TO:	**CHAIR AND MEMBERS** **STRATEGIC PRIORITIES AND POLICY COMMITTEE** **JANAURY 29, 2018**
FROM:	**GEORGE KOTSIFAS** **MANAGING DIRECTOR, DEVELOPMENT AND COMPLIANCE SERVICES AND CHIEF BUILDING OFFICIAL**
SUBJECT:	**DEVELOPMENT CHARGES:** **CORE AREA SERVICING STUDIES**

RECOMMENDATION

That, on the recommendation of the Managing Director, Development and Compliance Services and Chief Building Official, the following actions be taken with respect to the financing of growth-related infrastructure works for infill and intensification:

a) the Core Area Servicing Studies for water, wastewater, and stormwater services contained in the attached respective Executive Summaries (Appendix 'A'), and as further described in this report, **BE ENDORSED** to inform the funding of growth-related infrastructure projects to support infill and intensification development; it being noted that the projects identified in the Core Area Servicing Studies will be refined through the 2019 Development Charges Background Study and included in the relevant Multi-year Capital Budget Updates;

b) the attached Local Servicing Policy (Appendix 'C') **BE ENDORSED** as the funding approach for infill and intensification projects identified in the 2014 Development Charges Background Study and **BE REVIEWED** for inclusion in the 2019 Development Charge Background Study;

c) the Civic Administration **BE AUTHORIZED** to undertake all administrative acts necessary to integrate the funding policies outlined in the Core Area Servicing Studies for infrastructure improvements required to service infill and intensification developments.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

June 8, 2016	"Appointment of Consulting Engineers for the Core Area Servicing Studies; RFPS 16-14, 16-15, 16-16 (Irregular)", Civic Works Committee
January 28, 2016	"Initiation Report: Core Area Servicing Studies", Civic Works Committee
January 28, 2016	"Downtown Infrastructure Planning and Coordination," Strategic Priorities and Policy Committee
June 23, 2014	"Approval of 2014 Development Charges By-law and DC Background Study," Strategic Priorities and Policy Committee
August 27, 2012	"Master Servicing and 2014 Development Charge Studies Consultant Appointment," Strategic Priorities and Policy Committee.

April 30, 2012 "Initiation Report 2014 Development Charges Background Study and DC By-law Update," Strategic Priorities and Policy Committee

PURPOSE OF REPORT

In 2016, Council awarded three engineering assignments for the completion of the Core Area Servicing Studies (CASS). These studies reviewed potential ultimate servicing needs for water, wastewater and stormwater systems and proposed an approach to fund the network expansions for infill and intensification developments in the City's Downtown and surrounding areas. The three studies model potential ultimate build-out scenarios and anticipate growth throughout the CASS to apportion costs between growth and non-growth funding sources (i.e., development charges or tax/water and sewer rates). Due to the unpredictability of infill development, locations can be difficult to pinpoint and the CASS recommends a funding approach based on a theoretical growth scenario. The identification of Development Charges (DC)-eligible projects will be refined through the completion of the 2019 DC Background Study (DCBS), which will align the needs identified in the CASS with other core area works.

2015 – 2019 STRATEGIC PLAN

The 2015 – 2019 Strategic Plan identifies this objective under Building a Sustainable City: 5B – Responsible Growth by building new infrastructure as London grows in accordance with the Growth Management Implementation Strategy.

BACKGROUND

Bill 73, Smart Growth for Our Communities Act, 2015

On December 3, 2015, the Ontario Ministry of Municipal Affairs and Housing passed Bill 73, the *Smart Growth for Our Communities Act*. According to the Ministry, the intent of Bill 73 is to give Ontario's residents a greater say in how their communities grow, provide municipalities with more opportunities to fund growth-related infrastructure and community services, give municipalities more independence to make local decisions and make it easier to resolve disputes. A number of the amendments have a potential impact on infill and intensification growth works including:

- Requiring municipalities to better integrate how development charges fit with long-term planning;
- Creating clearer reporting requirements for the collection and use of money paid by developers for higher and denser developments, as well as for parkland;
- Helping municipalities identify and share their best practices on using development charges to address local planning and financial objectives; and,

Additionally, Bill 73 proposed changes under Section 2 of the Planning Act, in that decision-makers must have regard for matters of provincial interest, including the protection of ecological systems and agricultural resources, the supply, efficient use and conservation of energy and water, and the protection of public health and safety. Bill 73 adds the promotion of built form that is "well-designed, encourages a sense of place, and provides for public spaces that are of high quality, safe, accessible, attractive and vibrant" to this list of matters of provincial interest. This essentially is "Smart Growth" or intensification.

Context: London Plan and 45% Infill Target

The London Plan provides for a City Structure and growth framework intended to

encourage 45% or more of future unit construction to the built area of the City. A large portion of the unit growth is anticipated to occur in the Downtown, at the Rapid Transit Villages and along the Rapid Transit Corridors. Over time, significant development and re-development of vacant and underutilized sites in these areas will place increased demand on the City's existing finite capacity of water, sanitary and stormwater infrastructure. Ensuring we meet London's vision requires a comprehensive approach to future growth infrastructure so that the City is capable of meeting the needs of new development, and providing appropriate funding according to our "growth pays for growth" policies.

Presently, City Staff is tracking over 3500 units proposed for construction in the Downtown and Old East Village areas. This large amount of growth is anticipated to be constructed over a decade or more and is well beyond what the City has experienced in previous years. Since the inception of the Downtown and Old East Village DC exemptions/DC grants in the late 1990s, over 1100 units have been constructed in these areas using "free" capacity within the water, sanitary and stormwater systems. However, continued growth in the Downtown and Old East areas presents servicing challenges.

When the City's Development Charges (DC) Background Study master plan consultants reviewed growth infrastructure needs for the 20 year period of 2014-2033, the primary focus of their analysis was Greenfield growth. In recent years, an increasing number of residential development projects primarily located in the Core Area of the City has triggered the need to confirm this capacity and to determine whether the reconstruction of major works is required to accommodate future growth. Due to the unpredictability of intensification developments, identifying servicing needs can be difficult to pinpoint.

CASS FUNDING OBJECTIVES AND CONSTRAINTS

Objectives:

Throughout the study, the consultants were asked to factor in a series of high level objectives:

1. Ensure that DCs, tax and ratepayer revenues, and developers in the core area pay appropriate shares of the cost of infrastructure capacity enhancement and replacement.

2. Find a proactive approach to assess core area infrastructure needs that can be applied to the three services studied: Water, Wastewater, and Stormwater.

3. Use existing DC policies and procedures wherever possible to develop an infill and intensification program within the estimated budgets identified in the 2014 DC Study.

4. Incorporate new DC Act requirements.

5. Don't over-complicate.

Constraints:

<u>Infill and Intensification Locations Are Difficult to Anticipate</u>

Council's City-wide targets for growth anticipate that 45% of intensification will occur within the Built Area and that 75% of the 45% will be within the Primary Transit Area (PTA). With precise locations for infill and intensification growth difficult to anticipate, the funding framework requires an ability to respond to development applications in different locations throughout the core area.

Mutual Benefit

Throughout the review of the core area works, it is recognized that some of the infrastructure is in poor condition and must be replaced to maintain a consistent level of service. However, through the replacement, there may be a need and an opportunity to oversize the pipe to accommodate future growth; therefore the funding approach uses a scale that assigns benefit equally to both growth and non-growth.

2014 Development Charge Background Study Growth Information

The CASS review was started in mid-2016 and therefore, updated 2019 DC growth information were not available. The consultants used the same assumptions as the 2014 DC Study to generate growth and servicing models.

Complexity and Cost of Construction in the Core

The City has an interest in ensuring that infrastructure projects (large and small) are managed to reduce the social cost of construction. In the case of core area works, the potential impact to commuters and businesses is a major consideration in understanding the scope of a particular project. As part of the CASS policy, it is intended that the City will undertake most of the major pipe replacement projects and will look to coordinate growth related works with major capital investments, such as Rapid Transit. Local servicing works such as sanitary or water service tie-ins will lead to some smaller scale construction projects. Depending on the scope and location, City-staff may allow the developer to undertake work in the right-of-way and will reflect the delivery method in the Development Agreements.

Further, the 2014 DC Study project costs are generally focused on the Greenfield areas outside of the Built Area Boundary that typically have a less constrained ROW. When these project costs were compared against recent City-led construction projects and industry best-practices, 30% more project cost for works Downtown are reasonable to expect. These costs account for more direct business liaison, additional public communication, sub-surface utility engineering, trench shoring, increased temporary pedestrian and traffic movement needs, and other social or community focused concerns.

Recognizing the increased cost and complexity of these works, there are also advantages to undertaking one construction project that benefits growth and renews the service to current standards. The CASS studies took this into account and established a funding approach that can be included with the 2019 Development Charge Background Study to identify and coordinate growth projects with Capital Works in as many cases as possible.

FUNDING POLICY FRAMEWORK

Long-term planning for core area growth presents some challenges from a servicing and DC funding perspective. Due to the unpredictable nature of infill development, a key element of the policy is to ensure that the DC Reserve Funds have the ability to be responsive and foster opportunities for growth in the core. When reviewing a proposed infill development, the servicing constraints could be upstream or downstream of a particular site, which may not have been considered in the DCBS or the current Multi-

Year Capital Budget.

Ultimately, there are three different funding envelopes that are outlined in the CASS:

Funding Trigger	Explanation
Local Servicing	• Measureable area around development, i.e. one city block. • The developer is required to pay this cost. • Measurable cut-off by pipe size consistent with oversizing diameters identified in the City's Local Service Standards.
Planned Infrastructure Projects	• Projects identified by City as required for service renewal, Rapid Transit, Combined Sewer projects, etc. • Typically a large tax/rate based share of the cost. • Asset rating determines cost-sharing splits between DCs and water and sewer rates • DC's cover the cost to increase the pipe size to accommodate growth.
Servicing Constraints Caused by Growth	• Growth location is difficult to pinpoint. • Servicing constraint could be downstream or upstream of development. • Asset rating determines cost-sharing splits between DCs and water and sewer rates. • Oversizing portion of pipes to accommodate future growth is completely funded by DCs.

In conjunction with the CASS consultants and with feedback from the DC External Steering Committee, Staff developed a core area funding policy that draws on existing by-laws, growth management tools and development approval procedures. Staff has also made a strong link to the asset management and infrastructure rating work undertaken by the City's Corporate Asset Management (CAM) division where condition ratings for all of the pipes, maintenance holes, valves, etc. in the sanitary, storm and water systems are developed. The overall system ratings are reported to Council through the Infrastructure Report Card, which is an output of the detailed asset rating analysis used to inform our Infrastructure Lifecycle Replacement programs and PSAB (Public Sector Accounting Board).

For the CASS funding policy, City staff are recommending the use of condition ratings as a way to apportion costs based on the performance of existing infrastructure that could support intensification. The table below outlines the proposed funding splits between Growth (G) and non-Growth (nG):

G %	nG %	Pipe Condition Rating	Asset Definition
90	10	1	Very Good – Fit for Future
75	25	2	Good – Adequate for now
50	50	3	Fair – Requires attention
25	75	4	Poor – At risk
10	90	5	Very Poor – Unfit for sustained Service

When a development is proposed, part of the City's analysis will include an evaluation of the asset rating for the pipe fronting the new site as well as the upstream and downstream trunk services that would be impacted. A project scope and cost will be developed and the growth and benefit to existing (non-growth) funding splits will be generated using the asset rating of the pipes that the development is tying into. Where Capital Works projects are already planned in the core, Environmental and Engineering Services staff will build

capacity into projects by oversizing the new pipes for future growth.

This approach is consistent with the rules already outlined in the 2014 DC Bylaw and both staff and Development Industry members can make reasonable estimates of project costs for the individual developments as they occur. This funding policy also meets the objectives initially identified at the outset of the CASS:

CASS Objectives:	**Proposed CASS Policy Solution:**
1. Ensure that DCs, tax and ratepayer revenues, and developers in the core area pay appropriate shares of the cost of infrastructure replacement. This requires an assessment of the current condition and what is needed to accommodate growth at build-out.	• Scaled approach to funding based on varying conditions of existing infrastructure. • Shared approach to assigning costs to all core area growth projects to better match benefits with the funding source for those benefits.
2. Find a proactive approach to assess core area infrastructure that can be applied to the three services studied: Water, Wastewater, and Stormwater.	• Consistent asset rating scale across all three services. • Policy approach allows flexibility to apply rules to each service individually as well as upstream and/or downstream infrastructure.
3. Use existing DC policies and procedures wherever possible to develop an Infill and Intensification program within the estimated budgets identified in the 2014 DC Study.	• Uses 2014 DC oversizing policies, local servicing policies, unit rates, growth rates, work plan process, eligibility, and claim rules.
4. Incorporate new DC Act requirements.	• Directly incorporates Asset Management planning into DC funding process.
5. Don't over-complicate	• Straightforward rating scale and cost-sharing splits developed.

EXTERNAL STAKEHOLDER CONSULTATION

The DC External Stakeholder Committee was engaged throughout the CASS process. Updates on study progress were provided at the regular Stakeholder meetings, as well as one-on-one discussions with each of the stakeholder representatives to discuss the CASS approach and policy objectives. A meeting to introduce the draft reports was convened in July 2017 to present the findings, which was followed-up with a workshop in September 2017 with stakeholders, the consultants, and City staff to discuss each CASS report in detail after the initial review period.

A set of detailed comments were received from the Stakeholders. The CASS consulting team, along with staff in Engineering and Environmental Services, Finance and Corporate Services and Development and Compliance Services reviewed each submission in conjunction with the objectives, technical merits, proposed DC policies and funding framework. A follow-up meeting with the London Development Institute was arranged to discuss provided feedback and four items/themes emerged for which the Stakeholders and Staff have gained consensus:

1. The use of asset ratings to assign growth and non-growth costs.

2. The CASS policy should extend to the Built-Area-Boundary and not "end" at CASS

boundaries outlined in Appendix 'B2'.

3. City-staff should generally "allow" growth to occur ahead of identified project timing;
   i. Identify Lifecycle Reconstruction, RT and other needs in 2019 DC Study
   ii. First-come / First-serve approach for areas with major servicing constraints issues;
   iii. Recognition that ultimate servicing solution may be 3 to 5 years out and may result in an interim lower level of service.

4. Benefit to existing approach for combined sewers (CS) should be based on the asset rating established for the CS being replaced.

Staff support the four points outlined above and have adjusted the CASS policies accordingly. Further detailed analysis will occur over the next few months in conjunction with the DC Master Servicing plans, which will consolidate the policies and servicing needs in the core. The Rapid Transit Program and City Center Servicing Strategy will impact timing of Downtown works from a project coordination and construction impact perspective. As previously noted, the City has an interest in ensuring residents can still get to work and that businesses can maintain operations.

IMPACT TO DC RATES AND CAPITAL BUDGET

The financial analysis undertaken in the CASS is based on a hypothetical ultimate growth scenario and growth information from the 2014 DC Study. The costs identified in the CASS are for projects required to increase system capacity using a contiguous pattern of growth and assume redevelopment will occur only on vacant land within the core. Staff and the CASS consultants could not reasonably predict where and when intensification would occur and used best available information to estimate future servicing needs. Ultimately, the costs for upgrades to the services identified in the CASS are an example of a program that would be required to meet the anticipated infill and intensification need. The projects and costs identified are based on a snapshot in time using the condition of the infrastructure at that time. The total program cost, growth/non growth splits and scope of the projects may change depending on the servicing needs of proposed developments or the condition of the service at the time of development.

Based on the projected growth in the core, if the city's development community were to intensify all of the existing vacant land in the core area, the City would require tax/rate supported funding for approximately $111 Million of the non-growth share of the required works. A portion of these funds are already considered in existing Capital Works plans and will be further refined through the development of the City Center Servicing Strategy, the Rapid Transit program and ultimately the 2019 DC Study.

Build-Out CASS Program			
Service	**G** (000's)	**nG** (000's)	**%**
Wastewater	$30,350	$57,727	35 / 65
Water	$7,979	$624	93 / 7
Stormwater	$34,574	$52,978	40 / 60
	$72,903	$111,329	

G/nG splits will vary based on condition at time of development

From the DC perspective, approximately one-third of the $73 Million funding for infill and intensification works has already been established through the 2014 DC Study (see table below). To date, none of the $25 Million has been committed to core area works through a source of funding report. Based on the CASS findings, if intensification were to occur

at the rate identified in the 2014 DC Study, then an additional $48 Million of DCs are required to maintain affordability and ensure that all core area works can be funded appropriately. In addition, it is anticipated that the non-growth portion ($111M) of the build-out CASS program may have a significant impact on the Wastewater Treatment Budget and will likely result in higher wastewater utility rates. The impact will be determined in parallel with the completion of the Development Charges master plan engineering studies.

2014 DC Study – Infill and Intensification Works			
Project Name	**G** (000's)	**nG** (000's)	**%**
Wastewater	$3,722	$1,140	85 / 15
Water	$9,471	$1,519	94 / 6
Stormwater	$11,957	$1,825	93 / 7
	$25,150	$4,484	

COORDINATION WITH CAPITAL PROJECTS

With the CASS shared funding approach in place, Staff can refine growth costs into existing Capital Works plans. A further review of new growth needs and existing projects will be undertaken as part of the 2019 DC Background Study, based on work being completed for the City Center Servicing Strategy (CCSS) and Rapid Transit (RT). These future works will be assigned growth shares and oversizing of pipes will be included into the project scope, where applicable. The funding for these projects will be highlighted through the Source of Financing that accompanies all engineering and contract awards.

A further analysis will also be conducted as part of the 2019 DCBS using the final RT Environmental Assessment document. This analysis will examine growth shares of the water, sanitary and stormwater works within the RT corridor and assign a value for works that are not considered to be eligible for the Transit or Roads share of the work. Typically, this would be the oversizing of existing infrastructure to accommodate future growth along the RT routes.

RECENT DEVELOPMENT APPLCATIONS – SCENARIOS

During the study preparation, staff collected a number of media reports from local news sources as well as several active applications that could be used as test sites to confirm the funding approach. This planning information was reviewed and used to further refine accuracy of the funding allotments and capacity assessment analysis. The applications contained information such as proposed number of units and phasing which informed an analysis of the servicing needs and estimated cost of growth for each development application. This approach is consistent with how all new developments applications will be assessed, based on the new CASS policies.

Proposed Development	Comment	G Cost (000's)	nG Cost (000's)	Total (000's)
Dundas St. and Rectory St.	Existing servicing or capacity constraints compounded by additional growth flows.	$26,422	$42,024	$66,446
Wellington Rd. N and Wolfe	Local sewers have adequate capacity, downstream sewers under capacity.	$8,353	$36,792	$45,145
Richmond St. and Dufferin Ave.	Existing servicing or capacity constraints compounded by additional growth flows.	$1,917	$2,325	$4,242
Clarence St. and Queen's Ave	Existing servicing or capacity constraints compounded by additional growth flows.	$2,193	$1,798	$3,991
Dundas Street and King St.	Existing servicing or capacity constraints compounded by additional growth flows.	$760	$884	$1,645

The values above represent a theoretical scenario based on the analysis of projects in the CASS and applying the asset rating approach to funding splits. As noted, many of sewers have existing issues that have already been considered and will be addressed through the existing capital program. The 2019 DC Study will combine these projects and align them with other needs such as RT and CCSS.

CONCLUSION

The CASS identifies the projected costs required to accommodate growth and to fund reconstruction of water, wastewater, and stormwater infrastructure in the core using an ultimate build-out scenario. The 2014 DC Study identified a preliminary approach to funding infill and intensification projects, which has been further refined to recognize the condition of the asset. The CASS conclusions ensure that "growth pays for growth" and that DC's and water and sewer rate payers are funding the appropriate share of the reconstruction costs.

The CASS recommends the following approach for infill and intensification growth project funding:

1. The asset rating will be used to assign a Growth / Non-Growth share for existing infrastructure.
2. Oversizing will be 100% growth cost.
3. For most core area growth works, the City will lead design and construction.
4. The ultimate servicing solution for a proposed infill or intensification project may not be constructed as part of the development works, but rather constructed in conjunction with other infrastructure projects.
5. This policy will apply to works within the Built Area Boundary and not the Greenfield areas of the City.

A further analysis will also be conducted as part of the 2019 DCBS using the final RT EA document along with other pertinent planning and/or engineering studies. This analysis will examine growth shares of the water, sanitary and stormwater works within core area and

assign a Growth and non-Growth value for the works.

Acknowledgement:

The Core Area Servicing Studies were completed with the assistance of many individuals from across the Corporation including members from the Stormwater Engineering Division, Wastewater and Drainage Division, Water Engineering Division, Financial Planning and Policy, Development Finance, Development Services, and Planning Services.

City staff would also like to thank members of the DC External Stakeholder Committee for their feedback throughout the process.

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RECOMMENDED BY:	**CONCURRED IN BY:**
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January 22, 2018

c.c. Anna Lisa Barbon, Managing Director, Finance and Corporate Services and City Treasurer
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Attachments:

Appendix A1: CASS Executive Summary – Water
Appendix A2: CASS Executive Summary – Stormwater Wastewater
Appendix A3: CASS Executive Summary -- Wastewater
Appendix B1: Map of the Core Area Servicing Studies Study Area (Water map, SWM and Sanitary Map)
Appendix B2: Map of Built Area Boundary
Appendix C: Proposed Local Servicing Policy for 2019 DC Study

Appendix A1

CASS Executive Summary – Water

NOTE: Table numbers and appendices noted in executive summaries are references to CASS reports on file in the City Clerk's office and not the preceding SPPC report appendices or tables.

In general, the redevelopment of central areas of the City of London will require growth needed infrastructure to be placed in neighborhoods that already have some pre-existing services. Typically, these redevelopment zones are characterized by congested right-of-ways, old buildings and require new infrastructure designed for higher density population loadings that are prepared using contemporary Design Criteria. Applying Council adopted policy direction of "growth paying for growth" these infill areas will have infrastructure needs that should be recoverable from the Development Charges By-law & Fund. This report lists the infrastructure projects required to facilitate intensification of the City's core area, explains the modelling of the water distribution system required to meet infill growth needs over the next 20 years, estimates costs of projects, reviews amendments to current growth policies that may be undertaken by the City of London, assigns a financial benefit to existing (BTE) growth for service replacements, and distributes cost over different growth sectors (Residential, Institutional, Commercial and Industrial; commonly referred to as Res ICI).

This study was originally envisioned to cover a discrete central area defined by certain geographical road and river boundaries. Through discussion with stakeholders it was recommended that the suggested amendments to the Development Charges By-law & Fund policies be applied to the existing built boundary. Further refinement of those specific policy changes will be reviewed during the 2019 Development Charges By-law which will likely begin in the spring of 2018.

Prior to undertaking the creation of the modelling work to estimate the growth impacts of this intensification, the City of London asked AECOM and Watson Associates to review how other municipalities have planned and organized the payment for redevelopment in their central core areas. Specifically, we reviewed current City of London technical design parameters and Growth Policies with eight (8) comparator municipalities to ensure best management practices are followed, analyzed other jurisdictions level of service for water distribution systems, and summarized emergent policy needs and requirements for asset management principles laid out within Bill 73. This information is presented in **Table 1** in **Appendix A**.

Generally, the City of London is similar to comparator municipalities for technical parameters used for design standards and design criteria of the water distribution system and London provides a level of service consistent with other municipalities throughout Ontario with two exceptions:

- Regarding the minimum hydrant spacing, London meets the MOECC guidelines but several municipalities require hydrants to be spaced closer together. As such, London provides less of a level of service in this regard.
- For the maximum pipe velocity at normal and fire flow conditions, London provides a high level of service as they require relatively low velocities during normal and fire flow conditions in comparison to other municipalities.

As such, no significant changes to the existing technical standards have been recommended for adoption. However, changes to Development Charge and Growth Policies may be undertaken if Municipal Council chooses to:

- create partitions breaking the City into two or more zones;
- recognize different levels for local servicing definition for application of funding eligibility under the Development Charges by-law; and

- develop a more refined formula for BTE definition to recognize an asset condition of an existing infrastructure element that is not purely aged based are all possible refinements

Council may wish include these possible refinements when they make amendments during the next Development Charges by-law update study (2019). The proposed 2019 Development Charges by-law amendments are presented in **Table 2** in **Appendix A**. Our analysis suggested that work performed in the core area trends above other Greenfield projects, based on several City of London tenders for both downtown and Greenfield projects and the 2014 Development Charges estimates by at least 20-50%. This suggests a short fall in funding compared to the mostly Greenfield 2014 DCBS projects. For this reason, we recommend the application of 30% contingency over the traditional 20%, and increasing the Engineering Fee from 15% to 20% used in Greenfield project. Unit rate costs for watermains are presented in **Table 3** in **Appendix A**.

The impact of new growth in built up areas on the existing water distribution system was modelled using growth assumptions provided by the City of London Planning staff based on Draft Plan & Site plan applications, development inquires, the Vacant land Inventory and developer assembled parcels. The modelling of water infrastructure needs for the next twenty years was prepared by updating the 2014 Master Plan model after calibrating for the growth that occurred in the last 3 years. Specifically, the water demand model was updated for both existing and forecasted future demands and input into the hydraulic model. The new water demand model consists of the following components:

- An update of future growth population for each five year planning horizon to 2034 and ultimate for both the core area and beyond the core area based on available planning information. Design per capita water usage and peaking factors based on criteria applied to the growth population based on land use to obtain the future growth demand. As the demands in areas outside of the core areas will impact the level of service within the core areas, these were also included;
- Future growth average day demand for each five year planning horizon were determined based on planning data and consumption design criteria determined and added to the existing baseline demands;
- Non-Revenue Water (NRW) is estimated based on spatial distribution for various components, including: estimated usage for flushing, firefighting, street sweeping, and new construction. These would be estimated based on data assumed to be available from the City, and applied uniformly across the system; The remaining NRW volume was assumed to be attributable to breaks and leaks and will be assigned proportionally to the system based on the estimated leakage propensity, inferred from pipe material, diameter and age. For example, CI mains are assumed to have a higher leak / break component of NRW than new PVC mains;
- Peaking factors for maximum day demand were applied;
- Recent SCADA records were used to develop the Diurnal demand patterns for Elgin Middlesex Pumping Station (EPS), and were also used to develop the land use based diurnal demand patterns for each land use category. If growth intensification involved reassignment of land use to different categories, (e.g. institutional to residential), it is likely that this will have an impact on the temporal water use patterns within the study area, which were reflected in the model. We reviewed the use of land use based versus global diurnal demand patterns;

The modelling exercise provided a comprehensive evaluation of existing and future water infrastructure needs to accommodate the future growth of the Core Area and allows the City of London to identify water infrastructure upgrades associated with the future residential and non-residential growth in the Core Area for inclusion in the City's Growth Management Implementation Strategy (GMIS), 2019 Development Charges By-

Law update study and for capital budgeting purposes; as provided in **Table 4** in **Appendix A**.

In keeping with a focus on Asset Management a new methodology to assign a value to an existing pipe in situ was developed for use as a measure of Benefit to Existing (BTE). Condition ratings were taken from the City of London Asset Management ratings which are compiled based on age, visual inspection of defects, performance factors for pipe pressure and flow.

In the 2014 Water DCBS an age based formula was presented to "value an existing in situ pipe" that was predicated on the assumption that a typical pipes life expectancy is 80 years.

However, given the nature of infill development, growth works in the core area will likely replace or supplement existing utilities to meet intensification loading needs. This is different from previous Greenfield growth projects that installed new services in typically unserved areas that were considered in the 2014 DCBS study.

The maximum usable life assumption of 80 years can be exceeded by 20-40 years, and a fairly new pipe may have performance issues leading to its premature replacement prior to it reaching 80 years of age. The new valuation uses performance factors that better evaluate the condition of an existing pipe.

The BTE represents an advantage that the City would realize by reduction of future cost by a pipe replacement. The better the condition of the existing pipe the lower the BTE and less of an advantage is assigned. Conversely, the loss of pipe residual life is greater for a pipe in good condition and is represented by (1-BTE). This then captures the fact that a poor performing pipe would have a low condition rating, high BTE and low residual life.

The infrastructure works were reviewed holistically on a system wide basis with alternate routes considered and an implementation plan was developed that coordinates needs of Water Servicing, Sanitary Servicing, Storm Servicing, the Rapid Transit Project and other downtown initiatives (e.g. Dundas Place) that is financially responsible and viable. This staging plan is consistent with the London Plan in terms of development of growth areas.

This study is intended to provide the policy changes required for updates in the 2019 Development Charge Background Study. City-staff can apply growth and non-growth splits to projects currently funded by the DC14-WD01002 Infill and Intensification Nodes noted in the 2014 Development Charge Background Study. An amendment in the 2019 update study will be subject to a formal public review process and City Council adoption.

There are distinct cost savings to both the rate payer and Development Charges reserve funds when undertaking one construction project that is sized appropriately for both growth and the existing user. The extent of Local Servicing policy changes recommended for immediate project funding allocations and for the 2019 Development Charges Study are outlined **Appendix A - Table 2**.

As a means of showing relevancy of the study and potential impacts of draft policy on future developments, a review of several potential publically declared development applications without current status or draft status in the development process (subdivision or site plan) was undertaken. This report estimated the trigger servicing thresholds of these potential developments on the infrastructure needs suggested by this report. It being noted that the defined servicing requirements for these large tower developments will be submitted by the proponents and reviewed in detail by City staff and will be based on exact size, location zoning and usage of the built form. Variation

in servicing needs is expected between the actual development and our servicing needs estimated in this is report.

The proponent developers are expected not to rely upon this study, which is solely provided as an illustrative example of how policies and procedures may be applied with recognition that it is subject to the changes and amendments of the pending 2019 Development Charge Background Study.

Appendix A2

CASS Executive Summary – Stormwater

NOTE: Table numbers and appendices noted in executive summaries are references to CASS reports on file in the City Clerk's office and not the preceding SPPC report appendices or tables.

In general, the redevelopment of central areas of the City of London will require growth needed infrastructure to be placed in neighborhoods that already have some pre-existing services. Typically, these redevelopment zones are characterized by congested right-of-ways, old buildings and require new infrastructure designed for higher density population loadings with additional impervious areas associated with buildings and parking facilities that are prepared using contemporary Design Criteria. Applying Council adopted policy direction of "growth paying for growth" these infill areas will have infrastructure needs that should be recoverable from the Development Charges Bylaw & Fund.

This report lists the infrastructure projects required to facilitate intensification of the City's core area, explains the modelling of the stormwater drainage system required to meet infill growth needs over the next 20 years, estimates costs of projects, reviews amendments to current growth policies that may be undertaken by the City of London, assigns a financial benefit to existing (BTE) to growth for service replacements, and distributes cost over different growth sectors (Residential, Institutional, Commercial and Industrial; commonly referred to as Res ICI).

Prior to undertaking the creation of the modelling work to estimate the growth impacts of this intensification, the City of London requested AECOM and Watson Associates review how other municipalities have planned and organized the payment for redevelopment in their central core areas. Specifically, we reviewed current City of London technical design parameters and Growth Policies with eight comparator municipalities to ensure best management practices are followed, analyzed other jurisdictions level of service for stormwater distribution systems, and summarized emergent policy needs and requirements for asset management principles laid out within Bill 73. This information is presented in Tables 1, 2a and 2b in Appendix A. Generally, the City of London is similar to comparator municipalities for technical parameters used for design standards and design criteria of the stormwater system and London provides a level of service consistent with other municipalities throughout Ontario with two exceptions:

- The Major system allows for greater maximum ponding depth on roads (therefore, less conservative than other municipalities).
- The runoff coefficient (C) is more sophistically discretized and allows for greater flexibility, with no minimum C for predevelopment conditions (therefore, more conservative than other municipalities)

In review of these variations and comparison to current City of London practices, no significant changes to the existing technical standards have been recommended for adoption by this study.

However, changes to Development Charge and Growth Policies may be undertaken if Municipal Council chooses to:

- Create partitions breaking the City into two or more zones;
- Recognize different levels for local servicing definition for application of funding eligibility under the DC bylaw; and

- Develop a more refined formula for BTE definition to recognize an asset condition of an existing infrastructure element that is not purely aged based are all possible refinements.

Council may wish include these possible refinements when they make amendments during the next DC by-law update study (2019). The proposed 2019 DC by-law amendments are presented in Table 5 in Appendix A.

Our analysis suggested that work performed in the core area trends above other Greenfield projects, based on several City of London tenders for both downtown and Greenfield projects and the 2014 DC estimates by at least 20-50%. This suggests a short fall in funding compared to the mostly Greenfield 2014 DCBS projects. For this reason, we recommend the application of 30% contingency over the traditional 20%, and increasing the Engineering Fee from 15% to 20% used in Greenfield project. Unit rate costs are presented in Table 3 in Appendix A.

An existing conditions storm water model was developed for the study area through this study and existing deficiencies identified. The impact of new growth in built up areas on the existing storm sewer system was then modelled using growth assumptions provided by the City of London Planning staff based on Draft Plan and Site plan applications, development inquires, the Vacant land Inventory and developer assembled parcels. The modelling exercise provided a comprehensive evaluation of existing and future stormwater infrastructure needs to accommodate the future growth of the Core Area and allows the City of London to identify storm sewer infrastructure upgrades associated with the future residential and non-residential growth in the Core Area for inclusion in the City's Growth Management Implementation Strategy (GMIS), 2019 DC By-Law update study and for capital budgeting purposes; as provided in Table 4 in Appendix A.

In keeping with a focus on Asset Management a new methodology to assign a value to an existing pipe in situ was developed for use as a measure of Benefit to Existing (BTE). Condition ratings were taken from the City of London Asset Management ratings which are compiled based on age, visual inspection of defects, performance factors for pipe pressure and flow.

In the 2014 stormwater DCBS, an age based formula was presented to "value an existing in situ pipe" that was predicated on the assumption that a typical pipes life expectancy is 80 years. However, given the nature of infill development, growth works in the core area will likely replace or supplement existing utilities to meet intensification loading needs. This is different from previous Greenfield growth projects that installed new services in typically unserved areas that were considered in the 2014 DCBS study. The maximum usable life assumption of 80 years can be exceeded by 20 to 40 years, and a fairly new pipe may have performance issues leading to its premature replacement prior to it reaching 80 years of age. The new valuation uses performance factors that better evaluate the condition of an existing pipe.

The BTE represents an advantage that the City would realize by reduction of future cost by a pipe replacement. The better the condition of the existing pipe the lower the BTE and less of an advantage is assigned. Conversely, the loss of pipe residual life is greater for a pipe in good condition and is represented by (1-BTE). This then captures the fact that a poor performing pipe would have a low condition rating, high BTE and low residual life.

The infrastructure works were reviewed holistically on a system wide basis with alternate routes considered and an implementation plan was developed that coordinates needs of Water Servicing, Sanitary Servicing, Storm Servicing, infrastructure renewal, the Rapid Transit Project and other downtown initiatives (e.g.

Dundas Place) that is financially responsible and viable. This staging plan is consistent with the London Plan in terms of development of growth areas.
This report and study is intended to provide the policy changes required for update in the 2019 Development Charge Background Study. Whereby City-staff can apply growth and non-growth splits to projects currently funded by the DC14-WD01002 Infill and Intensification Nodes Storm Servicing noted in the 2014 Development Charge Background Study. Amendment in the 2019 update study is subject to a formal public review process and council adoption.

There are distinct cost savings to both the rate payer and DC reserve funds by undertaking one construction project that is sized appropriately for both growth and the existing user. The extent of Local Servicing policy changes recommended for immediate project funding allocations and for the 2019 DC Study are outlined Appendix A - Table 5.

As a means of showing relevancy of the study and potential impacts of draft policy on future developments .A review of several potential on-going publically declared development applications without current status or draft status in the development process (subdivision or site plan) was undertaken. This report estimated the trigger servicing thresholds of these perceived developments on the infrastructure needs suggested by this report. It being noted that exact servicing requirements for these large towers will be submitted by the proponents and reviewed in detail by City staff and will be based on exact size, location zoning and usage of the built form. Variation in servicing needs is expected between the actual development and our servicing need estimated in this is report. The proponent developers are expected not rely upon our work which is solely provided as an illustrative example of how policies, and procedures may be applied and subject to changes and, amendments of the upcoming 2019 Development Charge Background Study.

Appendix A3

CASS Executive Summary – Wastewater

NOTE: Table numbers and appendices noted in executive summaries are references to CASS reports on file in the City Clerk's office and not the preceding SPPC report appendices or tables.

The City of London is undertaking the Core Area Servicing Studies (CASS) to determine the infrastructure servicing requirements that will support the City's vision and official plan objectives for the core area of the City. The CASS is the City's first servicing study to evaluate growth-related infrastructure needs associated with infill and intensification in the downtown core area.

The CASS comprises a family of servicing studies that includes water, wastewater and stormwater that will form a critical component to enable the City of London's growth aspirations. GM BluePlan was retained to undertake the wastewater component of the CASS, recognizing that coordination with water and stormwater consultants and several other ongoing/planned initiatives, including the SHIFT rapid transit project, would be required.

The primary aim of the Core Area Servicing Study (CASS – Wastewater) is to determine the necessary infrastructure to deliver sanitary servicing for the Core Area of the City, based on ultimate build-out population projections. Subsequently, using the City's growth allocation for the Core Area, establish the phased infrastructure costs for a 20 year period, to 2034.

Hydraulic modelling was used to support capacity analysis of the system to identify existing constraints. Growth projections were used in conjunction with City design criteria to load the models and identify future system constraints and intervention options.

Identified infrastructure needs were primarily based on a meeting a 1 in 5 year design rainfall event level of service trigger. Identified interventions were defined and costed using agreed unit rates, consistent with both the water and stormwater CASS studies. Similarly, a consistent approach was developed and employed to split costs as Development Charge (DC) eligible and Benefit to Existing (BTE) eligible.

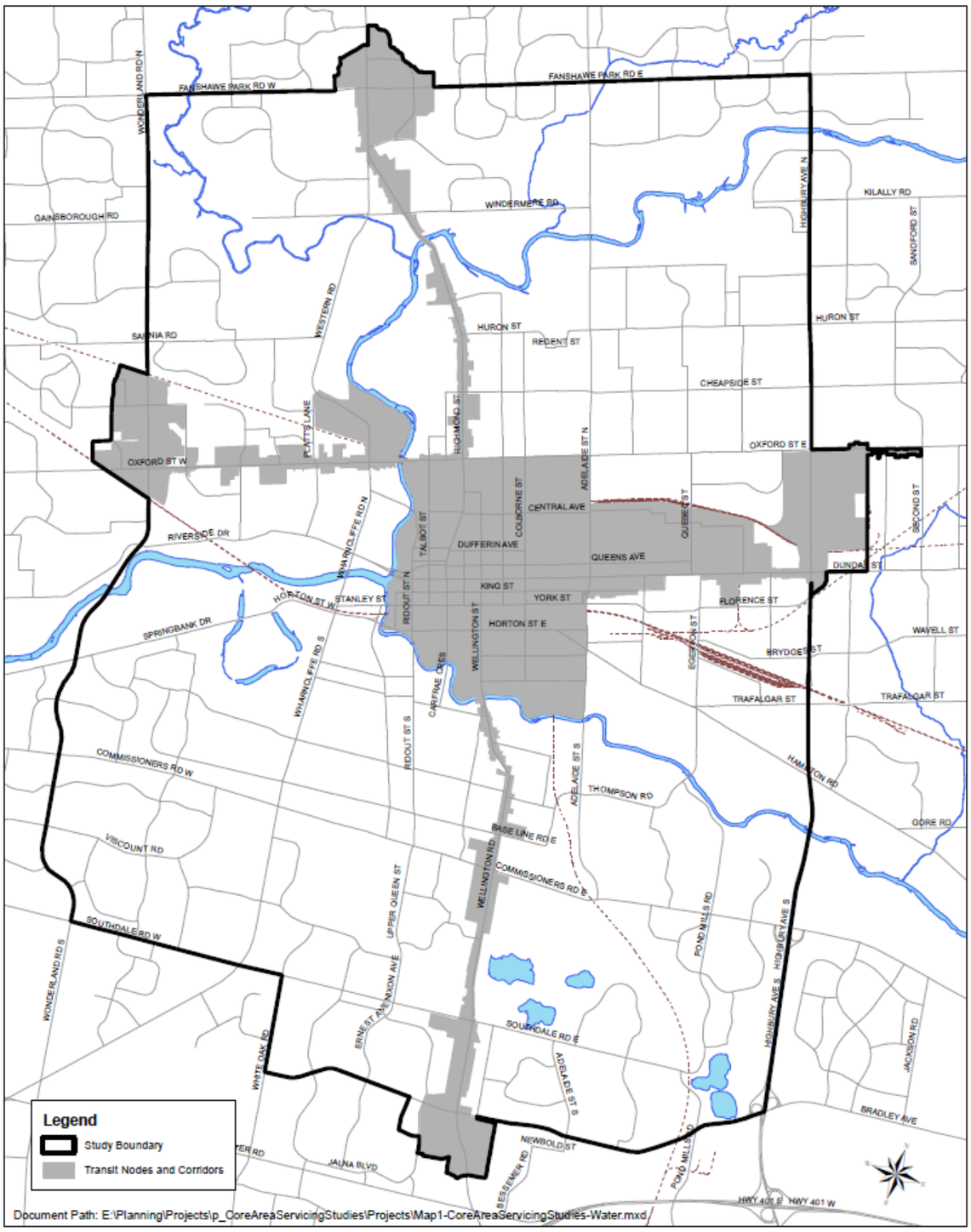
City-wide growth projections, provided by the City and used to establish future servicing impacts, are summarized in Table ES 1. A summary of the projected growth in the Core Area and outside of it is provided in Table ES 2. Total estimated summary costs are as provided in Table ES 3.

The servicing analysis identified a total of 18 constraints for which solutions were identified. The location, individual cost estimates and required timing of the interventions are provided in Figure ES 1, Table ES 4, and Figure ES 2 respectively.

Appendix B1

Map of the Core Area Servicing Studies Study Area (Water map, SWM and Sanitary Map)

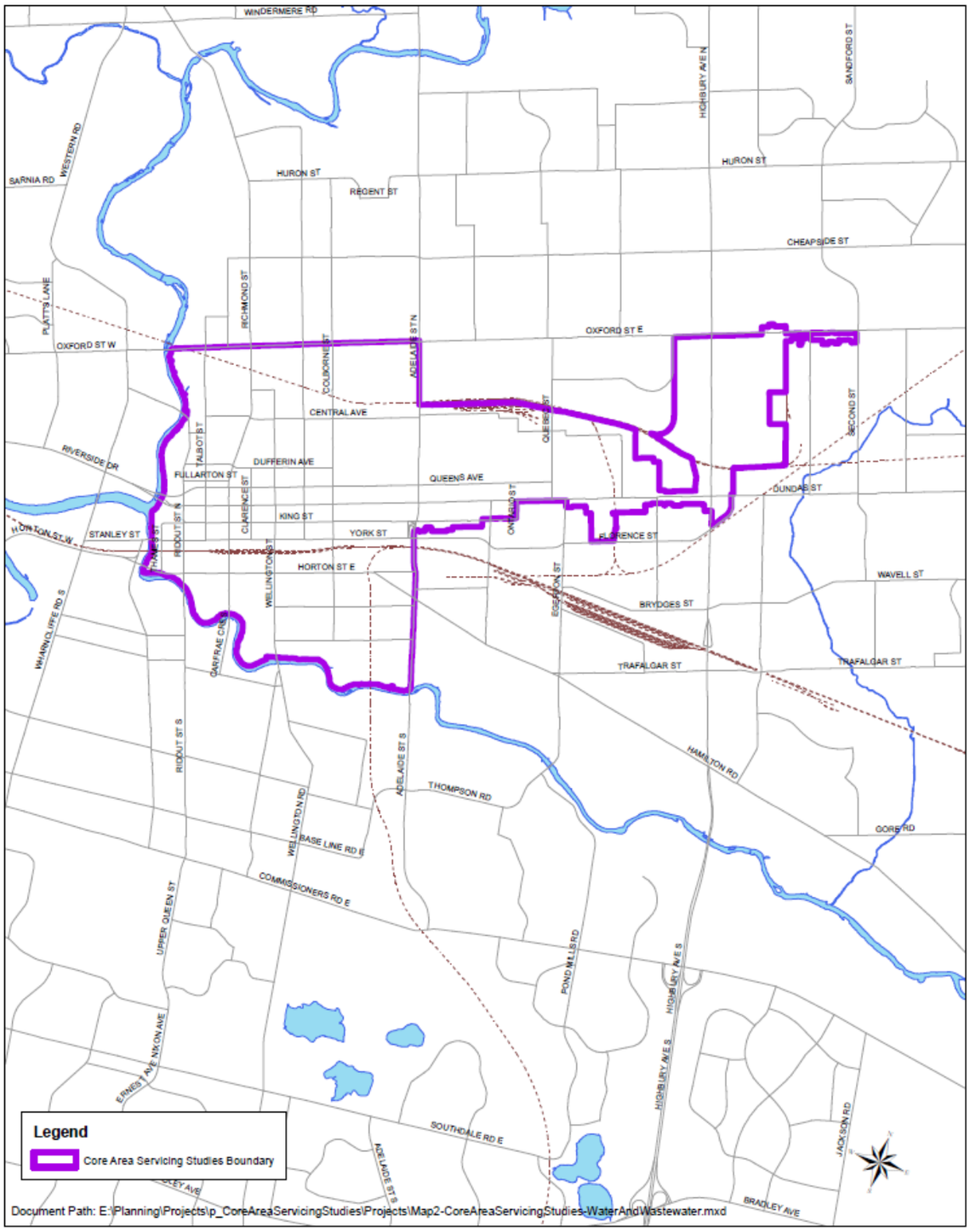
CASS Water Study Boundary



Appendix B1

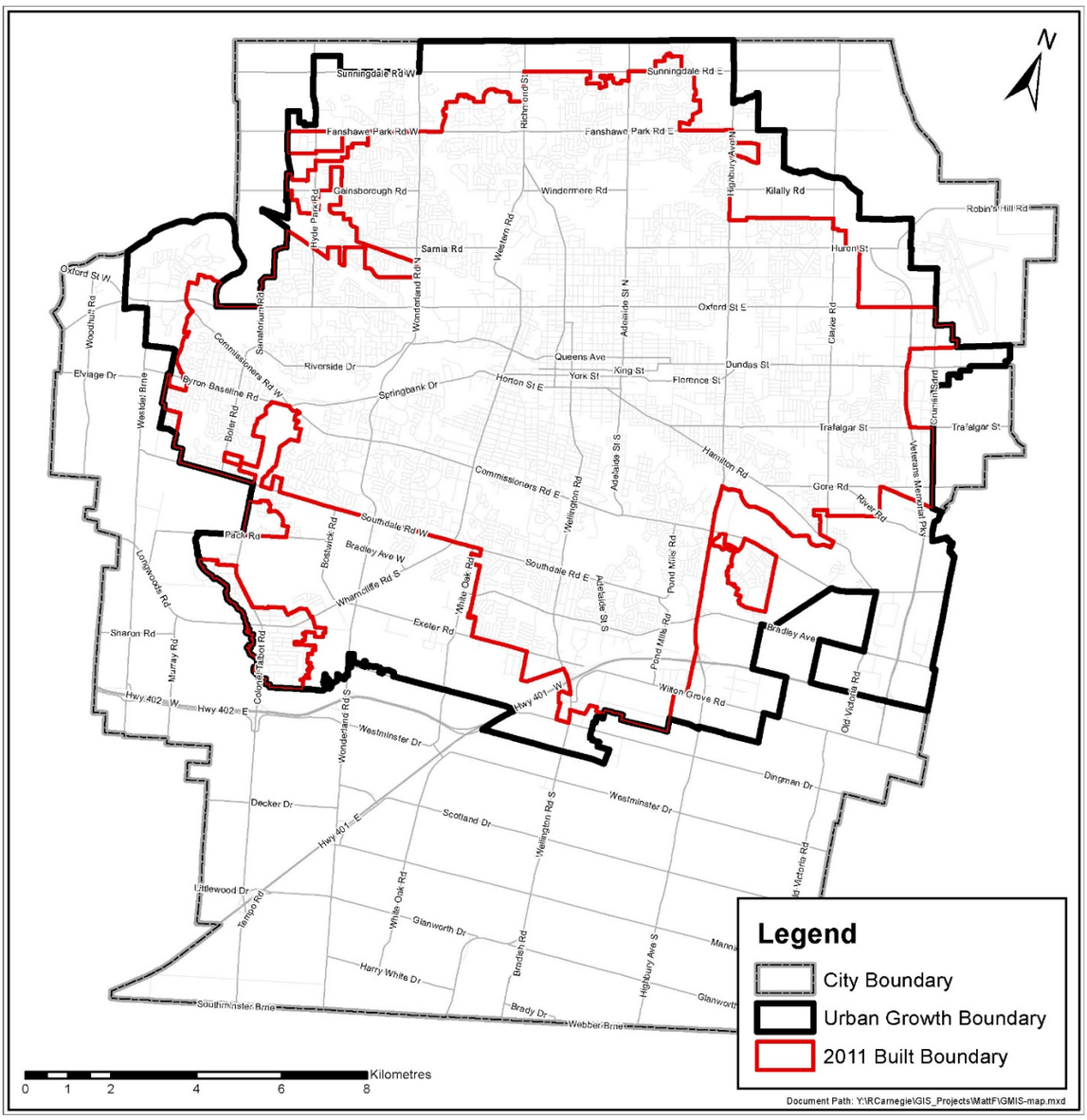
Map of the Core Area Servicing Studies Study Area (Water map, SWM and Sanitary Map)

CASS Stormwater and Wastewater Study Boundary



Appendix B2

Map of Built Area Boundary



Appendix C

Proposed Local Servicing Policy for 2019 DC Study

NOTE: The Local Servicing Policy below makes references to other documents, boundaries, and policies which will be reviewed for consistency through the update to the DC By-Law and as part of the 2019 DC Background Study process.

GENERAL

G-1. Claimability

Any item listed as claimable, subsidizable, or eligible for funding from a development charge reserve fund must also be provided for in the approved DC rates. To the extent that specific cost sharable works and projects cannot be identified as to location or timing, there should be a contingency provided for in the estimates that is incorporated into the rates.

It is important that the City continue to monitor between DC Background Studies, the accuracy of the estimates and assumptions used to establish the rates. To the extent that substantial variations are identified, Council should be advised and will need to consider whether to increase or decrease the rates in accordance with the monitoring observations.

G-2. DC Fund reimbursements for Exempted Development

The City currently exempts Industrial development, and certain specified forms of Institutional development from the payment of development charges. These exemptions support economic development and not-for-profit development initiatives.

With respect to any non-statutory exemptions the City approves in its DC policy, the City will pay for these exemptions through non-DC supported contributions to the respective DC reserve funds. This meets the legislative requirement that exemptions or reductions to charges otherwise payable not be recovered from other, non-exempt forms of development (DCA s.5 (6)3.)

G-3. Non-Growth Works that Benefit the Existing Population

Where minor works funded in part from the CSRF are subject to this policy and also include a non- growth component in the DC Background Study, funding of that portion of the works must wait until the City has approved sufficient funds in its Council approved capital budgets, or Council makes provision for a Reserve Fund designated for use in funding the non-growth share of DC funded works, to pay for that non-growth portion of the works. The non-growth portion of the funding shall be identified in the City's Capital Works Budget and approved by Council.

The Benefit To Existing (BTE) will be calculated based on the Asset Condition of the current infrastructure element as defined by the relevant Asset Management data base as defined by condition parameters and maintained by the City of London

G-4. Use of Contingencies

Works listed as eligible in the Development Charges Background Study, or with the approval of the City Engineer, in consultation with the Director, Development Finance, drawn from a contingency and/or an alternative to a work listed in the Background Study may be funded from the CSRF. The claimability of such a work would be subject to inclusion in the development agreement (for works less than $50,000 subject to approved funding in the Capital Budget) or subject to execution of a Municipal Servicing and Financing agreement prior to commencement of the work. The works funded from the CSRF under this paragraph would be subject to rules similar to those described for minor CSRF eligible works contained in this section with respect to eligibility, tender and claim completeness and submission.

G-5. Exceptions
The Development Charge By-law allows for exceptions to projects listed in the DC Background Study for works listed as eligible in the Development Charges Background Study, or with the approval of the City Engineer, in consultation with the Director, Development Finance, drawn from a contingency and/or substituted for a work listed in the Background Study may be claimable.

G-6. Work in the Right of Way (ROW) and Distribution of Costs
Given the congested nature of the ROW in the CASS study area it is unlikely for one Infrastructure element requiring a growth need upgrade can be improved without impacts upon other services in close proximity. In these cases:

- The City shall undertake the management of the required construction project (unless previous written permission by the City Engineer to do otherwise is secured)

- The claimable costs for the infrastructure upgrade will include Pipe, construction, engineering and related utility relocations with appropriate identification and deductions for Local Servicing portions(defined elsewhere in this document)) Restoration will be split between the City owned services being reconstructed (i.e. if all 3 services are impacted then restoration will be shared ,water 1/3, sanitary 1/3, stormwater 1/3) and BTE split generated using the City's asset rating is applied to corresponding portion of restoration.

G-7. Distribution of Growth Costs
The infill and intensification projects are to be considered Community Growth and a standard split is applied across several growth types in the CASS boundary as determine by the City's growth predictions and intensification policies.

G-8. Restoration and Damage

When an infrastructure upgrade is not deemed a Local Service then of any utility cuts, shoring, vibration monitoring and protection, pedestrian hoarding, signage, and or restoration of damage created by construction activities and /or construction traffic in and out of the development area. including but not limited to daily removal of mud tracking, daily dust suppression, milling and paving of deteriorated asphalt caused by construction traffic, grading of gravel shoulders to remove rutting caused by construction traffic shall be claimable as restoration;

G-9. Utility Upgrades

When an infrastructure upgrade is not deemed a Local Service then the costs related to the upgrading of any utility plant, or the relocation of the same, unless necessitated by the roadwork will not be covered by the Development Charges unless those upgrades pertain to City Owned services;

G-10. Relocation and Replacement Costs

When an infrastructure upgrade is not deemed a Local Service then the relocation and/or replacement costs of any encroachment on the City's road allowance or easement including but not limited to trees, art, signage, planters, paving stones, parking meters, bus bays, street trees, hedges, sprinklers systems and fences shall be part of the claimable work as restoration;

WATER DISTRIBUTION IN CASS AREA

CASS W-1. Major Watermains (CSRF-Water Distribution)
Claims against the CSRF Water Distribution fund may be made if:

a. the watermain is required to service future development on the Public ROW or in an Easement that are greater than or equal to 250mm in diameter are considered to satisfy a network wide benefit to growth and are identified separately as projects in the Development Charges Background Study, Growth Management Implementation Study (GMIS), or referred to in the CASS study and are eligible for a claim from the *CSRF*- Water Distribution Fund.

b. The claims shall be limited to the conditions mentioned herein, and limited to the reimbursements in the current Development Charges Background Study for oversizing are subject to reduction for Local Service components and council approval

Claims against the CSRF – Infill and Intensification Program if:

a. The works occur inside or service lands inside the CASS boundary as shown by Figure 1.1: Study Area.

b. Any watermain is deemed required to address an upgrade at a distance greater than the smallest of the following four conditions:

1) four Hydrants on the same line;
2) two valve chambers on the same line;
3) one city block or;
4) 150 m radius around the centroid of the development measured from the center of the proposed development frontage.

c. The claims shall be limited to the conditions mentioned herein, and limited to the reimbursements mention in the current Development Charges Background Study for oversizing are subject to reduction for Local Service components and council approval

CASS W-2. Watermain Oversizing (CSRF-Water Distribution)
Watermains with the all of the following attributes are eligible for a subsidy from the CSRF-Water Distribution:

- The watermain services external developable areas, and
- The watermain is greater than 250mm in diameter and less than 400mm in diameter.

The oversized portion (>250mm) is eligible for a subsidy payable based on an average oversizing cost and is stated in terms of a $/m of pipe constructed. The oversizing subsidy amounts will be identified in a schedule provided in the approved Development Charges By-law from the City Services Reserve Fund. Payment of claims from the City Services Reserve fund is subject to budget approval.

CASS W-3. Water Facilities *(CSRF*-Water Distribution*)*
Where the upgrading or construction of new public water booster pumping stations and reservoir projects are designed to increase capacity or improve service to acceptable standards and as a result of growth, these works are eligible for a claim from the CSRF-Water Distribution. These projects must also be identified in the Development Charges Background Study. This does not include privately owned water boosting devices.

CASS W-4. Temporary Facilities (Developer Cost)
Where a temporary facility precedes the construction of a permanent facility, the developer that requires the temporary facility will be required to also assist in making provision for the permanent facility (e.g. secure land for permanent facility)

as a condition of approval for the temporary facility. Approval of temporary works is at the discretion of the City Engineer. In order for a temporary work to proceed there must first be provisions for the permanent work within the current Development Charge Background Study.

CASS W-5. Local Service Costs (Developer Cost)
Any watermain or portion of a larger watermain that is less than or equal to 250mm in diameter located on the public ROW is referred to as "local works", and undertaken at the Developer's expense in the CASS boundary if the work is required to address an upgrade, not mentioned in the CASS Master Plan, within any of the following trigger distances::

1) four Hydrants on the same line;
2) two value chambers on the same line;
3) one city block or;
4) 150 m radius around the centroid of the development measured from the center of the proposed development frontage.

WASTEWATER IN CASS AREA

CASS SS-1. Regional Trunk Sewers (CSRF- Sanitary Sewerage)
Claims against the CSRF Sanitary Sewage Fund may be made if:

a. the Sanitary Sewer is required to service future development on the Public ROW or in an Easement that are greater than or equal to 300mm in diameter are considered to satisfy a network wide benefit to growth and are to be identified separately as projects in the Development Charges Background Study, Growth Management Implementation Study (GMIS), or referred to in the CASS study.

b. The claims shall be limited to the conditions mentioned herein, and limited to the reimbursements mention in the current Development Charges Background Study for oversizing are subject to reduction for Local Service components and Municipal Council approval.

c. All sewers of any diameter required to service future development that satisfy a regional benefit to growth and are identified as a strategic need by the City Engineer are considered to satisfy a regional benefit to growth and are to be identified as separate projects in the DC Background Study and are eligible.

d. In order to be eligible for a claim as a Regional Trunk Sewer, the sewer must have no Private Drain Connections to individual residential units otherwise the "Sewer Oversizing" policy applies.

e. This work will be undertaken by the City unless authorized prior by the City Engineer in writing.

CASS SS-2. Sewer Oversizing (CSRF - Minor Sanitary Sewers)
Sanitary Sewers, which are not Regional Trunk Sewers, with all of the following attributes are eligible for a subsidy from the CSRF - Minor Sanitary Sewers:

- The sewer services external developable areas, and
- The sewer is greater than 250mm in diameter.

The oversized portion (>250mm) is eligible for a subsidy payable based on an average oversizing cost and is stated in terms of a $/m of pipe constructed. The

oversizing subsidy amounts are to be reflected in an appendix of the DC Bylaw. The oversizing subsidy amounts cover the cost per meter of all associated eligible costs including engineering, manholes, restoration, etc.

CASS SS-3. CSRF – Infill and Intensification Program

Claims against the CSRF – Infill and Intensification Program if:

a. The works occur inside or service lands inside the CASS boundary.

b. Any Sanitary Sewer that is greater than 250 mm in diameter is deemed required to address a required upgrade at a distance of greater than the smallest of the following two conditions:

   1) one city block or;
   2) 150 m radius around the centroid of the development measured from the center of the proposed development frontage.

c. The claims shall be limited to the conditions mentioned herein, and limited to the reimbursements mention in the current Development Charges Background Study for oversizing are subject to reduction for Local Service components and Council approval.

d. The BTE shall be based on the City of London's asset rating of existing pipe.

e. This work will be undertaken by the City unless authorized prior by the City Engineer in writing.

CASS SS-4. Combined Sewers (CS)

Claims against the CSRF – Infill and Intensification Program for combined sewers are eligible if:

a. The work is required to service future development on the Public ROW or in an Easement and are considered to satisfy a network wide benefit to growth and outside the greater distance of either one city block or 150 m radius around the centroid of the development measured from the center of the proposed development frontage.

b. Work on CSO pipes will be similar to as noted in SS-8 for local service, however the BTE shall be based on the arithmetical sum of the individually calculated sanitary and storm BTE based on the City of London's asset rating of the existing sanitary and storm portions of the CSO pipe. This will be applied to the individual replacement costs of the new sanitary and storm pipe respectively to generate the total BTE split for the new service(s) (sanitary and storm).

c. This work will be undertaken by the City unless authorized prior by the City Engineer in writing.

CASS SS-5. Planned Works

All planned works noted in the CASS study as growth needs or upgrades will use the table in the 2014 DCBS/MP –for oversizing calculation. BTE will be generated using tables based on asset rating and be applied across construction costs for pipe, construction cost, engineering, utilities, land and restoration as a DC eligible cost. If there is deemed to be a local servicing costs then an appropriate share shall be allocated by the individual contributing developers.

CASS SS-6. Regional Pumping Stations (CSRF- Sanitary Sewerage)
The upgrading or construction of new regional pumping stations are to be identified as separate projects in the DC Background Study and are eligible for a claim from the CSRF- Sanitary Sewerage. These projects must also be identified in the Development Charges Background Study. A figure showing the location of all of these pumping stations is provided in the Sanitary Master Servicing Study.

CASS SS-7. Temporary Pumping Stations (Developer Cost)
The cost of any temporary pumping stations and/or forcemains is borne by the developer. Approval of temporary works is at the discretion of the City Engineer. Where a temporary facility precedes the construction of a permanent facility, the developer that requires the temporary facility will be required to make provision for the permanent facility (e.g. provide land for permanent facility at the developer's cost) as a condition of approval for the temporary facility. In order for a temporary work to proceed there must first be provisions for the permanent work within the current Development Charge Background Study.

CASS SS-8. Local Service Costs (Developer Cost)
Any pipe or portion of a larger pipe that is less than or equal to 250mm in diameter are referred to as local works, and undertaken at the Developer's expense
Any work or portion of a larger sewer that is on the public ROW or easement and undertaken at the Developer's expense in the CASS area if the work is required to address an upgrade not mentioned in the CASS Master Plan and within the lesser distance of either one city block or 150 m radius around the centroid of the development measured from the center of the proposed development frontage.

STORMWATER IN CASS AREA

CASS SWM-1. Regional Trunk Sewers
Claims against the CSRF Storm Sewage Fund may be made if:

a. the Storm Sewer is required to service future development on the Public ROW or in an Easement that are greater than or equal to 900mm in diameter are considered to satisfy a network wide benefit to growth and are to be identified separately as projects in the Development Charges Background Study, Growth Management Implementation Study (GMIS), or referred to in the CASS study.

b. The claims shall be limited to the conditions mentioned herein, and limited to the reimbursements mention in the current Development Charges Background Study for oversizing are subject to reduction for Local Service components and Municipal Council approval.

c. All sewers of any diameter required to service future development and that are identified as a strategic need by the City Engineer are considered to satisfy a regional benefit to growth and are to be identified as separate projects in the DC Background Study and are eligible.

d. In order to be eligible for a claim as a Regional Trunk Sewer, the sewer must have no Private Drain Connections to individual residential units otherwise the "Sewer Oversizing" policy applies.

e. This work will be undertaken by the City unless authorized prior by the City Engineer in writing

Claims against the CSRF – Infill and Intensification Program if:

a. The works occur inside or service lands inside the Built Urban Boundary.

b. Any storm sewer or combined sewer is deemed required to address a required upgrade at a distance of greater than the smallest of the following two conditions:

   1) one city block or;
   2) 50 m radius around the centroid of the development measured from the center of the proposed development frontage.

c. The claims shall be limited to the conditions mentioned herein, and limited to the reimbursements mention in the current Development Charges Background Study for oversizing are subject to reduction for Local Service components and council approval

This work will be undertaken by the City unless authorized prior by the City Engineer in writing.

CASS SWM-2. Regional Open Channels (CSRF- Major SWM Works)
Any open channel works identified through the Environmental Assessment process that are considered to satisfy a regional benefit to growth are to be identified as separate projects in the DC Background Study and are eligible for a claim from the CSRF- Major SWM Works.

CASS SWM-3. Storm Sewer Oversizing (CSRF- Minor Storm Works inside CASS)
Storm Sewers with all of the following attributes are eligible for a subsidy from the CSRF - Minor Storm Works:

- The sewer services external developable areas, and
- The sewer is greater than 900mm in diameter.

The oversized portion (>900mm) is eligible for a subsidy payable based on an average oversizing cost and is stated in terms of a $/m of pipe constructed. The oversizing subsidy amounts are to be reflected in an appendix of the DC Bylaw. The oversizing subsidy amounts cover the cost per meter of all associated eligible costs including engineering, manholes, restoration, etc.

CASS SWM-4. Open Channel Oversizing (CSRF- Minor Storm Works)
Open Channels with all of the following attributes are eligible for a subsidy from the CSRF - Minor Storm Works:

- An open channel design is required for the reason of inherent site drainage constraints and the design has been accepted by the City Engineer,
- The open channel services external developable areas, and
- The open channel has a 2-year storm design flow cross-sectional area greater than a 900mm sewer using the City's minimum design standards.
- The oversized portion represents the cross-sectional area required in excess of a 900mm sewer for a 2-year storm design. The oversizing subsidy will be calculated based on the additional cost of oversizing beyond an area equivalent to a 900mm pipe size using the City's minimum design standards for a 2-year storm design flow. The oversizing subsidy is payable based on an average oversizing cost in the form of a $/m of channel constructed as calculated by the Owners consulting engineer and as accepted by the City Engineer (or designate). An allowance of 15% will be added to the calculated oversizing amount to cover applicable engineering costs.

CASS SWM-5. Stormwater Management Works (CSRF- Major SWM Works)
Environmental Assessment Complete

Any municipally owned or operated stormwater management works designed to provide capacity to facilitate growth that are identified through the Environmental Assessment process and are considered to satisfy a regional benefit to growth are to be identified as separate projects in the DC Background Study and are eligible for a claim from the CSRF- Major SWM Works.

Environmental Assessment Not Complete
Stormwater Management Works for which an Environmental Assessment has not been completed that are anticipated to satisfy a regional benefit to growth are to be identified as separate area specific contingencies in the DC Background Study and are eligible for a claim from the CSRF- Major SWM Works.

Upon completion of the applicable Environmental Assessment (i.e. no outstanding Part 2 orders), a review of the related area specific contingency and the development charge rate will be undertaken and, if required, a revision to the development charge by-law will be made.

CASS SWM-6. Stormwater Management Facility Land Costs (CSRF- Major SWM Works)
Land will be reimbursed at a specific rate, with different land values assigned to different categories as outlined in the Development Charges By-law.

CASS SWM-7. Major SWM Facility Inlet and Outlet Sewers within the SWM Block(CSRF- Major SWM Works)
Any storm sewers within a Major SWM Facility block that are either upstream or downstream of a facility are considered to satisfy a regional benefit to growth and are eligible for a claim from the CSRF- Major SWM Works.

CASS SWM-8. Major SWM Facility Outlet Sewers outside the SWM Block (CSRF- Major SWM Works or CSRF- Minor Storm Works)
Any major SWM facility outlet sewer that extends outside the SWM block facility is considered to satisfy a regional benefit to growth and is eligible for a claim from the CSRF- Major SWM Works if the outlet sewer is not also used to provide drainage to a development adjacent to the outlet sewer.

In the event that all or a portion of the outlet sewer outside the SWM block is used to provide drainage to a development adjacent to the outlet sewer then the portion of the outlet sewer downstream from the adjacent development is eligible for “Storm Sewer Oversizing” as described in the DC By-law.

CASS SWM-9. Local Service Costs (Developer Cost)
Any pipe or portion of a larger pipe that is less than or equal to 900 mm in diameter are referred to as local works, and undertaken at the Developer’s expense and/or if the work is required to address an upgrade not mentioned in the CASS within the greater distance of either one city block or 150 m radius around the centroid of the development measured from the center of the proposed development frontage.

CASS SWM-10. Temporary Storm Sewers (Developer Cost)
Costs of all storm sewer systems that are temporary or not defined in the DC Background Charge Study shall be borne by the Developer. In order for a temporary work to proceed there must first be provisions for the permanent work within the current Development Charge Background Study.

CASS SWM-11. Temporary Stormwater Management Works (Developer Cost)
Any temporary works or works not included in the approved Development Charges Background Study are at the sole expense of the Developer including operation, maintenance and decommissioning. Approval of temporary works is at the discretion of the City Engineer. Where a temporary facility precedes the construction of a permanent facility, the developer that requires the temporary facility will be required to also assist in making provision for the permanent facility (e.g. secure land for permanent facility) as a condition of approval for the temporary facility. In order for

a temporary work to proceed there must first be provisions for the permanent work within the current Development Charge Background Study.

Best management practices or private drainage systems are not claimable unless identified through the Environmental Assessment process as being required to meet a regional benefit to growth.

The construction of road side ditches, swales, and overland flow routes are not eligible for claim from the City Services Reserve Fund - Stormwater Management.