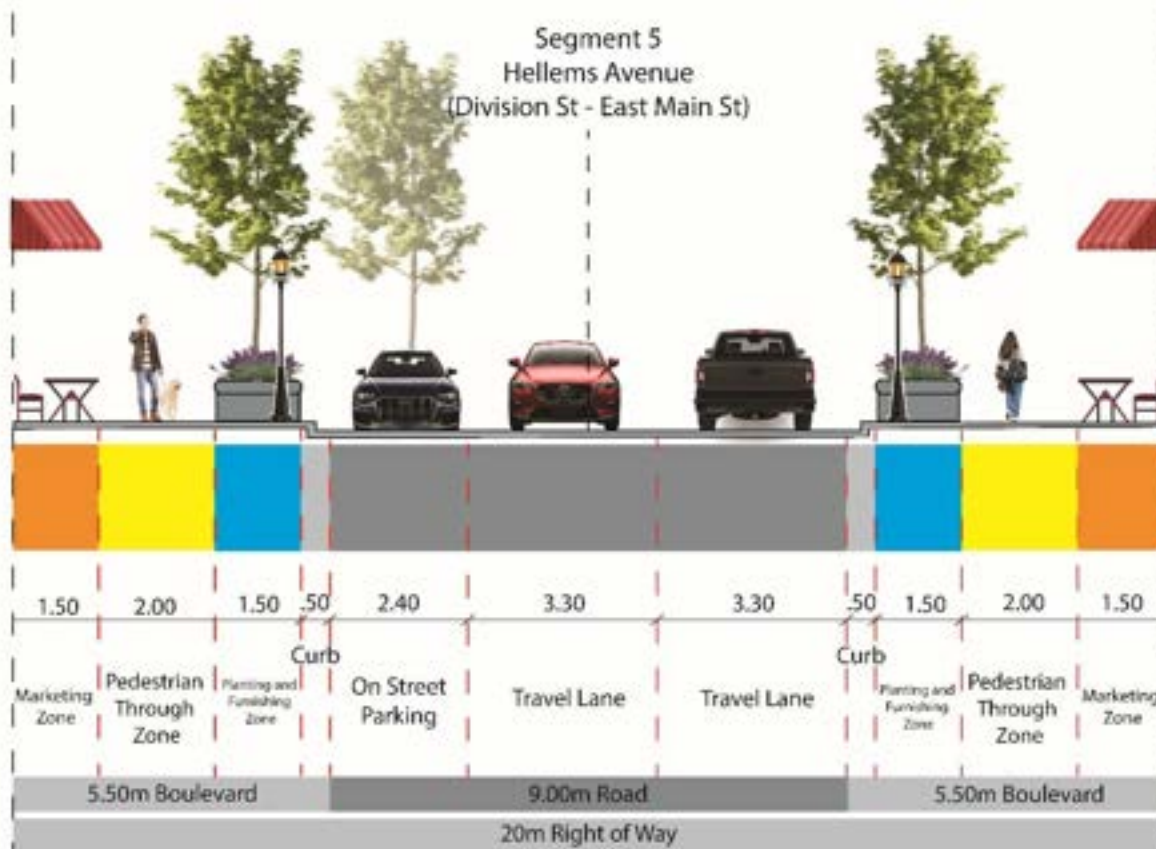


Figure 19 Segment 5 - 20m ROW

4.8.2.6 Segment 6: Bugar Street between East Main Street and Division Street.

Segment 6 is consistently a 20m ROW for its entire length. While this segment also provides a connection between Division Street and East Main Street, this is a one-way road, generally with two lanes of travel and one lane of on-street parking. It is noted

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

that there are turning lanes for both east and west as this meets the terminus of East Main Street when that road changes from a one-way to a two-way road.

Recommendation: We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. As a means of creating the appropriate streetscape and public realm condition to support the revitalization of the downtown, we recommend the following:

1. Reduce lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.
3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings.
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.

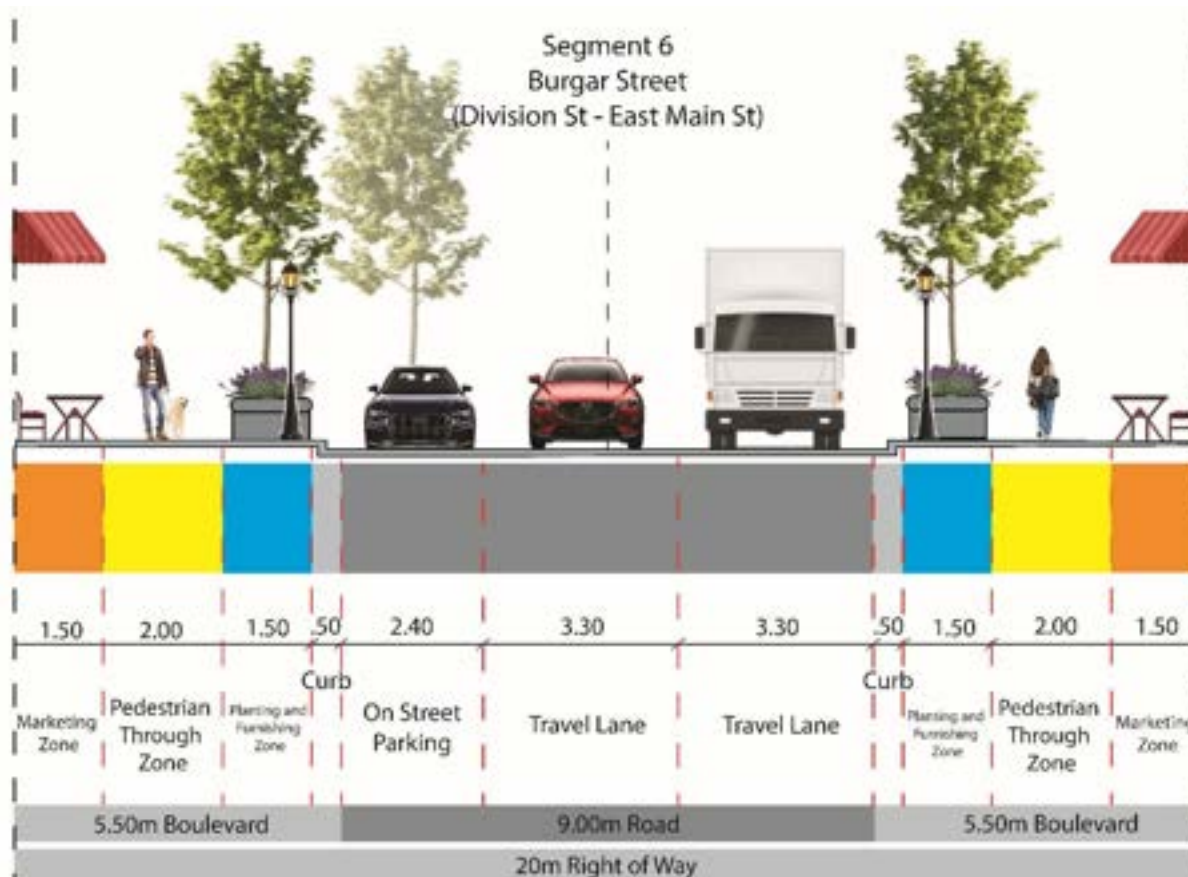


Figure 20 Segment 6 - 20m ROW

4.8.2.7 Segment 7: West Main Street between the bridge over the Welland Recreational Canal and Prince Charles Drive

Segment 7 is consistently an 18m ROW for its entire length. This segment provides for two lanes of two-way traffic as well as one lane of on-street parking. While some boulevards are provided, there is a lack of street trees that would be appropriate for West Main Street.

Recommendation:

We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. As a means of creating the appropriate streetscape and public realm condition to support the revitalization of the downtown, we recommend the following:

1. Reduce the width of the lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings..
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.

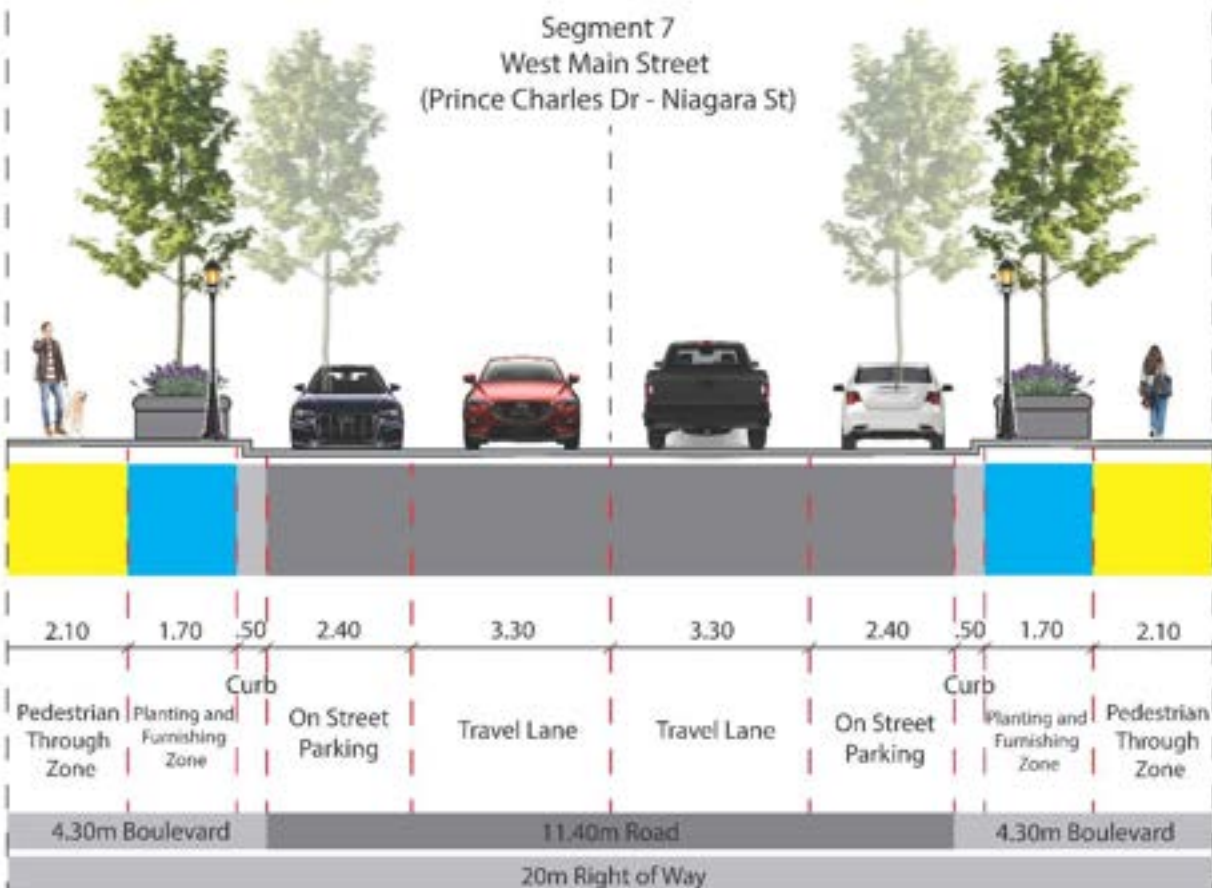


Figure 21 Segment 7: 20m ROW

4.8.2.8 Segment 8: Niagara Street between West Main Street and the Welland River.

Segment 8 is consistently a 20m ROW for its entire length. This segment provides for two-way traffic by utilizing 4 lanes. Generally, this ROW maintains two lanes of southbound traffic and one lane of northbound traffic along with a lane of on-street parking. Boulevards are quite small and there is a lack of street trees that would contribute to creating a sense of place as one enters Welland.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

Recommendation:

We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. As a means of creating the appropriate streetscape and public realm condition to support the urbanization of the entranceway into the Town, we recommend the following:

1. Reduce the width of the lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts noted above.
3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings.
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.
6. Due to the convergence of one- and two-way streets at the signalized intersection, incorporate slip lanes for appropriate right turn movements that can accommodate larger vehicles and to minimize delays.

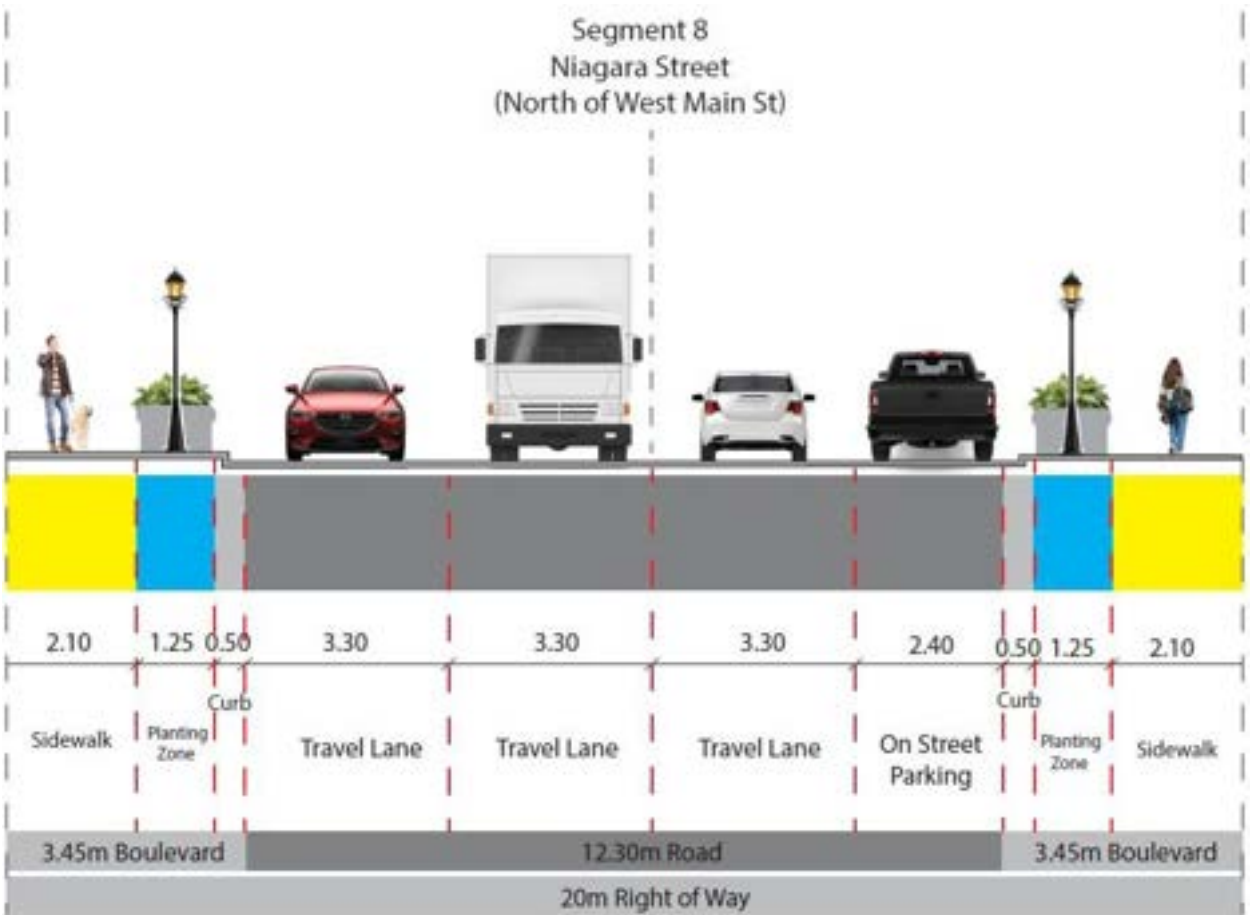


Figure 22 Segment 8 - 20 m ROW

4.8.2.9 Segment 9 & 10: King Street

Segments 9 and 10 are currently 20m for the entire length. Notwithstanding the delineation of two segments, we believe that from an urban design perspective, both segments warrant similar streetscape and public realm considerations. King Street currently maintains two-way traffic in two lanes with one additional lane of on-street parking. We note that there is a small portion between Division Street and Young Street that maintains two similar lanes of travel with two lanes of on-street parking.

Recommendation: We agree with Niagara Region in terms of protecting for the ultimate ROW width of 20m. We acknowledge that Niagara Region has identified the small portion between Division Street and Young Street as being protected for a 23m ROW. We recommend this portion remain to be protected for 23m but be treated as a 20m. There is no opportunity to take any widenings from Merritt Park on the canal side and that would mean that the entirety of the widening would come from the east side.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

Given the wider objectives of encouraging redevelopment, we do not believe that taking land away from the downtown would be beneficial.

As a means of creating the appropriate streetscape and public realm condition to support King Street's unique role and location adjacent the waterway and other significant areas for recreation, we recommend the following:

1. Reduce the width of the lanes of traffic to the minimum of 3.3m and on-street parking areas to 2.4m.
2. Allot all new space to the boulevards resulting in wider sidewalks and tree planting zones to avoid conflicts.
3. Maintain on-street parking to support the future mixed-use buildings, at-grade retail and reducing the reliance of underground parking.
4. Add a prominent planting/lighting zone for appropriate plantings.
5. Add a more pedestrian friendly sidewalk experience for increased safety and visibility.
6. Introduce a formal cycle track along the west side to work in concert with the various assets, including parks, trails and other non-vehicular connections in the area created by the canal. This would make the trail system along the waterway more accessible and integrate a new trail within the existing system. This would provide immediate access between Merritt Park at the north end of the segment, down to Station Park at the south end of the segment. This also provides east-west connections via the Keystone Trail. The cycle track should be separate from the vehicle travel lanes and pedestrian/other active transportation routes to eliminate incident potential.

Policy Options, Directions and Recommendations Report
 City of Welland Downtown and Health and Wellness Cluster and Brownfield
 Community Improvement Plan Update

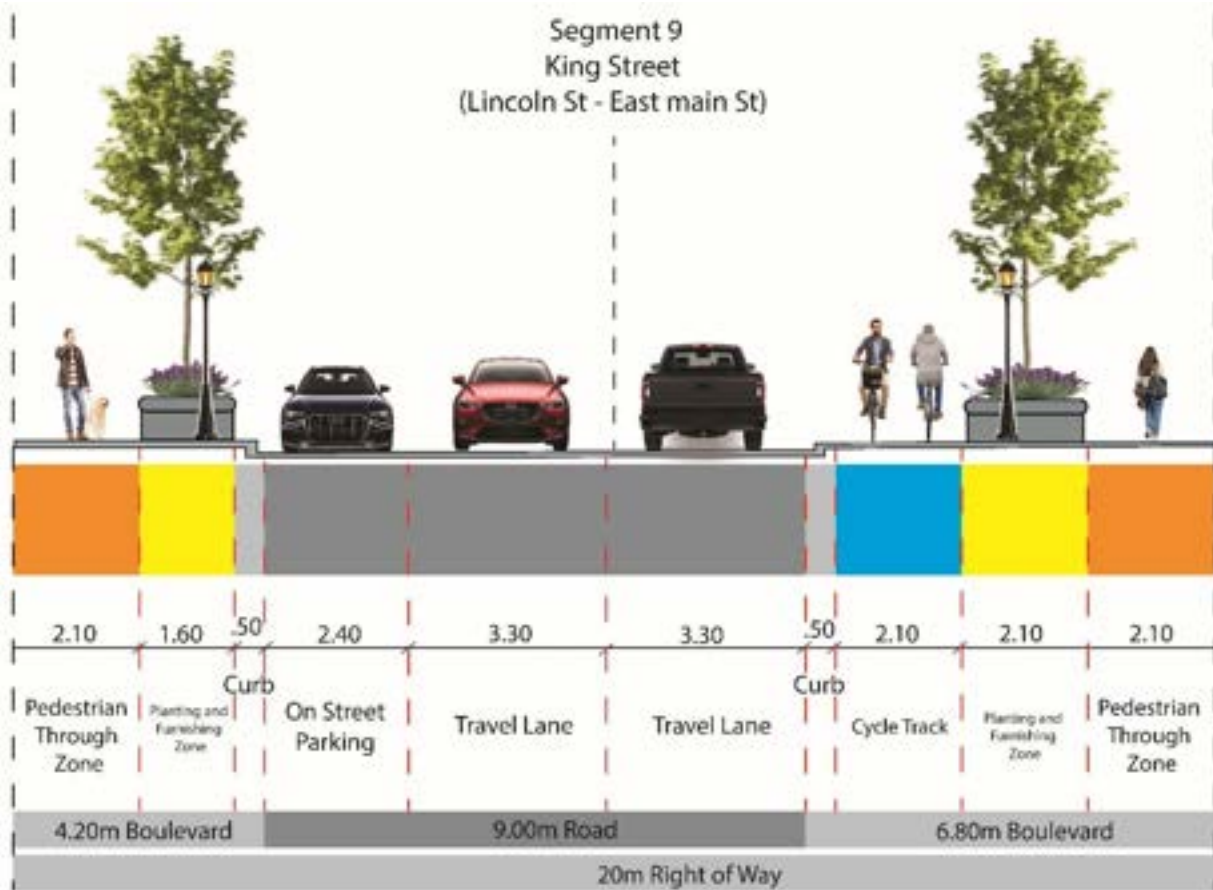


Figure 23 Segment 9: 20m ROW

Policy Options, Directions and Recommendations Report
 City of Welland Downtown and Health and Wellness Cluster and Brownfield
 Community Improvement Plan Update

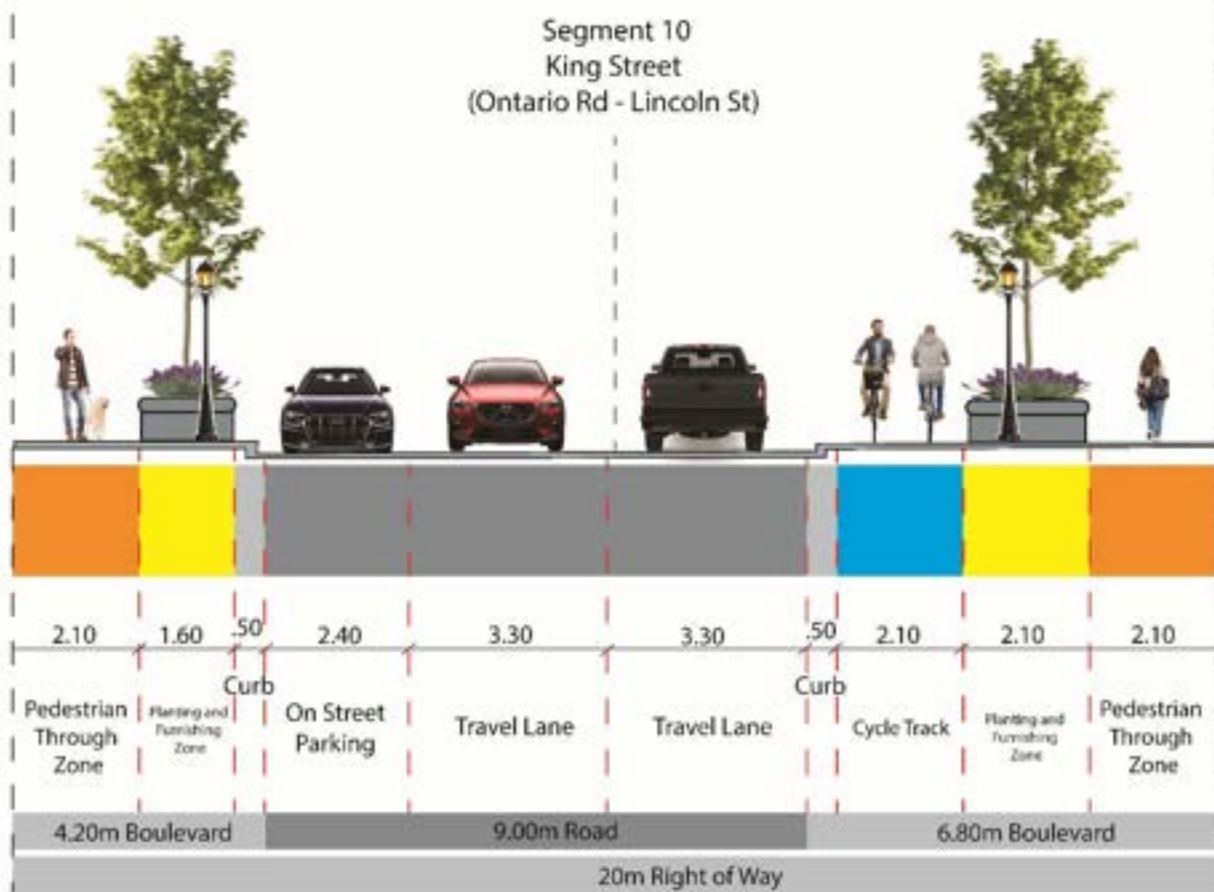


Figure 24 Segment 10 - 20m ROW

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

4.9 Urban Design

Further to the Background Report which set out the current and future policy framework, along with the current urban design vision for the Study Area, this section conducts a more detailed analysis of the various urban design considerations as it pertains to the Downtown and Connected Districts CIP. These factors will be incorporated into the urban design guidelines, which will form part of the final CIP.

While the overall objective remains to support the redevelopment and revitalization of the Study Area, with emphasis on the Downtown Area, these recommendations are intended to support business and encourage activity via increased residential density. Due to a number of factors, such as high-turnover, building vacancies and a lack of residential development, the vibrancy of Downtown has experienced some significant challenges. This assessment is generally categorized as follows:

1. Vision and Guiding Principles
2. Urban Design Guidelines

4.9.1 Vision and Guiding Principles

The following sections provide recommendations on where policies can/should be updated to encourage the scale and intensity of downtown redevelopment desired to support revitalization.

4.9.2 Vision

Welland is envisioned as an attractive, high-quality, safe, sustainable, accessible, interconnected, pedestrian-friendly and transit-ready community. The character and identity of Welland is maintained and enhanced through high-quality streetscapes, built form, and urban open spaces.

- Streetscapes are attractive, sustainable, comfortable, pedestrian and cyclist-friendly, transit-ready, and safe and accessible for all users.
- Buildings are sustainable, appropriately massed, well-articulated with high-quality materials, fenestration and detailing.
- Urban open spaces are strategically located to provide focal points, places for gathering, and passive recreation opportunities.

The defining urban design concept for Welland within the study area is the creation of a vibrant, mixed-use downtown and corresponding Main Street environment through compact urban form, and pedestrian supportive streetscapes, which makes walking an easy and pleasurable experience.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

The urban design concept should emphasize that the public streetscape and the private realm buildings and landscaping will be equal contributors to placemaking and the creation of a successful downtown and main streets for Welland.

It is expected that the urban design concept, and the tools offered to implement it, will result in an improved and high quality physical environment for the Study Area. Furthermore, it is hoped that a high quality urban environment will increase pride in the community, promote creative initiatives and lead to economic improvement through new investment.

4.9.3 Guiding Principles



1. Supporting a vibrant mixed-use environment and active streetscapes by encouraging more residential apartments and offices above shops within the downtown.



2. Creating a more cohesive public realm throughout Downtown Welland.



3. Demonstrating high-quality design in new development and incorporating best practices that respect and complement the character of Downtown Welland and its adjacent neighbourhoods.



4. Improving the character and visibility of existing pedestrian and cyclist connections throughout the area.
5. Creating vibrant, safe and comfortable pedestrian oriented streets through integrating Crime Prevention Through Environmental Design principles and design that enhances mobility for pedestrians, cyclists and drivers and will support existing and future transit.



6. Ensuring an attractive and distinctive Downtown that has outstanding architecture that both respects the heritage character and sits well within the context of visual diversity, interest and beauty.



7. Promoting a mix of uses in a variety of building forms and opportunities for retail, commercial and community uses.



8. Incorporating sustainable development and construction practices to maximize resource conservation.

4.9.4 Urban Design Guidelines

The current urban design guidelines provide a good general framework for growth throughout the City. With specific reference to the Downtown, there are specific guidelines that speak in general terms about massing and built form, building design, service and landscape. However, we do believe that the City would benefit from more direction, particularly as it relates to specific built forms.

Recommendation: Similar to the existing urban design policies of the Official Plan, there are sections that speak to important urban design considerations of the Downtown. However, they do not cover all aspects and we do suggest staff consider adding urban design policies that continue to supplement the appropriate development of the downtown. We recommend including additional categories to help guide applicants such as:

Site Organization

1. Building placement
2. Building Entrances
3. Amenity space
4. Site servicing and Parking
5. Public Art

Built Form, Massing and Heights

1. Street Proportion and Facades
2. Setbacks and Stepbacks
3. Rear Transition
4. Ground Floor Height
5. Balconies and Projections
6. Roofs and Mechanical Areas
7. Side yard setbacks

Pedestrian Realm

1. Streetscape and Landscape Design

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

2. Sidewalks
3. Pedestrian Level Wind Effects
4. Pedestrian Weather Protection

These guidelines are not intended to be prescriptive but rather provide guidance for applicants on urban design measures that will support the achievement of the vision and goals of the Downtown & Connected Districts CIP.

4.9.4.1 Tall Building Guidelines

As per the Background Report, one area of weakness identified through the SWOT analysis was that the current height/density regime appears to be insufficient to attract the critical mass of people to activate the downtown. The Draft Official Plan is contemplating up to 16 storeys in some areas. We then recommend introducing a new set of urban design guidelines specific for this building type with the overall goal to improve the aesthetics and appeal of the Downtown. This would include direction on the building base (podium), tower and building top. In this regard, we would also include matters such as:

1. Base Building Height and Scale
 - Delineate the ground, middle and tops of buildings as well as design treatment of each
2. Podium Setbacks and Stepbacks
 - Built form and massing considerations that balance intensification and transition
3. Street Animation
 - Tied to other policies/guidelines relating to streetscapes
4. First Floor Height
 - Prominent ground floor uses, lobby's, active retail, pedestrian supportive
5. Façade Articulation and Transparency
 - Overall design aesthetic, use of fenestration
6. Tower Floorplates
 - Maximums to ensure minimal undue impacts as a result of shadows, loss of skyview
7. Tower Separation
 - Also associated with shadows and loss of skyview, ensures meaningful open spaces.
8. Shadow Standards
 - Ensures minimum access to sunlight



Figure 25 Tall Buildings Sketch

5.0 Brownfield CIP

5.1 Vision and Objectives

The current Brownfield CIP encourages the remediation and redevelopment of abandoned, vacant, or underutilized brownfield sites, transforming them into vibrant assets that add social, environmental, and economic value to Welland. Recent public engagement revealed strong local interest in removing visual blight and revitalizing communities. To achieve this vision, the CIP should focus on promoting and streamlining financial incentives, expanding geographic eligibility to include the entire municipality, and increasing flexibility to reflect modern regulatory and redevelopment costs. The Brownfield CIP should place greater emphasis on urban and community renewal specific to Welland, highlighting how brownfield funding has already transformed parts of the city. Successful redevelopment projects, such as those downtown, along the Welland Recreational Canal, and in industrial areas—should be showcased to demonstrate past success and to build support for the updated Brownfield CIP by showing how future efforts will continue this positive momentum (Figure 26).



Figure 26 Brownfield Redevelopment Success Story: Canals Development

Objectives should include encouraging private investment through front-end support, enabling more effective environmental remediation, and enhancing transparency and uptake of programs like the Environmental Study Grant (ESG), Brownfield Tax Assistance (BTA), Brownfield Tax Increment Grant (BTIG), and the Brownfield Development Charge Reduction. The updated CIP should also emphasize measurable outcomes, support non-revenue-generating projects with community benefit, and promote innovation and partnerships to help unlock the potential of Welland's brownfield lands.

5.2 Community Improvement Project Area

While the current CIP covers most of Welland's urbanized areas, the City of Welland should consider expanding the Community Improvement Project Area (CIPA) to include the entire municipality, allowing greater flexibility to support brownfield redevelopment across all areas, including employment lands east of the Welland Canal. Within the expanded area, the City could identify and prioritize key redevelopment clusters such as the Downtown, canal corridor, and Gateway Economic Centre.

Research conducted by the Ministry of Municipal Affairs and Housing (MMAH) in 2018 found that 40% of CIPs targeted the entire municipality and 60% target specific locales (as referenced in De Sousa and Ridsdale 2021, page 106). Aligning the CIPA with infrastructure investment plans would further support shovel-readiness, while enhanced mapping and communication tools would improve public awareness and program accessibility. To maintain relevance over time, the City should also establish a

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

mechanism for periodic review and adjustment of the CIPA boundary based on development trends and community needs.

Agricultural or vacant sites may also still be considered contaminated and need funding support for redevelopment. A study examining Record of Site Conditions (RSCs) filed in Ontario between 2004 and 2015 found that 18.7% of sites were agricultural/other (other is defined as not fitting in the other categories), so expanding the CIPA to non-urbanized areas would allow the city to support remediation efforts at these sites (De Sousa and Spiess, 2018, Page 11, 12). Expanding the CIP boundary city-wide would ensure that all potentially contaminated properties have equitable access to financial support through the brownfield program. This would help unlock redevelopment opportunities in rural and transitional areas, reduce environmental risks, and promote more balanced growth across the municipality especially for employment areas.

5.3 Financial Incentives

The existing Brownfield CIP has four (4) financial incentive programs, with a fifth program added in 2022:

1. Environmental Study Grant (ESG) Program
2. Brownfields Tax Assistance (BTA) Program
3. Brownfields Tax Increment Grant (BTIG) Program
4. Brownfields Fees Grant (BFG) Program
5. Brownfield Development Charge Reduction

In the five years since the City's Brownfield CIP was last updated, the City has approved 62 applications, with most applications received in 2022. City grants totalled nearly \$40 million, with the Region providing over \$30 million towards brownfield redevelopment. Since the program began in 2013, there have been 82 brownfield grant applications approved by the City of Welland, to approximately 41 distinct addresses.

Comparatively speaking, Welland's Brownfield CIP uptake has been good. Welland's program stands out for offering both a Development Charge Reduction and a Tax Increment Grant, a combination not commonly found with other municipalities. Recent trends across Ontario of municipalities with existing brownfield CIPs point to brownfield CIP enhancement and incentivization to serve other priorities such as housing and sustainability, especially in response to rising housing costs and mandated housing targets.

To further enhance and modernize the Brownfield CIP to reflect current conditions, we are recommending several adjustments to better serve the development community, to support achieving municipal objectives and to advance brownfield redevelopment. Our emphasis, based on public consultation, is on maintaining and expanding a strong front-

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

end support system and providing flexibility for the reality of redevelopment given current trends and markets.

1. Enhance the Environmental Study Grant (ESG):

Continue prioritizing upfront financial incentives through the ESG as there is strong public and political support for front-end assistance over back-end programs like BTIG whereby the developer fronts the cost and is paid back once the project begins generating property taxes. We recommend tiering the maximum funding percentage from 50% to 100% to encourage not-for-profit projects that support affordable housing (City's priority areas). We also recommend increasing the total grant amount from \$35,000 to \$60,000 to make ESG more impactful to reflect inflation, rising costs of environmental studies and the number of studies that need to be completed. The eligible expense per study should remain the same at \$20,000 per study. These costs have escalated due to stricter regulatory requirements, increased demand for qualified environmental professionals, and rising material and laboratory testing expenses. Due to the nature of brownfield sites, the ESG related work uniquely complicates redevelopment projects. ESG work often has to be completed upfront before significant investment is secured. As such, it is at this critical stage that investment is most needed. Meaningful and significant adjustments to the ESG grant upper total limit would be a valuable contribution to kick start redevelopment so that brownfield redevelopment remains viable and attractive to property owners and developers.

It is recommended that the range of eligible studies that are approved under the ESG be expanded. Brownfield Sites with known or suspected contamination and that have defined Areas of Potential Environmental Concern (APECs) should be eligible to include grants for Excess Soil Characterization Reports, Sampling and Analysis Plan and Excess Soil Destination Reports in accordance with O. Regulation 406/19 (Excess Soil Regulation) and Annual Reports, Environmental Monitoring and Inspection required through a Certificate of Property Use. In the City's previous update to the brownfield CIP, the City expanded the ESG program to include Designated Substance Surveys, and Hazardous Material Surveys; a further expansion would be appropriate to adjust to the changing regulatory environment.

2. Modify Eligible Criteria to Capture Complement of Brownfield Redevelopment Costs

Eligible costs under the BTAP and BTIG programs are comprehensive and cover remediation, clean fill backfill, risk management, insurance, demolition, etc. Due

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

to changes in the regulatory framework, several clarifications should be made to the eligible costs to include:

- Excess Soil Characterization Reports, Sampling and Analysis Plan, Excess Soil Destination Reports in accordance with O. Reg. 406/19 (Excess Soil Regulation).
- Groundwater dewatering or removal and subsequent treatment, discharge or disposal and permit to take water or EASR applications.
- Soil tracking and hauling costs, including tipping fees at registered receiving sites and Reuse Sites and on-site imported soil expenses.
- Permit costs associated with excess soil registry filings and water discharge from dewatering activities.

Including these costs recognizes the regulatory burden and financial impact of excess soil compliance, and contaminated groundwater on brownfield redevelopment and aligns the CIP with current provincial regulatory requirements. BTAP and BTIG can be used to offset qualified remediation, water management and soil movement costs during project execution.

3. Clarify Eligible Costs and Promote Synergy Across Programs:

To provide further clarification it is recommended that the CIP be updated to:

- Ensure clear and consistent messaging in application forms regarding eligible costs, and how BTA, BTIG, and ESG programs can be combined to maximize coverage of Phase II Environmental Site Assessments (ESAs), investigations, cleanup, and risk management costs.
- Provide clarification and flexibility on intent of ineligibility for the primary polluter for instances of acquisition, land transfer and corporate amalgamation that often import new legal owners who may still be recognized under law as the responsible party.
- Recognize that ownership changes may happen during the life of a brownfield redevelopment and account for this potential in agreements.
- Clarify eligible costs to reduce applicant uncertainty and streamline the application process to improve overall program uptake. Clear guidance for all five incentive programs will help developers better plan their projects, leverage each available funding program more effectively, adjust for ownership changes, and avoid missed opportunities due to misunderstandings about cost eligibility between programs. Ultimately, this will enhance the efficiency and impact of the City's brownfield incentive programs.
- Strengthen communication on how the brownfield incentive programs work together, as well as other CIP and city programs, using clear flowcharts, case studies or guidance materials to illustrate combined funding pathways and timelines from study to build-out. Approximately 75% of the applicants only use one of the City's brownfield incentive

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

programs and in the past ten years, only one applicant has used all four of the City's brownfield incentive programs. Promoting successful case studies on the City's website would serve to highlight the benefits of the incentive programs. Through advertising and providing clarity, increased uptake on all of the brownfield program offerings may serve to accelerate development.

4. Evaluate and Adjust the Time Frames

A review of the time limits associated with the BTA and BTIG programs is recommended to ensure they align with the realistic timelines of brownfield redevelopment projects.

Specifically, the review should:

- Assess whether the duration of tax assistance (typically up to 3 years) under BTA is sufficient to meaningfully support projects that face longer remediation or phased development timelines. A longer timeframe (5 years) could allow more sustainable forms of remediation to be undertaken.
- Evaluate the BTIG time frame (e.g., 10 years) to determine if the grant period and percentage of tax increment returned is competitive and aligned with the lifecycle of project returns.
- Consider opportunities to introduce flexibility for projects that demonstrate environmental or community benefit but require extended timelines due to complexity, financing, or infrastructure coordination (e.g., infrastructure upgrades, affordable housing, canal-edge redevelopment).

These adjustments are recommended to better reflect the realities of brownfield redevelopment, which often involve unpredictable delays and extended planning timelines and also support City initiatives. By aligning program timelines with actual project needs, the City can improve uptake, reduce financial risk for developers, and accelerate the transformation of underutilized lands into productive community assets.

5. Evaluate Tiering and Project Caps of Relevant Programs

A tiered allocation under the Brownfield Fees Grant (BFG) is recommended, providing a grant equal to 60% of planning and building permit fees for most eligible projects, and up to 80% for student housing or affordable housing projects (where more than 20% of the units are designated as affordable). The maximum grant amount would be \$60,000 per project, or \$80,000 for student or affordable housing projects.

For the Tax Increment Grant (TIG), a tiered allocation ranging from 60% to 80% of the post-project tax increase should be considered, based on the level of site remediation costs. This approach would ensure that greater funding support is directed toward projects involving more heavily contaminated brownfield sites.

6. Modify the BTA to Incentivize Interim Uses

Interim or meanwhile uses are becoming more common in the current economic climate and serve to rapidly activate an unused site and enhance the community. Often these interim uses become a catalyst for growth that ultimately achieves uplift and site restoration. To encourage interim uses, the City could modify the BTA to provide 50% of the municipal property tax annually, for up to three years, to convert the land to an interim use that restores the aesthetics of the land and provides safe, compliant, community access. The City could prescribe what types of interim lands uses could be eligible, potentially including temporary parking, lot gardens, popup food trucks, temporary bench seating, popup courts or other uses.

7. Create a Brownfield Reserve Fund:

It is recommended that the City create a Reserve Fund that could be used to fund CIP programs, strategic placemaking or strategic land acquisitions of brownfield sites and City initiated brownfield testing and remediation. This could be funded by land sales.

8. Expanded Eligibility for Government and Crown Agencies

The current Brownfield CIP states that the Provincial and Federal governments, Crown Corporations, and the Regional Municipality of Niagara are not eligible to apply for any of the incentive programs. It is recommended that this restriction be revised to permit participation by these entities in order to encourage intergovernmental partnerships. Allowing such collaboration could help leverage additional funding for projects such as the remediation of legacy brownfields, as well as the development of affordable and student housing projects.

9. Introduce Non-Financial Incentives in the CIP:

Consideration should be given to non-monetary supports that the city can use to support remediation and redevelopment, such as:

- Potential expedited planning and streamlined approvals.
- Zoning flexibility (e.g., density bonuses, reduced parking minimums).
- Early engagement in pre-consultation to flag compatibility, infrastructure, or policy alignment issues.

10. Housekeeping Changes

A number of housekeeping changes are recommended to clarify program outcomes and the process:

- Clarify that the BTA program provides a 'rebate' rather than a 'cancellation' and modify legislative references to reflect the same.
- Add the registration of a plan of condominium/subdivision or occupancy as triggers to when the tax assistance under the BTA will cease.
- Modify specific quote requirements to reflect the difficulties in receiving multiple quotes for specific works as follows:

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

- Phase II ESA: 2 Quotes
- Phase II ESA – Delineation: 1 Quote
- Construction Project Costs: 1 Quote
- Environmental Consulting :1 Quote
- Servicing Costs :1 Quote
- Remediation Work Quotes (Excavation): 2 Quote

5.4 Administration and Monitoring

The current CIP contains a comprehensive strategy for marketing and monitoring however, these strategies do not seem to be realized. The city's collected financial information just outlines the amount of funds delivered and the source but provides little in terms of outcomes (increased assessed value, tax generation, land redeveloped, housing units generated, jobs, etc.). This information, along with short case studies, would go a long way toward marketing and supporting Welland's Brownfields CIP. The following are recommended:

1. Implement a Results-Based Monitoring Framework

Develop and maintain an outcomes-focused tracking system to monitor and report on key performance indicators (KPIs), including:

- Number of properties redeveloped.
- Total area of land remediated and put back to productive use.
- Increase in assessed property value.
- Tax increment generated.
- Number of housing units created.
- Environmental benefits (e.g., contamination removed, managed or treated, excess soil reused, GHG emissions avoided).

This will help demonstrate the return on investment and overall impact of the CIP beyond basic financial accounting. A dashboard could be created to visually track KPIs as a communication tool to highlight the benefits of the program to the public.

2. Integrate Case Studies into Marketing and Reporting

Develop short case studies of completed or in-progress projects that illustrate:

- Before-and-after site conditions.
- How CIP funding supported remediation and redevelopment.
- Economic and community outcomes.

These can be shared through the City's website, newsletters, and external economic development materials to showcase the program's value.

3. Establish a Periodic Program Review Cycle

Commit to a formal review of the CIP every 3–5 years, assessing program uptake, effectiveness, market conditions, and stakeholder feedback. This enables proactive adjustments and ensures the program remains relevant and responsive to Welland's redevelopment needs.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

- 2. Identify a CIP Coordinator** The city should designate a CIP coordinator (as recommended above, Section 4.6). This CIP coordinator would also be responsible for brownfields coordination. This individual can act as a matchmaker between landowners, prospective businesses, and brownfield developers, as well as a nurturer of local brownfield developers. They can be the point-person in the municipality to help navigate the planning and development process, and link planning, economic development, and in-house engineering staff, as well as finance, health, and environment staff (e.g., water). Research identifies this as a key ingredient in successful programs.
- 4. Create one agreement for the BTA and BTIG**
By creating one agreement for both programs, the City will encourage applicants to apply for both programs and streamline administrative processes by eliminating the need to manage two separate agreements.

6.0 Conclusions

This report sets forward-thinking directions for the City's Downtown and Brownfield CIPs to encourage economic investment, redevelopment and revitalization in the City's Downtown and surrounding area and its brownfield sites. This report builds off background data, best practices, and input from the community and stakeholders to inform and shape its recommendations for the City's Community Improvement Plans. These directions align with the City's strategic priorities for growth, health, environmental stewardship, and livability.

6.1 Downtown and Health and Wellness Cluster CIP

Regarding the Downtown and Health and Wellness Cluster CIP, the recommendations include adopting a new name, establishing a revised vision and objectives to address key priorities, expanding the CIP boundaries to promote investment in adjacent areas near downtown, new or revised financial incentives to reflect current economic conditions and local priorities, administrative updates to improve the implementation of the CIP and new design guidelines and streetscape plans to facilitate the creation of a safe and attractive streetscape in various areas throughout the CIP. It also considers projected growth in the Downtown and Health and Wellness CIP Area to 2051 based on the draft Official Plan densities to determine required upgrades to City and Regional infrastructure.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

6.2 Brownfield CIP

Given Welland's rich industrial history, the City contains numerous brownfield sites that present both challenges and opportunities for redevelopment. These sites, while offering significant potential for revitalization, are often considered the most financially risky for proponents due to factors such as site contamination, uncertain remediation costs, and complex regulatory requirements. The Community Improvement Plan (CIP) program is instrumental in helping to offset these financial risks by providing targeted incentives and support. Through the CIP update, the City can further help bridge funding gaps, encourage private investment, and make brownfield redevelopment more viable for landowners and developers, ultimately supporting the City's broader goals of sustainable growth and community revitalization. Recommendations from this report include: expanding the CIP area to apply City wide; updating the vision and objectives to place greater emphasis on urban and community renewal; new or revised financial incentives based on best practices which consider specific City priorities and the financial risks faced by landowners; options for funding the CIP program through existing tax offsets; and improvements to administration and monitoring to improve implementation and outcome tracking.

6.3 Next Steps

Following the presentation of the directions to Council, the project will proceed to Phase 3 which will include drafting updates to both CIPS and updates to the Downtown and Health and Wellness Cluster CIP Urban Design Guidelines. These updated documents will be made available on the City's website and a public information session will be held to invite members of the public to ask questions and provide feedback on the documents. After the public information session, these documents will be updated and presented for Council approval at a Statutory Public Meeting. Phase 3 is expected to conclude in the second quarter of 2026.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield Community Improvement Plan Update

This report has been prepared by J.L. Richards & Associates Limited and Watson & Associates Ltd. for the City of Welland's exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

This report was prepared for the sole benefit and use of the named client and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited, and anyone intending to rely upon this report is advised to contact J.L. Richards & Associates Limited in order to obtain permission and to ensure that the report is suitable for their purpose.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Reviewed by:



Alison Bucking, RPP, MCIP
Planner



David Welwood, RPP, MCIP
Senior Planner; Practice Lead

Ottawa

343 Preston Street
Tower II, Suite 1000
Ottawa ON Canada
K1S 1N4
613-728-3571
ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
613-544-1424
kingston@jlrichards.ca

**Sudbury**

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
705-522-8174
sudbury@jlrichards.ca

Timmins

834 Mountjoy Street S
Timmins ON Canada
P4N 7C5
705-360-1899
timmins@jlrichards.ca

North Bay

555-501 Oak Street E
North Bay ON Canada
P1B 8E3
705-495 7597
northbay@jlrichards.ca

Guelph

107-450 Speedvale Ave. West
Guelph ON Canada
N1H 7Y6
519-763-0713
guelph@jlrichards.ca

References

- De Sousa, Christopher, and Jennifer Ridsdale. *Brownfields and Planning: Reclaiming the Past for a Better Future*. Routledge, 2021., Page 106
- De Sousa, Christopher, and Jennifer Spiess. *A Toolkit for Measuring the Impacts of Brownfield Redevelopment*. Canadian Brownfields Network / Ryerson University School of Urban and Regional Planning, 2018.

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield
Community Improvement Plan Update

Appendix A

Consultation Summary

What Was Your Experience with the Existing CIP

How has the Brownfield CIP application process been; do you have suggestions for improvement/streamlining?

Have you taken advantage of the Environmental Study Grants? Why or Why not? Do you have any suggestions for improvement?

When there is change in a project, have you found the Brownfield CIP has been able to accommodate change? If so, how? If not, why?

Please use post-its to provide your feedback

Has it been straightforward to determine 'eligible costs'?

(i.e. Have you agreed with the rationale for 'eligible costs'? Any suggestions for modifying the definition of 'eligible costs'?)

What is the biggest hurdle (financial, schedule or otherwise) that you've encountered in brownfield redevelopment and how can the City support you in overcoming this obstacle?

Any additional thoughts?

Example
Lakeview
Community
in
Mississauga
to keep park
wide

Big picture
thinking
to vision
for the
types of dev
we want in area



Geosyntec[®]
consultants



What Would You Like To See As Part Of The Brownfield CIP Update?

Front-end Assistance through grants and application fee waivers

(i.e. waiving application fees, providing loans prior to work being started)

First assistance w/ upfront costs before redev. is fully complete

Loan to assist w/ front-end costs of remediation

Grants too small - insufficient

DC fees major barrier to financing a project at the outset w/ deferral of upfront cost

Front-end Assistance through loans and development charge waiver.

Support for initial feasibility studies / due diligence w/ eg. land use sustainability assessments

Longer approval times getting from a land purchase to shovel in the ground.

More eligible properties:
- archeology
- pre-war
- hard to remediate

Infill sites going in & re-greenfield is > & re-greenfield is better to have grants to re-greenfield - to put at eligible sites

Flexibility in addressing change.

(i.e. ability to offset unexpected costs when construction begins)

Give + take w/ support from city to meet in the middle on \$\$\$

Joint collaboration between city + Reg. responsibilities w/ working together

Servicing + infrastructure to support shovel-ready development

City setting a good example for the development community w/ beautification of public space

Please use post-its or dots to identify what you would like to see!

Funding top off based on specific criteria (i.e. level of contamination, sustainability features, housing, location, use, employment generation)

Shift in market to support purpose-built rental housing on former brownfields

10 years is good horizon for MFG

Alignment and coordination with Regional Program Requirements

Uncertainty in market conditions w/ difficult to find servicing/infra/building materials

Region DC only 75% / 15% should just be 100%

How can the city help with simplifying a complex approvals process w/ eg. CMHC funding app's

Other

Long / Lincoln w/ vacant land that sits under-utilized

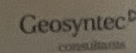
Barriers to traditional lending from banks

Support from City staff to understand application process + eligibility for any project

Can we support or incentivize re-naturalization of vacant land while approvals are pending?

Incentives to offset costs for underground parking or parking structure in lieu of street or surface parking?

Eligibility for all income to office - mixed use - not all brownfield



Should The Brownfield CIP Have Priority Areas Or Uses?

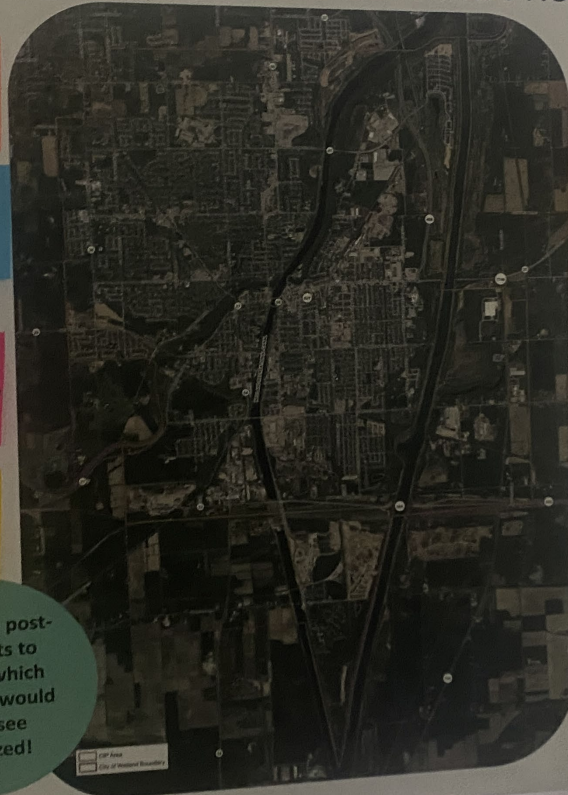
More housing
options
↳ bring people
into downtown

Need for
grocery
uses
locally

Walk-up
convenience
or neighborhood
commercial
labels

Affordable
options for
food/grocery
at grade
+ residential
uses above

Please use post-
its or dots to
identify which
areas you would
like to see
prioritized!



Brownfield CIP
Should be
City-wide
or localized

Should we prioritize brownfield
redevelopment which creates:

- Affordable Housing
- Market Housing
- Commercial Uses (i.e. retail)
- Industrial Uses
- Institutional (i.e. schools)
- Recreational Uses
- Other Uses

Please use post-
its or dots to
identify which
uses you would
like to see
prioritized!

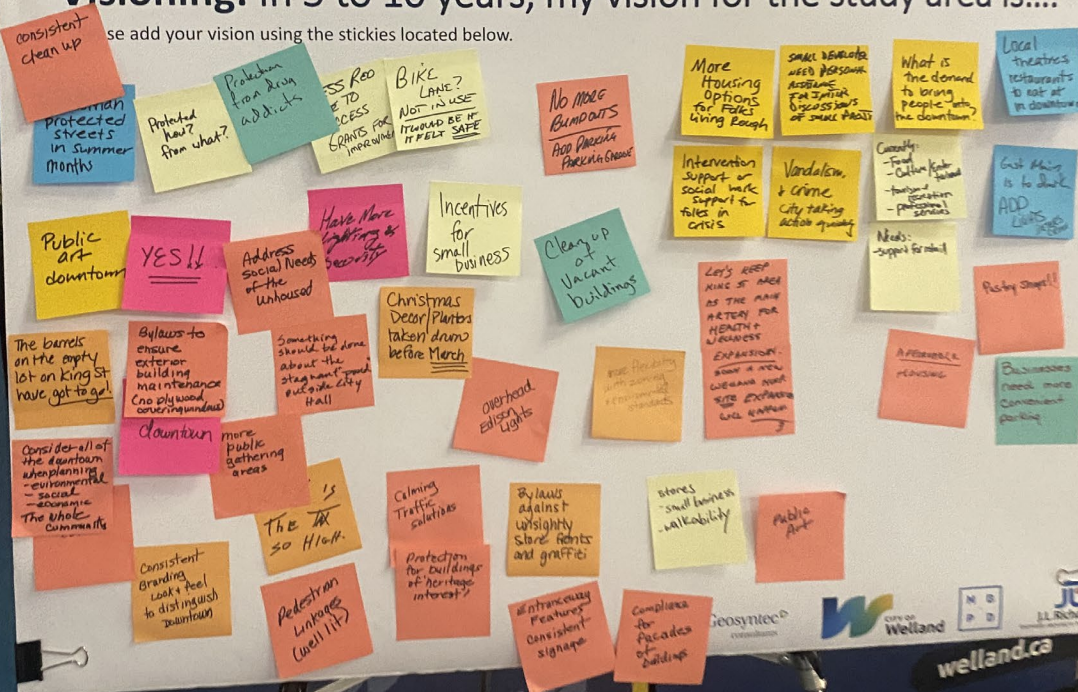


Geosyntec[®]
consultants



Visioning: In 5 to 10 years, my vision for the study area is....

Please add your vision using the stickies located below.



Existing Community Improvement Plan Incentives

1. Urban Design Study Grant Program

Covers 50% of cost to a maximum of \$2,500 per property.

2. Façade Improvement Grant Program

Covers 50% of the cost for non-residential building improvements to a maximum of \$12,500 per property. If the building is a designated heritage building they are eligible for an addition \$7,500.

3. Building Improvement Grant/Loan Program

Covers 50% of the cost for building improvement works to non-residential buildings to a maximum of \$12,500.
OR a loan equal to 70% of the cost of eligible building improvement works to a maximum of \$30,000 per property.

4. Residential Grant/Loan Program

Grant equal to \$15 per ft² of residential space created or rehabilitated to a maximum of \$15,000 per unit and a maximum of 4 units per property OR a loan equal to \$20 per ft² of residential space created or rehabilitated to a maximum of \$20,000 per property and a maximum of 4 units per property.

5. Tax Increment Grant Program

Grant equal to 80% of the increase in property taxes for up to 10 years after project completion. Region will match the percentage of the City grant.

6. Planning and Building Fees and Grant

Grant equal to 100% of the fees paid on planning/building permit/sign permit application to a maximum of \$5,000 per property.

7. Development Charge Reduction Program

Development charges are reduced by 75% for development or redevelopment projects in the CIP. Developments which satisfy the Regional Smart Growth Design Criteria receive an additional 25% reduction of City development charges.

Please add your comments here

What is the line between grant and building occupancy/use?

Incentives for affordable or supportive housing in existing buildings for people experiencing homelessness

Are property standards enforced?

Incentives for expanding living units for low income tenants

Incentives for Plymouth Garage area or more incentives for housing buildings.

On the way to the City of Vancouver and the City of Burnaby

Less Red Tape

Speed up the process

Boarded up or vacant bldgs - what can the City do?

Staff expertise

Geosyntec[®]
consultants

W

M B
P D

JR
J.L. Richards
ENGINEERING ARCHITECTURE PLANNING

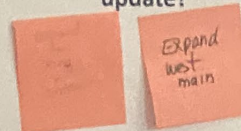
welland.ca

Should The CIP Area Be Scoped or Expanded?



Please use post-its or dots to identify which areas you think should be added or removed.

What should be the priorities for the CIP update?



Please use post-its to identify what you would like to see prioritized!



Geosyntec[®]
consultants



What are your comments on the Welland Streetscapes?

Traffic
calming

Have Region
give us air
roads back

Traffic
Calming
measures

Extra parking
around
hospital

Less traffic
congestion
from highway
along E Main
& King St.



Geosyntec[®]
consultants

JR
J.L. Richards
consultants

Policy Options, Directions and Recommendations Report

City of Welland Downtown and Health and Wellness Cluster and Brownfield
Community Improvement Plan Update

Appendix B

Infrastructure Assessment

Infrastructure Assessment

City of Welland Downtown and Health and Wellness Cluster CIP Update



Infrastructure Assessment

City of Welland Downtown and Health and Wellness Cluster CIP Update

Table of Contents

1.0	Existing Conditions and Previous Recommendations	2
1.1	Introduction	2
1.2	Water	4
1.2.1	Treatment and Supply	4
1.2.2	Distribution and Storage	4
1.3	Wastewater	8
1.3.1	Treatment.....	8
1.3.2	Collection System	9
1.4	Stormwater.....	14
1.5	Transportation	16
1.6	Solid Waste	18
1.7	Electrical Power	18
1.8	Natural Gas	18
1.9	Telecommunications.....	18
1.10	Ownership Structure and Coordination.....	19
2.0	Growth Forecast and Updated Assessment of Future Needs	20
2.1	Equivalent Population.....	20
2.2	Water	21
2.2.1	Treatment and Supply	21
2.2.2	Distribution and Storage.....	23
2.3	Wastewater	1
2.3.1	Treatment.....	1
2.3.2	Collection System	2
2.4	Stormwater.....	4
2.5	Transportation	4
2.6	Solid Waste	5
2.7	Electrical Power	5
2.8	Natural Gas	6
2.9	Telecommunications.....	6

List of Appendices

Appendix A	GEI Wastewater Modelling
Appendix B	AE Water Modelling

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

1.0 Existing Conditions and Previous Recommendations

1.1 Introduction

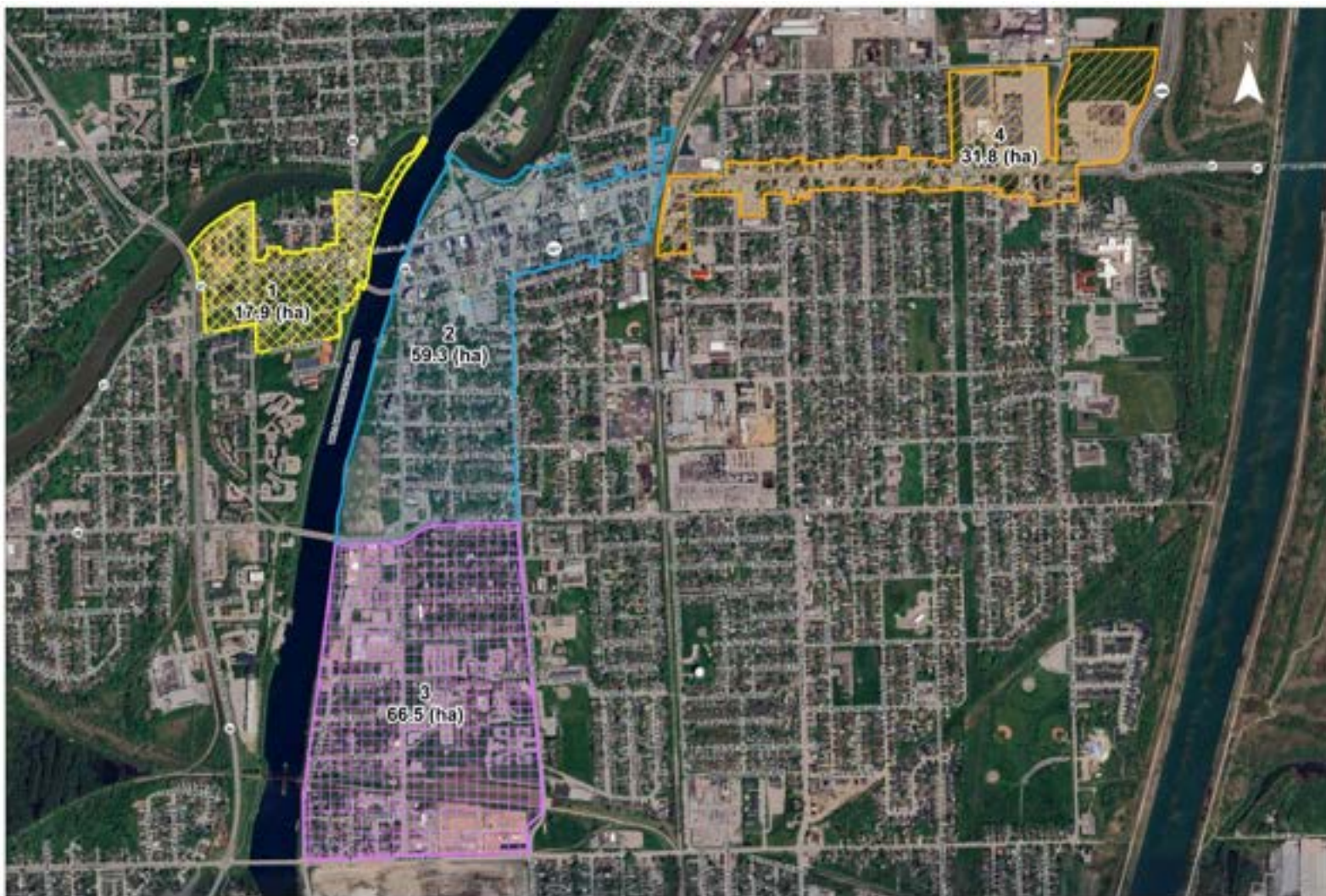
As part of the CIP for the Downtown and Health & Wellness Cluster CIP Area, an assessment of existing infrastructure in the four areas was undertaken to provide an understanding of the existing system under current conditions and the available capacity to support projected growth. These four areas are described as (see map in Figure 1).

1. West of the Welland Canal, bound by the Welland River to the north and Prince Charles Drive N to the west, extending south to Maple Avenue/Hooker Street.
2. East of the Welland Canal, bound by the Welland River to the north, extending eastward along East Main Street to Ross Street/Division Street, and southward along King Street and Hellems Avenue to Lincoln Street.
3. South of Area 2. East of the Welland Canal extending further south down King Street, bound by Lincoln Street to the north, Ontario Road to the south, and Plymouth Road to the east.
4. East of Area 2, extending further along East Main Street past Ross Street/Division Street to Highway 406.

The assessment included a desktop review of available data and reports, including GIS data, previous master plans developed by the Region of Niagara, annual infrastructure performance reports from the City and Region, and relevant studies completed by the City, including the 2024 Asset Management Plan and 2020 Pollution Prevention Control Plan Update. Moreover, the City's Director of Infrastructure Services was interviewed to provide insights on the constraints and opportunities in the City's existing water, wastewater, stormwater, and transportation infrastructure. A summary of infrastructure availability, capacity and ownership in the study area is provided, along with any previously identified challenges and constraints in the systems.

City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Figure 1. CIP Infrastructure Assessment Areas



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

1.2 Water

1.2.1 Treatment and Supply

1.2.1.1 Overview

The Welland WTP, with a capacity of 65,000 m³/day, receives water from Lake Erie, via the Old Welland Canal. The facility was originally constructed in 1910 and is located at 4 Cross Street, on the south side of Merrit Island with the Welland Recreational Canal to the west and the Welland River to the east. It is a conventional surface water treatment plant, which can also be operated as a direct filtration plant.

The WTP is owned and operated by the Regional Municipality of Niagara (Region), under Drinking Water Works Permit (DWWP) # 007-204 and Municipal Drinking Water License (MDWL) # 007-104. The Region holds a Permit to Take Water (PTTW) authorizing the withdrawal of up to 110,000 m³/day from the Old Welland Canal for operation of the WWTP (reference number 3120-DFQKC6).

1.2.1.2 Constraints and Ongoing Projects

In 2021, the Region of Niagara completed a Water Master Servicing Plan Update (MSPU) to evaluate the ability of existing and planned water infrastructure in Niagara Region to efficiently and effectively service the Region's existing users, service anticipated growth to 2051, and to evaluate and develop recommended servicing strategies. As noted previously, the Welland WTP has a rated capacity of 65,000 m³/day. However at the time of the 2021 MSPU, it was noted that upgrades were ongoing to increase the rated capacity of the plant to 73,000 m³/day.

The 2021 Region MSPU determined that existing and projected 2051 maximum day demands (MDD) at the Welland WTP are approximately 34,700 m³/day and 51,200 m³/day, representing 48% or 70% of the total rated capacity of the plant, respectively (based on the upgraded capacity of 73,000 m³/day a buildout population of 93,114). The MSPU therefore determined that the plant has sufficient capacity to support growth beyond 2051, however a sustainability upgrade for treatment was recommended.

Capacity upgrades at the WTP are still ongoing and involve the construction of a new WTP on the north side of the existing High Lift Pump Station (HLPS) and Reservoir, which includes various improvements such as a new reservoir, UV/High Lift Pumping Station, substation, and standby generator to enhance reliability. Currently, the existing Low Lift Pump Station (LLPS) is being refurbished with new pumps and a new raw water main that will connect the LLPS to the new WTP.

1.2.2 Distribution and Storage

1.2.2.1 Overview

The Welland Distribution System (DS) is owned and operated by the City of Welland, under DWWP # 076-101 and MDWL # 076-201. The City purchases drinking water from the Region, which is supplied from the WTP through the HLPS. Drinking water is supplied to residential, commercial, and industrial users via 273 km of City-owned watermain (feeder mains and distribution pipes) and 30.5 km of Region-owned transmission mains, ranging in size from 50 mm to 750 mm. The distribution

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

system provides water to the City of Thorold (DWS 260049621) and the Highlands Resident Association (DWS 260093522).

The Downtown and Health & Wellness CIP Area falls within the 220 hydraulic grade line (HGL) pressure zone. Two storage facilities support supply to the 220 HGL pressure zone, which includes the WTP reservoir and the Bemis Elevated Tank (ET). A base map of the existing water infrastructure is provided in Figure 2.

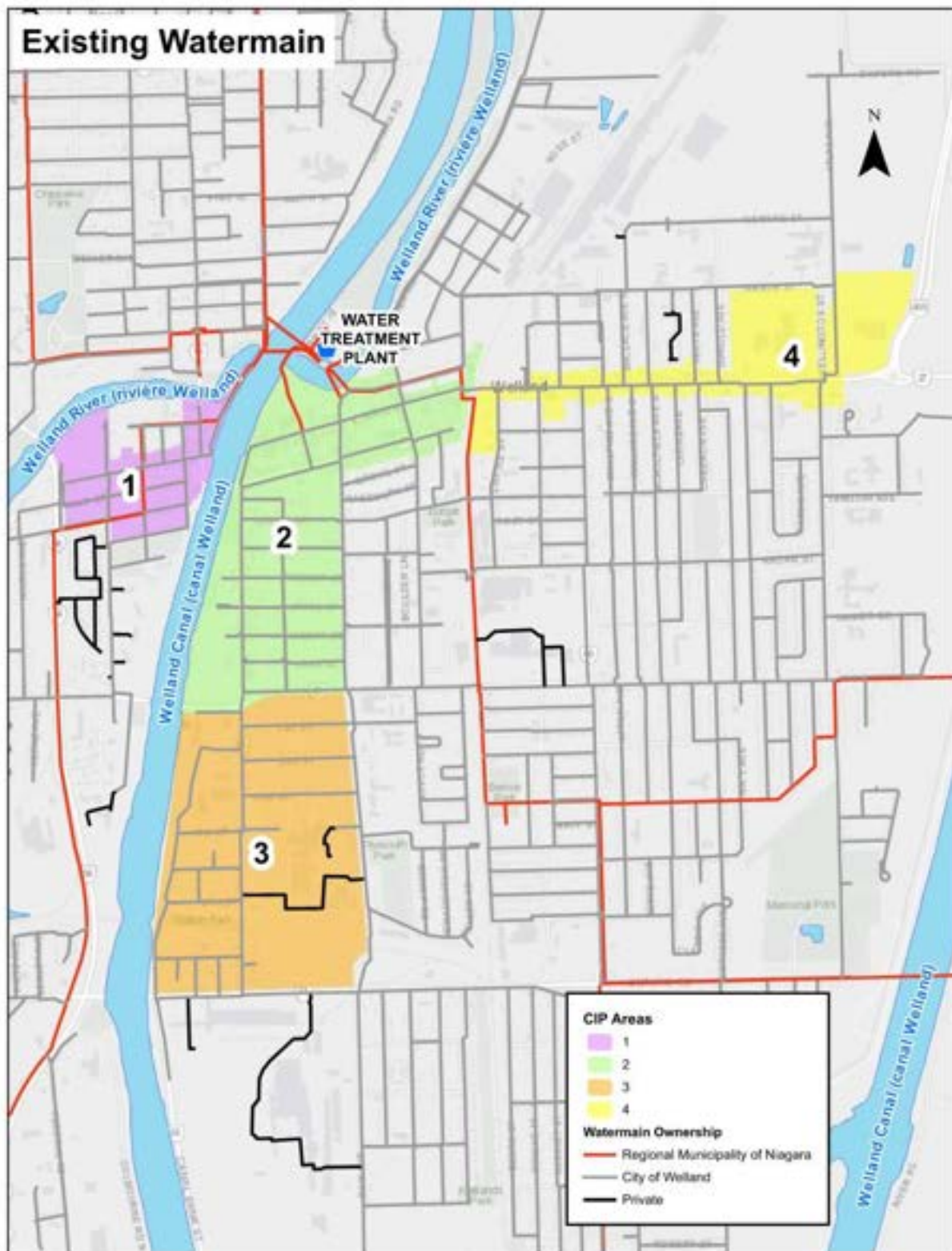
Area 1 (west of the Welland Canal) receives water from the treatment plant via two Region-owned CPP (cast polypropylene) transmission mains (400- and 600-mm diameter). The 600 mm diameter transmission main runs through the CIP Area (along Mill Street, Franklin Street/Queen Street and Maple Ave), supplying a network of City-Owned watermains. The 400 mm transmission main connects to a City-Owned secondary feeder running along the bank of the River/Canal, which provides additional supply to the distribution network.

Areas 2-4 are serviced by three Region-owned CPP transmission mains crossing the Welland River. This includes a 400 mm diameter transmission main running along Cross Street, connecting to a local distribution system along East Main Street. Additionally, two regional transmission mains (400- and 600-mm diameter) cross the River, connecting to the distribution system along Dorothy Street. A series of City-Owned secondary feeder mains along East Main Street, King Street and Plymouth Road/Hellems Avenue then provide service to local distribution pipes.

**City of Welland
Downtown and Health and Wellness Cluster CIP Infrastructure
Assessment**

Figure 2. Existing Water Distribution System

City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

1.2.2.2 Constraints and Ongoing Projects

The 2021 Region MSPU identified no concerns regarding pressures, fire flow availability or water age within the new Downtown and Health & Wellness CIP Area under 2051 growth projections, with the exception of local dead-end watermains. However, the study noted that there are many Regional watermains which experience velocities less than 0.6 m/s, which includes the feeder mains supplying all four CIP Areas. Recommendations involved additional feeder main capacity to support growth and address security of supply in certain areas, including new feeder mains and twinning of the an existing transmission main across the Welland Canal at the WWTP to service growth in the northwest area of the City.

No concerns regarding local water infrastructure were raised during City Staff interviews. In terms of Regional infrastructure, it was noted that the pump stations in the City, which are Region-owned, have been undergoing consideration for upgrades and improvements.

The 2021 Region MSPU also noted that the Welland WTP Reservoir has a total storage volume of 5.6 ML, however due to contact time requirements from the MECP, the usable volume is calculated to be 2.3 ML under 2051 MDD and 1.4 ML under post-2051 MDD. It was recommended that a study be completed to review the WTP reservoir CT volume and overall system storage to confirm. Additionally, it was noted that the Welland WTP High Lift Pumping Station (HLPS) has a firm capacity of 76 MLD, which currently is operating with a surplus capacity of 41.3 MLD (2021). The study noted that the HLPS would have a surplus capacity of 24.8 MLD by 2051, and 10.6 MLD beyond 2051, with no recommendations for upgrades or replacements.

Additionally, the Beamis Park Elevated Tower (ET) is located on Coventry Road, in the same pressure zone as the study area (220 HGL). The facility has a storage capacity of 5.7 ML, however the 2016 Region MSPU identified deficiencies in the pumping and storage capacities at the Bemis Park ET, resulting in operational challenges at downstream storage facilities in the City, which are also outside of the CIP study area. This triggered an Environmental Assessment (EA) for the replacement of the ET, which is now underway. The preferred alternative identified through the EA is to construct a new 12 ML water tower north of East Main Street, off Patterson Avenue (within Area 4). This project will also include the provision of a new water transmission main from the WTP to the tank, and new feeder main from the new tank to the distribution system.

1.3 Wastewater

1.3.1 Treatment

1.3.1.1 Overview

The Welland WWTP is a class IV conventional activated sludge treatment facility with an average day capacity of 54,500 m³/day. The plant also has a maximum day capacity to treat up to 65,000 m³/day and can also provide storm treatment for flows up to 118,000 m³/day (secondary bypass). The facility collects flows from the City of Welland as well as the Town of Pelham and the southern part of the City of Thorold. In 2023, a total of 36 secondary bypass events occurred at the plant. On average, the plant operates at 73% of its average day capacity, indicating the facility currently has sufficient capacity to meet the needs of the collection system, however constraints may arise under future growth projections. The facility is owned and operated by the Region, under Environmental Compliance (ECA) No. 3922-C9PJKZ, issued on April 3, 2022.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

1.3.1.2 Constraints and Ongoing Projects

In 2016, the Region completed a Wastewater Master Servicing Plan Update (MSPU) to evaluate the ability of existing and planned wastewater infrastructure in Niagara Region to efficiently and effectively service the Region's existing users, service anticipated growth to 2041, and to evaluate and develop recommended servicing strategies. Following this study, the City completed a Pollution Prevention Control Plan (PPCP) Update and Wastewater Master Servicing Plan in 2020 to establish a masterplan to meet community growth needs to 2041 while meeting the goals of the F-5-5 Procedure to reduce combined sewer overflow pollution to the environment, building on the findings from the 2016 MSPU. This study, which included all municipalities serviced by the Region (including the City of Welland), identified that the Welland WWTP will pass 80% of the plant capacity planning trigger in the 2036–2041 planning horizon, indicating that a study should be undertaken for the Welland WWTP Upgrade. It further noted that the 2041 flows did not exceed the 90% design/construction threshold for WWTP capacity upgrades, however the buildout growth flows exceeded the WWTP capacity and therefore will require upgrades post-2041.

An additional update to the Wastewater MSPU has since been completed in 2021 which incorporated population and employment growth to a 2051 planning horizon. Under these updated growth projections for the City, the study identified that flows to the WWTP will reach the 80% study trigger capacity around 2041 and that the post-2051 flows are expected to exceed the plant capacity; however, the plant can accommodate flows to 2051. The MSPU therefore recommended no capacity upgrades, however noted that the Region has several Region-wide programs focused on maintaining and improving treatment processes at the WWTP to re-establish capacity. The Region has since initiated various digester upgrades at the WWTP.

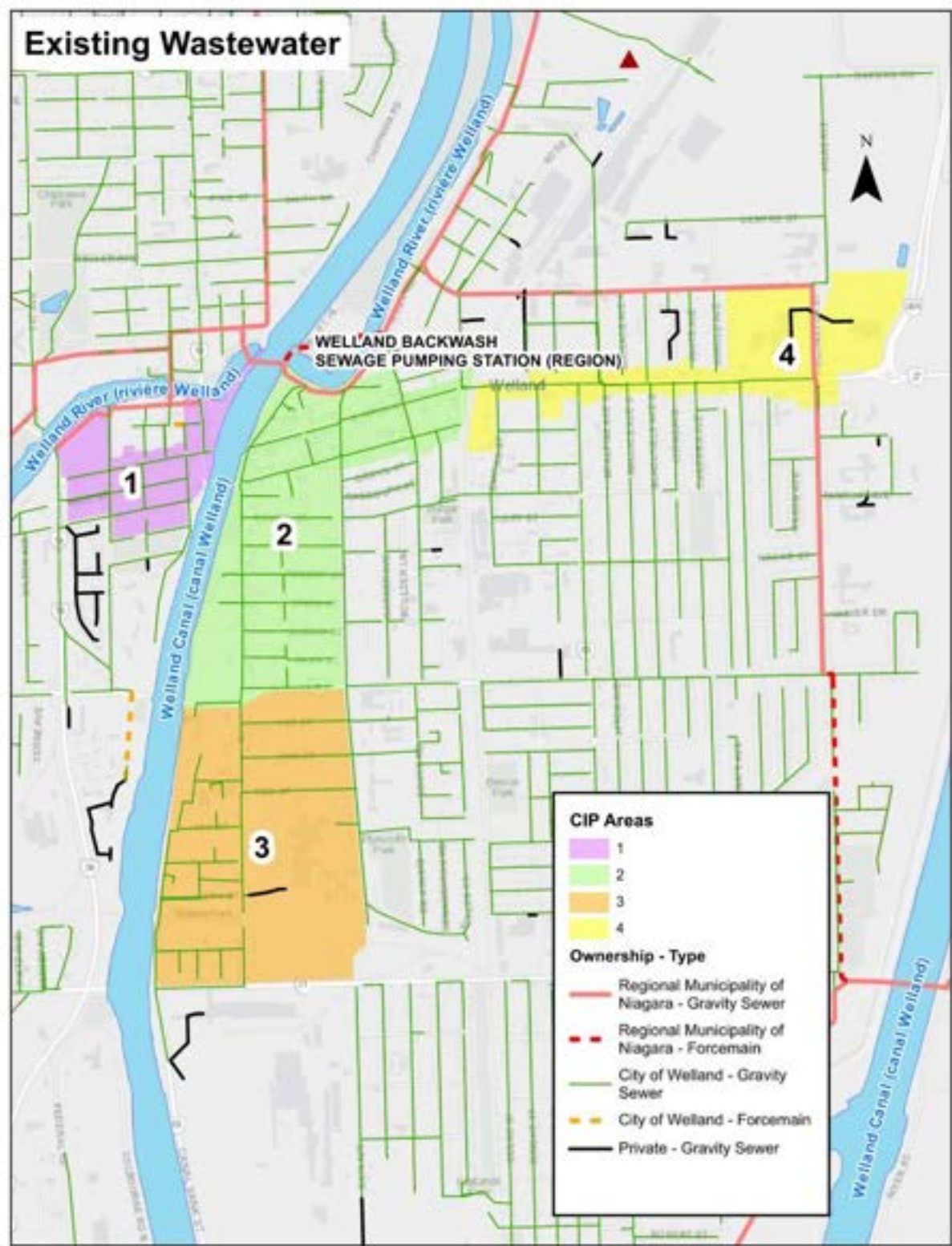
1.3.2 Collection System

1.3.2.1 Overview

The Welland WWTP collection system is a Class III system operated under a two-tier system, where the Region of Niagara owns and operates sewage pumping stations, forcemains, larger gravity sanitary sewers or trunk sewers and some sewage detention facilities, while the City owns and operates local gravity sewers. The Downtown and Health & Wellness CIP Area is part of the Welland Wastewater Treatment Plant (WWTP) catchment area which contains the Welland Backwash Sanitary Pumping Station (SPS). A base map of the existing sanitary infrastructure in the Downtown and Health & Wellness Cluster CIP Area is provided in Figure 3.

City of Welland
Downtown and Health and Wellness Cluster CIP Infrastructure
Assessment

Figure 3. Existing Wastewater Collection System



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

The system is divided by the Welland River with combined sewer overflow (CSO) facilities along the river configured to discharge into the receiving water when necessary. The sewer mains and trunks in the Downtown and Health & Wellness CIP Area generally range between 150 to 1800 mm in diameter, comprising PVC, BR, VC, AC, CP, CIP, lined CIP and BR. The largest sewer mains are generally contained within Area 2.

Wastewater in Area 1 (west of the Welland Canal) is collected via City-owned gravity sewers running along West Main Street, Niagara Street, Prince Charles Drive North and Denistoun Street. Local sewers are discharged into a 450 mm Region-Owned sewer north of Mill Street conveying flows via a siphon across the Welland Canal to the Welland WWTP. Flows from Area 1 have the potential to contribute to 5 CSOs which overflow to the Welland River (Prince Charles Drive South, Denistoun Street, Niagara Street South, Shotwell Street/Riverbank Street, Meritt Street/Lock Street) and 1 internal CSO which overflows to the storm system or ditch network (Queen Street/Bald Street).

Wastewater in Areas 2-4 (east of the Welland Canal) is conveyed to the treatment plant via a connection to the 1800 mm diameter Region-owned sewer trunk running along Court House Lane. Flows from Areas 2 and 3 are collected via a series of City-owned gravity sewers along East Main Street, King Street, Hellems Avenue and Plymouth Road. These sewers discharge into the 1800 mm diameter Region-owned sewer trunk which conveys flows to the WWTP along River Road. Flows from Area 4 are collected via a series of City-owned gravity sewers along East Main Street, Ross Street and McMaster Ave. These sewers discharge into the 1800 mm diameter Region-owned sewer trunk along river Road, which conveys flows to the WWTP. Flows from these areas have potential to contribute to 2 CSOs which overflow to the Welland River (King Street/Court House Lane and Hellems Ave/Dorothy St) and 3 internal CSOs which overflow to the storm system or ditch network.

Area 4 flows may also discharge into the Region-owned 1650 mm sewer on Wellington Street North, leading to the WTP along Major Street. These flows have potential to contribute to 2 CSOs which overflow to the storm system or ditch network (Major Street/White Ave and Major Street/Brownleigh Ave).

1.3.2.2 Constraints and Ongoing Projects

The 2020 PPCP noted that the Welland system currently meets the F-5-5 criteria of treating all dry weather flow and 90% of wet weather flows in an average year, however, in general, more growth will further strain the system in wet weather conditions which will increase the duration and frequency of overflows and increase basement flooding risks in some areas. The study determined there is high risk for basement flooding under a 10-year design storm in the Plymouth Road area (includes parts of Areas 2 and 3), due to high I&I, growth pressures, outlet restriction to the Region interceptor trunk sewer from the interceptor surcharge levels and shallow sewers in the upstream catchment. Recommendations included completing I&I investigations (including additional data collection to confirm flows), the implementation of an I&I reduction program to reduce trunk flows to 395 L/s, and upgrades to sewers along Plymouth Road (Churchill Ave to First St) to provide inline storage for basement flooding protection if the I&I reduction target is not met.

Similar to the 2020 PPCP, the Region's 2021 Wastewater MSPU suggested that there are no Region-owned sewer capacity deficits under the 2051 design peak wet weather flows. It was noted

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

that while the Welland interceptor is currently experiencing surcharging under wet weather events, this is primarily due to the Region utilizing the trunk sewer as balancing storage to minimize peak flows to the WWTP. Upgrades to local sewers were not addressed in the 2021 MSPU as they were to be funded and implemented by the local area municipalities (LAMs) through the PPCP.

Most of the wastewater-related issues highlighted during the City staff interview were in regard to sanitary system capacity constraints due to high inflow and infiltration (I&I) into the sanitary system. It was noted that high I&I rates in City are generally attributed to groundwater entering the sanitary network at connection points, primarily due to elevated water tables, malfunctioning weeping tiles, and other points of entry. Additionally, aging infrastructure is a known cause of I&I in the City, as the deterioration of pipes and joints over time can lead to cracks and structural failures, further facilitating the infiltration of groundwater into the system.

Generally, there were no infrastructure concerns or constraints noted in CIP Areas 1, 3, and 4. However, the concerns regarding basement flooding risk in the Plymouth Road area (within Area 2) identified in the PPCP were further discussed, with the Director indicating that the southern portion of the King St. Area exhibits the most significant challenges concerning I&I into the sanitary system. However, it was noted that measures are already being implemented to address these issues ensuring they do not pose a roadblock to other improvements in the area. Moreover, the City is addressing the challenges related to I&I with targeted investigations in certain development areas to ensure sufficient capacity for ongoing growth. The City has also recently received provincial funding for a new 2.4 km wastewater trunk sewer from the Ontario Road sewage pumping station (outside of the Downtown and Health & Wellness CIP Area) to King Street to support growth.

1.3.2.2.1 Hydraulic Modelling Analysis

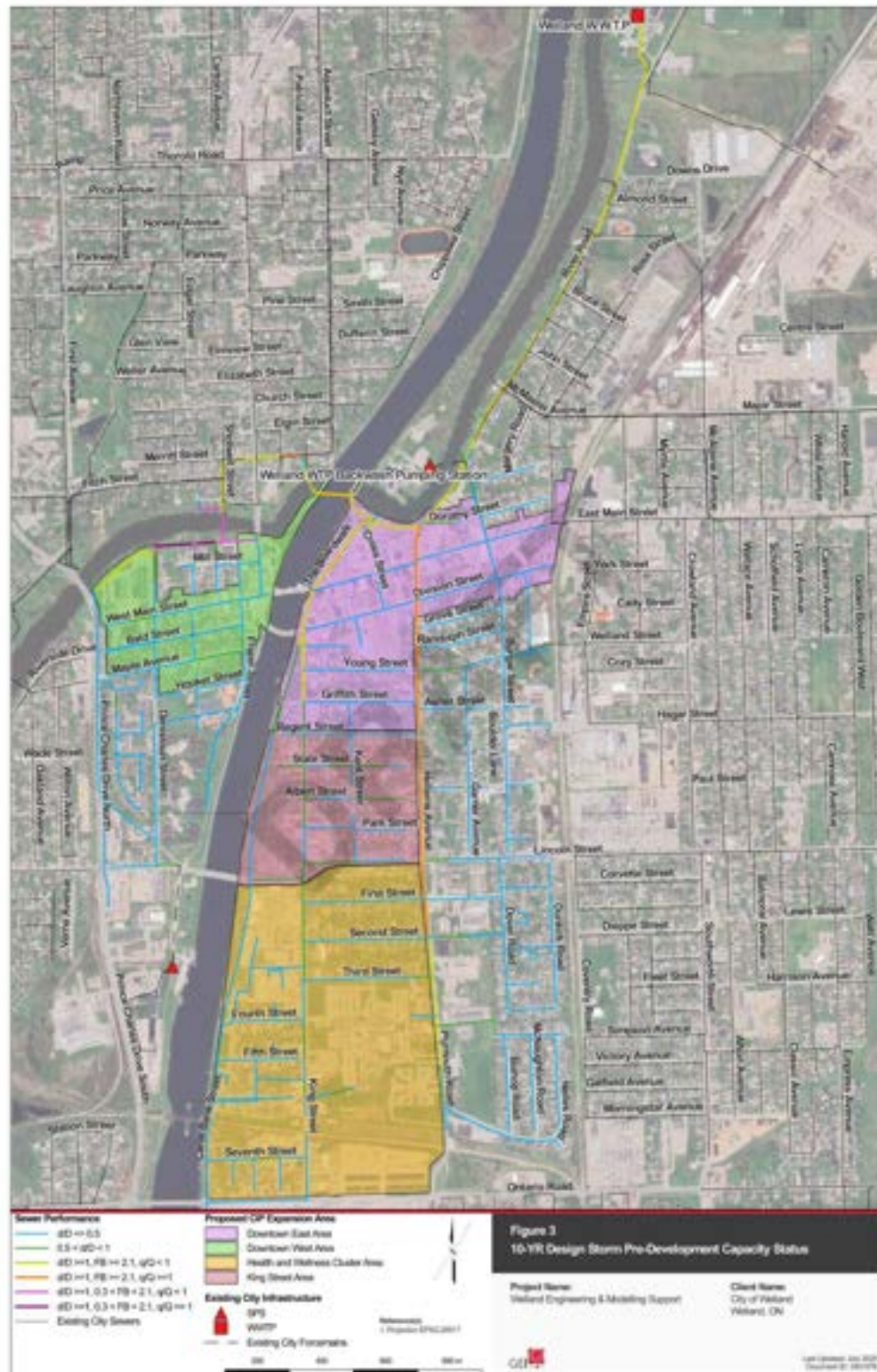
As part of this project, GEI Consultants Canada Ltd. (GEI) completed a review of the existing system's performance under 2-, 5-, and 10-year design storms using the City's existing wastewater model (see full report in Appendix A). Per capita residential and employment wastewater generation rates were applied from the 2021 Niagara Region Wastewater MSPU, as summarized in Table 1. The system performance of City-Owned sewers under the 10-year design storm in the Areas are shown in Figure 4 (Figure 3 of the GEI report).

Table 1: Wastewater Flow Parameters (Niagara Region Wastewater MSPU, 2021)

Parameter	Criteria
Recommended Per Capita Wastewater Flow Generation – Residential	255 L/cap/d
Recommended Per Capita Wastewater Flow Generation – Employment	310 L/cap/d
Extraneous Flow Design Allowance – Existing Areas	0.4 L/s/ha
Extraneous Flow Design Allowance – New Developments	0.286 L/s/ha

City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Figure 4. Existing Wastewater System Constraints: 10-Year Design Storm



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

The review noted that under existing 2, 5, and 10-year storm conditions, some City-Owned sewers (sections along Mill Street, King Street, Hellems Avenue, Plymouth Road, and East Main Street) and Regional sewers (north of Mill Street crossing Niagara Street), experience surcharging due to downstream Region sewer capacities and, in some instances, rely on downstream overflows to provide basement flooding protection.

These findings are consistent with those from the 2021 MSPU, as most of the surcharging segments are located within the area that was previously identified as a high-priority area for I&I reduction, with upgrades recommended on Plymouth Road to provide inline storage for basement flooding protection. Surcharging was also previously identified within the Region-owned sewer along Mill Street, where recommendations were provided for improving upstream flow management to address high peak flows and reduce risk of basement flooding and overflow risks.

1.4 Stormwater

The stormwater collection system in the Downtown and Health & Wellness CIP Area generally consists of storm sewers ranging from 150 to 2438 mm in diameter, comprising concrete, CP, RC, PVC, CSP and HDPE. The largest storm sewer mains are generally located in Area 2. A base map of the existing stormwater infrastructure in the Downtown and Health & Wellness CIP Area is provided in [Figure 5](#).

The storm sewer system is a part of the Welland Canal – Niagara River watershed which outlets to Lake Ontario. The storm sewers in the Downtown and Health & Wellness CIP Area outlet to the Welland Canal at several locations.

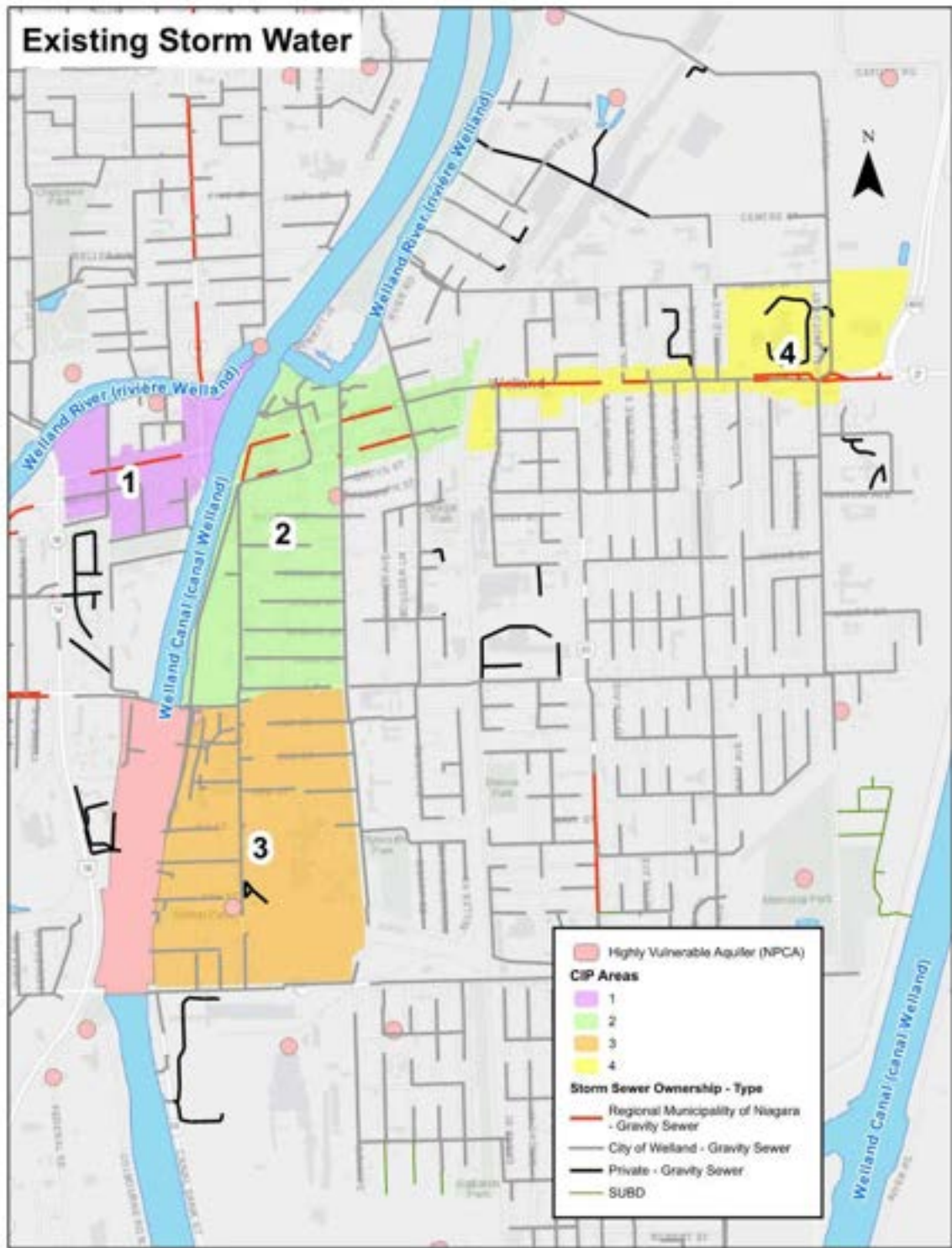
In Area 2 (west of the Welland Canal), stormwater is collected via City-owned storm sewers along Queen Street, Hooker Street and Frazer Street which drains to the Welland Canal via a 600 mm diameter CP storm sewer on Hooker Street. Stormwater is also collected via a Region-owned trunk sewer along West Main Street to the City-Owned sewer along Denistoun Street before draining the Canal. A combined sewer system also collects and conveys stormwater via a combined sewer running along Bald Street and Prince Charles Drive prior to draining to the Canal.

In Areas 2-4 (east of the Welland Canal), stormwater drains via several outlets to the Welland Canal and Welland River. The major collection system consists of City-Owned stormwater mains along King Street, Plymouth Road/Hellems Ave, East Main Street and the bank of the Canal, which drain to the Welland River via 3 separate outlets along Court House Lane and River Road. There are also several stormwater outlets to the Welland Canal within Area 3, specifically.

In the Downtown and Health & Wellness CIP Area, there are highly vulnerable aquifers, mainly at the section of the Welland Canal adjacent to Area 3. The Welland Canal also falls within the regulation limits of the Niagara Peninsula Conservation Authority. Stormwater servicing for future municipal developments will be required to be in compliance with the City's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA), including the requirements for water balance, water quality, sediment and erosion control, water quantity and flood control outlined in Appendix A of the CLI ECA.

City of Welland
Downtown and Health and Wellness Cluster CIP Infrastructure
Assessment

Figure 5. Existing Stormwater Management System



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

1.5 Transportation

The transportation network in the City of Welland comprises both Region-owned and City-owned roadways. A base map of the existing transportation infrastructure in the Downtown and Health & Wellness CIP Area is provided in Figure 6.

Area 1 is served by a Region-owned, two-way, two-lane arterial road known as West Main Street, which runs east-west and connects to a series of City-owned, two-way, two-lane local roads that run north-south, providing access to surrounding developments. Area 1 is connected to the Area 2 via the East Main Street bridge. The bridge was built in 1971 and consists of two separate structures, each with two lanes of one-way traffic. One structure accommodates westbound traffic along East Main Street towards the Area 1, while the second structure accommodates eastbound traffic from Niagara Street to Division Street towards the Area 2. The bridge and associated arterial roadways are owned by the Region. Currently, the East Main Street bridge is undergoing rehabilitation to address structural deficiencies to extend its service life by 30 years. This includes concrete removals and repairs, new concrete overlay on the bridge deck, sidewalk, curb and medians, and new asphalt road surface.

Area 2 also consists of a series of City-owned two-way arterial and local roadways, as well as two City-owned urban collectors running north-south along Hellems Avenue and Burgar Street, which operate as a one-way in some areas and a two-way in others. King Street, a two-way, two-lane City-owned arterial road, extends from Area 2 into Area 3 connecting with Lincoln Street, a two-way, four-lane arterial road running east-west. Hellems Avenue, a two-way, one-lane City-owned roadway also extends through Area 2 from East Main Street to Lincoln Street. Plymouth Road, a two-way, two-lane City-owned collector, then extends from Lincoln Street southbound through Area 3. Both King Street and Hellems Ave/Plymouth Road connect to a series City-owned local roads and dead-end streets servicing local developments. East Main Street, a two-way, two-lane arterial collector, also runs east-west connection Area 2 with Area 4.

Per Section 1.5, the City is undertaking a Traffic Management Plan (TMP) to provide the city with long-term road network and active transportation strategies to support existing needs and accommodate future projected population and employment growth by 2051. Regarding transportation infrastructure in the Downtown and Health & Wellness CIP Area, it was noted that there are currently no transportation constraints to proposed and ongoing intensification, suggesting that no capacity increases are required on any of the City's roadways. Some complaints or concerns regarding the 1-way traffic on Main Street have been received. However, it was noted that a consultant for the ongoing TMP in the City recently completed a feasibility study for the Region, determining that there is inadequate space for proper turning radius under a 2-way traffic system, given width and proximity of buildings, suggesting that they remain 1-way. Although there have been concerns regarding the 1-way traffic, the City noted that this should not be a constraint to future development in the study area.

City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Figure 6. Existing Road Network



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

1.6 Solid Waste

Residential waste collection in the City of Welland is managed by the Region of Niagara and includes garbage, recycling, and organics services. Garbage is collected every other week while green bin organics and recycling are collected weekly. As of January 2024, the Region's residential recycling program is managed by Circular Materials, a not-for-profit organization.

Niagara Region also owns and operates the Humberstone Landfill located in the City of Welland, which includes a leachate collection system and residential waste and recycling drop-off depot. The landfill accepts domestic, commercial, and non-hazardous solid industrial waste primarily from the City of Welland, Township of Wainfleet, City of Port Colborne and the Town of Fort Erie. The facility was recently expanded in 2022 to 4.6 million cubic meters, providing an additional 2.4 million cubic meters to increase the operating life until 2045. The Humberstone Landfill now occupies 37.8 ha of a 62.1 ha site with a total of 57,500 tonnes of waste landfilled each year, including curbside waste collected.

1.7 Electrical Power

The Region of Niagara's electricity is delivered by local distribution companies. Hydro One Networks Inc. (Hydro One) is the primary transmission asset owner. Residents and businesses in the Downtown and Health & Wellness CIP Area are serviced by Welland Hydro Electric System Corp. (WHESC), who own and operate the electricity distribution system. WHESC services approximately 25,000 customers, over an 81 km² service area in the Region. Power is supplied through the Crowland Transformation Station (TS). The TS comprises two 115 kV/27.6 kV transformers with a 10-day Limited Time Rating (LTR) of 96 MW. The Region completed an Integrated Regional Resource Plan (IRRP) in 2022 to address the electricity needs of the Niagara Region to 2041. The IRRP identified the need for additional capacity at the Crowland TS and recommended replacing the aging station with a new 230 kV station. This replacement would be supplied by new 230 kV double-circuit transmission lines forming part of the Welland to Thorold Transmission Main project. This project is designed to provide approximately 400 MW of additional capacity, addressing the forecasted 20% increase in electricity demand across South Niagara by 2032. The transmission upgrades aim to improve reliability and support growth in the region, with the new infrastructure expected to be in service by 2029. Hydro One is currently undertaking a Class EA to build a new 230-kV, double transmission line.

1.8 Natural Gas

Natural gas in the Region of Niagara, including the City of Welland, is supplied by Enbridge Gas Inc. Enbridge oversees a robust network of pipelines that deliver natural gas to homes and businesses across the City. There are currently no available reports detailing the natural gas infrastructure or constraints in the City of Welland.

1.9 Telecommunications

Wired telecommunications services in the Downtown and Health & Wellness CIP Area, including coaxial cable, fiber to the home (FTTH), digital subscriber line (DSL), and high-capacity transport services are provided by Cogeco, Bell, and the Niagara Regional Broadband Network. Fixed wireless connections are available from Bell, Rogers, Xplore, Niagara Wireless Internet Company (NWIC) and Last Mile Wireless Internet. Mobile connections are provided by Bell, Rogers, TELUS, and Freedom Mobile. Satellite is offered by Xplore.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Federal and provincial funding programs such as Connecting Canadians have been developed to encourage further expansion of high-speed internet, in particular to rural populations. In the Downtown and Health & Wellness CIP Area, 50/10 Mbps road coverage is available across the majority of the study area (75-100%), providing download speeds up to 50 Mbps and upload speeds of up to 10 Mbps for residents and businesses. Near-term further expansion of high-speed internet infrastructure in the area is likely to be primarily via fixed wireless and satellite infrastructure.

1.10 Ownership Structure and Coordination

The City's Director of Infrastructure Services highlighted that one of the biggest challenges the City faces is the coordination of infrastructure ownership between the Region and the City. In this two-tier system, the Region is responsible for larger infrastructure, such as water and wastewater treatment and major roads, while the City manages local services and facilities. This division can create misaligned priorities and slow decision-making, as differing priorities, finding sources, and regulatory frameworks between tiers can complicate decision-making and resource allocation. As the City continues to grow, effective integration of services becomes increasingly important. Without proper coordination, the result can be inefficient infrastructure development, service delivery gaps, and challenges in meeting the community's needs. Ensuring that infrastructure investments align with the goals of both the Region and the City is crucial for ensuring sustainable growth in the short and long-term.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

2.0 Growth Forecast and Updated Assessment of Future Needs

2.1 Equivalent Population

To estimate future development potential within each Area, population densities from the City's Official Plan were applied to the corresponding land use designations within each Area. Conservative values were used to ensure sufficient capacity planning. Occupancy rates from the City's Development Charges Background Study (Watson, 2022) were then applied to convert these densities to equivalent units. The criteria applied in the analysis are summarized in Table 2.

Table 2: Development Density and Occupancy by Land Use

CIP Land Use Designation	Land Use Type	Density ¹	Occupancy Rate ²
Downtown	Mixed (Residential / Employment)	300 dwellings per hectare (assumed to be equivalent to high-density residential)	2.11 persons per unit (assumed to be equivalent to high-density residential)
Health & Wellness			
Commercial			
Industrial			
Institutional			
	Employment		
High Density Residential	Residential	Min 75 to max 300 dwellings per hectare – Maximum of 300 dwellings per hectare applied	
Medium Density Residential		Min 15 to maximum of 60 dwellings per unit – Average of 37.5 dwellings per hectare applied	2.26 persons per unit
Low Density Residential		Min 35 to a maximum of 125 dwellings per unit – Average of 80 dwellings per hectare	2.53 persons per unit
Table Notes:			
1. From City of Welland Official Plan			
2. From Development Charges Background Study (Watson, 2022)			

Table 3 summarizes the total estimated developable land area and corresponding projected equivalent population within each Area, based on existing and planned land use, applied densities, and occupancy assumptions. Per this criterion, the planned total population for the new Downtown and Health & Wellness CIP Area is estimated to be 74,315 people and jobs. This greatly exceeds the high growth scenario in the 2020 PPCP Buildout, which estimated a population estimate of 55,960 within the urban boundary of the entire city. The 2021 Region MSPU was completed using an estimated buildout population of 93,114 within the City's urban boundary.

It should be noted that the new Downtown and Health & Wellness CIP Area is only part of the study area considered in the 2020 PPCP and 2021 Region MSPU, which considered growth across the entire city. For the purposes of this assignment, only the CIP buildout growth was considered, and other additional growth trajectories were not included in this analysis.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Table 3: Total Projected Equivalent Populations: CIP Areas

CIP Area	Total Area (ha)	Developable Area (ha) ¹	Equivalent Residential Population ²	Equivalent Employment Population ²	Total Equivalent Population
1	17.9	13.2	4,150	1,395	5,546
2	59.3	41.0	8,567	8,088	16,656
3	66.5	58.2	18,359	18,446	36,806
4	31.8	26.3	524	14,784	15,308
Total	175.5	138.5	31,601	42,714	74,315

Table Notes:

1. Includes both vacant land and assumed re-development land. Excludes land area classified under Open Space & Recreation, Core Natural Heritage, etc.
2. Due to limited available data, areas designated as “mixed” land use (residential and employment) were assumed to be evenly distributed (50/50 split).

2.2 Water

2.2.1 Treatment and Supply

As noted in Section 1.2.1, the 2021 Region MSPU determined that the existing and projected 2051 maximum day demands (MDD) at the Welland WTP are approximately 34,700 m³/day and 51,200 m³/day, representing 48% or 70% of the total rated capacity of the plant, respectively (based on the upgraded capacity of 73,000 m³/day a buildout population of 93,114).

As part of the servicing analysis for the current CIP Update, future water demands were estimated for each CIP Area based the projected equivalent population values presented in Table 3. Per capita residential and employment demand rates and peaking factors from the 2021 Region MSPU were applied, as summarized in Table 4. Projected Average Day (ADD) and Maximum Day Demands (MDD) are summarized in Table 5.

Table 4: Water Flow Parameters (Niagara Region Water MSPU, 2021)

Parameter	Criteria
Recommended Per Capita Water Demand Rate – Residential	240 L/cap/d
Recommended Per Capita Water Demand Rate – Employment	270 L/cap/d
Recommended Peaking Factor	1.49

Table 5: Summary of Anticipated Total Water Demands

CIP Area	Average Day Demand (m ³ /day)	Maximum Day Demand (m ³ /day)
1	1,373	2,045
2	4,240	6,318
3	9,387	13,986
4	4,117	6,135
Total	19,117	28,484

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

As shown in Table 5, the future MDD would be approximately 28,484 m³/day for only the Downtown and Health & Wellness CIP Area, which represents only a portion of the demand at the Welland WTP.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

As discussed in Section 2.1, the 2021 Region MSPU considered a broader growth pattern across the entire City, while the current study applies much higher density targets specifically within the CIP study area alone. This results in a significantly greater concentration of people and servicing demand in the CIP study area compared to what was assumed in earlier studies. If the proposed development densities for this area are fully realized, the resulting City-wide growth could greatly exceed what was assumed in earlier studies. As a result, capacity constraints that were not previously identified may occur.

However, as growth applied in the previous studies were distributed more broadly across the City, the total community-wide population and servicing demand may remain generally consistent – meaning that increased growth in the CIP Areas could be offset by lower growth elsewhere. It should also be recognized that the full buildout of this intensified growth scenario is likely to occur over an extended timeframe. Therefore, as development progresses, it will be important to continue to monitor growth and reassess potential impacts on treatment infrastructure to ensure the upgraded capacity of 73,000 m³/day at the WTP remains adequate to service growth.

However, as discussed in Section 1.2.1, the WTP operates under a PTTW, authorizing the withdrawal of up to 110,000 m³/day from the Old Welland Canal. With the current upgraded capacity of 73,000 m³/day, a margin of 37,000 m³/day remains available within the existing PTTW limit, indicating that future plant expansions could be undertaken without increasing the PTTW limit, to accommodate additional growth anticipated through this CIP update.

2.2.2 Distribution and Storage

As mentioned in Section 1.2.2, the 2021 Region MSPU identified no concerns regarding pressures, fire flow availability or water age to the Downtown and Health & Wellness CIP Area under 2051 growth projections, with the exception of local dead-end watermains. Recommendations included:

- New feeder mains and twinning of the existing transmission main across the Welland Canal at the WTP to increase supply.
- Complete a study to review the WTP reservoir CT volume and overall system storage to confirm available storage.
- Refine the operating strategy of the water system through the Bemis ET Schedule B EA and upgrades to the pumps at the Shoalt's Drive Pumping Station
- Decommissioning of the Bemis ET
- New high lift pumps at the WTP to support increased HGL, to be finalized through the Bemis ET EA

As part of this project, Associated Engineering (AE) completed a hydraulic assessment of the distribution system under the CIP buildout scenario, per the water demands calculated in Table 5. These demands were distributed among junctions within each CIP area to assess system pressures and fire flow availability (see full report in Appendix B). The assessment determined that under maximum day demand (MDD), minimum pressures ranged from 140 kPa to 350 Kpa, while under MDD plus fire flows, pressures range from <140 to 550 kPa. These results are shown in Figures 7 and 8 (Figures 1-2 and 1-4 of the AE report).

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Section 10.2.2.1 of the MECP Design Guidelines for Drinking Water Systems requires that all water mains, including those designed to provide fire protection, should be sized after a hydraulic analysis based on the following flow demands and pressure requirements:

- The system should be designed to maintain a minimum pressure of 140 mPa (20 psi) at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.
- The normal operating pressure in the distribution system should be approximately 350 to 480 kPa and not less than 275 kPa (40 psi).
- The maximum pressures in the distribution system should not exceed 700 kPa (100 psi) to avoid damage to household plumbing and unnecessary water and energy consumption.

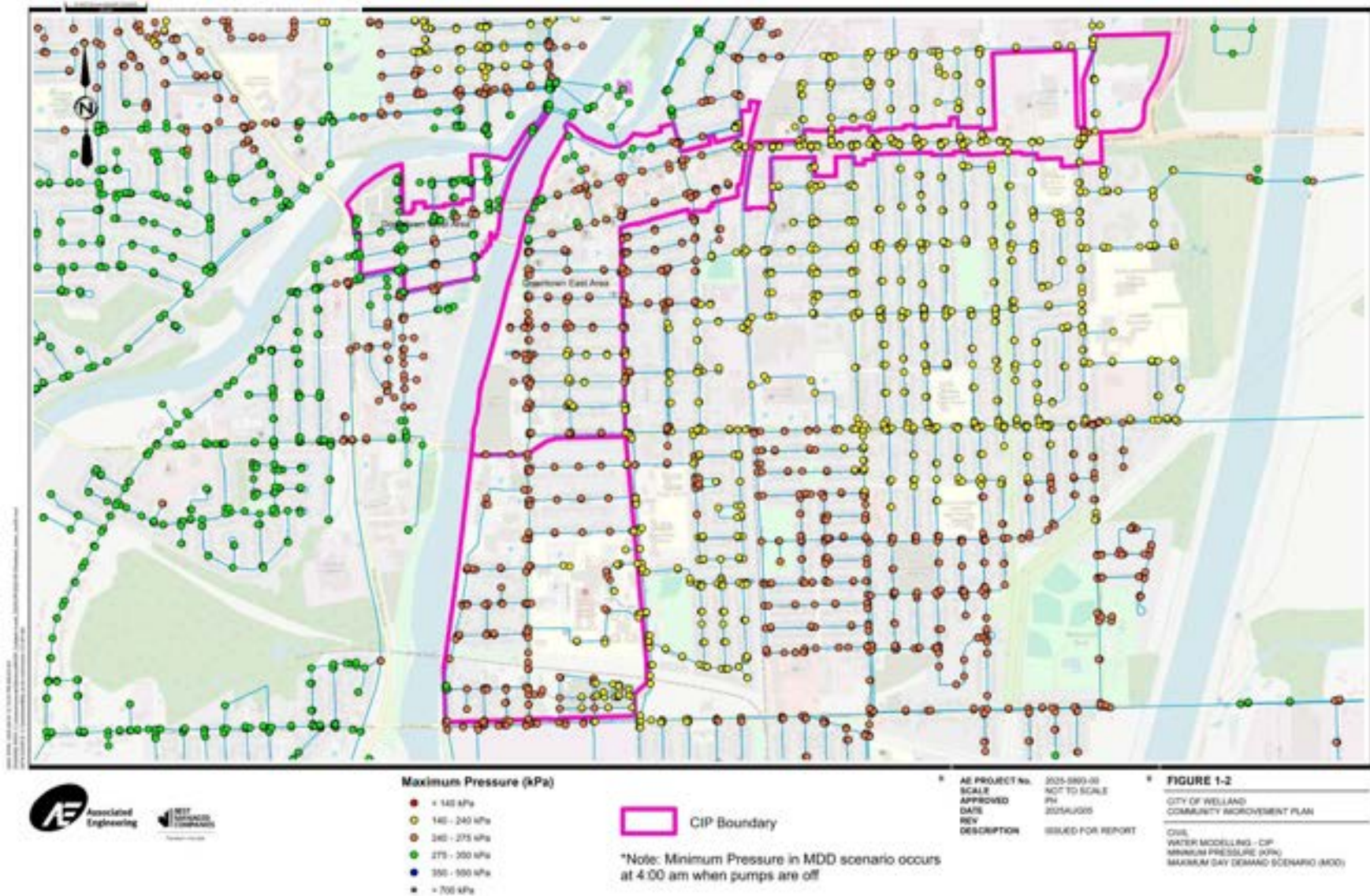
Based on the modeling review, there are some areas within the Downtown and Health & Wellness CIP Area where modelled pressures are outside of MECP guidelines. This is shown in Figure 9 (Figure 1-3 of the AE report).

The City's Municipal Standards (2013) require that fire flow requirements be based on the Fire Underwriters Survey (FUS). Fire flow requirements under FUS are calculated on a site-by-site basis, and for high-density development can exceed 133 L/s. Based on the modeling review, there are some areas within the Downtown and Health & Wellness CIP Area where 133 L/s cannot be provided. This is shown in Figure 9 (Figure 1-3 of the AE report).

It is expected that ongoing and planned upgrades to nearby storage facilities (new Bemis ET within the Area 4) may mitigate or delay the onset of these issues by improving system capacity and resilience. However, if the higher-density development is realized, continued monitoring and re-assessment of system performance will be key to confirm the distribution system maintains an adequate level of service to support the projected growth. This includes assessing fire flow requirements and availability on a site-by-site basis as development progresses.

City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

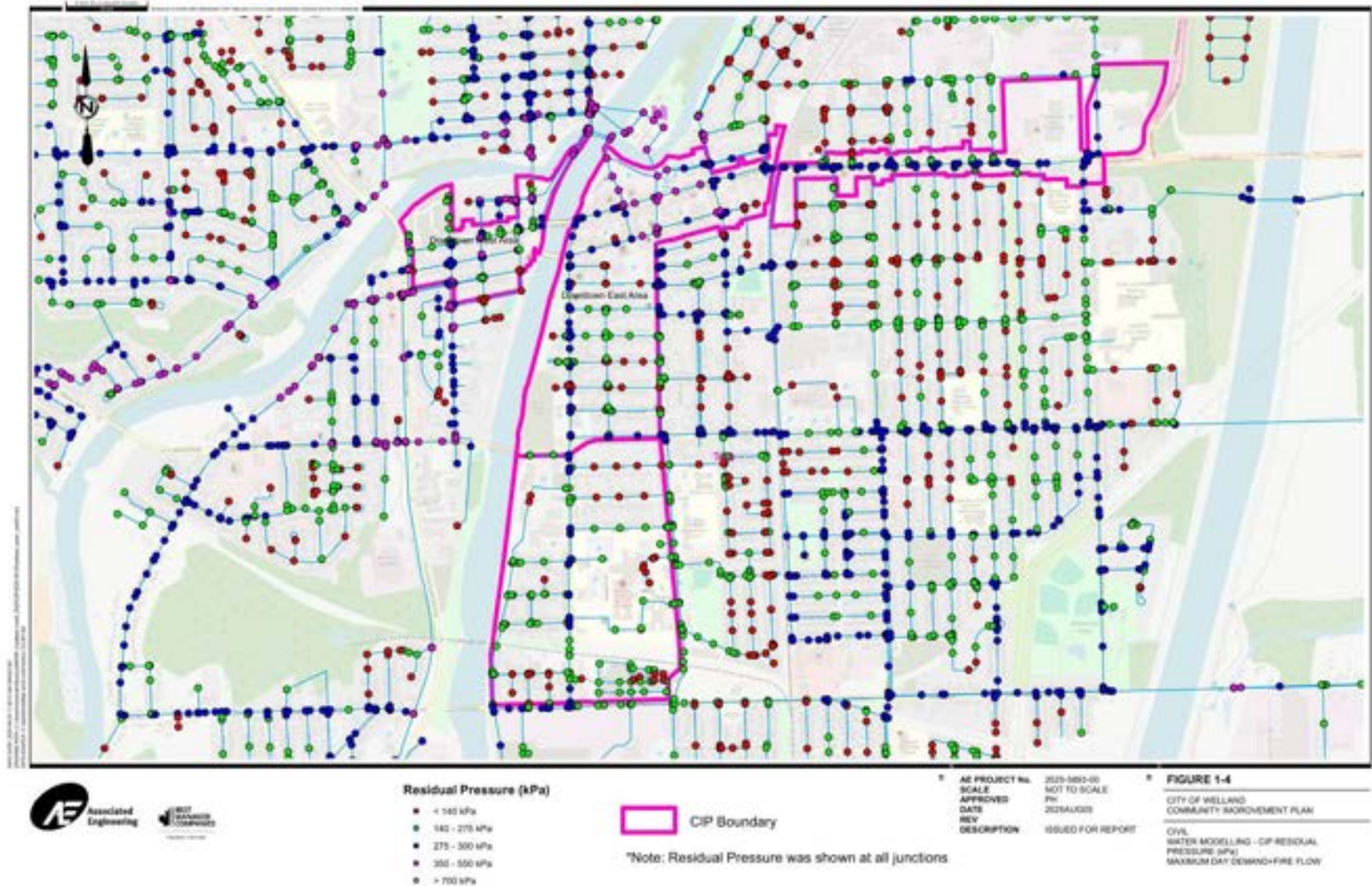
Figure 7. Distribution System Minimum Pressures – Maximum Day Demand (AE, 2025)



City of Welland
Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Figure 8. Distribution System Residual Pressure – Maximum Day Demand + Fire Flow (AE, 2025)

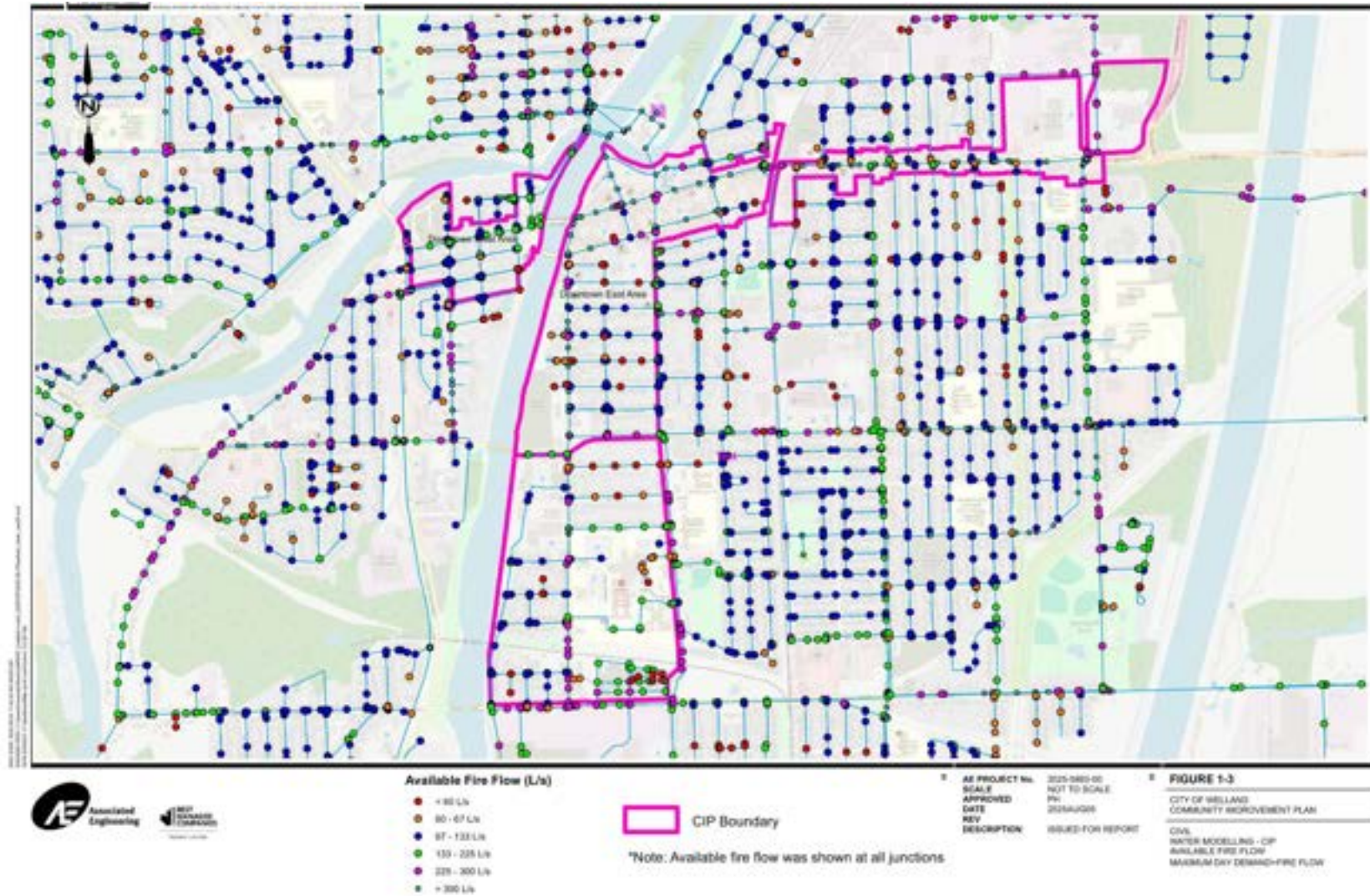
City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Figure 9. Distribution System Available Fire Flow Under Maximum Day Demand (AE, 2025)



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

2.3 Wastewater

2.3.1 Treatment

As noted in Section 1.3.1, the 2021 Region MSPU determined that the existing and projected 2051 average day flows (ADF) at the Welland WWTP are approximately 34,200 m³/day and 48,900 m³/day, representing 63% or 90% of the total rated capacity of the plant, respectively (based a capacity of 54,600 m³/day and a buildout population of 93,114). Further, the study determined that that flows to the WWTP will reach the 80% study trigger capacity around 2041 and that the post-2051 flows are expected to exceed the plant capacity.

Projected average day flows generated under the CIP buildout scenario were estimated based on a projected population of 74,315 in the CIP study area and a per capita wastewater average day flow of 374 L/cap/day at the Welland WWTP (per Table 4.1 of the 2021 MSPU). As a result of the proposed CIP high-density growth, average day flows from the CIP area to the WWTP are projected to be 27,780 m³/day. This represents only a portion of the flows to be treated at the WWTP. Projected wastewater flows generated from the proposed CIP buildout growth, compared to previous estimates, are summarized in Table 6.

Table 6. Comparison of Estimated Average Day Flows at the WWTP

	2021 MSPU – Existing ¹	2021 MSPU- Buildout (to 2051) ¹	CIP Area – Buildout
Average Day Flow (m ³ /day)	34,200	48,900	27,780
Table Notes: 1. Wastewater flows within the City's urban boundary (2021 MSPU) 2. Wastewater flows within Health & Wellness CIP Area, only.			

Further to the discussions above, the 2020 PPCP and 2021 Region MSPU considered a broader growth pattern across the entire City, while the current study applies much higher density targets specifically within the CIP study area alone. This results in a significantly greater concentration of people and servicing demand in the CIP study area compared to what was assumed in earlier studies. If the proposed development densities for this area are fully realized, the resulting City-wide growth could exceed what was assumed in earlier studies. As a result, capacity constraints that were not previously identified may occur. However, increased growth in the CIP Areas could be offset by lower growth elsewhere. It should also be recognized that the full buildout of this intensified growth scenario is likely to occur over an extended timeframe. Therefore, as development progresses, it will be important to continue to monitor growth and reassess potential impacts on treatment infrastructure to ensure confirm the requirement and timing for capacity-related upgrades at the WWTP.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

2.3.2 Collection System

As part of the servicing analysis for the current CIP Update, future wastewater flows were estimated for each CIP Area based the per capita residential and employment wastewater generation rates from the 2021 MSPU, presented in Table 1, and the projected equivalent population values presented in Table 3.

GEI then applied these dry weather flows to the City's wastewater model (from the 2021 MSPU) to complete a review of the system's future performance under future 2-, 5-, and 10-year design storms (see full report in Appendix A). Peaking factors were applied using the Harmon formula. In addition, rain-derived inflow and infiltration (I&I) allowances were based on recommended extraneous flow design allowances from the 2021 MSP, also presented in Table 1. The results of the review are summarized in Table 7 (Table 1 of the GEI report) and Figure 10 (Figure 4 of the GEI report).

Table 7: Summary of Projected CIP Area Wastewater Flows (GEI, 2024)

CIP Area	Total Average Dry Weather Flow (L/s)	Peaking Factor ¹	Peaked Dry Weather Flow (L/s) ¹	Additional RDII (L/s)	Total CIP Peaked DWF (L/s)
1	17.26	3.20	55.27	0.99	56.26
2	54.29	2.73	148.35	2.07	150.45
3	120.37	2.39	287.77	4.31	292.09
4	54.59	2.77	151.19	2.26	153.45
Total	246.52	-	642.59	7.37	652.25
Table Notes:					
1. Harmon's Peaking Factor					

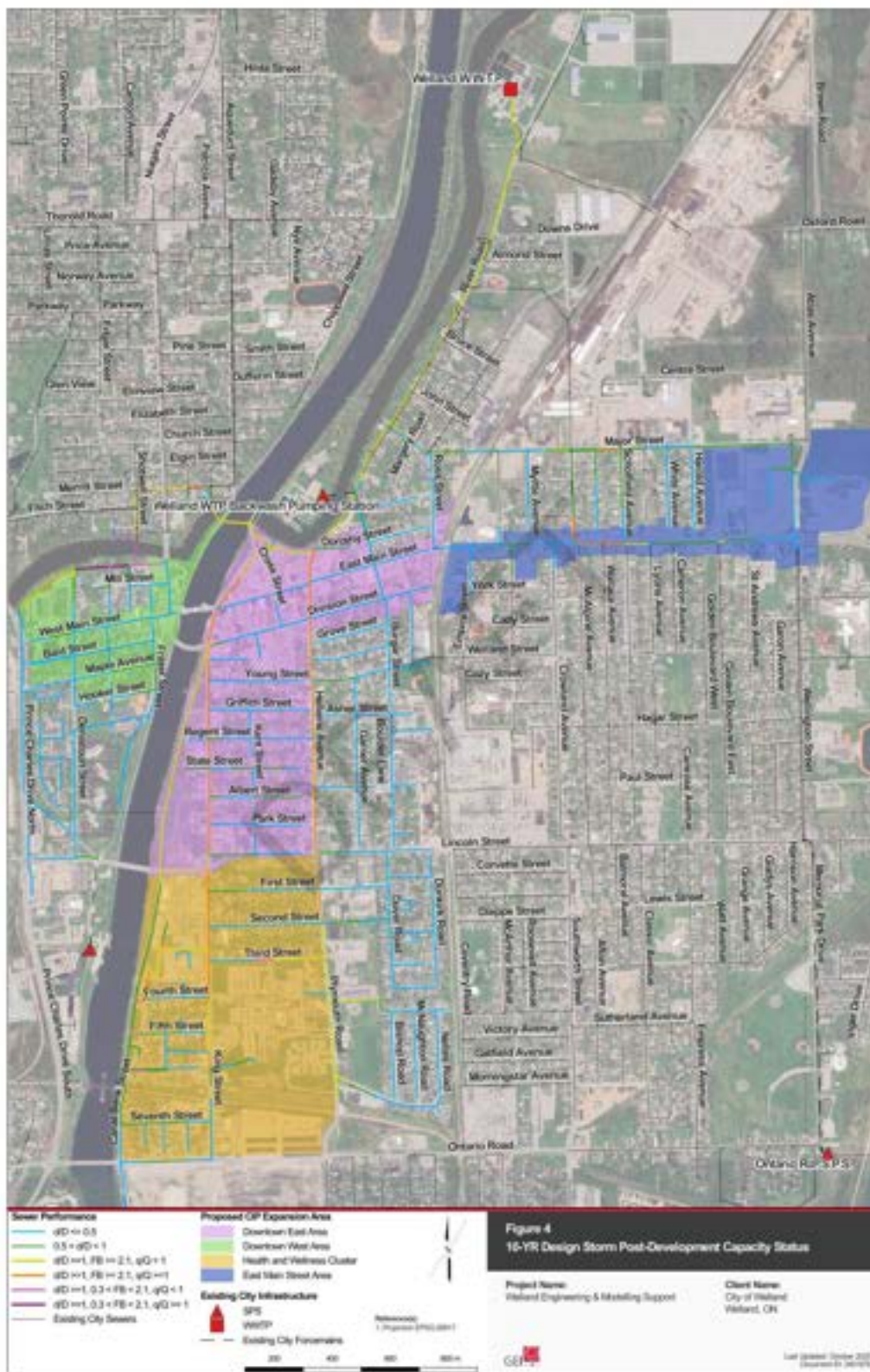
GEI then used the calibrated model to estimate the existing DWF in these areas, as well as future projected DWFs per the 2021 Region MSPU. As presented in Table 8, the projected CIP buildout peak flows are significantly higher than the estimated existing and 2021 MSPU projected peak flows, by roughly 1.5 and 1.3 orders of magnitude, respectively.

Table 8. Comparison of Peaked Dry Weather Wastewater Flows

CIP Area	Existing Peaked DWF (L/s)	2021 MSPU Future Peaked DWF (L/s)	2025 CIP Update Peaked DWF (L/s)
1	1.86	5.9	56.26
2	3.49	9.86	150.45
3	3.97	6.32	292.09
4	2.50	2.89	153.45
Total	19.27	36.66	652.25

City of Welland Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Figure 10. Buildout Wastewater System Constraints: 10-Year Design Storm



City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

Moreover, the evaluation determined that additional CIP buildout flows have an impact on the existing surcharging and basement flooding risks, in addition to the existing constraints identified in Section 1.3.2. Additional City-Owned sewers experience surcharging under the buildout 2, 5, and 10-year design storm conditions due to downstream Region sewer capacities and in some instances, rely on downstream overflows to provide basement flooding protection. This includes sections along King Street/west of King Street, Plymouth Road/Hellems Ave, Major Street, and East Main Street as well as short sections along Third, Fourth, Fifth and Sixth Street. GEI also noted that with CIP buildout flows, there is a risk of overflows occurring under dry weather flows, which is noncompliant to F-5-5 requirements. Additionally, overflow volumes increase in 6 of the 13 overflows downstream of the CIP Areas under the 2, 5, and 10-year design storms.

Ongoing and planned upgrades to trunk sewers and continued efforts to reduce I&I are expected to help mitigate or delay the onset of these issues. Recommendations from the MSPU for upgrades along Plymouth Road remain a priority to provide additional online storage and basement flooding protection, with similar measures potentially required along Hellems Ave, King Street and East Main Street under the CIP growth conditions. As intensification progresses, continued monitoring and re-assessment of system performance will be key to confirm the collection system maintains an adequate level of service to support the projected growth.

2.4 Stormwater

As discussed in Section 1.4, stormwater servicing for future municipal developments will be required to be in compliance with the City's Consolidated Linear Infrastructure (CLI) Environmental Compliance Approval (ECA), including the requirements for water balance, water quality, sediment and erosion control, water quantity and flood control outlined in Appendix A of the CLI ECA.

As development progresses within the CIP Areas, stormwater management systems will be expanded to accommodate growth. While the CIP will accelerate development, it will not alter the regulatory requirements for new drainage infrastructure. New developments, including subdivisions, will be required to incorporate stormwater management facilities in line with current regulations, ensuring that post-development flows do not exceed pre-development levels. Although stormwater facilities are typically designed for individual developments, there are significant benefits to creating comprehensive stormwater management master plans. These plans would allow for shared facilities between subdivisions, optimizing land use and reducing costs, while ensuring long-term compliance with regulatory standards.

2.5 Transportation

Per Section 1.5, the City is currently undertaking a TMP to assess road network and active transportation needs to accommodate existing and future projected population and employment growth to 2051. It is recommended the plan's findings and strategies be incorporated into the development of the CIP. The TMP outlined key objectives to enhance network connectivity, promote active transportation, and improve safety and accessibility, which will be essential as the CIP Areas experience growth. Additionally, the TMP emphasizes the importance of regional integration and the need for updated transportation policies, all of which align with the density information provided in the Development Charges (DC) Background Study and the City's Official Plan. By integrating these strategies, the City can address potential transportation challenges,

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

ensure consistency with the City's long-term goals, and support the development of a sustainable transportation system for future growth.

In terms of future constraints, particular attention should be given to potential capacity limitations on key streets and intersections, especially along East/West Main Street and Niagara Street, where increased density may lead to congestion. The TMP highlights these areas as requiring future upgrades to maintain efficient traffic flow and ensure pedestrian and cyclists' safety. Addressing these constraints proactively will be crucial to accommodating expected development while maintaining adequate transportation network performance. While the TMP identified these constraints and outlined corresponding improvements, its implementation plan did not fully align with the projected timeline of growth in the CIP Area. As a result, these items may need to be implemented sooner than originally anticipated.

2.6 Solid Waste

As described in Section 1.6, the Region of Niagara provides municipal curbside collection for garbage recycling to all residents living within the City of Welland. Regardless of the progress of the CIP, the City's growing population will require expanded collection services, such as more equipment (e.g., trucks) to continue the service at current levels. This need is projected to increase as growth continues in the CIP Areas. Collection services can typically be adjusted by optimizing collection routes, procuring more equipment (e.g., collection trucks), or by revising collection contracts to cater for population growth. As there is limited capital infrastructure involved in waste and recycling collection, the impacts on this municipal service are likely to be manageable.

Additionally, given the recent expansion and the resulting increase in capacity (see Section 1.6), the landfill is expected to be sufficient to accommodate projected growth in waste volumes over the planning horizon. Its extended operating life provides a level of assurance that, despite anticipated development and intensification, the site will continue to support the community's needs without requiring additional investments in disposal infrastructure. The remaining undeveloped area within the site also offers flexibility for operational adjustments or future capacity enhancements, if needed.

As noted in the Niagara Region 2025 Corporate Asset Management Plan, the Region is currently developing a Waste Management Strategic Plan to guide the long-term delivery of waste services. Future infrastructure improvements and program planning related to solid waste management should align with the direction and priorities established in this Strategic Plan.

2.7 Electrical Power

Per Section 1.7, Hydro One is currently undertaking a Class EA to build a new double transmission line from the existing Hydro one corridor in Thorold into the Crowland TS. Given the high density growth targets being proposed in this CIP update are much higher than those estimated in previous master plans and other studies, it is important to consider potential constraints related to electrical servicing to support populations estimated in . Welland Hydro was contacted as part of this study to address the feasibility of supporting future development in the CIP Areas. They advised that each CIP Area would require circuit expansion to accommodate the electrical loads associated with high-density residential development. However, available capacity exists on the adjacent 27.6 kV systems. At this time, no significant issues are anticipated in meeting future capacity requirements in these areas as development

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

progresses. It is recommended that the City continue to engage Welland Hydro early in future project planning to confirm servicing needs and ensure that adequate hydro capacity is available to support proposed developments.

2.8 Natural Gas

While there are currently no available reports detailing the existing natural gas infrastructure in Welland, further information was obtained through direct consultation with Enbridge. A meeting was held to discuss their natural gas service, available capacity, and any existing limitations within the area. Enbridge confirmed that there are no known current constraints or limitations on the system supporting existing demands. However, to assess potential future constraints, detailed information would be required, including the type of development and associated gas demands – details that are not yet available or have not been confirmed. As the City expands, future development may require reinforcement of the natural gas network. It is therefore recommended that ongoing consultation with Enbridge be incorporated into the CIP expansion process to ensure infrastructure planning aligns with growth.

2.9 Telecommunications

As discussed previously in Section 1.9, given the likelihood that future high-speed internet expansion in the area will rely primarily on fixed wireless and satellite infrastructure, consideration must also be given to potential servicing constraints. Attempts were made to engage telecommunications service providers, including Cogeco and Bell, however responses were not received. As such, future development should include direct consultation with telecommunications providers to confirm service availability and identify any infrastructure needs early in the planning process.

City of Welland

Downtown and Health and Wellness Cluster CIP Infrastructure Assessment

This report has been prepared by J.L. Richards & Associates Limited for Client's exclusive use. Its discussions and conclusions are summary in nature and cannot properly be used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report is based on information, drawings, data, or reports provided by the named client, its agents, and certain other suppliers or third parties, as applicable, and relies upon the accuracy and completeness of such information. Any inaccuracy or omissions in information provided, or changes to applications, designs, or materials may have a significant impact on the accuracy, reliability, findings, or conclusions of this report.

This report was prepared for the sole benefit and use of the named client and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited, and anyone intending to rely upon this report is advised to contact J.L. Richards & Associates Limited in order to obtain permission and to ensure that the report is suitable for their purpose.

Ottawa

343 Preston Street
Tower II, Suite 1000
Ottawa ON Canada
K1S 1N4
613-728-3571
ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
613-544-1424
kingston@jlrichards.ca

**Sudbury**

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
705-522-8174
sudbury@jlrichards.ca

Timmins

834 Mountjoy Street South
Timmins ON Canada
P4N 7C5
705-360-1899
timmins@jlrichards.ca

North Bay

122 Main Street West, Suite 3
North Bay ON Canada
P1B 2T5
705-495-7597
northbay@jlrichards.ca

Guelph

107-450 Speedvale Avenue West
Guelph ON Canada
N1H 7Y6
519-763-0713
guelph@jlrichards.ca

London

380 Wellington Street
Tower B, 7th Floor
London ON Canada
N6A 5B5
226-700-5127
london@jlrichards.ca



Platinum
member



Appendix A

GEI Wastewater Hydraulic
Assessment



Welland Modelling, Analysis, and Engineering Services

Welland CIP Expansion Re-Analysis

Submitted to:

Kelly Walsh
City of Welland

Submitted by:

GEI Consultants Canada Ltd.
1266 South Service Road, Unit C31
Stoney Creek, ON L8E 5R9
905-643-6688

October 22, 2025
Project No. 2401976
Task 16



Nicolas Chan, B.A.Sc.
Technical Specialist

Joy Liu, M.A.Sc.
Project Manager

Alyssa Kochanski, P. Eng
Project Manager

Table of Contents

1.	Project Scope	1
1.1.	Study Area	1
1.2.	Project Scope	1
2.	Sanitary System Performance Objectives	3
2.1.	Sanitary Sewer Hydraulic Performance Objectives	3
2.2.	Sanitary Overflow Performance	3
3.	Sanitary System Review	4
3.1.	Local System	4
3.2.	Wastewater Flow Analysis	4
3.3.	Impact on Sanitary Sewer System Performance	7
3.3.1.	Overflows	13
4.	Summary and Recommendations	15

List of Tables

Table 1: Summary of Proposed CIP Expansion Areas	6
Table 2: Peak d/D Capacity Results in City Sewers Collecting Local Flows	10
Table 3: Overflow Receiving Volume Results within CIP Expansion Area	14
Table 4: Downtown West Theoretical and Modelled Flows	16
Table 5: Downtown East Theoretical and Modelled Flows	18
Table 6: Health & Wellness Area Theoretical and Modelled Flows	23
Table 7: King Street Area Theoretical and Modelled Flows	27

List of Figures

Figure 1: CIP Expansion Areas	2
Figure 2: Wastewater Flow Route	5
Figure 3: 10-Year Design Storm Pre-Development Capacity Performance	11
Figure 4: 10-Year Design Storm Post-Development Capacity Performance	12

NC/JL

"B:\Working\WELLAND ON, CITY OF\2401976 - 620137 Welland Engineering & Modelling Support\Task 16 - Welland CIP Re-Analysis\2401976 Task 16 - Welland CIP ReAnalysis DRAFT - 2025-10-XX.docx"

Certification

PREPARED BY:

GEI Consultants Canada Ltd.

PREPARED BY:

GEI Consultants Canada Ltd.

Nicolas Chan B.A.Sc.
Technical Specialist

Joy Liu, M.A.Sc.
Project Manager

Alyssa Kochanski, P. Eng
Project Manager

1. Project Scope

1.1. Study Area

The City of Welland has retained GEI Consultants Canada Ltd. (GEI) to assess the City's wastewater system capacity for supporting the Community Improvement Plan (CIP) and Expansion Areas. The CIP Expansion Area includes the areas of Downtown West, Downtown East, Health and Wellness, and East Main Street, as shown in **Figure 1**. The planned total population for the CIP area is estimated to total 74,315 people and jobs, as summarized in **Table 1**.

1.2. Project Scope

GEI previously completed a draft wastewater modelling analysis and system review for the CIP Expansion area dated July 2025. The previous wastewater system review concluded that:

- The majority of the existing City-owned sewers downstream of the proposed expansion area have sufficient capacity to convey CIP Buildout flows. However, there is surcharging due to backflow from Region sewers downstream. Overflows maintains the hydraulic grade line elevation below the basement flooding protection freeboard elevation.
- With the proposed CIP buildout flows, there is a risk of overflows occurring under dry weather flows, which does not meet the F-5-5 requirements.
- Local system servicing needs for significant growth may be addressed through a City Master Servicing Plan (MSP). The previous City Pollution Prevention Control Plan (PPCP) and Niagara Region Master Servicing Plan Update (MSPU) were last completed in 2020 and 2021 respectively. There is an ongoing Niagara Region Master Servicing Plan Update to review the Region-owned infrastructure needs and it is recommended that the City coordinates growth with the Region through this process.

This report is updated with the updated CIP Expansion areas as shown in **Figure 1**.

It is noted that the CIP area is partially included in the growth considered in the Pollution Prevention Control Plan and Wastewater Master Servicing Plan Update (2020 PPCP) and the 2021 Region Master Servicing Plan Update (2021 Region MSPU). However, the CIP growth estimates of 74,315 far exceed the high growth scenario estimated as part of the 2020 PPCP Buildout population of 55,960 across the entire City. The 2021 Region MSPU was completed using a projected buildout population of 93,114 allocated across the City.

There are no pumping stations downstream of the CIP area. However, growth may impact the Ontario Road SPS through the works planned as part of the Commercial Street Master Servicing Plan, which involves a new trunk sewer redirecting parts of the Health & Wellness Cluster east to the Ontario Road SPS. Details of the redirection can be found in the *Ontario Trunk Design Analysis for Commercial Street Area – L-Site Decommissioning* (GEI Consultants Inc., December 2024). Due to uncertainty in timing of works, this report will analyze the impacts of the growth on the existing network only.

The wastewater system was assessed using the City's updated model that was the basis of the City's Pollution Prevention Control Plan (PPCP) (2020), updated as part of the Region's Master Servicing Plan Update (2021), and most recently updated with the City's 2020-2021 flow monitoring program data (2022).

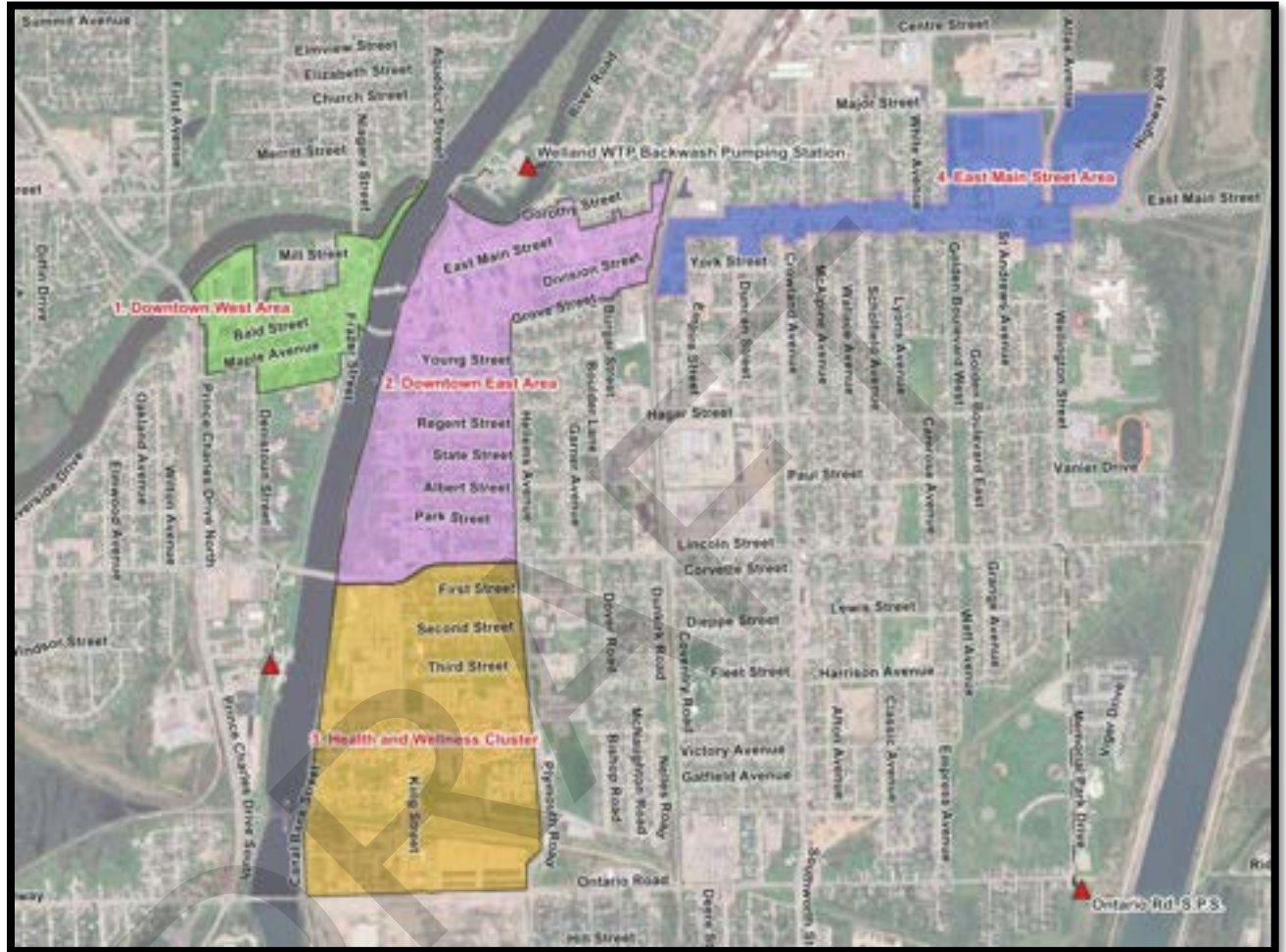


Figure 1: CIP Expansion Areas

2. Sanitary System Performance Objectives

2.1. Sanitary Sewer Hydraulic Performance Objectives

For existing sewer capacities, sewer performance criteria were assessed using the following conditions:

- Maintain depth of flow in pipe equal to or less than obvert elevation ($d/D \leq 1$); and, if failing to do so then,
- Maintain system hydraulic grade line (HGL) of a surcharging sewer below the basement protection freeboard of 2.1 meters below grade.

Performance is based on the 10-year design storm as defined in the PPCP.

2.2. Sanitary Overflow Performance

Through the PPCP, the following overflow criteria were identified:

- No overflows during dry weather;
- 90% volumetric capture and treatment of wet weather flows during a 7-month period commencing within 15 days of April of an average year;
- Maximize the use of the collection system for the storage of wet weather flows when capacity is unavailable;
- No growth-related net increase in system overflows under an average year

To meet the above overflow objectives, the PPCP identified a net citywide target of reducing wet weather flows by 10%. Further, with the goal of removing wet weather flows at a rate equal to or greater than new development flows.

Additionally for the City's permanent overflows, it is understood that provided there is sufficient downstream sewer capacity, wet weather reduction projects do not need to be targeted in the same catchment as the growth areas provided that the city-wide wet weather flow reduction rate is equal to or greater than new development flows.

3. Sanitary System Review

3.1. Local System

The CIP Expansion Areas are collected by City-owned local sewers which flow into interceptor sewers along the Welland Canal and ultimately to the Welland Wastewater Treatment Plant (WWTP). There are no downstream sewage pumping stations (SPS).

Local sewers in the Downtown West Area, west of the Welland Canal, are collected by a 450mm Region-Owned sewer north of Mill Street conveying flows via a siphon across the Welland Canal to the Welland WWTP. The flows have potential to contribute to 6 overflows as shown in **Figure 2**.

The Health and Wellness Cluster, Downtown East Area, and East Main Street Area flows, east of the Welland Canal, are collected by the City-owned sewers on King Street, Plymouth Road, Hellems Avenue, and East Main Street. These sewers discharge into the Region-owned 1800mm interceptor trunk sewers on Court House Lane leading to the Welland WWTP. The East Main Street Area flows may also discharge into the Region-owned 1650mm sewer on Wellington Street North, similarly leading to the Welland WWTP. These flows have potential to contribute to 2 overflows shown in **Figure 2**.

3.2. Wastewater Flow Analysis

The system was evaluated under both existing and post-development conditions to gauge the development impact on the sanitary system holistically.

9.2.1 Design Flows

Calculation of sewage design flows shall conform to the latest editions of the Regional Municipality of Niagara, Public Works Department's "Guidelines for the Design and Construction of Sewer and Water Main Systems", and the Ontario Ministry of the Environment's "Guidelines for the Design of Water Storage Facilities, Water Distribution Systems, Sanitary Sewage Systems and Storm Sewers".

The City currently uses the 2021 Niagara Region MSPU methodology for flow generation which is 255 L/c/d for people and 310 L/c/d for jobs. This value is updated from the previous Regional MSP and the City's 2020 Pollution Prevention and Control Plan and Master Servicing Plan Study. The planned growth and wastewater flows were calculated by J. L. Richards, summarized in **Table 1**.

The GEI review considered the CIP area already included in the existing model sewershed area. Only the CIP areas outside of the existing model sewershed area were allocated a RDII allowance. It follows that the CIP will add **652.25 L/s** of buildout flow to the existing system.

It is noted that the CIP area was partially included in the growth considered in the Pollution Prevention Control Plan and Wastewater Master Servicing Plan Update (2020 PPCP) and the 2021 Region Master Servicing Plan Update (2021 Region MSPU). For the purposes of this assignment, only the CIP buildout growth was considered and other additional growth trajectories were not included in this analysis.

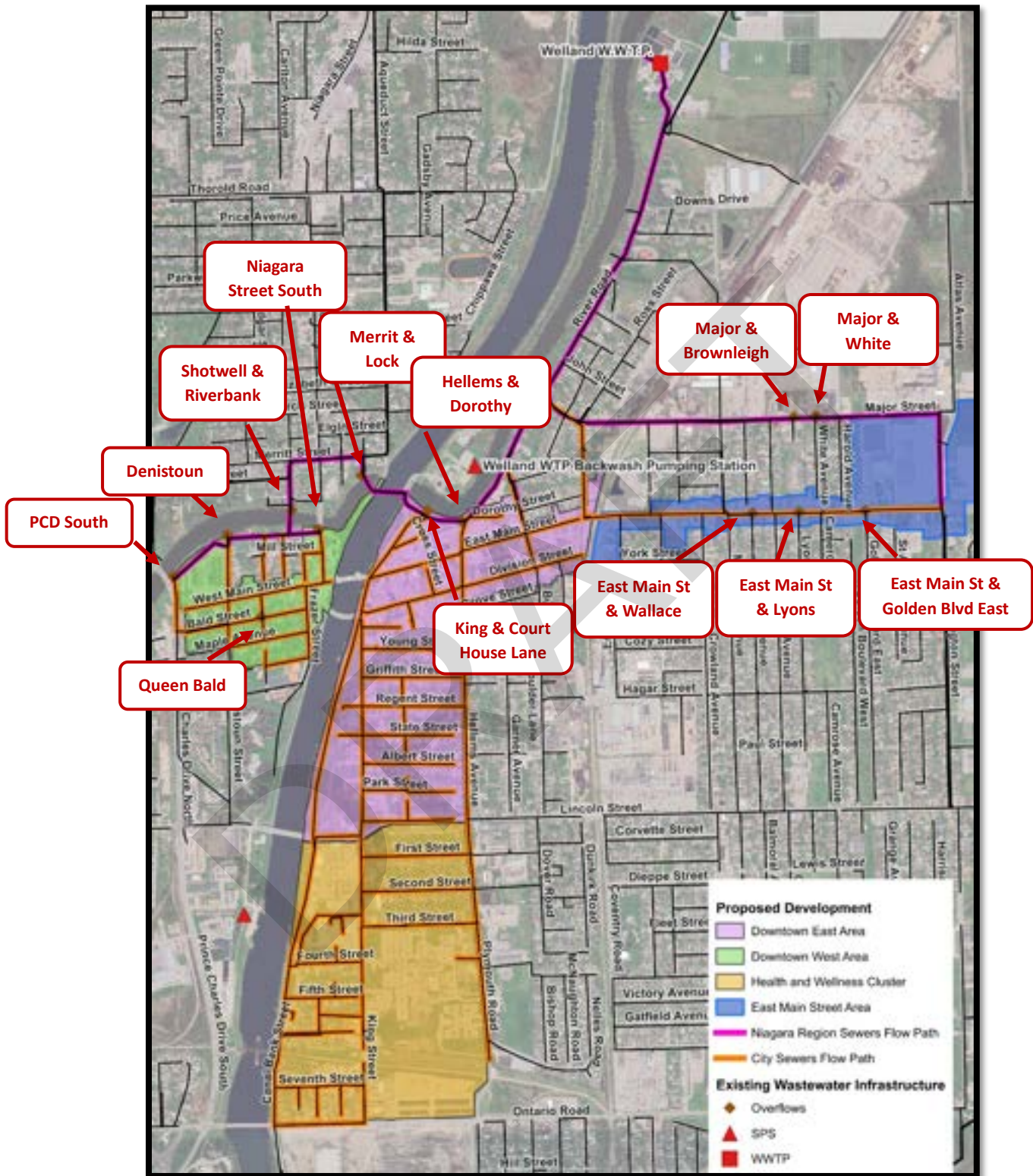


Figure 2: Wastewater Flow Route

Table 1: Summary of Proposed CIP Expansion Areas

CIP Area	Existing Peaked DWF ⁽³⁾ (L/s)	Total 2051 Peaked DWF ⁽³⁾ (2021 Region MSPU) (L/s)	Land Use				Proposed Population		Proposed Wastewater Flows					
			Land Use ⁽¹⁾	Area ⁽¹⁾ (ha)	Total Area ⁽¹⁾ (ha)	Area outside of existing Sewershed (ha)	Additional RDII (L/s)	Equivalent Total Population ⁽¹⁾	Total Population ⁽¹⁾	Total Average DWF ⁽¹⁾ (m3/d)	Total Average DWF ⁽¹⁾ (L/s)	Peaking Factor ⁽²⁾	Peaked DWF (L/s)	Total Proposed Flow (L/s)
Downtown West	1.86	5.9	Downtown	3.85	13.7	3.46	0.99	2,435	5,546	1,491	17.26	3.20	55.27	56.26
			High Density Residential	3.86				2,442						
			Institutional	0.28				178						
			Low Density Residential	5.18				491						
Downtown East	3.49	9.86	Community Commercial Corridor	0.79	40.94	7.22	2.07	500	16,656	4,691	54.29	2.73	148.35	150.45
			Downtown	18.87				11,943						
			General Industrial	0.02				13						
			High Density Residential	0.99				629						
			High Density Residential-SPA	0.37				235						
			Institutional	0.87				551						
			Light Industrial	<0.01				1						
			Low Density Residential	12.50				1,186						
			Low Residential	0.01				1						
			Medium Density Residential	3.01				545						
			Mixed-Use Commercial	3.51				1,052						
Health and Wellness	3.97	6.32	Health and Wellness Cluster	57.88	58.14	15.1	4.31	36,640	36,805	10,400	120.37	2.39	287.77	292.09
			Health and Wellness Cluster-SPA	0.12				78						
			Institutional	0.14				87						
East Main Street	2.50	2.89	Community Commercial Corridor	19.37	26.26	7.9	2.26	12,260	15,308	4,717	54.59	2.77	151.19	153.45
			Institutional	3.99				2,524						
			Low Density Residential	0.00				0						
			Medium Density Residential	2.90				524						
Total	19.27	36.66	-	138.51	25.76	7.37	74,315		21,299	246.52	-	642.62	652.25	

1. Provided by J. L. Richards (highlighted in grey)
2. Harmon’s Peaking Factor
3. Based on calibrated model.

3.3. Impact on Sanitary Sewer System Performance

The system performance was reviewed under 2-year, 5-year, and 10-year design storms using the City's existing wastewater model in line with the City's PPCP capacity assessment. **Table 2** below summarizes the sewer system performance under existing flows and with CIP buildout flows.

The system performance of City-owned sewers under the 10-year design storm in the CIP Area are shown in **Figure 3** and **Figure 4**. Based on model results:

- Downtown West Area:
 - Under the existing and buildout 2, 5, and 10-year design storm conditions, the majority of City-owned sewers do not experience surcharging due to overflow controls.
 - The 250 – 750mm Regional sewers north of Mill Street crossing Niagara Street experiences surcharging above the 2.1 m basement flooding risk protection elevation due to capacity constraints and backflow from the downstream Region sewers under both existing and buildout conditions
 - Additional CIP Buildout flows exacerbates the existing surcharge and basement flooding risk.
- Downtown East Area
 - Under existing 2, 5, and 10-year design storm conditions, there are City-owned sewers that experience surcharging, as listed below:
 - The 600 mm City-owned sewer on King Street or The Boardwalk between Division Street and Court House Lane.
 - The 525 mm City-owned sewers on Hellems Avenue between Lincoln Street and Court House Lane or Dorothy Street.
 - Under buildout 2, 5, and 10-year design storm conditions, the following additional City-owned sewers experience surcharging, as listed below:
 - The 600 mm City-owned sewers on King Street between Lincoln Street to Division Street.
 - The 900 mm City-owned sewer west of King Street between Lincoln Street to Division Street.
 - Surcharging is due to backflow from the downstream Region sewer. However, surcharging remains below the 2.1m basement flooding risk protection elevation with existing and CIP buildout flows due to overflow controls.
 - The additional CIP Buildout flows have a moderate impact on surcharging and basement flooding risk.
- Health and Wellness Cluster:

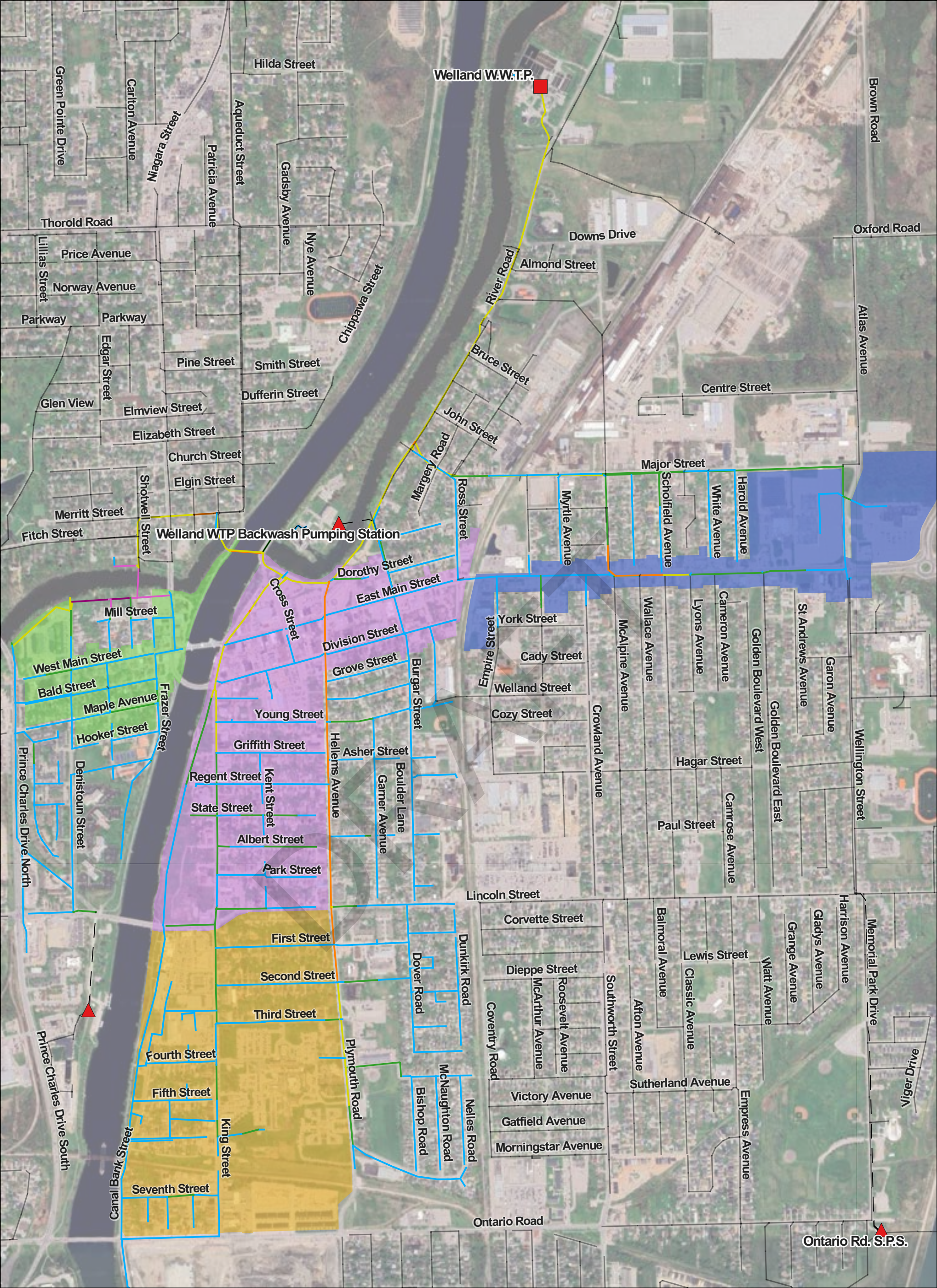
- Under the existing 2, 5, and 10-year design storm conditions, the majority of City-owned sewers do not experience surcharging with the exception of the 450 mm City-owned sewer on Plymouth Road/Hellems Avenue between Churchill Avenue and Lincoln Street. However, surcharging remains below the 2.1 m basement flooding risk protection elevation.
- Under the buildout 2, 5, and 10-year design storm conditions, the additional CIP Buildout flows result in additional surcharging in City-owned sewers, as listed below:
 - The 450 mm City-owned sewer on Plymouth Road/Hellem Avenue between Nelles Road and Lincoln Street, with surcharging remaining below the 2.1 m basement flooding risk protection elevation.
 - The 250 – 600 mm City-owned sewer along King Street between Sixth Street and Lincoln Street, with surcharging remaining below the 2.1 m basement flooding risk protection elevation.
 - Short sections of City sewers surcharge above the 2.1 m basement flooding risk protection elevation:
 - Third Street between King Street and Plymouth Road
 - Fourth Street at Canal Bank Street
 - Fifth Street at Canal Bank Street
 - Sixth Street at Canal Bank Street
 - The additional CIP Buildout flows have a significant impact on surcharging and basement flooding risk.
- East Main Street Area
 - Under the existing and buildout 2, 5, and 10-year design storm conditions, the City-owned sewers experience surcharging, as listed below:
 - The 750 mm City-owned sewer between East Main Street and Lyons Avenue to McAlpine Avenue and Spencer Street. However, surcharging remains below the 2.1 m basement flooding risk protection elevation.
 - Under buildout 2, 5, and 10-year design storm conditions, the additional CIP Buildout flows result in additional surcharging in City-owned sewers, as listed below:
 - The 450 mm City sewer on Major Street between Schofield Avenue and Wallace Avenue.
 - The 250 mm City sewer on East Main Street and Golden Boulevard East.
 - However, all surcharging remains below the 2.1 m basement flooding risk protection elevation with the usage of overflow controls.
 - The additional CIP Buildout flows have a moderate impact on surcharging and basement flooding risk.

Appendix A shows the theoretical Manning's capacity of local City pipes with diameter greater than 300mm downstream of the CIP Expansion area and the peak flows under the existing and buildout DWF, 2, 5, and 10-year design storm scenarios.

DRAFT

Table 2. Peak d/D Capacity Results in City Sewers Collecting Local Flows

Scenario		Downtown West Area		Downtown East Area		Health & Wellness Area		East Main Street Area	
		Max. d/D	Min. Freeboard (m)	Max. d/D	Min. Freeboard (m)	Max. d/D	Min. Freeboard (m)	Max. d/D	Min. Freeboard (m)
Existing (Pre-Development)	DWF	0.56	Within Obvert	0.51	Within Obvert	0.51	Within Obvert	0.09	Within Obvert
	1:2 Year	≥1.00	1.71	≥1.00	2.55	≥1.00	5.85	0.99	Within Obvert
	1:5 Year	≥1.00	1.67	≥1.00	2.43	≥1.00	4.52	≥1.00	4.90
	1:10 Year	≥1.00	1.63	≥1.00	2.38	≥1.00	4.04	≥1.00	4.80
CIP Buildout (Post-Development)	DWF	≥1.00	2.90	≥1.00	3.23	≥1.00	3.47	0.34	Within Obvert
	1:2 Year	≥1.00	1.62	≥1.00	2.45	≥1.00	1.76	≥1.00	5.02
	1:5 Year	≥1.00	1.56	≥1.00	2.36	≥1.00	1.72	≥1.00	4.83
	1:10 Year	≥1.00	1.53	≥1.00	2.29	≥1.00	1.56	≥1.00	4.66



Sewer Performance

d/D <= 0.5

0.5 < d/D < 1

d/D >=1, FB >= 2.1, q/Q < 1

d/D >=1, FB >= 2.1, q/Q >=1

d/D >=1, 0.3 < FB < 2.1, q/Q < 1

d/D >=1, 0.3 < FB < 2.1, q/Q >= 1

Existing City Sewers

Proposed CIP Expansion Area

Downtown East Area

Downtown West Area

Health and Wellness Cluster

East Main Street Area

Existing City Infrastructure

SPS

WWTP

Existing City Force mains

Reference(s)

1. Projection EPSG:26917

200

400

600

800 m

Figure 3

10-YR Design Storm Pre-Development Capacity Status

Project Name:

Welland Engineering & Modelling Support

Client Name:

City of Welland

Welland, ON

GEI

consultants

Last Updated: October 2025

Document ID: 2401976

z:\0137 Welland\Welland ON CITY OF\2401976 - Development\Reviews\GIS - Modelling Support\GIS - Modelling Support\Reviews\2401976 - WW Dev Rev Tracking.qpg

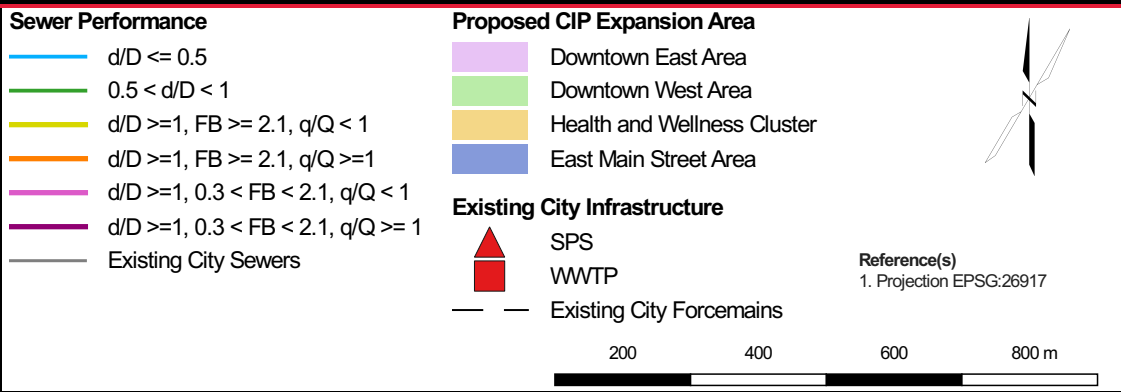
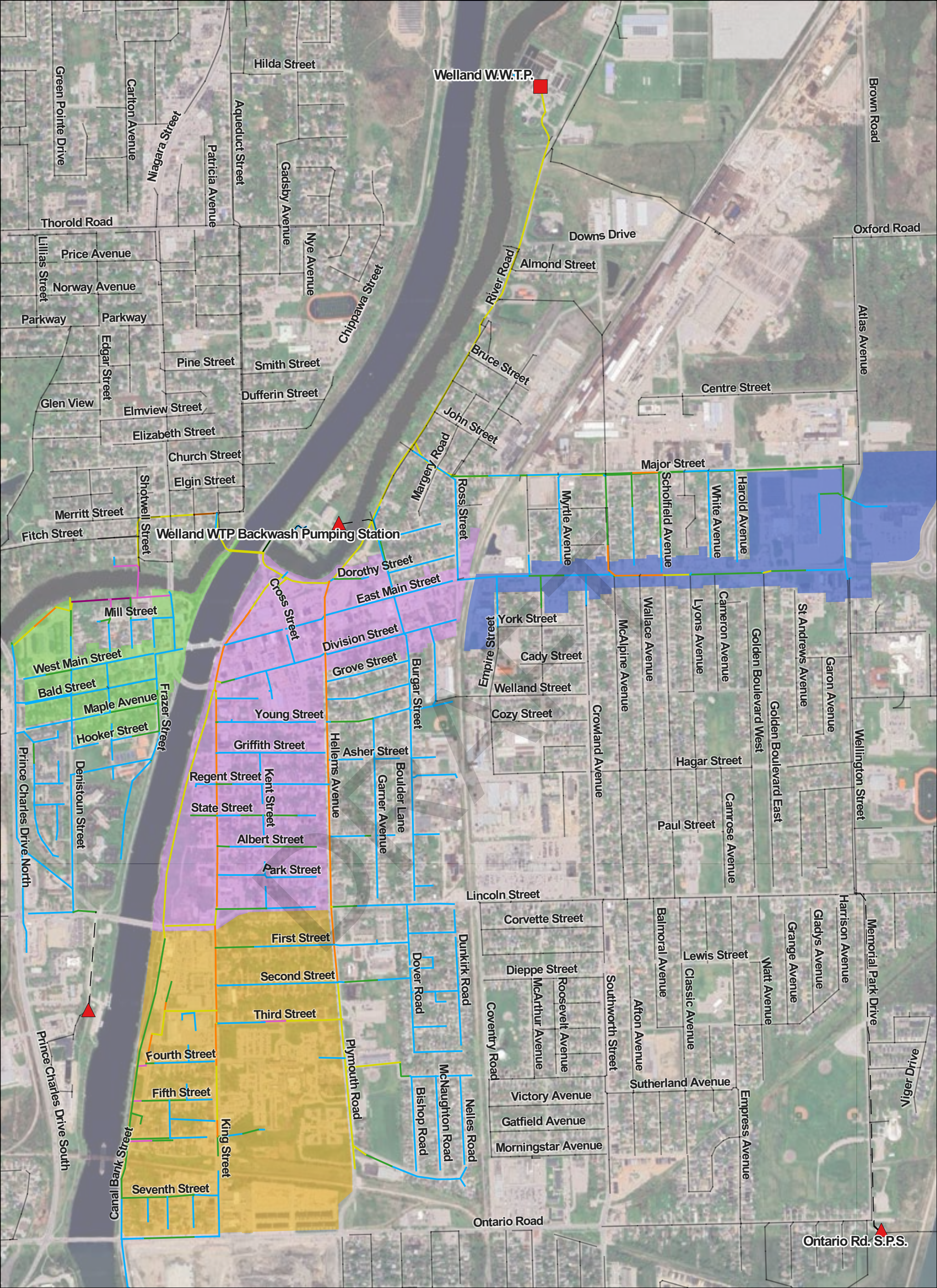


Figure 4
10-YR Design Storm Post-Development Capacity Status

Project Name:
Welland Engineering & Modelling Support

Client Name:
City of Welland
Welland, ON



Last Updated: October 2025
Document ID: 2401976

3.3.1. Overflows

Although the majority of the city-owned sewers have sufficient capacity for the proposed CIP Buildout flows, the HGL is mainly managed by downstream overflows. There are 13 downstream overflows that provide basement and basement flooding protection as shown in **Figure 2**. Under the existing system, the overflows are compliant with the F-5-5 regulatory criteria listed in **Section 2.2**.

With the CIP buildout flows, there is a risk of overflows occurring under dry weather flows, as summarized in **Table 3**, which does not meet F-5-5 requirements. Further, overflow volumes increase in 6 of the 13 overflows downstream of the CIP Expansion Area under the 2, 5, and 10-year design storms. To reduce overflows, the City's PPCP set out a goal of reducing wet weather flows by 10% and remove wet weather flows at a rate equal or greater to new development flows.

DRAFT

Table 3: Overflow Receiving Volume Results within CIP Expansion Area

Overflow Location	CIP Expansion Area	Overflow Volume (m ³)							
		DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
		Existing	Post-Dev	Existing	Post-Dev	Existing	Post-Dev	Existing	Post-Dev
East Main St & Golden Blvd East	East Main Street	0	523	19	559	30	585	62	635
Denistoun	Downtown West	0	3,685	3,124	10,654	3,922	11,426	4,479	12,168
Niagara Street South	Downtown West	0	3,381	2,090	8,099	2,623	8,643	3,017	9,125
PCD South	Downtown West	0	4,194	2,749	8,974	3,323	9,248	3,775	9,091
Hellems & Dorothy	Downtown East	0	8,294	24,633	64,797	32,037	72,662	37,846	80,243
East Main St & Lyons	East Main Street	0	523	0	531	0	535	7	556
Queen Bald	Downtown West	0	0	0	0	0	0	0	0
Major & Brownleigh	East Main Street	0	0	0	0	0	0	0	0
Major & White	East Main Street	0	0	0	0	0	0	0	0
Shotwell & Riverbank	Downtown West	0	0	0	0	0	0	0	0
East Main St & Wallace	East Main Street	0	0	0	0	0	0	0	0
Merrit & Lock	Downtown West	0	0	0	0	0	0	0	5
King & Court House Lane	Downtown East	0	0	1,417	4,174	2,234	5,206	2,945	6,192

4. Summary and Recommendations

The Welland CIP Expansion has the following impacts on the existing wastewater system:

- The proposed Welland CIP Expansion area is estimated to total 74,315 people and jobs. This buildout estimate far exceeds the growth trajectories estimated as part of the 2020 PPCP and the 2021 Region MSPU.
- A majority of the existing City-owned sewers downstream of the proposed expansion area have sufficient capacity to convey CIP Buildout flows, but surcharge due to downstream Region sewer capacities and rely on downstream overflows to provide basement flooding protection as shown in **Table 3**.
- With CIP buildout flows, there is a risk of overflows occurring under dry weather flows, which does not meet F-5-5 requirements.
- Local system servicing needs for significant growth may be addressed through a City Master Servicing Plan (MSP). The previous City Pollution Prevention Control Plan (PPCP) and Niagara Region Master Servicing Plan Update (MSPU) were last completed in 2020 and 2021 respectively. There is an ongoing Niagara Region Master Servicing Plan Update to review the Region-owned infrastructure needs and it is recommended that the City coordinates growth with the Region through this process.

Appendix A Theoretical and Modelled Flows

Table 4: Downtown West Theoretical and Modelled Flows

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289007479	416094SL01	300	61	0	0	4	4	5	5	5	5
289007480	416095SL02	300	61	0	0	4	4	5	5	6	6
289008787	426112SL01	450	687	0	7	3	9	3	9	3	10
289008789	426113SL01	375	18	0	11	4	15	5	15	5	16
289008790	426113SL02	375	18	0	12	4	16	5	17	5	17
289008909	426130SL04	300	64	1	1	19	19	22	22	25	25
289008910	426019SL06	300	117	0	0	2	2	2	2	2	2
289008986	426039SL01	300	68	1	1	19	19	22	22	25	25
289009080	416095SL01	300	52	0	0	5	5	6	6	7	7
289009081	416096SL01	300	44	0	0	6	6	7	7	7	7
289009082	416096SL02	300	66	0	0	6	6	7	7	8	8
289009083	426038SL01	300	68	1	1	19	19	22	22	25	25
289009084	426027SL01	300	68	0	0	6	6	7	7	7	7
289009240	426102SL01	375	78	0	3	0	3	0	3	1	3
289009243	426101SL02	300	46	0	0	1	1	1	1	1	1
289009244	416191SL01	300	82	0	0	0	0	0	0	0	0
289009253	426111SL01	375	144	0	2	2	3	2	3	2	4
289009254	426121SL01	300	86	0	3	1	4	1	4	1	4
289009256	426110SL01	375	144	0	0	1	1	1	1	1	1
289009350	416097SL02	525	426	3	3	17	17	20	20	22	22
289009351	416097SL03	525	169	3	3	23	23	27	27	30	29
289009356	426015SL07	300	74	2	2	11	11	13	13	14	14
289009357	426015SL01	300	91	2	2	10	10	11	11	12	12

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289009361	426112SL03	450	265	0	6	3	8	3	8	3	8
289009362	426122SL02	300	104	0	5	4	9	4	10	5	10
289009373	426029SL05	300	54	0	0	3	3	3	3	3	3
289009375	426114SL01	450	295	1	27	8	35	9	36	10	37
289009383	426113SL04	450	294	1	24	7	31	8	32	9	33
289009384	426113SL03	450	281	1	25	7	33	8	34	9	35
289009389	426112SL04	300	98	0	0	0	0	0	0	0	0
289009392	426133SL05	450	144	1	7	37	42	43	49	48	54
289009393	426143SL02	500	236	2	8	39	46	46	52	51	58
289009394	426132SL03	375	40	1	5	36	40	42	46	46	50
289009395	426132SL02	375	68	1	4	34	37	40	43	44	47
289009397	426130SL02	375	100	1	1	26	26	31	31	34	34
289009399	426130SL03	375	64	1	1	23	23	27	27	30	30
289009402	426019SL03	300	64	0	0	2	2	3	3	3	3
289009403	426019SL04	300	75	0	0	1	1	2	2	2	2
289009404	426019SL05	300	33	0	0	1	1	2	2	2	2
289009696	426101SL01	375	62	0	1	0	2	0	2	0	2
289015751	426006SL05	525	193	2	2	15	15	17	17	19	19
289015919	426131SL01	375	76	1	3	34	35	39	40	43	45
289015939	426144SL01	300	92	0	4	3	7	3	7	4	8
289017704	426006SL03	525	206	2	2	15	15	17	17	19	19
289017705	426006SL04	525	217	2	2	15	15	17	17	19	19
289017713	426029SL06	300	13	0	0	3	3	4	4	4	4
289017744	426130SL07	375	51	0	0	4	4	5	5	5	5
289018461	426029SL01	300	10	0	0	0	0	0	0	0	0

1. Uncertain maximum theoretical flow due to uncertain invert GIS (text in grey)

Table 5: Downtown East Theoretical and Modelled Flows

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289007425	426151SL02	600	298	13	320	183	349	211	354	230	359
289007426	426150SL02	600	231	13	307	175	336	202	343	223	346
289007427	426059SL03	600	195	13	299	169	329	195	335	215	340
289007466	426152SL04	600	418	14	326	185	353	215	359	233	363
289007481	426058SL03	600	193	11	289	155	292	179	292	198	292
289007482	426057SL01	600	152	11	279	143	281	165	281	182	281
289007483	426056SL01	600	247	10	273	129	275	148	274	164	274
289007485	426055SL04	600	338	9	256	115	259	131	259	145	259
289007649	426193SL14	300	15	0	5	5	10	6	10	7	11
289007650	426193SL02	300	93	0	4	4	8	5	8	5	9
289007652	436103SL02	300	80	0	2	2	4	2	4	2	4
289007653	436104SL01	300	68	1	8	20	28	24	31	27	34
289007654	426194SL01	300	84	1	9	21	29	25	33	28	36
289008331	436113SL01	300	68	0	1	0	1	1	1	1	2
289008401	436025SL02	300	36	0	0	1	1	1	1	1	1
289008402	436026SL01	300	32	0	0	4	4	5	5	5	5
289008403	436027SL01	300	54	0	0	7	7	8	8	9	9
289008406	436006SL01	300	66	0	0	4	4	5	5	5	5
289008407	436007SL01	300	66	0	0	6	6	7	7	8	8
289008408	436007SL02	375	67	0	0	8	8	9	9	10	10
289008409	436008SL01	375	76	0	0	10	10	12	12	13	13
289008410	436009SL01	450	138	0	0	12	12	14	14	16	16
289008411	436009SL02	450	151	1	1	14	14	16	16	18	18
289008412	436100SL01	450	95	1	1	17	17	20	20	22	22
289008414	436115SL02	300	62	1	7	18	24	21	27	23	30

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289008548	426055SL03	600	725	9	263	121	266	139	266	153	266
289008708	436027SL04	300	52	0	0	6	6	7	7	8	8
289008710	436028SL01	375	101	0	0	17	17	20	20	23	23
289008711	436029SL07	375	79	1	1	19	19	22	22	25	25
289008712	436029SL06	450	81	1	1	23	23	27	27	31	31
289008713	436120SL07	450	140	1	1	26	26	31	31	34	34
289008714	436120SL06	450	125	1	1	27	27	32	32	36	36
289008716	436121SL01	450	135	1	1	28	28	33	33	37	37
289008756	426152SL05	600	437	14	354	190	384	212	403	220	415
289008815	426058SL01	300	202	1	8	34	41	40	47	45	52
289008823	436122SL04	350	136	0	0	0	0	0	0	0	0
289008824	436122SL02	300	61	0	0	1	1	1	1	2	2
289008825	436113SL03	300	105	0	0	3	3	3	3	3	3
289008826	436102SL01	300	89	0	0	4	4	5	5	6	6
289008828	436102SL02	300	80	0	0	4	4	5	5	6	6
289008829	426192SL05	300	101	0	0	6	6	7	7	8	8
289008830	426192SL01	300	94	0	0	6	6	7	7	8	8
289008832	426192SL08	525	190	9	60	204	244	232	282	256	302
289008842	426195SL03	300	249	0	3	1	4	1	4	2	4
289008845	436107SL03	525	4,785	0	3	5	8	6	8	6	9
289008846	436116SL02	525	548	0	3	4	7	5	7	5	8
289008847	436116SL04	525	535	0	2	3	5	4	6	4	6
289008849	436115SL03	525	456	0	1	0	1	0	1	0	1
289008855	436121SL15	350	151	0	0	1	1	1	1	1	1
289008856	436123SL01	300	78	0	0	1	1	1	1	1	1
289009265	426086SL02	300	63	0	2	2	3	2	4	2	4
289009266	426086SL03	300	73	0	3	3	5	3	6	3	6

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289009267	426076SL02	300	77	0	4	3	7	4	7	4	8
289009268	426066SL01	375	133	1	7	6	12	7	13	8	14
289009269	426066SL02	375	139	1	8	7	14	8	15	8	16
289009421	436114SL02	300	66	0	4	12	15	14	17	15	19
289009422	436114SL03	300	385	0	1	1	2	2	3	2	3
289009471	436029SL01	300	47	0	0	4	4	4	4	5	5
289009519	426152SL06	600	272	14	336	186	356	220	360	235	366
289010110	426069SL02	375	174	1	6	33	38	38	44	43	48
289010113	426089SL02	375	134	0	2	15	16	17	19	19	21
289010114	426089SL01	375	126	0	1	8	9	10	11	11	12
289010116	426079SL02	375	128	0	3	19	22	22	25	25	27
289010223	426068SL01	300	85	1	7	34	41	40	46	45	51
289010229	426067SL01	300	83	0	3	33	35	38	41	42	45
289010230	426067SL02	375	115	0	4	37	40	43	46	48	51
289010470	426164SL05	600	419	15	376	200	411	216	433	226	446
289010774	426185SL05	750	741	15	392	397	387	423	388	376	386
289010777	426175SL07	750	1,696	15	383	374	423	389	445	422	459
289010778	426175SL08	600	713	15	382	394	422	397	444	392	459
289010824	426175SL01	600	568	15	380	242	421	266	443	353	458
289010825	426175SL02	600	726	15	380	243	420	262	442	261	457
289010827	426164SL01	600	90	15	379	196	416	206	436	227	450
289010828	426164SL02	600	381	15	377	198	415	210	435	227	450
289010829	426164SL03	600	407	15	376	197	413	209	433	227	448
289015805	426055SL02	600	250	9	264	122	266	140	266	154	266
289015843	426076SL03	375	178	0	5	3	8	4	8	4	9
289015952	426152SL03	600	292	15	366	196	401	217	421	224	436
289015956	426153SL01	600	292	15	368	197	403	217	423	223	436

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289015983	426163SL01	600	342	15	375	198	411	215	430	226	445
289015984	426163SL02	600	307	15	370	196	403	217	423	225	437
289016007	426172SL01	300	102	0	4	2	6	2	6	2	6
289016008	426172SL02	450	257	0	3	2	5	2	5	2	5
289016030	426183SL01	300	43	0	2	2	3	2	4	2	4
289016845	436101SL04	450	127	1	1	18	18	21	21	24	24
289016856	436114SL01	300	76	0	0	0	0	0	0	0	0
289016866	436124SL01	300	54	0	2	6	8	7	9	8	10
289017481	426191SL06	300	54	2	2	55	55	65	65	72	72
289017489	426193SL11	300	301	0	6	5	11	6	11	7	12
289017490	426194SL11	300	178	1	10	21	30	25	34	28	37
289017522	426191SL07	525	134	8	59	201	236	223	273	246	291
289017523	426190SL06	450	100	6	55	168	179	178	207	179	216
289017524	426099SL08	450	160	6	54	166	177	178	201	179	210
289017526	426098SL04	450	111	6	51	165	174	179	197	181	206
289017527	426097SL08	450	169	5	50	160	169	175	191	176	199
289017534	426195SL14	525	84	11	89	257	315	284	361	316	387
289017535	426194SL12	525	180	9	74	215	276	253	317	280	339
289017536	426193SL12	525	254	9	62	208	253	241	292	266	313
289017538	426195SL15	525	43	11	88	240	314	283	359	314	385
289017614	426095SL06	450	109	5	48	146	160	162	179	165	186
289017615	426096SL04	450	137	5	49	153	165	171	186	171	193
289017631	426191SL10	300	137	2	2	55	55	65	65	72	72
289017848	436122SL03	300	55	0	0	1	1	2	2	2	2
289018064	426099SL07	450	133	6	52	167	175	180	199	181	208
289018195	426175SL14	750	938	15	388	396	385	422	383	373	381
289018208	436121SL07	350	162	0	0	1	1	1	1	1	1

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289018209	436111SL05	300	68	1	1	34	34	40	40	45	45
289018210	436101SL09	450	1,235	1	1	18	18	21	21	24	24
289018211	436101SL10	300	113	2	2	53	53	62	62	70	70
289018212	436121SL10	450	358	1	1	30	30	36	36	40	40
289018213	436121SL12	300	79	0	0	2	2	3	3	3	3
289018217	436103SL04	300	85	0	3	4	7	4	7	5	8
289018277	436121SL18	300	162	0	0	2	2	3	3	3	3
289018342	426195SL20	525	952	11	90	1,011	1,154	1,106	1,205	1,173	1,257
289018343	426099SL10	375	153	0	0	0	0	0	0	0	0
289018449	426069SL03	375	136	1	5	33	37	38	43	43	47

1. Uncertain maximum theoretical flow due to uncertain invert GIS (text in grey)

Table 6: Health & Wellness Area Theoretical and Modelled Flows

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289007412	425937SL03	300	64	0	8	5	13	6	14	7	14
289007486	426054SL03	600	71	9	254	113	258	129	258	142	258
289007487	426053SL01	600	160	8	236	105	240	121	240	133	240
289007552	426051SL03	300	64	5	35	28	58	32	63	35	66
289007855	426030SL05	600	485	2	133	63	148	74	147	82	147
289007910	425924SL08	300	171	0	19	9	28	10	29	11	31
289007915	426092SL13	450	645	0	1	0	1	0	1	0	1
289007964	425926SL01	450	141	1	67	37	103	43	110	48	114
289007965	425925SL01	450	141	1	36	14	49	16	52	18	54
289007966	425936SL02	300	69	1	29	22	51	26	54	28	57
289007980	425938SL02	900	777	2	98	46	138	54	146	59	152
289008089	426030SL04	600	139	2	150	75	173	87	167	97	167
289008091	426030SL03	600	637	2	128	63	142	74	142	82	142
289008092	426030SL06	600	177	2	130	63	145	74	144	82	144
289008093	425939SL02	900	382	2	126	59	175	69	186	76	193
289008557	426052SL06	450	609	0	18	8	27	10	28	11	29
289008630	426030SL01	300	95	0	15	11	26	13	28	15	30
289008722	425949SL01	300	50	0	8	4	11	4	12	5	12
289008723	425939SL01	300	60	1	15	13	27	15	28	16	30
289008724	425958SL01	450	211	0	3	5	7	5	8	6	8
289008725	425947SL02	300	61	0	3	3	5	3	6	4	6
289008731	425938SL01	900	725	2	96	46	137	54	145	60	152
289008733	425956SL01	300	25	0	9	6	15	7	16	8	16
289008734	425946SL01	300	38	0	16	14	30	16	34	18	35
289008772	426040SL01	300	68	0	13	11	24	13	25	14	27
289008976	425924SL03	375	120	0	11	1	12	1	12	1	12

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289008977	425933SL01	900	523	0	0	0	0	0	0	0	0
289008978	425931SL01	900	1,306	0	0	0	0	0	0	0	0
289008979	425933SL02	375	75	0	11	1	12	1	12	1	12
289008980	425932SL02	900	661	0	0	0	0	0	0	0	0
289008981	425932SL03	375	176	0	11	0	12	0	12	1	12
289008982	425931SL02	375	98	0	0	0	0	0	0	0	0
289009911	436032SL03	300	71	0	0	10	10	12	12	13	13
289009963	426094SL04	300	50	1	1	18	18	21	21	23	23
289009964	436004SL01	300	50	1	1	17	17	20	20	22	22
289009966	425939SL03	300	43	1	18	13	30	15	31	16	33
289009967	425938SL04	600	389	0	5	1	8	2	8	2	8
289009968	425927SL02	900	373	1	75	39	113	46	120	50	124
289009969	425927SL03	450	228	1	72	38	110	45	116	49	121
289009970	425926SL02	450	159	1	69	38	107	44	115	49	119
289009982	436021SL01	375	114	0	0	6	6	7	7	8	8
289009983	436022SL03	375	74	0	0	11	11	13	13	15	15
289009984	436022SL04	375	119	1	1	25	25	29	29	32	32
289009993	436014SL04	300	67	0	0	9	9	11	11	12	12
289009994	436014SL02	300	31	0	0	7	7	9	9	10	10
289010004	425938SL03	900	579	2	106	47	146	55	154	61	159
289010005	425927SL01	900	1,850	1	86	42	123	48	132	53	137
289010424	426082SL02	450	190	0	8	3	12	4	12	4	13
289010425	426082SL01	450	202	0	6	1	7	1	7	2	7
289010426	426092SL01	450	220	0	3	0	4	0	4	0	4
289010428	426091SL02	450	112	0	8	5	13	6	14	7	21
289010447	436013SL01	375	68	1	1	28	28	33	33	37	37
289010451	436002SL01	375	70	1	1	34	34	41	41	45	45
289010541	426081SL01	375	69	0	5	5	10	5	10	6	14

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289010542	426071SL01	300	48	0	3	2	5	3	5	3	7
289010555	426051SL01	300	187	5	25	26	47	30	51	33	54
289010564	426062SL02	450	203	0	16	7	23	9	24	10	25
289010565	426062SL01	450	211	0	13	7	20	8	21	9	22
289010566	426072SL01	450	238	0	11	5	16	6	17	7	18
289010792		900	651	0	8	4	76	5	115	5	145
289015682	425924SL02	900	183	0	11	3	14	3	14	3	15
289015684	425924SL05	450	189	0	11	3	14	3	14	4	15
289015737	425958SL03	300	60	5	18	22	35	25	38	27	40
289015740	425959SL02	300	55	5	20	25	40	28	45	31	47
289015772		900	458	0	3	0	74	0	106	0	131
289015777		900	392	0	5	0	76	0	105	0	133
289015789	426050SL02	300	46	5	23	26	44	30	48	33	51
289015796	426052SL03	600	164	8	215	97	218	111	218	122	218
289015865	426091SL01	450	581	0	10	6	16	7	20	8	28
289017604	435919SL03	300	69	1	1	28	28	33	33	36	36
289017605	436010SL04	300	61	1	1	29	29	33	33	37	37
289017606	436010SL05	300	54	1	1	33	33	38	38	42	42
289017607	436000SL07	300	56	1	1	33	33	39	39	43	44
289017608	426090SL03	450	136	2	14	58	70	67	80	76	87
289017609	426090SL05	300	48	1	10	24	35	28	39	34	42
289017610	426091SL08	450	119	2	22	65	76	76	86	83	97
289017611	426094SL07	450	113	5	48	137	151	156	170	160	177
289017612	426092SL10	450	181	3	39	83	99	99	110	105	115
289017613	426093SL06	450	87	4	44	118	134	136	151	139	156
289017616	426091SL09	450	582	0	13	17	26	23	26	27	31
289017618	426092SL11	450	522	1	1	34	34	45	45	46	46
289017620	426092SL12	450	1,344	0	2	0	2	0	2	0	2

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289017621	426094SL08	300	158	1	1	18	18	21	21	24	24
289017721	426090SL01	300	76	0	3	4	6	5	7	5	7
289018105	426092SL02	450	29	1	1	34	34	77	77	85	85
289018194	425924SL04	450	648	0	14	3	17	3	17	4	17
289018215	436022SL08	300	75	0	0	12	12	14	14	16	16
289018216	436032SL07	300	92	0	0	9	9	11	11	12	12
289018223	435909SL06	300	51	1	8	24	31	28	36	31	39
289018293	425923SL02	900	515	0	0	0	0	0	0	0	0
289018299	436014SL05	300	66	0	0	9	9	11	11	12	12
289018399		300	43	0	10	7	18	9	19	10	20
289018400	426040SL02	300	37	0	5	2	7	2	7	2	7
289018401		300	60	1	1	16	16	19	19	21	21
289018402	436014SL03	300	60	0	0	10	10	11	11	12	12
289018415		600	198	2	165	73	168	84	168	92	168
289018416	426042SL01	600	342	3	178	75	180	86	180	94	180
289018537	425923SL04	900	1,224	0	11	1	13	2	13	2	13
289018668	435929SL08	300	60	1	1	28	28	32	32	36	36
289018669	435929SL09	300	49	1	1	19	19	23	23	25	25
289018670	435939SL06	300	49	0	0	10	10	12	12	13	13
426031SL03	426031SL03	600	220	2	153	75	177	87	175	97	170
426041SL05	426041SL05	600	208	2	155	75	179	87	174	97	173
426042SL07	426042SL07	600	195	2	163	73	165	83	166	92	166

1. Uncertain maximum theoretical flow due to uncertain invert GIS (text in grey)

Table 7: East Main Street Area Theoretical and Modelled Flows

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
19002264	446159SL02	1650	4,615	89	140	759	834	817	834	933	842
19002265		1650	4,861	89	113	738	752	749	768	760	778
19002266		1650	5,296	89	111	734	748	748	764	758	774
19002267	446166SL10	1650	4,324	89	105	733	740	747	756	757	766
289007536	446116SL01	300	63	0	4	13	17	15	19	17	21
289007537	446127SL02	300	57	0	4	11	16	13	18	15	19
289007581	446106SL01	300	61	0	4	12	16	14	18	16	20
289007586	436175SL01	375	115	1	6	23	28	27	32	30	35
289007656	436156SL01	300	81	0	5	2	7	2	7	2	7
289008286	446126SL01	750	523	1	15	109	120	126	136	138	148
289008302	436186SL02	300	201	0	5	5	10	6	11	6	11
289008306	436186SL04	750	274	5	54	498	539	569	599	602	624
289008309	436186SL01	450	180	2	18	31	47	37	53	42	58
289008310	436165SL01	500	160	2	28	60	85	71	96	80	105
289008870	436145SL02	800	595	6	15	247	255	288	297	320	329
289008885	436165SL03	500	242	2	33	63	93	74	104	83	113
289008897	436145SL03	900	1,197	9	94	365	444	427	506	475	554
289008898	436145SL04	900	303	9	91	365	439	426	501	475	550
289008899	436155SL02	600	1,348	4	70	118	181	138	202	154	218
289008900	436155SL03	600	248	4	65	128	196	151	213	170	239
289010348	436144SL05	800	635	5	10	241	246	282	286	313	318
289010378	436165SL07	600	326	3	55	114	163	134	183	149	198
289010379	436165SL06	375	95	1	16	49	63	57	72	64	78
289016946	436185SL01	300	81	1	9	23	31	27	35	30	38
289016948	436185SL04	450	351	1	7	22	28	27	33	30	37
289016967	436195SL01	750	334	4	37	464	489	529	545	557	564

Sewer ID	City ID	Diameter (mm)	Theoretical Max Flow (L/s)	DWF Design Storm		2-Year Design Storm		5-Year Design Storm		10-Year Design Storm	
				Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)	Existing Flow (L/s)	Post-Dev Flow (L/s)
289017268	446106SL02	750	462	1	25	202	219	225	233	237	241
289017270	446106SL04	750	1,420	4	33	462	481	525	535	550	555
289017288	446116SL02	750	707	1	20	166	181	192	203	204	212
289017302	446126SL02	750	395	1	15	115	126	133	142	142	147
289017881	436186SL05	750	358	4	49	496	535	568	593	600	617

1. Uncertain maximum theoretical flow due to uncertain invert GIS (text in grey)

Appendix B

Water Hydraulic Modelling
Analysis by AE

Issue Date:	August 8, 2025	Reference/Project No.:	2025-5893
To:	Kelly Walsh, C.E.T.	Previous Issue Date:	
From:	Associated Engineering (Ont.) Ltd.		
Client:	City of Welland		
Project Name:	City of Welland - Modelling Assignments 2025		
Subject:	Water Modelling - CIP, City of Welland (Assignment-009)		

1 INTRODUCTION

Associated Engineering (AE) was retained by the City of Welland (the City) to conduct hydraulic assessments on their behalf for 2025 development applications. This assignment is referred to as Assignment-009. The scope of this assignment includes incorporating the water demands calculated by J.L. Richards & Associates for the identified Community Improvement Plan (CIP) areas and running the updated model. Specifically, the following water model outputs were requested:

- A map of maximum system pressures under future Average Day Demand (ADD)
- A map of minimum system pressures under future Maximum Day Demand (MDD)
- A map of available fire flows under future MDD + Fire Flow conditions
- A map of minimum system pressures under MDD + Fire Flow conditions
- Existing and future peak demand at the booster and high lift pumping stations

The CIP boundary map, prepared by J.L. Richards, is included in Appendix A.

The CIP includes four designated areas as follows:

1. Health and Wellness Cluster – Bounded by Ontario Road to the south, Lincoln Street to the north, Plymouth Road to the east, and the Welland Canal to the west.
2. King Street Area – Bounded by Lincoln Street to the south, Regent Street to the north, Hellems Avenue to the east, and the Welland Canal to the west.
3. Downtown East Area – Encompasses lands along East Main Street extending to Highway 406, including adjacent areas to the north and south of East Main Street, bounded to the west by the Welland Canal.
4. Downtown West Area – Located west of the Welland Canal, between the Welland River to the north and Hooker Street to the south.

2 BACKGROUND AND MODEL SET UP

2.1 Existing Distribution System and Model

The City's water distribution system receives potable water from the Regional Municipality of Niagara (the Region). The system includes the Welland Water Treatment Plant (WTP), Shoalts Reservoir, Bemis Elevated Tank, and Hunter's Pointe Booster Pumping Station (BPS). The majority of the City's distribution network, is part of a single pressure zone, with system pressures regulated by the water level in the Bemis Tank, which has a maximum hydraulic grade line (HGL) of 219.1 m. A small portion of the City, located at higher elevations, receives boosted water via the Hunter's Pointe BPS.

Memo To: Kelly Walsh, City of Welland
August 08, 2025
Page 2

Additionally, the Welland distribution system extends beyond the City limits, providing water to the Town of Pelham (through the Shoalt's Pumping Station) and portions of Thorold (via the Hansler Road and Port Robinson West watermain connections).

The City's hydraulic model is maintained as an InfoWater all-pipe model for the water distribution system. AE updated the City's model prior to these assignments. The same model used for 744 First Avenue (Assignment-008) has been applied to this assignment and includes all previous modelling assignments up to Assignment-008.

The City's InfoWater model includes both existing and future (interim and full buildout) average day and maximum day extended period simulation (EPS) scenarios. The future scenario model has been used to conduct the hydraulic analysis for the subject site.

2.2 Water Demand

The estimated water demands were calculated by J.L. Richards and provided in an email dated May 21, 2025. These demands were distributed among selected and random junctions within each CIP area. As noted, the demands provided by J.L. Richards are high-level estimates and were not verified or compared against the City's design criteria as part of this assignment. The assigned demands are summarized in Table 2-1 below.

Table 2-1 Projected Future Demands (Source: J.L. Richards) and Node Allocation

CIP Area	Land Use		Water Demand						Allocated Demand Nodes
	Land Use	Area (ha)	ADD (m3/d)	MDD (m3/d)	ADD (m3/d)	MDD (m3/d)	ADD (L/S)	MDD (L/S)	Junction ID
Downtown West	Downtown	3.85	621	925	1,373	2,045	7.19	10.71	J 1665
	High Density Residential	3.86	586	873			6.78	10.10	J 1826
	Institutional	0.28	48	72			0.56	0.83	J 1896
	Low Density Residential	5.18	118	176			1.37	2.04	J 1662
Downtown East	Community Commercial Corridor	0.79	135	201	4,240	6,318	1.56	2.33	J 2269
	Downtown	18.87	3045	4538			35.24	52.52	J 2257

Memo To: Kelly Walsh, City of Welland

August 08, 2025

Page 3

CIP Area	Land Use		Water Demand						Allocated Demand Nodes
	General Industrial	0.02	4	5			0.05	0.06	J 2613
	High Density Residential	0.99	151	225			1.75	2.60	J 2847
	High Density Residential-SPA	0.37	56	84			0.65	0.97	J 6133
	Institutional	0.87	149	222			1.72	2.57	J 6140
	Light Industrial	0	0	0			0.00	0.00	-
	Low Density Residential	12.5	285	424			3.30	4.91	J 3186
	Low Residential	0.01	0	0			0.00	0.00	-
	Medium Density Residential	3.01	131	195			1.52	2.26	J 3634
	Mixed-Use Commercial	3.51	284	423			3.29	4.90	J 6151
Health and Wellness	Health and Wellness Cluster	57.88	9343	13922	9,387	13,986	108.14	161.13	J 2082
	Health and Wellness Cluster-SPA	0.12	20	30			0.23	0.35	J 2072
	Institutional	0.14	23	35			0.27	0.41	J 2085

Memo To: Kelly Walsh, City of Welland
August 08, 2025
Page 4

CIP Area	Land Use	Water Demand							Allocated Demand Nodes
King Street	Community Commercial Corridor	19.37	3310	4932	4,117	6,135	38.31	57.08	J 2213
	Institutional	3.99	681	1015			7.88	11.75	J 2217
	Low Density Residential	0	0	0			0.00	0.00	-
	Medium Density Residential	2.9	126	187			1.46	2.16	J 2220
Total		138.5	19117	19,117	28,484	28,484	221.25	329.68	-

3 HYDRAULIC ANALYSIS

3.1 Normal Condition Results

3.1.1 Average Day

To simulate system conditions under ADD, a total of 221.25 L/s was allocated to the junctions listed in Table 2-1. The results, showing maximum pressures using colour coding, are provided in Appendix B.

3.1.2 Maximum Day

To simulate system conditions under MDD, a total of 329.28 L/s was allocated to the junctions listed in Table 2-1. The results, showing minimum pressures using colour coding, are provided in Appendix C.

3.2 Fire Flow

The available fire flows represent the maximum available flow under MDD conditions, while maintaining a residual pressure of 140 kPa (20 psi) at the flowing hydrant node and meeting the City's maximum allowable pipe velocity of 3.5 m/s.

All junctions within the CIP area were included in the fire flow analysis to represent hydrant locations under MDD conditions. In the model, all existing hydrants were placed on short hydrant leads, which often act like dead-ends and result in lower available fire flows. To avoid this limitation, all junctions were used to represent hydrants directly connected to the watermain, providing a more accurate representation of available fire flow. The locations that still show available

Memo To: Kelly Walsh, City of Welland

August 08, 2025

Page 5

flows below 67 L/s are mainly those existing hydrants located on leads, where lower fire flow values are expected. The results for available fire flow are included in Appendix D.

In Appendix E, the same fire flow run was used, but the results show residual pressures during fire flow conditions.

3.3 Peak Demand at Pumping Stations

As requested, the model was reviewed to determine the existing and future peak demand at the booster and high lift pumping stations. At the Water Treatment Plant (WTP), the maximum flow in the pipe immediately downstream of the pumps was checked under MDD conditions, both before and after adding the CIP demands. In both cases, the maximum flow remained at 1291 L/s. It should be noted that the model may not be configured to allow the WTP to exceed 1291 L/s, and the actual plant capacity is more complex than what a model run can represent. As a result, the model may not be the most reliable source for determining future peak demands at pumping stations.

Prepared by:

P.Hadipour Aug 08, 2025

Pegah Hadipour, P.Eng.
Civil Infrastructure Engineer

Reviewed by:



Andrea LaPlante, P.Eng.
Manager, Civil Infrastructure



[PH/AL]

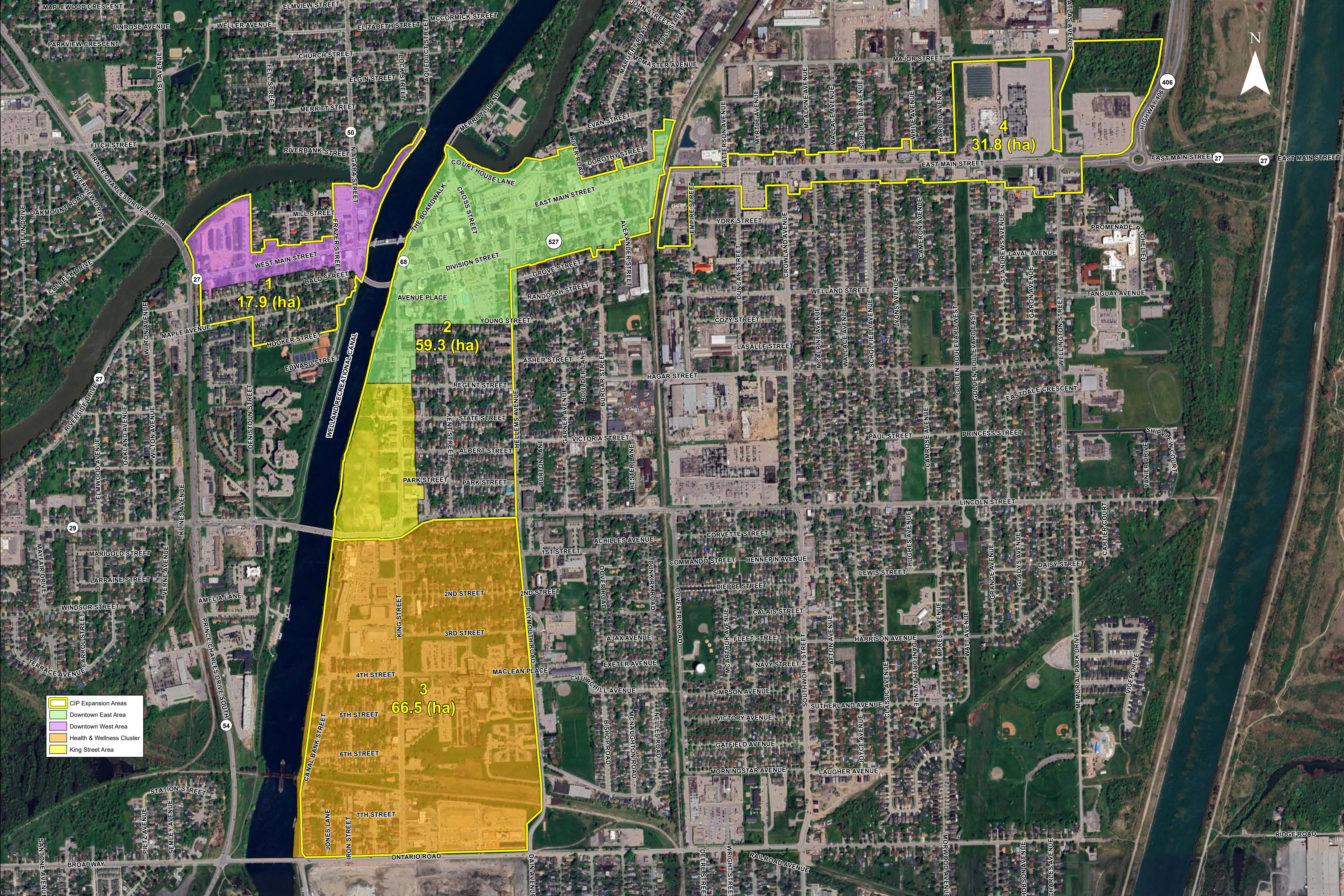
Attachment: Appendix A – CIP Area Boundaries Map (provided by J.L. Richards)

Attachment: Appendix B – Maximum Pressure Map under ADD Conditions

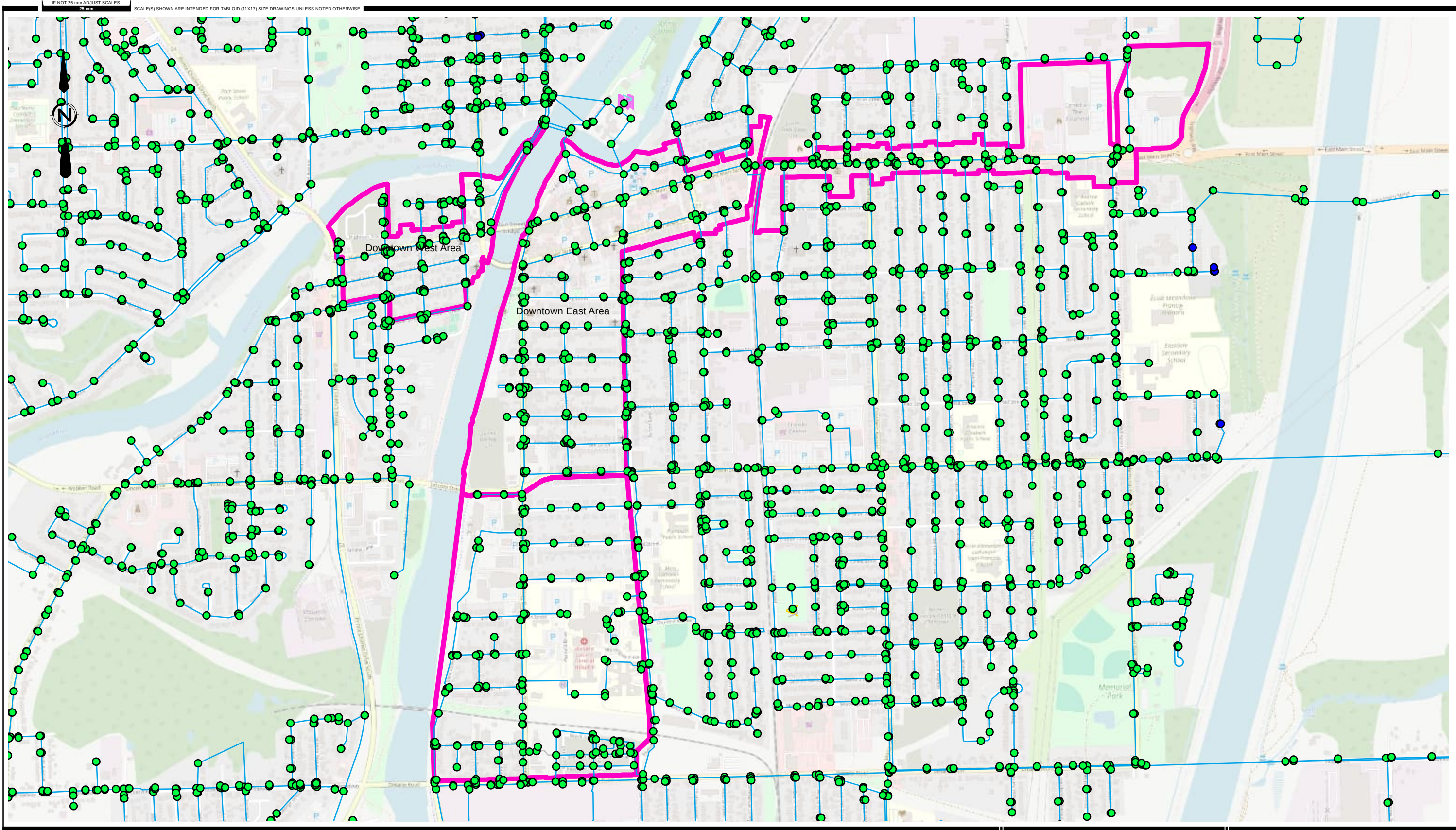
Attachment: Appendix C – Minimum Pressure Map under MDD Conditions

Attachment: Appendix D – Available Fire Flow Map under MDD + Fire Flow Conditions

Attachment: Appendix E – Residual Pressure Map under MDD + Fire Flow Conditions



- CIP Expansion Areas
- Downtown East Area
- Downtown West Area
- Health & Wellness Cluster
- King Street Area



SAVE DATE: 2025-08-05 10:27:45 AM SAVED BY:
DRAWING PATH: C:\Users\Wland\OneDrive\Wland\SP Updated model_2025\08-05\Welland_water_jas09.mxd
DATA SOURCE: © OpenStreetMap (and) contributors, CC-BY-SA



Maximum Pressure (kPa)

- < 275 kPa
- 275 - 350 kPa
- 350 - 550 kPa
- 550 - 700 kPa
- > 700 kPa



CIP Boundary

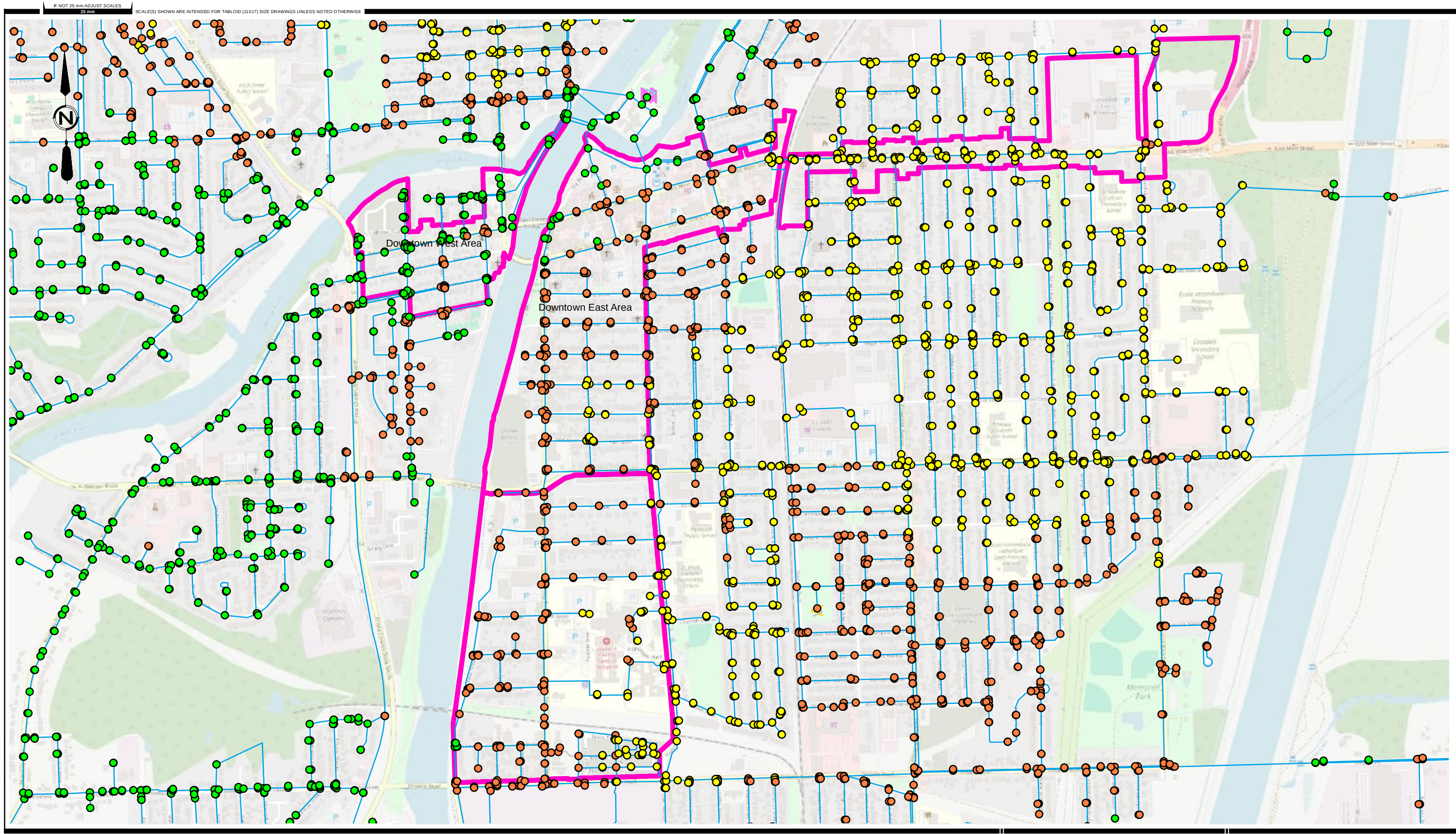
AE PROJECT No.	2025-5893-00
SCALE	NOT TO SCALE
APPROVED	PH
DATE	2025AUG05
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE 1-1

CITY OF WELLAND
COMMUNITY IMOROVEMENT PLAN

CIVIL
WATER MODELLING - CIP
MAXIMUM PRESSURE (kPa)
AVERAGE DAY DEMAND (ADD)

SAVE DATE: 2025-08-05 12:15:35 PM, SAVED BY:
DRAWING PATH: C:\Users\blawen\Desktop\WSP_Updated model_2025\GIP\2025-08-05\Welland_water_gis09.mxd
DATA SOURCE: © OpenStreetMap (and) contributors, CC-BY-SA



Maximum Pressure (kPa)

- < 140 kPa
- 140 - 240 kPa
- 240 - 275 kPa
- 275 - 350 kPa
- 350 - 550 kPa
- > 700 kPa



CIP Boundary

*Note: Minimum Pressure in MDD scenario occurs at 4:00 am when pumps are off

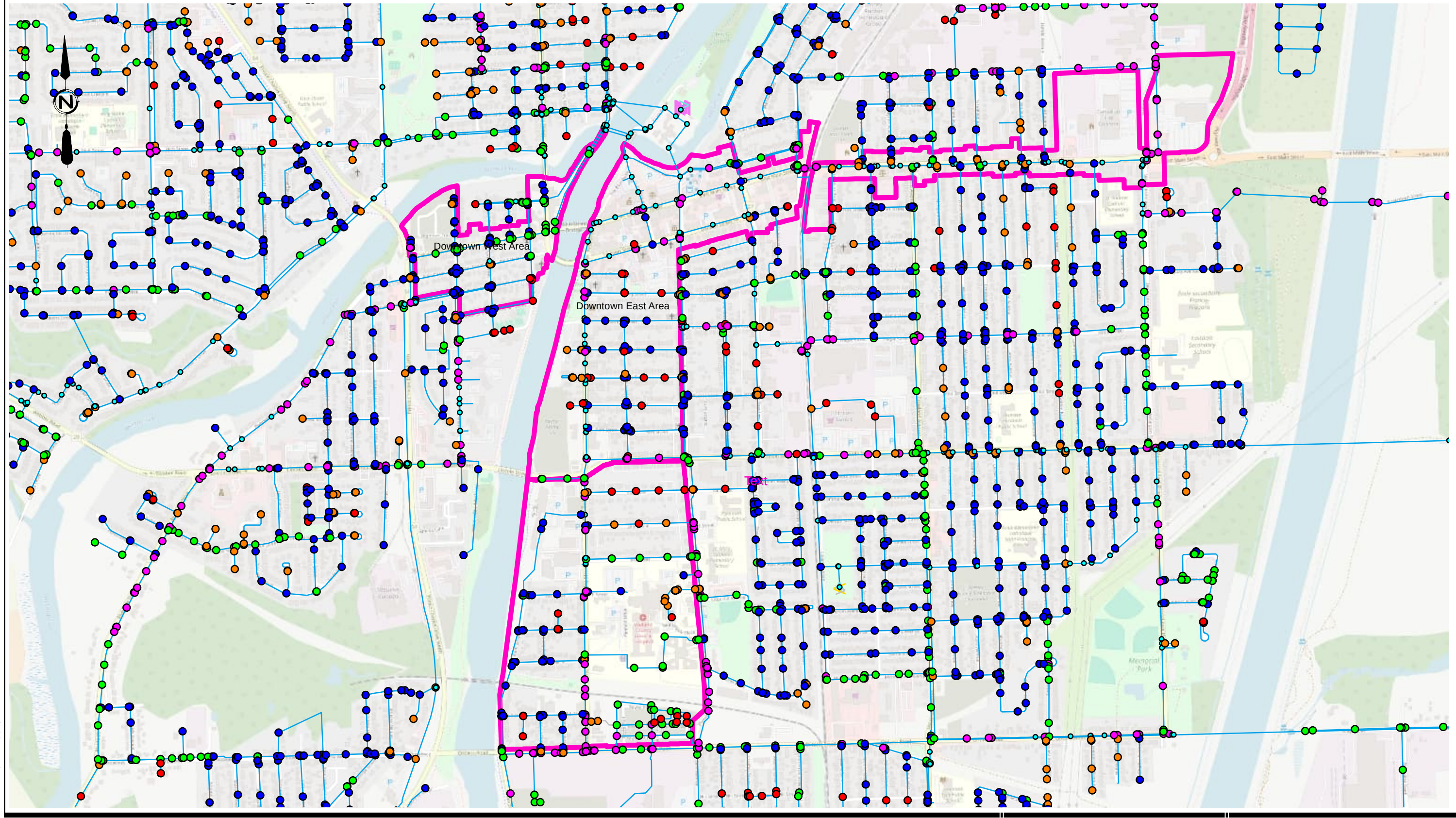
AE PROJECT No.	2025-5893-00
SCALE	NOT TO SCALE
APPROVED	PH
DATE	2025AUG05
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE 1-2
CITY OF WELLAND
COMMUNITY IMOROVEMENT PLAN
CIVIL
WATER MODELLING - CIP
MINIMUM PRESSURE (KPA)
MAXIMUM DAY DEMAND SCENARIO (MDD)

SAVE DATE: 2025-08-05 11:42:39 AM SAVED BY:
DRAWING PATH: C:\Users\mwanan\Desktop\CIP_Updated model_2025\08-05\Welland_water_jas09.mxd
DATA SOURCE: © OpenStreetMap (and) contributors, CC-BY-SA,

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



Available Fire Flow (L/s)

- < 60 L/s
- 60 - 67 L/s
- 67 - 133 L/s
- 133 - 225 L/s
- 225 - 300 L/s
- > 300 L/s



CIP Boundary

*Note: Available fire flow was shown at all junctions

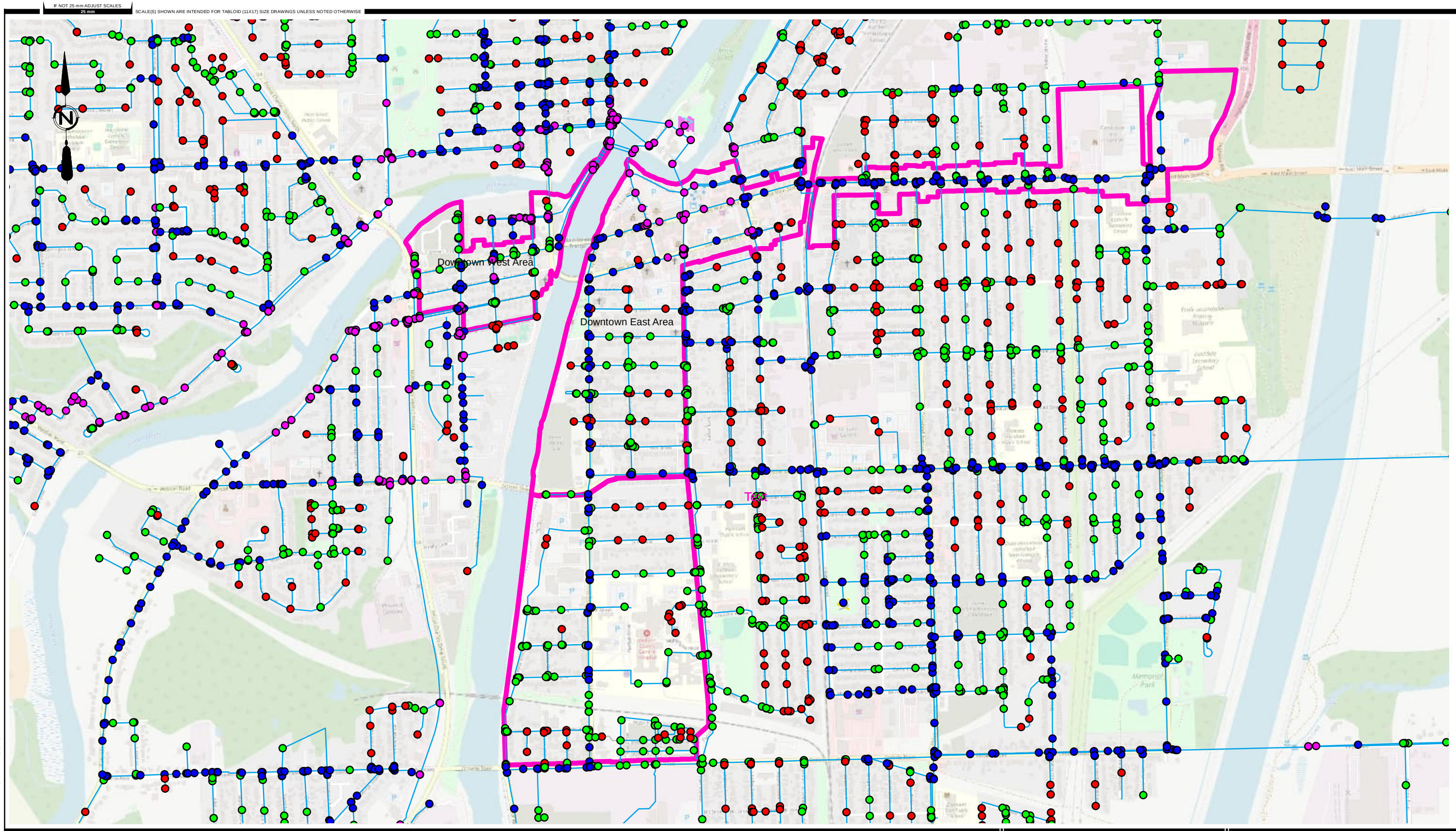
AE PROJECT No.	2025-5893-00
SCALE	NOT TO SCALE
APPROVED	PH
DATE	2025AUG05
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE 1-3
CITY OF WELLAND
COMMUNITY IMOROVEMENT PLAN

CIVIL
WATER MODELLING - CIP
AVAILABLE FIRE FLOW
MAXIMUM DAY DEMAND+FIRE FLOW



SAVE DATE: 2025-08-05 11:48:13 AM SAVED BY:
DRAWING PATH: C:\Users\jwheeler\Desktop\WSP_Updated model_2025\08-05\Welland_water_jas09.mxd
DATA SOURCE: © OpenStreetMap (and) contributors, CC-BY-SA,



Residual Pressure (kPa)

- < 140 kPa
- 140 - 275 kPa
- 275 - 300 kPa
- 350 - 550 kPa
- > 700 kPa



CIP Boundary

*Note: Residual Pressure was shown at all junctions

AE PROJECT No.	2025-5893-00
SCALE	NOT TO SCALE
APPROVED	PH
DATE	2025AUG05
REV	
DESCRIPTION	ISSUED FOR REPORT

FIGURE 1-4
CITY OF WELLAND COMMUNITY IMOROVEMENT PLAN
CIVIL WATER MODELLING - CIP RESIDUAL PRESSURE (kPa) MAXIMUM DAY DEMAND+FIRE FLOW